# Government of the People's Republic of Bangladesh
# Bangladesh Regional Connectivity Project-1
# (BRCP-1)

# COURSEWARE
# ON
# BASIC COMPUTER & DIGITAL MARKETING E-COMMERCE IT TRAINING PARTICIPANTS GUIDE

**Government of the People's Republic of Bangladesh**
**WTO-Cell, Ministry of Commerce**
**Level-12 (West Side), Probashi Kollyan Bhaban**
**71-72 Eskaton Garden Road, Dhaka-1000**

# Table of Content

# MODULE 1: BASIC COMPUTING

## Lesson 1: Basics of Computing

### 1.1 What is a Computer?

A computer is an electronic device that manipulates information, or data. It has the ability to store, retrieve, and process data. You may already know that you can use a computer to type documents, send email, play games, and browse the Web. You can also use it to edit or create spreadsheets, presentations, and even videos.

Characteristics of computers

The characteristics of computers that have made them so powerful and universally useful are speed, accuracy, diligence, versatility and storage capacity. Let us discuss them briefly.

**Speed**

Computers work at an incredible speed. A powerful computer is capable of performing about 3-4 million simple instructions per second.

**Accuracy**

In addition to being fast, computers are also accurate. Errors that may occur can almost always be attributed to human error (inaccurate data, poorly designed system or faulty instructions/programs written by the programmer)

**Diligence**

Unlike human beings, computers are highly consistent. They do not suffer from human traits of boredom and tiredness resulting in lack of concentration. Computers, therefore, are better than human beings in performing voluminous and repetitive jobs.

**Versatility**

Computers are versatile machines and are capable of performing any task as long as it can be broken down into a series of logical steps. The presence of computers can be seen in almost every sphere – Railway/Air reservation, Banks, Hotels, Weather forecasting and many more.

**Storage Capacity**

Today's computers can store large volumes of data. A piece of information once recorded (or stored) in the computer, can never be forgotten

## 1.2 Computer association

1.1 Computer System

Basic Concepts of Computer : computer system (figure 1.1) consists of mainly four basic units; namely input unit, storage unit, central processing unit and output unit. Central Processing unit further includes Arithmetic logic unit and control unit, as shown in Figure 1.2.

A computer performs five major operations or functions irrespective of its size and make. These are

- it accepts data or instructions as input,
- it stores data and instruction
- it processes data as per the instructions,
- it controls all operations inside a computer, and
- It gives results in the form of output.

Functional Units:

**a. Input Unit:** This unit is used for entering data and programs into the computer system by the user for processing.

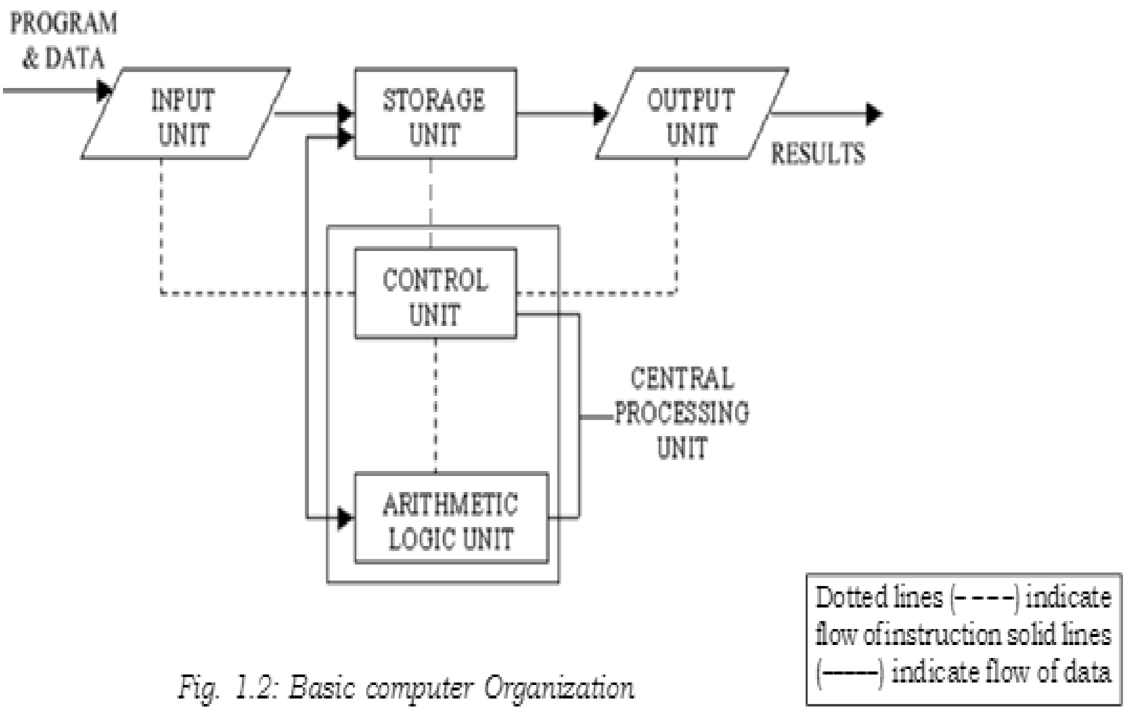



*Fig. 1.2: Basic computer Organization*

**b. Storage Unit:**
The storage unit is used for storing data and instructions before and after processing.
**c. Output Unit:** The output unit is used for storing the result as output produced by the computer after processing.
**d. Processing:** The task of performing operations like arithmetic and logical operations is called processing. The Central Processing Unit (CPU) takes data and instructions from the storage unit and makes all sorts of calculations based on the instructions given and the type of data provided. It is then sent back to the storage unit. CPU includes Arithmetic logic unit (ALU) and control unit (CU)

- **Arithmetic Logic Unit:** All calculations and comparisons, based on the instructions provided, are carried out within the ALU. It performs arithmetic functions like addition, subtraction, multiplication, division and also logical operations like greater than, less than and equal to etc.
- **Control Unit:** Controlling of all operations like input, processing and output are performed by control unit. It takes care of step by step processing of all operations inside the computer.

Memory
Computer's memory can be classified into two types;

- Primary memory and
- Secondary memory

a. **Primary Memory** can be further classified as RAM and ROM:
**RAM** or Random Access Memory is the unit in a computer system. It is the place in a computer where the operating system, application programs and the data in current use are kept temporarily so that they can be accessed by the computer's processor. It is said to be 'volatile' since its contents are accessible only as long as the computer is on. The contents of RAM are no more available once the computer is turned off.

**ROM or Read Only Memory** is a special type of memory which can only be read and contents of which are not lost even when the computer is switched off. It typically contains manufacturer's instructions. Among other things, ROM also stores an initial program called the 'bootstrap loader' whose function is to start the operation of computer system once the power is turned on.

b. **Secondary Memory** RAM is volatile memory having a limited storage capacity. Secondary/auxiliary memory is storage other than the RAM. These include devices that are peripheral and are connected and controlled by the computer to enable permanent storage of programs and data. Secondary storage devices are of two types; magnetic and optical. Magnetic devices include hard disks and optical storage devices are CDs, DVDs, Pen drive, Zip drive etc.

## Hard Disk

*Fig. 1.3: Hard Disk*

Hard disks are made up of rigid material and are usually a stack of metal disks sealed in a box. The hard disk and the hard disk drive exist together as a unit and is a permanent part of the computer where data and programs are saved. These disks have storage capacities ranging from 1GB to 80 GB and more. Hard disks are rewritable.

### Compact Disk

Compact Disk (CD) is portable disk having data storage capacity between 650-700 MB. It can hold large amount of information such as music, full-motion videos, and text etc. CDs can be either read only or read write type.

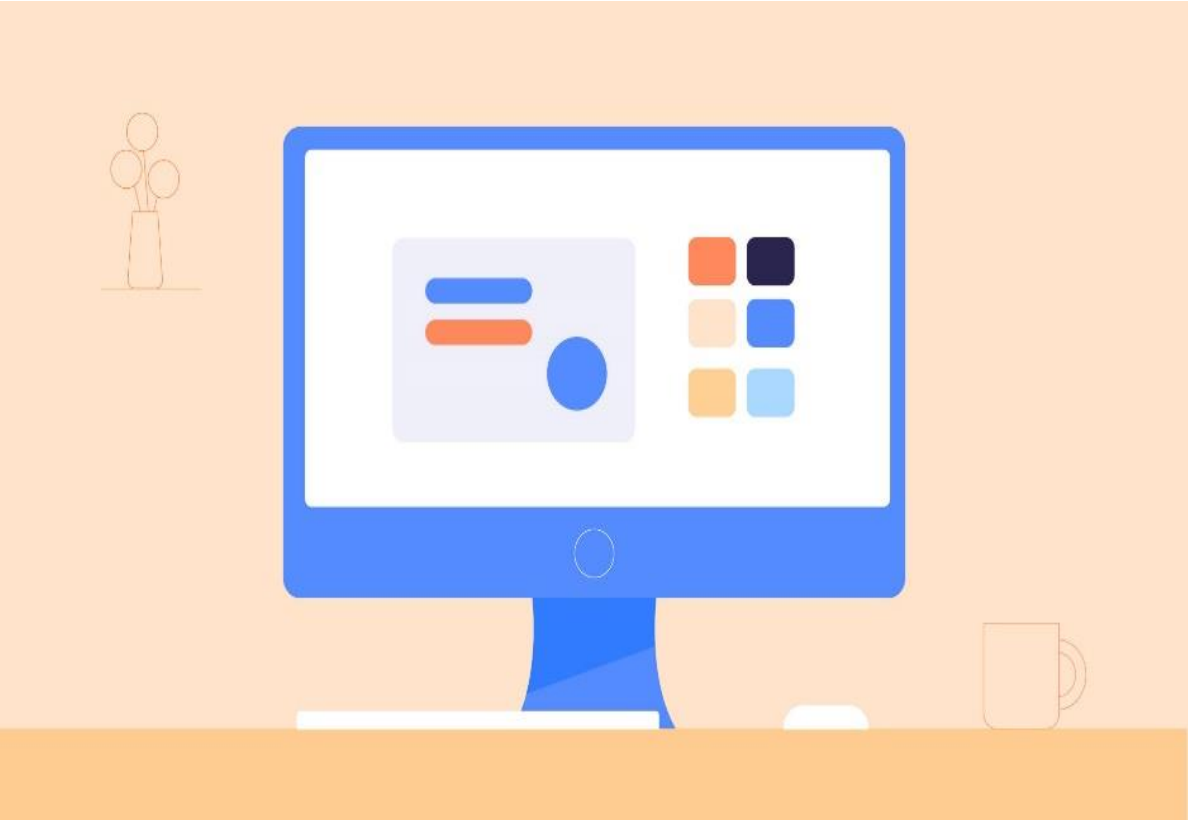
### Digital Video Disk

Digital Video Disk (DVD) is similar to a CD but has larger storage capacity and enormous clarity. Depending upon the disk type it can store several Gigabytes of data. DVDs are primarily used to store music or movies and can be played back on your television or the computer too. These are not rewritable.

## 1.3 What are the different types of computers?

When most people hear the word **computer**, they think of a **personal computer** such as a **desktop** or **laptop**. However, computers come in many shapes and sizes, and they perform many different functions in our daily lives. When you withdraw cash from an ATM, scan groceries at the store, or use a calculator, you're using a type of computer.


Desktop computers

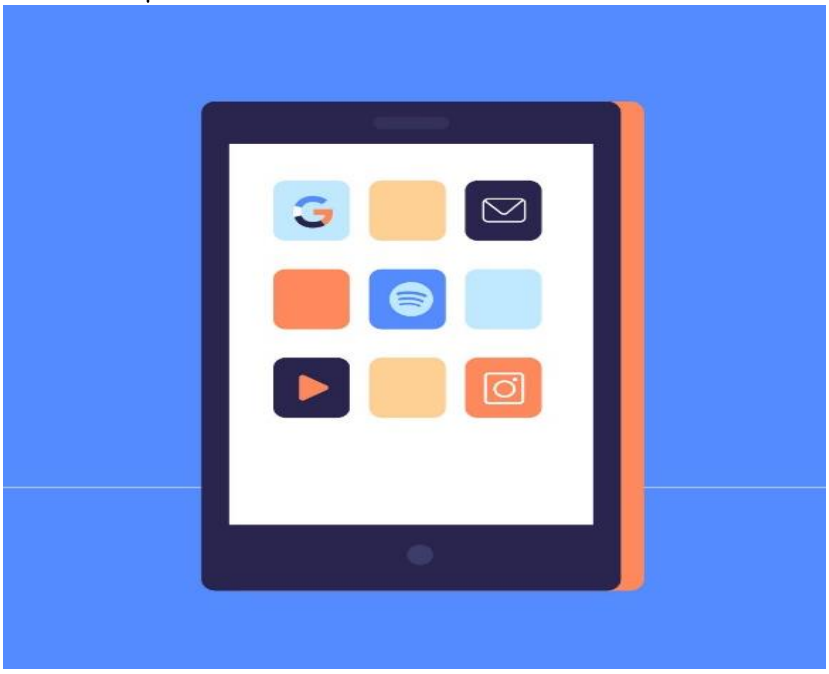


Many people use **desktop computers** at work, home, and school. Desktop computers are designed to be placed on a desk, and they're typically made up of a few different parts, including the **computer case**, **monitor**, **keyboard**, and **mouse**.

Laptop computers

The second type of computer you may be familiar with is a **laptop computer**, commonly called a laptop. Laptops are battery-powered computers that are **more portable** than desktops, allowing you to use them almost anywhere.

Tablet computers



**Tablet computers**—or **tablets**—are handheld computers that are even more portable than laptops. Instead of a keyboard and mouse, tablets use a **touch-sensitive screen** for typing and navigation. The **iPad** is an example of a tablet.

## Servers

A **server** is a computer that serves up information to other computers on a network. For example, whenever you use the Internet, you're looking at something that's stored on a server. Many businesses also use local **file servers** to store and share files internally.

## Other types of computers

Many of today's electronics are basically **specialized computers**, though we don't always think of them that way. Here are a few common examples.

- **Smartphones**: Many cell phones can do a lot of things computers can do, including browsing the Internet and playing games. They are often called **smartphones**.
- **Wearables**: Wearable technology is a general term for a group of devices—including **fitness trackers** and **smartwatches**—that are designed to be worn throughout the day. These devices are often called **wearables** for short.
- **Game consoles**: A **game console** is a specialized type of computer that is used for playing **video games** on your TV.
- **TVs**: Many TVs now include **applications**—or **apps**—that let you access various types of online content. For example, you can stream video from the Internet directly onto your TV.

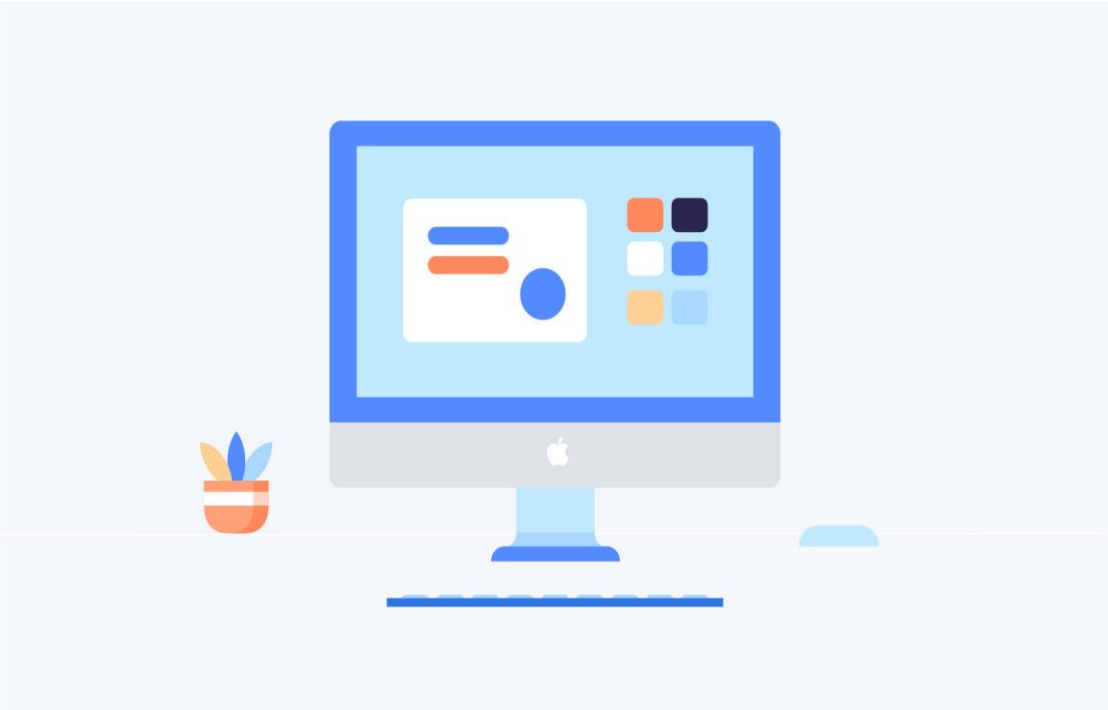
## PCs and Macs

Personal computers come in two main styles: **PC** and **Mac**. Both are fully functional, but they have a different look and feel, and many people prefer one or the other.

**PCs**

This type of computer began with the original **IBM PC** that was introduced in 1981. Other companies began creating similar computers, which were called **IBM PC Compatible** (often shortened to **PC**). Today, this is the most common type of personal computer, and it typically includes the **Microsoft Windows** operating system.

**Macs**



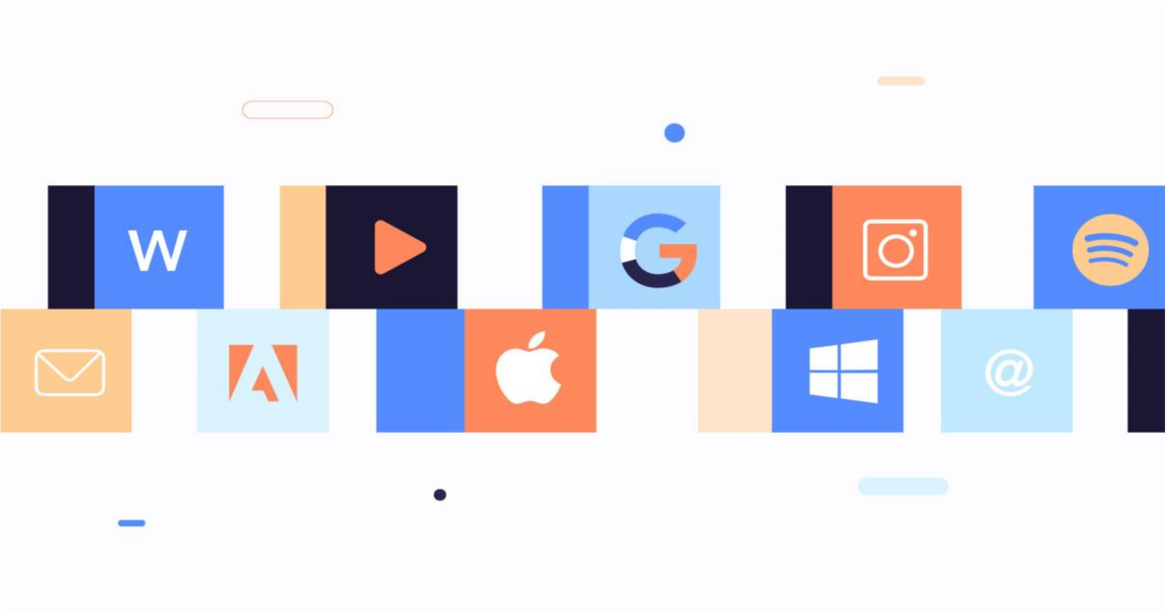
The **Macintosh** computer was introduced in 1984, and it was the first widely sold personal computer with a graphical user interface, or **GUI** (pronounced **gooey**). All Macs are made by one company (**Apple**), and they almost always use the **Mac OS X** operating system.

## 1.4 Hardware vs. software

Before we talk about different types of computers, let's talk about two things all computers have in common: **hardware** and **software**.

- **Hardware** is any part of your computer that has a **physical structure**, such as the keyboard or mouse. It also includes all of the computer's internal parts, which you can see in the image below.

- **Software** is any **set of instructions** that tells the hardware **what to do** and **how to do it**. Examples of software include web browsers, games, and word processors.




Everything you do on your computer will rely on both hardware and software. For example, right now you may be viewing this lesson in a **web browser** (software) and using your **mouse** (hardware) to click from page to page. As you learn about different types of computers, ask yourself about the differences in their hardware. As you progress through this tutorial, you'll see that different types of computers also often use different types of software.

## Lesson 2: Hardware Basics

### 2.1 Basic Parts of a Computer

#### Computer case

The **computer case** is the metal and plastic box that **contains the main components** of the computer, including the motherboard, central processing unit (CPU), and power supply. The front of the case usually has an **On/Off button** and one or more **optical drives**.

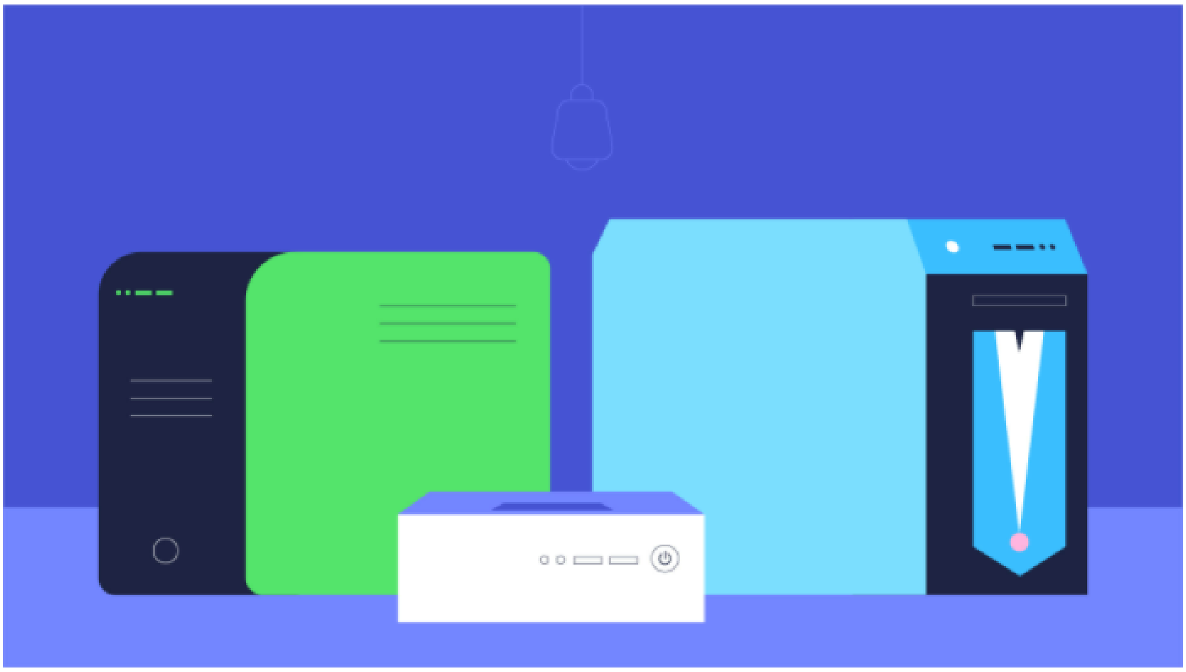
Computer cases come in different shapes and sizes. A **desktop case** lies flat on a desk, and the monitor usually sits on top of it. A **tower case** is tall and sits next to the monitor or on the floor. **All-in-one** computers come with the internal components built into the monitor, which eliminates the need for a separate case.

#### Input / Output Devices:

These devices are used to enter information and instructions into a computer for storage or processing and to deliver the processed data to a user. Input/output devices are required for users to communicate with the computer. In simple terms, input devices bring information INTO the computer and output devices bring information OUT of a computer system. These input/output devices are also known as peripherals since they surround the CPU and memory of a computer system.

#### Input Devices

An input device is any device that provides input to a computer. There are many input devices, but the two most common ones are a keyboard and mouse. Every key you press on the keyboard and every movement or click you make with the mouse sends a specific input signal to the computer.



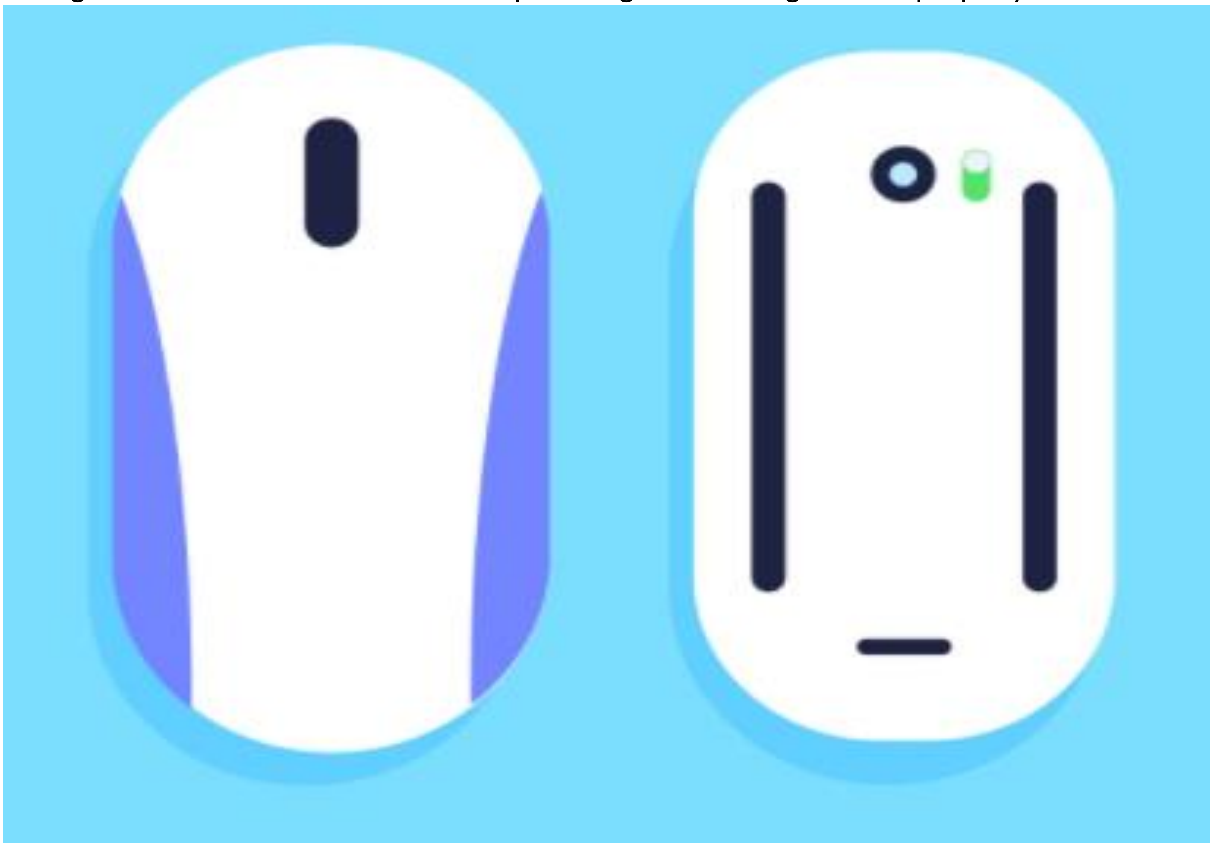
#### Keyboard

The keyboard is one of the main ways to communicate with a computer. There are many different types of keyboards, but most are very similar and allow you to accomplish the same basic tasks.


## Mouse

The mouse is another important tool for communicating with computers. Commonly known as a pointing device, it lets you point to objects on the screen, click on them, and move them.

There are two main mouse types: optical and mechanical. The optical mouse uses an electronic eye to detect movement and is easier to clean. The mechanical mouse uses a rolling ball to detect movement and requires regular cleaning to work properly.



Mouse alternatives

There are other devices that can do the same thing as a mouse. Many people find them easier to use, and they also require less desk space than a traditional mouse. The most common mouse alternatives are below.

- **Trackball**: A trackball has a ball that can rotate freely. Instead of moving the device like a mouse, you can roll the ball with your thumb to move the pointer.
- **Touchpad**: A touchpad—also called a **trackpad**—is a touch-sensitive pad that lets you control the pointer by making a drawing motion with your finger. Touchpads are common on laptop computers.
- **Touch Screen:** It allows the user to operate/make selections by simply touching the display screen. A display screen that is sensitive to the touch of a finger or stylus. Widely used on ATM machines, retail point-of-sale terminals, car navigation systems, medical monitors and industrial control panels.
- **Light Pen:** Light pen is an input device that utilizes a light-sensitive detector to select objects on a display screen.

Some other Input devices

Magnetic ink character recognition (MICR): MICR can identify character printed with a special ink that contains particles of magnetic material. This device particularly finds applications in banking industry.

Optical mark recognition (OMR): Optical mark recognition, also called mark sense reader is a technology where an OMR device senses the presence or absence of a mark, such as pencil mark. OMR is widely used in tests such as aptitude test.

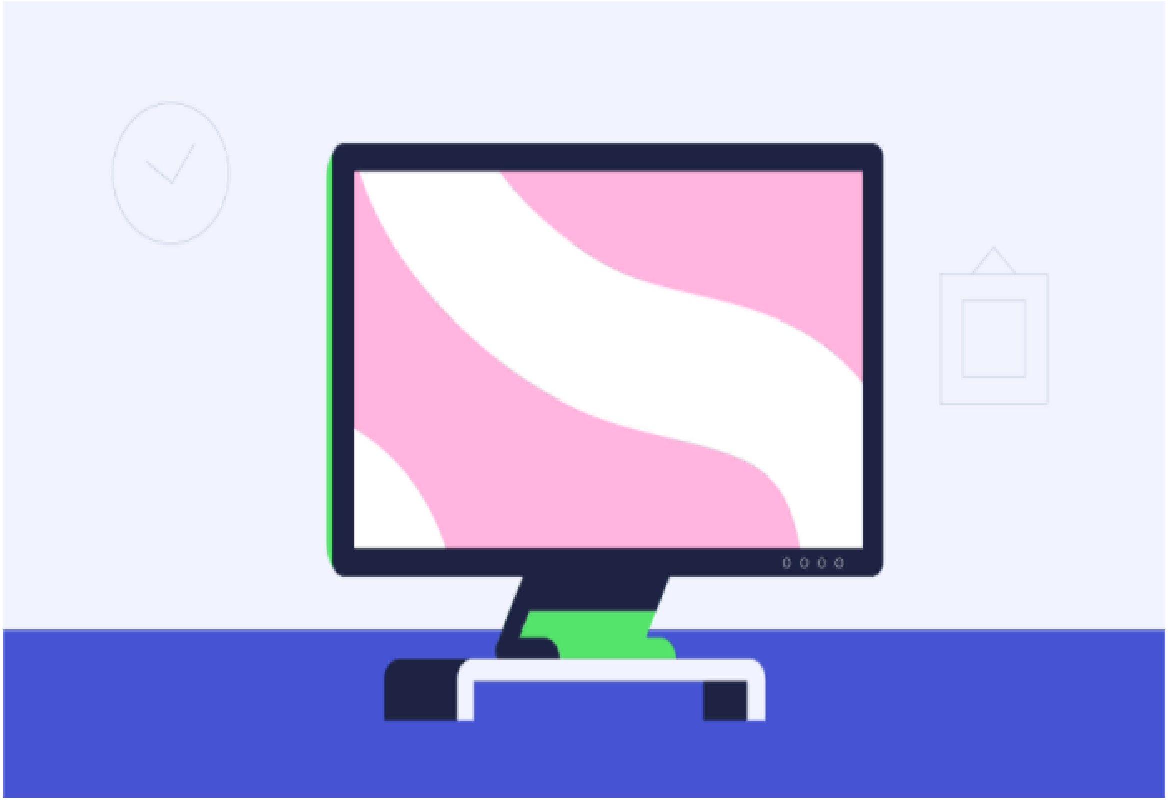
Bar code reader: Bar-code readers are photoelectric scanners that read the bar codes or vertical zebra strips marks, printed on product containers. These devices are generally used in super markets, bookshops etc.

Scanner: Scanner is an input device that can read text or illustration printed on paper and translates the information into a form that the computer can use. A scanner works by digitizing an image.

Output Devices: Output device receives information from the CPU and presents it to the user in the desired from. The processed data, stored in the memory of the computer is sent to the output unit, which then converts it into a form that can be understood by the user. The output is usually produced in one of the two ways – on the display device, or on paper (hard copy).

Monitor

The **monitor** works with a **video card**, located inside the computer case, to display images and text on the screen. Most monitors have **control buttons** that allow you to change your monitor's display settings, and some monitors also have built-in speakers. Newer monitors usually have **LCD** (liquid crystal display) or **LED** (light-emitting diode) displays. These can be made very thin, and they are often called **flat-panel displays**. Older monitors use **CRT** (cathode ray tube) displays. CRT monitors are much larger and heavier, and they take up more desk space.



Printer: Printers are used to produce paper (commonly known as hardcopy) output. Based on the technology used, they can be classified as Impact or Non-impact printers.

**Impact printers** use the typewriting printing mechanism wherein a hammer strikes the paper through a ribbon in order to produce output. Dot-matrix and Character printers fall under this category.

**Non-impact printers** do not touch the paper while printing. They use chemical, heat or electrical signals to etch the symbols on paper. Inkjet, Deskjet, Laser, Thermal printers fall under this category of printers.

Plotter: Plotters are used to print graphical output on paper. It interprets computer commands and makes line drawings on paper using multicolored automated pens. It is capable of producing graphs, drawings, charts, maps etc.

Facsimile (FAX): Facsimile machine, a device that can send or receive pictures and text over a telephone line. Fax machines work by digitizing an image.

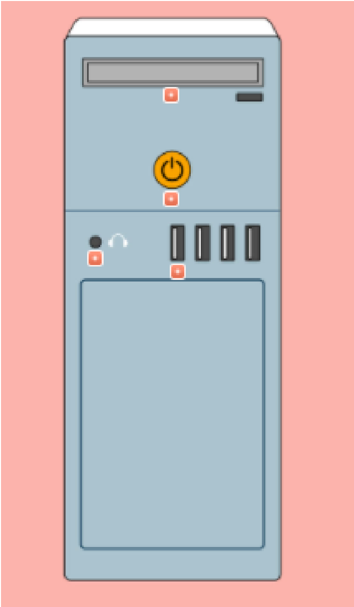
Sound cards and Speaker(s): An expansion board that enables a computer to manipulate and output sounds. Sound cards are necessary for nearly all CD-ROMs and have become commonplace on modern personal computers. Sound cards enable the computer to output sound through speakers connected to the board, to record sound input from a microphone connected to the computer, and manipulate sound stored on a disk.

## 2.2 Buttons and Ports on a Computer

Take a look at the front and back of your computer case and count the number of buttons, ports, and slots you see. Now look at your monitor and count any you find there. You probably counted at least 10, and maybe a lot more.

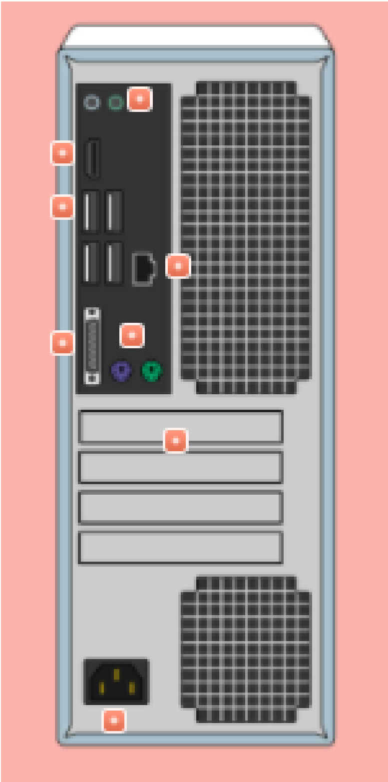
Each computer is different, so the buttons, ports, and sockets will vary from computer to computer. However, there are certain ones you can expect to find on most desktop computers. Learning how these ports are used will help whenever you need to connect something to your computer, like a new printer, keyboard, or mouse.

Front of a computer case



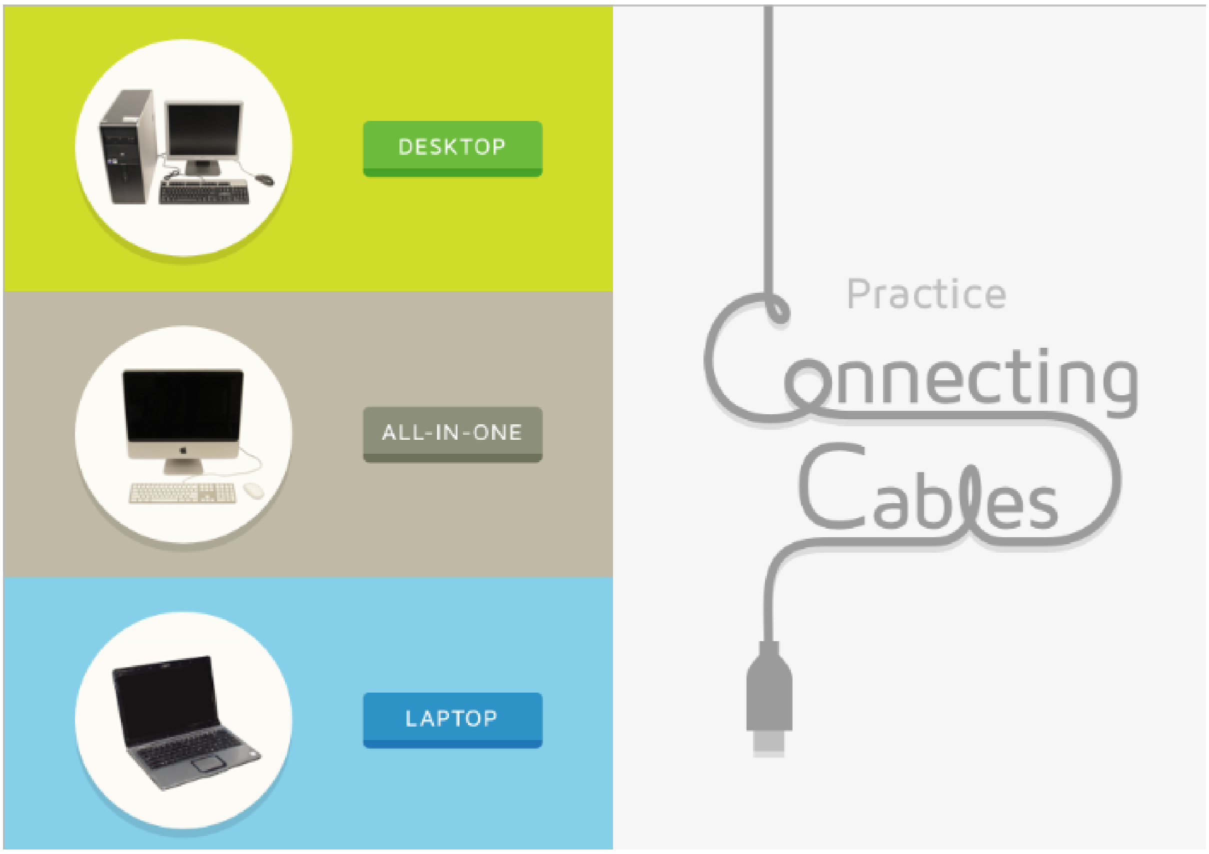
Back of a computer case

The back of a computer case has **connection ports** that are made to fit **specific devices**. The placement will vary from computer to computer, and many companies have their own special connectors for specific devices. Some of the ports may be **color coded** to help you determine which port is used with a particular device.



Other types of ports

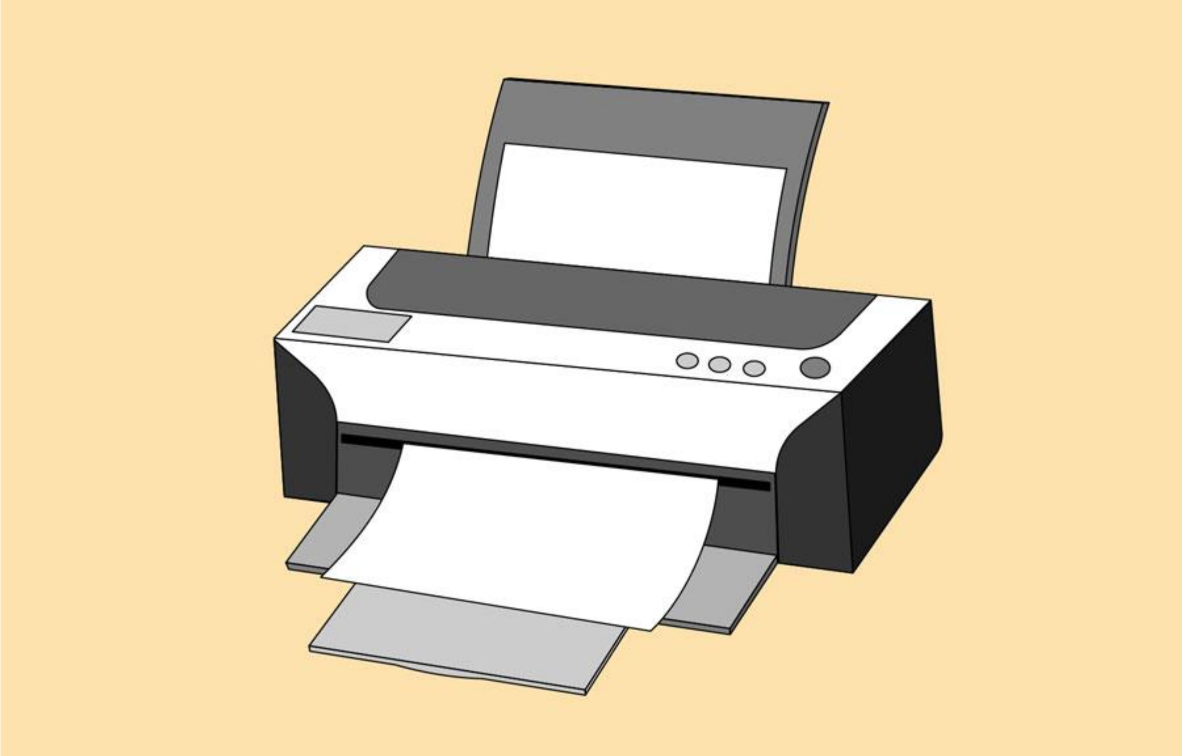
There are many other types of ports, such as FireWire, Thunderbolt, and HDMI. If your computer has ports you don't recognize, you should consult your manual for more information.



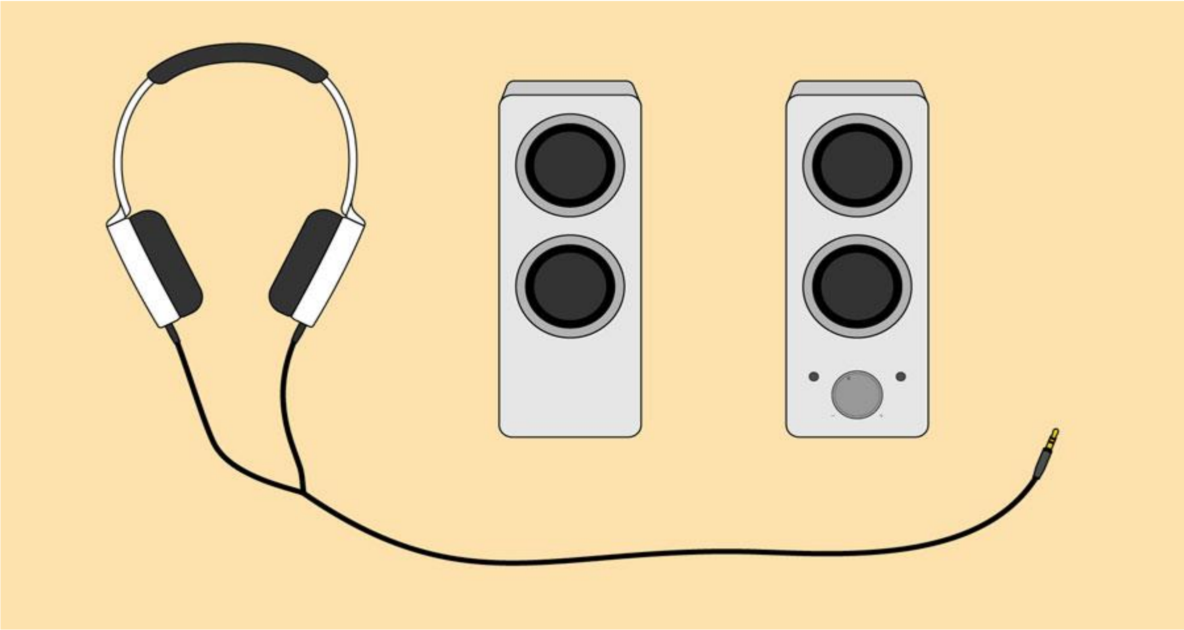

Peripherals you can use with your computer

The most basic computer setup usually includes the **computer case**, **monitor**, **keyboard**, and **mouse**, but you can plug many different types of devices into the extra ports on your computer. These devices are called **peripherals**. Let's take a look at some of the most common ones.

- **Printers**: A **printer** is used to **print** documents, photos, and anything else that appears on your screen. There are many types of printers, including **inkjet**, **laser**, and **photo** printers. There are even **all-in-one printers**, which can also scan and copy documents.



- **Scanners**: A **scanner** allows you to **copy a physical image or document** and save it to your computer as a **digital (computer-readable)** image. Many scanners are included as part of an all-in-one printer, although you can also buy a separate **flatbed** or **handheld** scanner.
- **Speakers/headphones**: **Speakers** and **headphones** are output devices, which means they send information from the computer to the user—in this case, they allow you to **hear sound and music**. Depending on the model, they may connect to the **audio** port or the **USB** port. Some monitors also have built-in speakers.



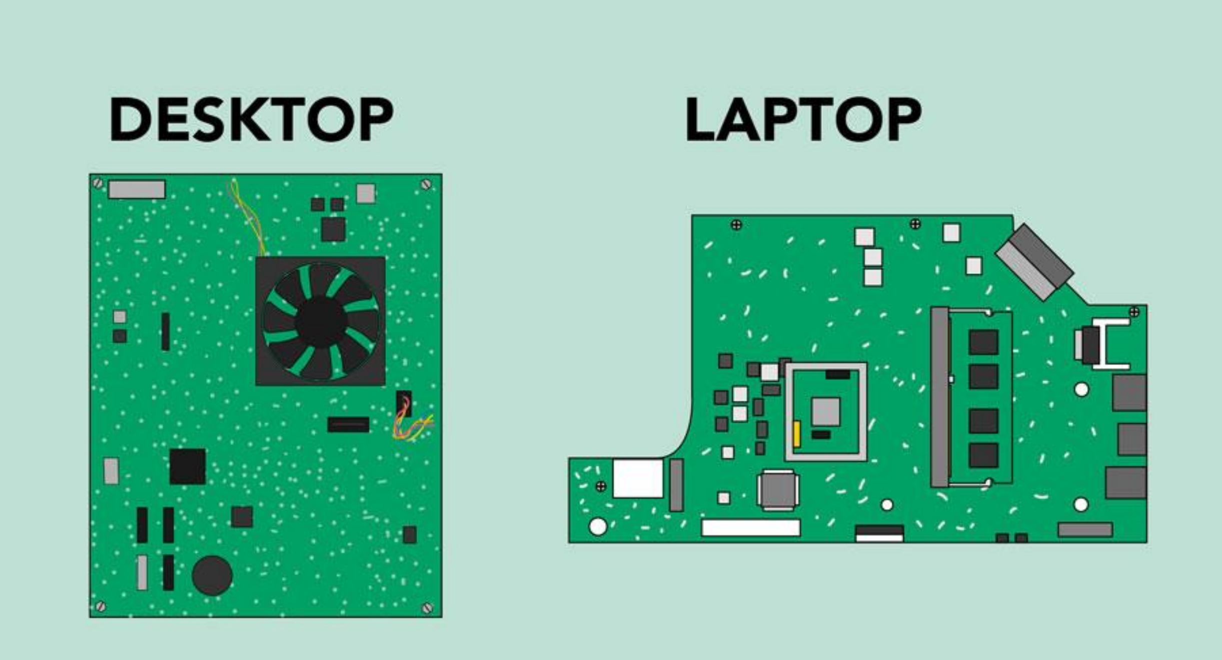
- **Microphones**: A **microphone** is a type of input device, or a device that receives information from a user. You can connect a microphone to **record sound** or **talk with someone else** over the Internet. Many laptop computers come with built-in microphones.

- **Web cameras**: A **web camera**—or **webcam**—is a type of input device that can record **videos** and take **pictures**. It can also transmit video over the Internet in **real time**, which allows for **video chat** or **video conferencing** with someone else. Many webcams also include a microphone for this reason.
- **Game controllers** and **joysticks**: A game controller is used to control computer games. There are many other types of controllers you can use, including **joysticks**, although you can also use your **mouse** and **keyboard** to control most games.
- **Digital cameras**: A **digital camera** lets you capture pictures and videos in a digital format. By connecting the camera to your computer's USB port, you can transfer the images from the camera to the computer.
- **Mobile phones, MP3 players, tablet computers, and other devices**: Whenever you buy an electronic device, such as a mobile phone or MP3 player, check to see if it comes with a **USB cable**. If it does, this means you can most likely connect it to your computer.

## 2.3 Inside a Computer

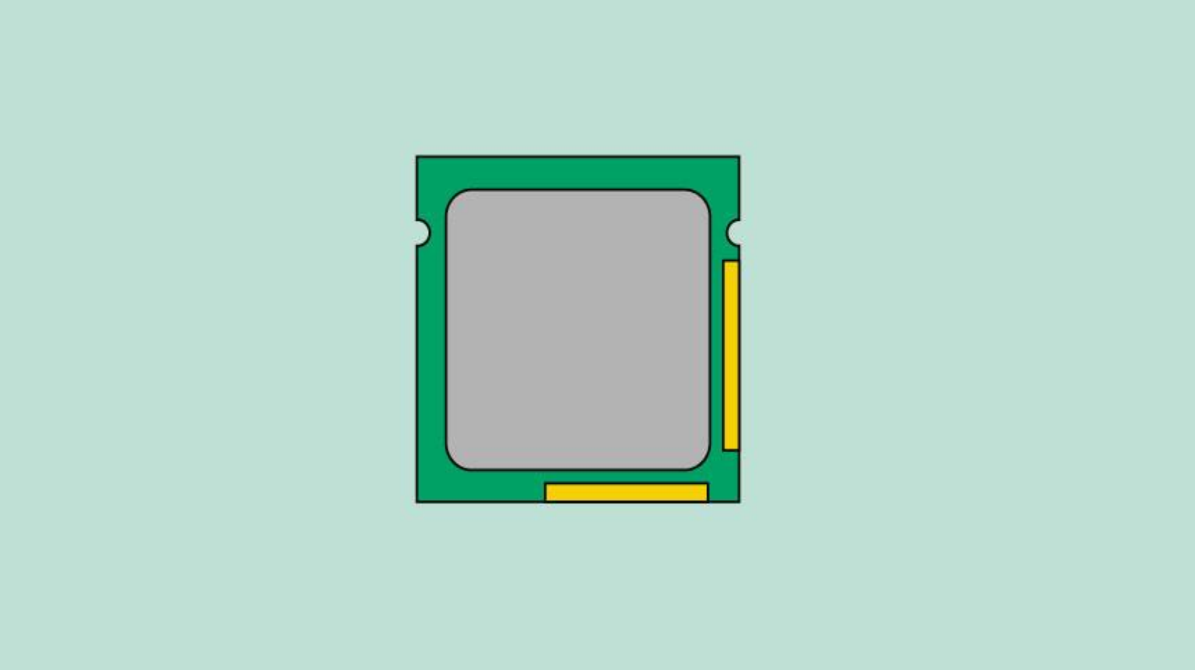
Have you ever looked inside a computer case, or seen pictures of the inside of one? The small parts may look complicated, but the inside of a computer case isn't really all that mysterious. This lesson will help you master some of the basic terminology and understand a bit more about what goes on inside a computer.

Motherboard




The **motherboard** is the computer's **main circuit board**. It's a thin plate that holds the CPU, memory, connectors for the hard drive and optical drives, expansion cards to control the video and audio, and connections to your computer's ports (such as USB ports). The motherboard connects directly or indirectly to every part of the computer.

CPU/processor

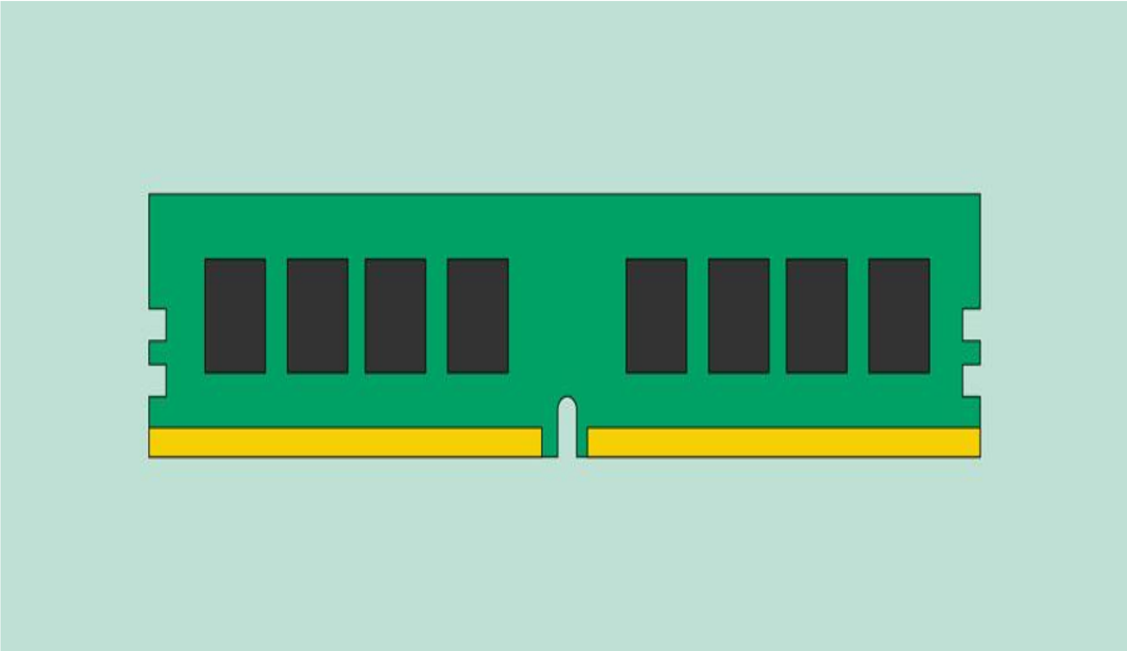


The central processing unit (CPU), also called a **processor**, is located inside the **computer case** on the motherboard. It is sometimes called the brain of the computer, and its job is to carry out commands. Whenever you press a key, click the mouse, or start an application, you're sending instructions to the CPU.

The CPU is usually a **two-inch ceramic square** with a **silicon chip** located inside. The chip is usually about the size of a thumbnail. The CPU fits into the motherboard's **CPU socket**, which is covered by the **heat sink**, an object that absorbs heat from the CPU.

A processor's **speed** is measured in **megahertz (MHz)**, or millions of instructions per second; and **gigahertz (GHz)**, or billions of instructions per second. A faster processor can execute instructions more quickly. However, the actual speed of the computer depends on the speed of many different components—not just the processor.

RAM (random access memory)

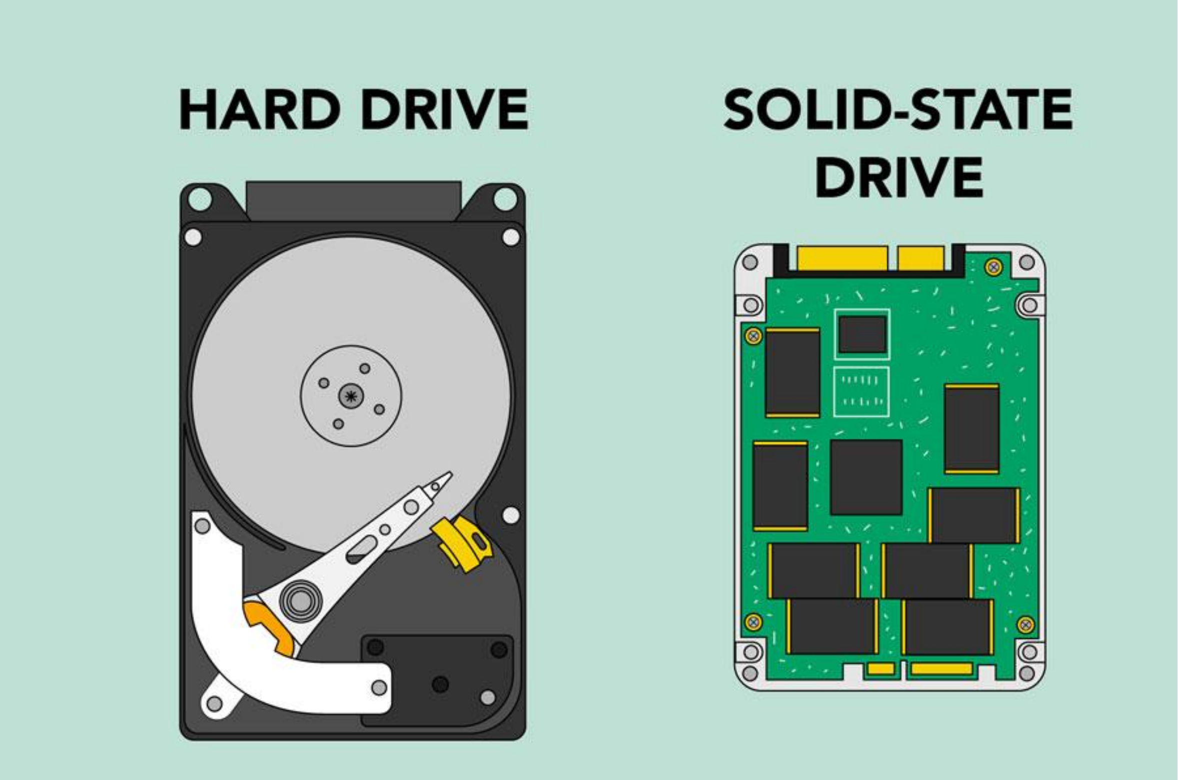


RAM is your system's **short-term memory**. Whenever your computer performs calculations, it temporarily stores the data in the RAM until it is needed.

This **short-term memory disappears** when the computer is turned off. If you're working on a document, spreadsheet, or other type of file, you'll need to **save** it to avoid losing it. When you save a file, the data is written to the **hard drive**, which acts as **long-term storage**.

RAM is measured in **megabytes (MB) or gigabytes (GB)**. The **more RAM** you have, the more things your computer can do at the same time. If you don't have enough RAM, you may notice that your computer is sluggish when you have several programs open. Because of this, many people add **extra RAM** to their computers to improve performance.

Hard drive




The **hard drive** is where your software, documents, and other files are stored. The hard drive is **long-term storage**, which means the data is still saved even if you turn the computer off or unplug it.

When you run a program or open a file, the computer copies some of the data from the **hard drive** onto the **RAM**. When you **save** a file, the data is copied back to the **hard drive**. The faster the hard drive, the faster your computer can **start up** and **load programs**.

### Power supply unit

The power supply unit in a computer **converts the power** from the wall outlet to the type of power needed by the computer. It sends power through cables to the motherboard and other components.

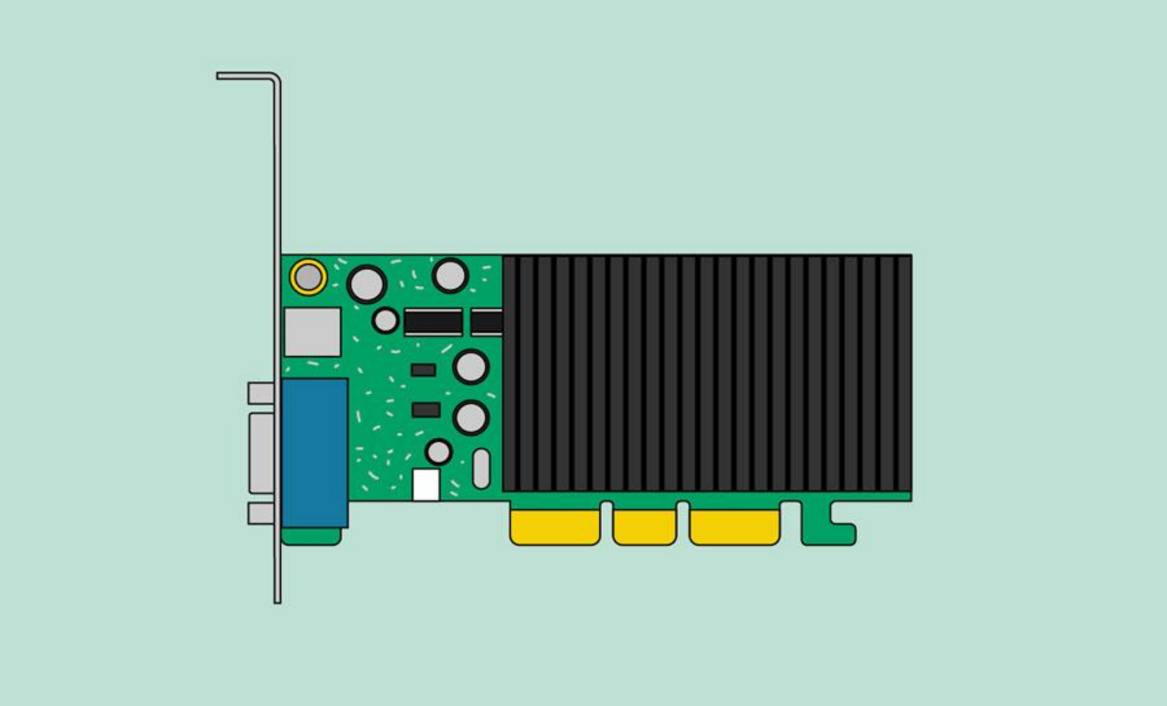
If you decide to open the computer case and take a look, make sure to **unplug** the computer first. Before touching the inside of the computer, you should touch a grounded metal object—or a metal part of the computer casing—to discharge any static buildup. Static electricity can be transmitted through the computer circuits, which can seriously damage your machine.

### Expansion cards

Most computers have **expansion slots** on the motherboard that allow you to add various types of **expansion cards**. These are sometimes called **PCI (peripheral component interconnect) cards**. You may never need to add any PCI cards because most motherboards have built-in video, sound, network, and other capabilities.

However, if you want to boost the performance of your computer or update the capabilities of an older computer, you can always add one or more cards. Below are some of the most common types of expansion cards.

Video card

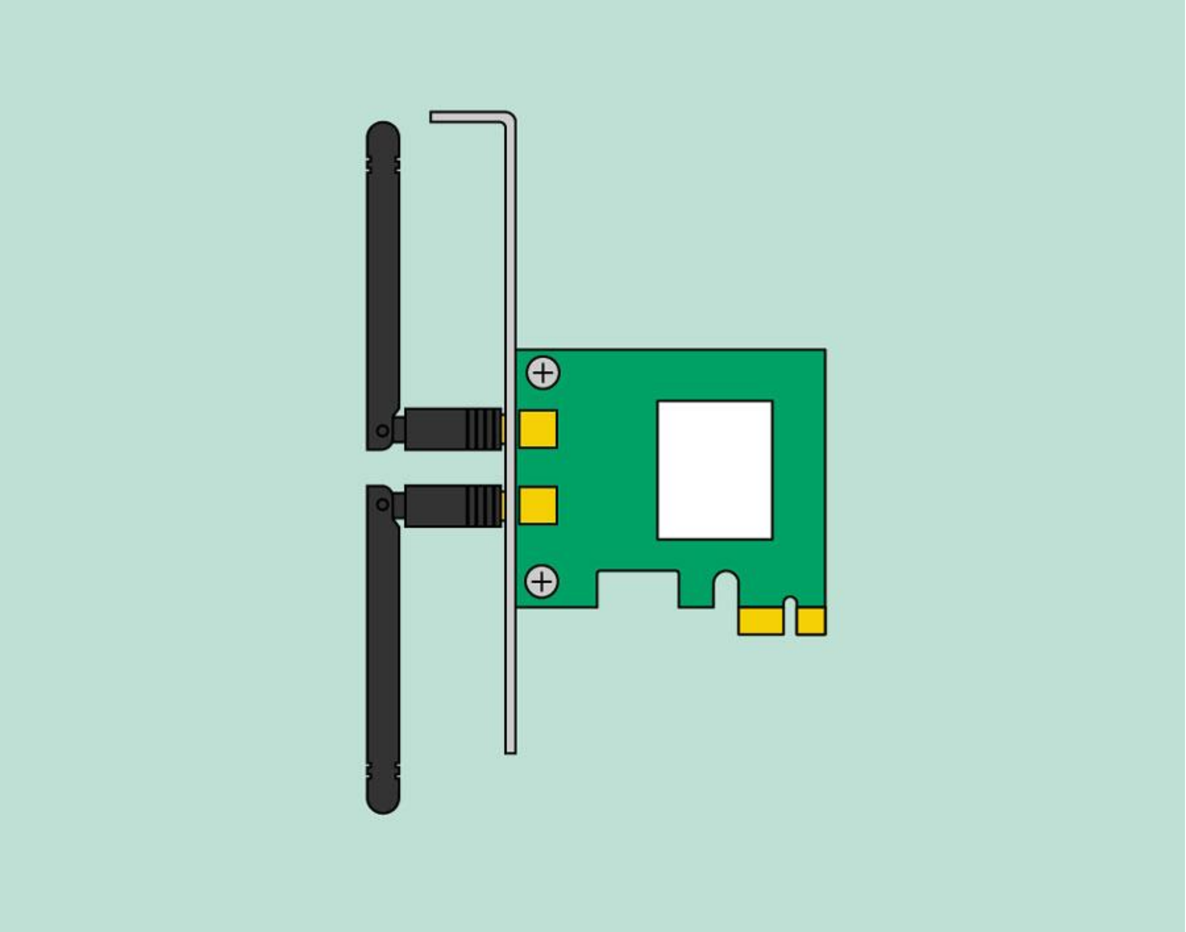


The **video card** is responsible for **what you see** on the monitor. Most computers have a **GPU (graphics processing unit)** built into the motherboard instead of having a separate video card. If you like playing graphics-intensive games, you can add a faster video card to one of the **expansion slots** to get better performance.

Sound card

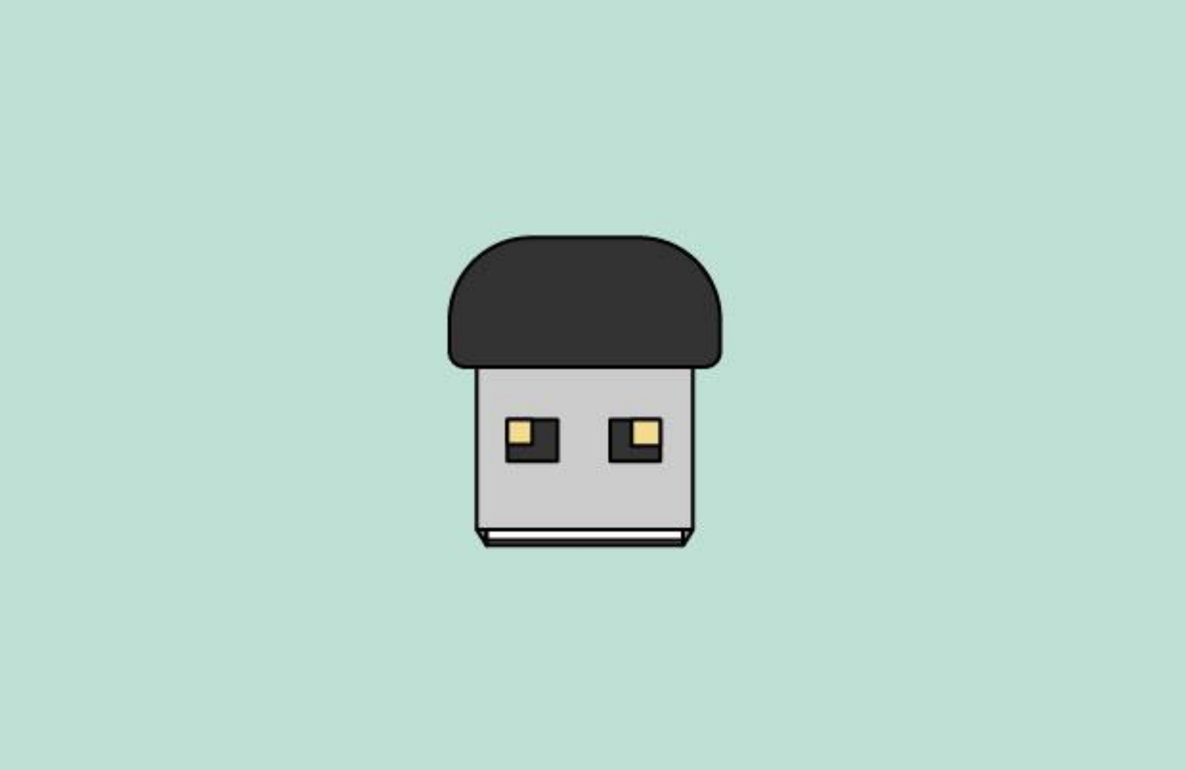
The **sound card**—also called an audio card—is responsible for **what you hear** in the speakers or headphones. Most motherboards have integrated sound, but you can upgrade to a dedicated sound card for higher-quality sound.

Network card



The **network card** allows your computer to communicate over a network and access the Internet. It can either connect with an **Ethernet** cable or through a **wireless** connection (often called **Wi-Fi**). Many motherboards have built-in network connections, and a network card can also be added to an expansion slot.

Bluetooth card (or adapter)



Bluetooth is a technology for wireless communication over short distances. It's often used in computers to communicate with wireless **keyboards**, **mice**, and **printers**. It's commonly built into the motherboard or included in a **wireless network card**. For computers that don't have Bluetooth, you can purchase a USB adapter, often called a **dongle**.

## 2.4 Laptop Computers

A laptop is a personal computer that can be easily moved and used in a variety of locations. Most laptops are designed to have all of the functionality of a desktop computer, which means they can generally run the same software and open the same types of files. However, laptops also tend to be more expensive than comparable desktop computers.

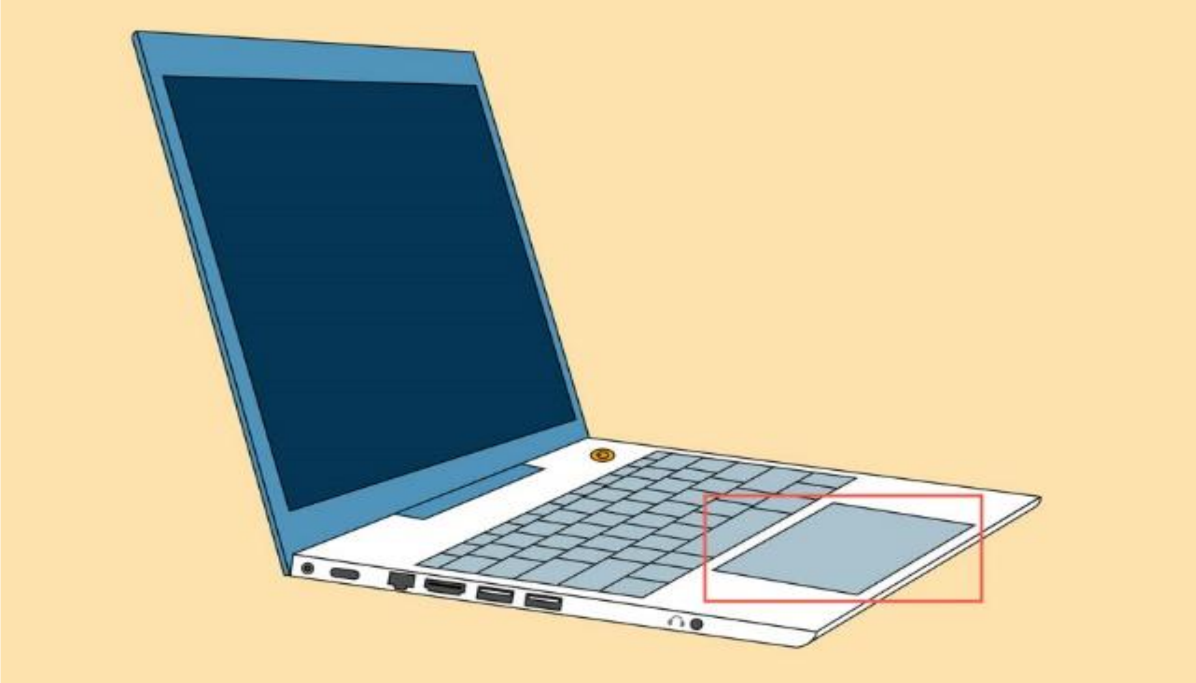
### How is a laptop different from a desktop?

Because laptops are designed for portability, there are some important differences between them and desktop computers. A laptop has an **all-in-one design**, with a built-in **monitor**, **keyboard**, **touchpad** (which replaces the mouse), and **speakers**. This means it is fully functional, even when no peripherals are connected. A laptop is also quicker to set up, and there are fewer cables to get in the way.

You'll also have to the option to connect a regular mouse, larger monitor, and other peripherals. This basically **turns your laptop into a desktop computer**, with one main difference: You can easily disconnect the peripherals and take the laptop with you wherever you go.

Here are the main differences you can expect with a laptop.

- **Touchpad:** A touchpad—also called a **trackpad**—is a touch-sensitive pad that lets you control the pointer by making a drawing motion with your finger.



- **Battery:** Every laptop has a battery, which allows you to use the laptop when it's not plugged in. Whenever you plug in the laptop, the battery **recharges**. Another benefit of having a battery is that it can provide **backup power** to the laptop if the power goes out.
- **AC adapter:** A laptop usually has a specialized power cable called an **AC adapter**, which is designed to be used with that specific type of laptop.

- **Ports:** Most laptops have the same types of ports found on desktop computers (such as **USB**), although they usually have **fewer ports** to save space. However, some ports may be different, and you may need an adapter in order to use them.
- **Price**: Generally speaking, laptops tend to be **more expensive** than a desktop computer with the same internal components. While you may

find that some basic laptops cost less than desktop computers, these are usually much less powerful machines.

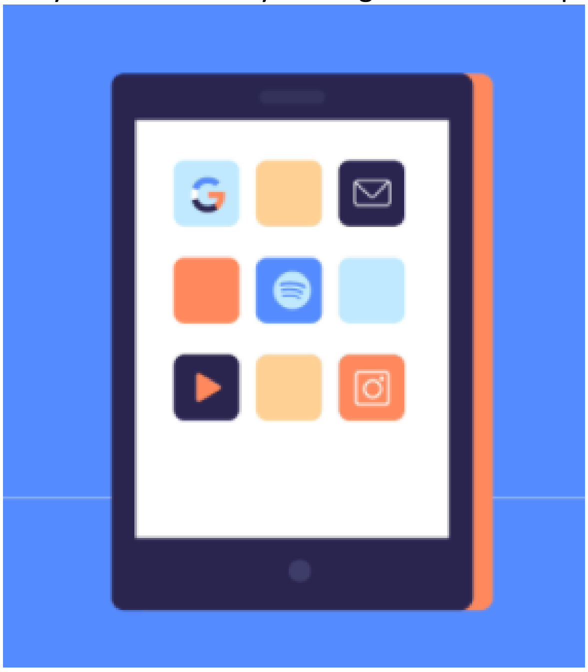
## 2.5 Mobile Devices

### What is a mobile device?

A mobile device is a general term for any type of handheld computer. These devices are designed to be extremely portable, and they can often fit in your hand. Some mobile devices—like tablets, e-readers, and smartphones—are powerful enough to do many of the same things you can do with a desktop or laptop computer.

### Tablet computers

Like laptops, tablet computers are designed to be portable. However, they provide a different computing experience. The most obvious difference is that tablet computers don't have keyboards or touchpads. Instead, the entire screen is touch-sensitive, allowing you to type on a virtual keyboard and use your finger as a mouse pointer.



Tablet computers can't necessarily do everything traditional computers can do. For many people, a traditional computer like a **desktop** or **laptop** is still needed in order to use some programs. However, the convenience of a tablet computer means it may be ideal as a **second computer**.

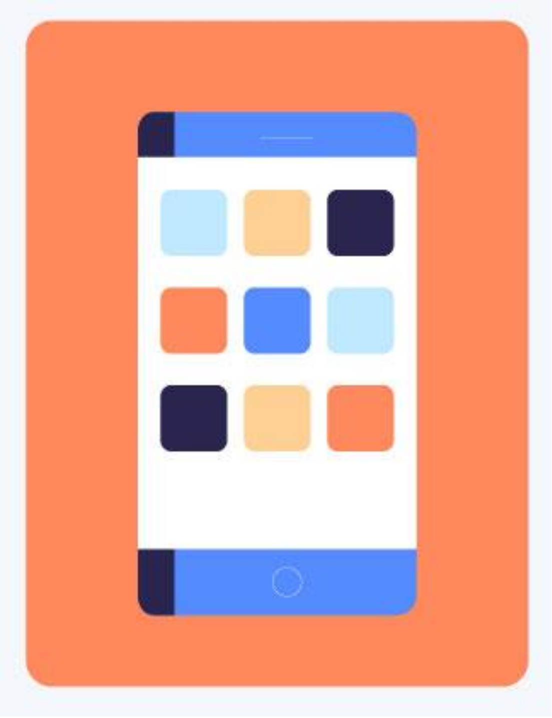
### E-readers

**E-book readers**—also called **e-readers**—are similar to tablet computers, except they are mainly designed for reading **e-books** (digital, downloadable books). Notable examples include the **Amazon Kindle**, **Barnes & Noble Nook**, and **Kobo**. Most e-readers use an **e-ink** display, which is easier to read than a traditional computer display. You can even read in bright sunlight, just like if you were reading a regular book.


You don't need an e-reader to read e-books. They can also be read on **tablets**, **smartphones**, **laptops**, and **desktops**.

Smartphones

A smartphone is a more powerful version of a traditional cell phone. In addition to the same basic features—phone calls, voicemail, text messaging—smartphones can **connect to the Internet** over Wi-Fi or a cellular network (which requires purchasing a monthly **data plan**). This means you can use a smartphone for the same things you would normally do on a computer, such as checking your email, browsing the Web, or shopping online.



Most smartphones use a **touch-sensitive screen**, meaning there isn't a physical keyboard on the device. Instead, you'll type on a virtual keyboard and use your fingers to interact with the display. Other standard features include a high-quality digital camera and the ability to play digital music and video files. For many people, a smartphone can actually replace electronics like an old laptop, digital music player, and digital camera in the same device.

## Lesson 3: Software Basics

### 3.1 Understanding Operating Systems

#### What is an operating system?

An operating system is the most important software that runs on a computer. It manages the computer's memory and processes, as well as all of its software and hardware. It also allows you to communicate with the computer without knowing how to speak the computer's language. Without an operating system, a computer is useless.

System software consists of a group of programs that control the operations of a computer equipment including functions like managing memory, managing peripherals, loading, storing, and is an interface between the application programs and the computer. MS DOS (Microsoft's Disk Operating System), UNIX are examples of system software.

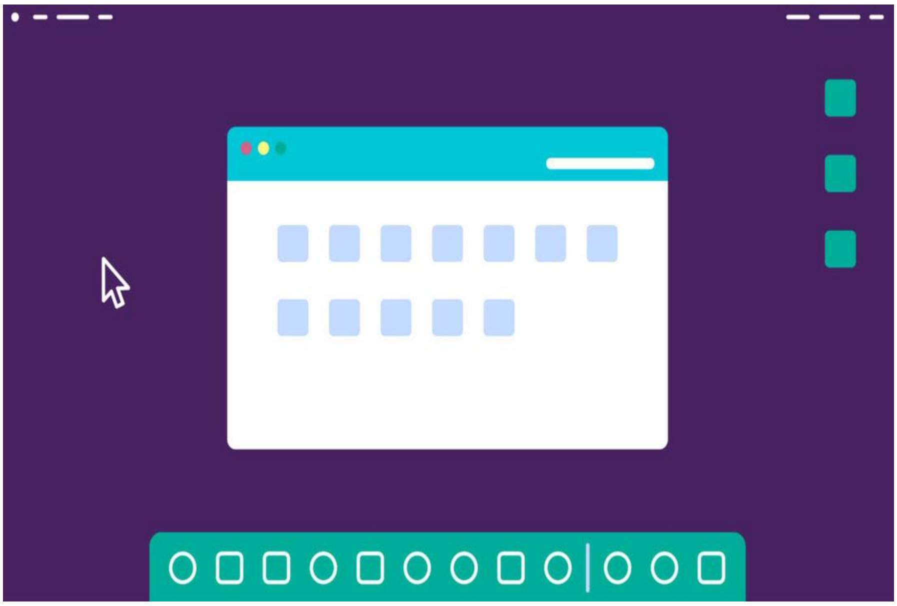
#### The operating system's job

Your computer's **operating system** (**OS**) manages all of the **software** and **hardware** on the computer. Most of the time, there are several different computer programs running at the same time, and they all need to access your computer's **central processing unit (CPU)**, **memory**, and **storage**. The operating system coordinates all of this to make sure each program gets what it needs.

#### Types of operating systems

Operating systems usually come **pre-loaded** on any computer you buy. Most people use the operating system that comes with their computer, but it's possible to upgrade or even change operating systems. The three most common operating systems for personal computers are **Microsoft Windows**, **macOS**, and **Linux**.

Modern operating systems use a **graphical user interface**, or **GUI** (pronounced **gooey**). A GUI lets you use your mouse to click **icons**, **buttons**, and **menus**, and everything is clearly displayed on the screen using a combination of **graphics** and **text**.



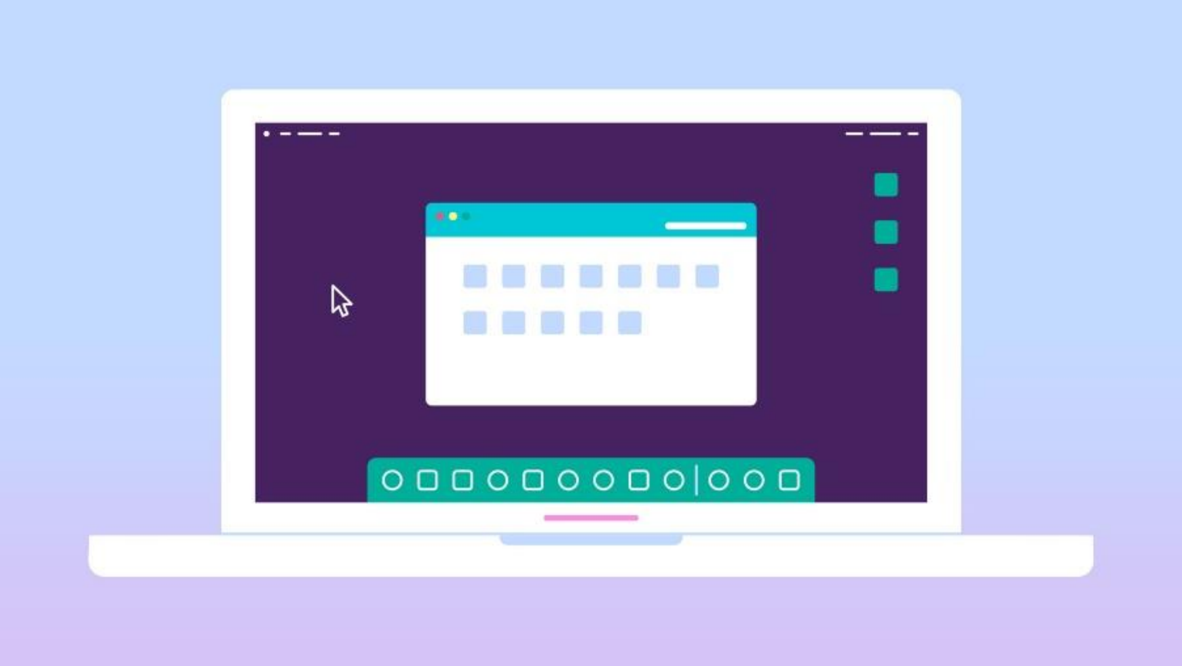
Each operating system's GUI has a different look and feel, so if you switch to a different operating system it may seem unfamiliar at first. However, modern operating systems are designed to be **easy to use**, and most of the basic principles are the same.

Microsoft Windows

Microsoft created the **Windows** operating system in the mid-1980s. There have been many different versions of Windows, but the most recent ones are **Windows 10** (released in 2015), **Windows 8** (2012), **Windows 7** (2009), and **Windows Vista** (2007). Windows comes **pre-loaded** on most new PCs, which helps to make it the **most popular operating system** in the world.

macOS

**macOS** (previously called **OS X**) is a line of operating systems created by Apple. It comes preloaded on all Macintosh computers, or Macs. Some of the specific versions include **Mojave** (released in 2018), **High Sierra** (2017), and **Sierra** (2016).
According to StatCounter Global Stats, macOS users account for less than **10%** of global operating systems—much lower than the percentage of Windows users (more than **80%**). One reason for this is that Apple computers tend to be more expensive. However, many people do prefer the look and feel of macOS over Windows.



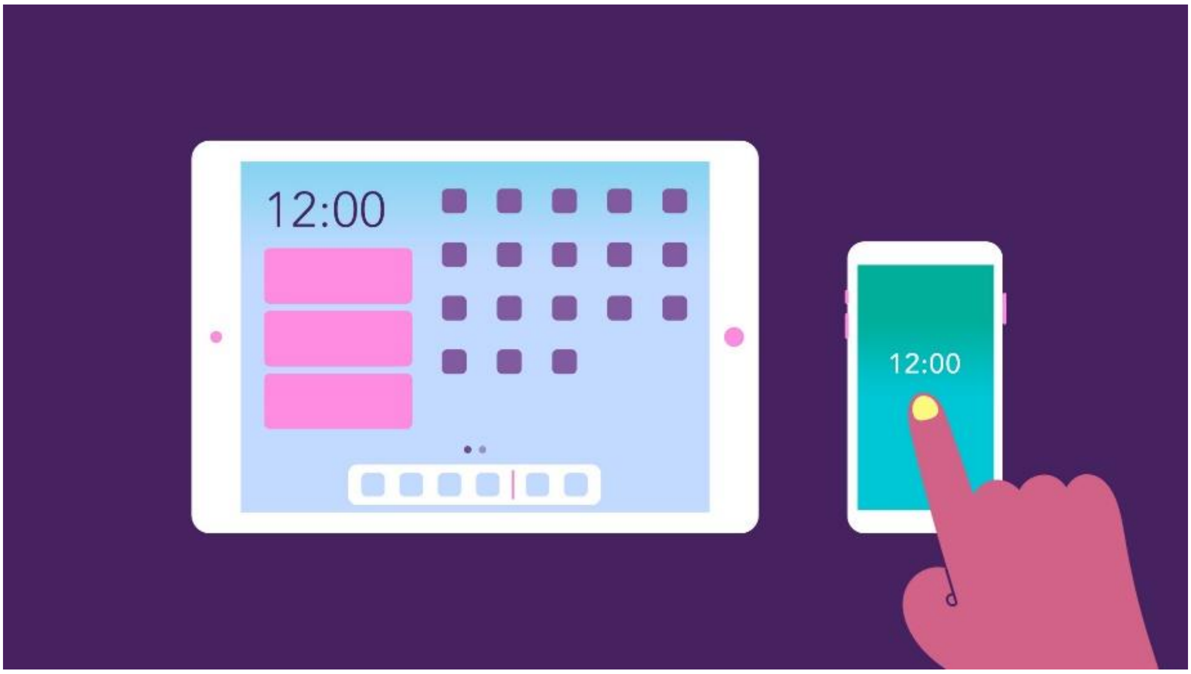
Linux

**Linux** (pronounced **LINN-ux**) is a family of **open-source** operating systems, which means they can be modified and distributed by anyone around the world. This is different from **proprietary software** like Windows, which can only be modified by the company that owns it. The advantages of Linux are that it is **free**, and there are many different **distributions**—or versions—you can choose from.

According to StatCounter Global Stats, Linux users account for less than **2%** of global operating systems. However, most **servers** run Linux because it's relatively easy to customize.

Operating systems for mobile devices

The operating systems we've been talking about so far were designed to run on **desktop** and **laptop** computers. **Mobile devices** such as **phones**, **tablet computers**, and **MP3 players** are different from desktop and laptop computers, so they run operating systems that are designed specifically for mobile devices. Examples of mobile operating systems include **Apple iOS** and **Google Android**. In the screenshot below, you can see iOS running on an iPad.




Operating systems for mobile devices generally aren't as fully featured as those made for desktop and laptop computers, and they aren't able to run all of the same software. However, you can still do a lot of things with them, like watch movies, browse the Web, manage your calendar, and play games.

## 3.2 Understanding Applications

### What is an application?

You may have heard people talking about using a **program**, an **application**, or an **app**. But what exactly does that mean? Simply put, an **app** is a type of software that allows you to **perform specific tasks**. Applications for desktop or laptop computers are sometimes called **desktop applications**, while those for mobile devices are called **mobile apps**. When you open an application, it runs inside the **operating system** until you close it. Most of the time, you will have more than one application open at the same time, which is known as **multi-tasking**.

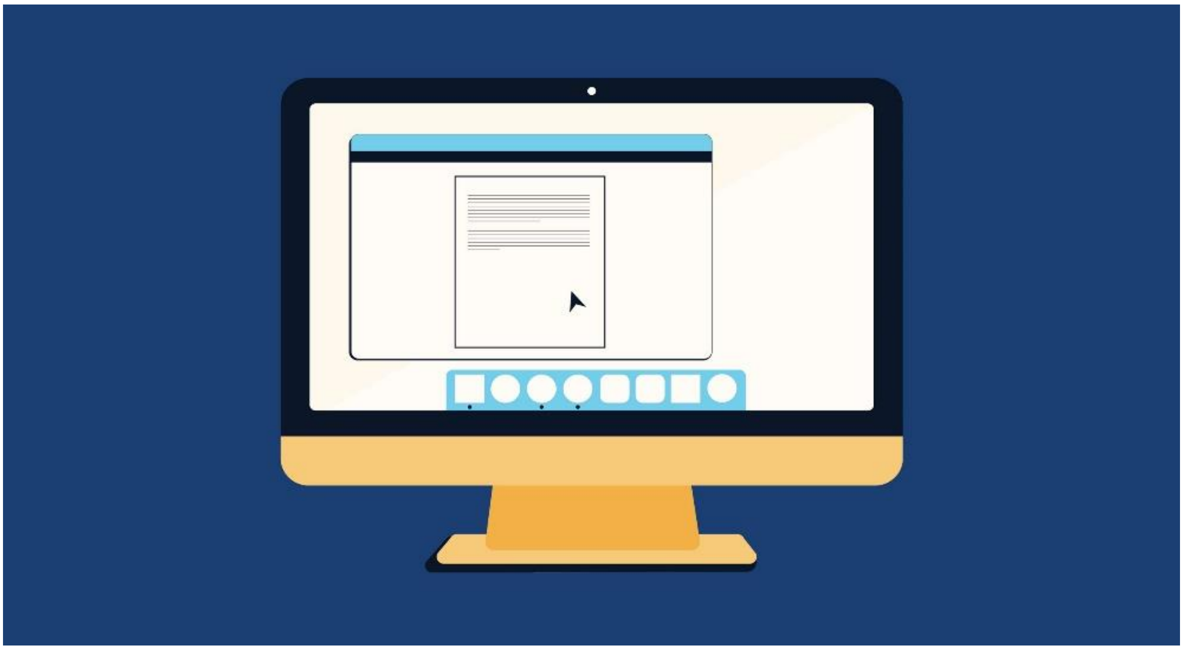
**App** is a common term for an **application**, especially for **simple applications** that can be downloaded **inexpensively** or even **for free**. Many apps are also available for **mobile devices** and even some **TVs**.

Software that can perform a specific task for the user, such as word processing, accounting, budgeting or payroll, fall under the category of application software. Word processors, spreadsheets, database management systems are all examples of general purpose application software. Types of application software are:

### Desktop applications

There are countless desktop applications, and they fall into several categories. Some are more **full featured** (like **Microsoft Word**), while others may only do **one or two things** (like a **clock** or **calendar** app). Below are just a few types of applications you might use.

- **Word processors**: A word processor allows you to write a letter, design a flyer, and create many other types of documents. The most well-known word processor is **Microsoft Word**.



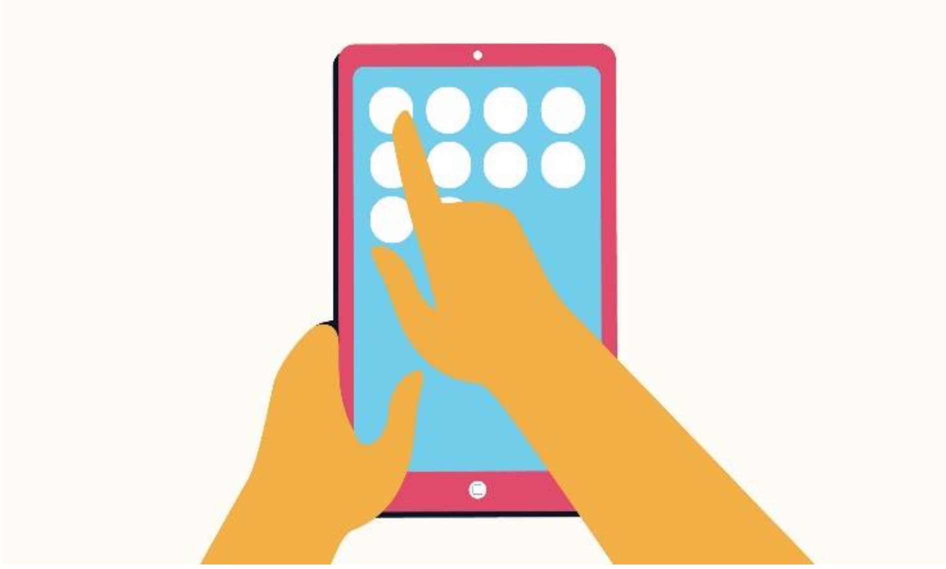
- **Web browsers**: A **web browser** is the tool you use to access the **Internet**. Most computers come with a web browser **pre-installed**, but you can also download a different one if you prefer. Examples of browsers include **Internet Explorer**, **Mozilla Firefox**, **Google Chrome**, and **Safari**.


- **Media players**: If you want to listen to **MP3s** or watch **movies** you've downloaded, you'll need to use a **media player**. **Windows Media Player** and **iTunes** are popular media players.

- **Games**: There are many types of games you can play on your computer. They range from card games like **Solitaire** to action games like **Halo**. Many action games require a lot of **computing power**, so they may not work unless you have a newer computer.
- **Database software:** Database is a collection of related data. The purpose of this software is to organize and manage data. The advantage of this software is that you can Change the way data is stored and displayed. MS access, dBase, FoxPro, Paradox, and Oracle are some of the examples of database software.
- **Spread sheet software:** The spread sheet software is used to maintain budget, financial statements, grade sheets, and sales records. The purpose of this software is organizing numbers. It also allows the users to perform simple or complex calculations on the numbers entered in rows and columns. MS-Excel is one of the example of spreadsheet software.
- **Presentation software:** This software is used to display the information in the form of slide show. The three main functions of presentation software is editing that allows insertion and formatting of text, including graphics in the text and executing the slide shows. The best example for this type of application software is Microsoft PowerPoint.
- **Multimedia software:** Media players and real players are the examples of multimedia software. This software will allow the user to create audio and videos. The different forms of multimedia software are audio converters, players, burners, video encoders and decoders.

Mobile apps

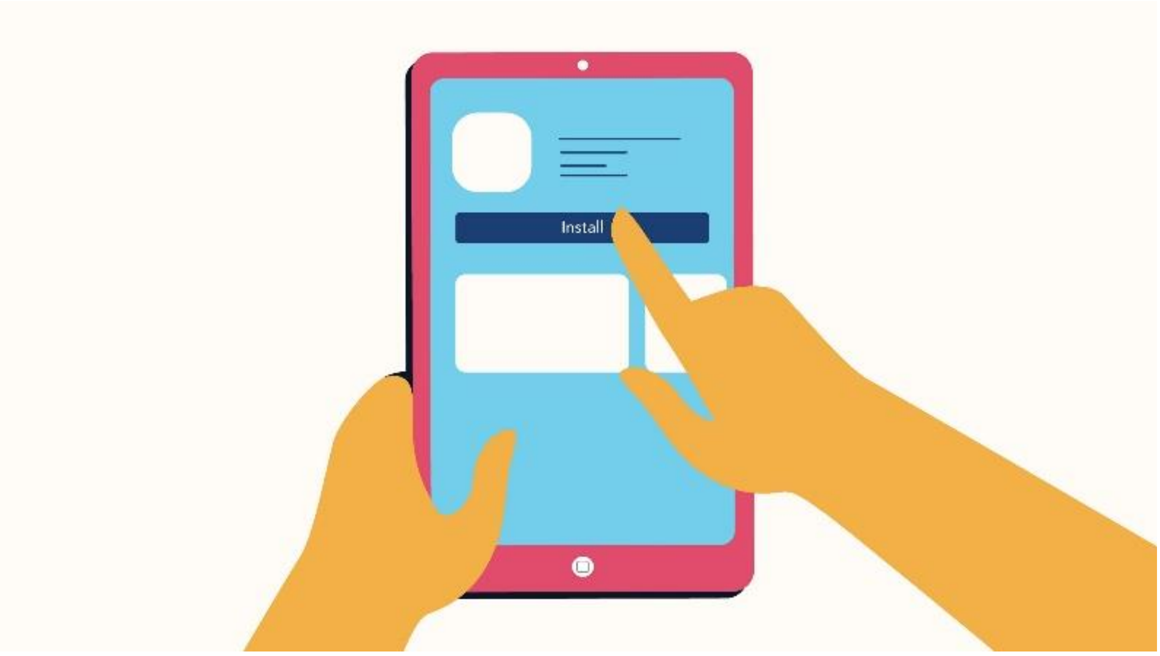
Desktop and laptop computers aren't the only devices that can run applications. You can also download apps for mobile devices like **smartphones** and **tablets**. Here are a few examples of mobile apps.



- **Gmail**: You can use the Gmail app to easily view and send emails from your mobile device. It's available for **Android** and **iOS** devices.
- **Instagram**: You can use Instagram to quickly share photos with your friends and family. It's available for **Android** and **iOS**.
- **Duolingo**: With a combination of quizzes, games, and other activities, this app can help you learn new languages. It's available for **Android** and **iOS**.

Installing new applications

Every computer and mobile device will come with some applications already built in, such as a web browser and media player. However, you can also purchase and install new apps to add more functionality. You can review our lessons on Installing Software on Your Windows PC, Installing Software on Your Mac, and Free Software to learn more.



## Lesson 4: Using a Computer

### 4.1 Setting up a Computer

**Setting up a computer**

So you have a **new computer** and you're ready to set it up. This may seem like an overwhelming and complicated task, but it's actually a lot easier than you might think! Most computers are set up in a similar way, so it doesn't matter what brand of computer you have.

If you're setting up a new computer that's still in the box, you'll probably find a **how-to guide** that includes **step-by-step details**. Even if it didn't include instructions, you can still set up the computer in a **few easy steps**. We'll take you through the different steps needed to set up a typical computer.

Setting up a laptop computer

If you have a laptop, setup should be easy: Just open it and press the power button. If the battery isn't charged, you'll need to plug in the **AC adapter**. You can continue using the laptop while it charges.

If your laptop has any **peripherals**, like **external speakers**, you may want to read the instructions below. Laptops and desktops generally use the same types of connections, so the same steps will still apply.

Setting up a desktop computer

Step 1

Unpack the **monitor** and **computer case** from the box. Remove any plastic covering or protective tape. Place the monitor and computer case on a desk or work area.

Be sure to place your computer case in an area that is **well ventilated** and has good air flow. This will help to prevent the computer from overheating.

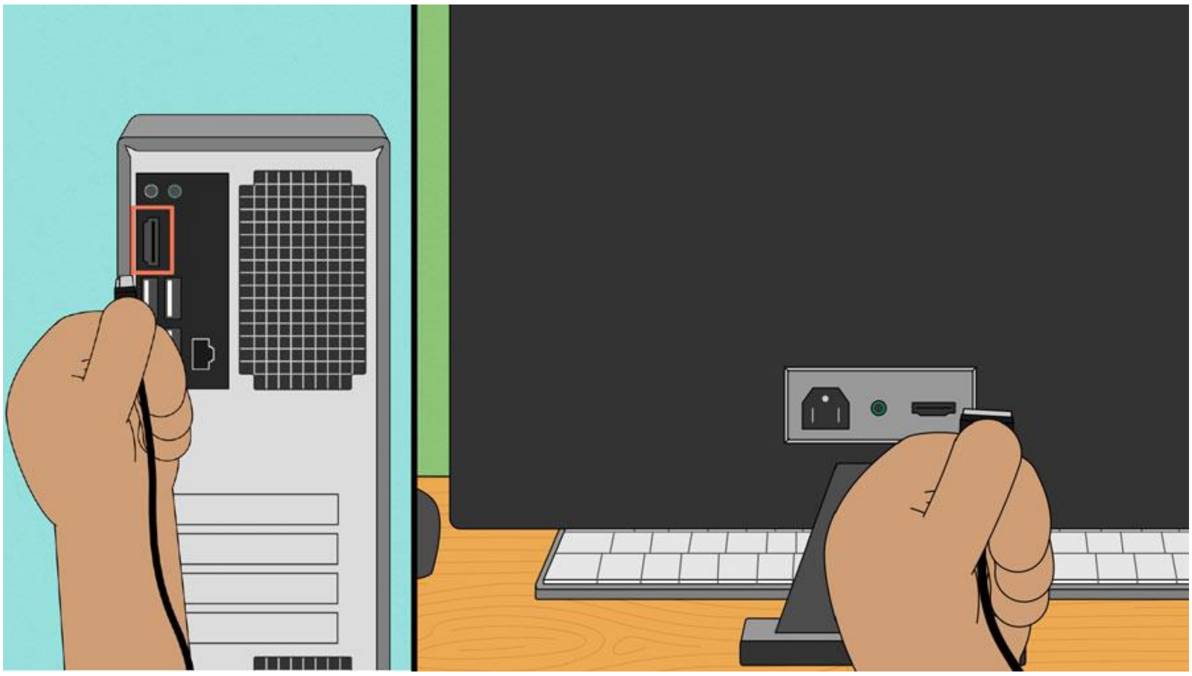
Step 2

Locate the **monitor cable**. There are several types of monitor cables, so the one for your computer may not look like the one in the image below.

If you're having trouble finding your monitor cable, refer to the instruction manual for your computer. (If you have an **all-in-one** computer that's built into the monitor, you can skip to **Step 4**).

Step 3

Connect one end of the cable to the **monitor port** on the back of the **computer case** and the other end to the **monitor**.

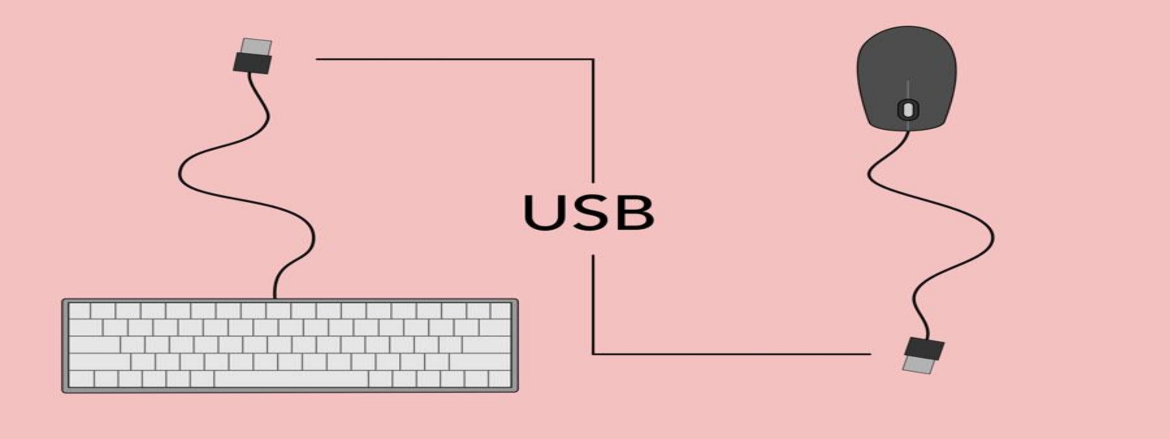


Many computer cables will only fit a specific way. If the cable doesn't fit, don't force it or you might damage the connectors. Make sure the plug aligns with the port, then connect it.

To figure out which cables belong in which ports, try our Connecting Cables interactive.

Step 4

Unpack the **keyboard** and determine whether it uses a **USB** (rectangular) connector or a **PS/2** (round) connector. If it uses a USB connector, plug it into any of the USB ports on the back of the computer. If it uses a PS/2 connector, plug it into the **purple** keyboard port on the back of the computer.




Step 5

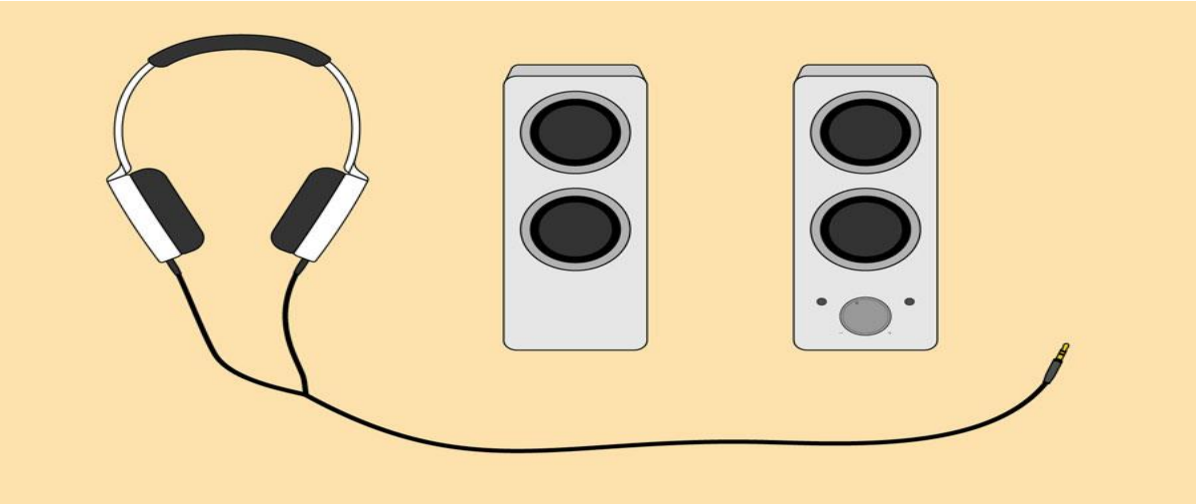
Unpack the **mouse** and determine whether it uses a **USB** or **PS/2** connector. If it uses a USB connector, plug it into any of the USB ports on the back of the computer. If it uses a PS/2 connector, plug it into the **green** mouse port on the back of the computer.

If your keyboard has a **USB port**, you can connect your mouse to the keyboard instead of connecting it directly to your computer.

If you have a **wireless** mouse or keyboard, you may need to connect a Bluetooth **dongle** (USB adapter) to your computer. However, many computers have built-in Bluetooth, so an adapter may not be necessary.

Step 6

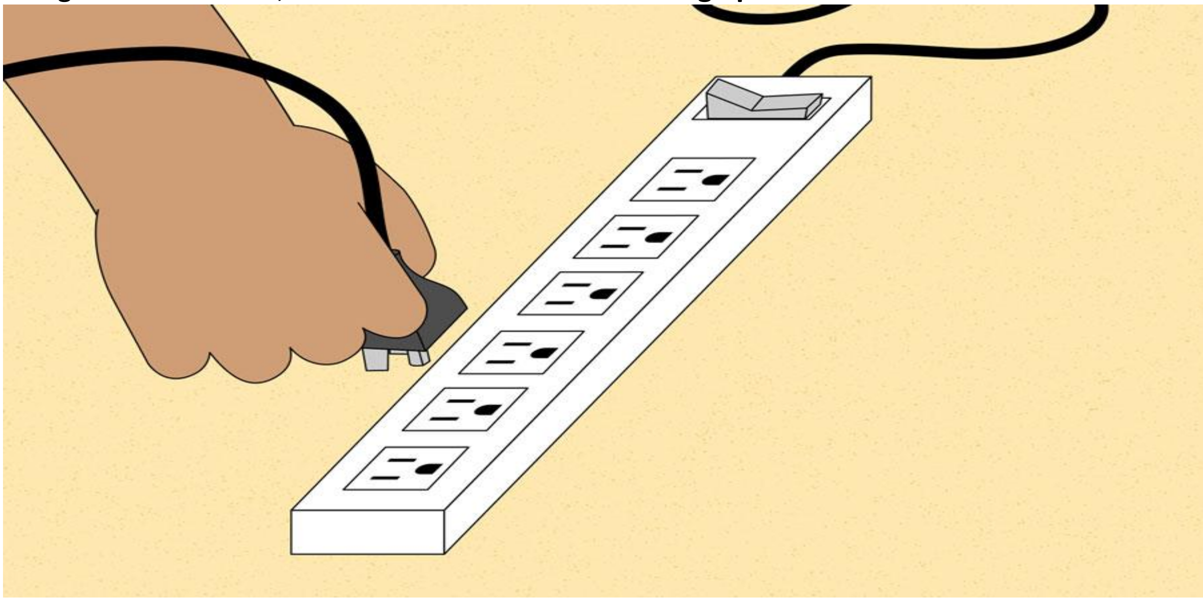
If you have **external speakers** or **headphones**, you can connect them to your computer's **audio port** (either on the front or back of the computer case). Many computers have color-coded ports. **Speakers** or **headphones** connect to the **green** port, and **microphones** connect to the **pink** port. The **blue** port is the **line in**, which can be used with other types of devices.



Some speakers, headphones, and microphones have **USB connectors** instead of the usual audio plug. These can be connected to any USB port. In addition, many computers have speakers or microphones built into the monitor.

Step 7

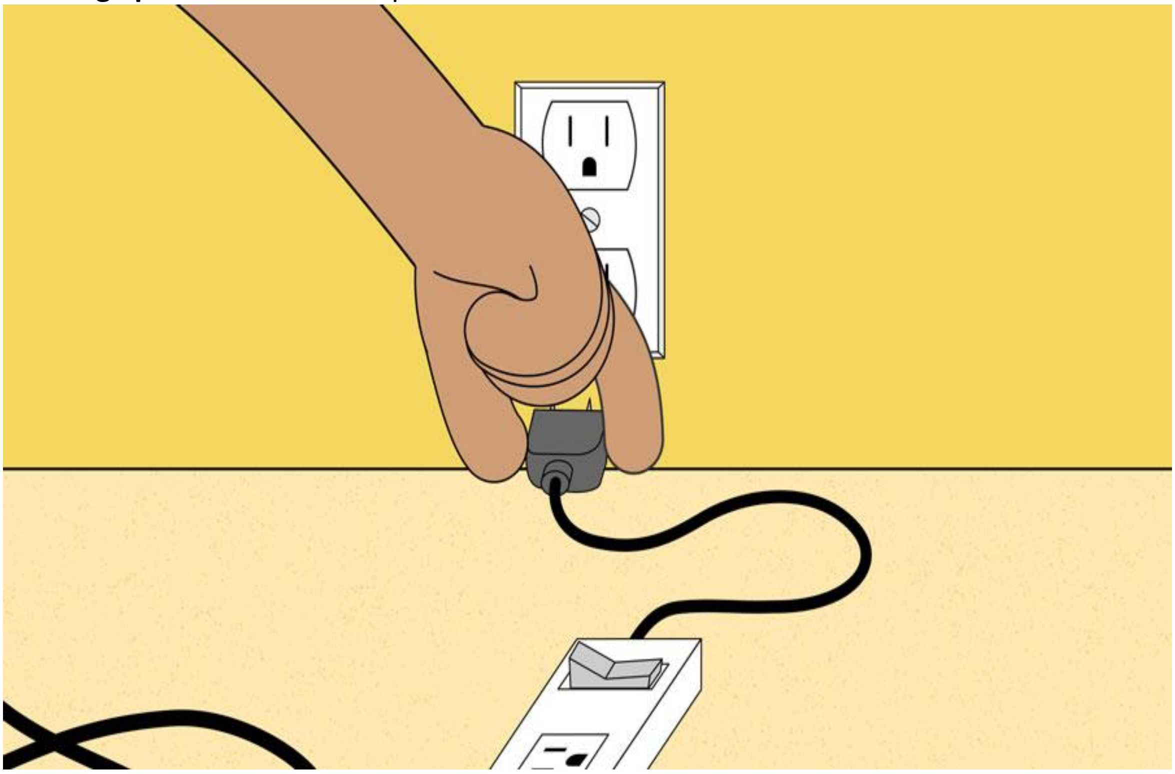
Locate the two **power supply cables** that came with your computer. Plug the first power supply cable into the back of the **computer case** and then into a **surge protector**. Then, using the other cable, connect the **monitor** to the **surge protector**.



You can also use an **uninterruptable power supply (UPS)**, which acts as a surge protector and provides temporary power if there is a power outage.

Step 8

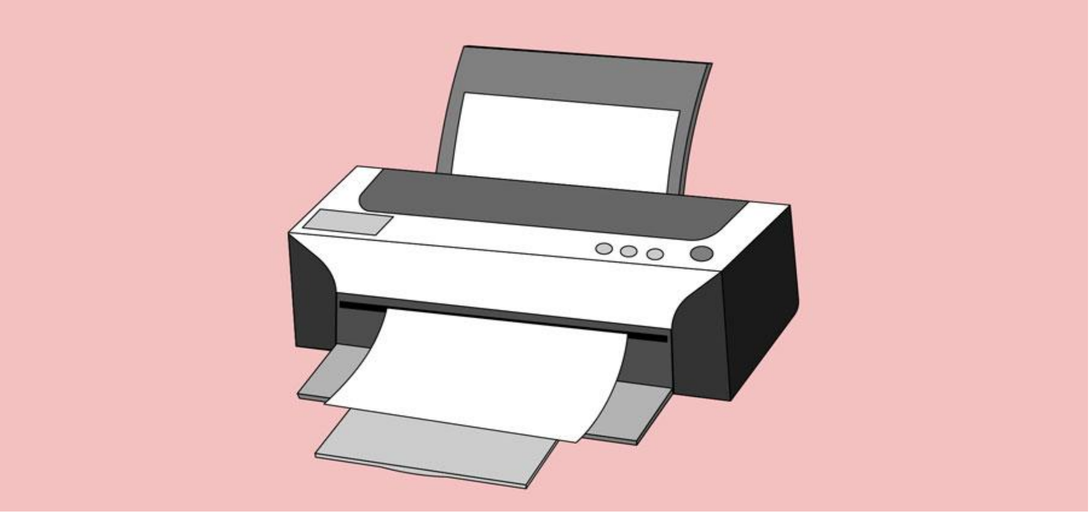
Finally, plug the **surge protector** into a wall outlet. You may also need to turn on the **surge protector** if it has a power switch.



If you don't have a surge protector, you can plug the computer directly into the wall. However, this is **not recommended** because electrical surges can damage your computer.

Step 9

If you have a **printer**, **scanner**, **webcam**, or other **peripherals**, you can connect them at this point. Many peripherals are **plug and play**, which means they will be recognized by your computer as soon as they are plugged in.



Other peripherals may include **software** that needs to be installed before you can begin using them. Use the instructions included with the device to install it if necessary.

Generally, peripherals are **optional**, and you can add new ones at any time; you don't have to add all peripherals during the initial setup of your computer.

Setup complete!

That's it—you've finished setting up your computer, so it's time to start using it!

## 4.2 Getting Started with Your First Computer

### Getting started with your first computer

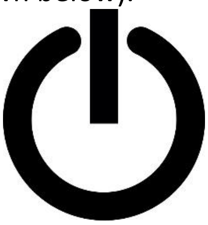
A computer is more than just another household appliance. The vast amount of information and possibilities can be overwhelming. But you can accomplish a lot with a computer, and using one can be a good experience. Let's walk through getting started with your first computer.

Turning on a computer for the first time can be different from one computer to the next. Your experience could be different from this lesson. It's OK to ask someone for help.

If you're using a desktop computer, you'll need to make sure that the keyboard, mouse, and monitor are plugged into the computer case before you continue. Review our lesson on **Setting Up a Computer** to learn how.

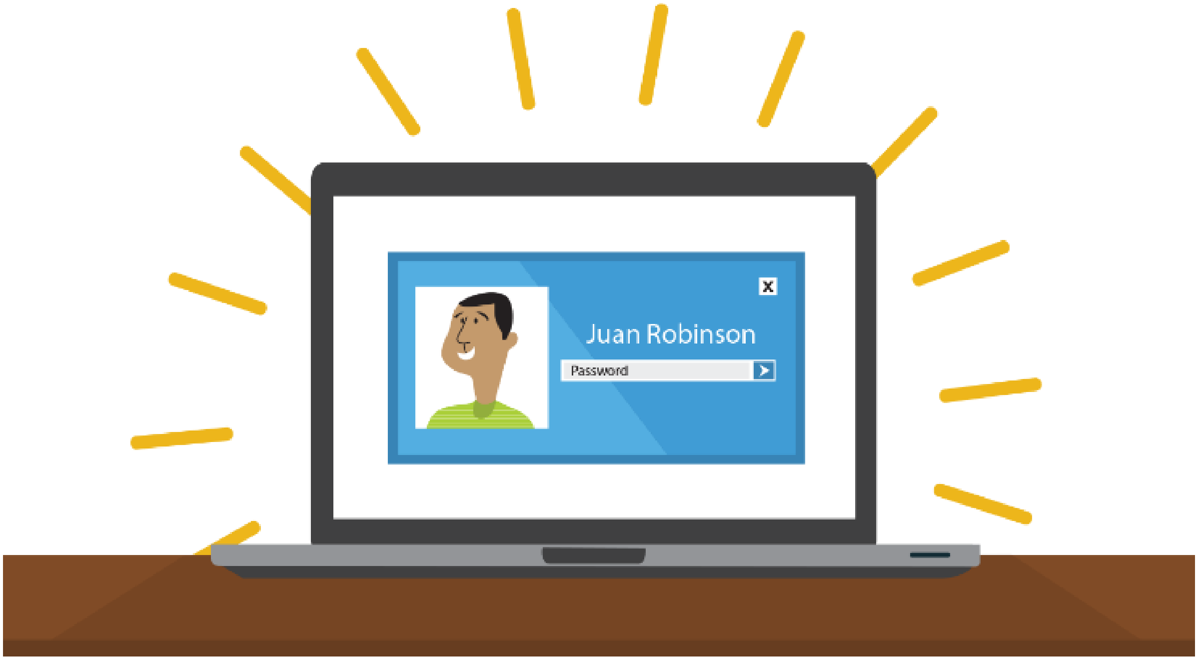
### Turning on a computer

The very first step is to **turn on** the computer. To do this, locate and press the **power** button. It's in a different place on every computer, but it will have the universal power button symbol (shown below).



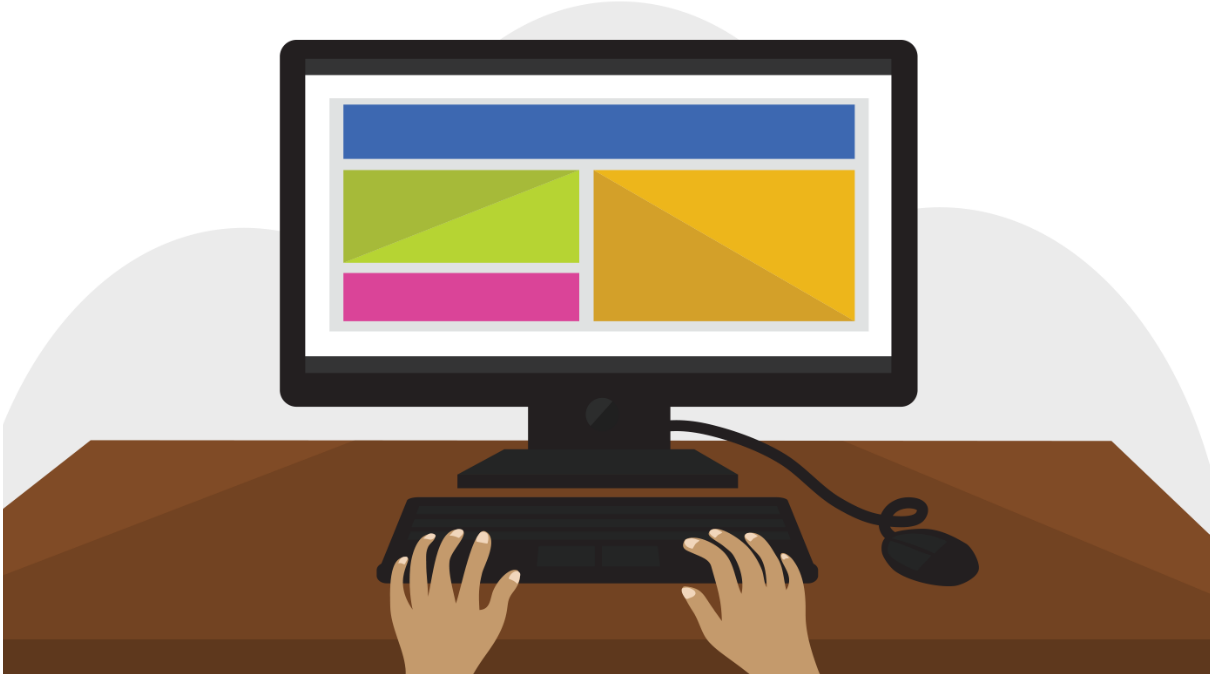
Once turned on, your computer takes time before it's ready to use. You may see a few different displays flash on the screen. This process is called **booting up**, and it can take anywhere from 15 seconds to several minutes.

Once the computer has **booted up**, it may be ready to use, or it may require you to **log in**. This means identifying yourself by typing your user name or selecting your profile, then typing your password. If you've never logged in to your computer before, you may need to **create an account**.

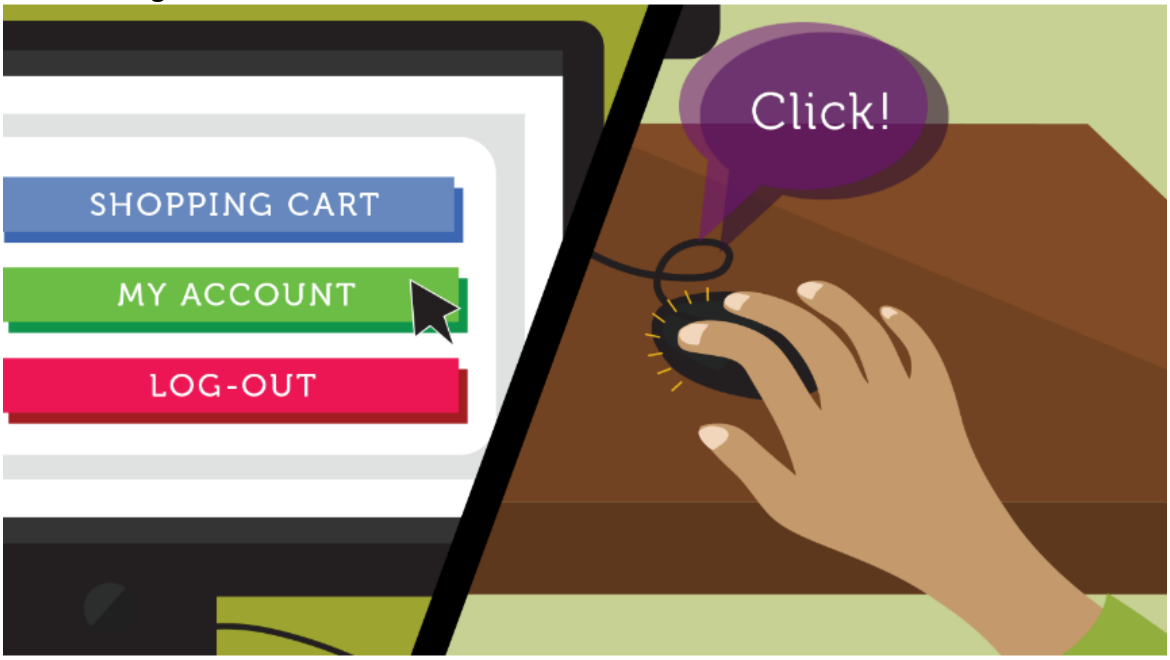



The keyboard and mouse

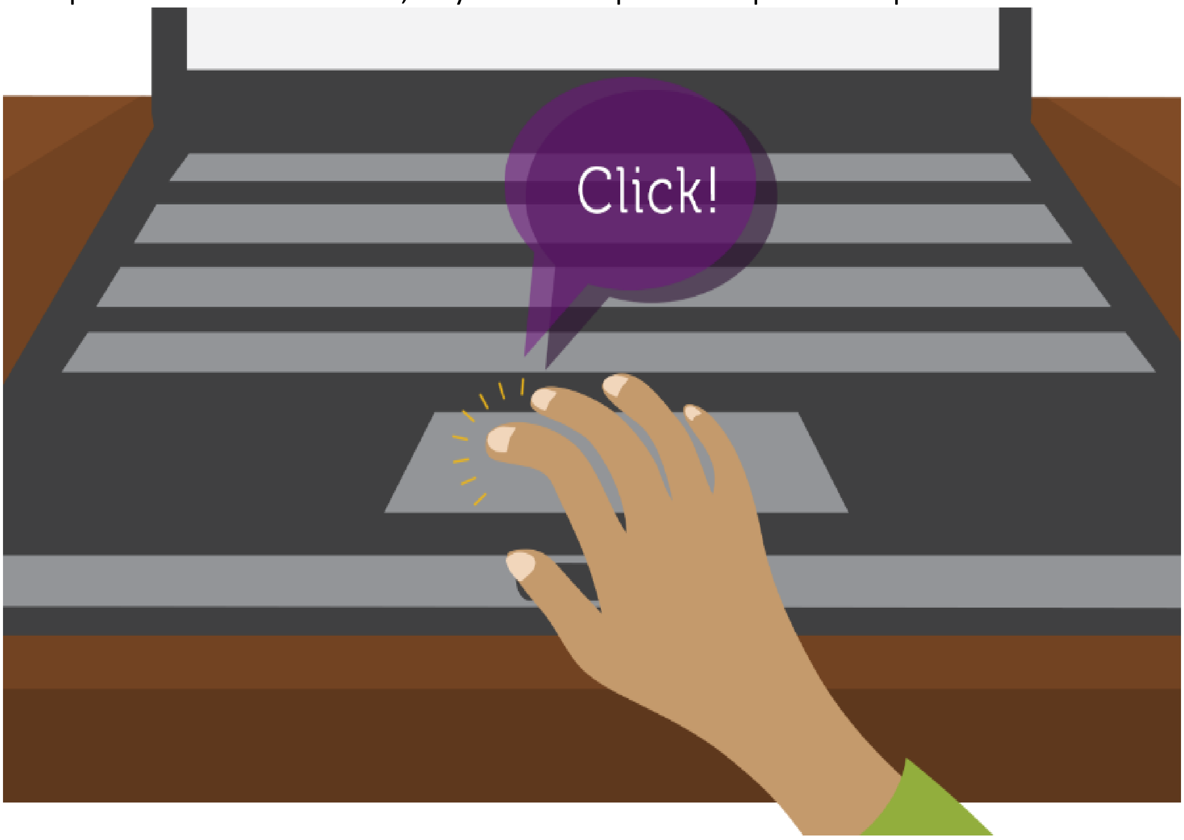
You interact with a computer mainly by using the **keyboard** and **mouse,** or a **trackpad** on laptops. Learning to use these devices is essential to learning to use a computer. Most people find it comfortable to place the keyboard on the desk directly in front of them and the mouse to one side of the keyboard.



The mouse controls the **pointer** on the screen. Whenever you move the mouse across the desk, the pointer will move in a similar manner. A mouse usually has two buttons, which are referred to as the left button and the right button. You will often interact with the computer by moving the mouse pointer over something on the computer screen, then clicking one of the buttons.




On laptops, you can use the **trackpad**, located below the keyboard, instead of a mouse. Simply drag your finger across the trackpad to move the **pointer** on the screen. Some trackpads do not have buttons, so you'll either press or tap the trackpad to click.




The keyboard allows you to type letters, numbers, and words into the computer. Whenever you see a flashing vertical line—called the **cursor**—you can start typing.

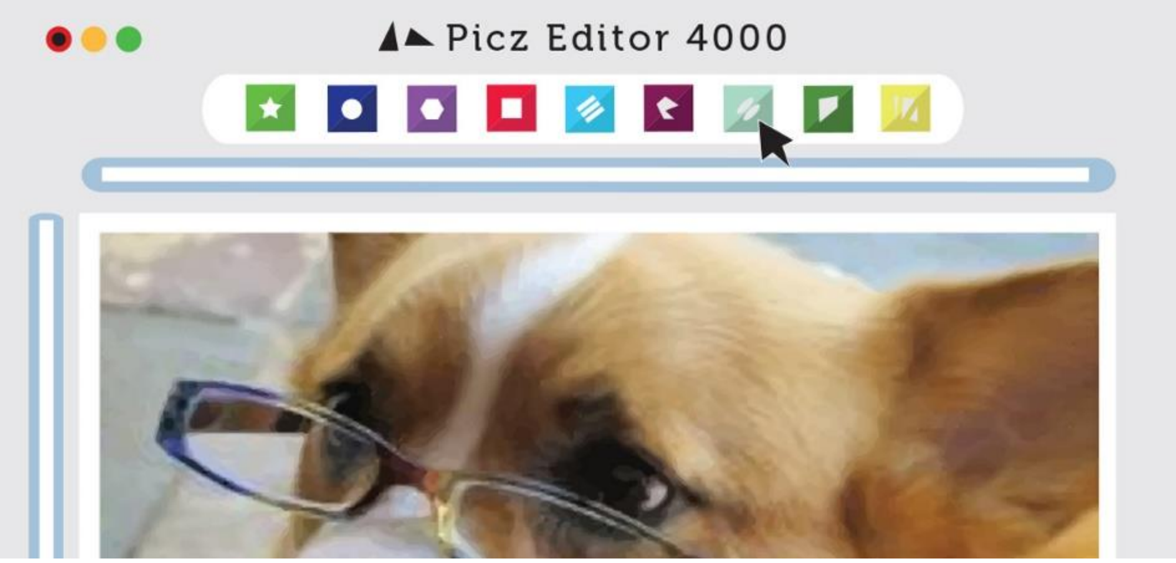

Note that the **mouse pointer** is also called a **cursor**, but it is shaped differently.
The **keyboard cursor** is also called the **insertion point**.

Using a computer

The main screen you'll start from is the **desktop**. This is sort of like a main menu or a table of contents. From here, you can access the programs and features you need to use your computer.

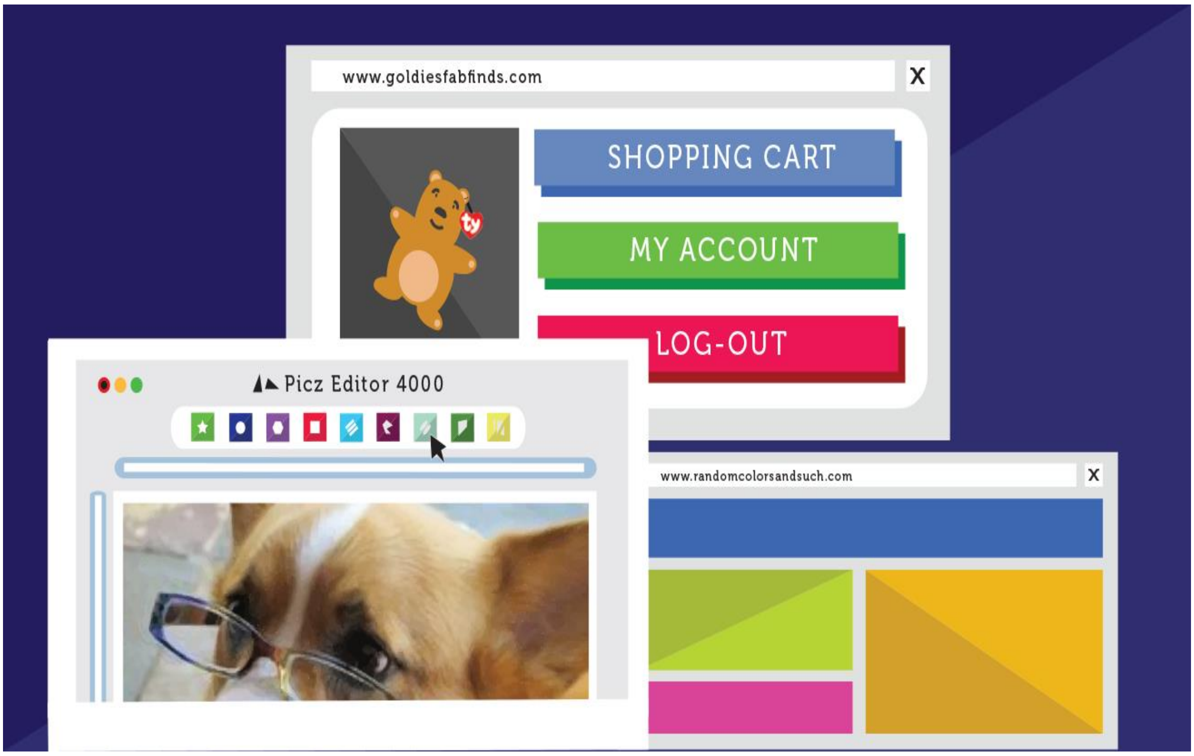
**Icons** are used to represent the different files, applications, and commands on your computer. An icon is a small image that's intended to give you an idea at a glance of what it represents, like a logo. Double-clicking an icon on the desktop will open that application or file.


A **button** is a command that performs a specific function within an application. The most commonly used commands in a program will be represented by buttons.




**Menus** are organized collections of commands and shortcuts. Click a **menu** to open it and display the commands and shortcuts within. Then click an item in the **menu** to execute it.


When you open an application or folder, it is displayed in its own **window**. A **window** is a contained area—like a picture within a picture—with its own menus and buttons specific to that program. You can rearrange multiple **windows** on the desktop and switch between them.



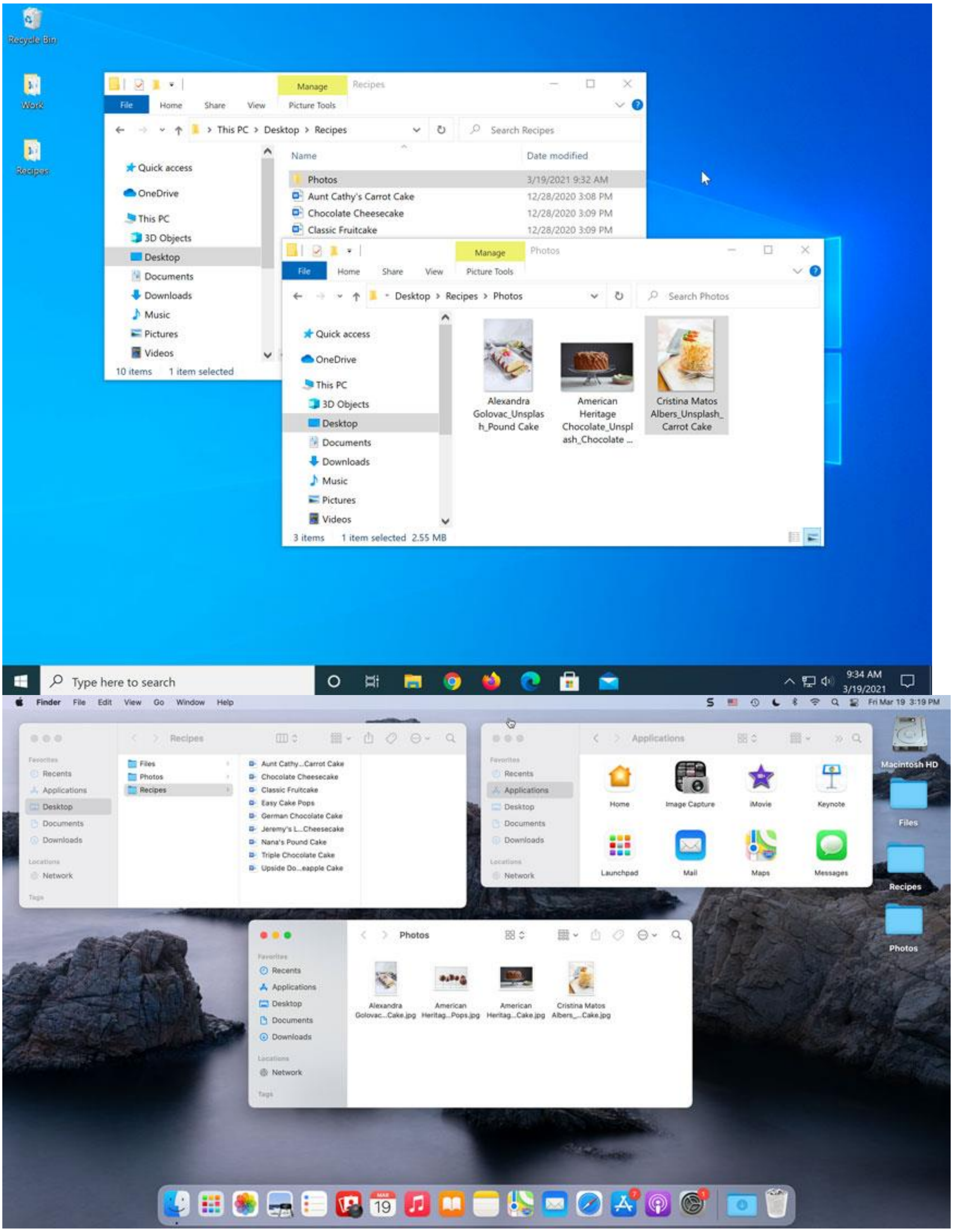

## 4.3 Getting to Know the OS

### Getting to know your computer's OS

Now that you know the absolute basics of using a computer, it's time to learn more about your computer's operating system. We'll be talking about the two most common operating systems in this lesson: Microsoft Windows and macOS.

### Getting to know the interface

Both PCs and Macs use a graphical user interface (GUI), and they each have their own look and feel. The interactives below will introduce you to the Windows and Mac interfaces.




If you have difficulty seeing or hearing—or if you have trouble manipulating the mouse or keyboard—there are many settings that can help make your computer easier to use. To learn more, check out our lesson on Using Accessibility Features.

### All about your computers file system

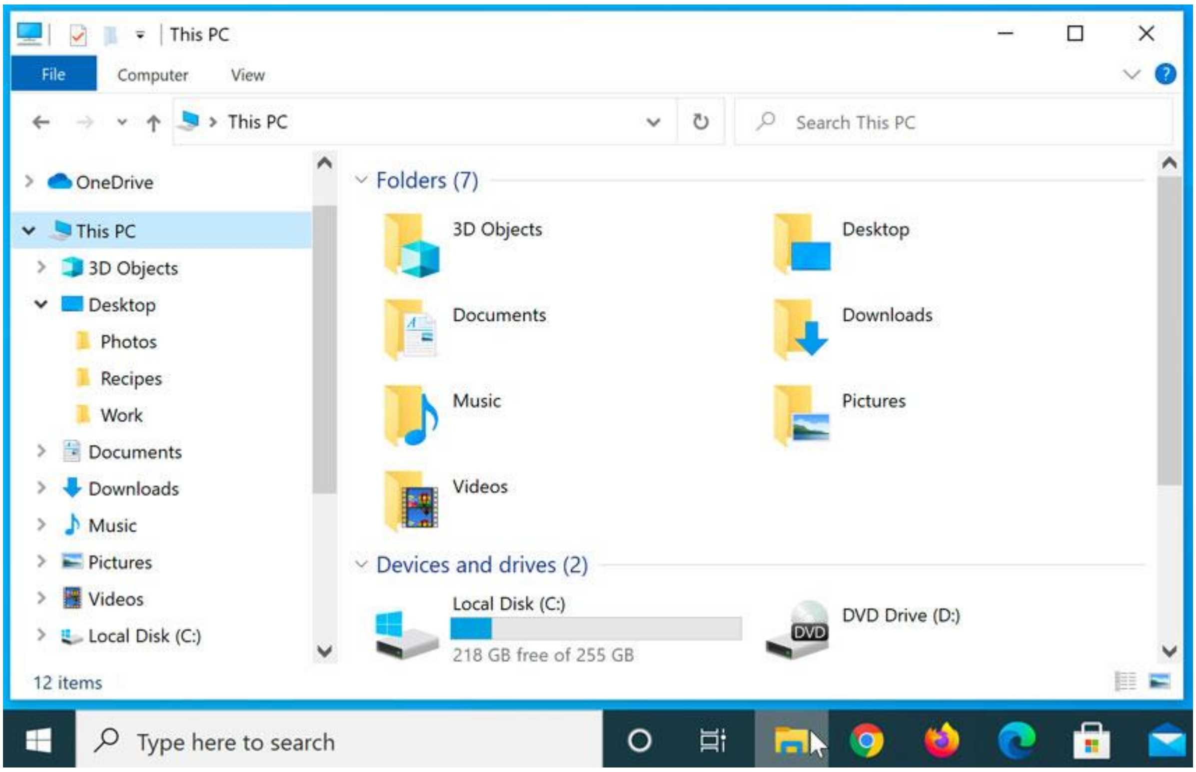
No matter which operating system you use, your computer uses **folders** to organize all of the different files and applications it contains. **Folder icons** on your computer are designed to look like file folders full of documents or pictures.


Each operating system has its own file system, which helps you find your folders and files. If you have a Windows PC, you'll use the **File Explorer** (also known as **Windows Explorer**). If you have a Mac, you'll use **Finder**. Here, we'll talk about the basic functions that are common to all computer file systems.

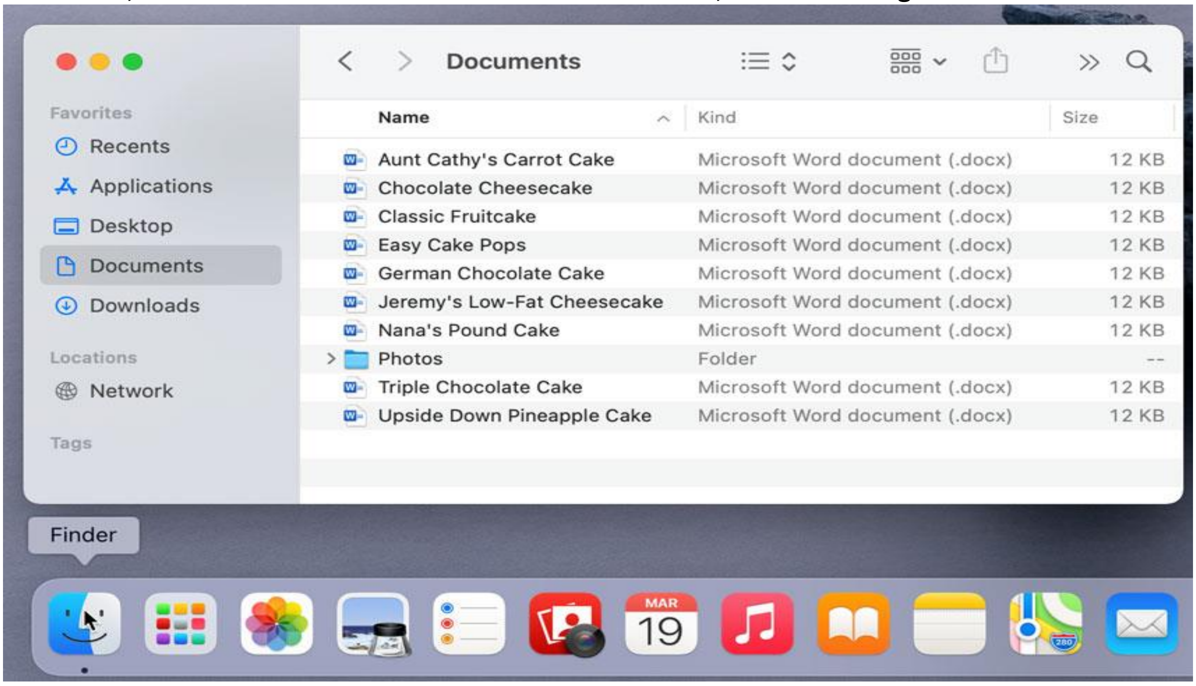
To find out more about file systems on Macs, check out the lesson on Working with Files in our macOS Basics tutorial. To learn more about PC file systems, take a look at the Working with Files lesson in our Windows Basics tutorial.

### Opening your computer's file system

Whether you're using a PC or a Mac, the file system icon will be on the toolbar. On a PC, the **File Explorer icon** looks like a folder, as in the image below.



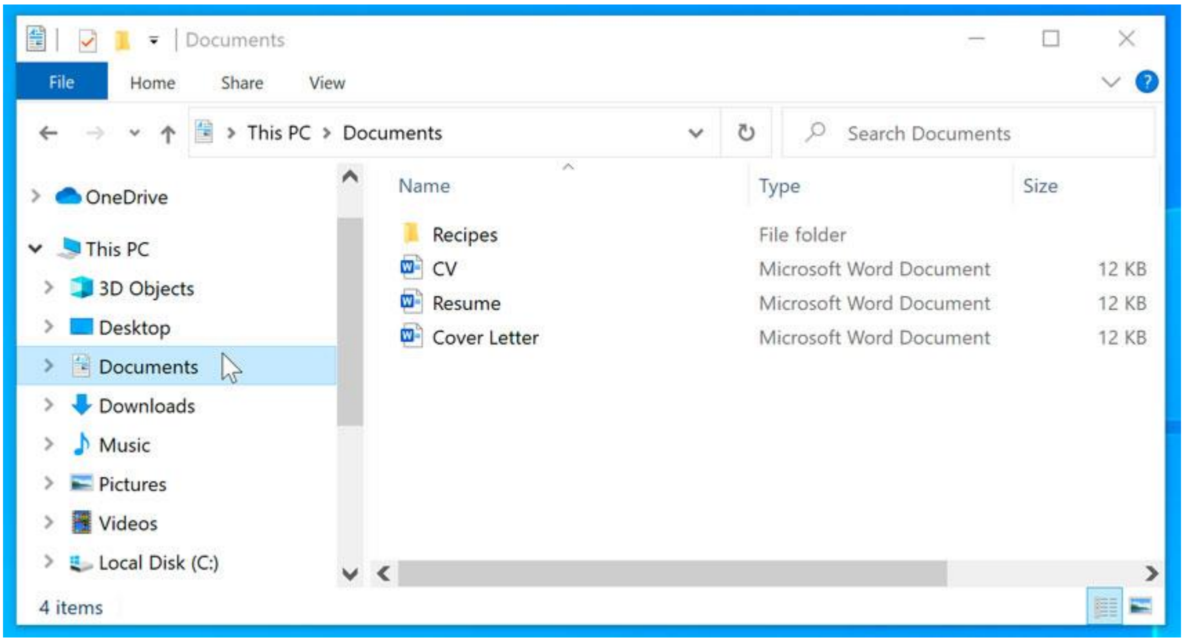

On a Mac, the **Finder icon** looks like a face on the Dock, as in the image below.




In both operating systems, you can also open the file system by **clicking a folder** from your **desktop**.

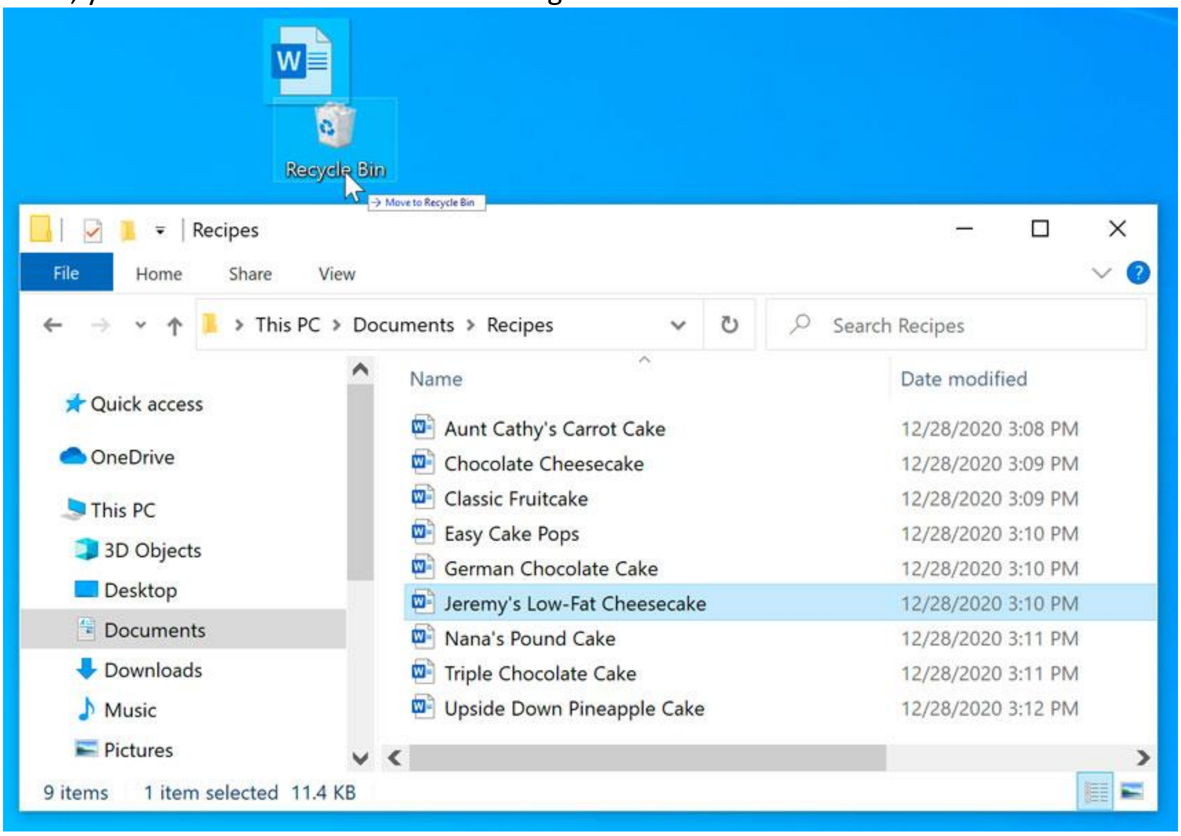
Basic navigation

Whether you're using File Explorer or Finder, basic navigation will work the same way. If you see the file you want, you can double-click it with your mouse. Otherwise, you can use the **Navigation pane** on the left side of the window to select a different location.

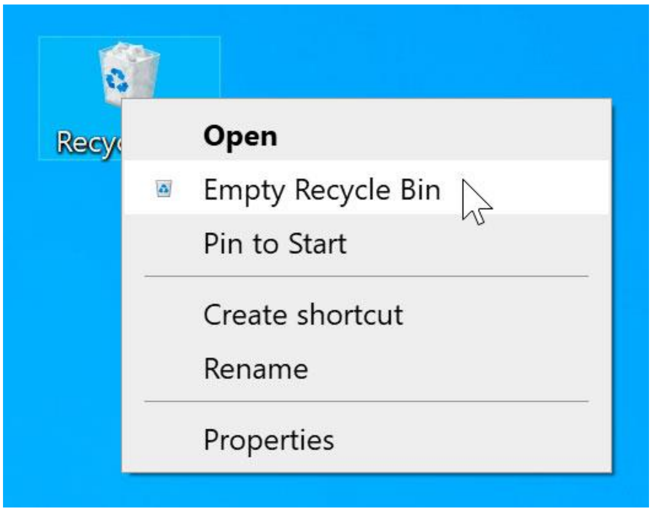



Deleting files

macOS and Windows use a **Trash can**—or **Recycle Bin**—to prevent you from accidentally deleting files. When you delete a file, it is moved to the Trash can. If you change your mind, you can move the file back to its original location.

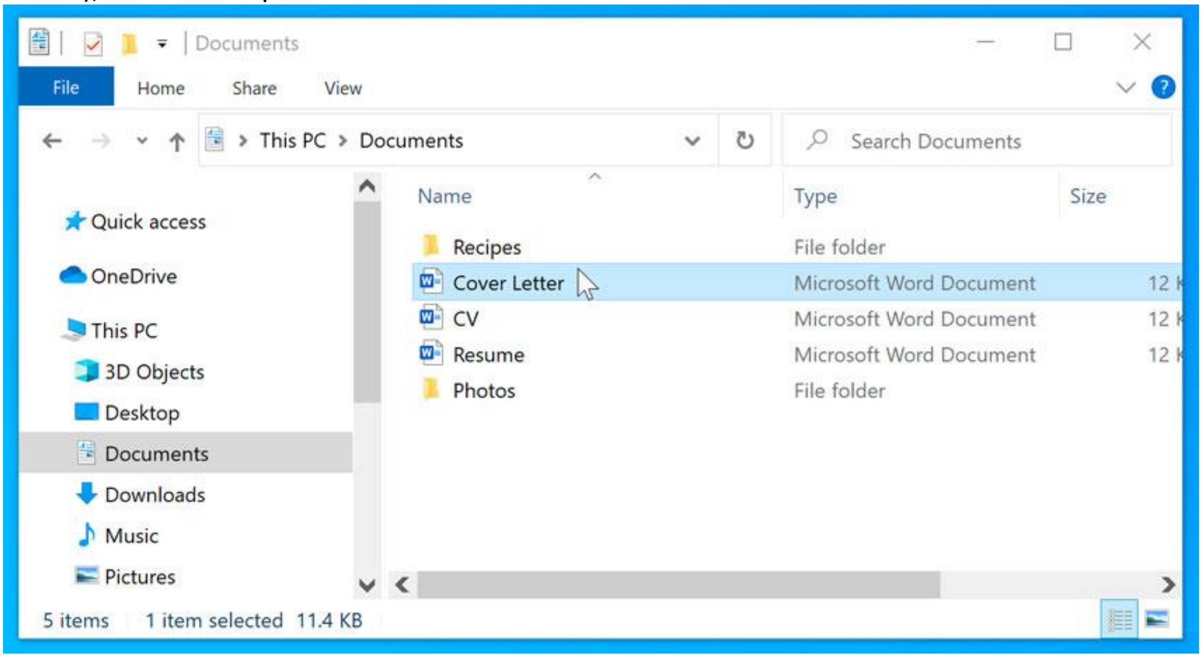



If you want to permanently delete the file, you will need to **empty the Trash or Recycle Bin**. To do this, right-click the icon and select **Empty**.



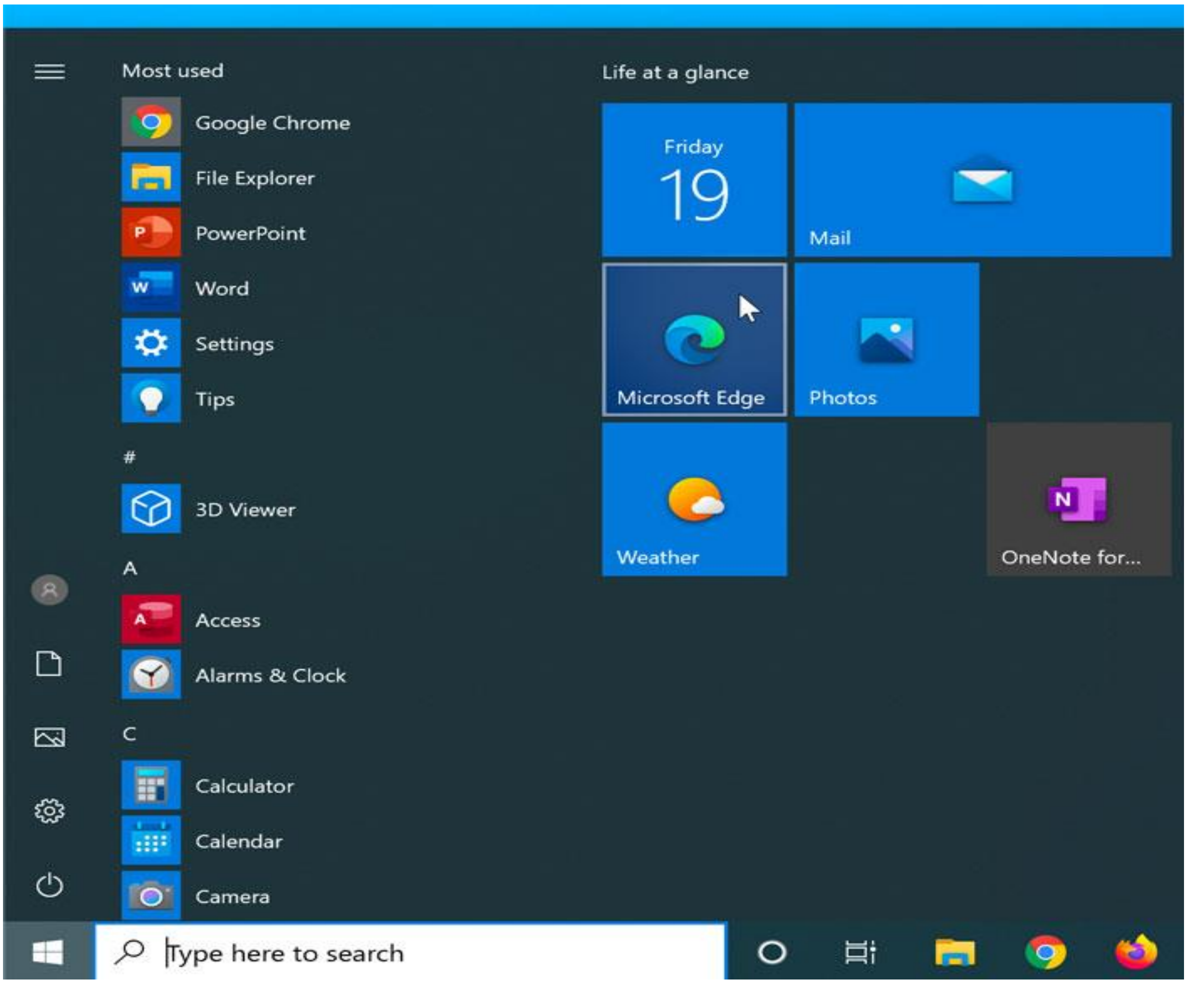

Opening files and applications

Each application on your computer has a group of **file types**—or **formats**—it is able to open. When you **double-click** a file, your computer will automatically use the correct application to open it. In our example, we're opening a Microsoft Word document (**Cover Letter**), which will open in **Microsoft Word**.




However, there may be times you may want to open an application directly, instead of just opening a file.

- To open an application in **Windows**, click the **Start** button, then select the desired application. If you don't see the one you want, you can click **All Programs/All Apps** to see a full list, scroll through the application list in Windows 10, or simply **type the name of the application** on your keyboard to search for it. In the example below, we're opening **Microsoft Edge** from the tiles.

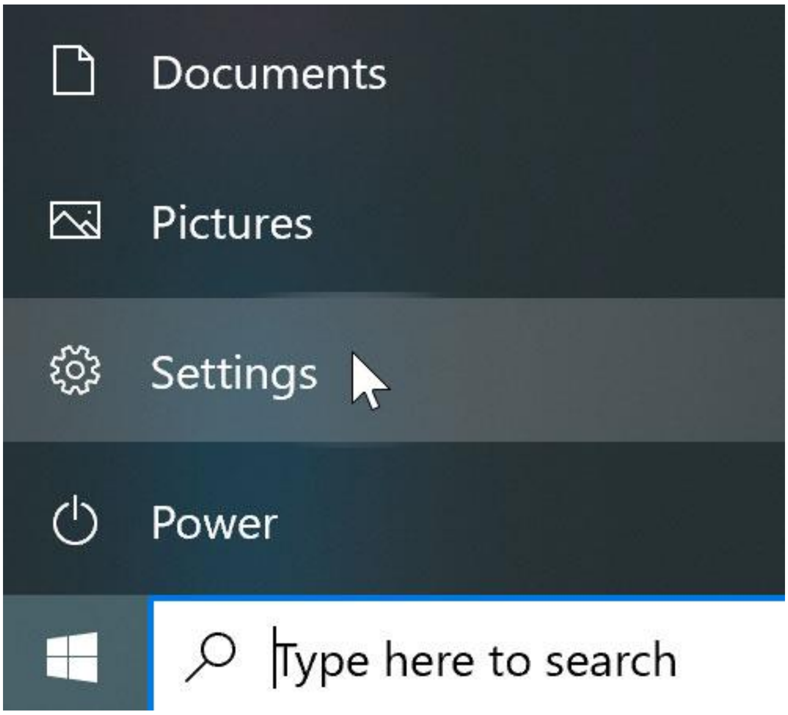



- To open an application on a **Mac**, click the application's icon on the **Dock**. If you don't see the one you want, click the **Spotlight** icon in the top-right corner of the screen, then **type the name of the application** on your keyboard to search for it. In the example below, we're opening **Safari**.

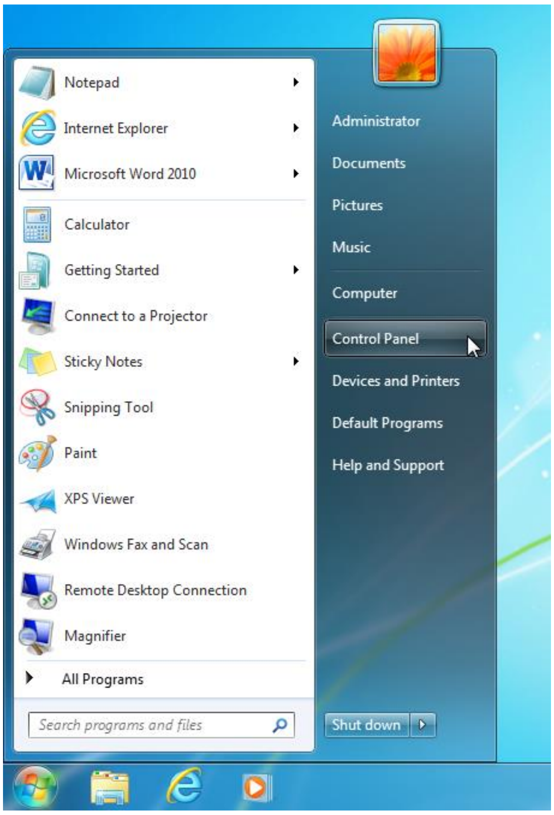

Adjusting your computer's settings

When you start using a new computer, you may want to begin by adjusting the computer's settings. Adjusting your settings can range from simple tasks such as changing your **desktop background** to more advanced tasks like adjusting your **security** or **keyboard settings**.

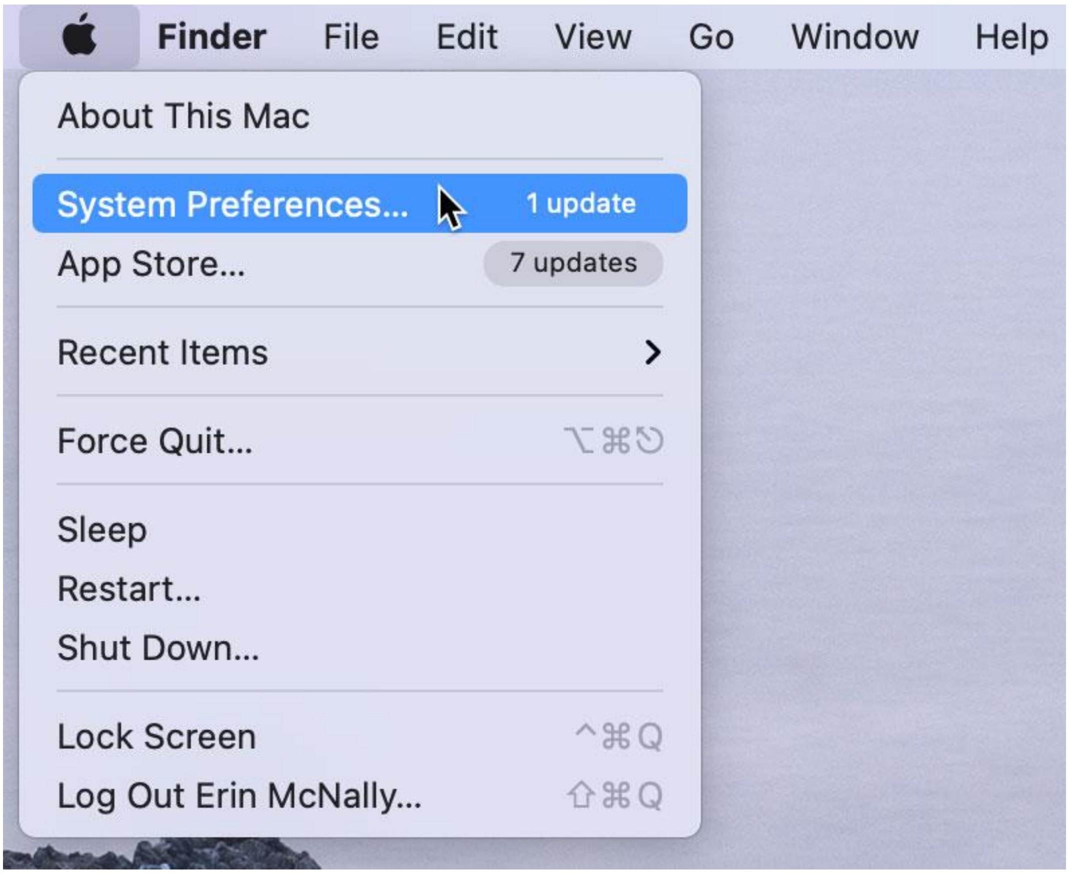
- In **Windows 10**, click the **Start** button, then select **Settings**.




- In **Windows 8.1** and earlier, click the **Start** button, then locate and select the **Control Panel**. Check out the **Adjusting Your Settings** lesson in our **Windows Basics** tutorial to learn more about the Control Panel.



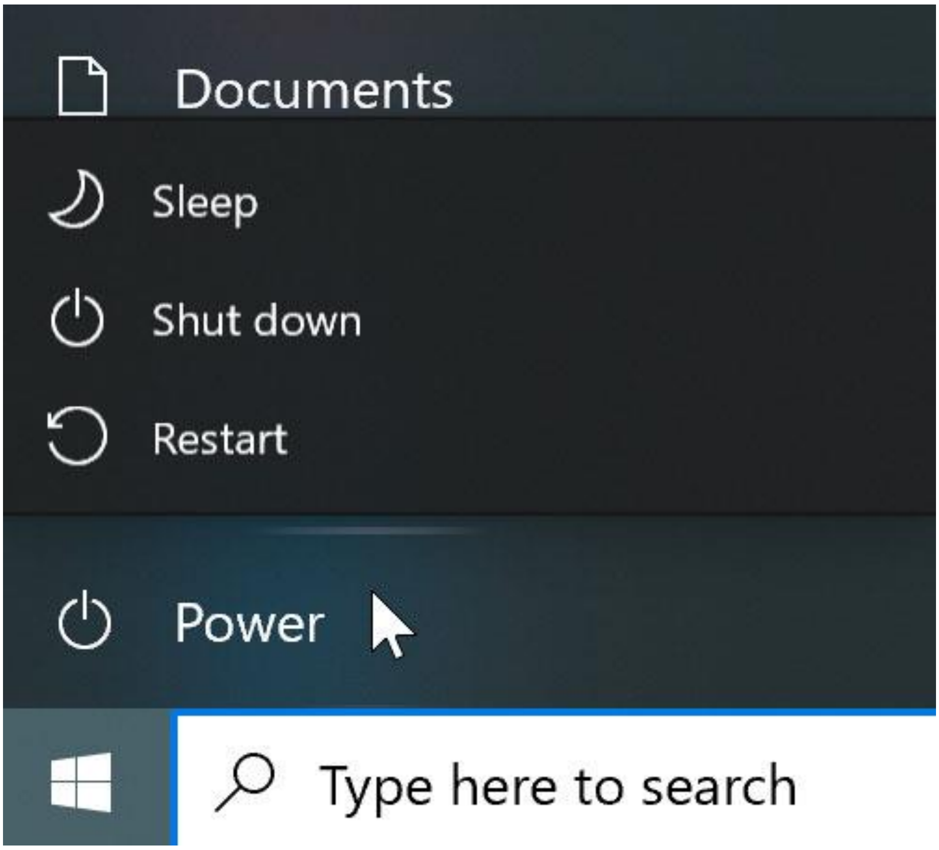

- On a **Mac**, click the **Apple** icon, then select **System Preferences**. Check out our **Adjusting Your Settings** lesson in our **macOS Basics** tutorial to learn more about System Preferences.



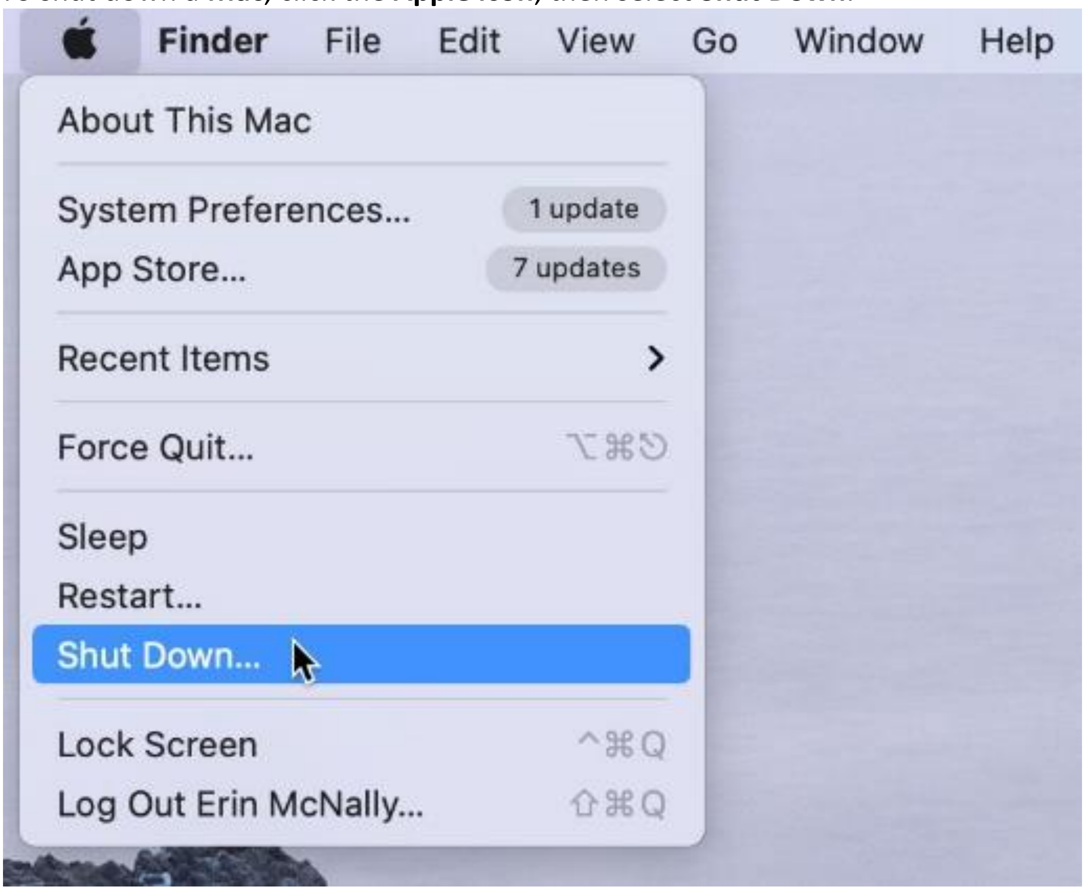

Shutting down your computer

When you're done using your computer, it's important to **shut it down properly**.

- To shut down **Windows**, click the **Start** button, then select **Shut down** from the menu (in some versions, this may say **Turn Off Computer** or look like the power symbol).




- To shut down a **Mac**, click the **Apple icon**, then select **Shut Down**.



## Lesson 5: Working with file and folders

All the data for documents and programs on your computer is stored in electronic files. These files are then arranged into a series of folders and subfolders—just as you'd arrange paper files in a series of file folders in a filing cabinet.

In Windows 10, you use File Explorer to view and manage your folders and files. You can navigate to folders and files on your computer and connected devices, or to those on other computers on your network.

### 5.1 What is a file?

There are many different types of files you can use. For example, Microsoft Word documents, digital photos, digital music, and digital videos are all types of files. You might even think of a file as a digital version of a real-world thing you can interact with on your computer. When you use different applications, you'll often be viewing, creating, or editing files.

Files are usually represented by an icon. In the image below, you can see a few different types of files below the Recycle Bin on the desktop.

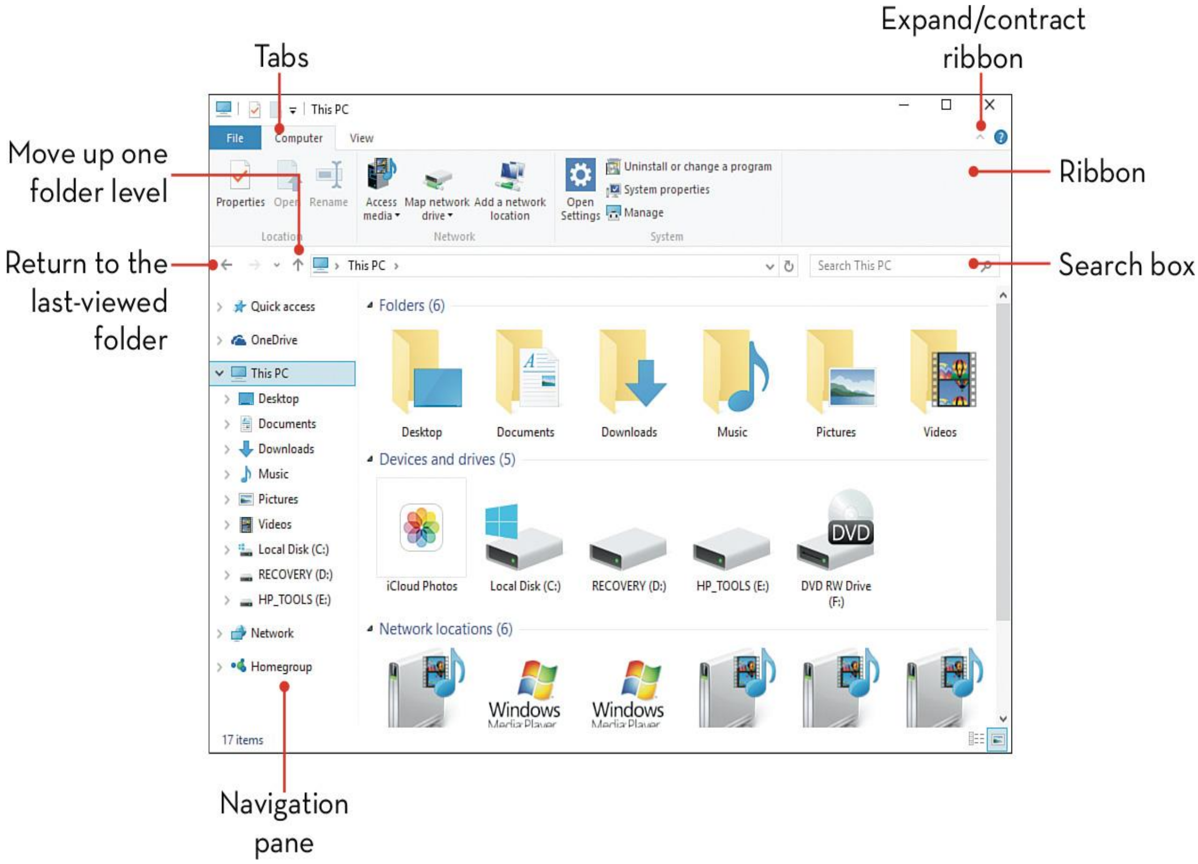

### 5.2 What is a folder?

Windows uses folders to help you organize files. You can put files inside a folder, just like you would put documents inside a real folder. In the image below, you can see some folders on the desktop.


### 5.3 File Explorer

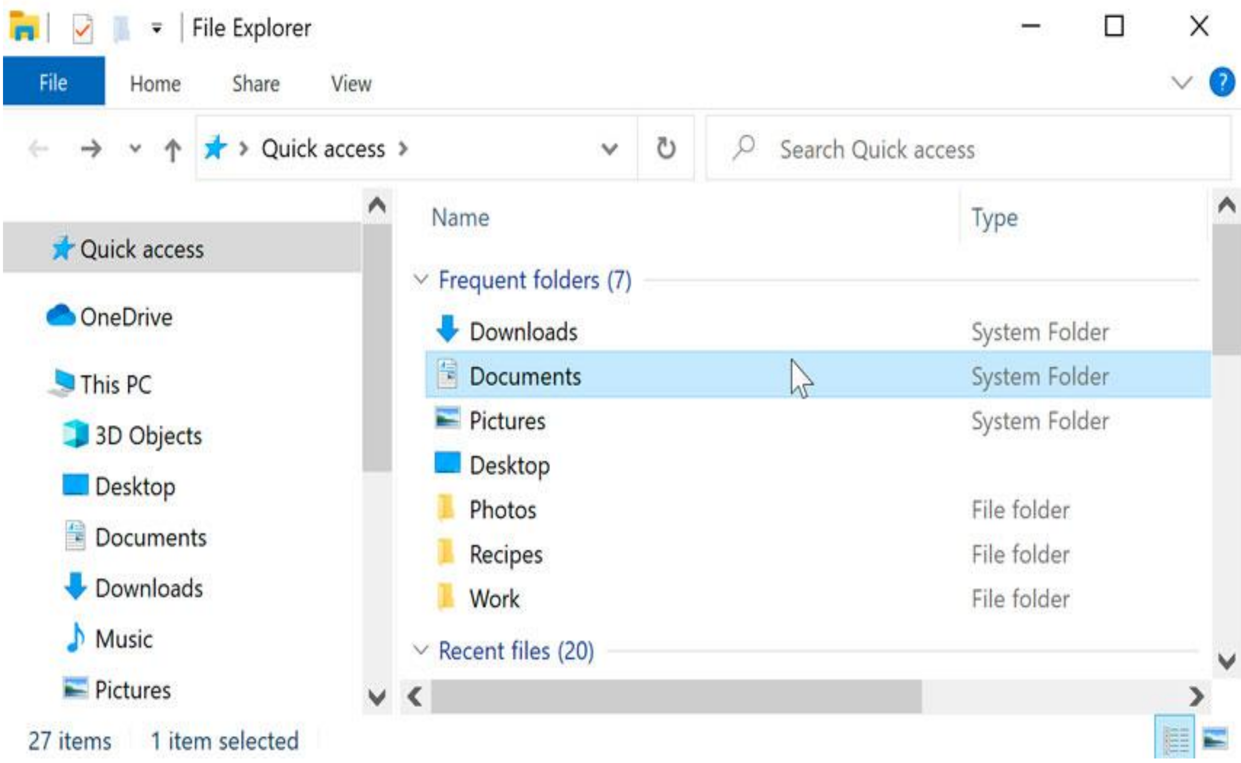
You can view and organize files and folders using a built-in application known as File Explorer (called Windows Explorer in Windows 7 and earlier versions).

To open File Explorer, click the File Explorer icon on the taskbar, or double-click any folder on your desktop. A new File Explorer window will appear. Now you're ready to start working with your files and folders.

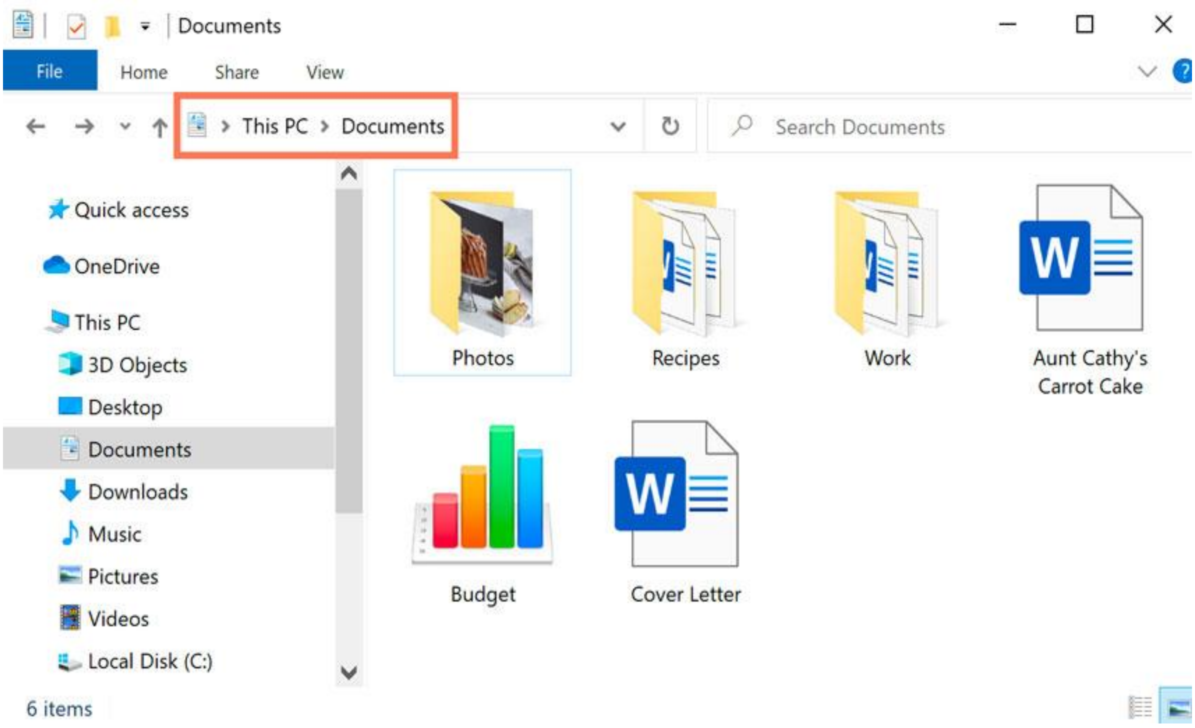



## Launching File Explorer

From File Explorer, **double-click a folder to open it**. You can then see all of the files stored in that folder.



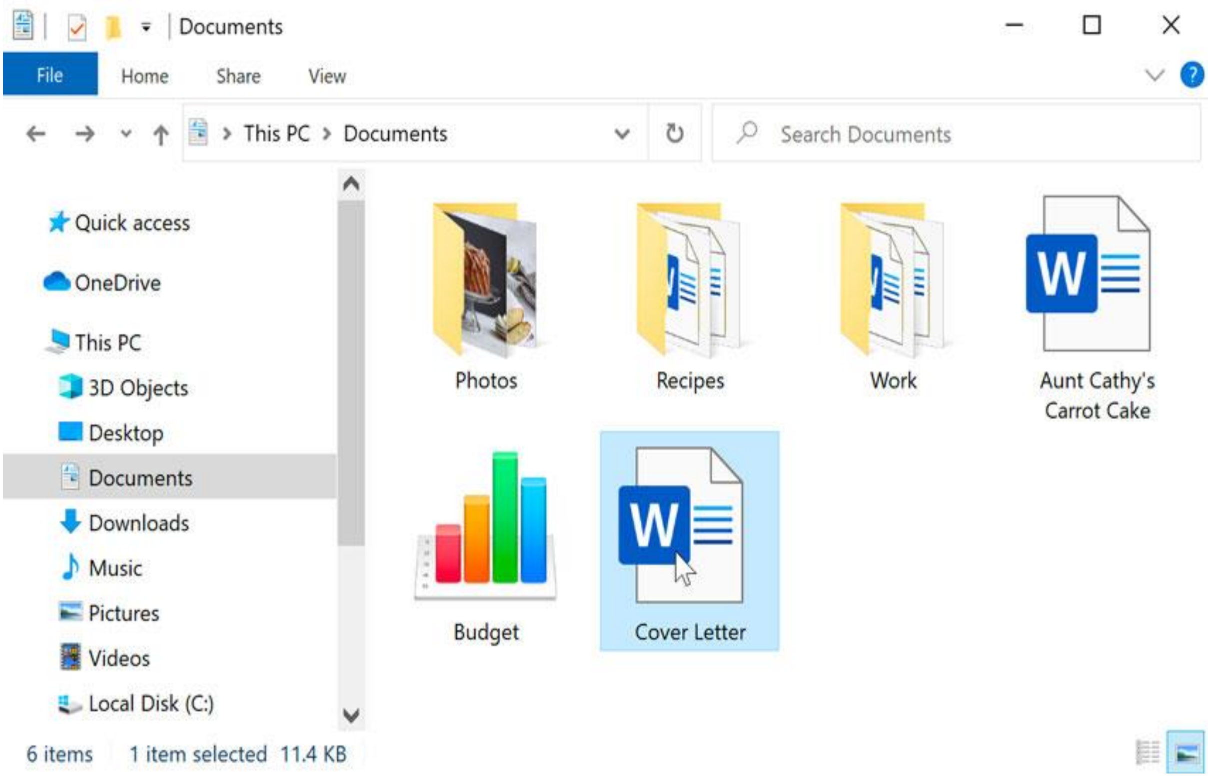

Notice that you can also see the **location** of a folder in the **address bar** near the top of the window.



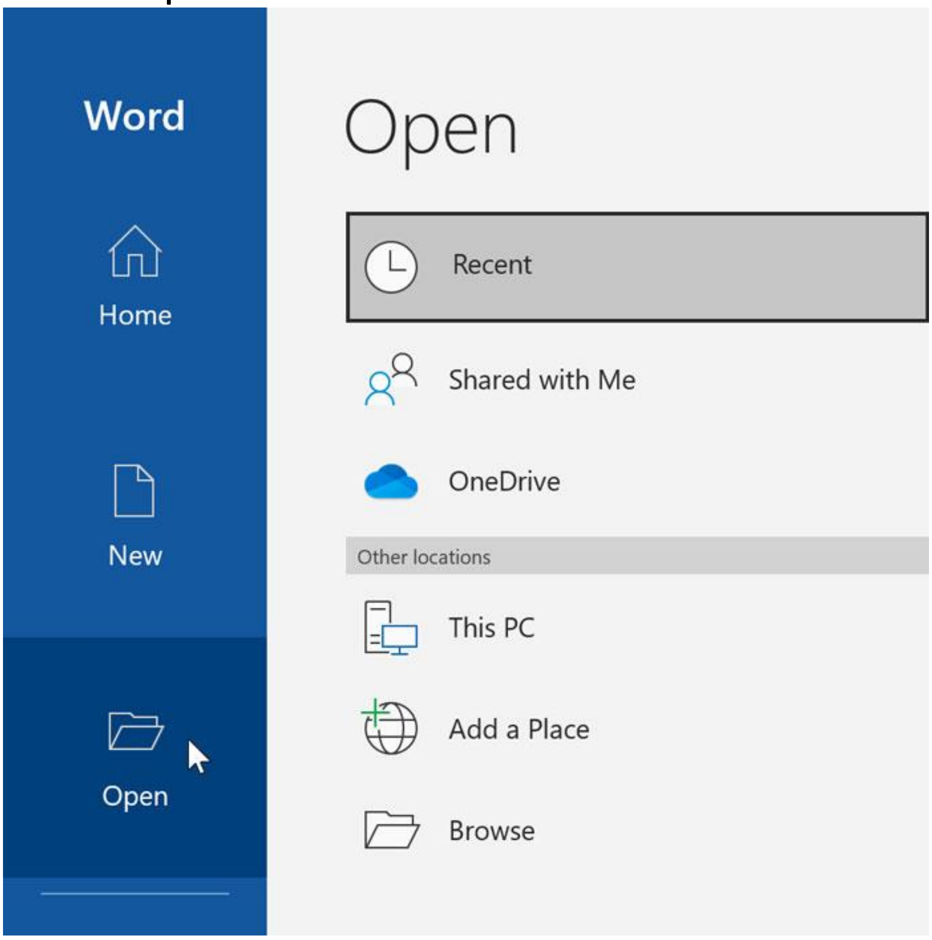

To open a file:

There are two main ways to open a file:

- **Find the file on your computer and double-click it**. This will open the file in its **default application**. In our example, we'll open a Microsoft Word document (**Cover Letter.docx**), which will open in **Microsoft Word**.




- **Open the application, then use the application to open the file**. Once the application is open, you can go to the **File** menu at the top of the window and select **Open**.



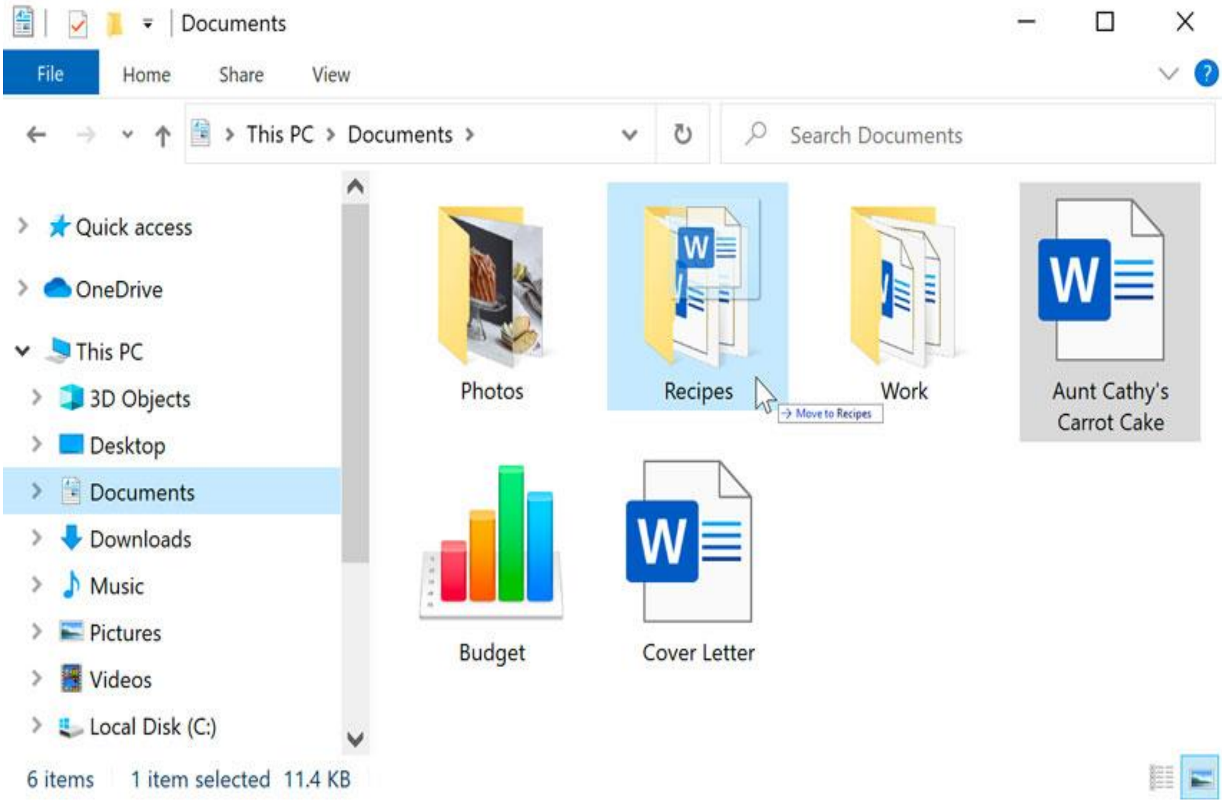
Moving and deleting files

As you begin using your computer, you will start to collect more and more files, which can make it more difficult to find the files you need. Fortunately, Windows allows you to **move files** to different folders and **delete files** you no longer use.

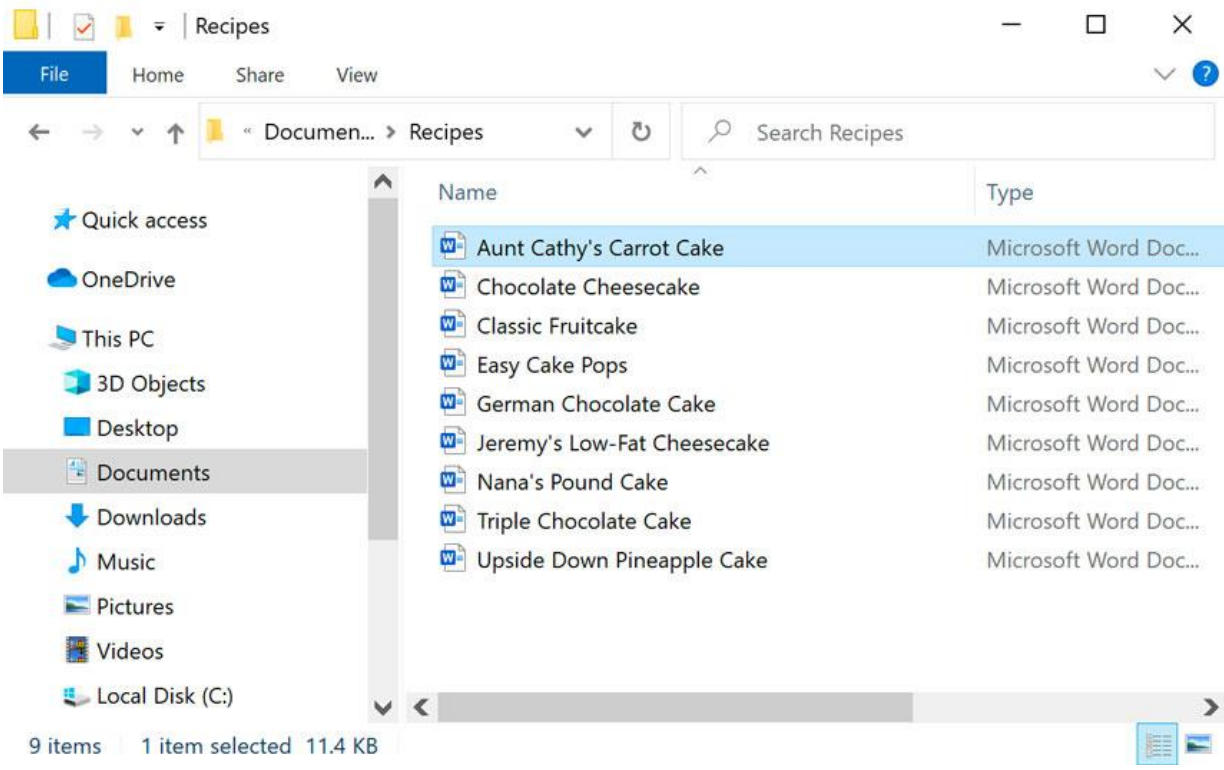
To move a file:

It's easy to move a file from one location to another. For example, you might have a file on the **desktop** that you want to move to your **Documents** folder.

1. Click and drag the file to the desired location.



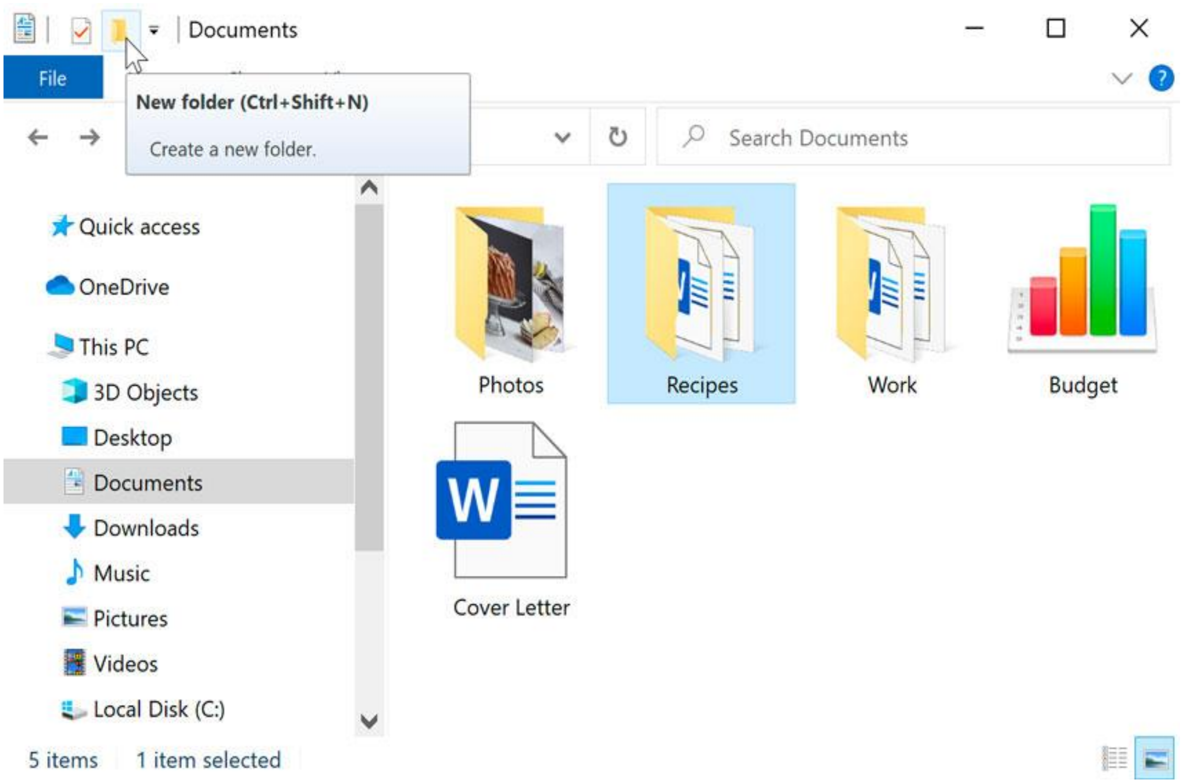

2. Release the mouse. The file will appear in the new location. In this example, we have opened the folder to see the file in its new location.



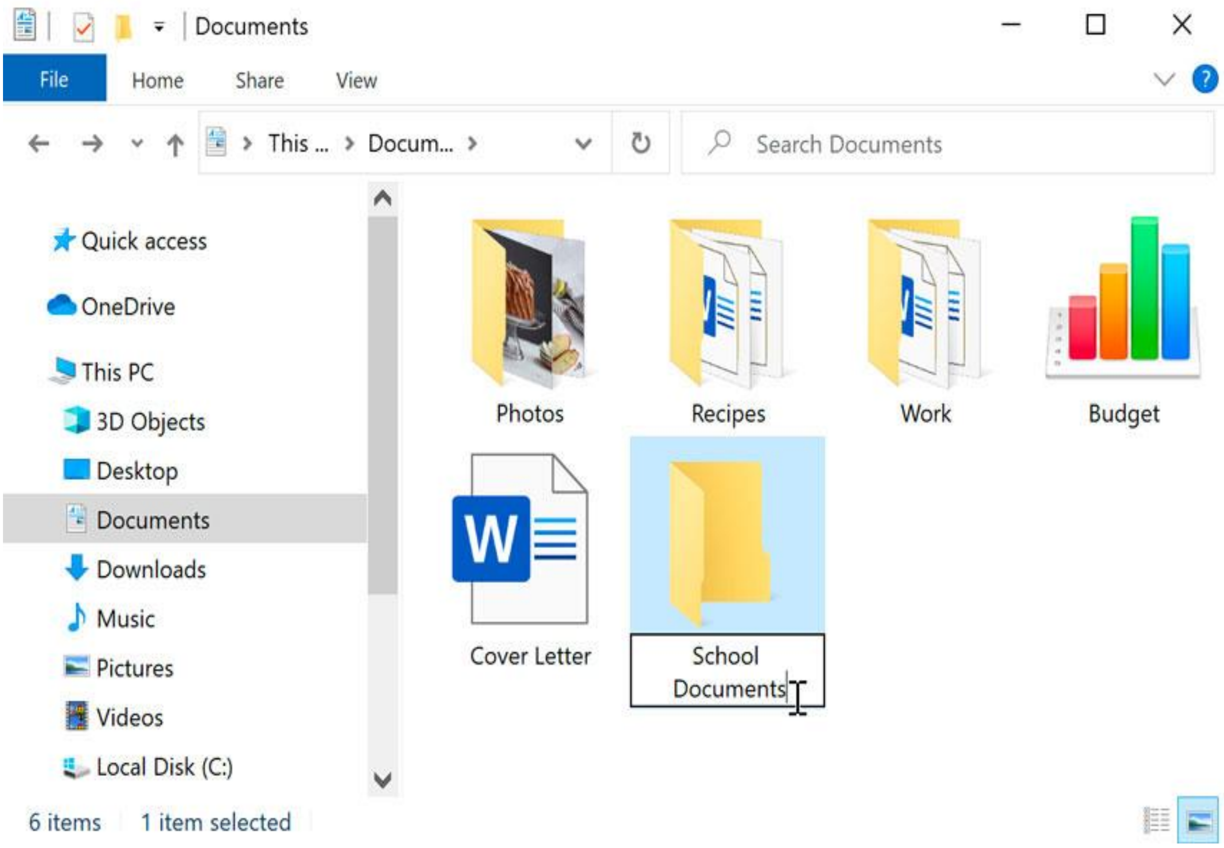

You can use this same technique to **move an entire folder**. Note that moving a folder will also move all of the files within that folder.

To create a new folder:

1. Within File Explorer, locate and select the **new folder** button. You can also **right-click** where you want the folder to appear, then select **New > Folder**.



2. The new folder will appear. Type the desired **name** for the folder and press **Enter**. In our example, we'll call it **School Documents**.

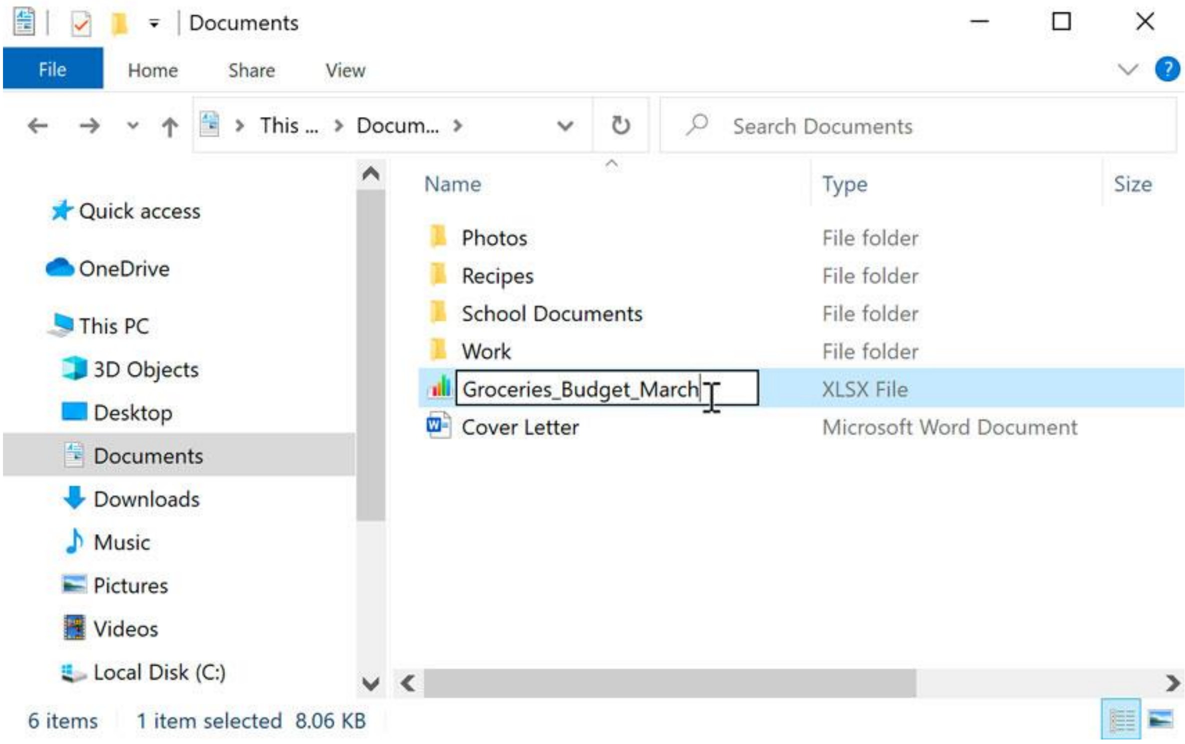



3. The new folder will be created. You can now move files into this folder.

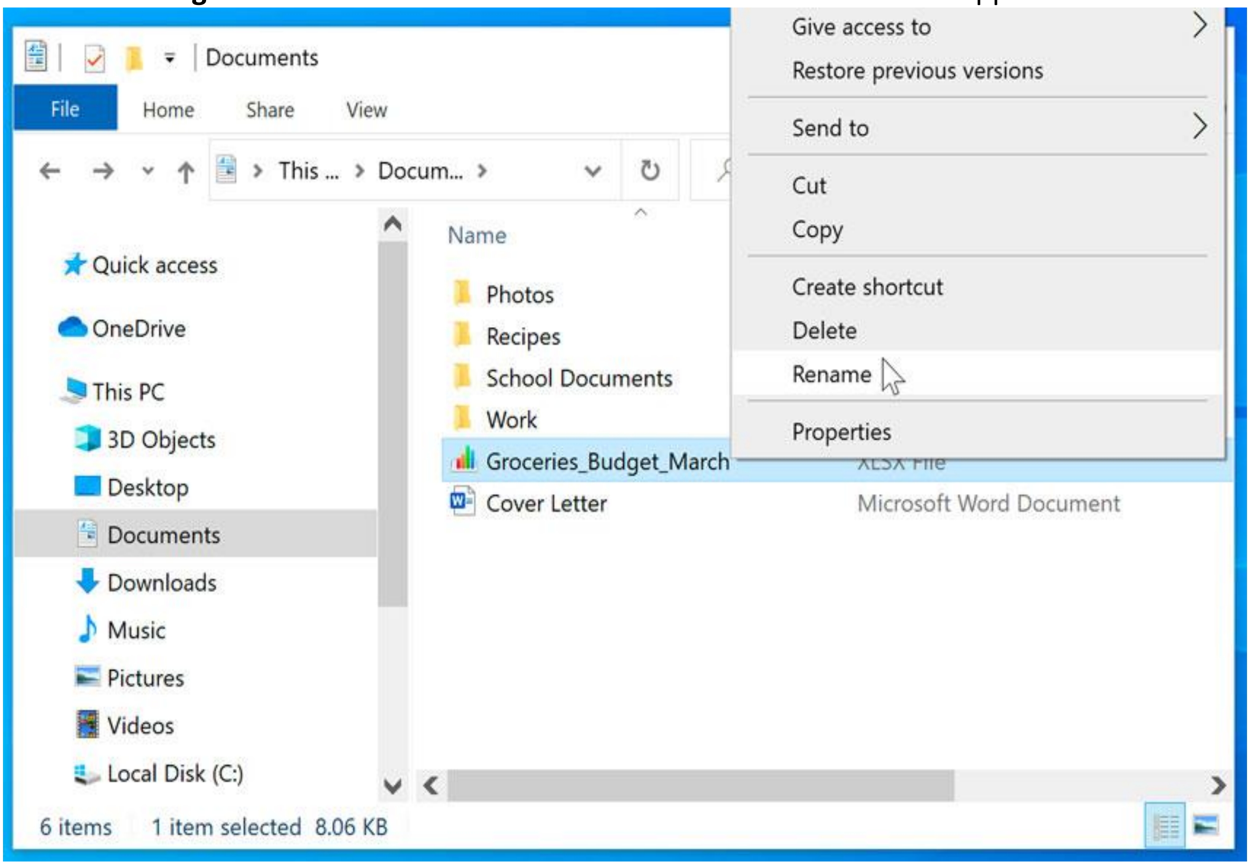
To rename a file or folder:

You can change the name of any file or folder. A unique name will make it easier to remember what type of information is saved in the file or folder.

1. Click the file or folder, **wait about one second**, and click again. An editable text field will appear.
2. Type the desired name on your keyboard and press **Enter**. The name will be changed.



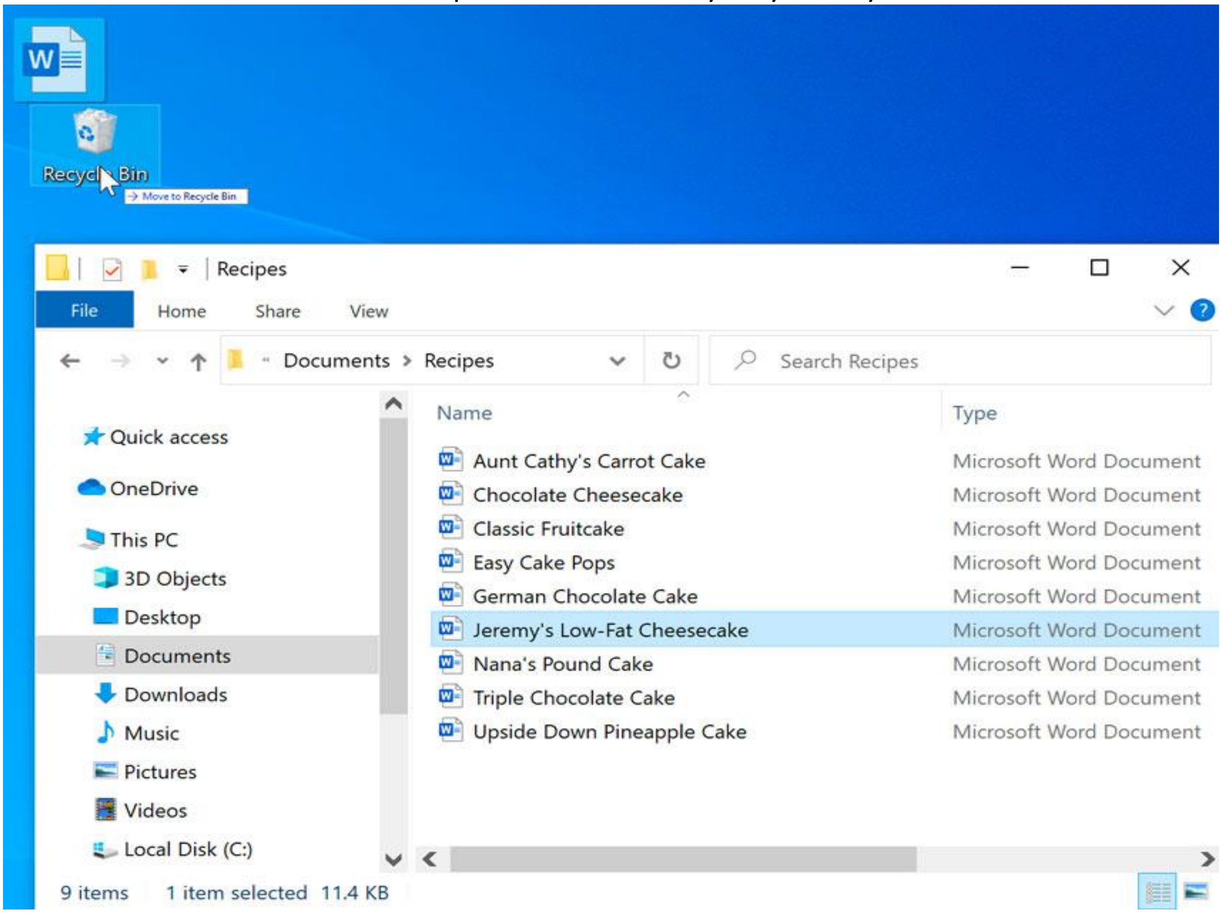

You can also **right-click** the folder and select **rename** from the menu that appears.



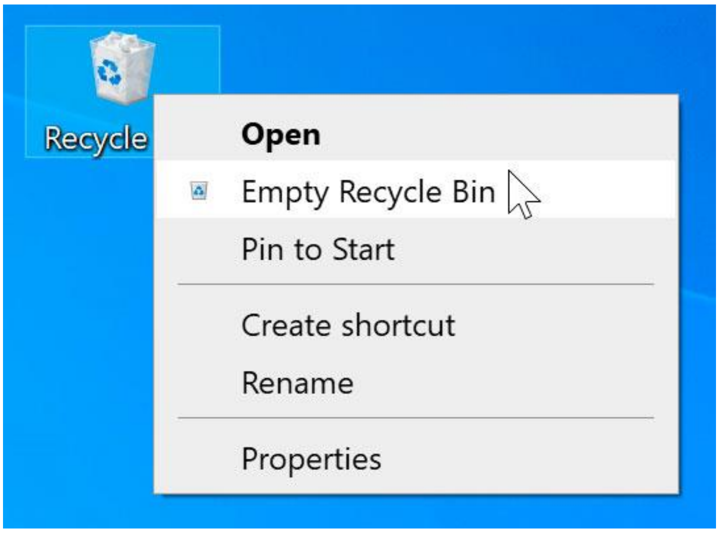

To delete a file or folder:

If you no longer need to use a file, you can delete it. When you delete a file, it is moved to the **Recycle Bin**. If you change your mind, you can move the file from the Recycle Bin back to its original location. If you're sure you want to permanently delete the file, you will need to **empty the Recycle Bin**.

1. Click and drag the file to the **Recycle Bin** icon on the **desktop**. You can also click the file to select it and press the **Delete** key on your keyboard.




2. To permanently delete the file, right-click the **Recycle Bin** icon and select **Empty Recycle Bin**. All files in the Recycle Bin will be permanently deleted.




Note that deleting a folder will also delete all of the files within that folder.

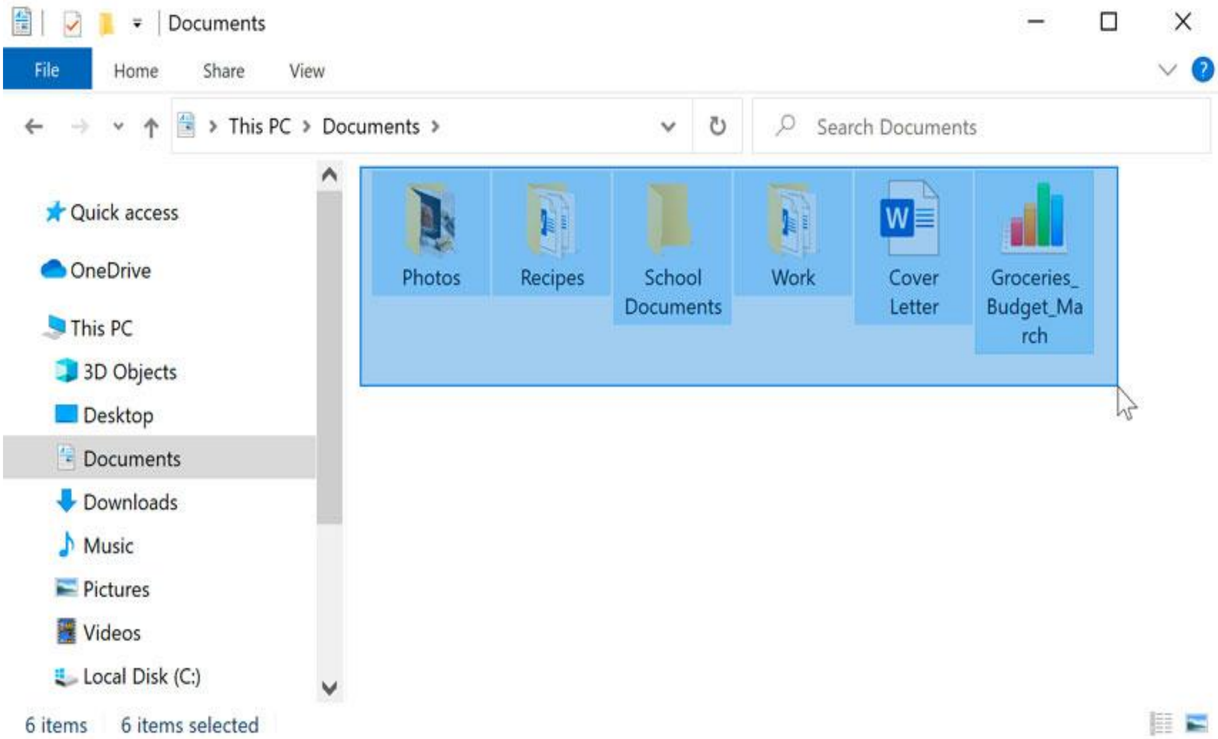
Selecting multiple files

Now that you know the basics, here are a few tips to help you move your files even faster.

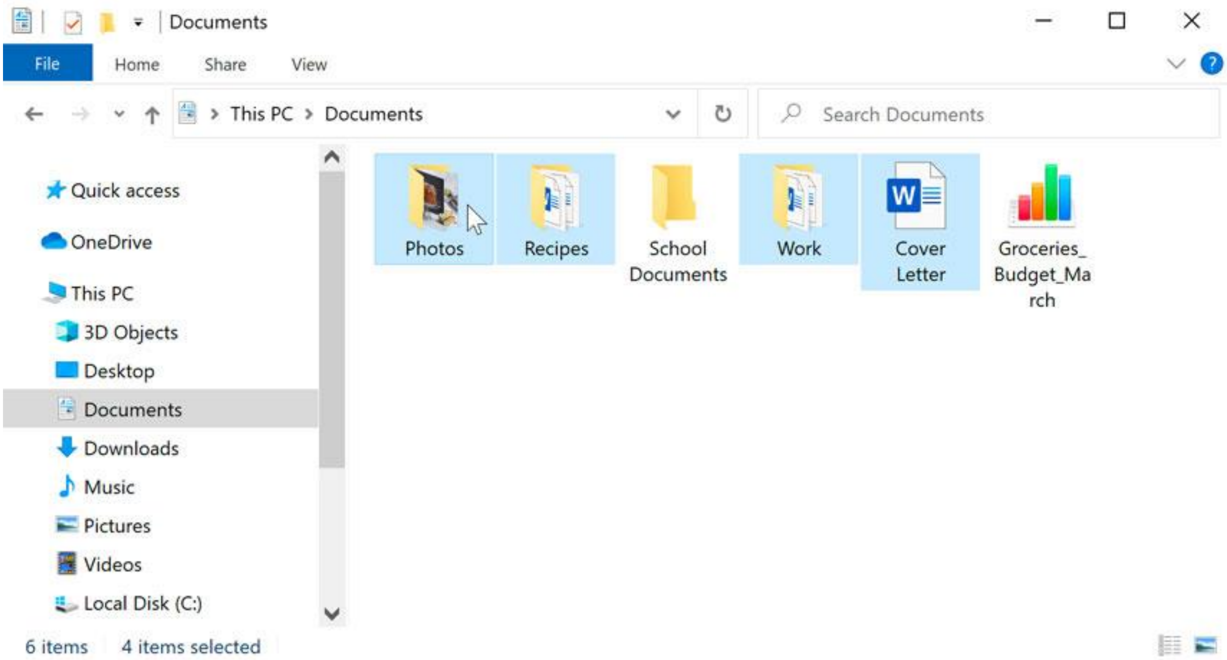
Selecting more than one file

There are a few ways to select **more than one file at a time**:

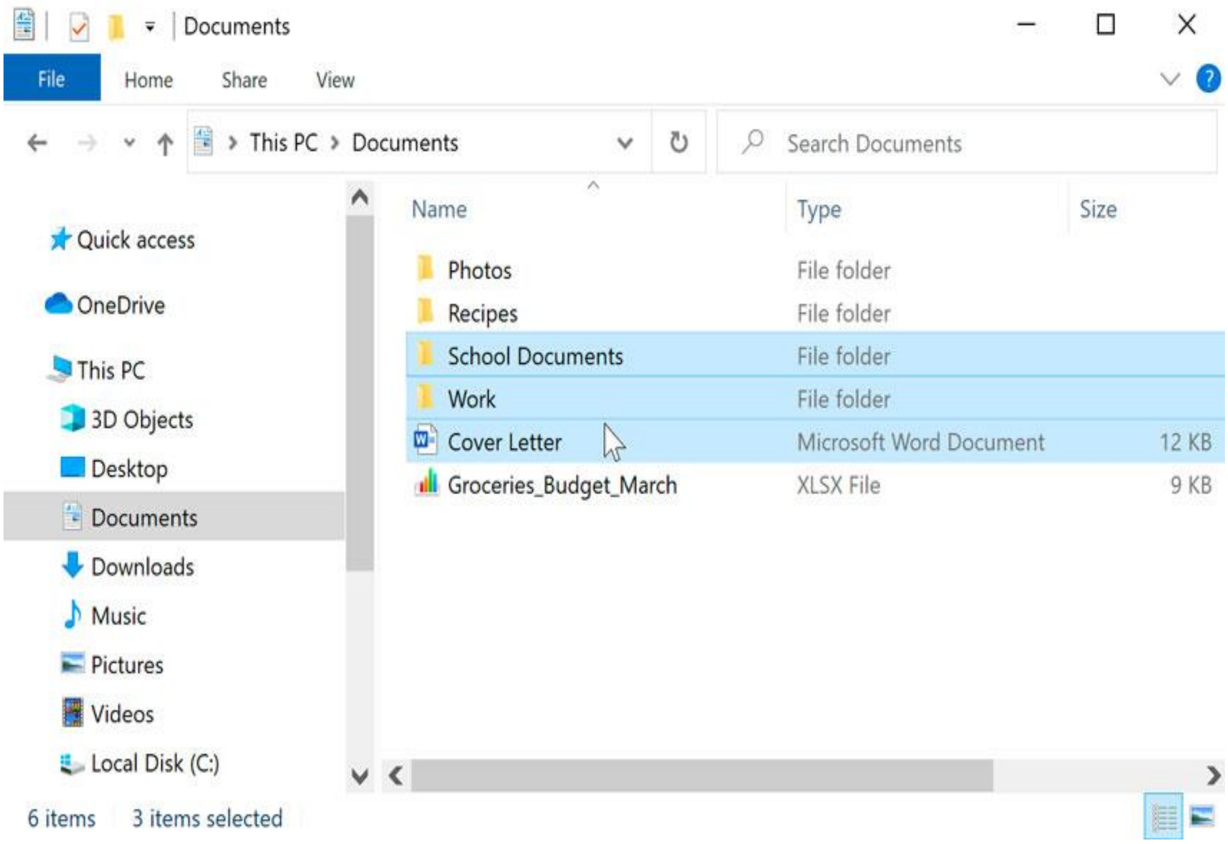
- If you're viewing your files as icons, you can **click and drag the mouse to draw a box** around the files you want to select. When you're done, release the mouse; the files will be selected. You can now move, copy, or delete all of these files at the same time.




- To select **specific files** from a folder, press and hold the **Control** key on your keyboard, then click the files you want to select.

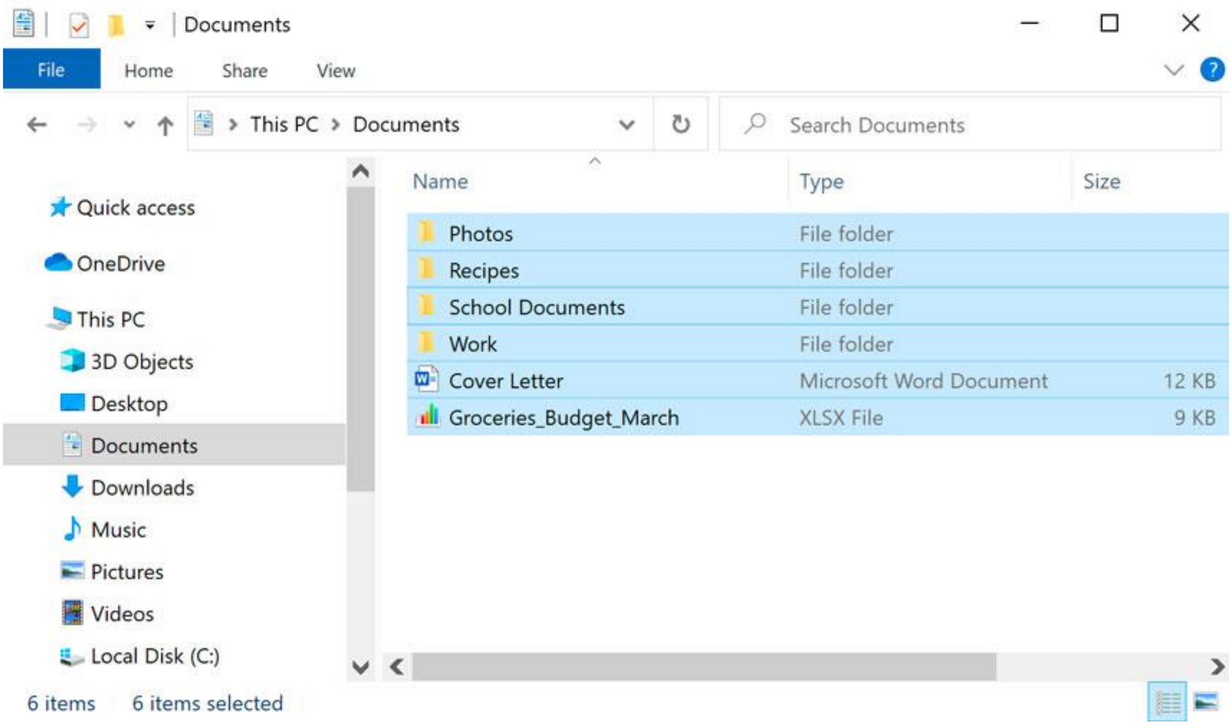


- To select a **group of files** from a folder, click the first file, press and hold the **Shift** key on your keyboard, then click the last file. All of the files between the first and last ones will be selected.




Selecting all files

If you want to select **all files in a folder** at the same time, open the folder in File Explorer and press **Ctrl+A** (press and hold the **Control** key on your keyboard, then press **A**). All of the files in the folder will be selected.




Ctrl+A is an example of a **keyboard shortcut**. If working with files and folders feels a little tricky right now, don't worry! Like anything else, working with files and folders is largely a matter of practice. You'll start to feel more comfortable as you continue using your computer.

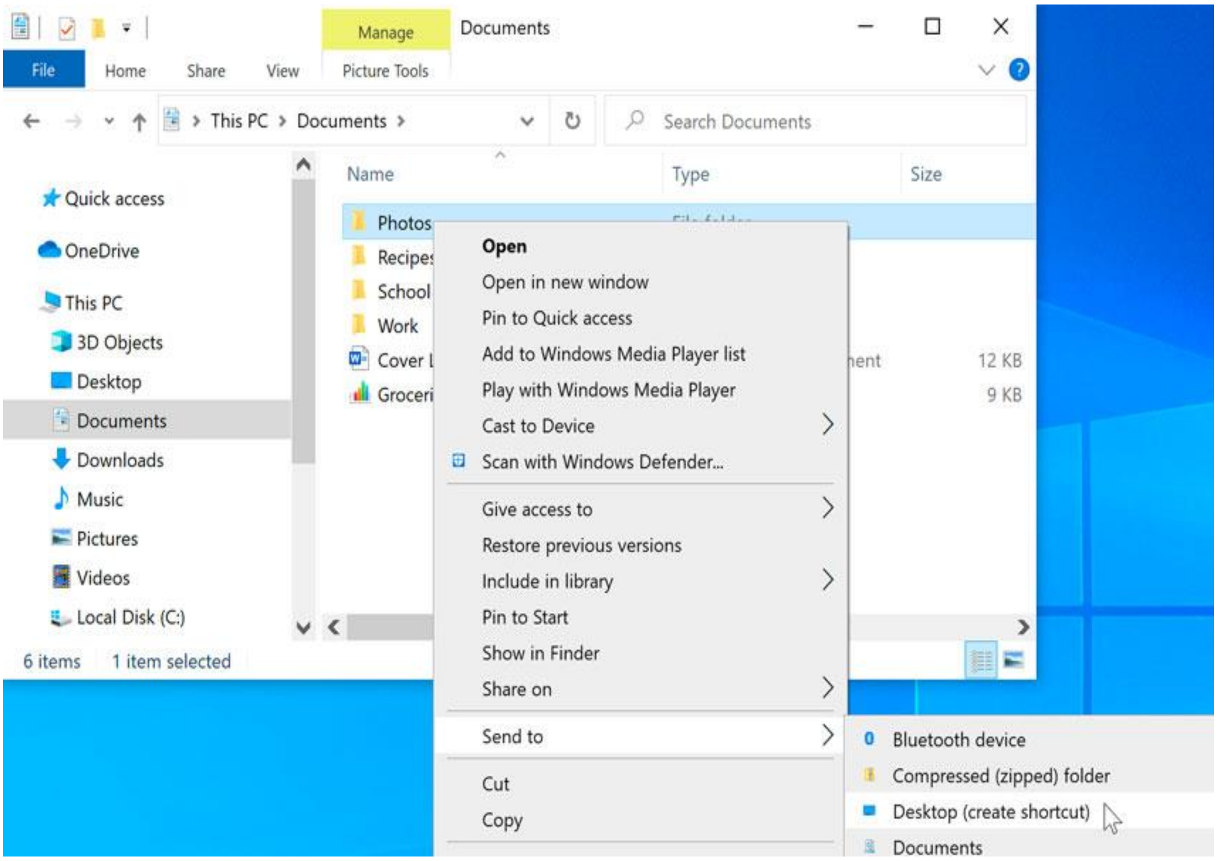
Shortcuts

If you have a file or folder you use frequently, you can save time by creating a **shortcut** on the desktop. Instead of navigating to the file or folder each time you want to use it, you can simply double-click the shortcut to open it. A shortcut will have a small arrow in the lower-left corner of the icon.

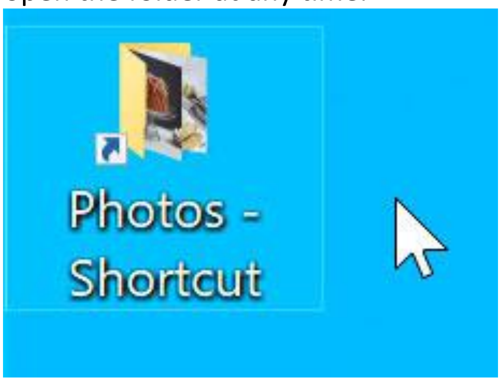
Note that creating a shortcut does **not** create a duplicate copy of the folder; it's simply a way to access the folder more quickly. If you delete a shortcut, it will not delete the actual folder or the files it contains. Also note that copying a shortcut onto a flash drive will not work; if you want to bring a file with you, you'll need to navigate to the actual location of the file and copy it to the flash drive.

To create a shortcut:

1. Locate and right-click the desired folder, then select **Send to Desktop (create shortcut)**.




2. A shortcut to the folder will appear on the desktop. Notice the arrow in the lower-left corner of the icon. You can now double-click the shortcut to open the folder at any time.




You can also hold the **Alt** key on your keyboard, then click and drag the folder to the desktop to create a shortcut.

5.4 Finding Files on Your Computer

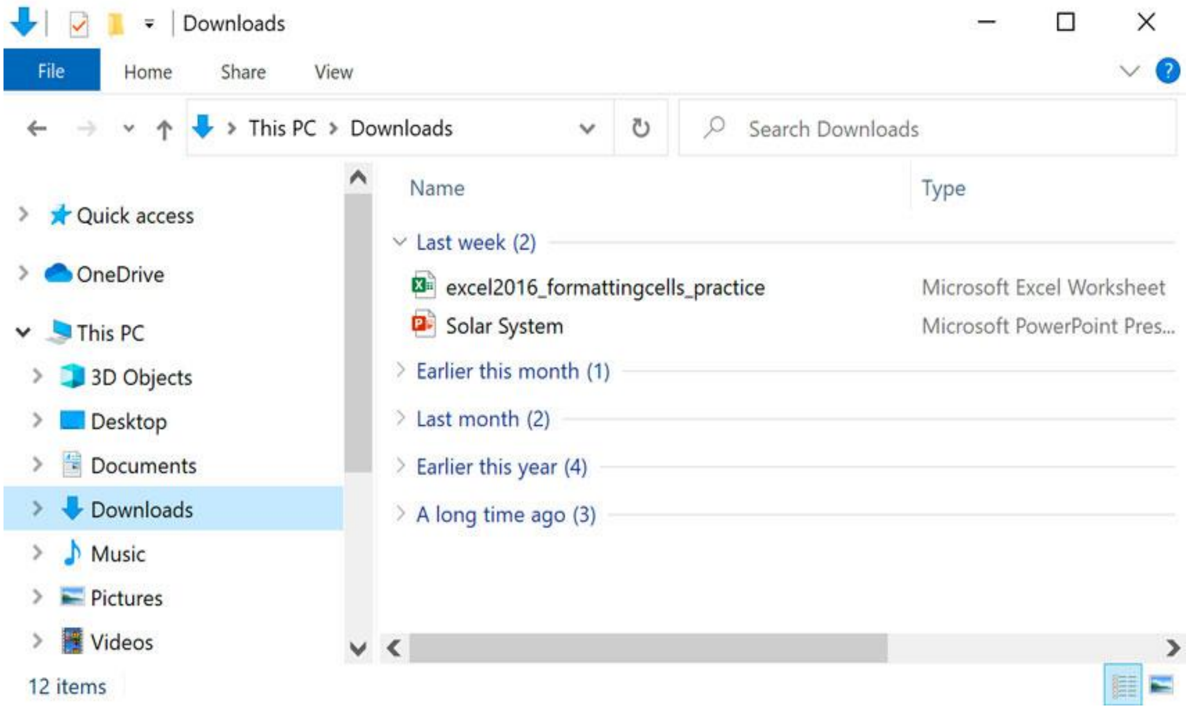
Finding files on your computer

There may be times when you have trouble finding a certain file. If this happens to you, don't panic! The file is probably still on your computer, and there are a few simple ways to find it. In this lesson, we'll show you different techniques you can use to find your files, including searching and looking in common places.

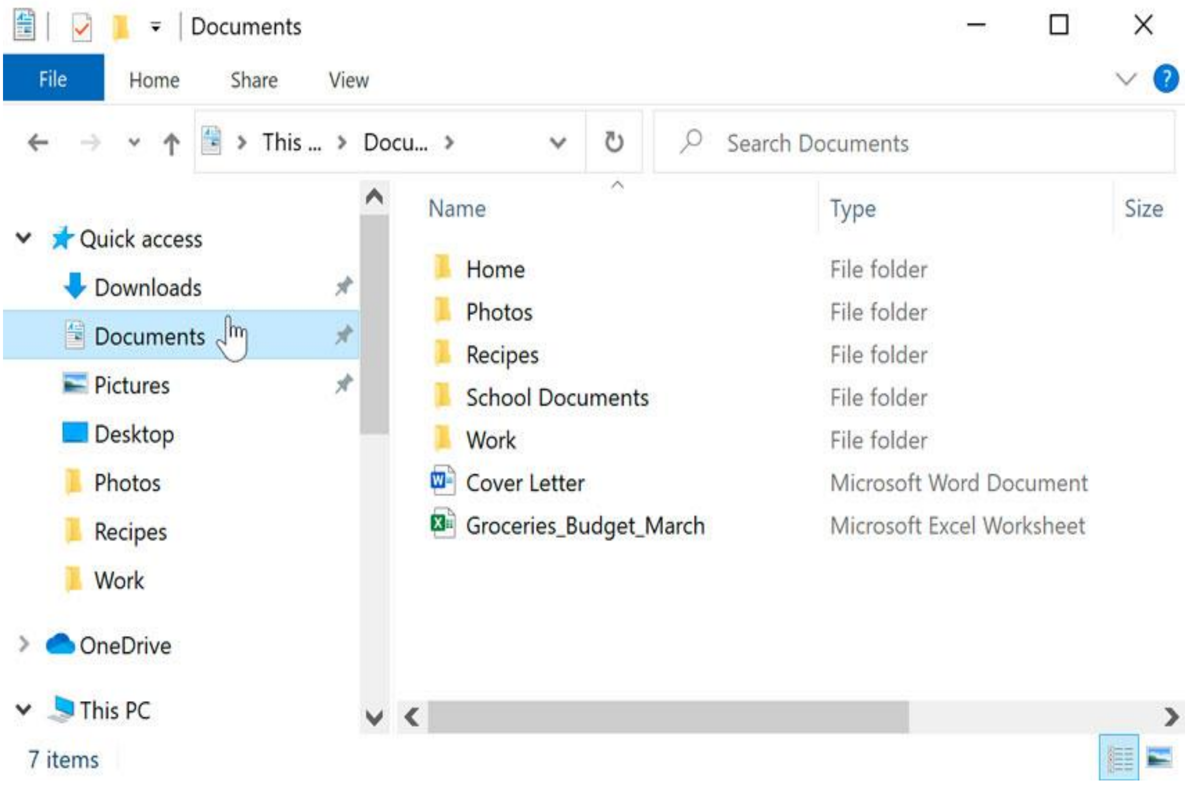
Common places to look for files

If you're having a difficult time finding a file, there's a good chance you can find it in one of the following places:

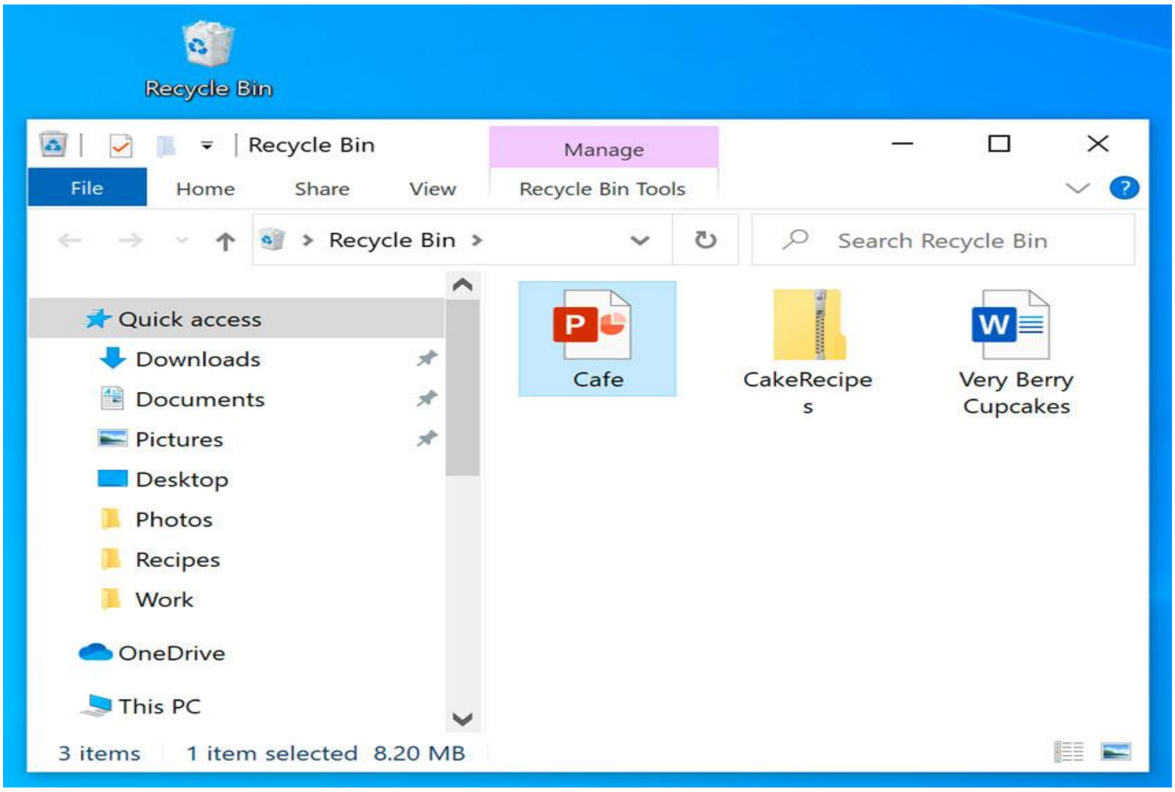
- **Downloads**: By default, your computer will place downloaded files in a specific folder, known as the **Downloads** folder. If you're having trouble finding a file you downloaded from the Internet, such as a photo attached to an email message, this is the **first place** you should look. To view the Downloads folder, open **File Explorer**, then locate and select **Downloads** (below **Favorites** on the left side of the window). A list of your recently **downloaded files** will appear.




- **Default folders**: If you don't specify a location when saving a file, Windows will place certain types of files into default folders. For example, if you're looking for a Microsoft Word document, you could try looking in the **Documents** folder. If you're looking for a photo, try looking in the **Pictures** folder. Most of these folders will be accessible on the left side of the File Explorer window.




- **Recycle Bin**: If you deleted a file by mistake, it may still be in the Recycle Bin. You can double-click the Recycle Bin icon on the desktop to open it. If you find the file you need, click and drag it back to the desktop or to a different folder.

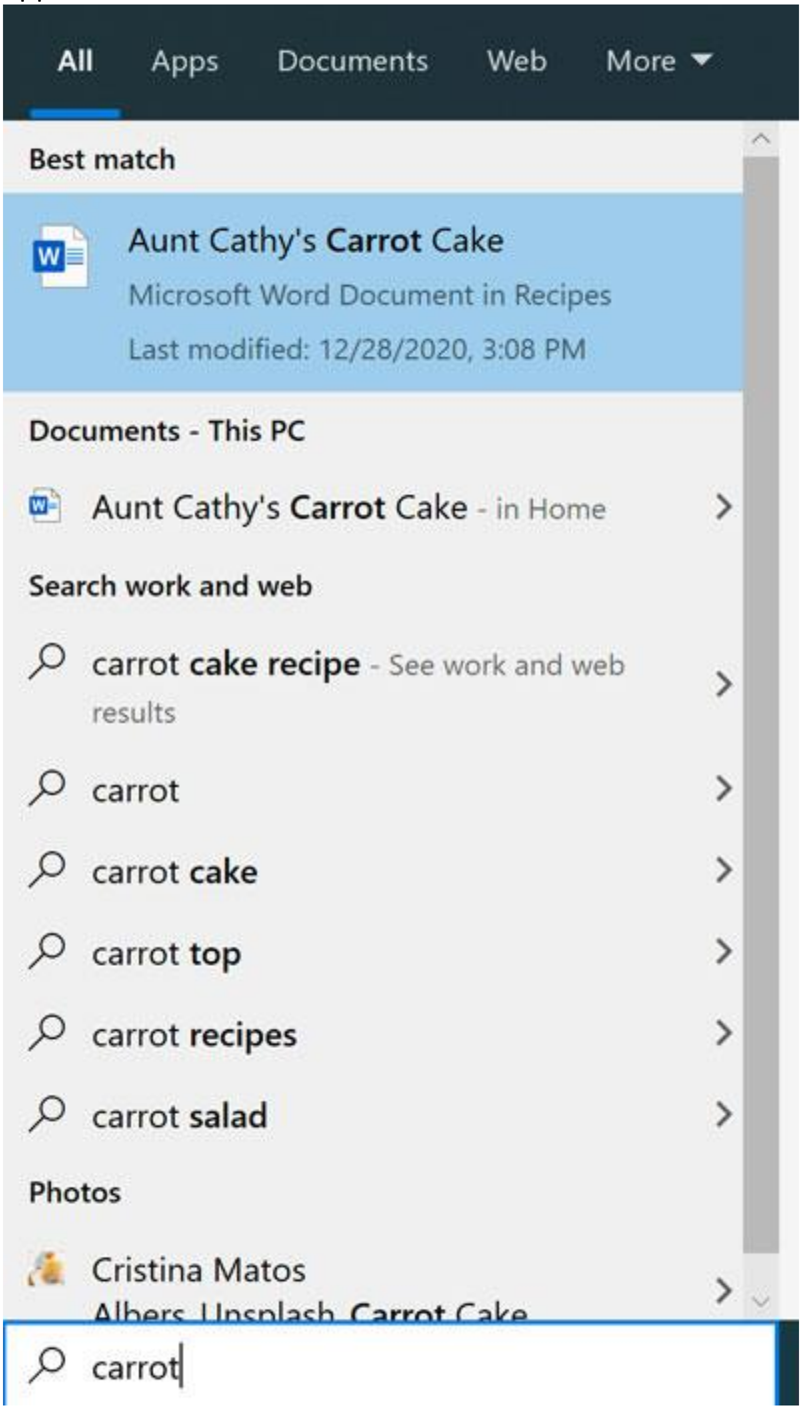


Searching for files

Let's say you recently downloaded a few photos that were attached to an email message, but now you're not sure where these files are on your computer. If you're struggling to find a file, you can always **search for it**. Searching allows you to look for **any file** on your computer.

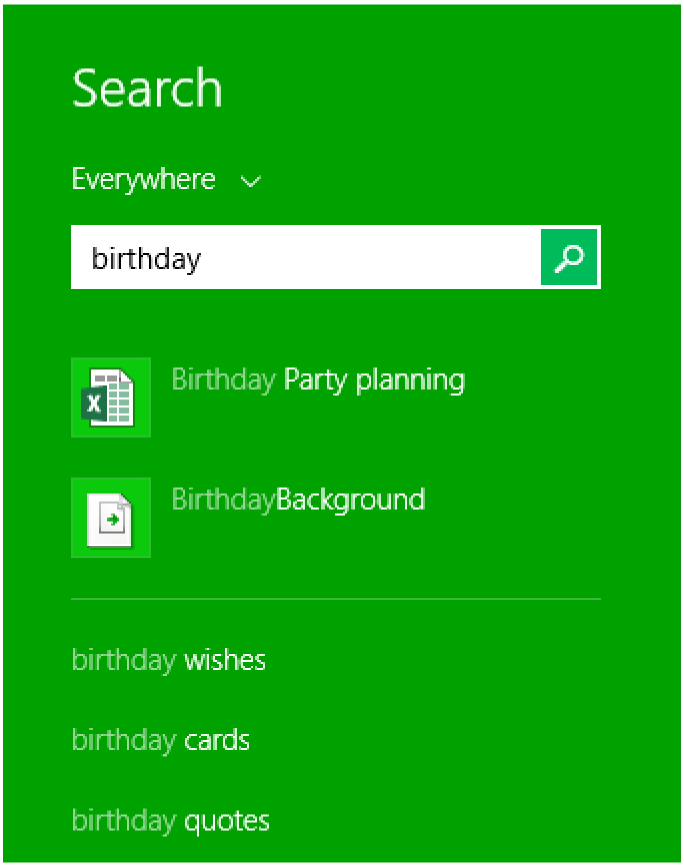
To search for a file (Windows 10):

In the **Search Box** next to the Start button, type to search for a file. The search results will appear above the search box.



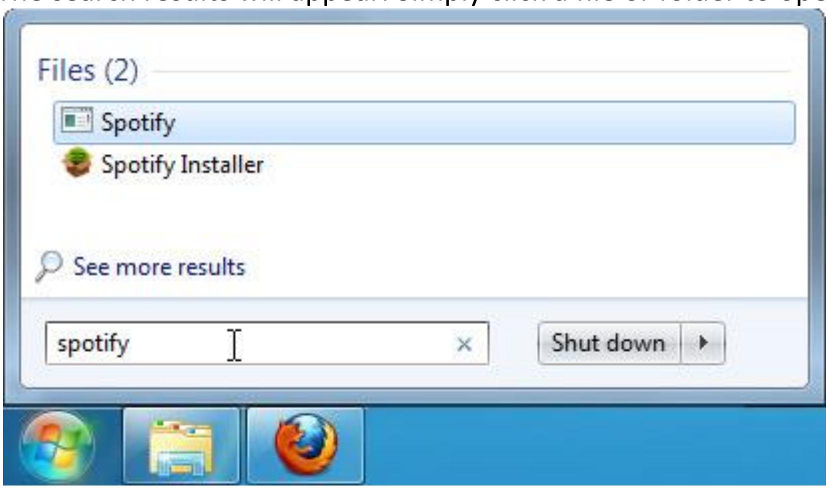
To search for a file (Windows 8):

Click the **Start button** to go to the **Start screen**, then start typing to search for a file. The search results will appear on the right side of the screen. Simply click a file or folder to open it.




To search for a file (Windows 7 and earlier):

Click the **Start button**, type the **file name** or **keywords** with your keyboard, and press **Enter**. The search results will appear. Simply click a file or folder to open it.



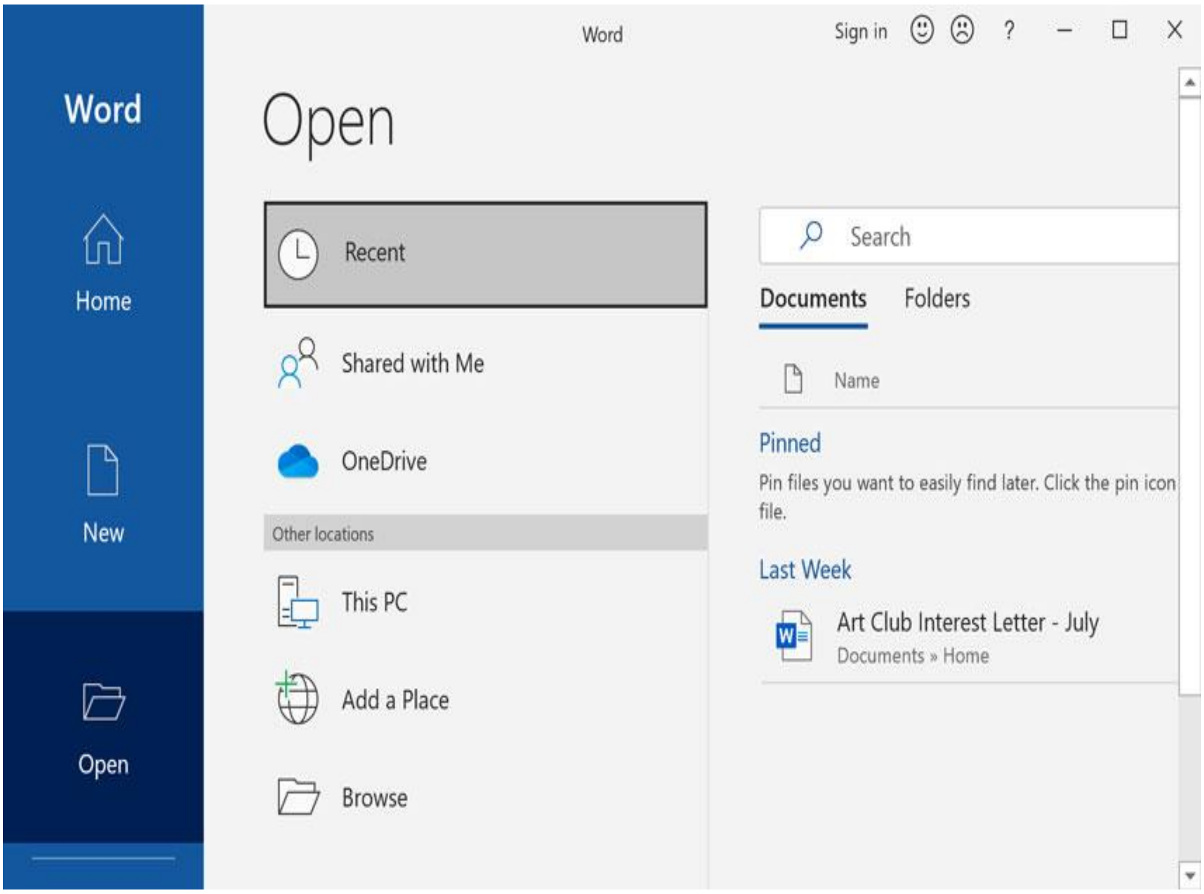

Tips for finding files

If you're still having trouble finding the file you need, here are some additional tips.

- **Try different search terms**. If you're using the search option, try using different terms in your search. For example, if you're looking for a certain

Microsoft Word document, try searching for a few different file names you might have used when saving the document.

- **Open the last application used to edit the file**. If you know you used a certain application to edit a file, open that application and select **File > Open > Recent** from the menu. The file may appear in the list of recently edited files.




- **Move and rename the file after finding it**. Once you've located the file, you may want to **move it to a related folder** so you can find it more easily in the future. For example, if the file is a picture, you might move it to your **Pictures** folder. You may also want to give it a file name that will be easy to remember.

## 5.5 Common Computer Tasks

### Common computer tasks

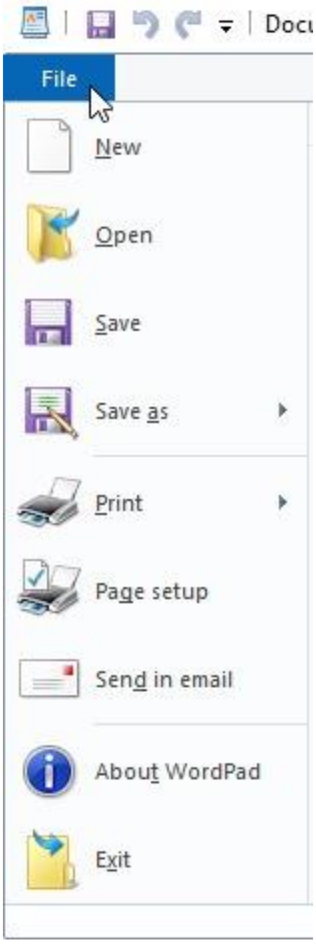
There are some common computer skills that will **work the same way** in almost any situation. Once you learn how to use these skills, you'll be able to use them to perform a variety of tasks on your computer. In this lesson, we'll talk about some common commands you can use in almost any application, including **cut**, **copy**, **paste**, and **undo**.

### The Menu bar

Most applications have a **Menu bar** at the top of the window. Each menu has a set of **commands** that will perform a specific action within the program. While each application is different, there are some common commands that **work the same way**, no matter which application you're using. Whenever you open a program for the first time, try clicking these menus to see the various options available.


File menu commands

You'll find the **File** menu on the leftmost side of the Menu bar in almost every application. The File menu will usually have the same type of commands. For example, you can create a **new** file, **open** an existing file, and **save** the current file, among other functions.

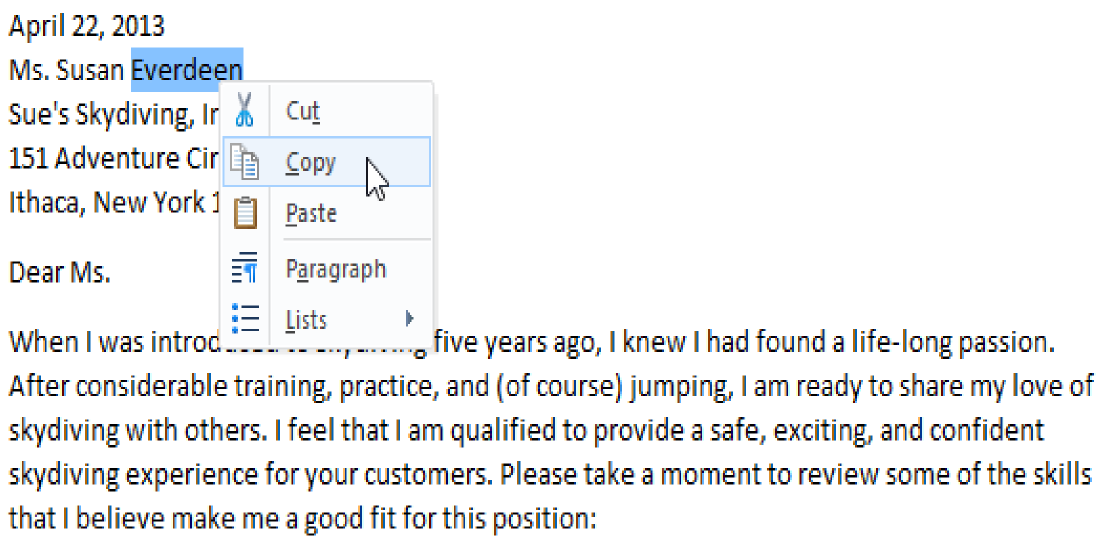



Cut, copy, and paste

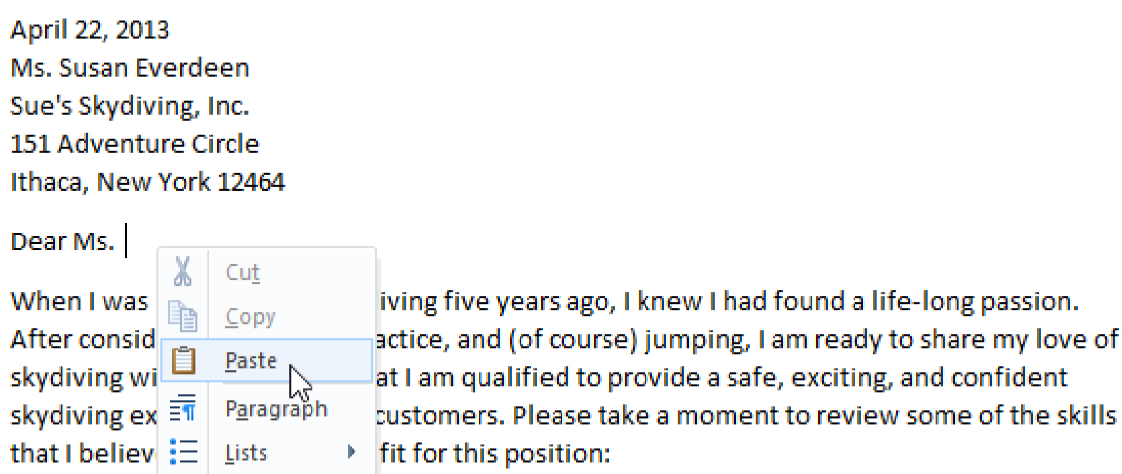
Many applications allow you to **copy** items from one place and then **paste** them to another. For example, if you're working with a word processor, you might copy and paste text to avoid typing the same thing over and over. If there's something you want to move from one place to another, you can **cut and paste** instead.

To copy and paste:

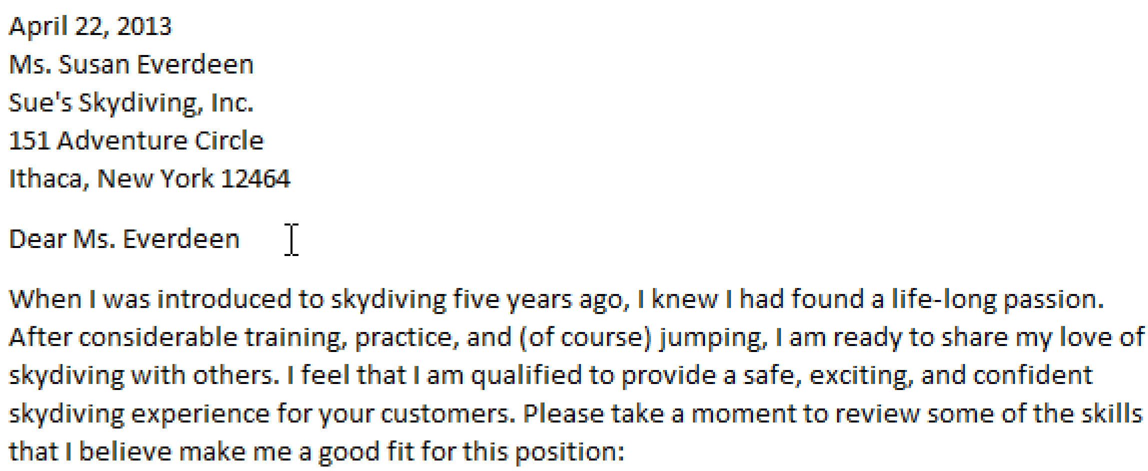
1. Select the item you want to copy. In our example, we'll select a word in a document.
2. Right-click the mouse and select **Copy** from the menu that appears. You can also press **Ctrl+C** on your keyboard.




3. Locate and right-click the desired location for the item, then select **Paste**. You can also press **Ctrl+V** on your keyboard.

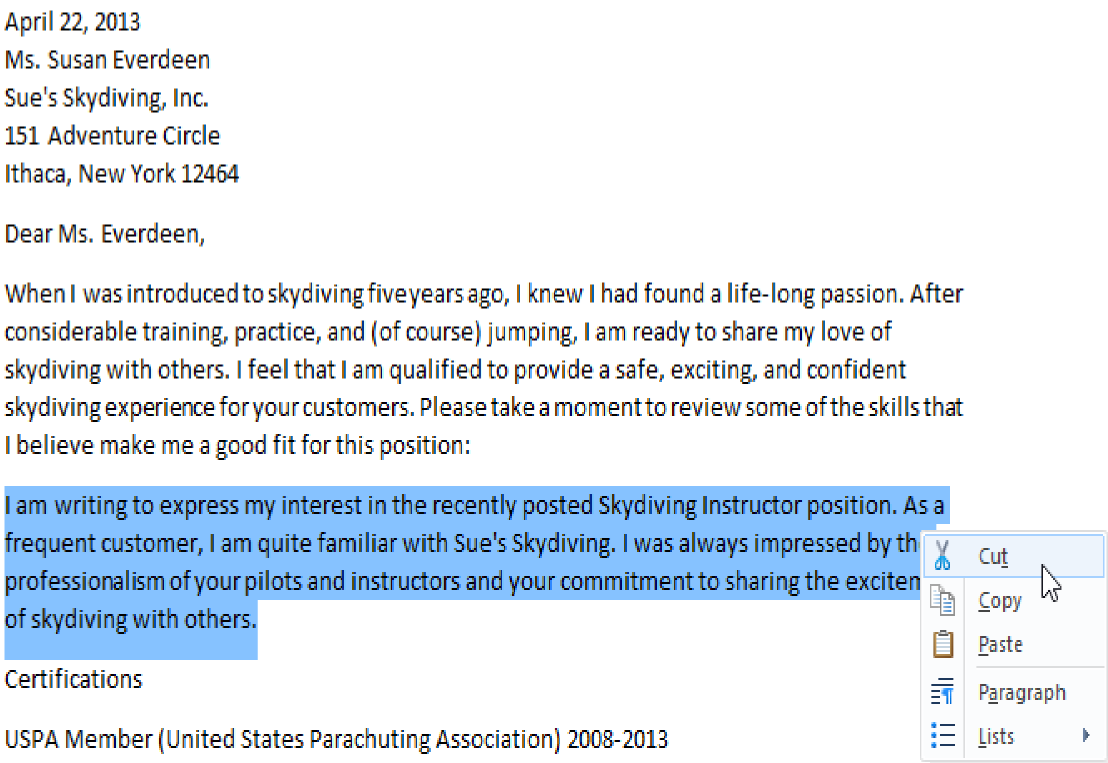



4. The item will be copied to the new location. Notice how the original text that was copied has not been moved or changed.

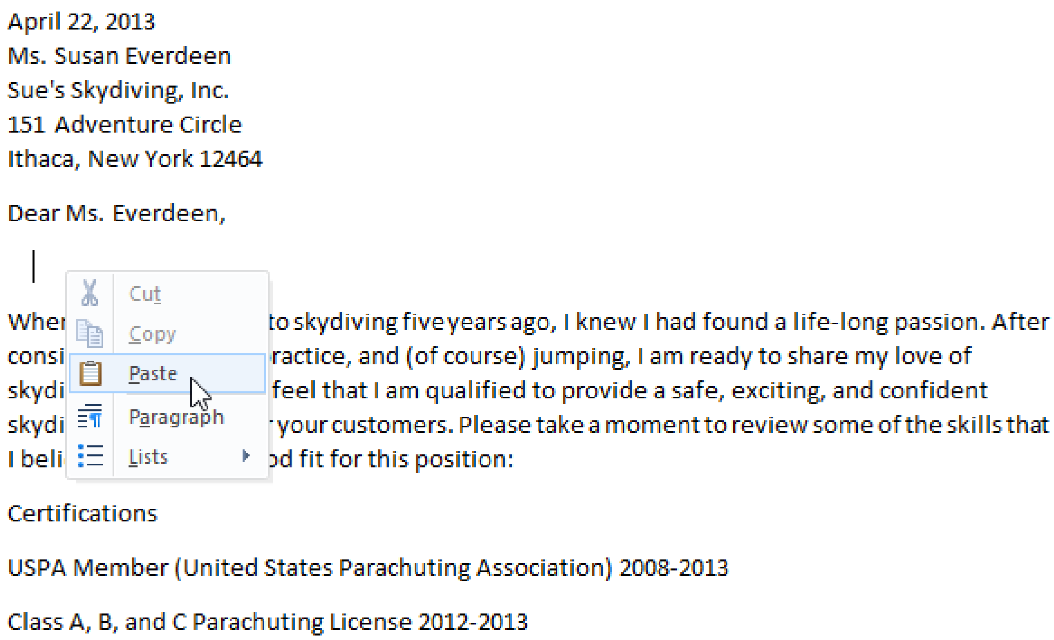


To cut and paste:

1. Select the item you want to cut. In our example, we'll select a paragraph of text in a document.
2. Right-click the mouse and select **Cut** from the menu that appears. You can also press **Ctrl+X** on your keyboard.




3. Locate and right-click the desired location for the item, then select **Paste**. You can also press **Ctrl+V** on your keyboard.



4. The item will be pasted, or moved, to the new location. In our example, we used the cut and paste commands to move the second paragraph above the first paragraph.

April 22, 2013
Ms. Susan Everdeen
Sue's Skydiving, Inc.
151 Adventure Circle
Ithaca, New York 12464

Dear Ms. Everdeen,

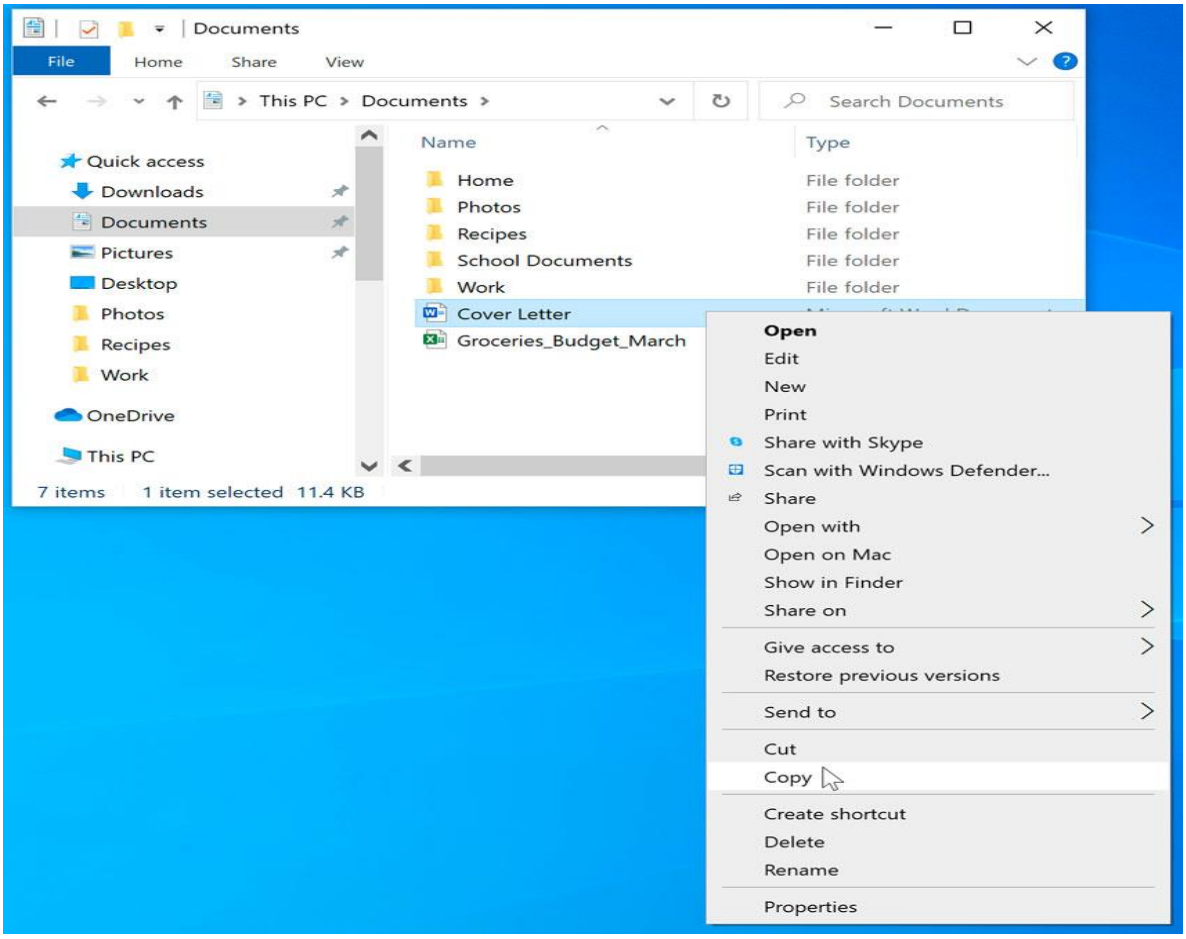
I am writing to express my interest in the recently posted Skydiving Instructor position. As a frequent customer, I am quite familiar with Sue's Skydiving. I was always impressed by the professionalism of your pilots and instructors and your commitment to sharing the excitement of skydiving with others.

When I was introduced to skydiving five years ago, I knew I had found a life-long passion. After considerable training, practice, and (of course) jumping, I am ready to share my love of skydiving with others. I feel that I am qualified to provide a safe, exciting, and confident skydiving experience for your customers. Please take a moment to review some of the skills that I believe make me a good fit for this position:

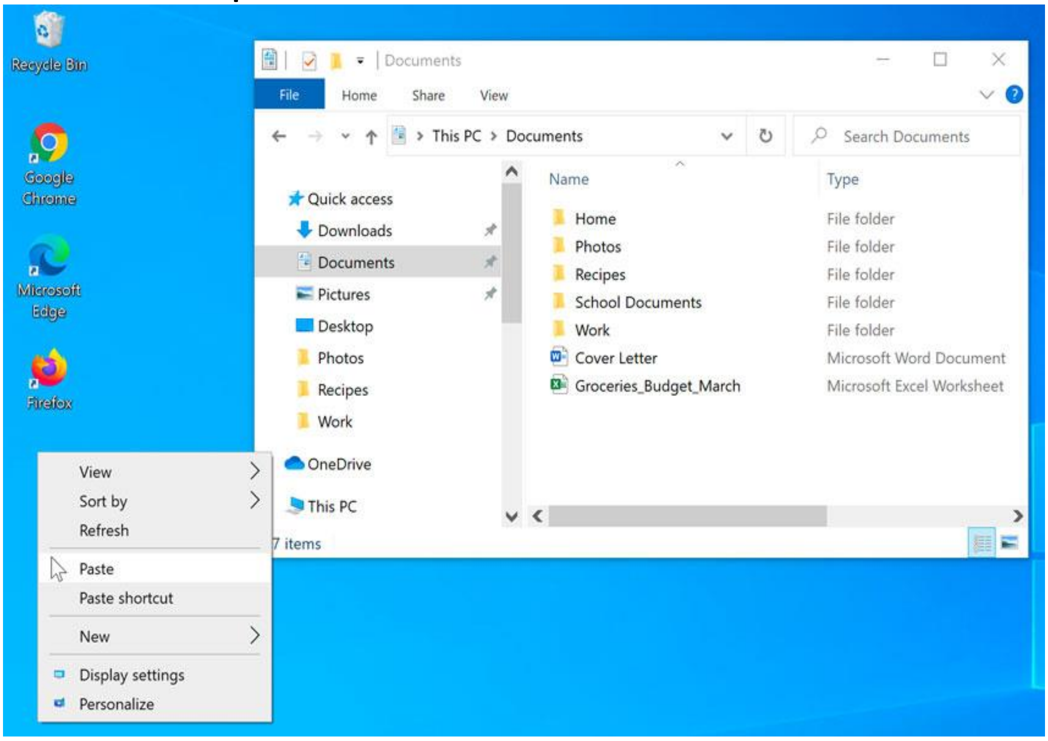
To copy and paste files:

You can use the cut, copy, and paste commands for a variety of tasks on your computer. For example, if you wanted to create a **duplicate** copy of a file, you could **copy it** from one folder to another.

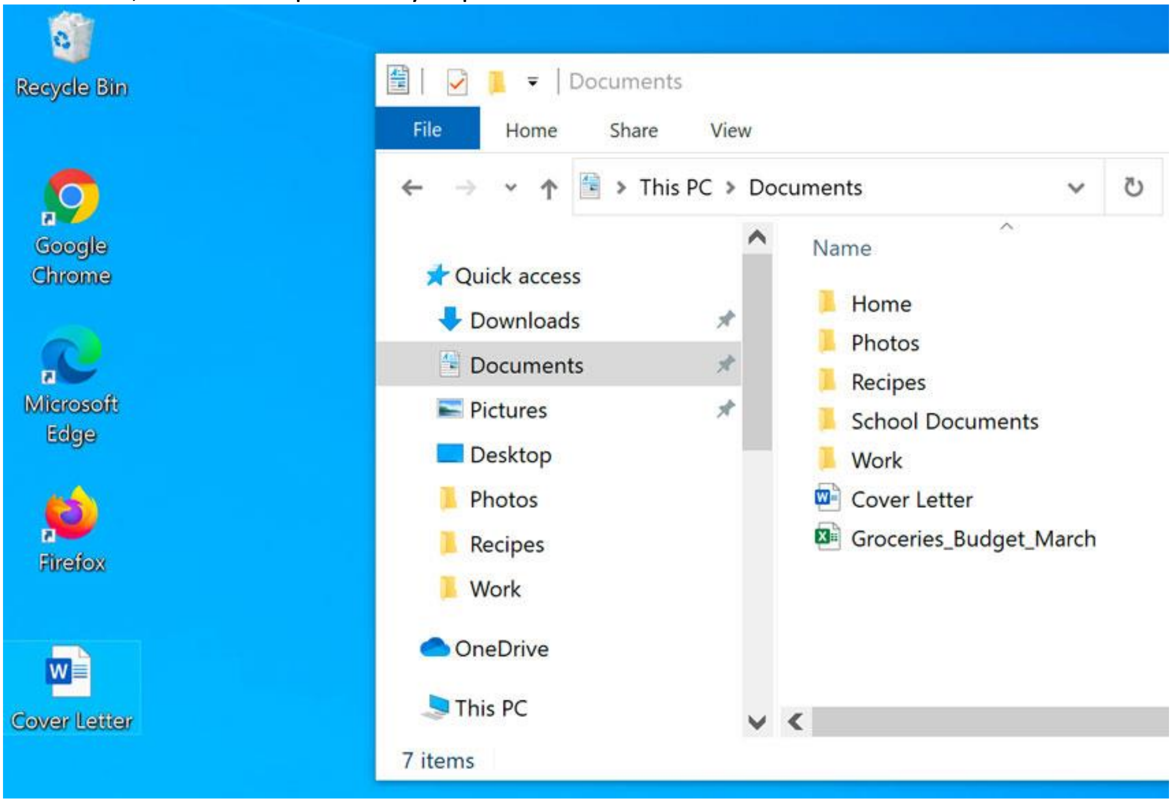
1. Right-click the file and select **Copy** from the menu that appears. You can also press **Ctrl+C** on your keyboard.




2. Locate and right-click the new location, then select **Paste**. You can also press **Ctrl+V** on your keyboard. In our example, we'll paste the file to the **desktop**.



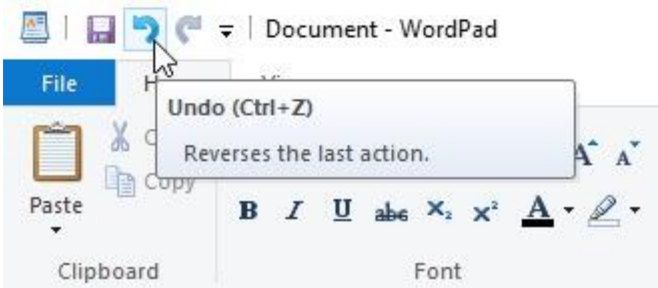
3. The duplicate file will appear. Notice how the original file has not been moved or changed. Also, note that if you make a change to the original file, it will **not** update any copies of that file.




Copying a file is **not** the same as creating a shortcut. You can review our lesson on Working with Files to learn more about using shortcuts.

Undoing changes

Let's say you're working on a text document and accidentally delete some text. Fortunately, you won't have to retype everything you just deleted! Most applications allow you to **undo your most recent action** when you make a mistake like this. Just locate and select the **Undo** command, which is usually in the upper-left corner of the window near the Menu bar. You can also press **Ctrl+Z** on your keyboard. You can continuing using this command to undo multiple changes in a row.




Note that the Undo command will work almost all of the time, but not in every situation. For example, if you empty the Recycle Bin to permanently delete a file, you can't undo the action.

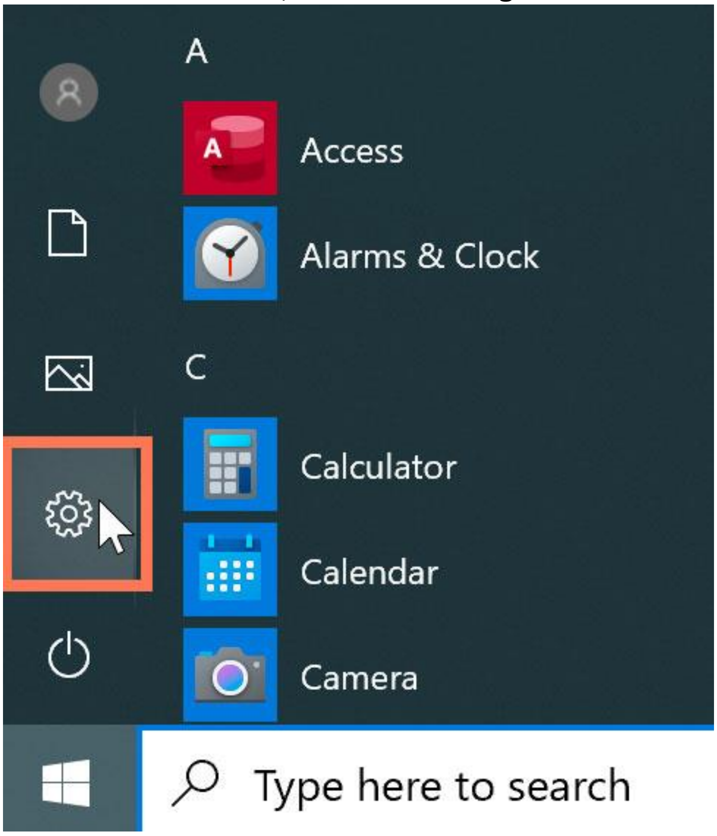
## Lesson 6: Adjusting Your Settings

6.1 Adjusting your settings

At some point, you may want to adjust your computer's settings. For example, you might want to change your desktop background or modify your Internet settings. You can change these settings and more from the Control Panel.
However, in Windows 10, the Control Panel has mostly been replaced by the Settings app. The Control Panel is still available, but most of the tasks and settings are now also located in the Settings app.

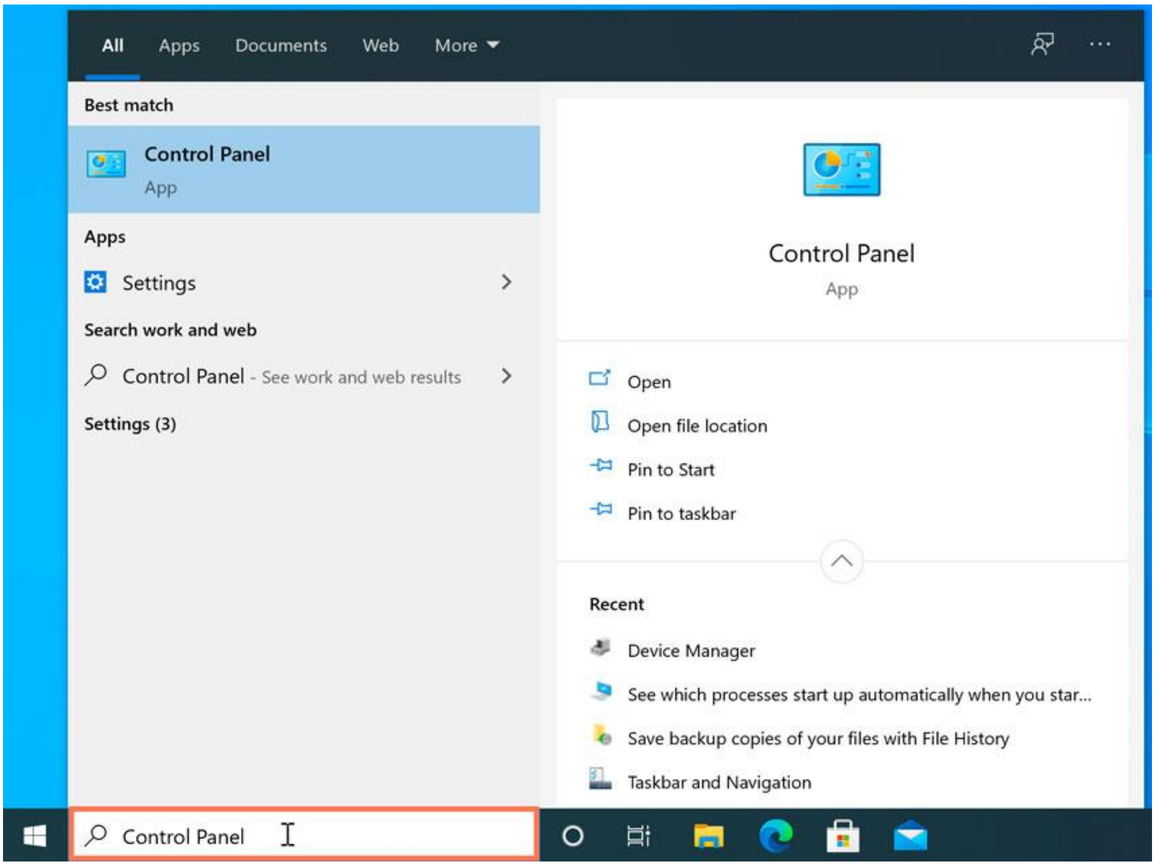
To open the Settings app (Windows 10):

Click the **Start** button, then select the **gear** icon.



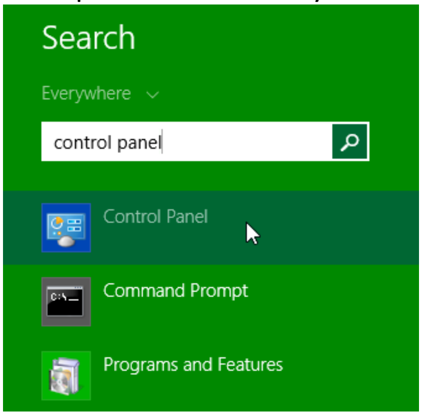

6.2 To open the Control Panel (Windows 10):

Type **Control Panel** in the **Search Box** next to the Start button. Then, select the Control Panel app from the menu.



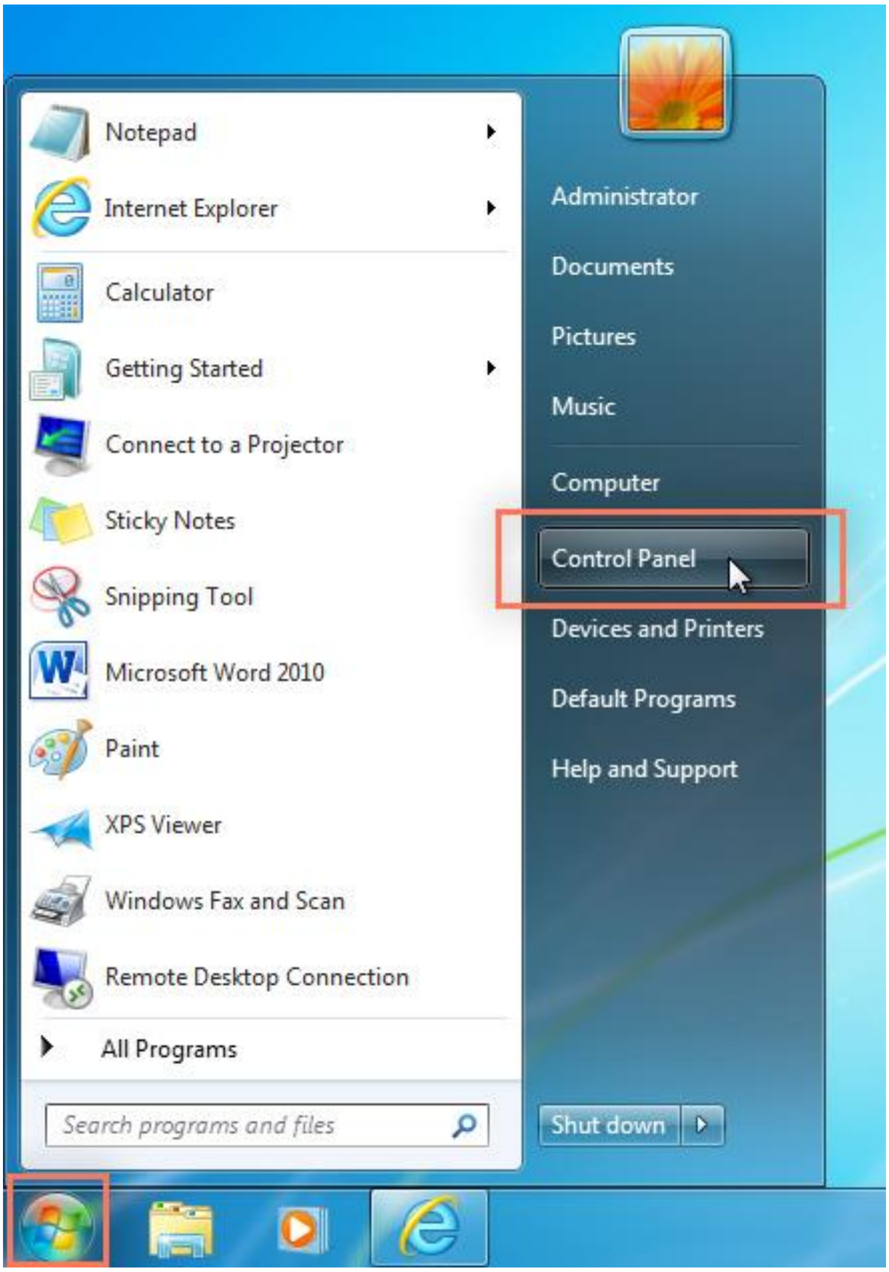

To open the Control Panel (Windows 8):

In Windows 8, you can open the Control Panel directly from the Start screen. Using your keyboard, type **Control Panel** and press the **Enter** key.




To open the Control Panel (Windows 7 and earlier):

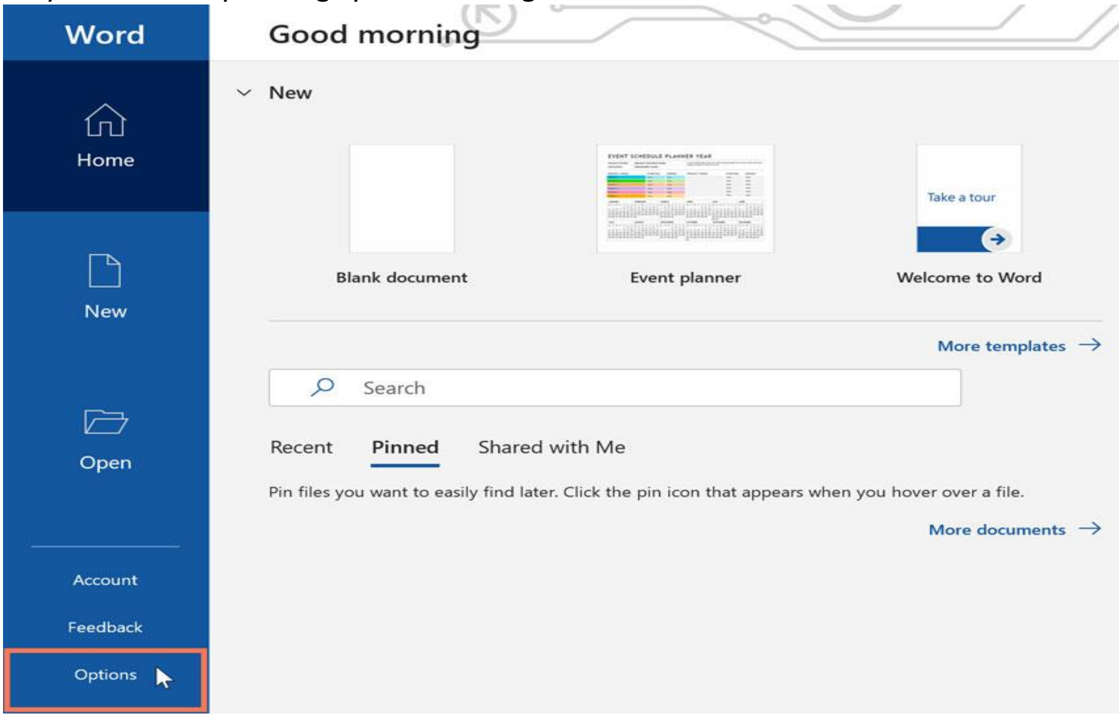
1. Click the **Start** button, then select **Control Panel**.




2. The Control Panel will appear. Simply click a setting to adjust it. In this example, we'll click **Change desktop background** to choose a new wallpaper for our desktop.


Adjusting application settings

You'll also be able to change the settings for different **applications** on your computer. You will usually find application settings under **File > Options**, **Tools > Options**, or within a separate **Settings** menu. Keep in mind that the location will vary, and some applications may not have any settings you can change.



## Lesson 7 Understanding user accounts

A user account allows you to sign in to your computer. By default, your computer already has one user account, which you were required to create when you set up your computer. If you plan to share your computer with others, you can create a separate user account for each person.

### 7.1 Why use separate user accounts?

At this point, you may be wondering why you would even need to use separate user accounts. But if you're sharing a computer with multiple people—for example, with your family or at the office—user accounts allow everyone to save their own files, preferences, and settings without affecting other computer users. When you start your computer, you'll be able to choose which account you want to use.

### 7.2 Administrator, Standard, and Managed accounts

Before you create new user accounts, it's important to understand the different types.

- **Administrator**: Administrator accounts are special accounts that are used for making changes to system settings or managing other people's accounts. They have full access to every setting on the computer. Every computer will have at least one Administrator account, and if you're the owner you should already have a password to this account.
- **Standard**: Standard accounts are the basic accounts you use for normal everyday tasks. As a Standard user, you can do just about anything you would need to do, such as running software or personalizing your desktop.
- **Standard with Family Safety**: These are the only accounts that can have **parental controls**. You can create a Standard account for each child, then go to the **Family Safety** settings in your **Control Panel** to set website restrictions, time limits, and more.

Generally, it's safer to be signed in to a Standard account than an Administrator account. If you're logged in as an Administrator, it may actually make it easier for an **unauthorized user to make changes** to your computer. Therefore, you may want to create a Standard account for yourself, even if you're not sharing the computer with anyone. You'll still be able to make **Administrator-level changes**; you'll just need to provide your **Administrator password** when making these changes.

### 7.3 Adding and managing user accounts

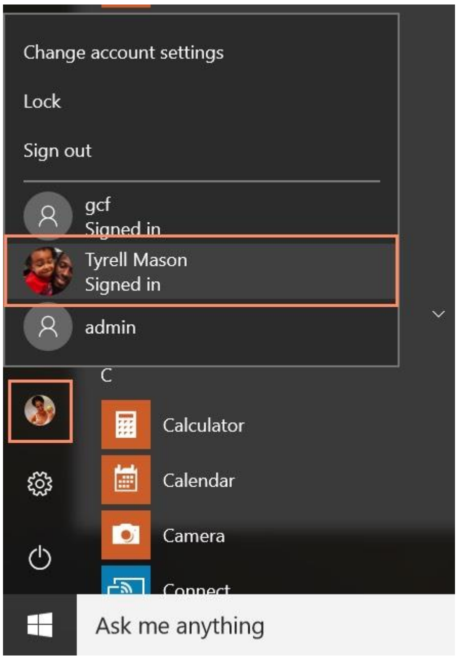
The process for adding and managing user accounts is quite different for each version of Windows.

#### Switching between user accounts

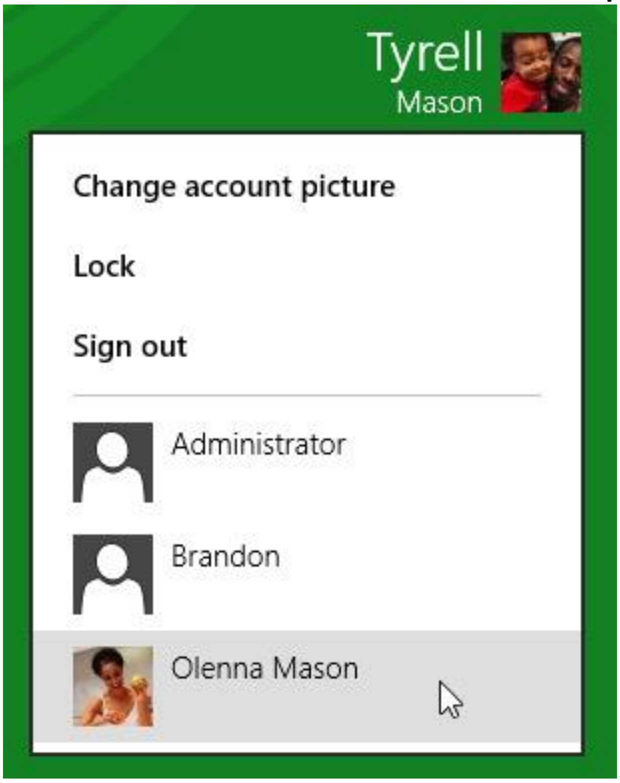
If you have multiple user accounts on your computer, it's easy to **switch between** users without signing out or closing your current apps. Switching users will **lock** the current user, so you won't need to worry about someone else accessing your account.

#### To switch between user accounts (Windows 10):

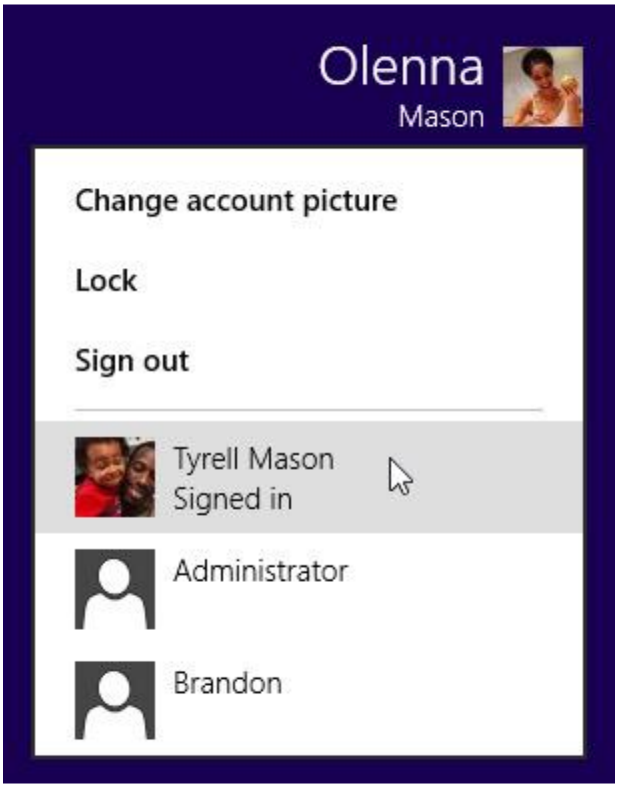
Click the **current user icon** on the left side of the **Start menu**, then select the **desired user** from the drop-down menu. The user will then need to **enter a password** to sign in.



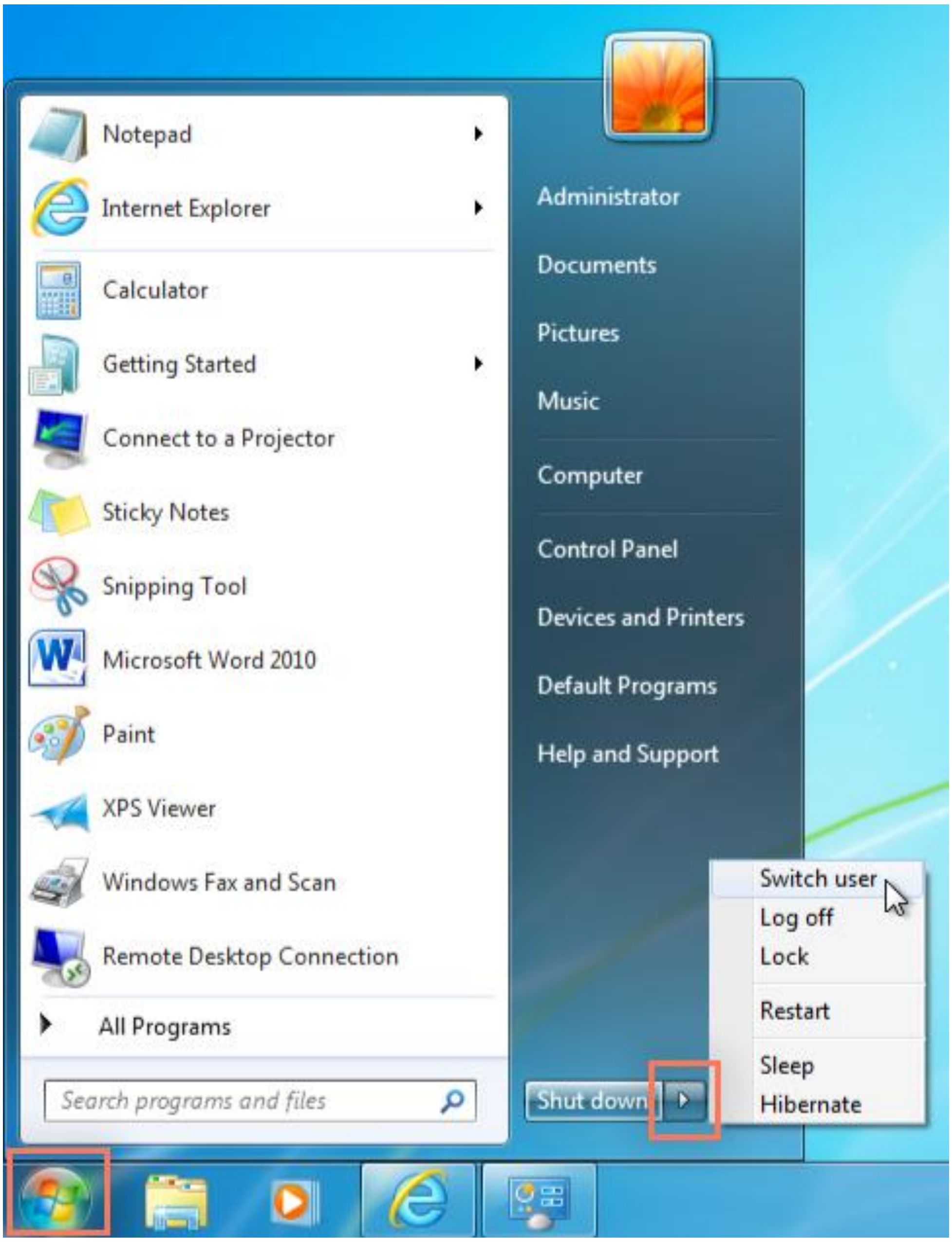

To switch between user accounts (Windows 8):
Click the **current user** in the upper-right of the **Start screen**, then select the **desired user** from the drop-down menu. The user will then need to **enter a password** to sign in.




You can **switch back** by selecting the desired user from the drop-down menu. You'll need to **re-enter your password** to **unlock** the account.




To switch between user accounts (Windows 7):
Click the **Start** button, click the **arrow** next to Shut Down, and select **Switch user**.




If you're finished using the computer, you can also choose to **log off**. This will allow other users to sign in to the computer with different accounts.

## Lesson 8: Using the Internet

### 8.1 Connecting to the Internet

Once you've set up your computer, you may want to purchase home Internet access so you can send and receive email, browse the Web, stream videos, and more. You may even want to set up a home wireless network, commonly known as Wi-Fi, so you can connect multiple devices to the Internet at the same time.

## 8.2 Types of Internet service

The type of Internet service you choose will largely depend on which **Internet service providers** (ISPs) serve your area, along with the types of service they offer. Here are some common types of Internet service.

- **Dial-up**: This is generally the slowest type of Internet connection, and you should probably avoid it unless it is the only service available in your area. Dial-up Internet uses your **phone line**, so unless you have multiple phone lines you will not be able to use your landline and the Internet at the same time.
- **DSL**: DSL service uses a **broadband connection**, which makes it much faster than dial-up. DSL connects to the Internet **via a phone line** but does not require you to have a landline at home. And unlike dial-up, you'll be able to use the Internet and your phone line at the same time.
- **Cable**: Cable service connects to the Internet **via cable TV**, although you do not necessarily need to have cable TV in order to get it. It uses a broadband connection and can be faster than both dial-up and DSL service; however, it is only available where cable TV is available.
- **Satellite**: A satellite connection uses broadband but does not require cable or phone lines; it connects to the Internet **through satellites orbiting the Earth**. As a result, it can be used almost anywhere in the world, but the connection may be affected by weather patterns. Satellite connections are also usually slower than DSL or cable.
- **3G and 4G**: 3G and 4G service is most commonly used with mobile phones, and it connects **wirelessly** through your ISP's network. However, these types of connections aren't always as fast as DSL or cable. They will also **limit the amount of data** you can use each month, which isn't the case with most broadband plans.

## 8.3 Choosing an Internet service provider

Now that you know about the different types of Internet service, you can do some research to find out what ISPs are available in your area. If you're having trouble getting started, we recommend talking to friends, family members, and neighbors about the ISPs they use. This will usually give you a good idea of the types of Internet service available in your area.

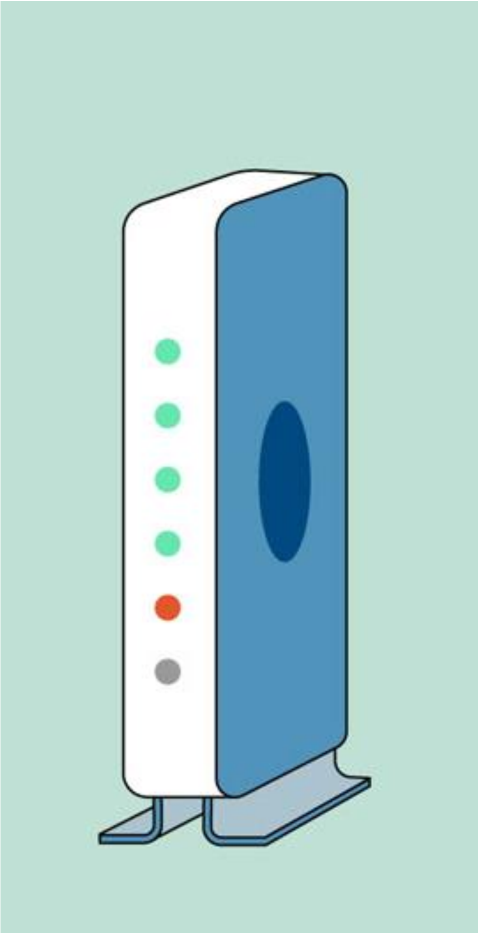
Most ISPs offer several tiers of service with different Internet speeds, usually measured in **Mbps** (short for **megabits per second**). If you mainly want to use the Internet for **email** and **social networking**, a slower connection (around 2 to 5 Mbps) might be all you need. However, if you want to **download music** or **stream videos**, you'll want a faster connection (at least 5 Mbps or higher).

You'll also want to **consider the cost** of the service, including installation charges and monthly fees. Generally speaking, the faster the connection, the more expensive it will be per month.

Although **dial-up** has traditionally been the **least expensive** option, many ISPs have raised dial-up prices to be the **same as broadband**. This is intended to encourage people to switch to broadband. We do not recommend dial-up Internet unless it's your only option.

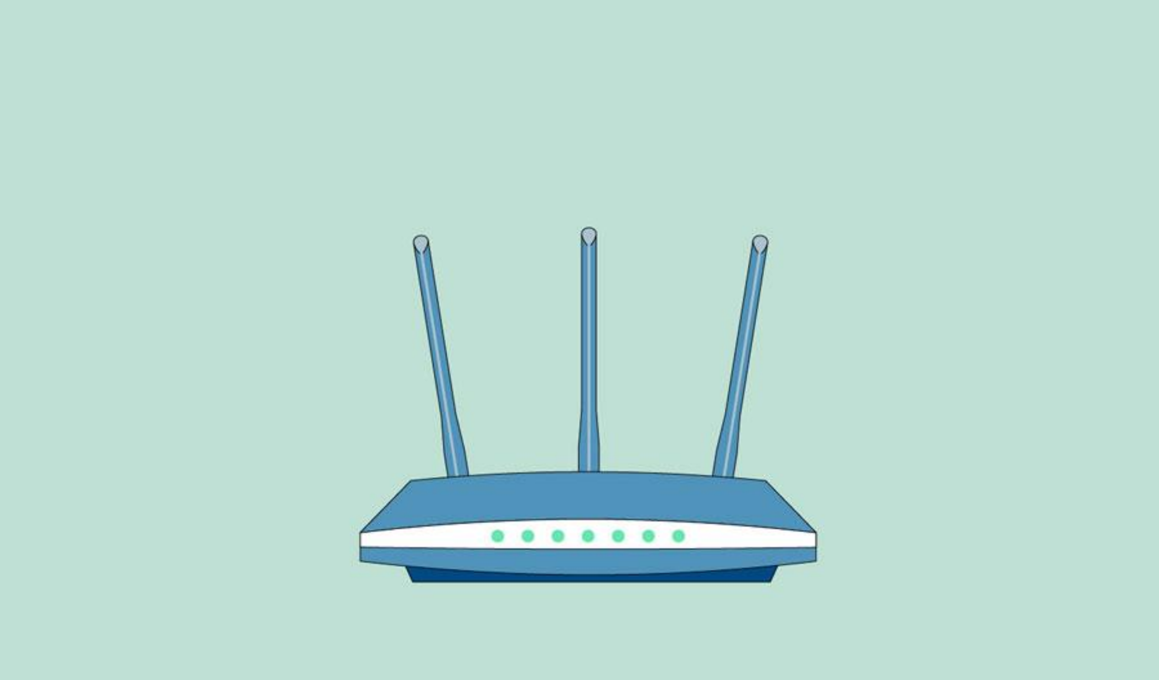
## 8.4 Hardware needed

### Modem



Once you have your computer, you really don't need much additional hardware to connect to the Internet. The primary piece of hardware you need is a **modem**.
The type of Internet access you choose will determine the type of modem you need. **Dial-up** access uses a **telephone modem**, **DSL** service uses a **DSL modem**, **cable** access uses a **cable modem**, and **satellite** service uses a **satellite adapter**. Your ISP may give you a modem—often for a fee—when you sign a contract, which helps ensure that you have the **right type** of modem. However, if you would prefer to shop for a **better** or **less expensive** modem, you can choose to buy one separately.

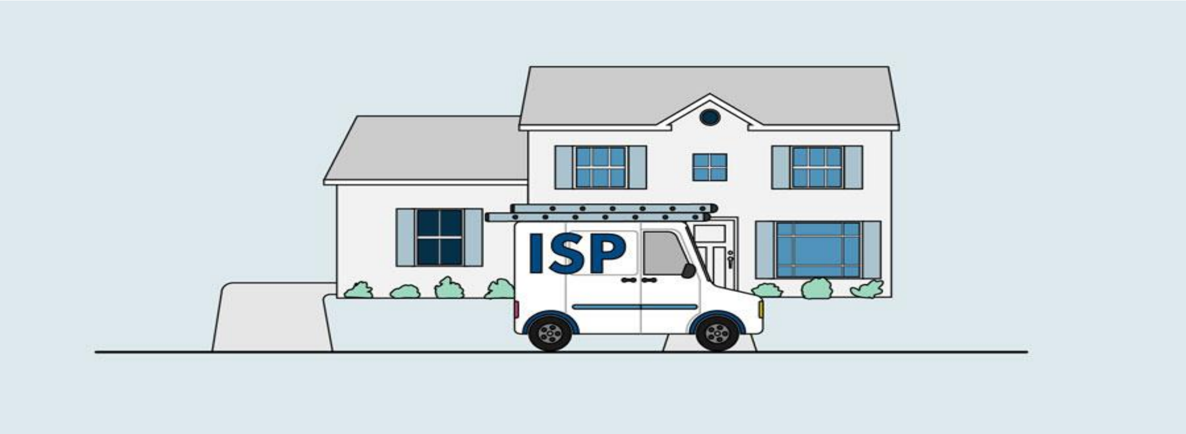
Router



A **router** is a hardware device that allows you to connect **several computers** and **other devices** to a single Internet connection, which is known as a **home network**. Many routers are **wireless**, which allows you to create a **home wireless network**, commonly known as a **Wi-Fi network**.

You **don't necessarily need to buy a router** to connect to the Internet. It's possible to connect your computer directly to your modem using an Ethernet cable. Also, many modems include a **built-in router**, so you have the option of creating a Wi-Fi network without buying extra hardware.

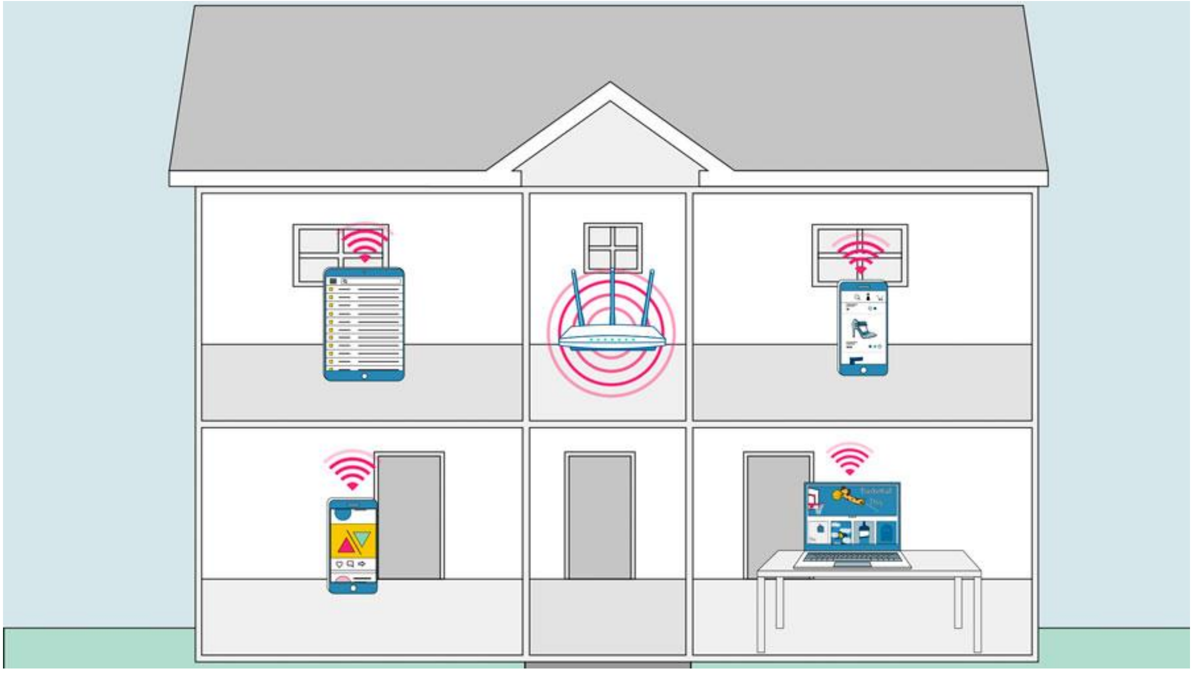
8.5 Setting up your Internet connection




Once you've chosen an ISP, most providers will **send a technician to your house** to turn on the connection. If not, you should be able to use the instructions provided by your ISP—or included with the modem—to set up your Internet connection.

After you have everything set up, you can open your **web browser** and begin using the Internet. If you have any problems with your Internet connection, you can call your ISP's **technical support** number.

Home networking



If you have multiple computers at home and want to use all of them to access the Internet, you may want to create a **home network**, also known as a **Wi-Fi network**. In a home network, all of your devices connect to your **router**, which is connected to the **modem**. This means everyone in your family can use the Internet **at the same time**. Your ISP technician may be able to set up a home Wi-Fi network when installing your Internet service.

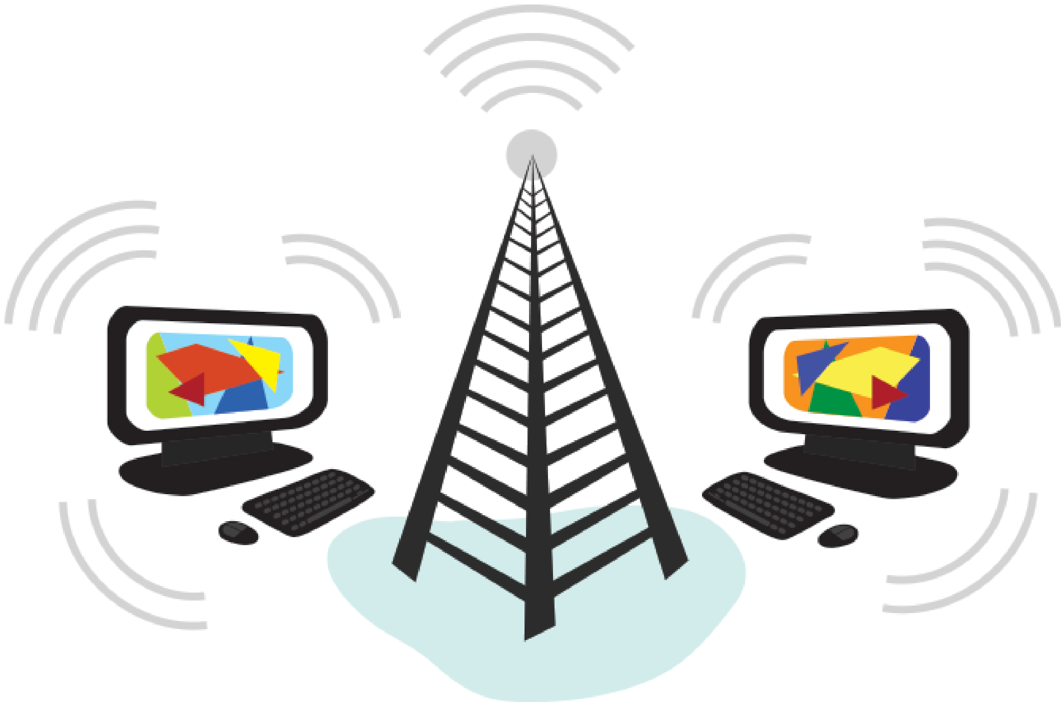
## 8.6 Getting Started with the Internet

### Getting started with the Internet

The Internet is a global network of billions of computers and other electronic devices. With the Internet, it's possible to access almost any information, communicate with anyone else in the world, and much more. You can do all of this on your computer.

### Connecting to the Internet

A device has to be connected to the Internet before you can access it. If you plan to use the Internet at home, you'll usually need to purchase an Internet connection from an **Internet service provider**, which will likely be a phone company, Cable Company, or the government. Other devices usually connect through **Wi-Fi** or **cellular Internet** connections. Sometimes libraries, cafes, and schools offer free Wi-Fi for their patrons, customers, and students.



Browsing the web

Most information on the Internet is on **websites**. Once you are connected to the Internet, you can access websites using a kind of application called a **web browser**.

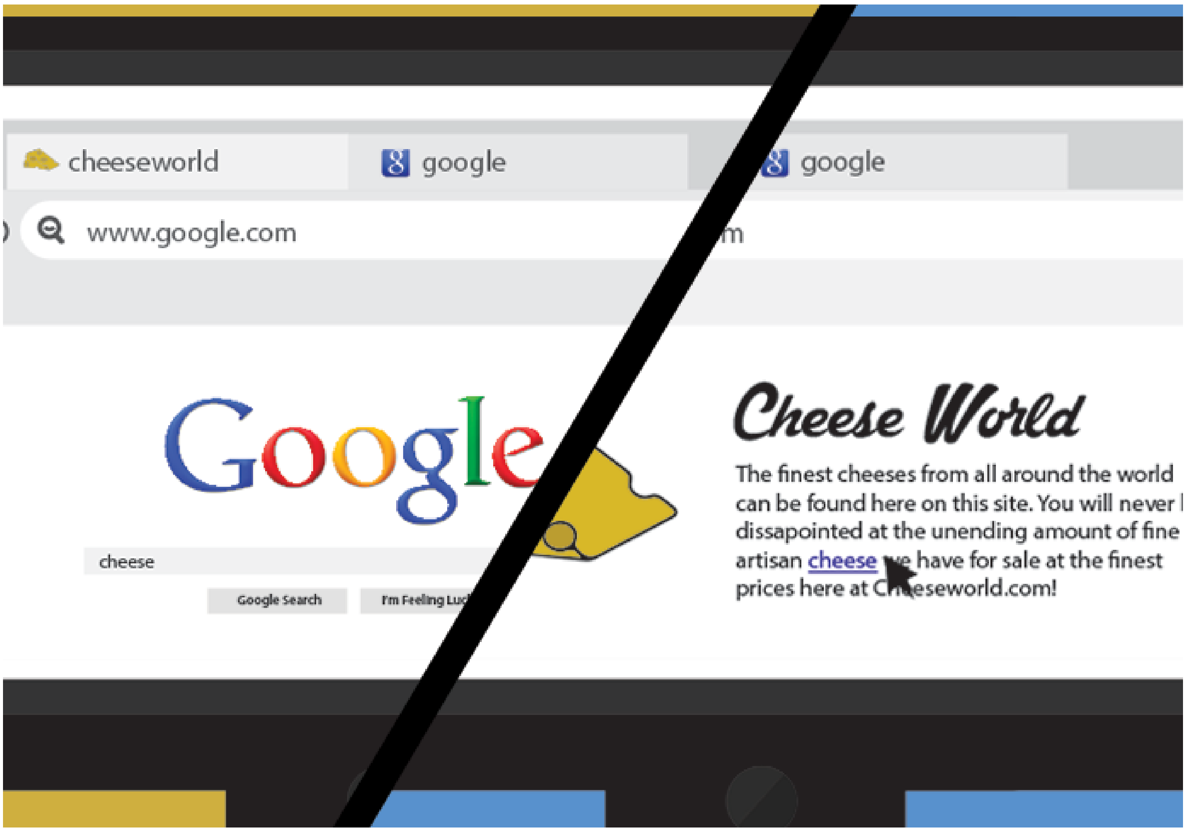
A **website** is a collection of related text, images, and other resources. Websites can resemble other forms of media—like newspaper articles or television programs—or they can be interactive in a way that's unique to computers. The purpose of a website can be almost anything: a news platform, an advertisement, an online library, a forum for sharing images, or an educational site like us!


A **web browser** allows you to connect to and view websites. The web browser itself is not the Internet, but it displays pages on the Internet. Each website has a unique address. By typing this address into your web browser, you can connect to that website and your web browser will display it.

Navigating websites

Websites often have **links** to other sites, also called **hyperlinks**. These are often parts of the text on the website. They are usually colored blue, and sometimes they are underlined or bold. If you click the text, your browser will load a different page. Web authors use hyperlinks to connect relevant pages. This web of links is one of the most unique features of the Internet, lending to the old name World Wide Web.

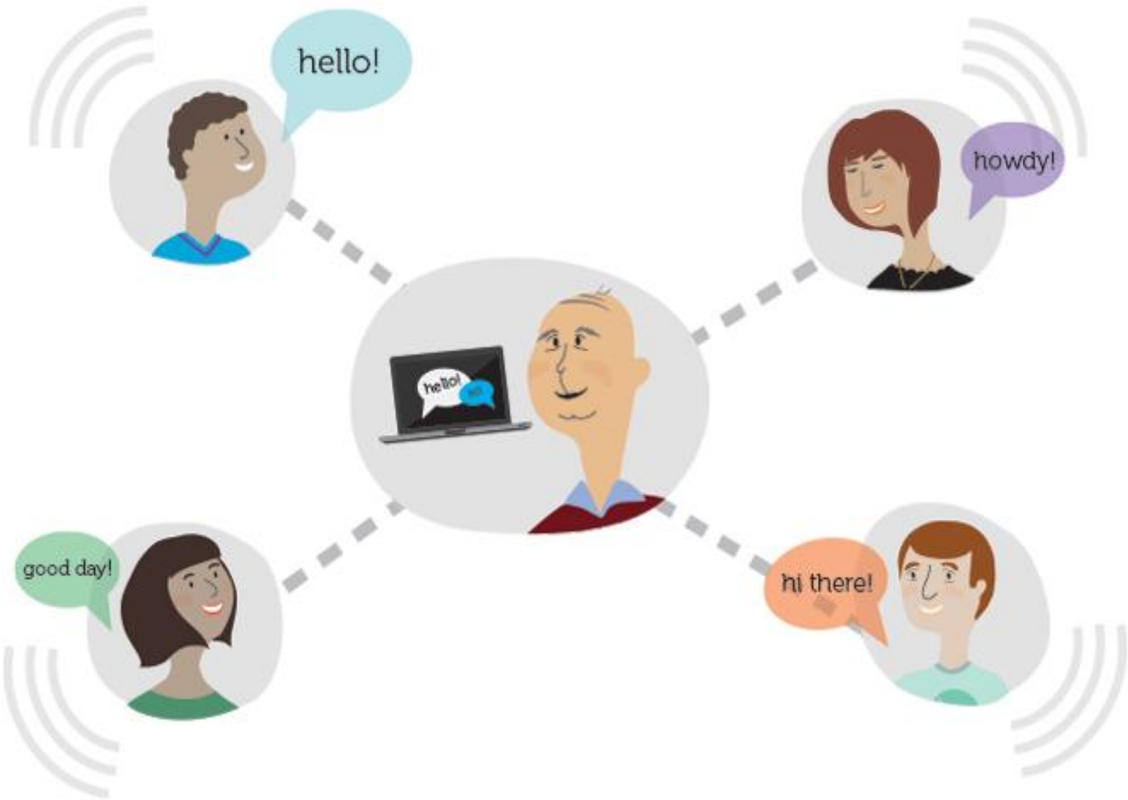
Each website has a unique address, called a **URL**. You'll notice that when you click a link, the URL changes as your browser loads a new page. If you type a URL in the address bar in your browser, your browser will load the page associated with that URL. It's like a street address, telling your browser where to go on the Internet.




When you're looking for specific information on the Internet, a **search engine** can help. A search engine is a specialized website that's designed to help you find other websites. If you type keywords or a phrase into a search engine, it will display a list of websites relevant to your search terms.

Other things you can do on the Internet

One of the best features of the Internet is the ability to communicate almost instantly with anyone in the world. Email is one of the oldest and most universal ways to communicate and share information on the Internet, and billions of people use it. Social media allows people to connect in a variety of ways and build communities online.




There are many other things you can do on the Internet too. There are thousands of ways to keep up with news or shop for anything online. You can pay your bills, manage your bank accounts, meet new people, watch TV, or learn new skills. You can learn or do almost anything online.

## 8.7 Understanding the Cloud

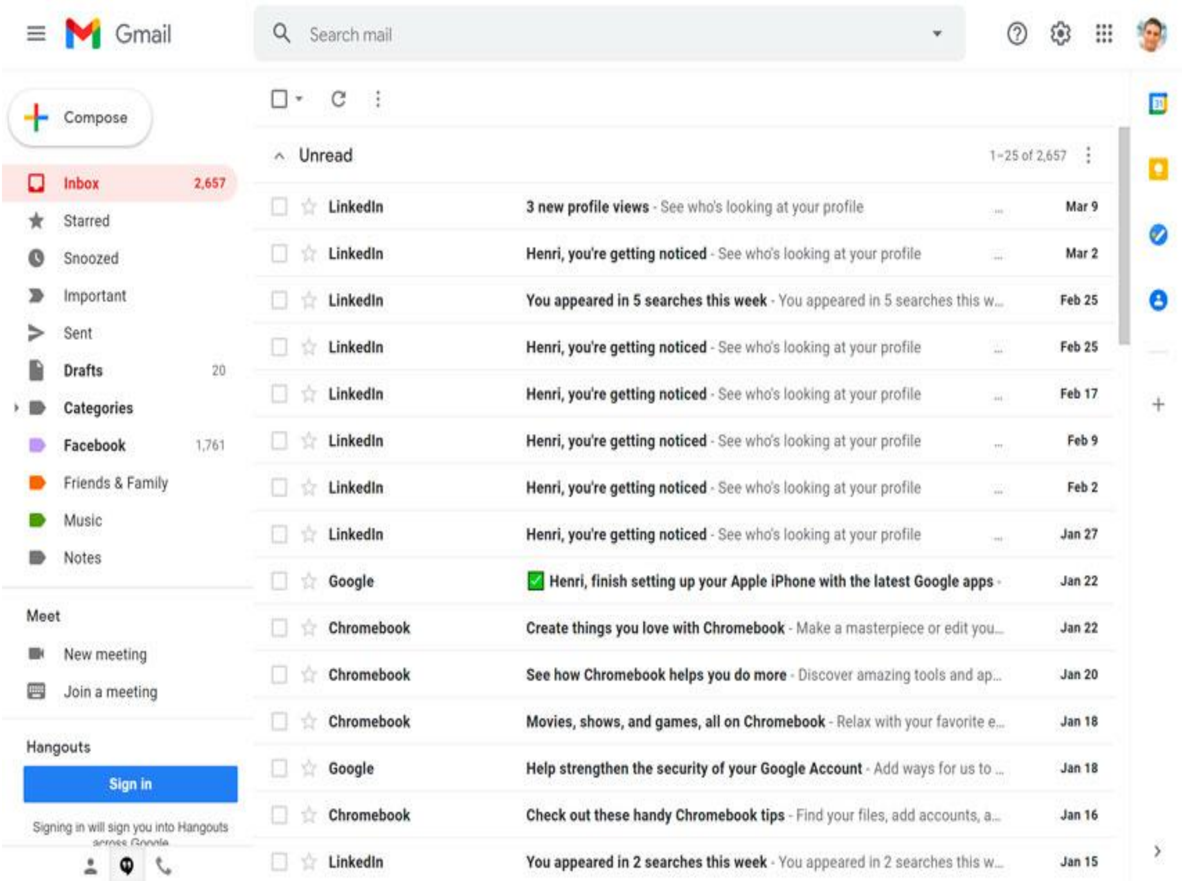
### What is the cloud?

You may have heard people using terms like the cloud, cloud computing, or cloud storage. But what exactly is the cloud?

Simply put, the cloud is the Internet—more specifically, it's all of the things you can access remotely over the Internet. When something is in the cloud, it means it's stored on Internet servers instead of your computer's hard drive.

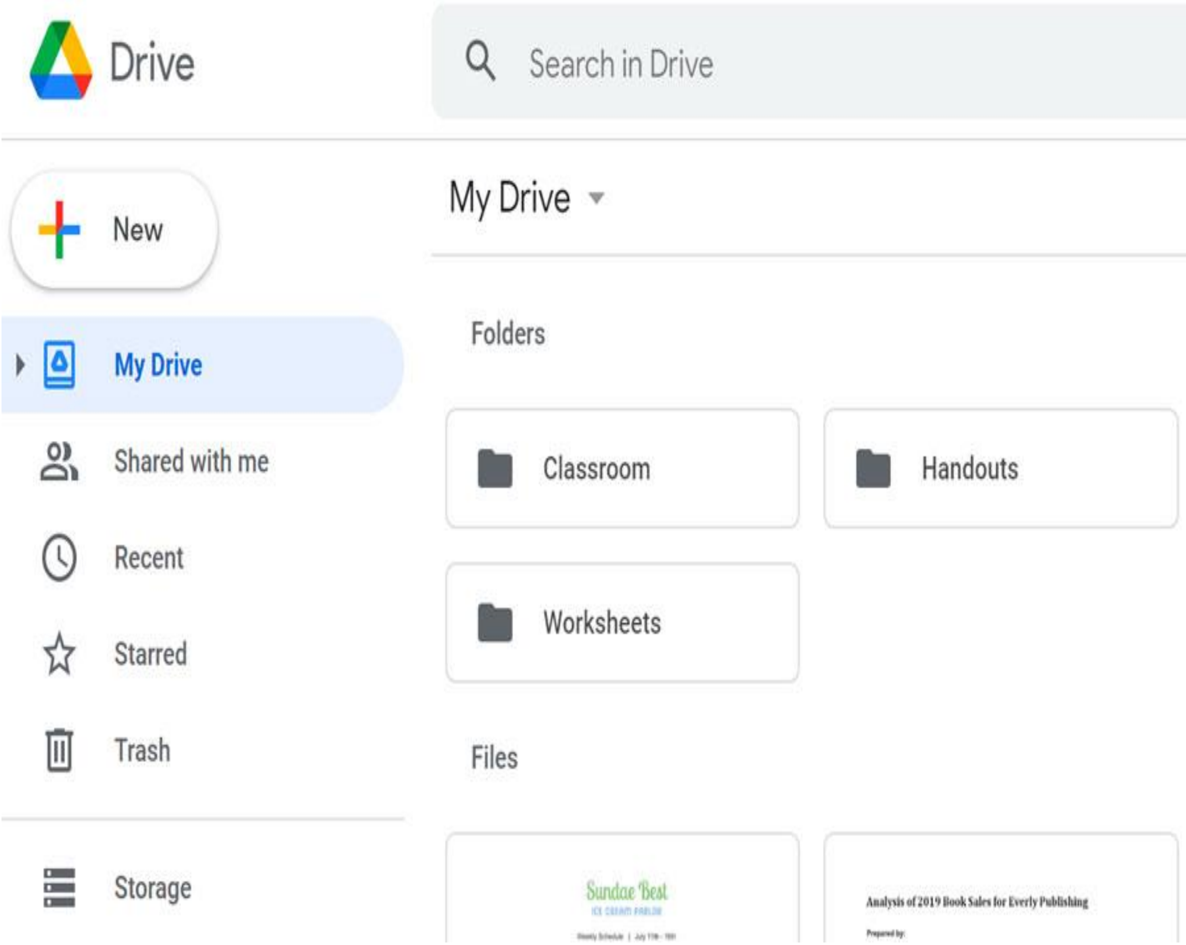
### Why use the cloud?

Some of the main reasons to use the cloud are **convenience** and **reliability**. For example, if you've ever used a **web-based email service**, such as **Gmail** or **Yahoo! Mail**, you've already used the cloud. All of the emails in a web-based service are stored on servers rather than on your computer's hard drive. This means you can access your email from any computer with an Internet connection. It also means you'll be able to recover your emails if something happens to your computer.

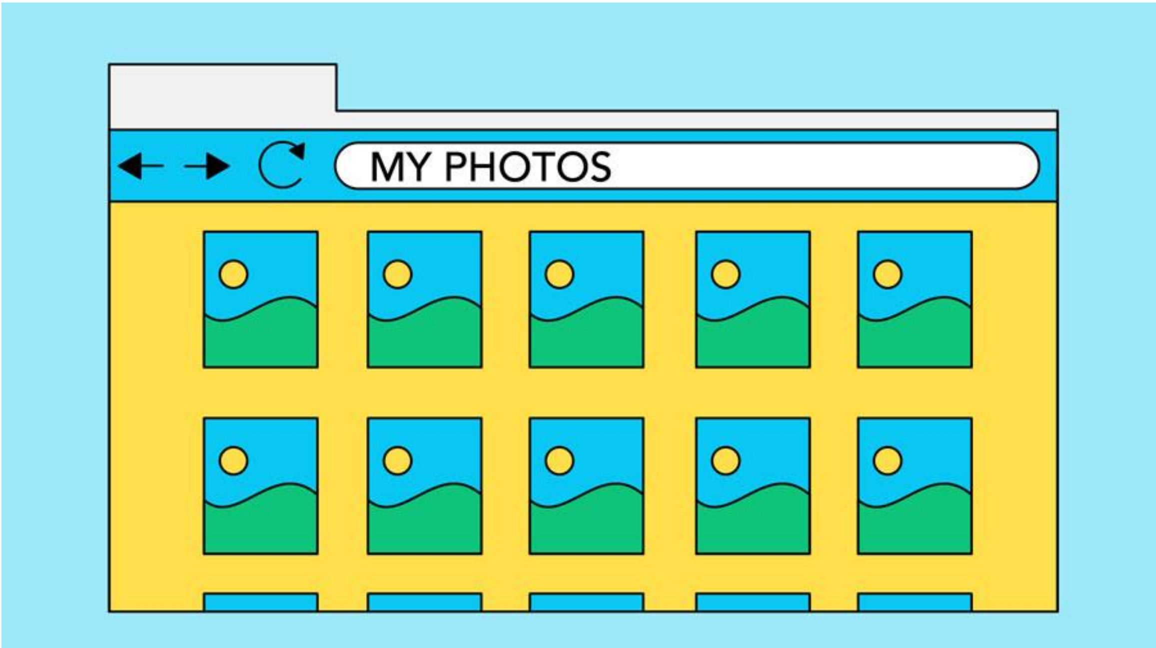



Let's look at some of the most common reasons to use the cloud.

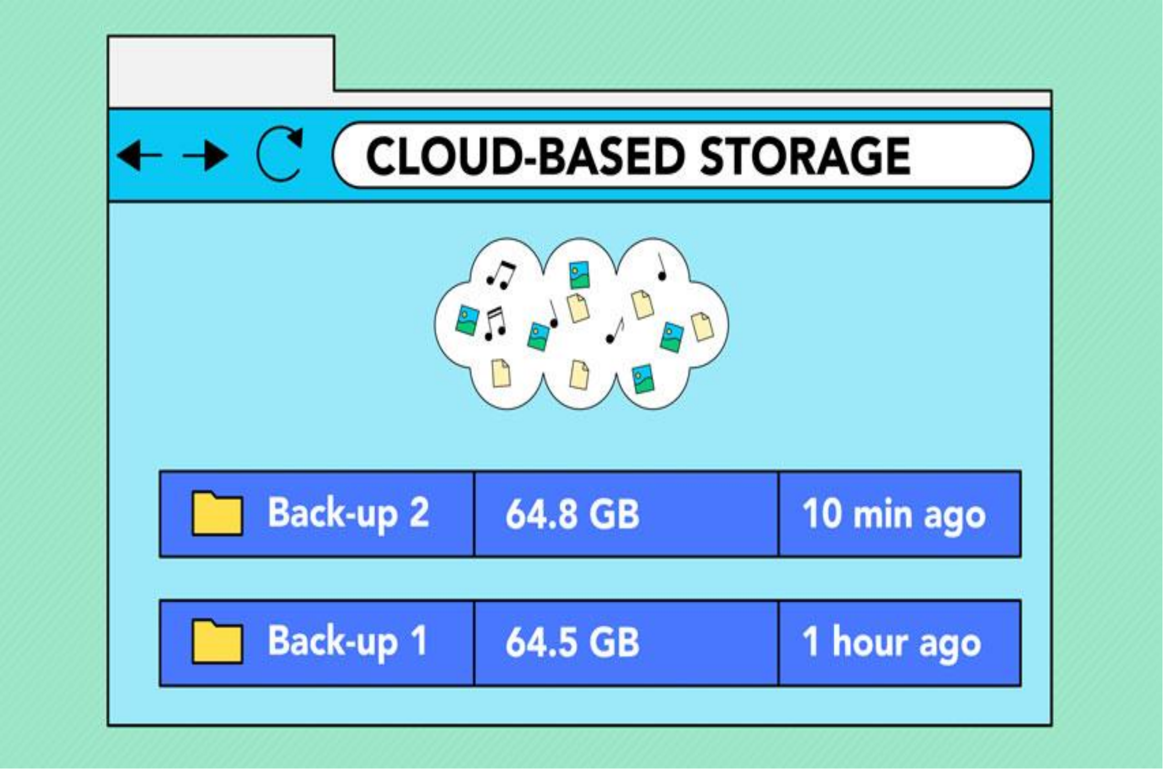
- **File storage**: You can store all types of information in the cloud, including files and email. This means you can access these things from **any computer** or **mobile device** with an Internet connection, not just your home computer. **Dropbox** and **Google Drive** are some of the most popular cloud-based storage services.




- **File sharing**: The cloud makes it easy to **share files** with several people at the same time. For example, you could upload several photos to a cloud-based photo service like **Flickr** or **iCloud Photos**, then quickly share them with friends and family.



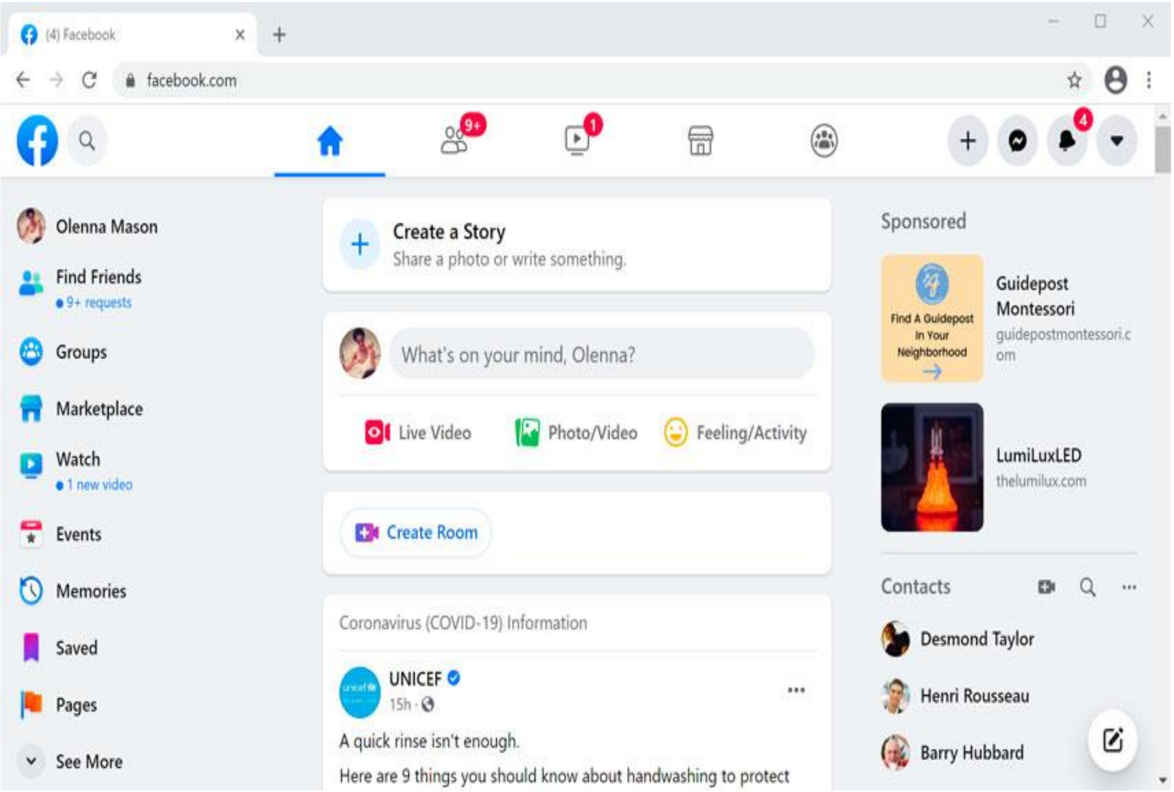

- **Backing up data**: You can also use the cloud to protect your files. There are apps such as **Carbonite** that **automatically back up your data** to the cloud. This way, if your computer ever is lost, stolen, or damaged, you'll still be able to recover these files from the cloud.




What is a web app?

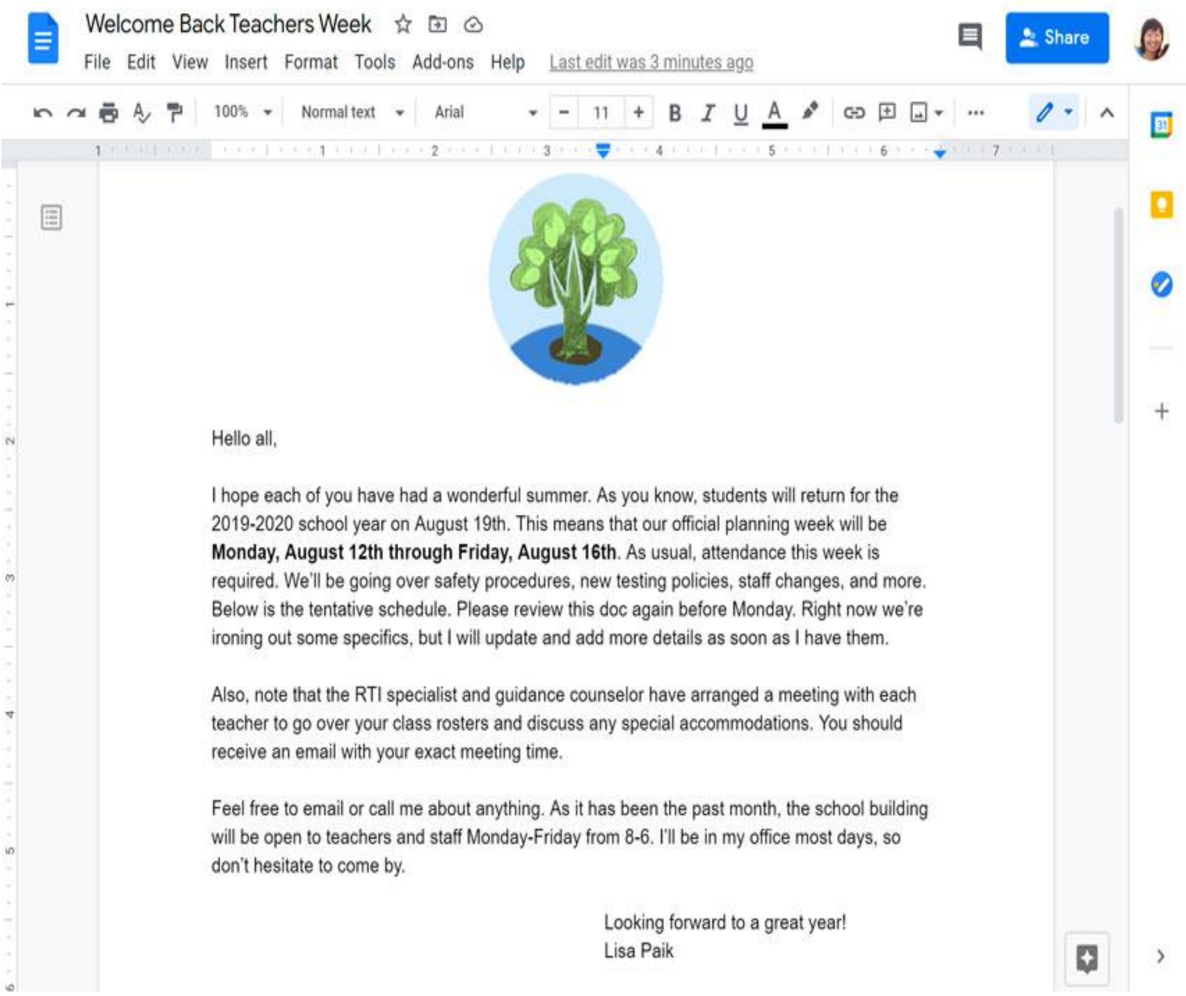
Previously, we talked about how **desktop applications** allow you to perform tasks on your computer. But there are also **web applications**—or **web apps**—that run **in the cloud** and do not need to be installed on your computer. Many of the most popular sites on the Internet are actually web apps. You may have even used a web app without realizing it! Let's take a look at some popular web apps.

- **Facebook:** Facebook lets you create an online **profile** and interact with your **friends**. Profiles and conversations can be updated at any time, so Facebook uses web app technologies to **keep the information up to date**.




- **<u>Pixlr</u>**: Pixlr is an **image editing application** that runs in your web browser. Much like **Adobe Photoshop**, it includes many advanced features, like color correction and sharpening tools.


- **<u>Google Docs</u>:** Google Docs is an **office suite** that runs in your browser. Much like **Microsoft Office**, you can use it to create **documents**, **spreadsheets**, **presentations**, and more. And because the files are stored **in the cloud**, it's easy to **share** them with others.




Hello all,

I hope each of you have had a wonderful summer. As you know, students will return for the 2019-2020 school year on August 19th. This means that our official planning week will be **Monday, August 12th through Friday, August 16th**. As usual, attendance this week is required. We'll be going over safety procedures, new testing policies, staff changes, and more. Below is the tentative schedule. Please review this doc again before Monday. Right now we're ironing out some specifics, but I will update and add more details as soon as I have them.

Also, note that the RTI specialist and guidance counselor have arranged a meeting with each teacher to go over your class rosters and discuss any special accommodations. You should receive an email with your exact meeting time.

Feel free to email or call me about anything. As it has been the past month, the school building will be open to teachers and staff Monday-Friday from 8-6. I'll be in my office most days, so don't hesitate to come by.

Looking forward to a great year!
Lisa Paik

## Lesson 9: Keyboard shortcuts in Windows

Keyboard shortcuts are keys or a combination of keys you can press on your keyboard to perform a variety of tasks. Using keyboard shortcuts is often faster than using a mouse because you can keep both hands on the keyboard. Keyboard shortcuts are also universal, which means you can use many of the same shortcuts in a variety of applications. For example, you can use the shortcuts to copy and paste text in a word processor and in a web browser.

### 9.1 Using shortcuts

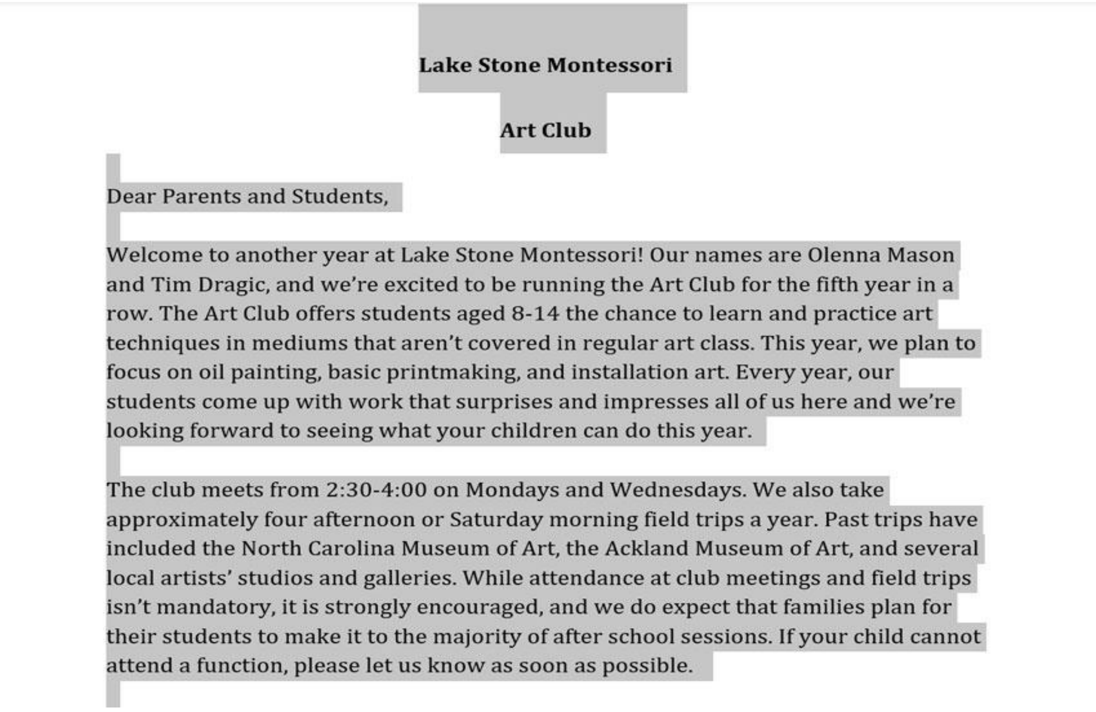
Many keyboard shortcuts require you to press two or more keys in a specific order. For example, to perform the shortcut Ctrl+X, you would press and hold the Ctrl key, then press the X key, then release.

You'll use the Ctrl (Control) or Alt key to perform most keyboard shortcuts. You'll find these keys near the bottom-left corner of your keyboard.


9.2 Working with text

These keyboard shortcuts are useful when working with text in word processors, email applications, and more. They can help you perform **commonly repeated tasks**, like **copying and pasting** text.

- **Ctrl+X**: Cut the selected text.
- **Ctrl+C**: Copy the selected text.
- **Ctrl+V**: Paste the copied or cut text.
- **Ctrl+A**: Select all of the text on the page or in the active window.


**Lake Stone Montessori**

**Art Club**

Dear Parents and Students,

Welcome to another year at Lake Stone Montessori! Our names are Olenna Mason and Tim Dragic, and we're excited to be running the Art Club for the fifth year in a row. The Art Club offers students aged 8-14 the chance to learn and practice art techniques in mediums that aren't covered in regular art class. This year, we plan to focus on oil painting, basic printmaking, and installation art. Every year, our students come up with work that surprises and impresses all of us here and we're looking forward to seeing what your children can do this year.

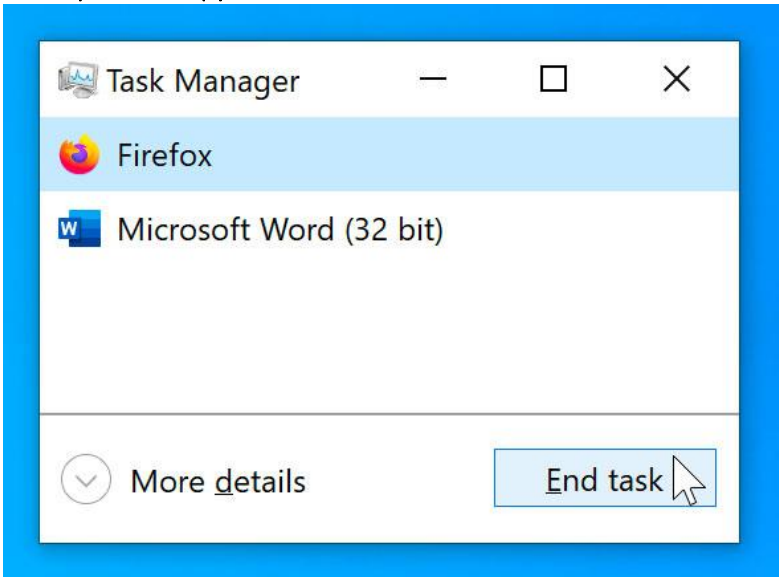
The club meets from 2:30-4:00 on Mondays and Wednesdays. We also take approximately four afternoon or Saturday morning field trips a year. Past trips have included the North Carolina Museum of Art, the Ackland Museum of Art, and several local artists' studios and galleries. While attendance at club meetings and field trips isn't mandatory, it is strongly encouraged, and we do expect that families plan for their students to make it to the majority of after school sessions. If your child cannot attend a function, please let us know as soon as possible.

- Ctrl+B: Bold the selected text.
- Ctrl+I: Italicize the selected text.
- Ctrl+U: Underline the selected text.

### 9.3 Working with files and applications

You can use keyboard shortcuts to **open**, **close**, and **switch** applications. When working with a file, like a Microsoft Word document, shortcuts can be used to **create new files**, **find words**, and **print**.

- **Ctrl+Alt+Delete**: Force an unresponsive or frozen program to quit. This keyboard shortcut opens the **Task Manager**. You can then select the unresponsive application and close it.

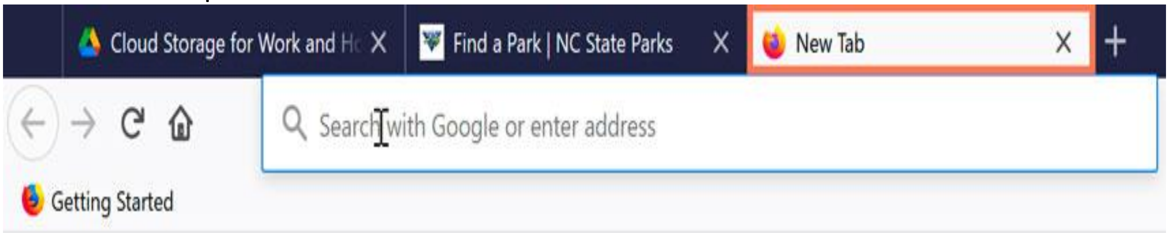



- **Delete**: Send a selected file or files to the **Recycle Bin**.
- **Enter**: Open a selected application or file.
- **Ctrl+N**: Create a new file.
- **Ctrl+O**: Open an existing file.
- **Ctrl+S**: Save the current file.
- **Ctrl+Z**: Undo the previous action. If you want to redo the action, press **Ctrl+Y**.
- **Windows key**: Open the Start menu (or the Start screen in Windows 8).

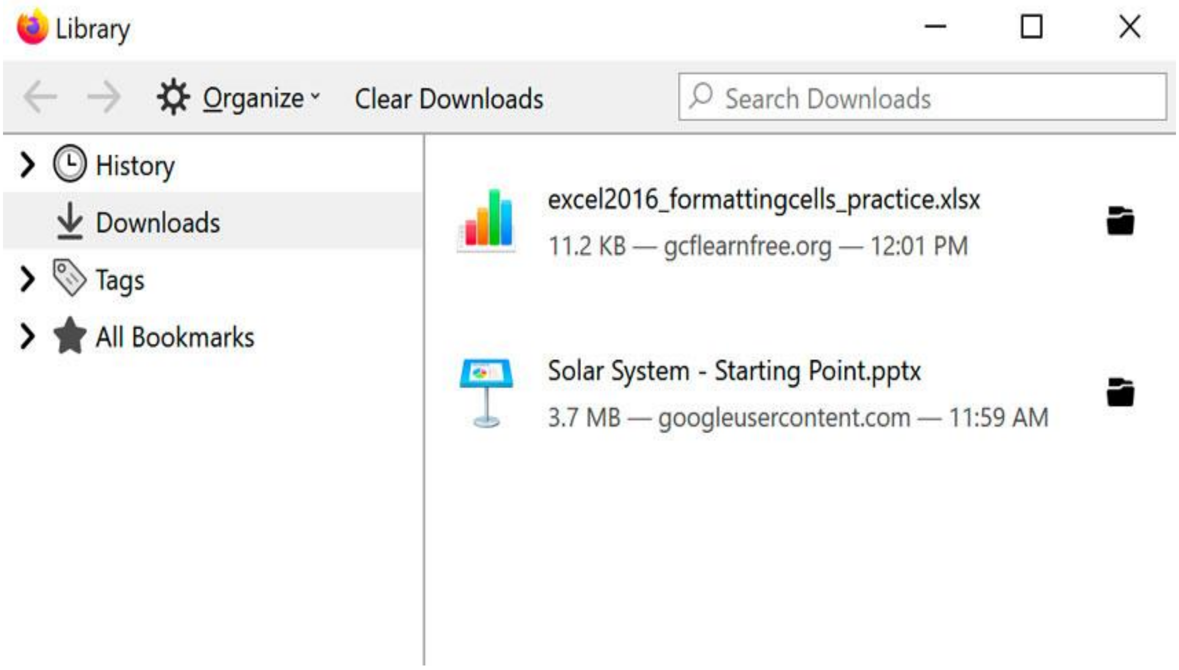

### 9.4 Internet shortcuts

Keyboard shortcuts can also be used to **navigate your web browser**. Many of the **text shortcuts** above are also useful online, like the shortcuts for **selecting**, **copying**, and **pasting** text into your web browser's address bar. Note that some of these shortcuts may work a bit differently depending on the web browser you're using.

- **Ctrl+N**: Open a new browser window.
- **Ctrl+T**: Open a new browser tab.

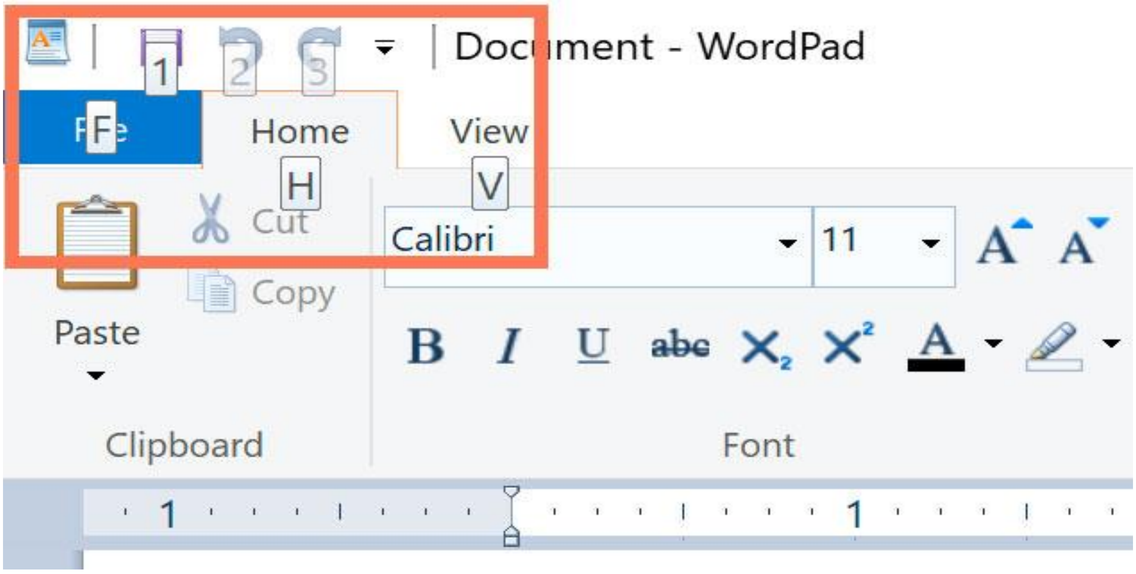



- **Ctrl+D**: Bookmark the current page.
- **Ctrl+B**: View bookmarks.
- **Ctrl+J**: View recently downloaded files.



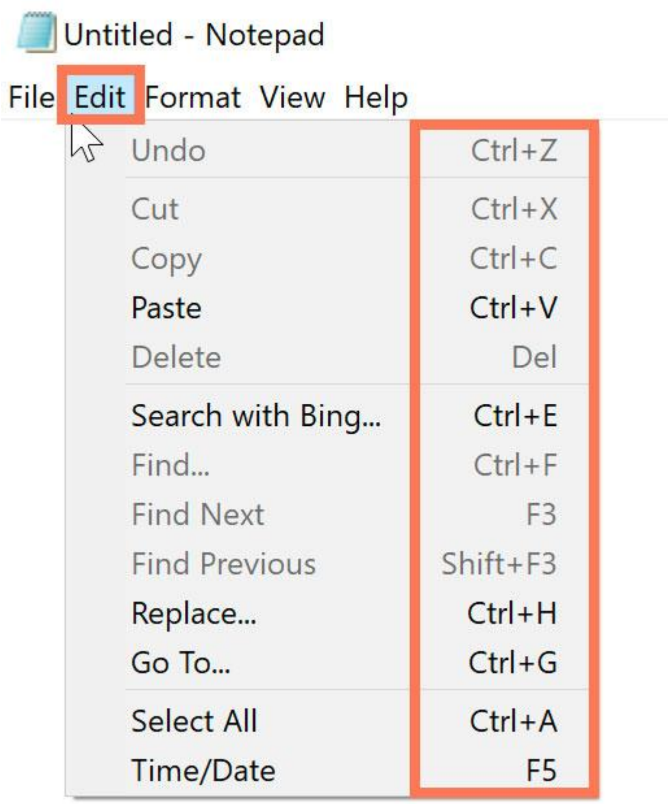

## 9.5 Using the Alt key to navigate menus

When you press the **Alt key**, you will have access to all of the menus in the current application. This means you can perform almost any task with just your keyboard. For example, you can type **Alt+F+X** to quit an application. When performing these shortcuts, you will not need to hold down the **Alt** key.

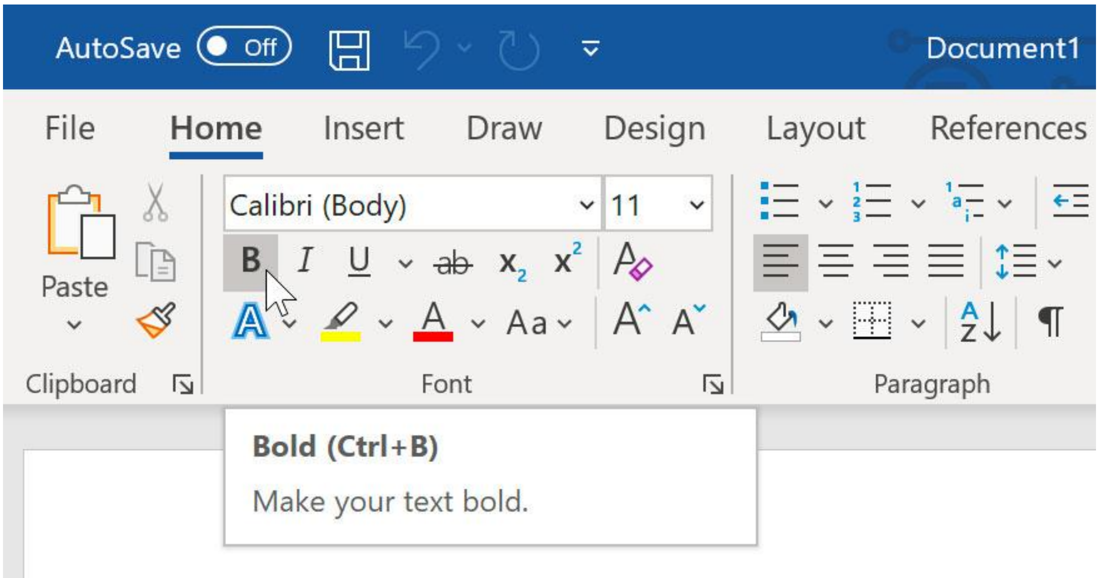



9.6 Finding more keyboard shortcuts

In many applications, you'll find keyboard shortcuts next to menu items.




In some applications, you may need to hover over a button to display its keyboard shortcut.




## Lesson 10: Safety and Maintenance

### 10.1 Keeping Your Computer Clean

### Keeping your computer physically clean

Dust isn't just unattractive—it can potentially damage or even destroy parts of your computer. Cleaning your computer regularly will help you keep it working properly and avoid expensive repairs.

#### Cleaning the keyboard

Dust, food, liquid, and other particles can get stuck underneath the keys on your keyboard, which can prevent it from working properly. The **basic cleaning tips** below can help keep your keyboard clean.

1. **Unplug** the keyboard from the USB or PS/2 port. If the keyboard is plugged into the PS/2 port, you will need to shut down the computer before unplugging it.
2. Turn the keyboard **upside down** and gently shake it to remove dirt and dust.
3. Use a can of **compressed air** to clean between the keys.

4. Moisten a **cotton cloth** or **paper towel** with rubbing alcohol and use it to clean the tops of the keys. Do not pour alcohol or any other liquid directly onto the keys.

5. **Reconnect** the keyboard to the computer once it is dry. If you are connecting it to a PS/2 port, you will need to connect it **before** turning on the computer.

Dealing with liquids

If you **spill liquid** on the keyboard, quickly shut down the computer and disconnect the keyboard. Then **turn the keyboard upside down** and allow the liquid to drain.

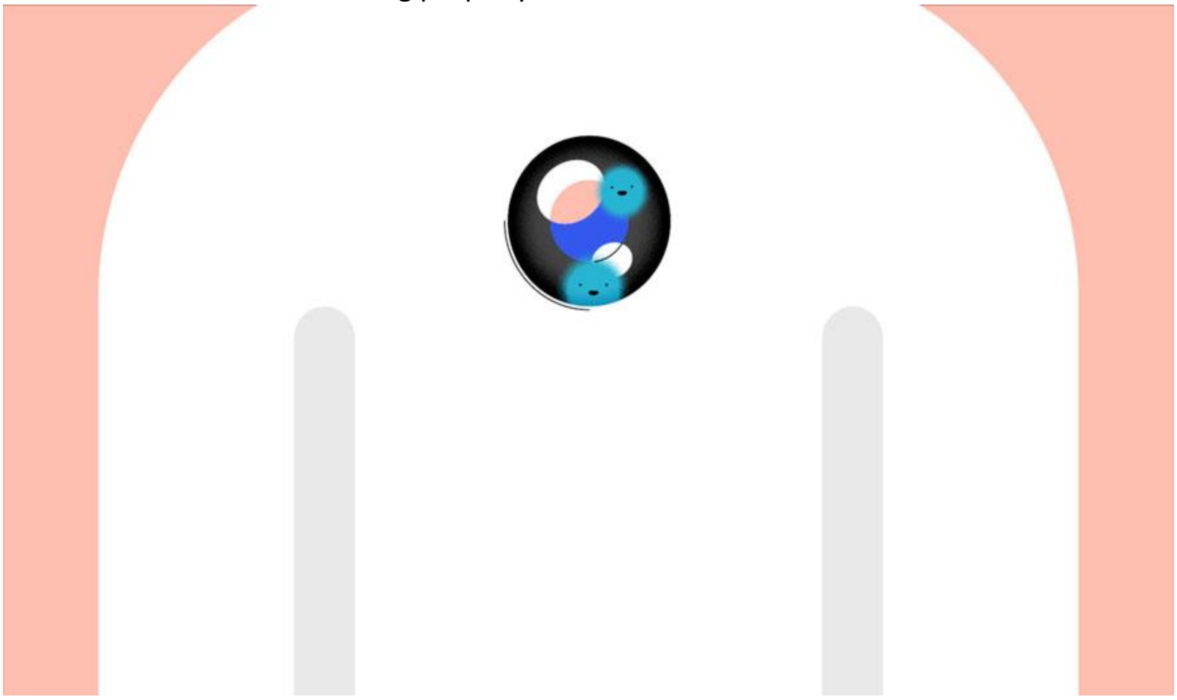
If the liquid is sticky, you will need to hold the keyboard on its side under running water to **rinse** away the sticky liquid. Then turn the keyboard upside down to drain for two days before reconnecting it. Please note that the keyboard may not be fixable at this point, but the method above is probably the best option.

To prevent this situation altogether, we recommend keeping drinks away from the computer area.

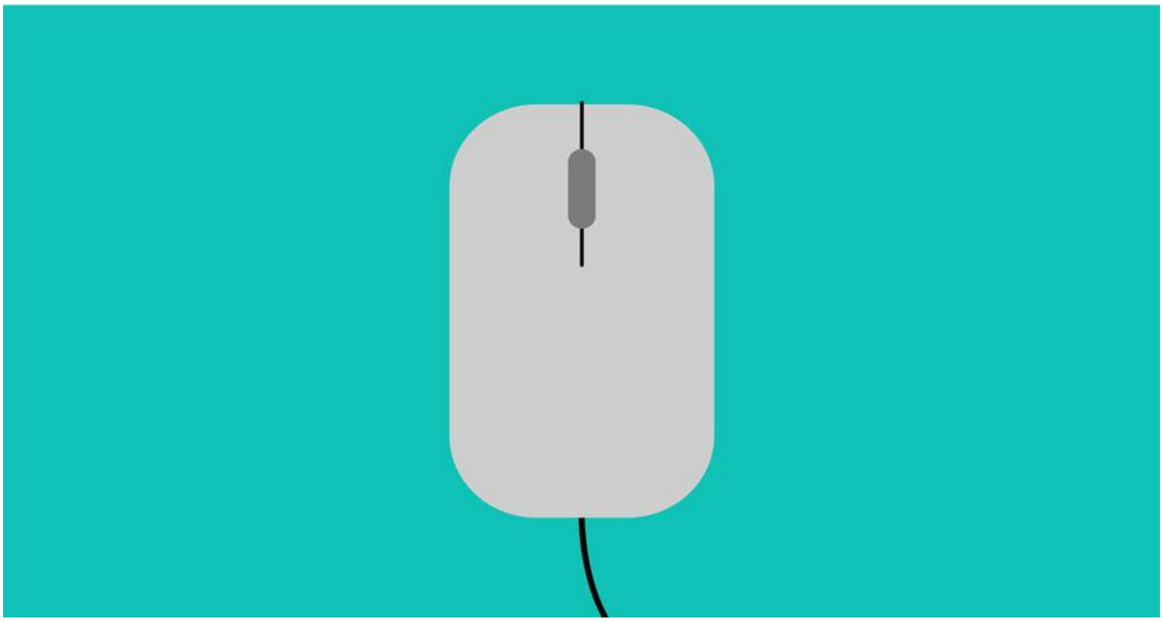
### Cleaning the mouse

There are two main mouse types: **optical** and **mechanical**. Each is cleaned in basically the same way, although the mechanical mouse requires a bit more work.

- **Optical mice** require **no internal cleaning** because they do not contain any rotating parts; however, they can get **sticky** over time as dust collects near the light emitter. This can cause erratic cursor movement or prevent the mouse from working properly.



- **Mechanical mice** are especially susceptible to **dust** and **particles** that can accumulate inside the mouse, which can make it difficult to track—or move—properly. If the mouse pointer does not move smoothly, the mouse may need to be cleaned.



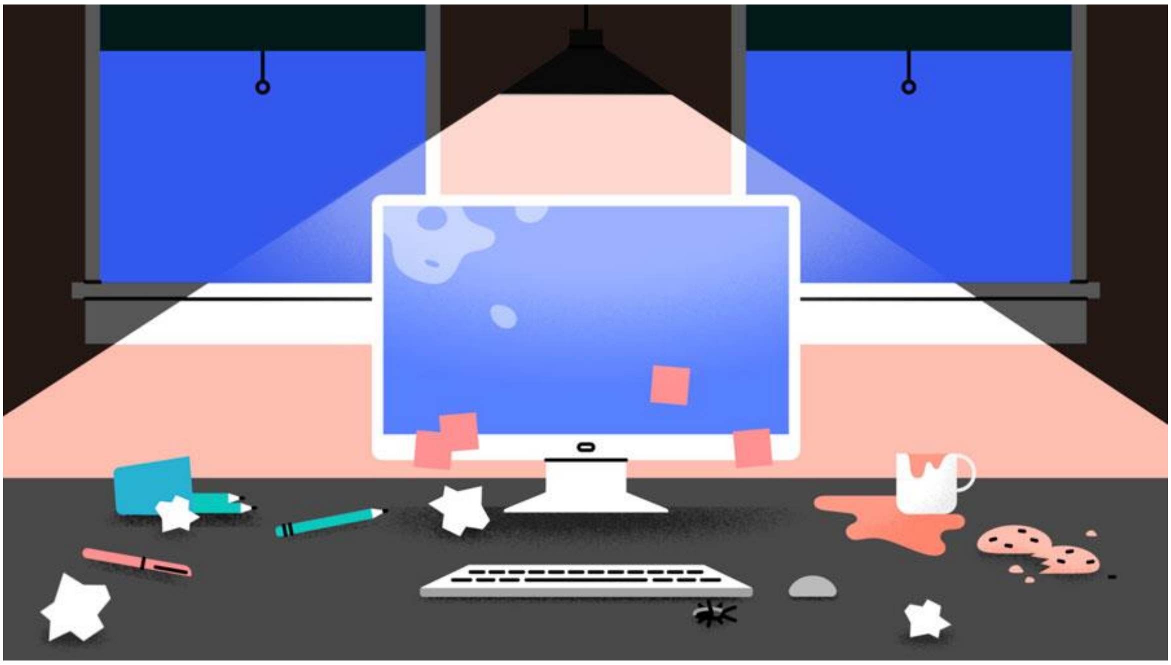
The **basic cleaning tips** below will help keep your mouse clean:

1. **Unplug** the mouse from the USB or PS/2 port. If the mouse is plugged into the PS/2 port, you will need to shut down the computer before unplugging it.
2. Moisten a **cotton cloth** with rubbing alcohol, and use it to clean the top and bottom of the mouse.
3. If you have a **mechanical mouse**, remove the **tracking ball** by turning the **ball-cover ring** counter-clockwise. Then clean the tracking ball and the inside of the mouse with a **cotton cloth** moistened with rubbing alcohol.
4. **Allow all of the parts to dry** before reassembling and reconnecting the mouse. If you are connecting it to a PS/2 port, you will need to connect it **before** turning on the computer.

If you just want to give the mouse a quick cleaning, place it on a **clean sheet of paper** and **move the mouse back and forth**. Some of the dust and particles should rub off onto the paper.

### Cleaning the monitor

Dirt, fingerprints, and dust can make your computer screen difficult to read; however, it's easy to **clean your screen** when needed. There are monitor-cleaning kits you can buy, but they may damage your monitor if they're designed for a different type of monitor. For example, a monitor cleaner that is designed for **glass screens** may not work with some **non-glass LCD screens**. The safest method is simply to use a **soft clean cloth** moistened with **water**.



Do not use glass cleaner to clean a monitor. Many screens have anti-glare coatings that can be damaged by glass cleaner.

1. **Turn off** the computer.
2. **Unplug** the monitor from the power. If you are using a laptop, unplug the laptop.
3. Use a **soft clean cloth** moistened with **water** to wipe the screen clean.

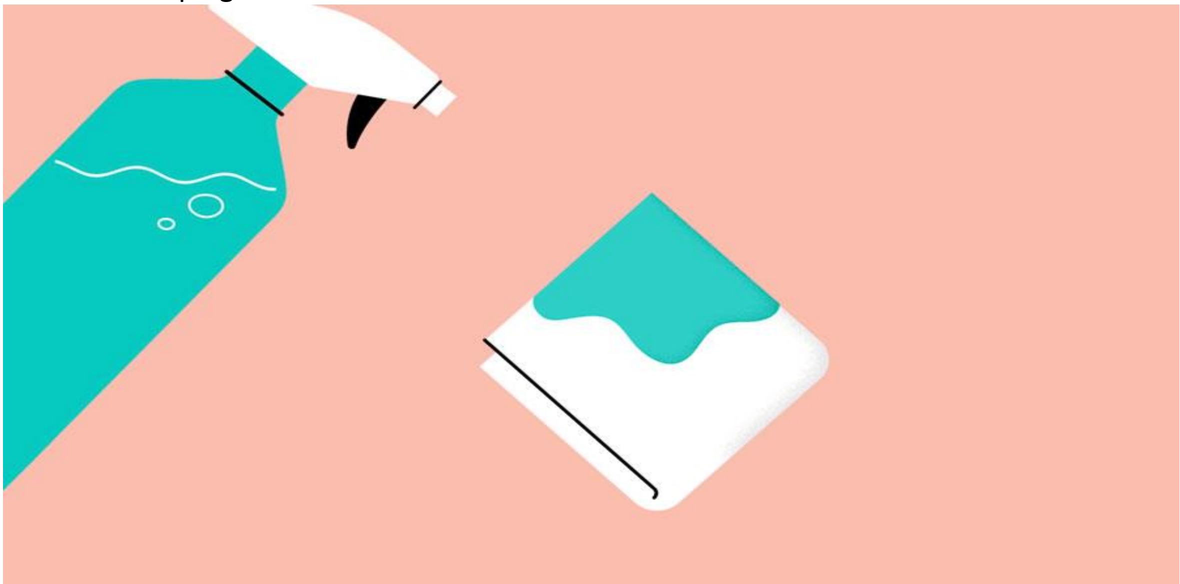
Do not spray any liquids directly onto the screen. The liquid could leak into the monitor and damage the internal components.

Tips for cleaning other computer surfaces

From time to time, you should clean your computer case and the sides and back of the monitor to avoid a buildup of dust and dirt. Here are a few tips you can use when cleaning these surfaces.

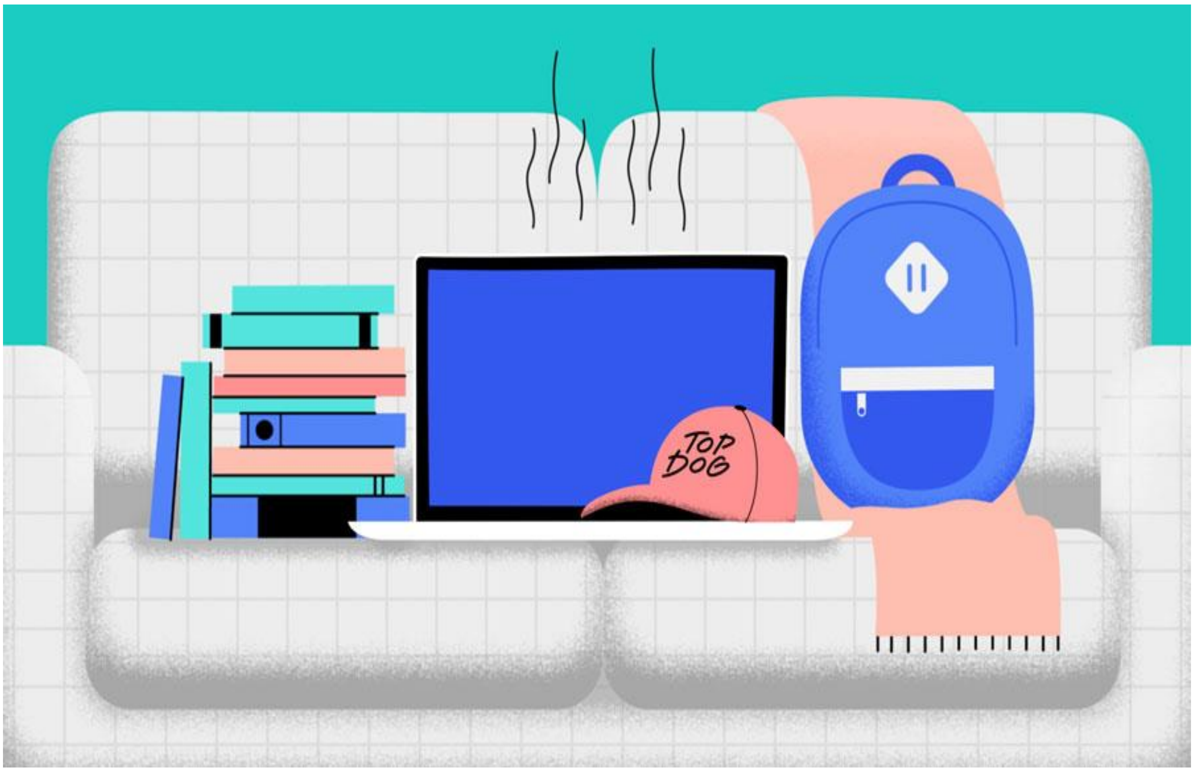
- Dust is your computer's main enemy. Use an **anti-static** cloth to lightly dust your computer casing. **Do not** use furniture cleaners or strong solvents.
- Use a can of **compressed air** to blow out debris from the air intake slots.

- **Ammonia** diluted with water—or **glass cleaner** comprised mostly of ammonia and water—is a safe cleaning solution for **computer surfaces**. The milder the solution, the better.
- Clean the **monitor housing** and **case** (but **not** the monitor screen) by spraying a safe cleaning solution onto a paper towel or anti-static cloth and wiping in a downward motion.



Keep it cool

**Don't restrict airflow** around your computer. A computer can generate a lot of heat, so the casing has **fans** that keep it from overheating. Avoid stacking papers, books, and other items around your computer.




Many computer desks have an **enclosed compartment** for the computer case. If you have this type of desk, you may want to position the case so it is not against the back side of the desk. If the compartment has a door, you may want to leave it open to improve airflow.

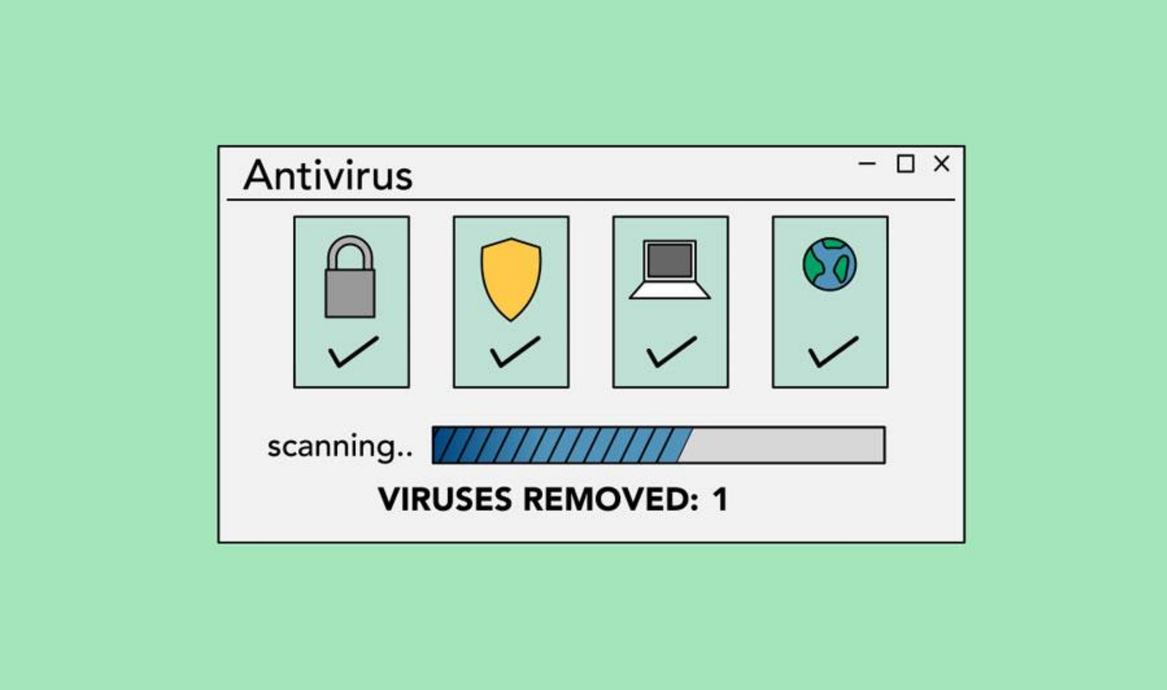
## 10.2 Protecting Your Computer

Your computer faces many potential threats, including viruses, malware, and hard drive failure. This is why it's important to do everything you can to protect your computer and your files.

### Safeguarding against malware

**Malware** is any type of software that is designed to **damage your computer** or gain **unauthorized access** to your personal information. It includes **viruses**, **worms**, **Trojan horses**, and **spyware**. Most malware is distributed over the **Internet** and is often bundled with other software.

The best way to guard against malware is to install **antivirus software**, such as **Bitdefender**, **Norton**, or **Kaspersky**. Antivirus software helps to **prevent** malware from being installed, and it can also **remove** malware from your computer.



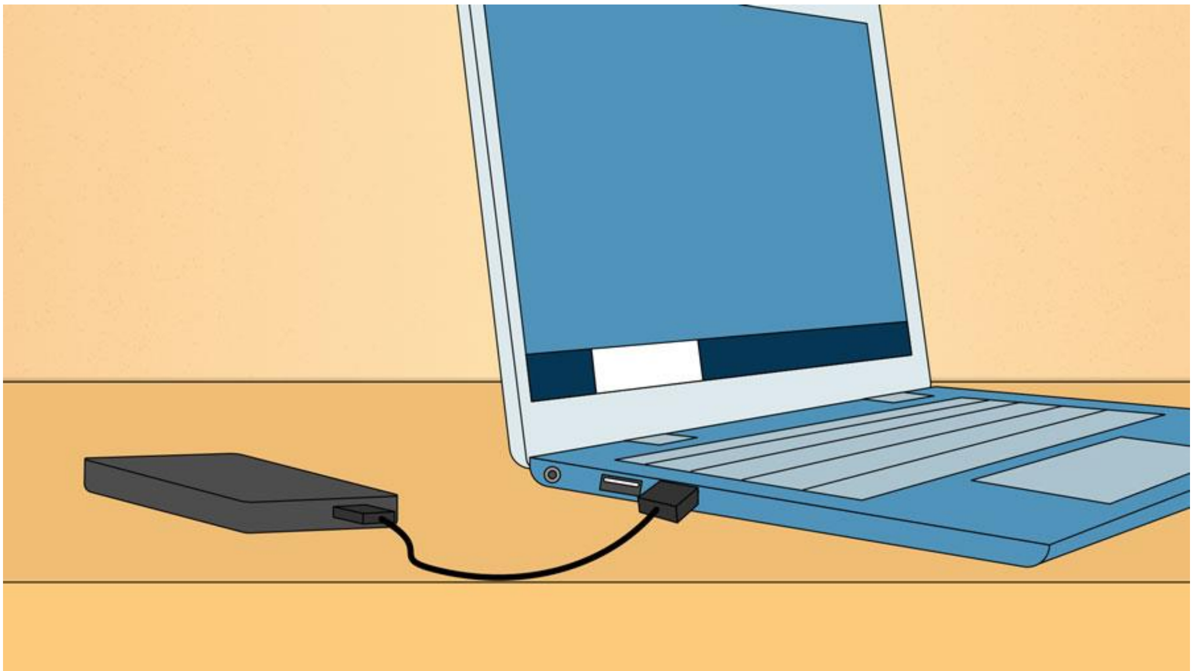

It's also important to **stay smart** when you're browsing the Web or using email. If a website or email attachment looks suspicious, trust your instincts. Keep in mind that your antivirus program **may not catch everything**, so it's best to avoid downloading anything that might contain malware.

To learn more about protecting your computer from malware, check out **How to Avoid Malware** in our **Internet Safety** tutorial.

Backing up your computer

Imagine what would happen if your computer suddenly stopped working. Would you lose any important documents, photos, or other files? It may be possible to repair your computer, but your files may be **lost forever**. Luckily, you can prevent this by creating **backup** copies of all of your files (or just the important ones) on an **external hard drive** or an **online backup service**.

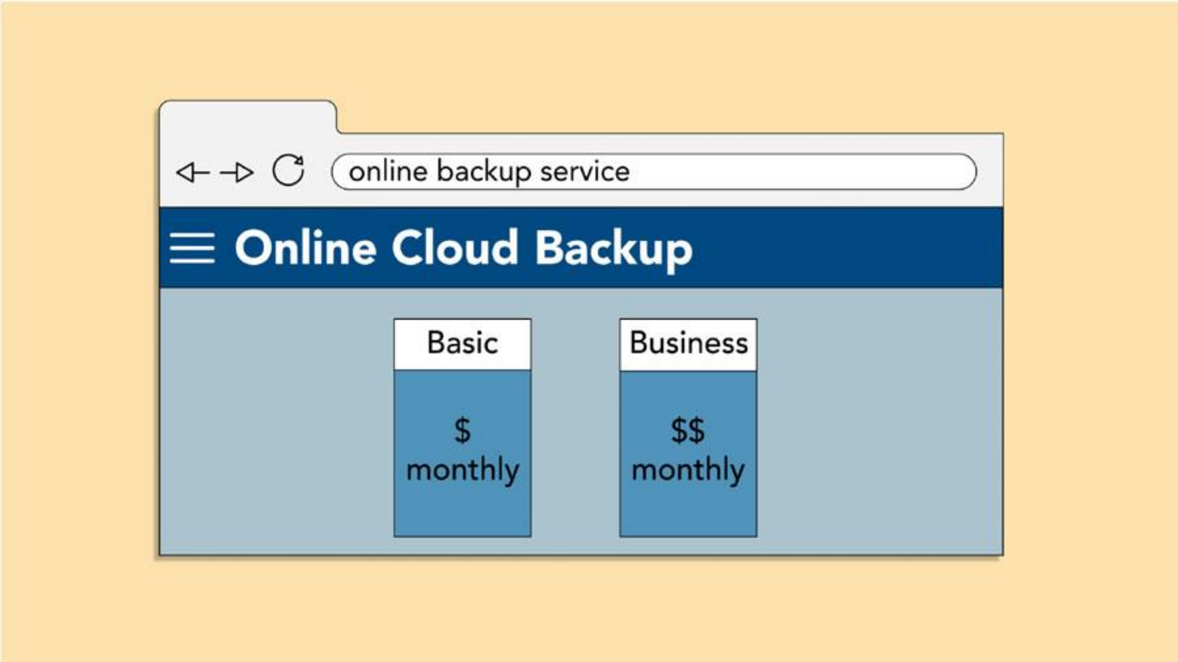
**External hard drives**



You can purchase an **external hard drive** and copy the contents of your computer to it. The **initial backup could take several hours**, so you will need to select a period of time when you do not need access to your computer. Running the backup overnight usually works best. Follow-up backups should be conducted on a regular basis, but they should not take as long.

One drawback is that an external hard drive can be lost, damaged, or stolen—just as your computer might be. This is why it's important to keep your drive in a **secure location** when not in use.

Online backup services



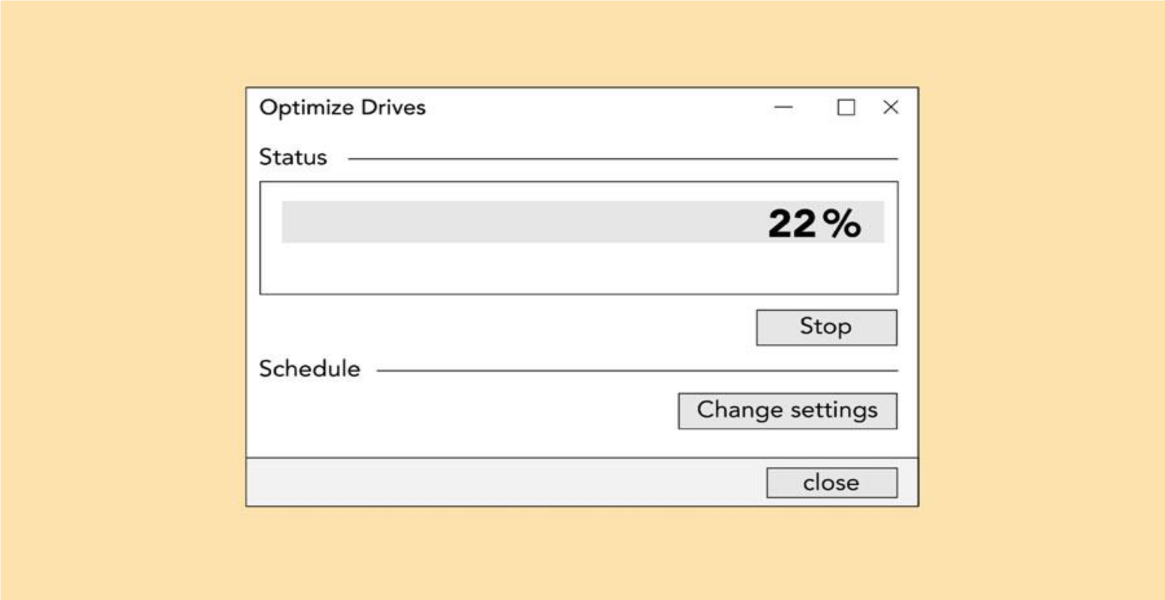

You can also back up your files to an **online backup service** like **Mozy**, **Carbonite**, or **Box**. These services will back up your your files **in the cloud**, which means you'll be able to recover them from any computer with an Internet connection. The amount of storage provided by these sites varies, and you will probably need to pay a fee for adequate storage space.

One drawback to online backup services is that the **initial backup can be slow** and may even take days to upload if you have a lot of files. However, subsequent backups should not take as long.

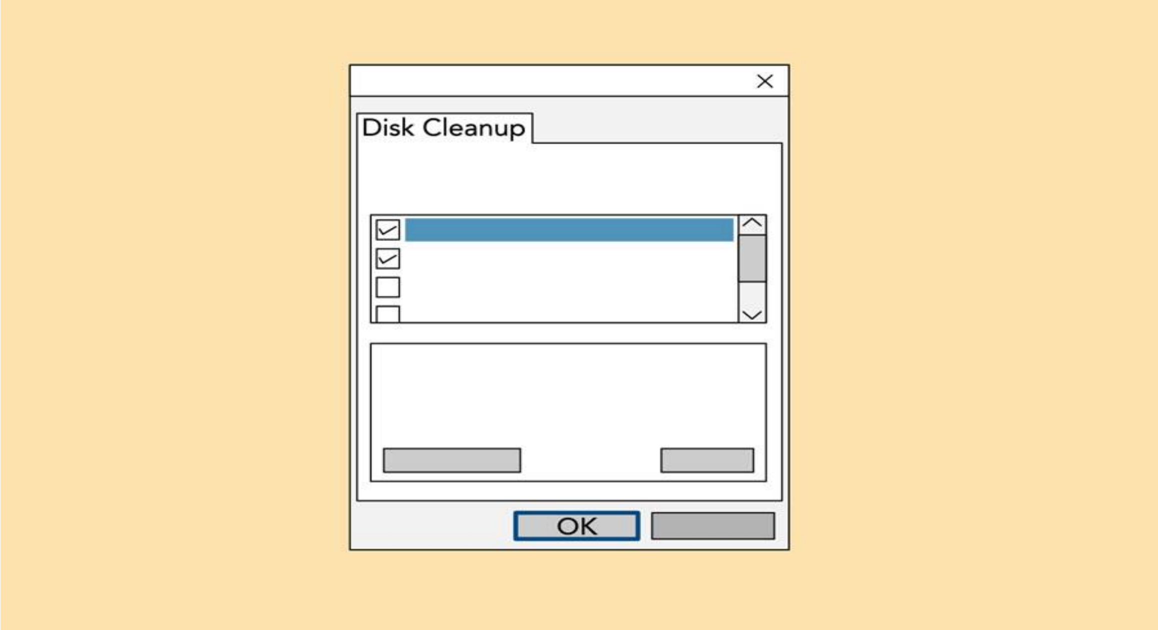
### Other maintenance techniques

To keep your computer running smoothly, it's important to keep files and folders **uncluttered**. Cluttered or unorganized folders make it more difficult to find the files you need. Additionally, unwanted files can eventually fill up your **hard drive**, which will make your computer slower and more difficult to use. Here are a few things you can do to delete unwanted files and improve your computer's performance.

- **Delete files:** If you have any unwanted files, you can delete them manually. To do this, drag them to the **Recycle Bin** or **Trash**, then empty it to permanently delete the files.
- **Run the Disk Defragmenter:** Windows includes a **Disk Defragmenter** program in the Control Panel. If your computer is running slowly, running Disk Defragmenter can help to speed it up.




- **Run a Disk Cleanup:** Windows also includes a **Disk Cleanup** program in the Control Panel. It scans your computer for **temporary files** and other files that can be deleted. You can then delete the files to free up space on your hard drive.



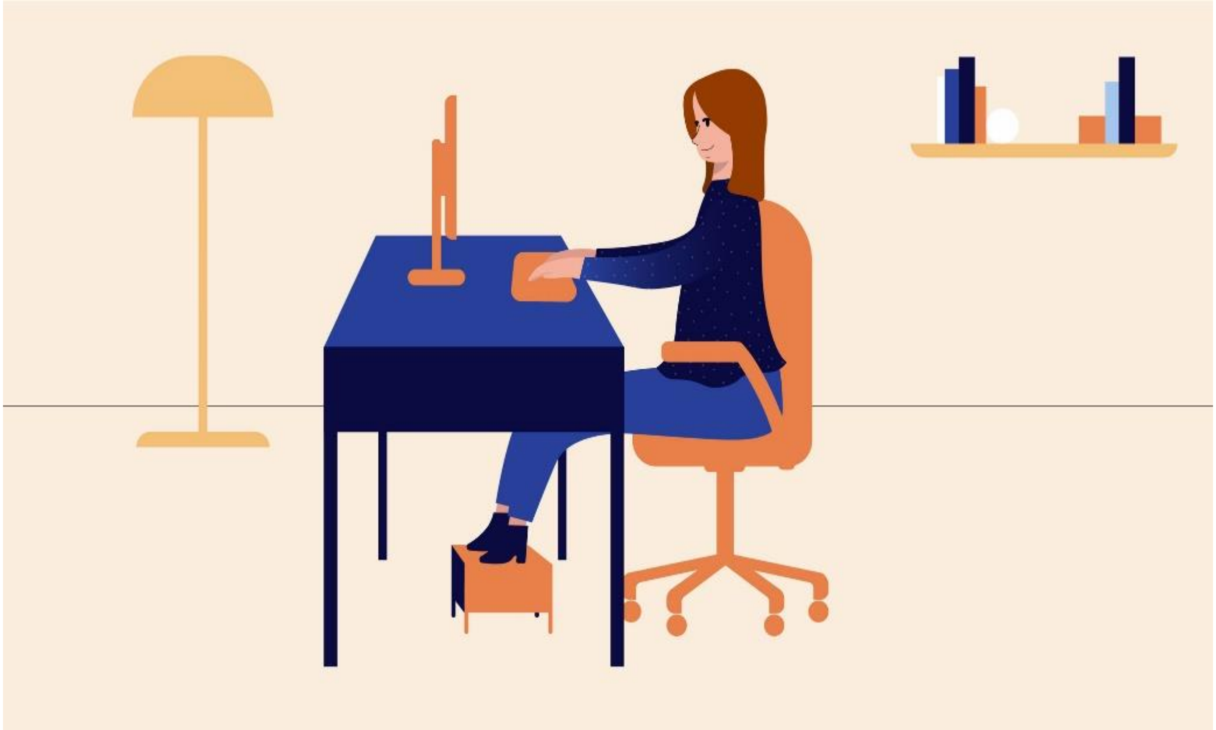

## 10.3 Creating a Safe Workspace

In addition to keeping your computer healthy, it's important to think about your own health. Using a computer involves a lot of repetitive motions such as typing and using the mouse. Over time, these motions can begin to negatively impact your body, especially your wrists, neck, and back. Staring at a monitor for long periods of time can also cause eye strain. To minimize these risks, you should take a few moments to make sure your workspace is arranged in a comfortable and healthy way.

Avoiding strain and injury:

Computer ergonomics

Computer ergonomics **is** the science of equipment design and how specific equipment usage and placement can reduce a user's discomfort and increase productivity. Some equipment is designed with special attention to ergonomics, like **ergonomic keyboards** and **ergonomic chairs**.

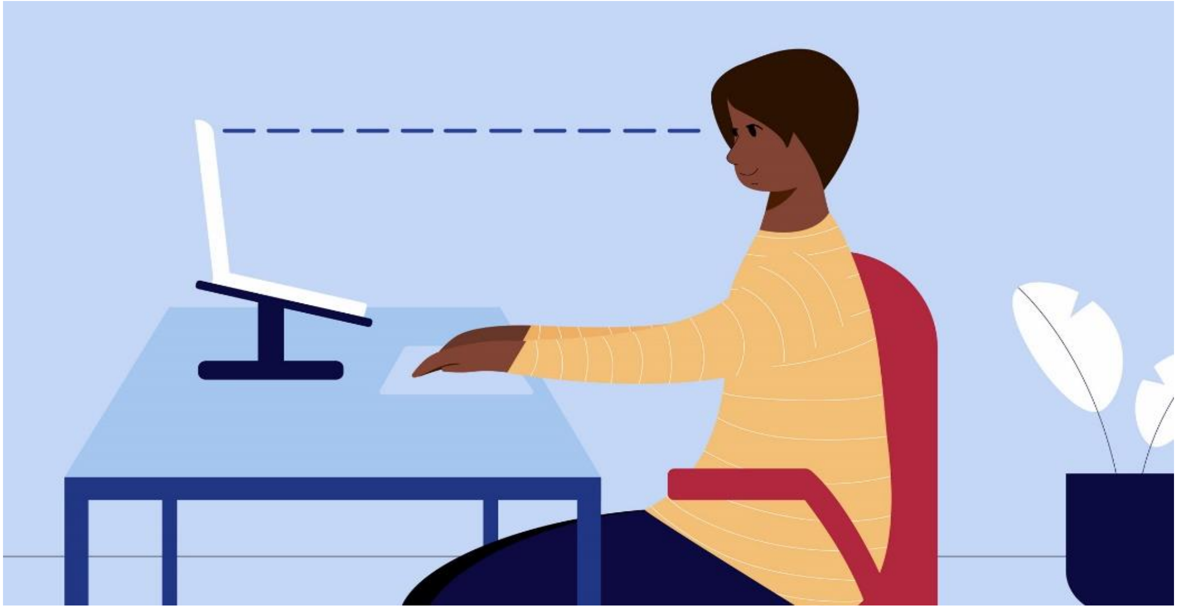


Here are a few tips to help you avoid injury in your workspace.

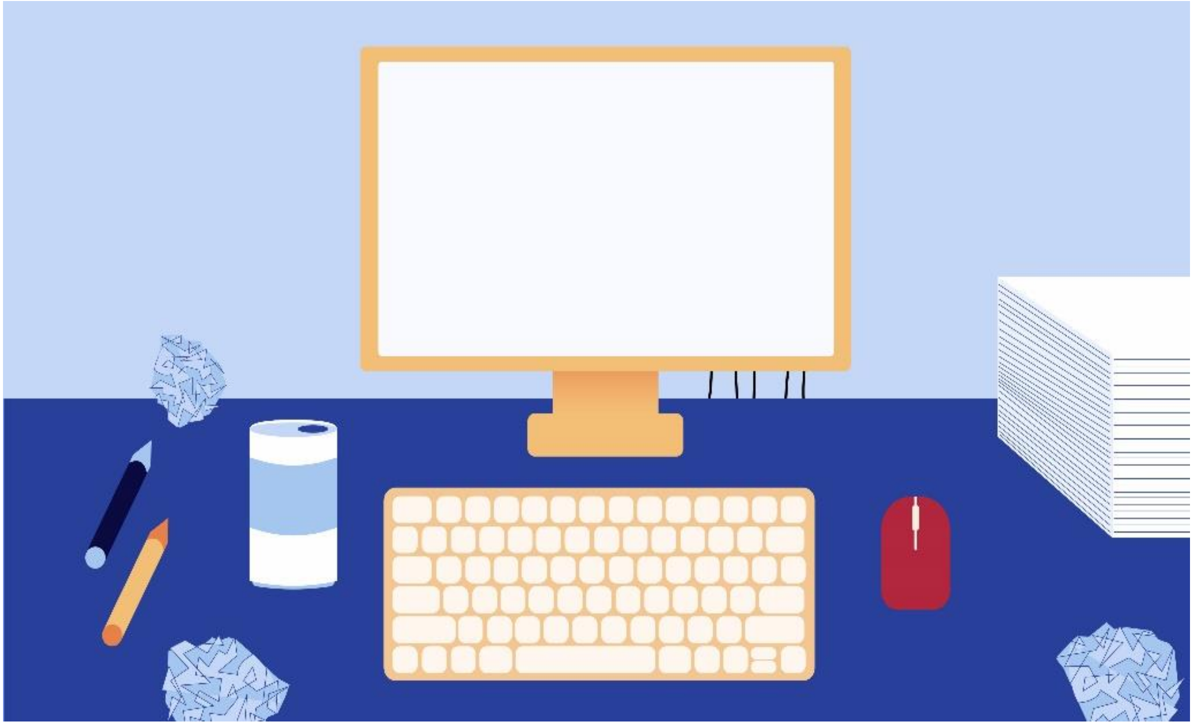
- **Adjust your chair**: Make sure your chair is adjusted to allow you to sit in a natural, comfortable position. Many office chairs are specially designed to **support the lower back** and promote good posture.


- **Keep the keyboard at a comfortable height**: Try to place the keyboard in a position that allows you to keep your wrists straight and relaxed to avoid wrist strain. Many desks have a keyboard tray that can keep the keyboard at a better height. You can also buy an **ergonomic keyboard** that is designed to minimize wrist strain.

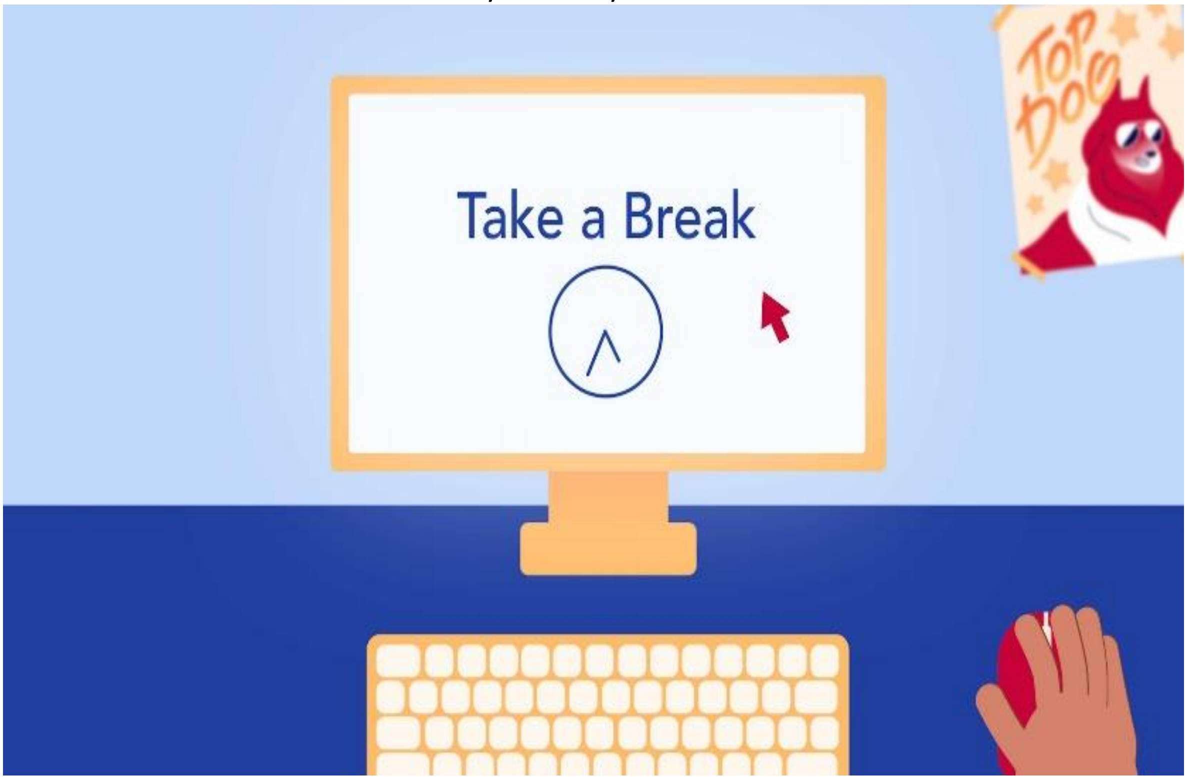
- **Keep the mouse close to the keyboard**: If possible, place the mouse right next to the keyboard. If the mouse is **too far away**, it may be uncomfortable or awkward to reach for it.
- **Place the monitor at a comfortable distance**: The ideal position for a monitor is **20 to 40 inches** away from your eyes. It should also be **at eye level** or **slightly lower**.



- **Avoid clutter**: The computer area can quickly become **cluttered** with paper, computer accessories, and other items. By keeping this area as uncluttered as possible, you can improve your productivity and prevent strain and injury.



- **Take frequent breaks**: It's important to take breaks while you're working at your computer. To avoid eye strain, you should **look away from the monitor** every once in a while. You can also **stand up and walk around** to avoid sitting in the same position for long periods of time. Programs such as Work rave can automatically remind you to take breaks.




For more information on setting up a computer workspace, visit the Computer Workstations eTool from the Occupational Safety & Health Administration (OSHA).

## 10.4 Basic Troubleshooting Techniques

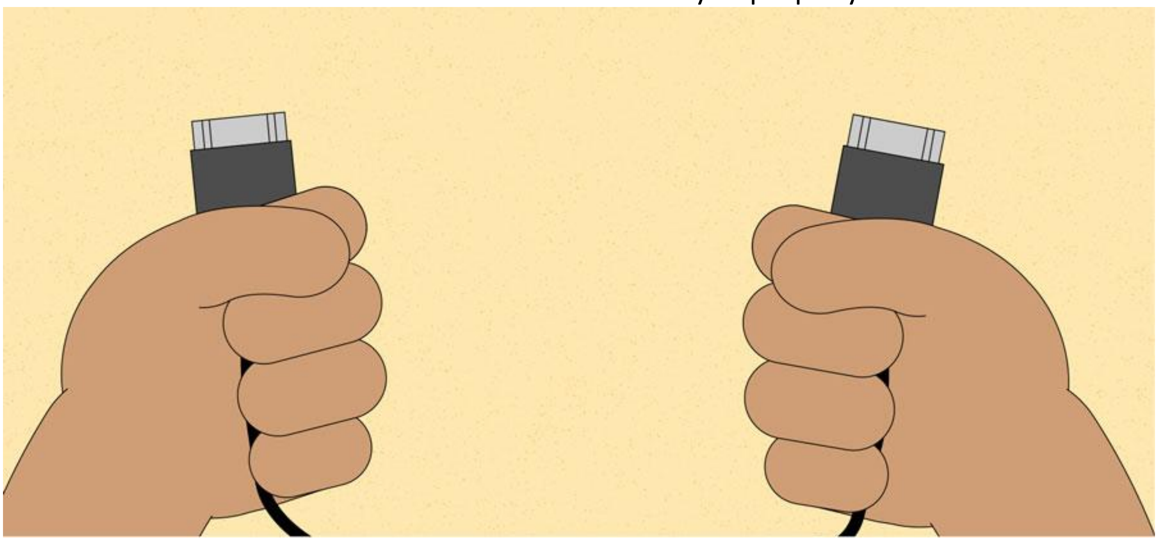
### Troubleshooting

Do you know what to do if your screen goes blank? What if you can't seem to close an application, or can't hear any sound from your speakers? Whenever you have a problem with your computer, **don't panic!** There are many **basic troubleshooting techniques** you can use to fix issues like this. In this lesson, we'll show you some simple things to try when troubleshooting, as well as how to solve common problems you may encounter.

### General tips to keep in mind

There are many different things that could cause a problem with your computer. No matter what's causing the issue, troubleshooting will always be a process of **trial and error**—in some cases, you may need to use several different approaches before you can find a solution; other problems may be easy to fix. We recommend starting by using the following tips.

- **Write down your steps**: Once you start troubleshooting, you may want to **write down** each step you take. This way, you'll be able to remember exactly what you've done and can avoid repeating the same mistakes. If you end up asking other people for help, it will be much easier if they know exactly what you've tried already.
- **Take notes about error messages**: If your computer gives you an **error message**, be sure to write down as much information as possible. You may be able to use this information later to find out if other people are having the same error.
- **Always check the cables**: If you're having trouble with a specific piece of computer **hardware**, such as your monitor or keyboard, an easy first step is to check all related cables to make sure they're properly connected.



- **Restart the computer**: When all else fails, **restarting the computer** is a good thing to try. This can solve a lot of basic issues you may experience with your computer.

### Using the process of elimination

If you're having an issue with your computer, you may be able to find out what's wrong using **the process of elimination**. This means you'll make a list of things that could be causing the problem and then test them out one by one to eliminate them. Once you've identified the source of your computer issue, it will be easier to find a solution.

Scenario:

Let's say you're trying to print out invitations for a birthday party, but the printer won't print. You have some ideas about what could be causing this, so you go through them one by one to see if you can **eliminate** any possible causes.

First, you check the printer to see that it's turned on and plugged in to the **surge protector**. It is, so that's not the issue. Next, you check to make sure the printer's **ink cartridge** still has ink and that there is paper loaded in the **paper tray**. Things look good in both cases, so you know the issue has nothing to do with ink or paper.

Now you want to make sure the printer and computer are **communicating correctly**. If you recently downloaded an **update to your operating system**, it might interfere with the printer. But you know there haven't been any recent updates and the printer was working yesterday, so you'll have to look elsewhere.

You check the printer's **USB cord** and find that it's not plugged in. You must have unplugged it accidentally when you plugged something else into the computer earlier. Once you plug in the USB cord, the printer starts working again. It looks like this printer issue is solved!

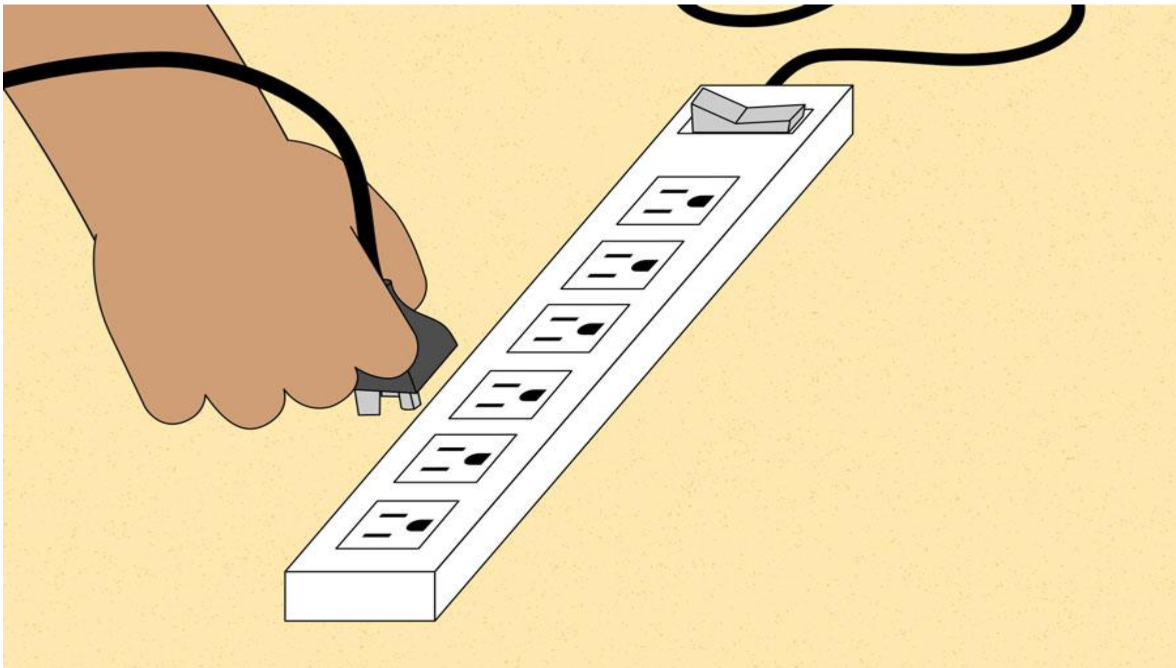
This is just one example of an issue you might encounter while using a computer. In the rest of this lesson, we'll talk about other common computer problems and some ways to solve them.

Simple solutions to common problems

Most of the time, problems can be fixed using simple troubleshooting techniques, like **closing** and **reopening** the program. It's important to try these simple solutions before resorting to more extreme measures. If the problem still isn't fixed, you can try other troubleshooting techniques.

Problem: Power button will not start computer

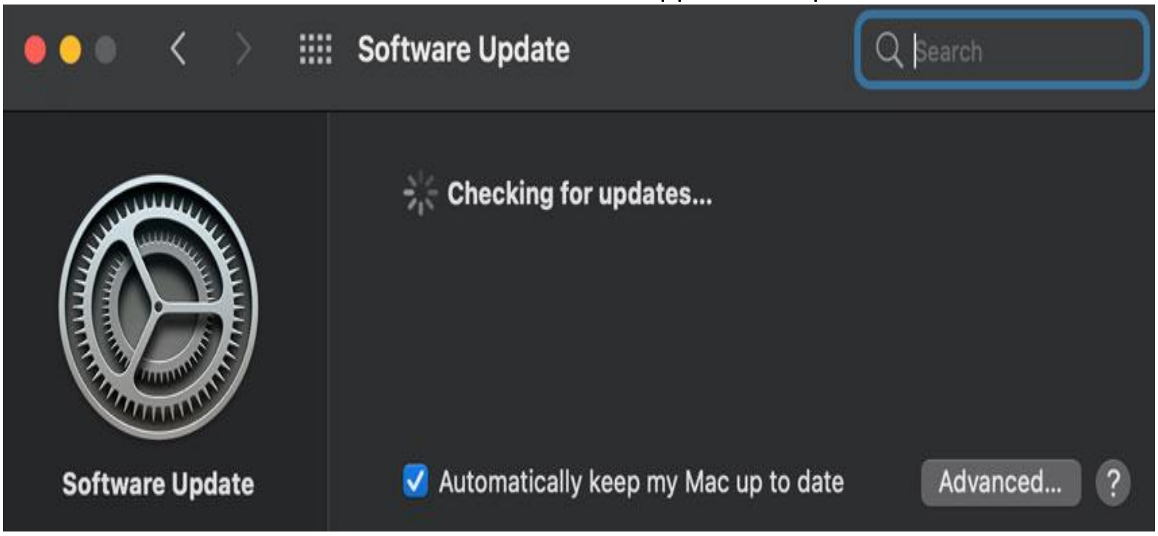
- **Solution 1**: If your computer **does not start**, begin by checking the power cord to confirm that it is plugged securely into the back of the computer case and the power outlet.
- **Solution 2**: If it is plugged into an outlet, make sure it is a **working outlet**. To check your outlet, you can plug in another **electrical device**, such as a lamp**.**
- **Solution 3**: If the computer is plugged in to a **surge protector**, verify that it is turned on. You may have to **reset** the surge protector by turning it off and then back on. You can also plug a lamp or other device into the surge protector to verify that it's working correctly.



- **Solution 4**: If you are using a **laptop**, the **battery** may not be charged. Plug the **AC adapter** into the wall, then try to turn on the laptop. If it still doesn't start up, you may need to wait a few minutes and try again.

Problem: An application is running slowly

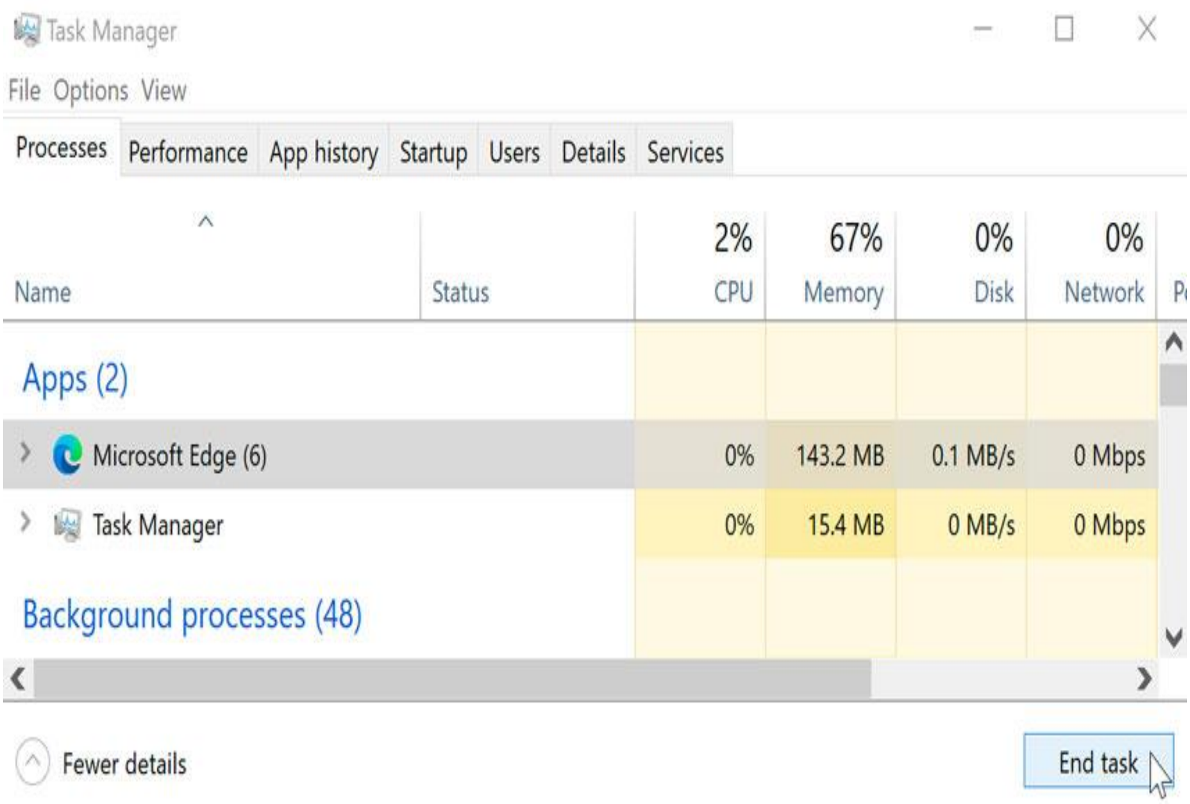
- **Solution 1**: Close and reopen the application.
- **Solution 2**: Update the application. To do this, click the **Help** menu and look for an option to check for **Updates**. If you don't find this option, another idea is to run an online search for application updates.




Problem: An application is frozen

Sometimes an application may become stuck, or **frozen**. When this happens, you won't be able to close the window or click any buttons within the application.

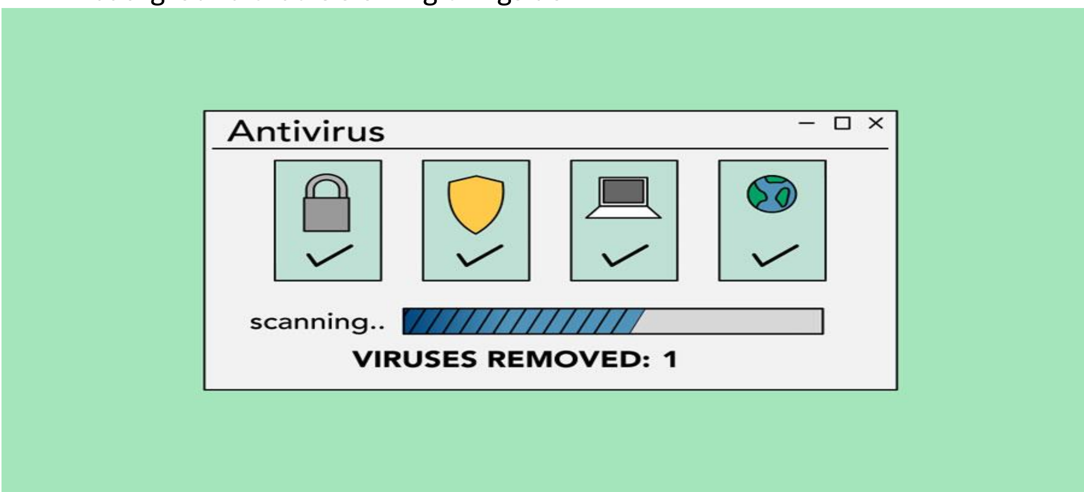
- **Solution 1**: Force quit the application. On a PC, you can press (and hold) **Ctrl+Alt+Delete** (the Control, Alt, and Delete keys) on your keyboard to open the **Task Manager**. On a Mac, press and hold **Command+Option+Esc**. You can then select the unresponsive application and click **End task** (or **Force Quit** on a Mac) to close it.




- **Solution 2**: Restart the computer. If you are unable to force quit an application, **restarting** your computer will close all open apps.

Problem: All programs on the computer run slowly

- **Solution 1**: Run a **virus scanner**. You may have **malware** running in the background that is slowing things down.

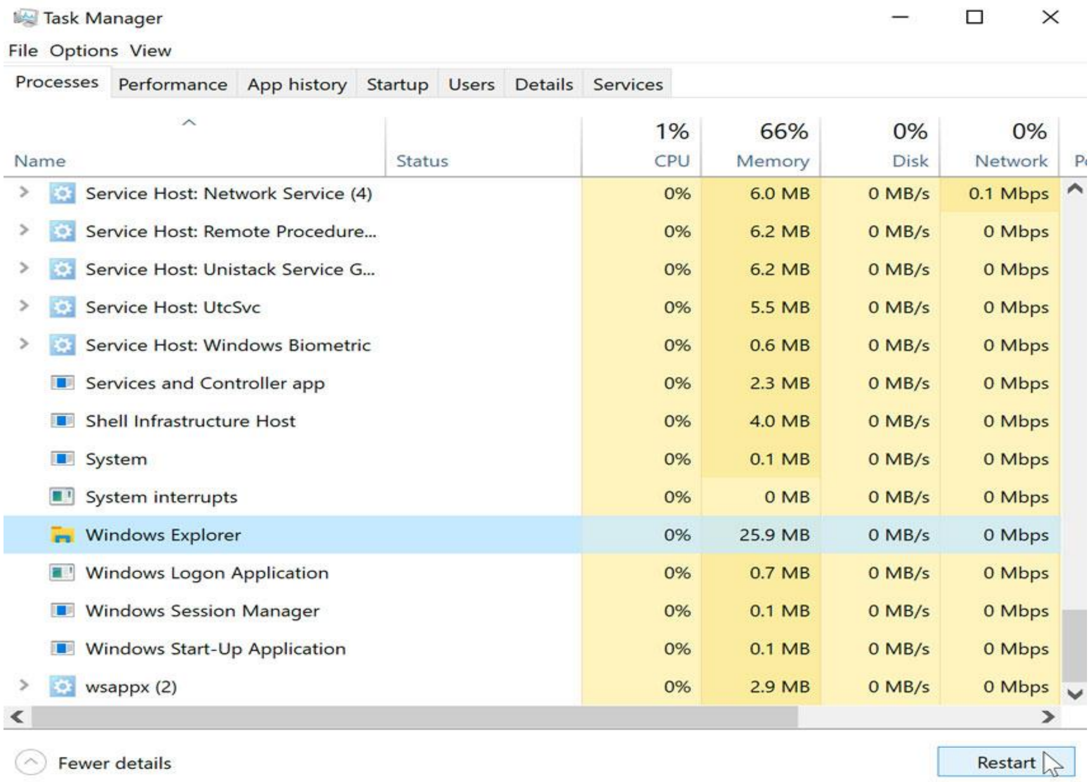



- **Solution 2**: Your computer may be running out of hard drive space. Try **deleting** any files or programs you don't need.
- **Solution 3**: If you're using a **PC**, you can run **Disk Defragmenter**. To learn more about **Disk Defragmenter**, check out our lesson on Protecting Your Computer.

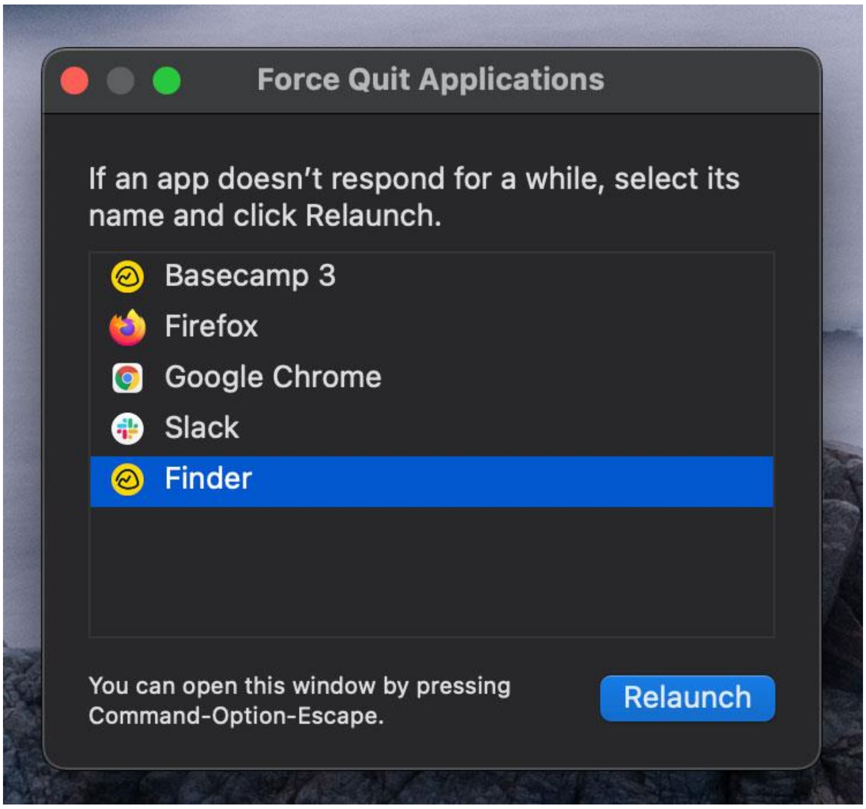
Problem: The computer is frozen

Sometimes your computer may become completely unresponsive, or **frozen**. When this happens, you won't be able to click anywhere on the screen, open or close applications, or access shut-down options.

- **Solution 1 (Windows only)**: Restart Windows Explorer. To do this, press and hold **Ctrl+Alt+Delete** on your keyboard to open the **Task Manager**. Next, locate and select **Windows Explorer** from the **Processes** tab and click **Restart**. You may need to click **More Details** at the bottom of the window to see the Processes tab.



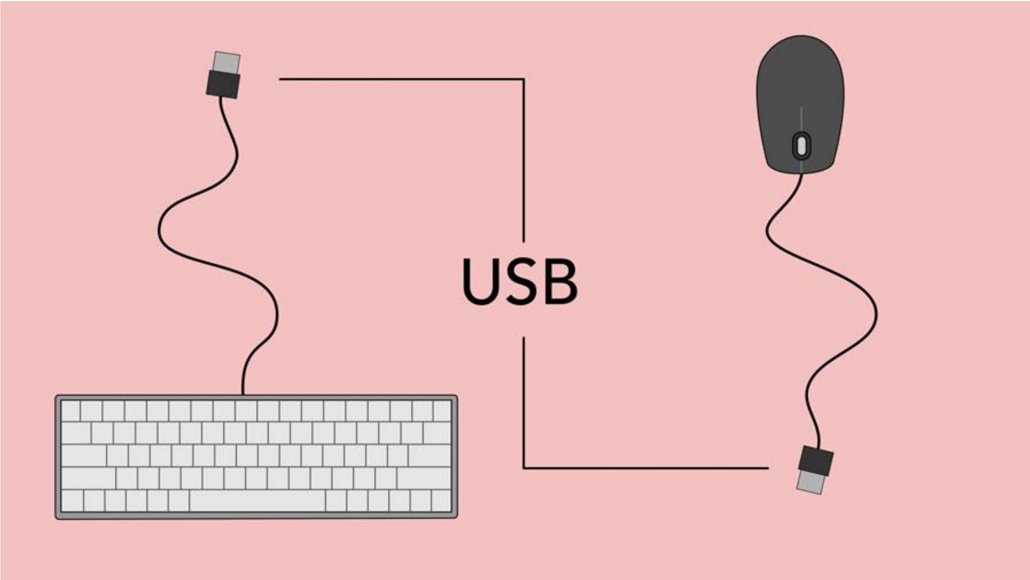

- **Solution 2 (Mac only):** Restart Finder. To do this, press and hold **Command+Option+Esc** on your keyboard to open the **Force Quit Applications** dialog box. Next, locate and select **Finder**, then click **Relaunch**.




- **Solution 3**: Press and hold the Power button. The Power button is usually located on the front or side of the computer, typically indicated by the **power symbol**. Press and hold the Power button for **5 to 10 seconds** to force the computer to shut down.
- **Solution 4**: If the computer still won't shut down, you can **unplug the power cable** from the electrical outlet. If you're using a laptop, you may be able to remove the battery to force the computer to turn off. **Note**: This solution should be your **last resort** after trying the other suggestions above.

Problem: The mouse or keyboard has stopped working

- **Solution 1**: If you're using a **wired** mouse or keyboard, make sure it's correctly plugged into the computer.




- **Solution 2**: If you're using a **wireless** mouse or keyboard, make sure it's turned on and that its batteries are charged.

Problem: The sound isn't working

- **Solution 1**: Check the volume level. Click the audio button in the top-right or bottom-right corner of the screen to make sure the sound is turned on and that the volume is up.
- **Solution 2**: Check the audio player controls. Many audio and video players will have their own separate audio controls. Make sure the sound is turned on and that the volume is turned up in the player.
- **Solution 3**: Check the cables. Make sure external speakers are plugged in, turned on, and connected to the correct audio port or a USB port. If your computer has **color-coded** ports, the audio output port will usually be **green**.
- **Solution 4**: Connect headphones to the computer to find out if you can hear sound through the headphones.

Problem: The screen is blank

- **Solution 1**: The computer may be in **Sleep** mode. Click the mouse or press any key on the keyboard to wake it.
- **Solution 2**: Make sure the monitor is **plugged in** and **turned on**.
- **Solution 3**: Make sure the computer is **plugged in** and **turned on**.
- **Solution 4**: If you're using a desktop, make sure the monitor cable is properly connected to the computer tower and the monitor.

Solving more difficult problems

If you still haven't found a solution to your problem, you may need to ask someone else for help. As an easy starting point, we'd recommend **searching the Web**. It's possible that other users have had similar problems, and solutions to these problems are often posted online. Also, if you have a friend or family member who knows a lot about computers, they may be able to help you.

Keep in mind that most computer problems have simple solutions, although it may take some time to find them. For difficult problems, a **more drastic solution** may be required, like reformatting your hard drive or reinstalling your operating system. If you think you might need a solution like this, we recommend **consulting a professional** first. If you're not a computer expert, it's possible that attempting these solutions could make the situation worse.

## Lesson 11: Extras

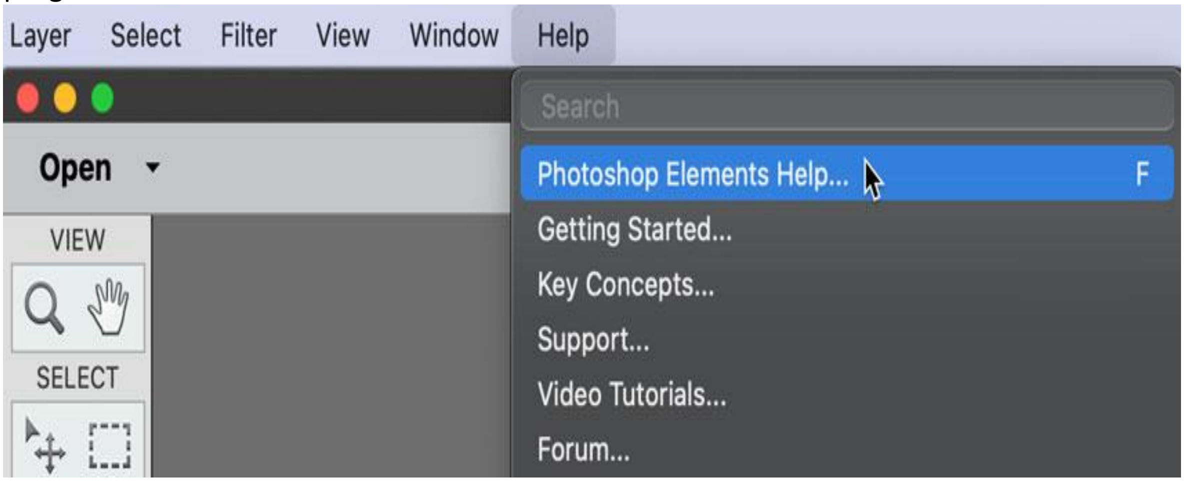
### 11.1 How to Use Your Computer's Built-in Help

**How to use your computer's built-in help**

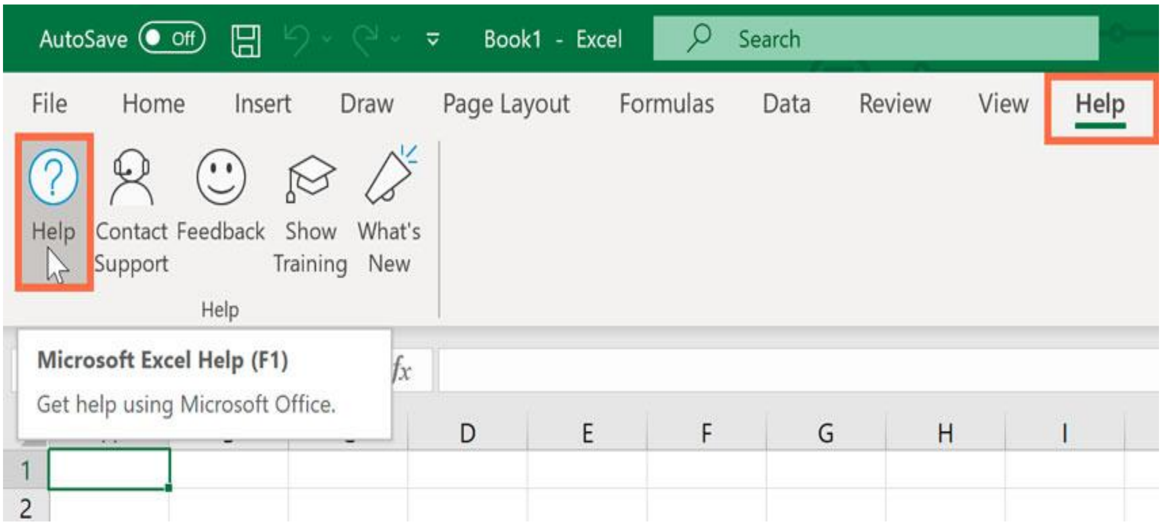
Everyone needs to look for help sometimes. Luckily, when you want help with a computer program, it's usually easy to find. Most programs have a help feature somewhere, and learning how to use it can make a big difference. You may not find everything you need, but your computer's built-in help is a great place to start.
Different programs integrate help features in different ways. Some are like interactive manuals included with the program that you can open with a menu, while others are just links to the developer's support website. But they're always designed with the same thing in mind: to help you learn the features of the program and to solve problems yourself.

#### How to access built-in help

Most programs have one of two ways to access built-in help. For example, Adobe Photoshop Elements has a **Help** menu with a variety of options. Many of these options open Adobe's support page in your web browser, while others access features within the program itself.



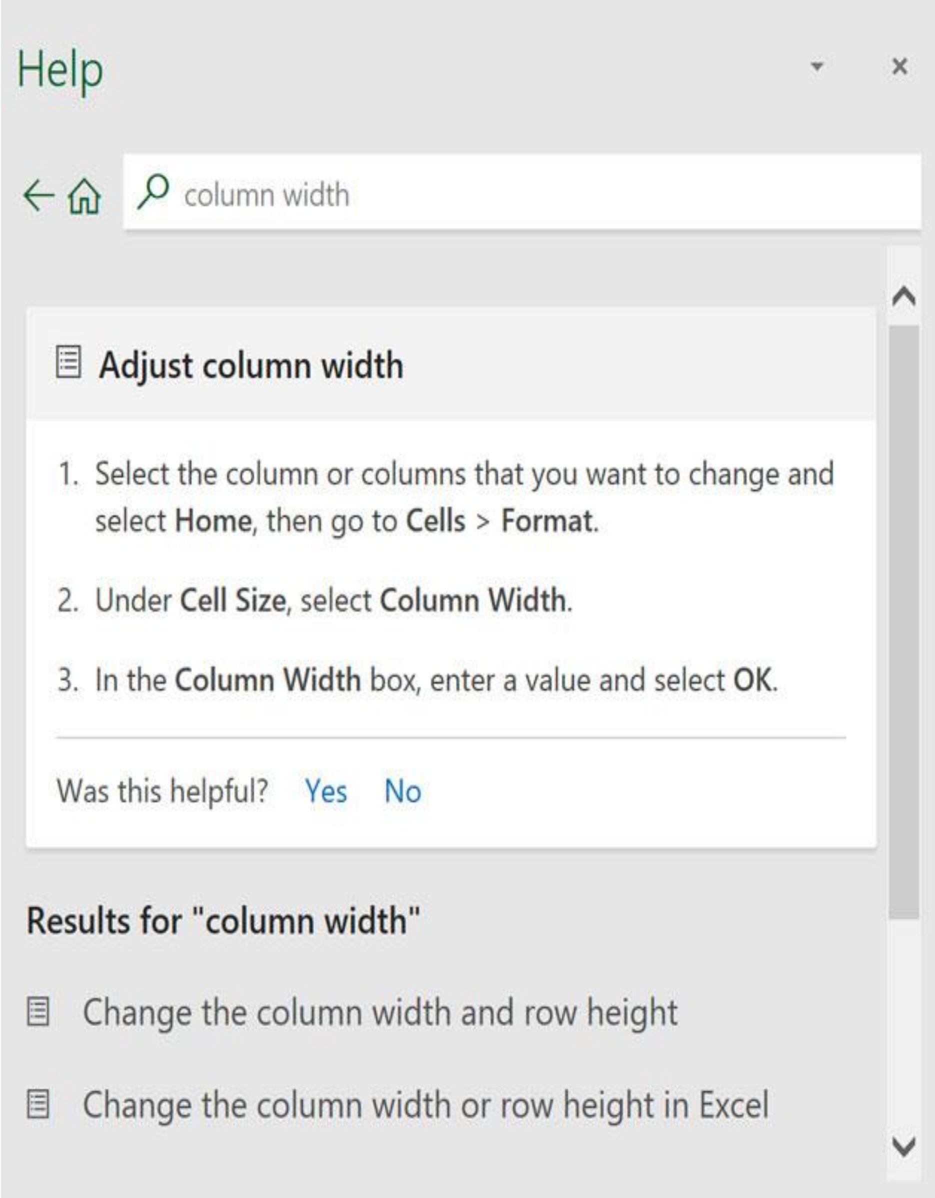

Other programs have a help button. For example, Microsoft Office 2016 has the Help tab with a Help button to open a search.



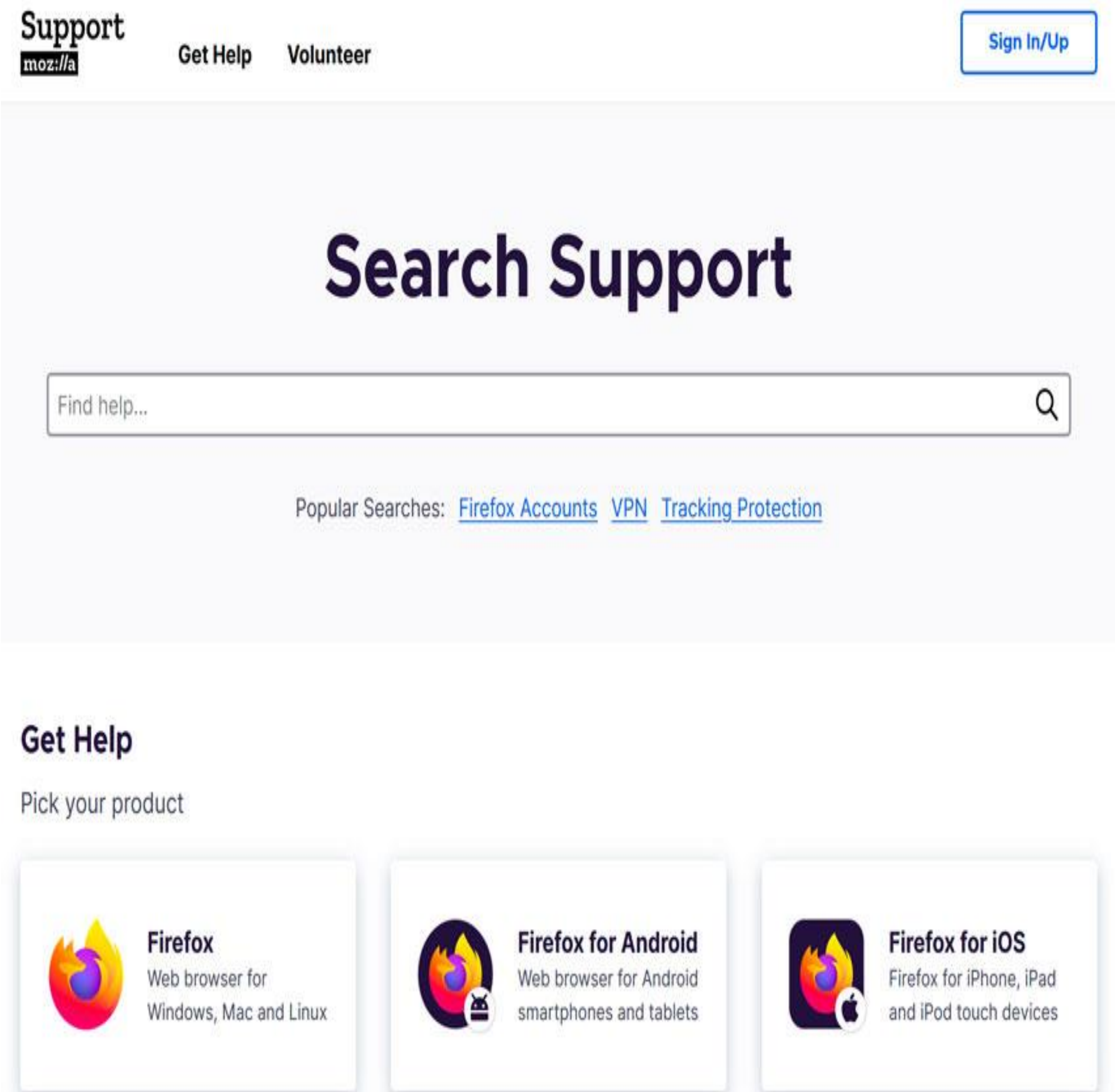

Features of a help file

Help files can be organized in a variety of ways, including as a table of contents, FAQ, or searchable database.

When you open the help panel in Office 2016, you'll see a search box. Much like a search engine, you type keywords in the search bar, and it will display topics relevant to the keywords you entered.




The table of contents for Mozilla’s support page is a broad list of categories. Clicking any of these hyperlinks will lead to a list of narrower topics and specific help articles. There’s also a search bar to help you.




Although built-in help can be useful, it may not always have the information you want. If you can’t find what you’re looking for or don’t understand what you've found, you can usually ask someone you know, do a Google search, or contact support staff. It can take a little extra time and effort, but learning how to find solutions on your own is a valuable skill—and you’ll get better at it with practice.

## 11.2 Learning a New Program

### Learning a new program

*You ask a friend who is good with computers to help you do something in a new program. The friend says she hasn't used the program before, but will give it a try. Two minutes later, she's figured out what to do.*

How did she do that? If you've experienced a situation like the one just described, it might seem like magic. But your friend probably just applied what she knew about computers and computer programs to the program you were trying to use. In this lesson, we'll show you how you can do the same thing.

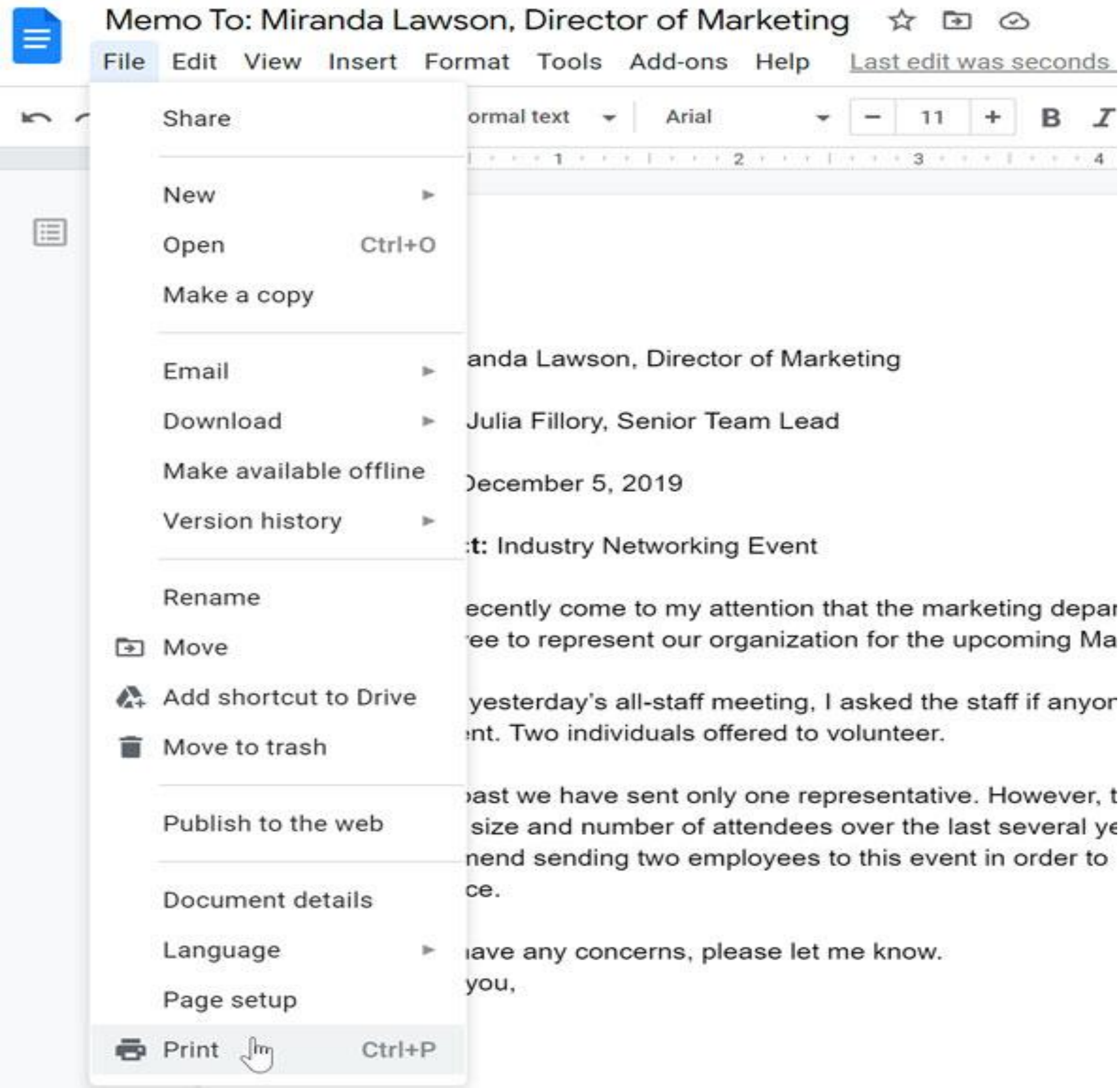
You know more than you think you do!

Starting to use a new computer **program** can seem overwhelming, but keep in mind that you already know more than you think you know. Even if the screen in front of you looks totally unfamiliar, everything you've learned so far about your computer and other programs will help you figure out what to do next. As you spend more time using the new program, it will start to feel more familiar.

Look for similarities with programs you've used

The first thing you'll want to do when opening a new program is look for **familiar features**. You may not realize it, but most computer programs have certain basic features in common—so once you've learned to use one program, you'll already know something about any other ones you try to use. For example, many **keyboard shortcuts** remain the same from program to program.

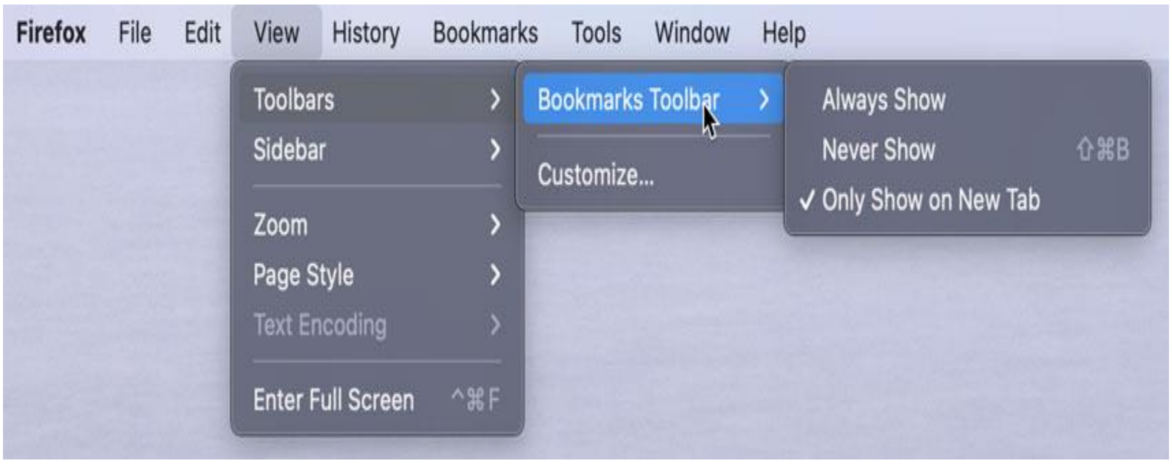
Most programs also have **File** and **Edit** menus, and they'll usually be in the same place: at the top of your screen, either as a **drop-down menu** or in a **ribbon**. The File and Edit menus tend to contain similar functions in any program. So if you know the **Print** function appears in the File menu in **Microsoft Word**, you'll have a good idea of where to look for it in **Google Docs**, as in the image below.



Even if you're switching from a **PC** to a **Mac** or vice versa, **keyboard shortcuts** will remain mostly the same. Just substitute the **Command** key on a Mac for the **Ctrl** key on a PC. For example, the shortcut for the **Cut** function is **Ctrl+X** on a PC; on a Mac, it's **Command+X**.

### Check for hidden toolbars or panels

Let's say you've checked your new program for familiar functions, but there are a few you just can't find. Don't give up! If you believe a particular function should be there, you're probably right—you may just need to open it. Many programs have **toolbars**, **sidebars**, or **panels** you can **hide** or **make visible**, and they are often hidden by default when you start the program. If you can't find a function you need, try clicking the **View** or **Window** menu to check for hidden toolbars, as shown in the image of the Firefox web browser below.

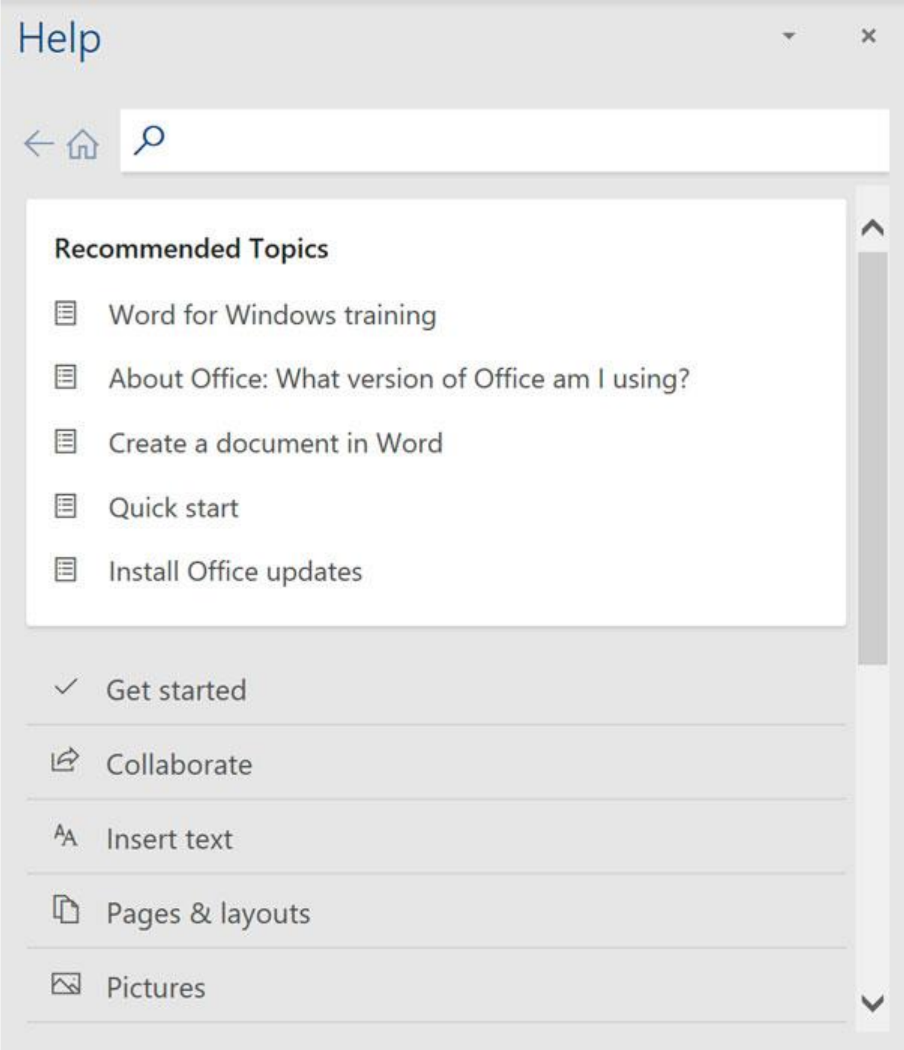



### If you're having trouble

If the program you're trying to use has a lot of unfamiliar elements—or if there's a feature you simply don't know how to use—don't despair. There are still some simple things you can do to find your way around a program.

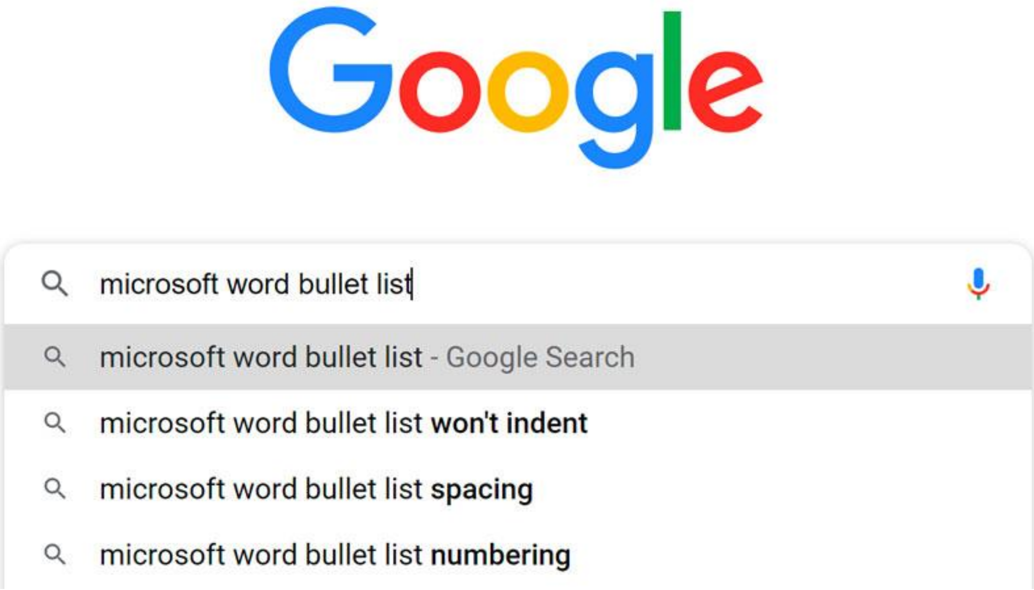
### Use the help feature

Software companies know that most users will have questions about how to use their programs, which is why they include **built-in help features**. You can usually access a program's help feature by clicking a **Help** menu (sometimes represented by a **question mark icon**) at the top of your screen. There, you'll find **instructions** on how to do things, **troubleshooting tips**, and answers to **frequently asked questions**. Some help features will even include links to **online help forums**, where users can post answers to each other's questions. Remember, if something isn't obvious to you, it probably isn't obvious to other users either, so the help section should have some information on it.



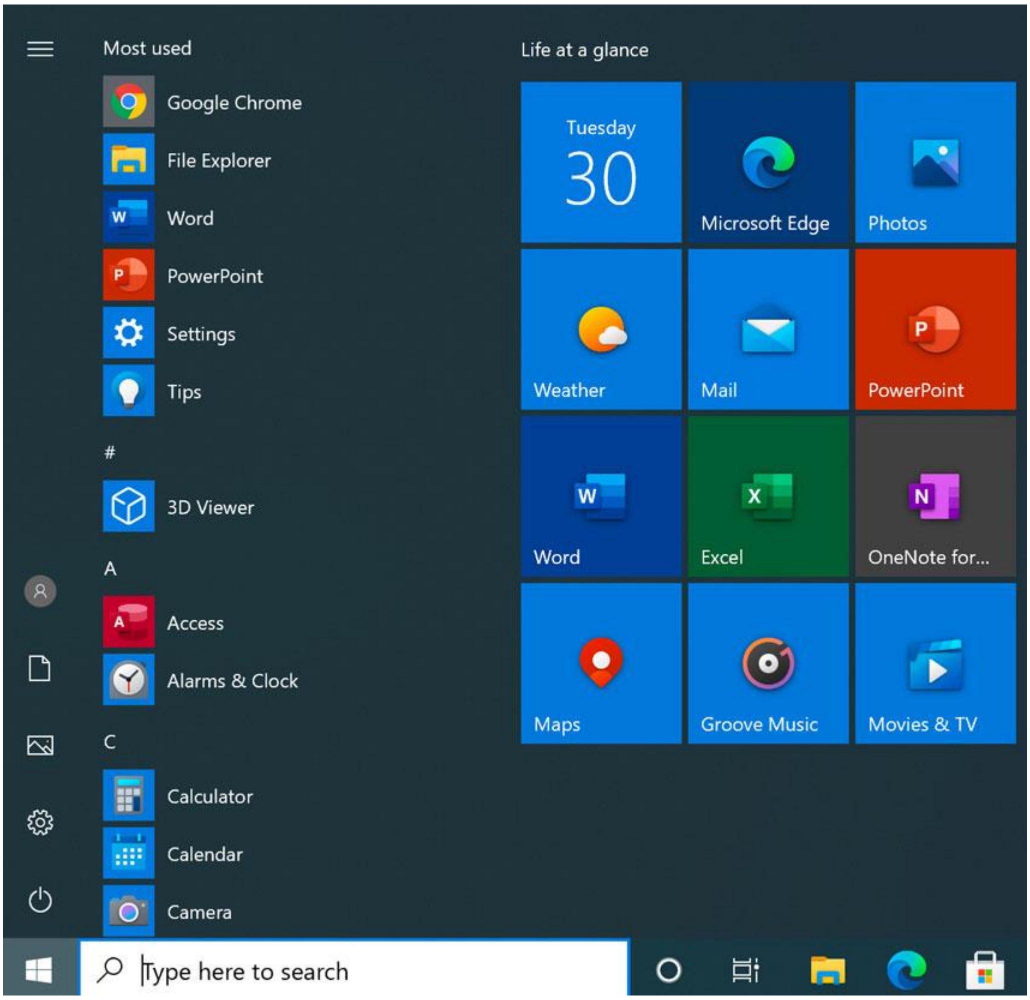

Google it!

If you haven't found the answer in the program's help feature, try searching for a solution on Google. You will probably find tutorials or posts from other users explaining how to use the program. You may also want to search YouTube for video tutorials on the program you're using.




## 11.3 Common applications in Windows

Windows comes with several useful applications already installed. These applications can help you with many common tasks, including browsing the Internet, managing your calendar, and shopping for music.
Most of these apps can be opened by clicking the Start button, then clicking the icon of the app you want to open. You may need to navigate the Start menu to find the app you're looking for.




Web browsers

Microsoft Edge replaces Internet Explorer in Windows 10 but serves the same function. It has a few new features over Internet Explorer, including an option to display webpages in an easy-to-read format, better security, and integration with other parts of Windows 10.

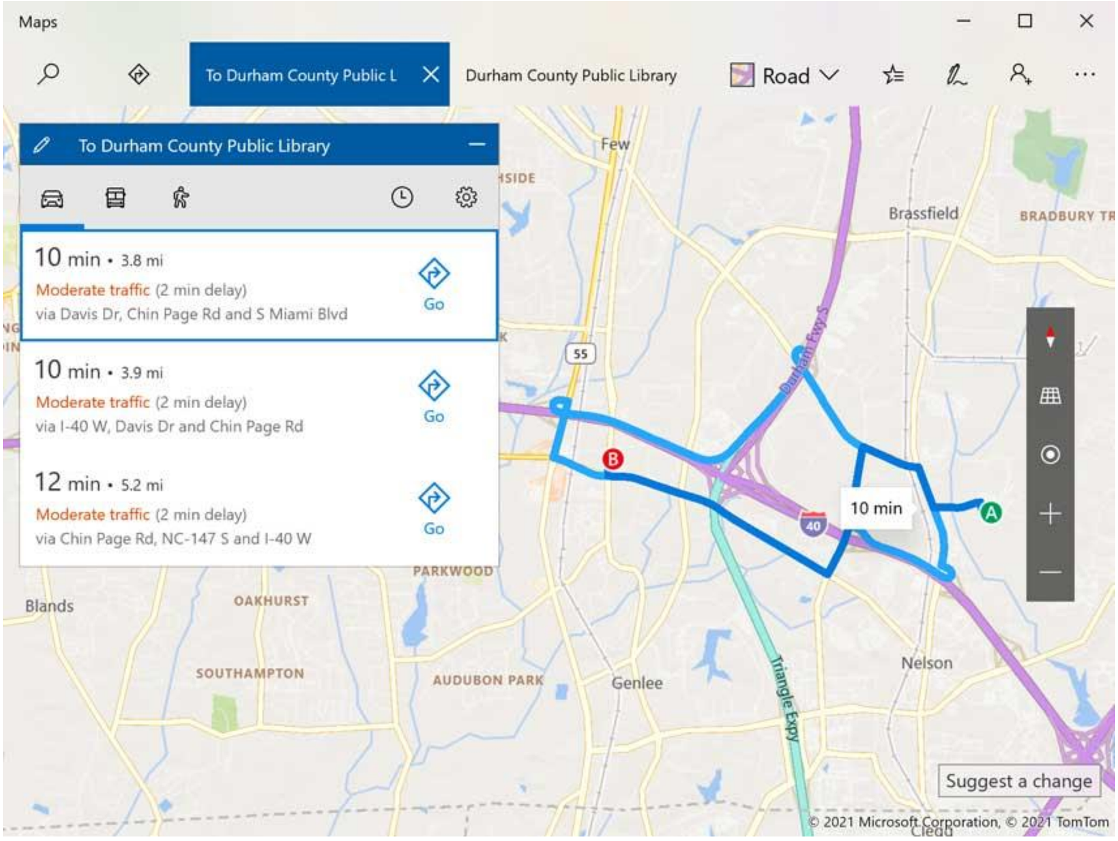

**Internet Explorer** is one of the most well-known applications on the Internet, primarily because it has come bundled with many versions of Windows for the past 20 years. It has a simple interface and most standard web browser features, including bookmarking your favorite websites.

Productivity

Windows 8 and Windows 10 include several productivity apps that can help you with daily tasks, like managing your email and calendars, finding directions, and organizing notes.

**Mail** and **Calendar** are apps that connect your accounts with other services, such as Microsoft, Google, and Apple. They synchronize your mailboxes and calendars within these services and display them in a single window on your computer.

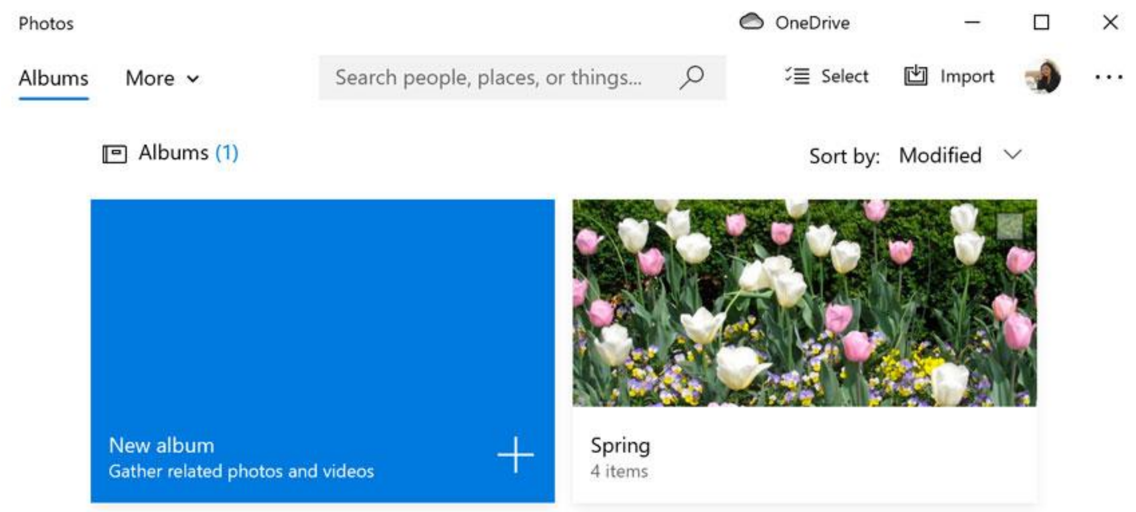
**Maps**, an app powered by Bing Maps, gives you access to all of the same navigation and search features. It adds a few other features as well, like pinning locations and saving directions on all of your Windows devices.




**OneNote** is the advanced note organization software originally included with Microsoft Office, but now it's a default app in Windows 10. OneNote lets you create a collection of notes that you can then search and share.

Media

**Photos**, introduced in Windows 8, is a digital photo organizer that helps you store, sort, and display photos on your computer. It also includes features for editing, online storage, and sharing to social media.

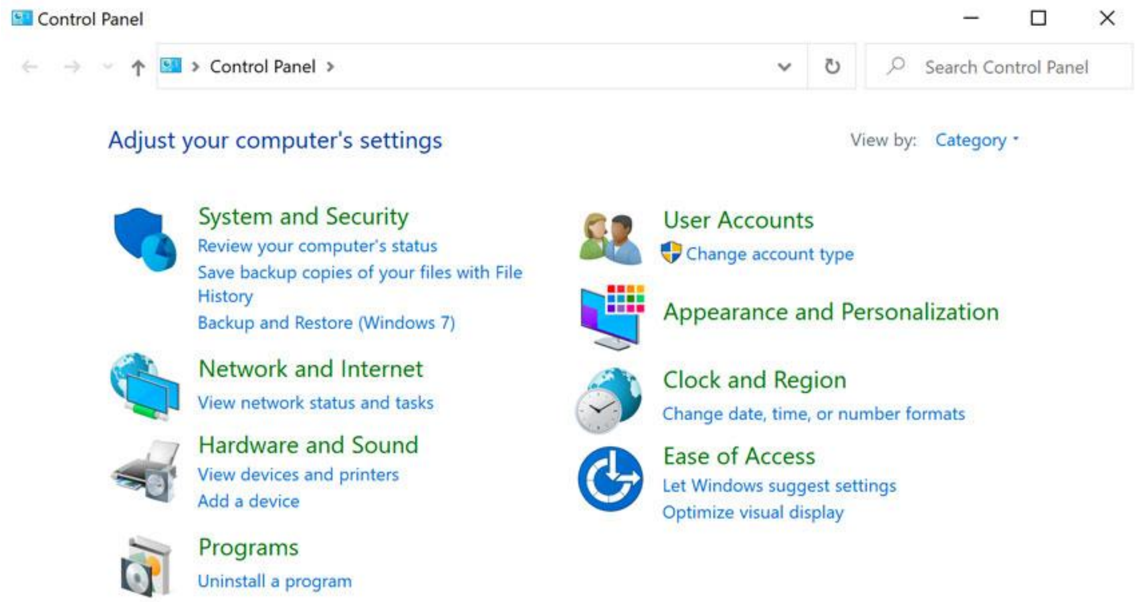



**Groove Music** and **Movies & TV** are apps included with Windows 10 that access Microsoft's online media services. Groove Music can play music stored on your computer and OneDrive, and it can stream online music with the purchase of a monthly subscription. You can play video files stored on your computer with Movies & TV, and you can use it to shop for movies and TV shows online as well.

**Windows Media Player** is Microsoft's default basic media player that has come with most versions of Windows. It can play most types of audio and video files stored on your computer.

Settings

The **Control Panel** is where you can adjust your computer's settings and configurations. The **Settings** app, introduced in Windows 8, gives you access to most of your computer's settings but is designed in a new tablet style instead of the classic Windows style.



## 11.4 Opening Files with Different Applications

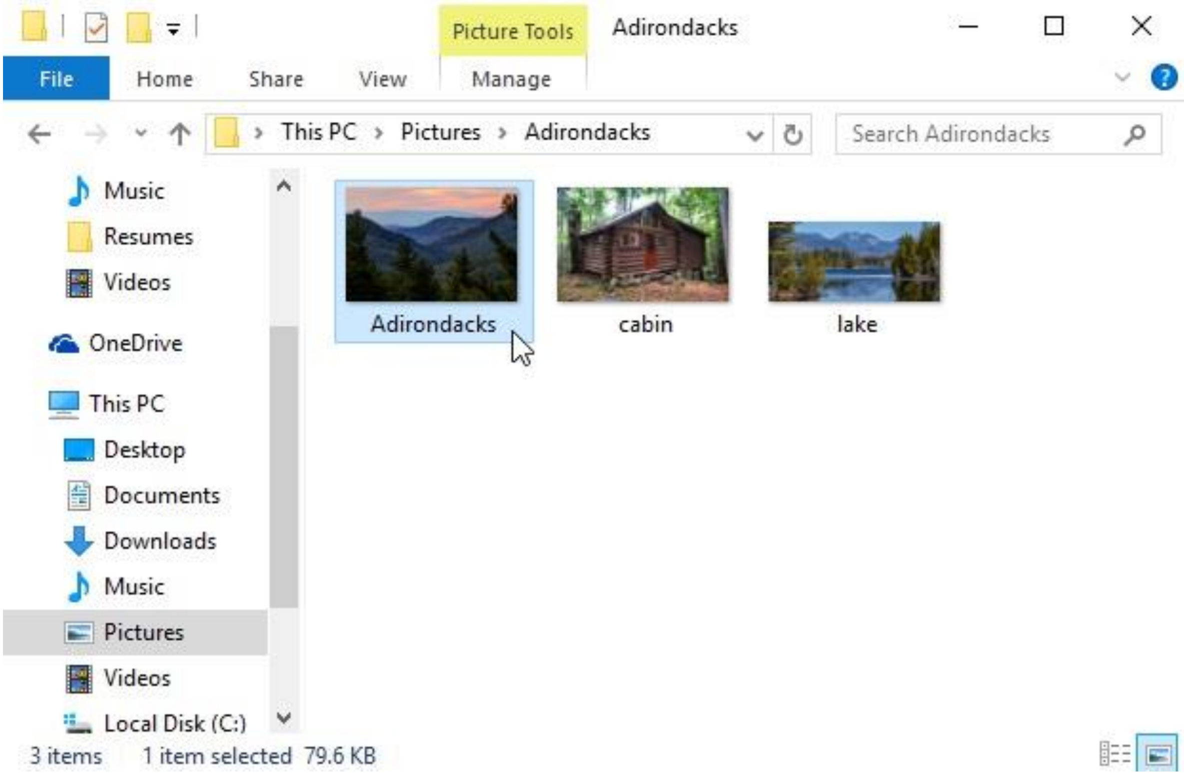
### Opening files with different applications

When you open a file in Windows, it will usually open **in the default application for that type of file**. For example, a **photo** will open in **Windows Photo Viewer** (or the **Photos** application in Windows 8) by default. But you may not always want this. In this lesson, we'll show you how to **open a file in a different application**, as well as how to **change the default application** so a file will always open in your preferred program.

If you're using Windows 8, files will usually open in a **Start screen application**, even if you opened it from the **desktop**. If you prefer to work in the desktop, you can choose to open the file with a **desktop application**. For example, a **jpeg picture** in Windows 8 will open in the **Photos** application by default, but you can open it on the desktop in **Windows Photo Viewer** instead.

### Opening a file in the default application

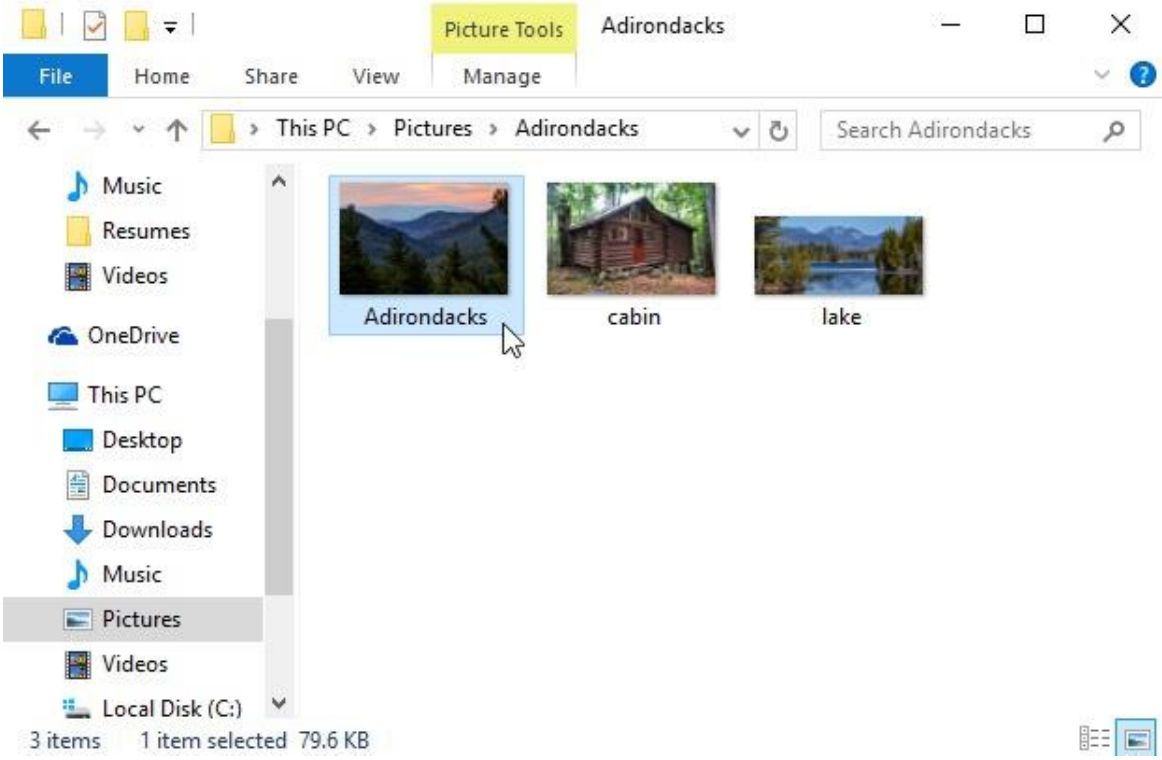
As you learned in our lesson on Working with Files, you can locate and **double-click** a file to open it. It will open in the **default application** for that type of file.



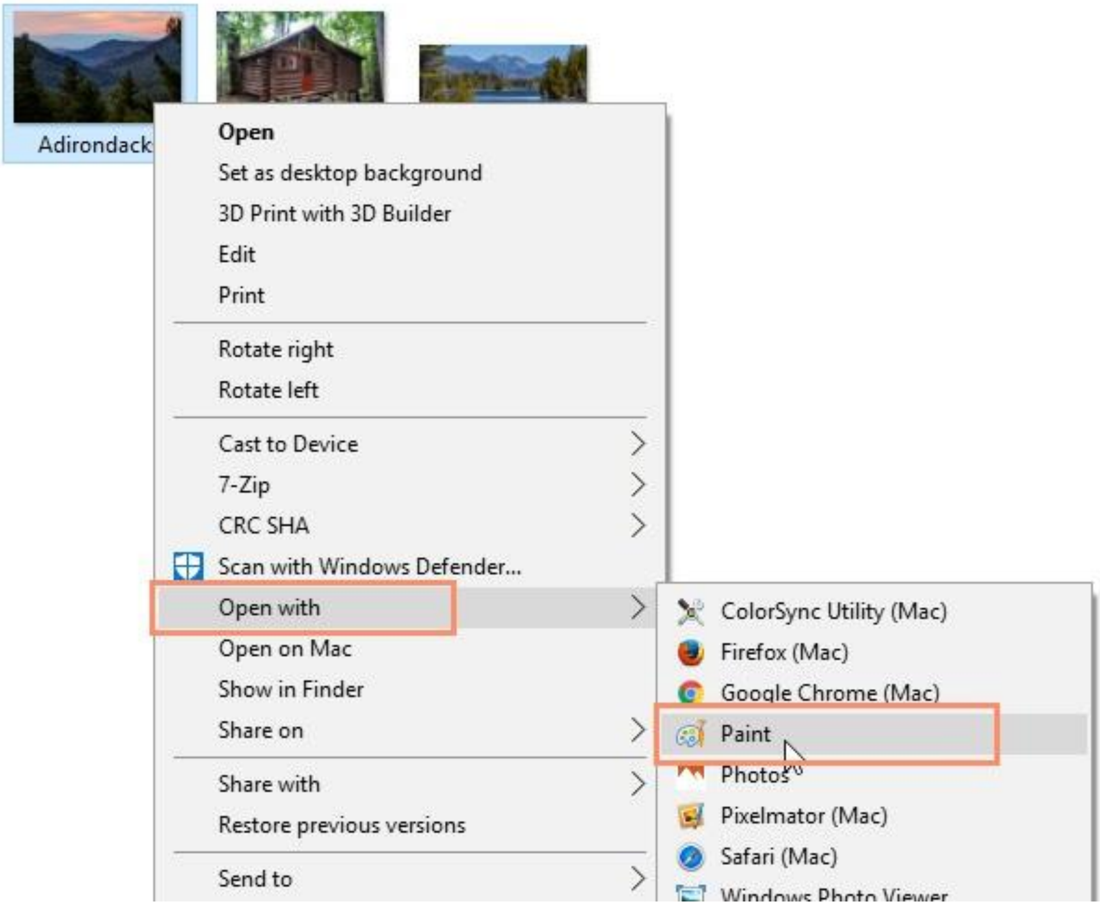

### To open a file in a different application:

Sometimes you may want to open a file in a different application **without changing the default**. For example, you may want to open a photo with **Microsoft Paint** to crop or resize it.

1. From the desktop, **right-click** the desired file.




2. From the drop-down menu, click **Open with**, then select the desired **application**. In this example, we'll select **Paint**.

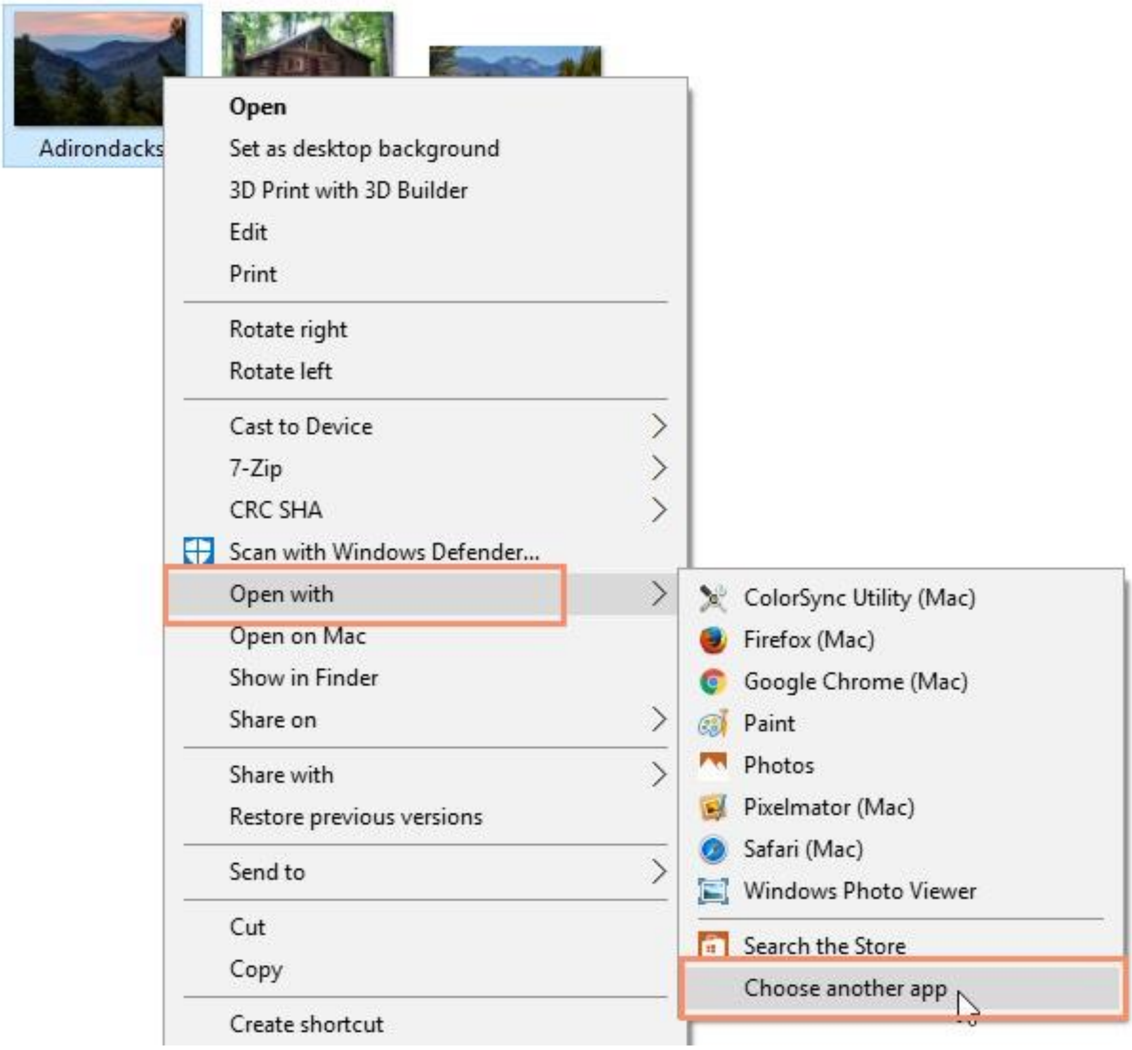



3. The file will open in the selected application.

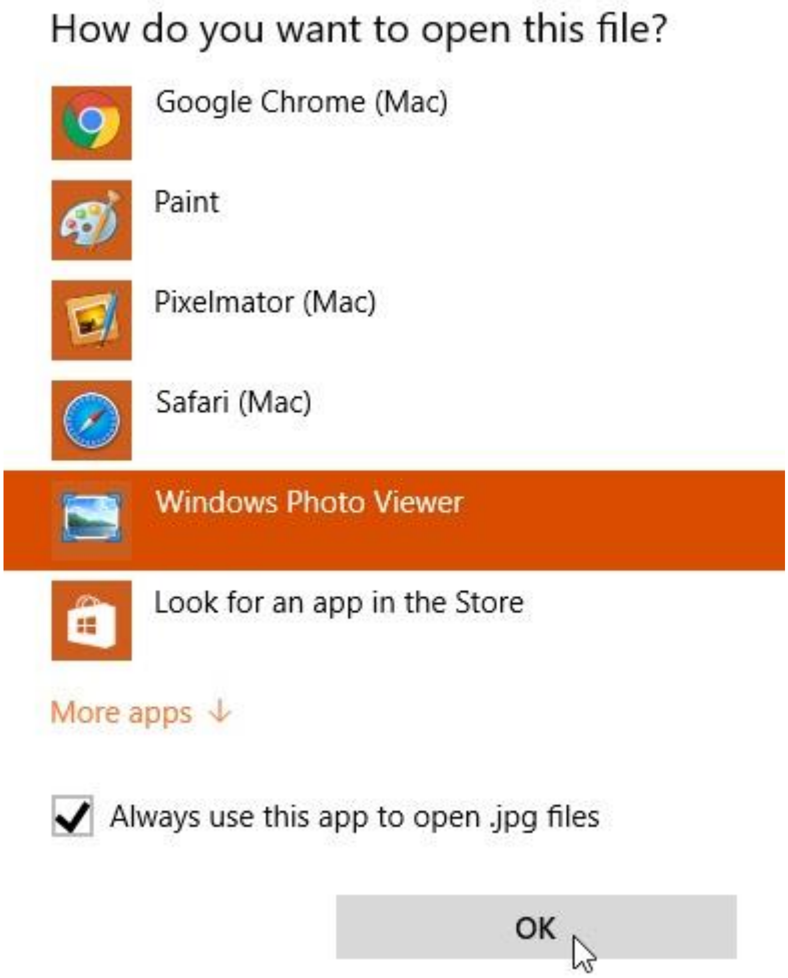

To change the default application:

You may prefer to change the **default application** for certain types of files so they'll **always open in the new app** when you double-click them. For example, you may want your photos to always open in **Windows Photo Viewer** instead of the **Photos** application.

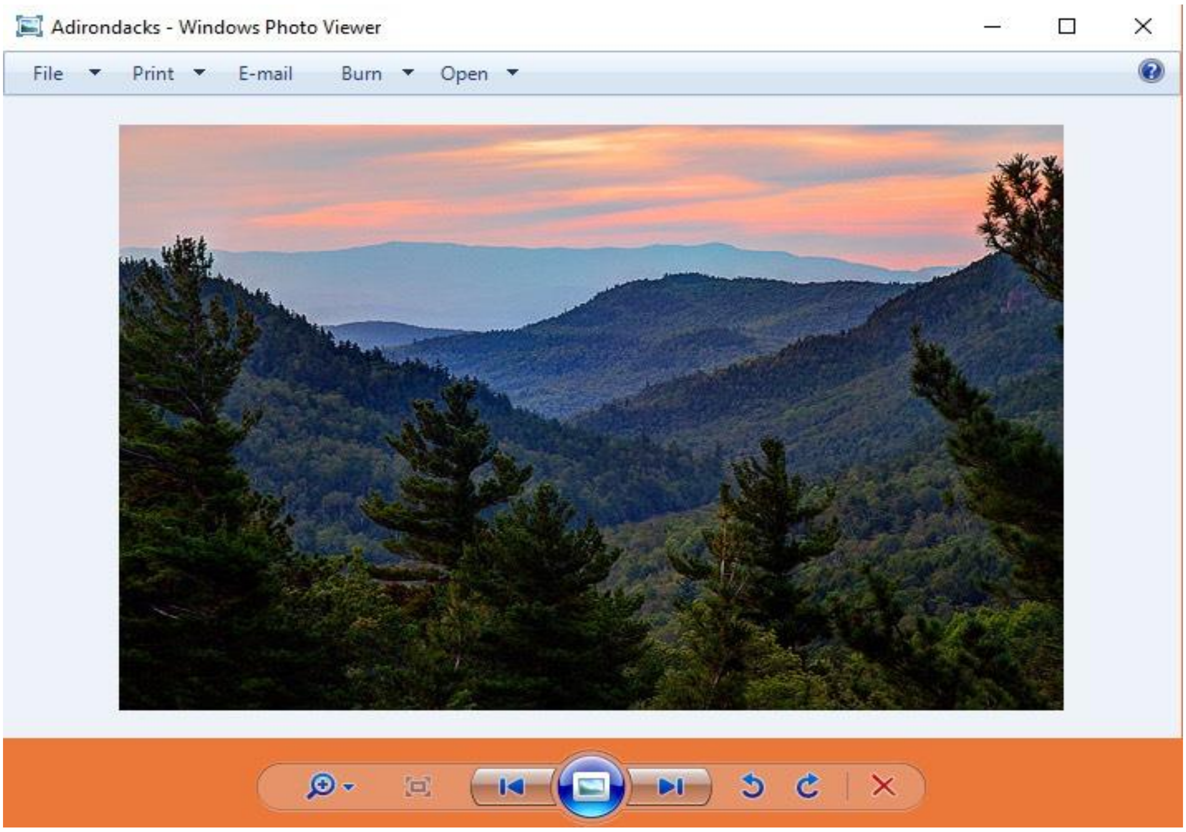
1. From the desktop, **right-click** the desired file, select **Open with**, and click **Choose another app** from the menu that appears.




2. Select the desired **application**. If you don't see the one you want, click **More apps** or **Look for an app in the Store** to look for other applications. In this example, we want to open the file in **Windows Photo Viewer**. Then check off **Always use this app to open .jpg files** and click **OK**.




3. The file will open in the new application. The next time you double-click a file of that type, it will open in the new default application.




## 11.5 Bringing Your Files with You

### Bringing your files with you

When you're working on a document or other computer file, you can always save it to your computer's **hard drive**. Sometimes, you may want to **bring your file with you** and open it on a different computer. In this lesson, we'll talk about two ways to save your files so you can access them from almost anywhere.

- **Flash drive**: Flash drives are **small**, **removable hard drives** that plug into the **USB ports** on your computer. They are relatively inexpensive (usually less than $20) and can be purchased at any store with an electronics section.
- **Cloud storage**: Cloud storage means you save your files on **servers** on the Internet using an account with a cloud service. With cloud storage, you can access your files from any computer with Internet access without having to keep track of a **physical device**.

Flash drives and the cloud can also be used to **back up** your files. To learn more, check out our lesson on **Backing Up Your Files**.

Using a flash drive

Flash drives make it easy to carry your important files and documents with you in a portable form. You should always back up the files on your flash drive elsewhere just in case it gets lost or breaks.

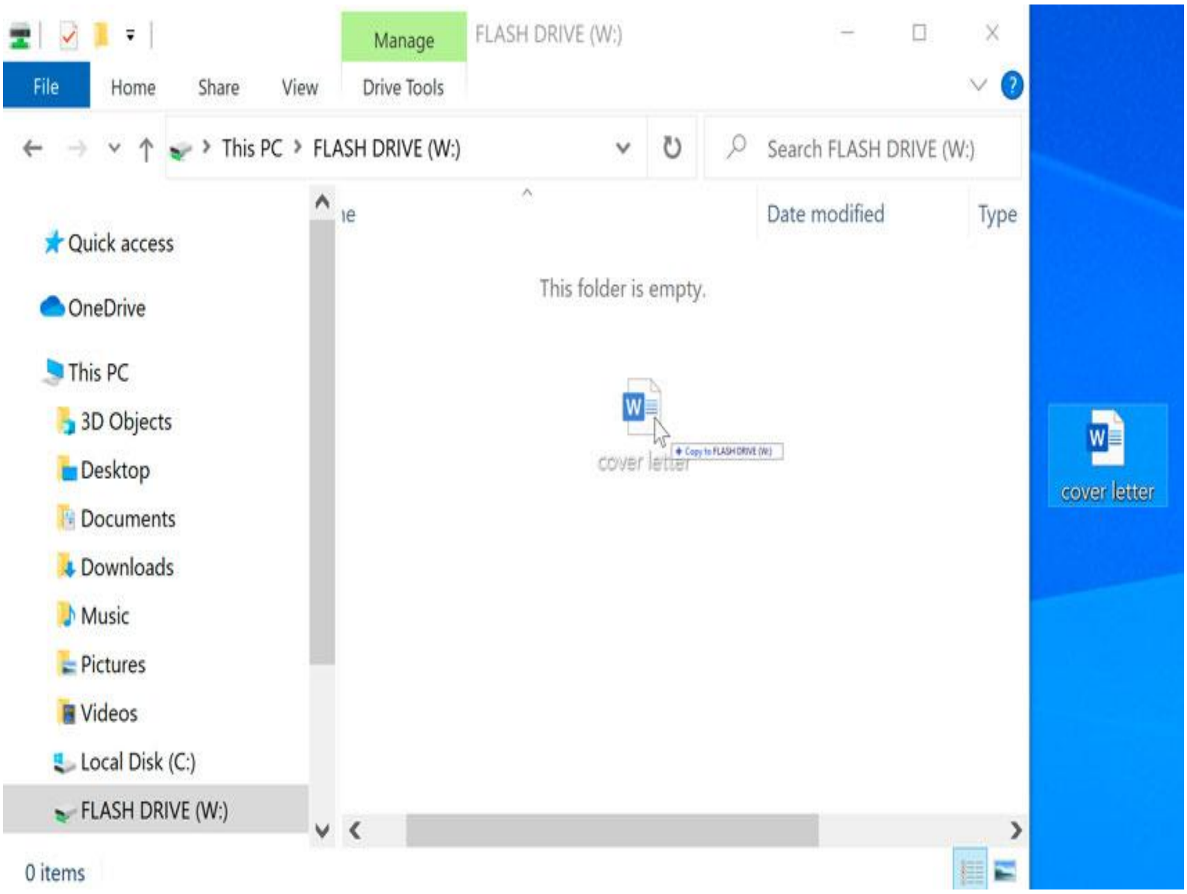
To connect a flash drive:

1. **Insert the flash drive** into a **USB port** on your computer. You should find a USB port on the front, back, or side of your computer (the location may vary depending on whether you have a desktop or laptop).
2. If you're using **Windows**, a dialog box may appear. If it does, select **Open folder to view files**. On a **Mac**, a **flash drive icon** will usually appear on the desktop.
3. If a dialog box does not appear, open **Windows Explorer**—or **Finder** if you're using a **Mac**—and select the flash drive on the left side of the window. Note that the name of the flash drive may vary.

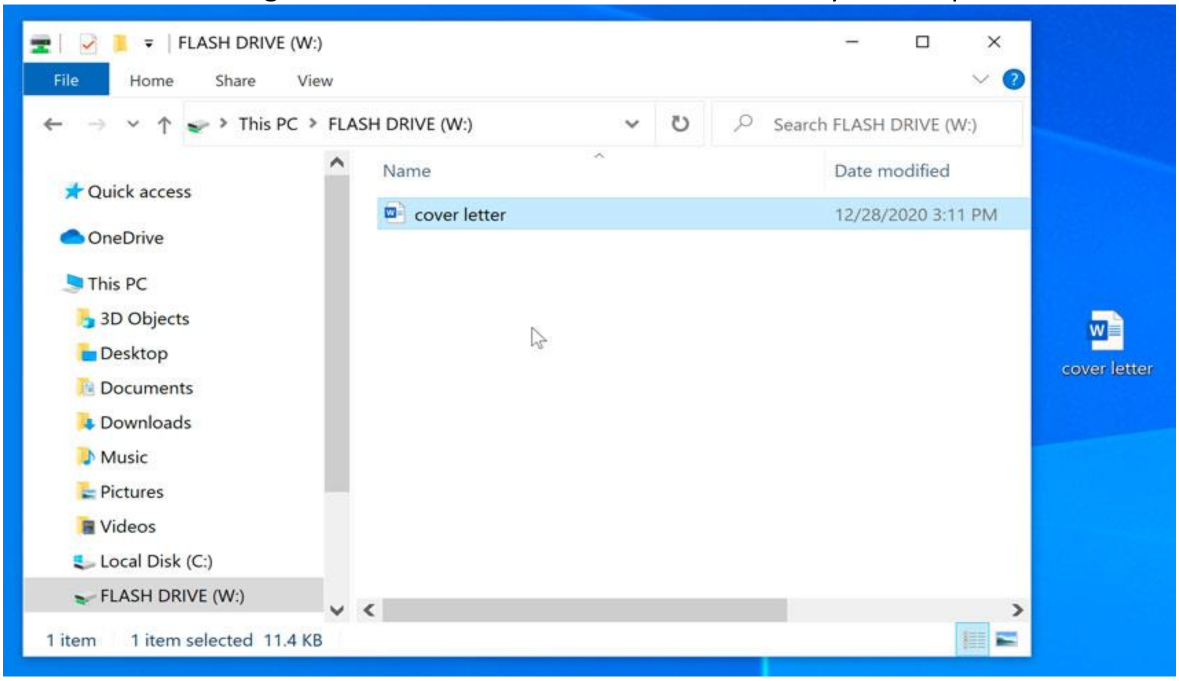

To work with a flash drive:

Once you've connected a flash drive, you can work with it just like any other folder on your computer, including moving and deleting files.

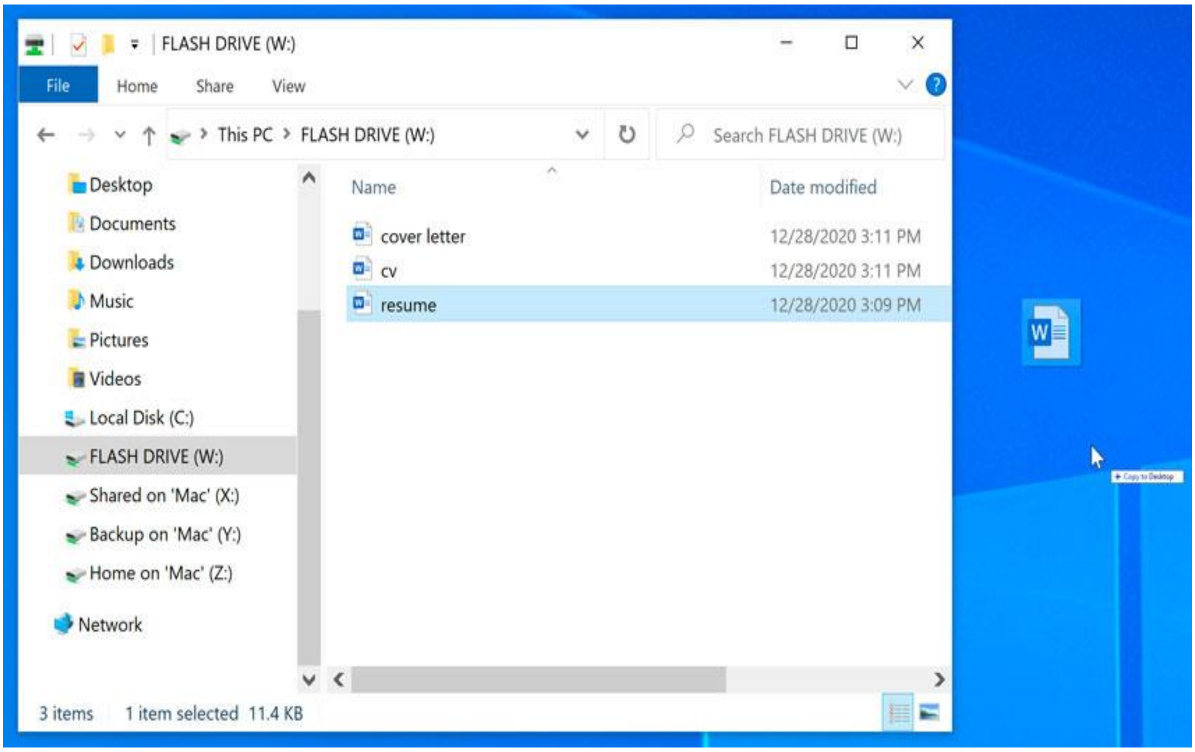
1. If you want to copy a file **from your computer to the flash drive**, click and drag the file from your computer to this window.



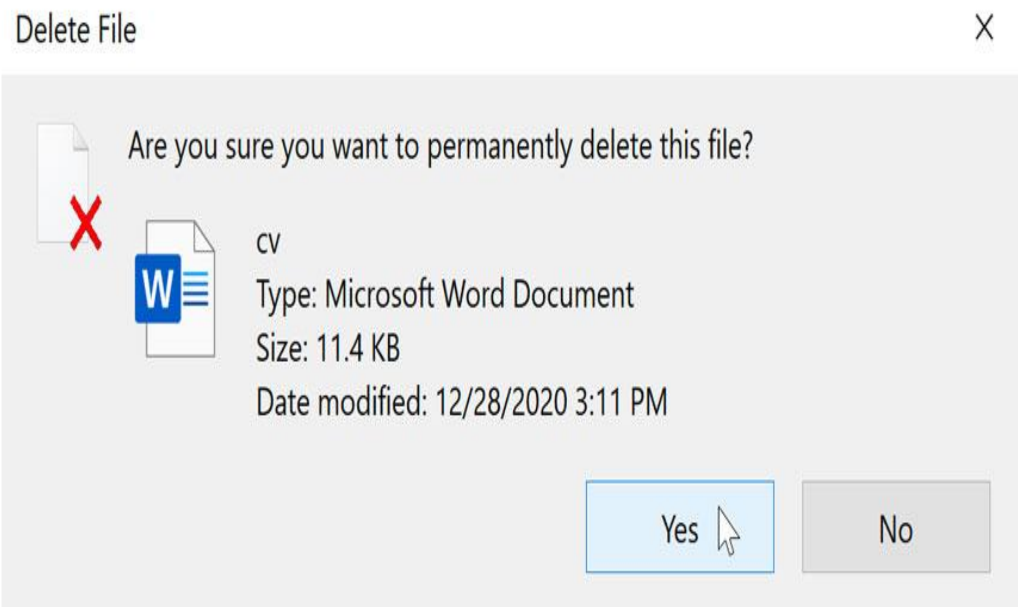

2. The file will be **duplicated**, and this new version will be saved to the flash drive. The original version of the file will still be saved to your computer.




3. If you want to copy a file **from your flash drive to your computer**, click and drag the file from this window to your computer.




4. If you want to **remove a file from your flash drive**, click and drag the file to the **Recycle Bin** on a PC or the **Trash can** on a Mac. A dialog box may appear appear. If it does, click **Yes** to confirm that you want to permanently delete the file.

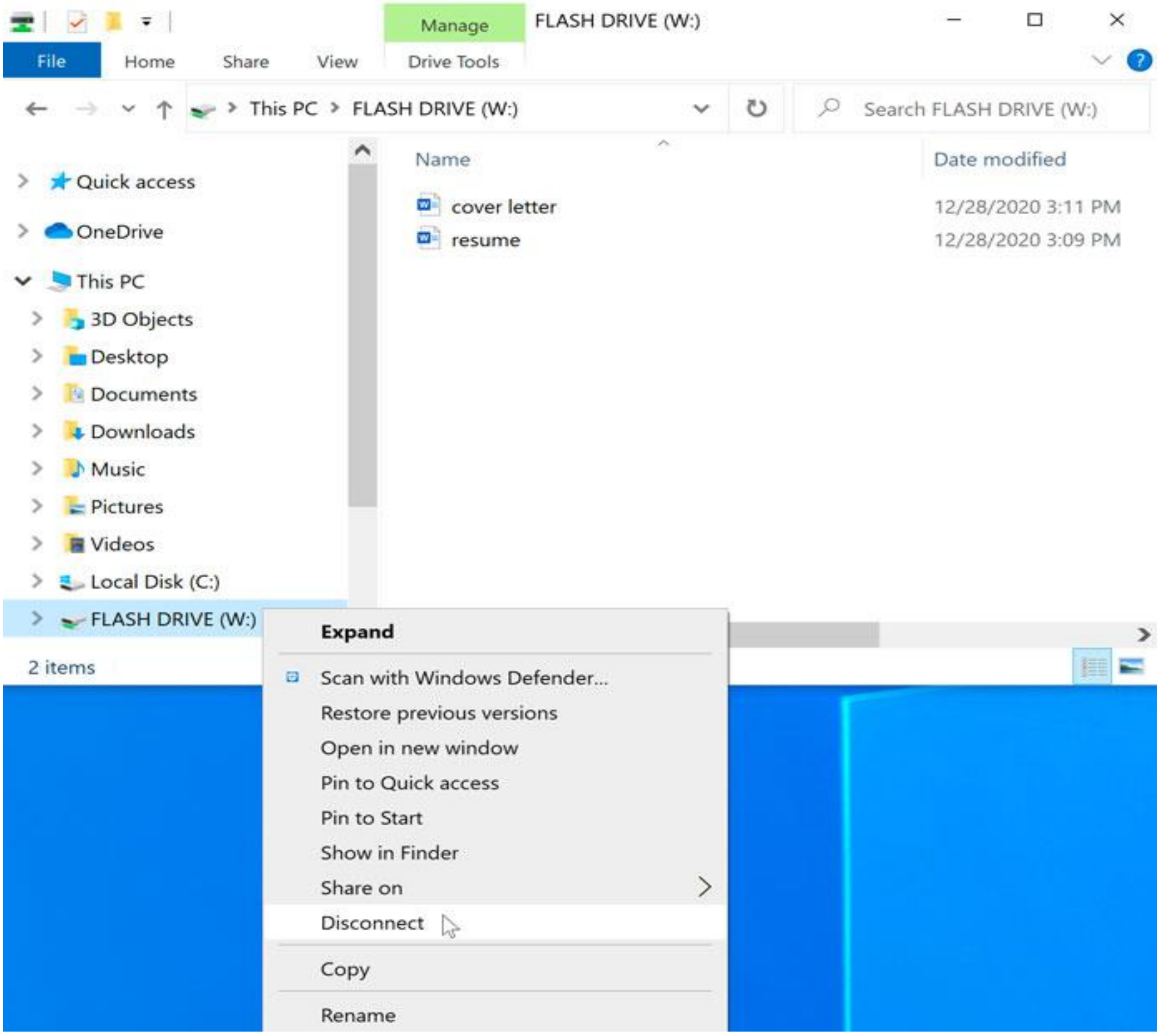



If a dialog box does not appear, you may need to **empty the Trash can** to permanently delete the file.

To safely remove a flash drive:

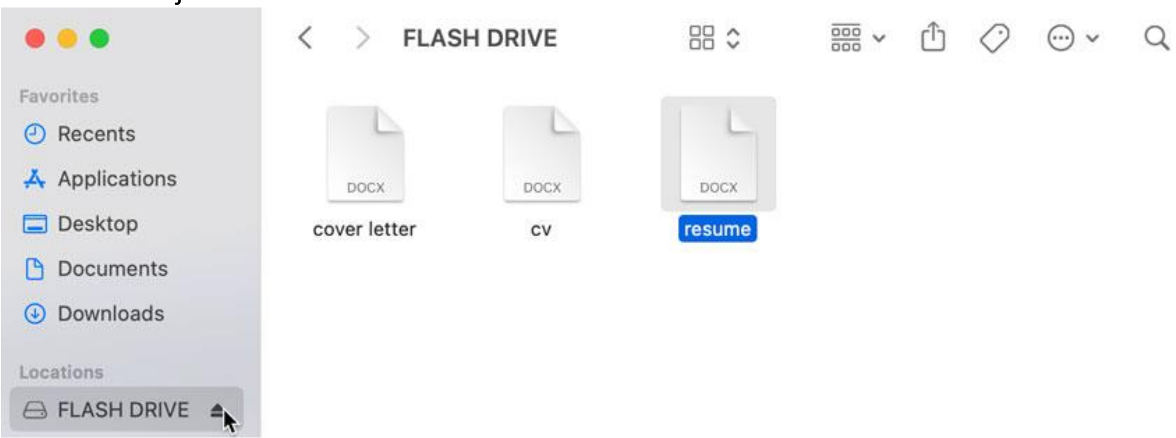
When you're done using a flash drive, don't remove it from the USB port just yet. You'll need to make sure to disconnect it properly to avoid damaging files on the drive.

1. Right-click the flash drive and select **Disconnect** (or **Eject**).




2. You can now safely remove the flash drive from the USB port.

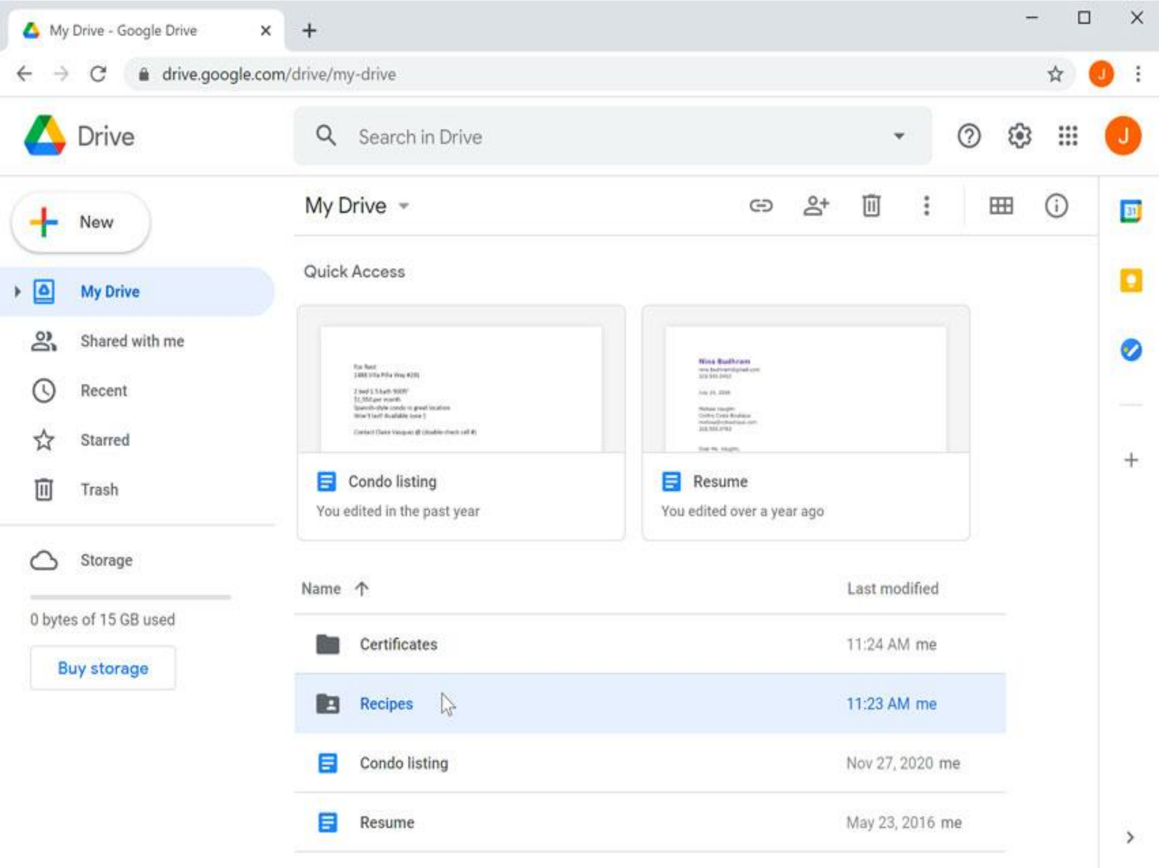
If you're using a **Mac**, you can also click the **Eject** button next to the flash drive in **Finder** to eject it.




Saving files to the cloud

There are many services that allow you to create **a free account** and save documents, images, and other files **to the cloud**. Some of the most popular are **Google Drive**, **OneDrive**, and **Dropbox**. The **free storage space** that comes with these accounts (usually around **15GB**) should be plenty if you're using your account for regular personal, work, or school purposes. If you own a business and want to keep all of your documents in the cloud, you may want to pay your cloud service for more storage.

Unlike **physical media**, the cloud can't break or get lost, so you don't necessarily need to back up the files you keep on it. Files in the cloud are also easier to **share** so you can **collaborate** with friends and coworkers. However, when you save something online, there's always a risk that **unauthorized** users will try to gain access to your **personal information**. To protect your files, create a **strong password** and pay attention to the **privacy settings and policies** of the cloud service you're using.




## 11.6 Using Accessibility Features

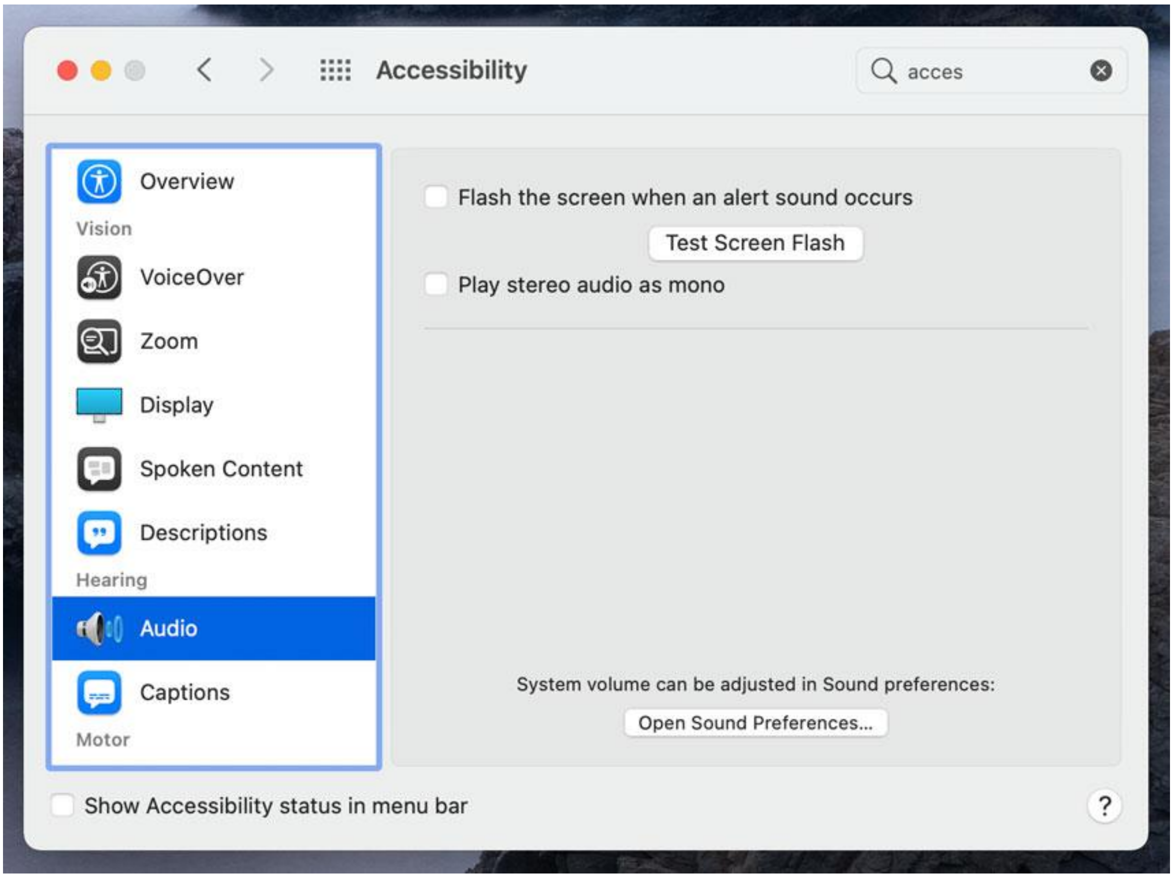
**Accessibility features** are designed to help people with disabilities use technology more easily. For example, a **text-to-speech** feature may read text out loud for people with limited vision, while a **speech-recognition** feature allows users with limited mobility to control the computer with their voice. In this lesson, we'll introduce you to some **common accessibility features**. We'll also discuss **assistive technology** that you can attach to your computer for greater accessibility.

### Common accessibility features

Although some accessibility features require special software **downloads**, many are built into the operating system of your computer or mobile device. Here are just a few types of accessibility features you may already have on your device.

- **Features for blind or low-vision computer users**: Features such as **text-to-speech** allow users to hear what's on the screen instead of reading it. Other features, like **high-contrast themes** and **enlarged cursors**, make it easier for users with limited vision to see the screen.

- **Features for deaf or low-hearing computer users**: **Closed-captioning** helps to convey audio information to deaf users in visual form. **Mono audio** systems transmit right and left audio signals through both earbuds and headphones so users with limited hearing in one ear will not miss part of what they are listening to.
- **Features for limited-mobility computer users**: **Keyboard shortcuts** are convenient for many people, but they are especially helpful to those with difficulty physically manipulating a mouse. For users who have difficulty pressing several keys at once, **sticky keys** allows them to press keys one at a time to activate a shortcut.



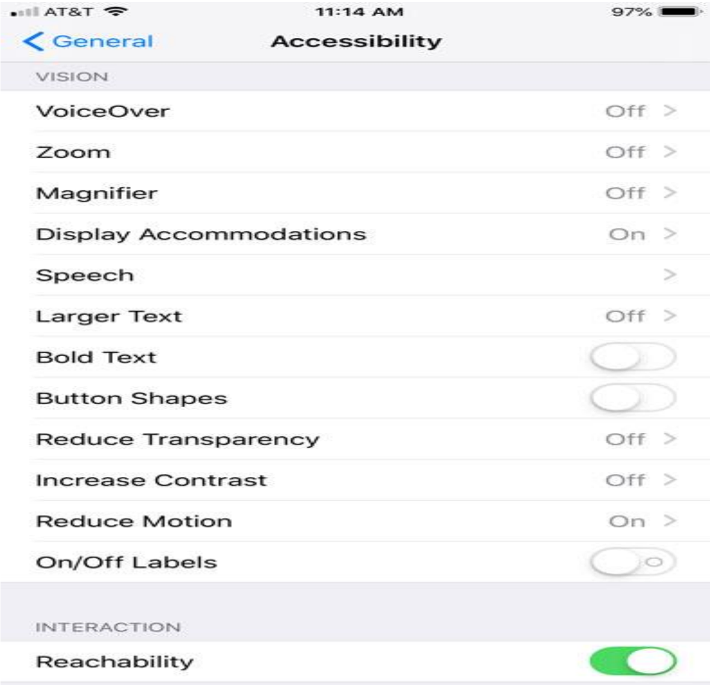

Using accessibility features

Most computers and mobile devices come with built-in accessibility features, although they'll usually need to be turned on before you can use them. Let's take a look at how to locate these features for your device.

- In **Windows**, open the **Settings** app (or **Control Panel** in Windows 8 and earlier), then click **Ease of Access**.

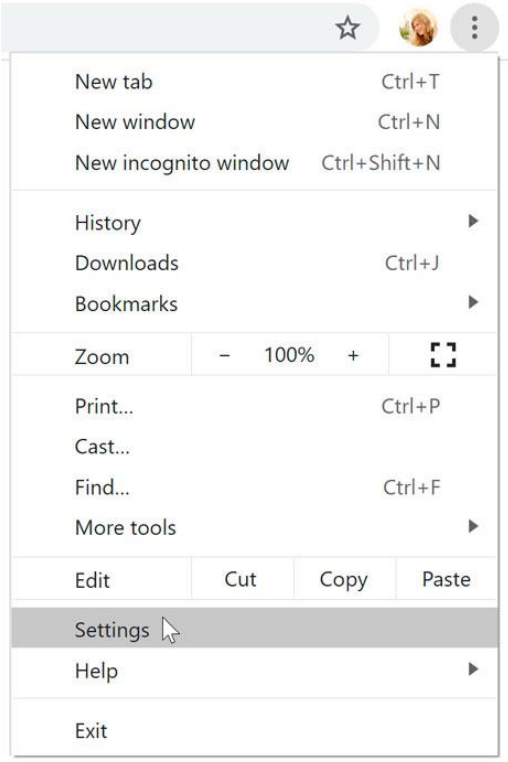

- In **macOS**, open **System Preferences**, then click **Accessibility** (or **Universal Access** in older versions).


- On mobile devices that use **Android** or **iOS**, open the **Settings app**, then locate the **Accessibility** section. On iOS devices, you'll find it within the **General** settings category.




## Web accessibility

Most web browsers also offer their own built-in accessibility features. You'll usually find these options in your browser's settings.




Before you adjust these settings, you may want to try **zooming** instead. Zooming is an easy way to make webpages easier to read, and it works the same way in most browsers. If you're using a browser in **Windows**, you can **zoom in or out** by pressing **Ctrl+** or **Ctrl-** (hold down the **Ctrl** key and press the **+** or **-** key). If you're using a Mac, you'll press **Command+** or **Command-**.

To return to the default zoom level, press **Ctrl+0** (hold down the **Ctrl** key and press the **zero** key). If you're using a Mac, press **Command+0**.

### Accessibility features in specific software

There are many more accessibility features you can use, depending on the type of computer you have and the software you use. The resources below will direct you to accessibility features for some of the most commonly used applications.

- **Microsoft Accessibility**: Here, you'll find news on Microsoft's accessibility projects, as well as help pages on accessibility features in the Windows operating system and in the Microsoft Office suite.
- **Apple Accessibility**: This is Apple's overview site for accessibility features on Macs, iPods, iPhones, and iPads. From here, you can navigate to help documents for specific features.
- **Google Accessibility**: This is Google's help site for accessibility features on Android phones and tablets and in Chrome.
- **Accessibility Features in Firefox**: This is Mozilla's official help site for Firefox's accessibility features.
- **Apples**: This community-based website offers tips, tutorials, and product reviews for blind and low-vision users of Apple products.

### Assistive technology devices

As you've already seen, **software** can do a lot to make computers more accessible for disabled users. However, some accessibility features require extra **hardware**, or **assistive technology**. Most assistive-technology devices are similar to keyboards and speakers—they are **peripherals** that can be plugged into the main computer. Here are some common types of assistive technology you may encounter.

- **Screen magnifiers**: Screen magnifiers can be placed over your computer's monitor to ensure the content on the screen always appears magnified. Today, most people use the magnifier or zoom features on their operating systems to view content, but external magnifiers are still available as well.
- **Alternative keyboards**: For people who have difficulty using standard keyboards, there are a range of **alternative options**. For example, users can purchase keyboards with **larger keys** that are easier to see or press. They can also buy keyboards with **alternative key arrangements**, including arrangements for people who can only type with one hand or with a limited number of fingers.
- **Switch-adapted peripherals**: **Switch devices** allow people with limited mobility to control technology with very **small motions**, such as a puff of breath or a head movement. **Switch-adapted mice and keyboards** make it possible for disabled users to interact with computers even if they are unable to operate peripherals with their hands.

# MODULE 2: MICROSOFT WORD (BASIC TO ADVANCE)

**Introduction**

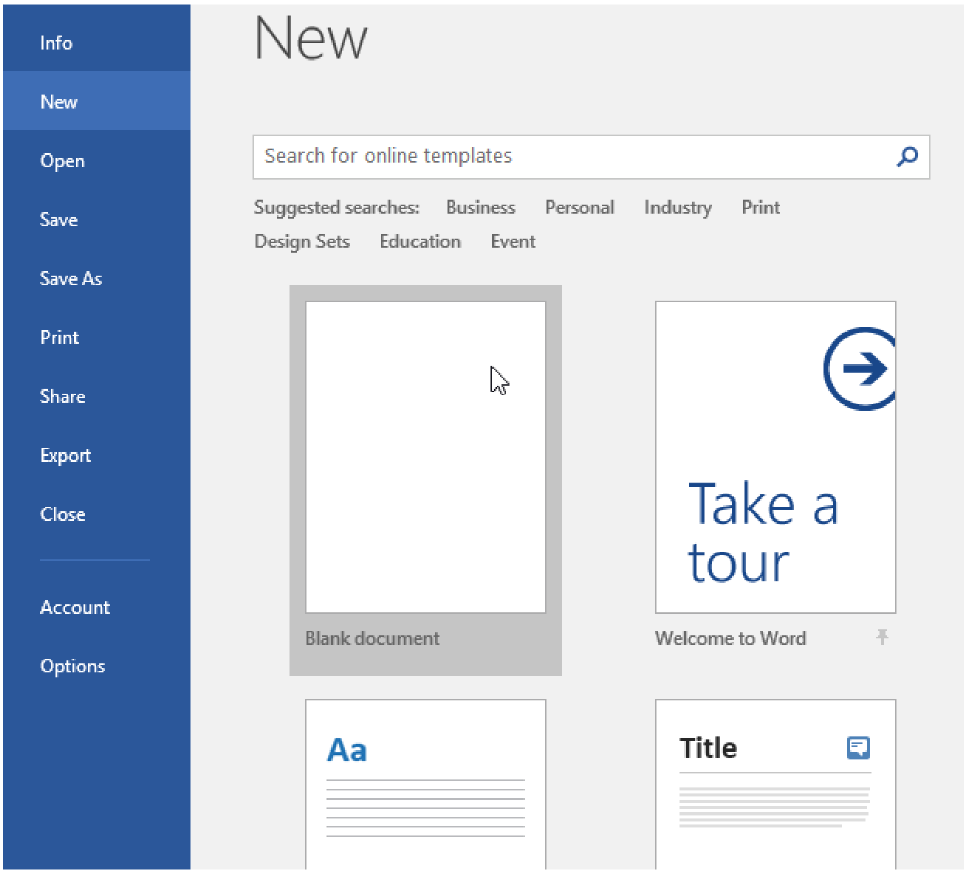
Microsoft Word 2016 is a **word processing** application that allows you to create a variety of **documents**, including letters, resumes, and more. In this lesson, you'll learn how to navigate the Word interface and become familiar with some of its most important features, such as the **Ribbon**, **Quick Access Toolbar**, and **Backstage view**.

## Lesson 1: Getting to know Word 2016

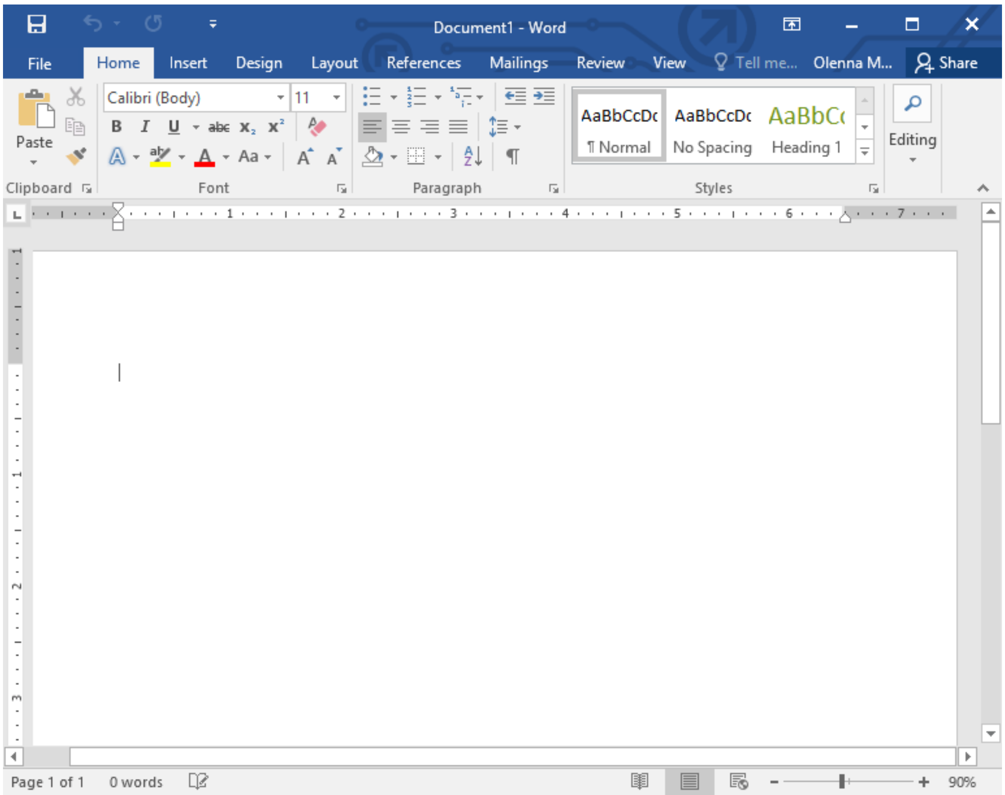
**Word 2016** is similar to Word 2013 and Word 2010. If you've previously used either version, then Word 2016 should feel familiar. But if you are new to Word or have more experience with older versions, you should first take some time to become familiar with the **Word 2016 interface**.

The Word interface

When you open Word for the first time, the **Start Screen** will appear. From here, you'll be able to create a **new document**, choose a **template**, and access your **recently edited documents**. From the **Start Screen**, locate and select **Blank document** to access the Word interface.




Click the buttons in the interactive below to learn more about the Word interface:



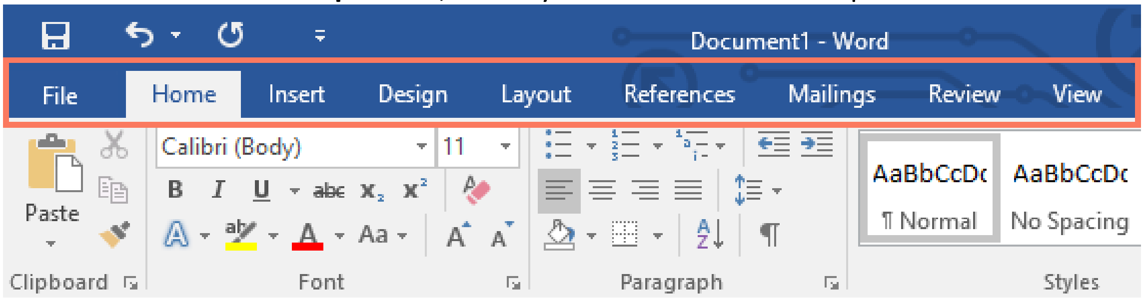

Working with the Word environment

Like other recent versions, Word 2016 continues to use features like the **Ribbon** and the **Quick Access Toolbar**—where you will find commands to perform common tasks in Word—as well as **Backstage view**.

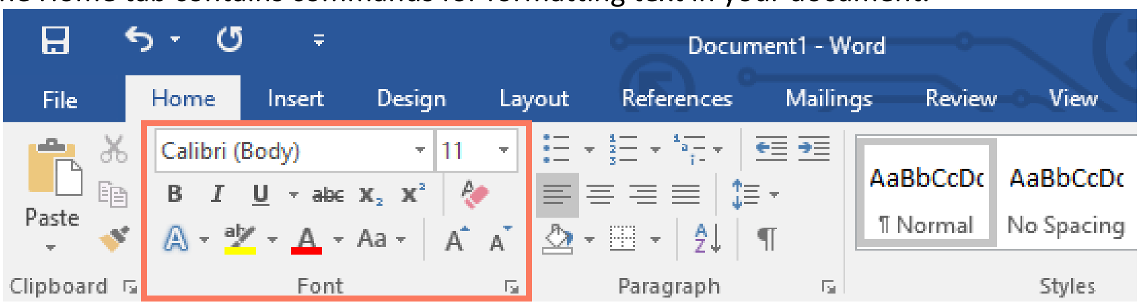
The Ribbon

Word uses a **tabbed Ribbon system** instead of traditional menus.

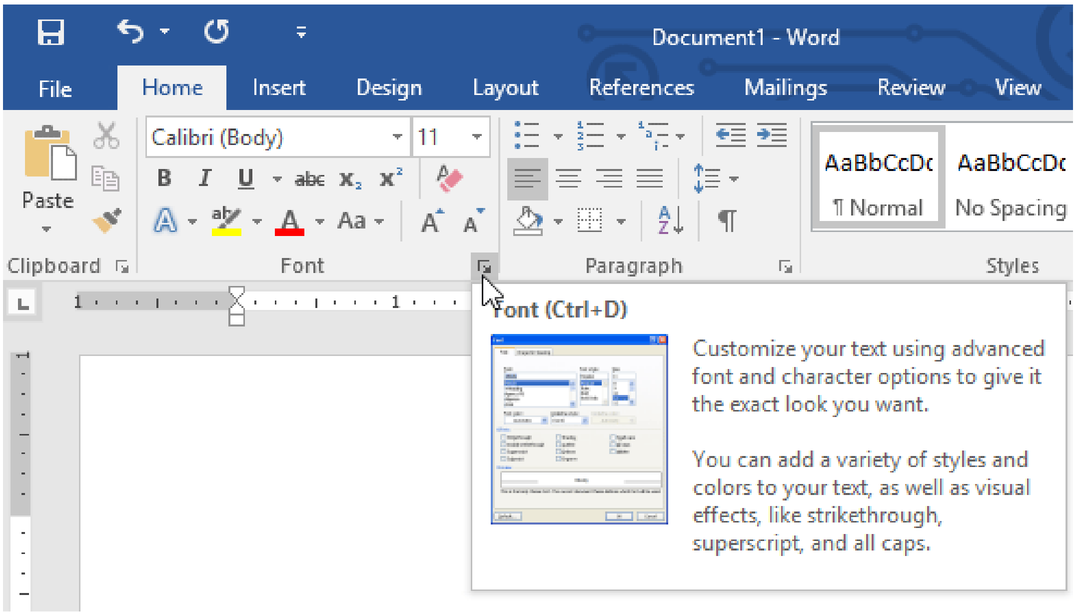
The **Ribbon** contains **multiple tabs**, which you can find near the top of the Word window.




Each tab contains several **groups of related commands**. For example, the Font group on the Home tab contains commands for formatting text in your document.

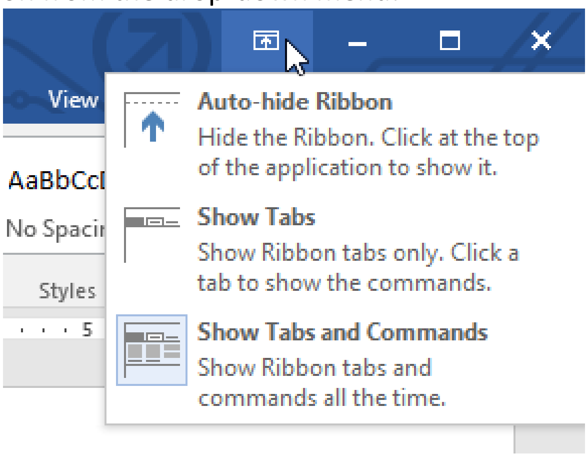



Some groups also have a **small arrow** in the bottom-right corner that you can click for even more options.




Showing and hiding the Ribbon

If you find that the Ribbon takes up too much screen space, you can hide it. To do this, click the **Ribbon Display Options** arrow in the upper-right corner of the Ribbon, then select the desired option from the drop-down menu:

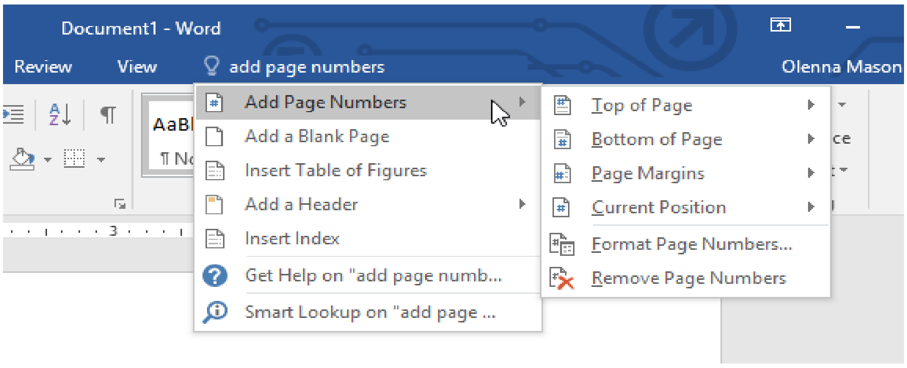



- **Auto-hide Ribbon**: Auto-hide displays your document in full-screen mode and completely hides the Ribbon from view. To show the Ribbon, click the **Expand Ribbon** command at the top of screen.
- **Show Tabs**: This option hides all command groups when they're not in use, but tabs will remain visible. To show the Ribbon, simply click a tab.
- **Show Tabs and Commands:** This option maximizes the Ribbon. All of the tabs and commands will be visible. This option is selected by default when you open Word for the first time.

To learn how to add **custom tabs** and **commands** to the Ribbon, review our Extra on Customizing the Ribbon.

Using the Tell me feature

If you're having trouble finding command you want, the **Tell Me** feature can help. It works just like a regular search bar: Type what you're looking for, and a list of options will appear. You can then use the command directly from the menu without having to find it on the Ribbon.

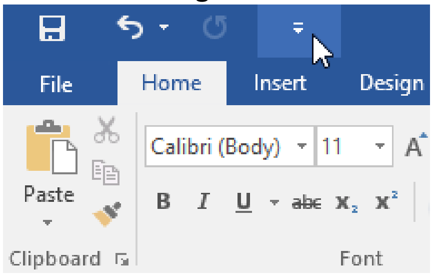



The Quick Access Toolbar

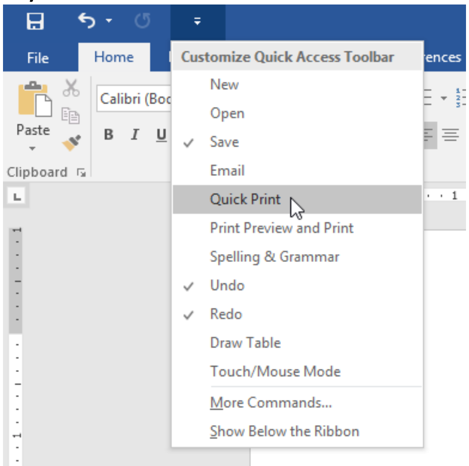
Located just above the Ribbon, the **Quick Access Toolbar** lets you access common commands no matter which tab is selected. By default, it shows the **Save**, **Undo**, and **Redo** commands, but you can add other commands depending on your needs.

To add commands to the Quick Access Toolbar:

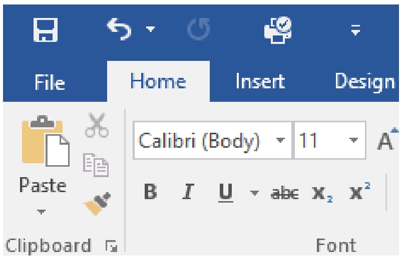
1. Click the **drop-down arrow** to the right of the **Quick Access Toolbar**.




2. Select the **command** you want to add from the menu.




3. The command will be **added** to the Quick Access Toolbar.

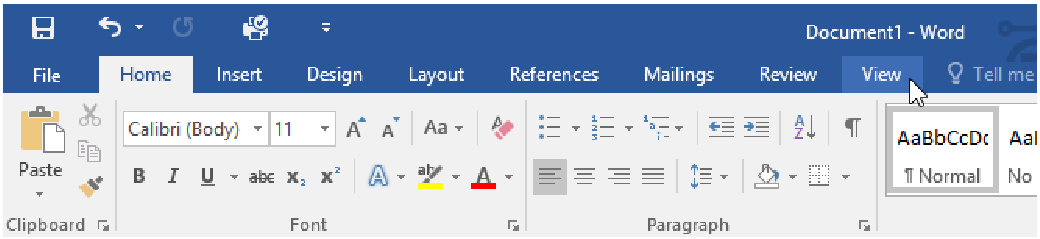



The Ruler

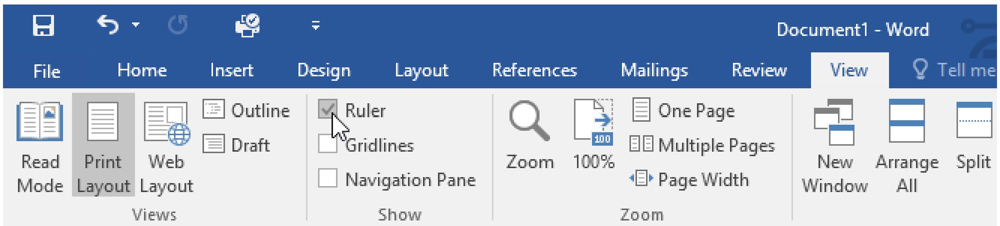
The **Ruler** is located at the top and to the left of your document. It makes it easier to **adjust** your document with precision. If you want, you can hide the Ruler to create more screen space.

**To show or hide the Ruler:**

1. Click the **View** tab.

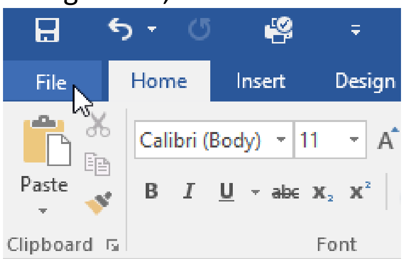



2. Click the checkbox next to **Ruler** to **show** or **hide** the Ruler.

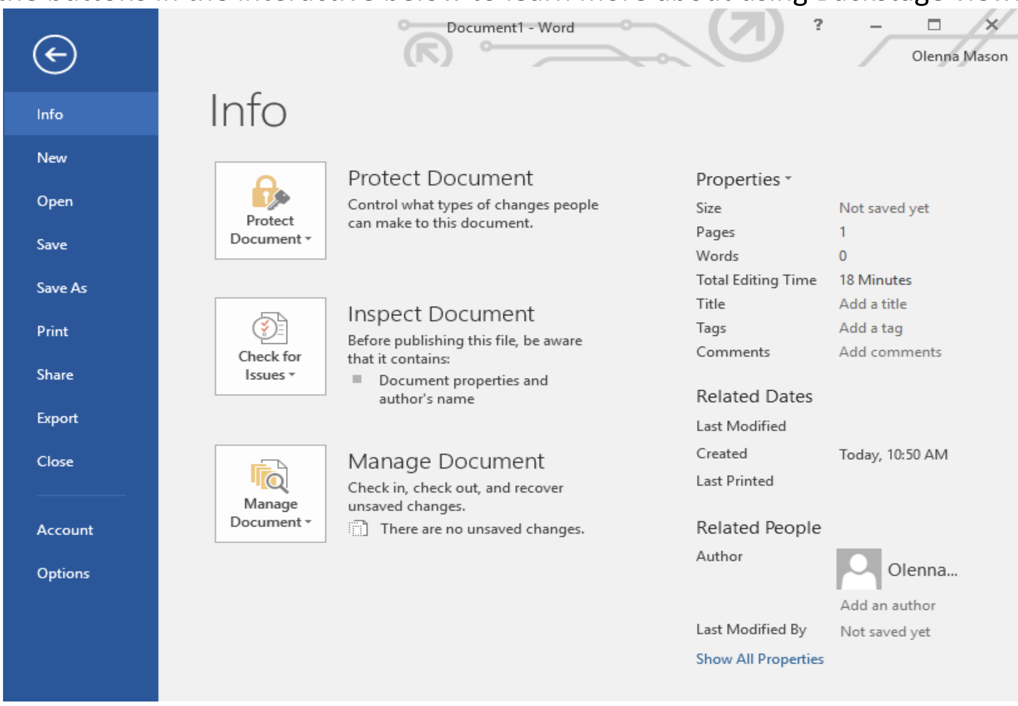



Backstage view

**Backstage view** gives you various options for saving, opening a file, printing, and sharing your document. To access Backstage view, click the **File** tab on the **Ribbon**.




Click the buttons in the interactive below to learn more about using Backstage view.



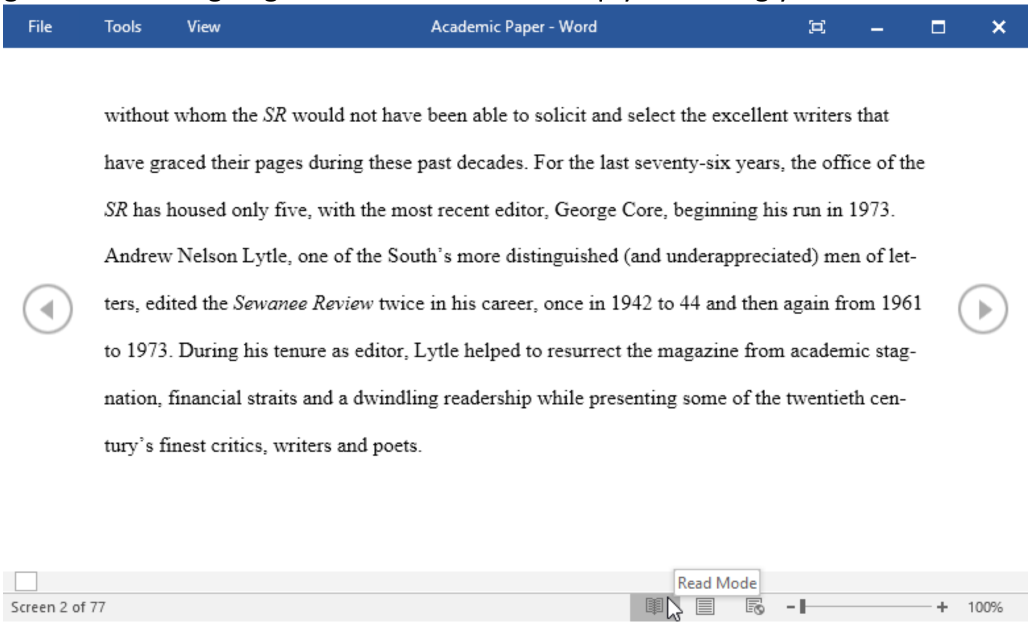

Document views and zooming

Word has a variety of viewing options that change how your document is displayed. You can choose to view your document in **Read Mode**, **Print Layout**, or **Web Layout**. These views can be useful for various tasks, especially if you're planning to **print** the document. You can also **zoom in and out** to make your document easier to read.

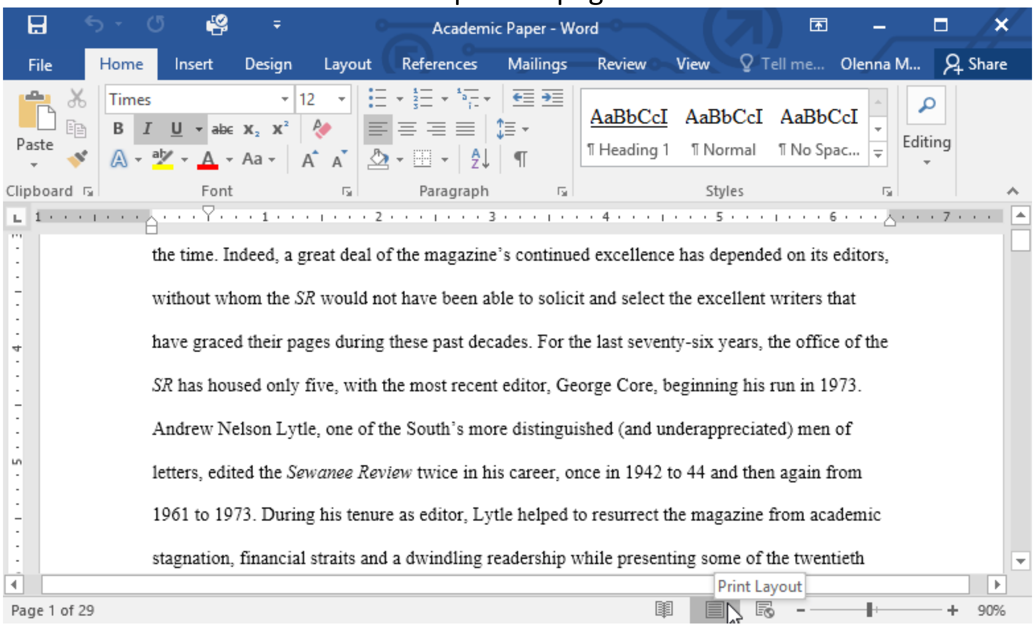
Switching document views

Switching between different document views is easy. Just locate and select the desired **document view command** in the bottom-right corner of the Word window.

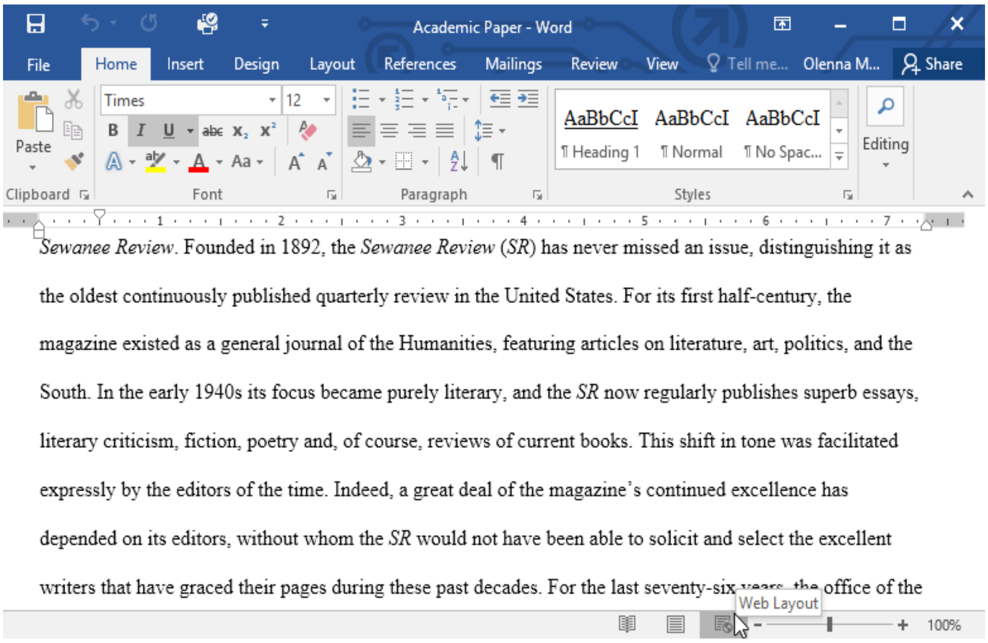
- **Read Mode**: This view opens the document to a full screen. This view is great for reading large amounts of text or simply reviewing your work.




- **Print Layout**: This is the default document view in Word. It shows what the document will look like on the printed page.

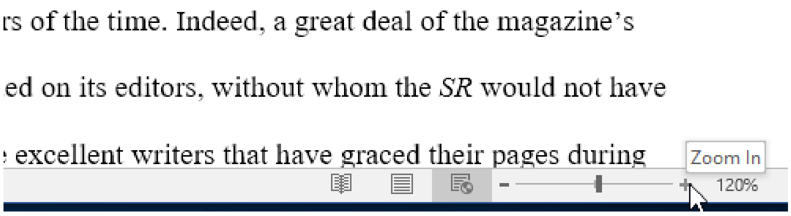



- **Web Layout**: This view displays the document as a webpage, which can be helpful if you're using Word to publish content online.




Zooming in and out

To zoom in or out, click and drag the **zoom control slider** in the bottom-right corner of the Word window. You can also select the **+** or **- commands** to zoom in or out by smaller increments. The number next to the slider displays the current **zoom percentage**, also called the **zoom level**.




## Lesson 2: Creating and Opening Documents

Introduction

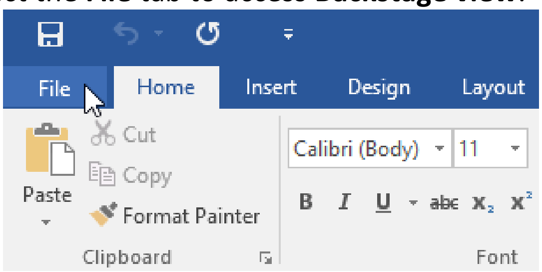
Word files are called **documents**. Whenever you start a new project in Word, you'll need to **create a new document**, which can either be blank or from a template. You'll also need to know how to **open an existing document**.

Watch the video below to learn more about creating and opening documents in Word.

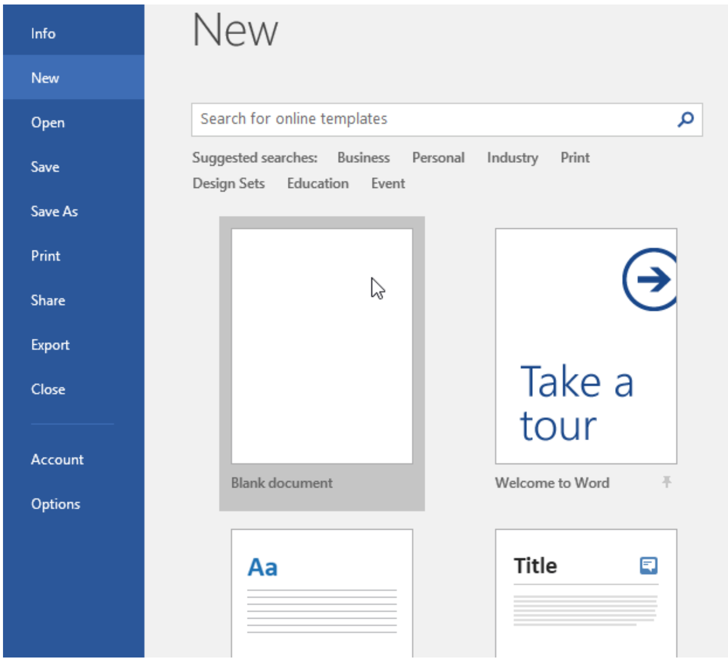
To create a new blank document:

When beginning a new project in Word, you'll often want to start with a new blank document.

1. Select the **File** tab to access **Backstage view**.




2. Select **New**, then click **Blank document**.

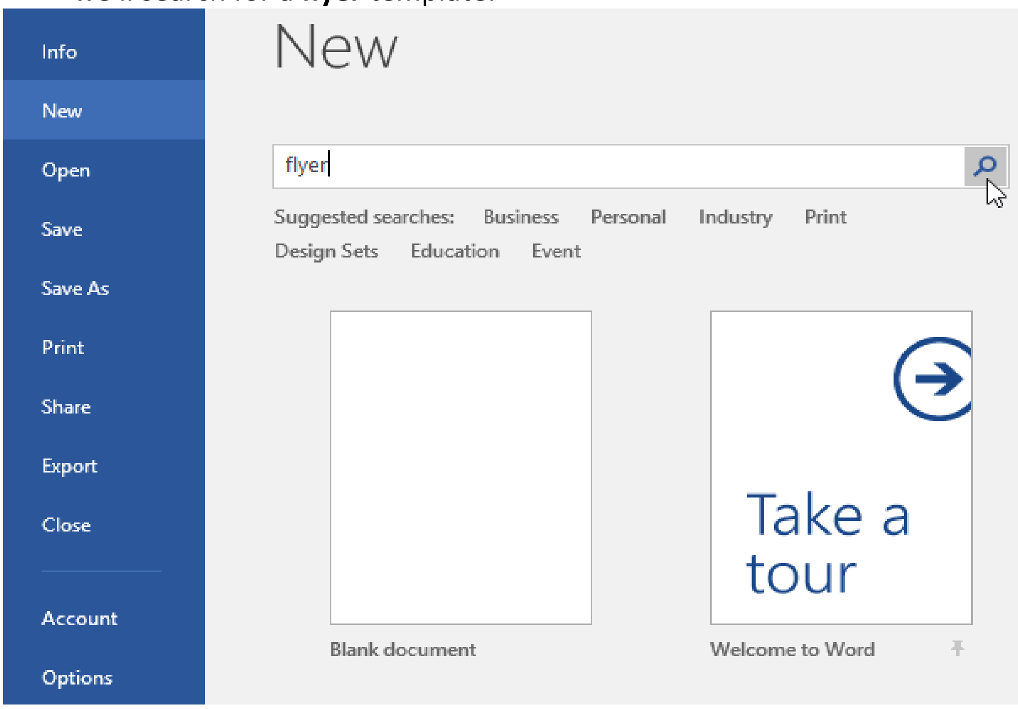



3. A new blank document will appear.

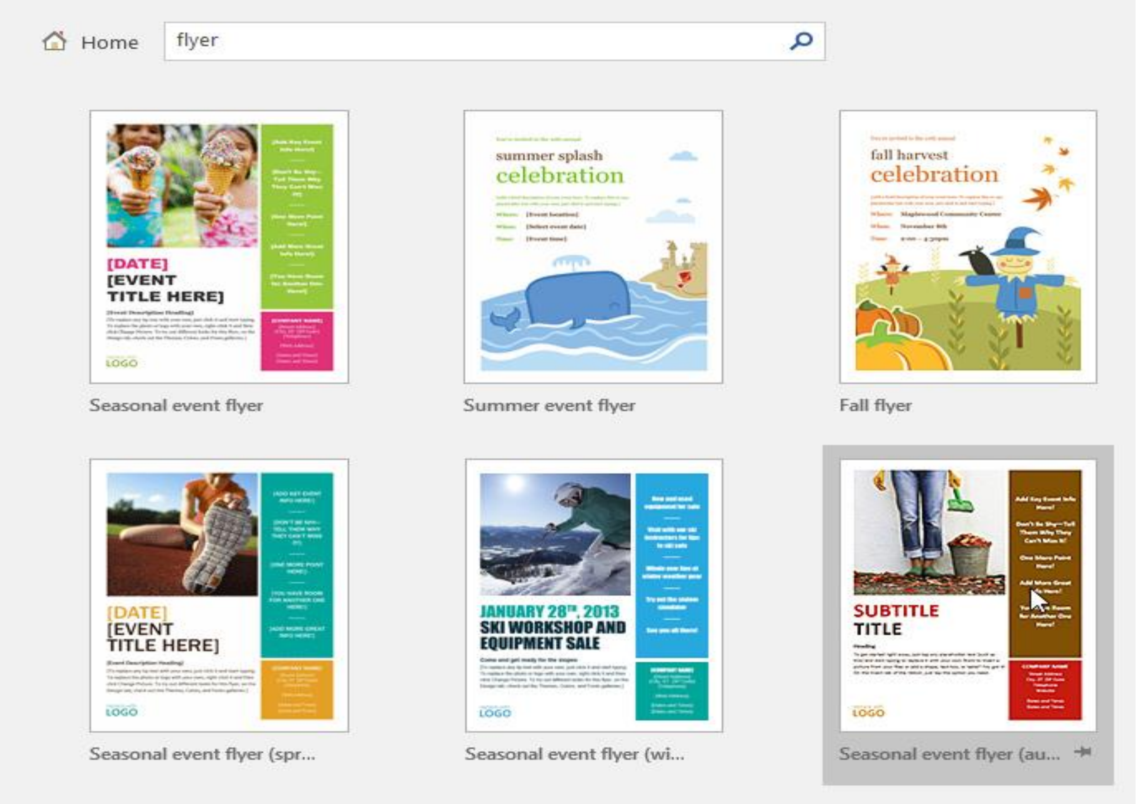
To create a new document from a template:

A **template** is a **predesigned document** you can use to create a new document quickly. Templates often include **custom formatting** and **designs**, so they can save you a lot of time and effort when starting a new project.

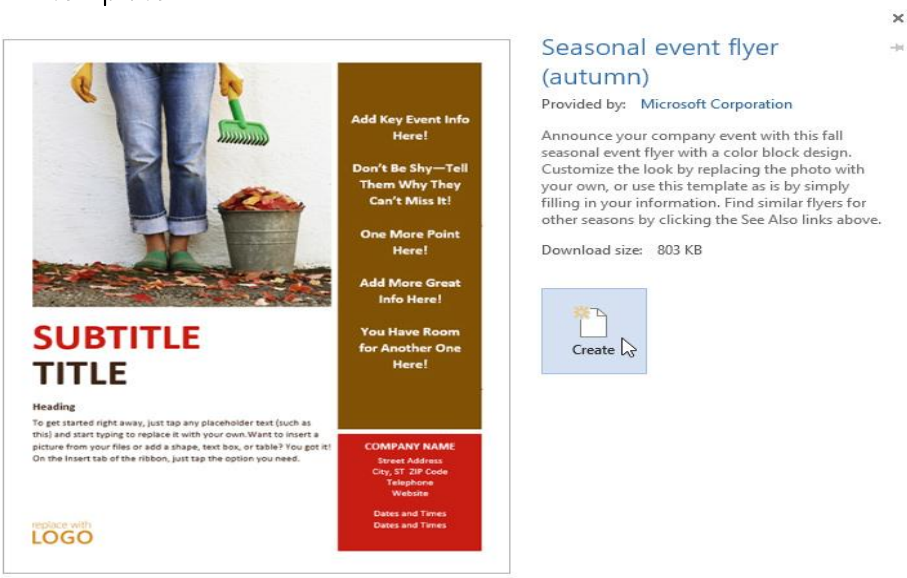
1. Click the **File** tab to access **Backstage view**, then select **New**.
2. Several templates will appear below the **Blank document** option. You can also use the search bar to find something more specific. In our example, we'll search for a **flyer** template.




3. When you find something you like, select a template to preview it.

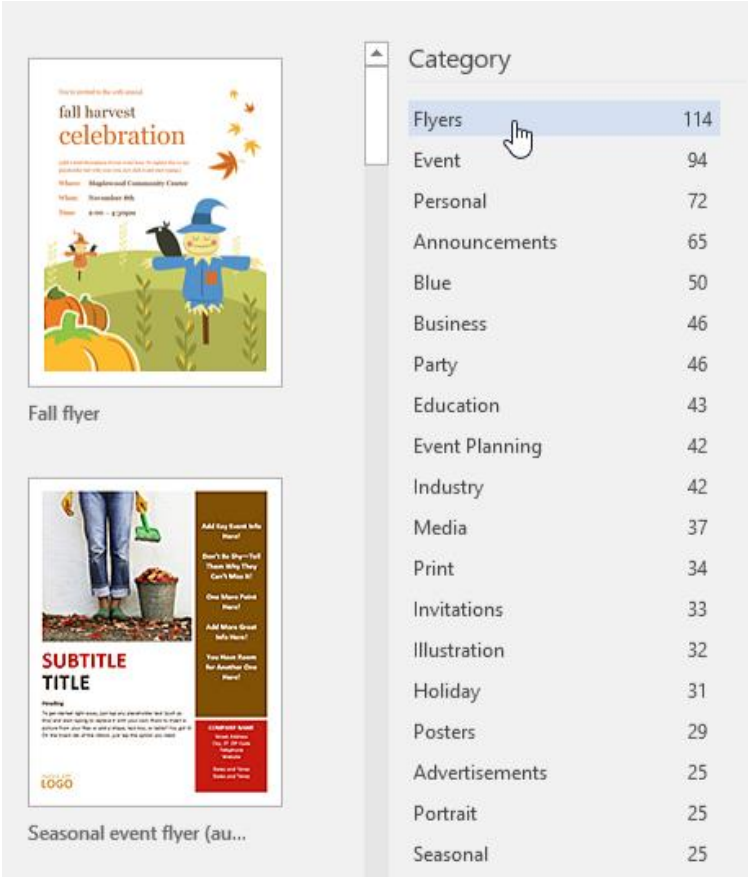



4. A **preview** of the template will appear. Click **Create** to use the selected template.




5. A new document will appear with the **selected template**.

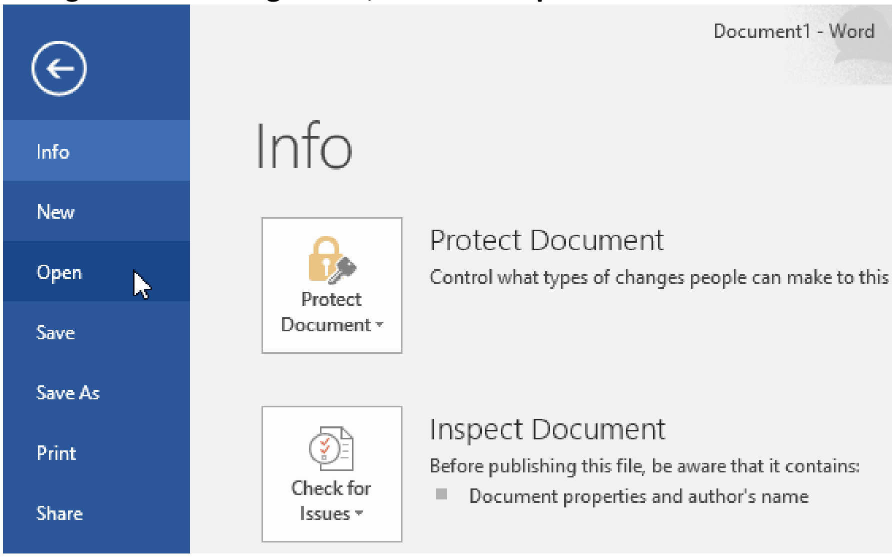
You can also browse templates by category after performing a search.



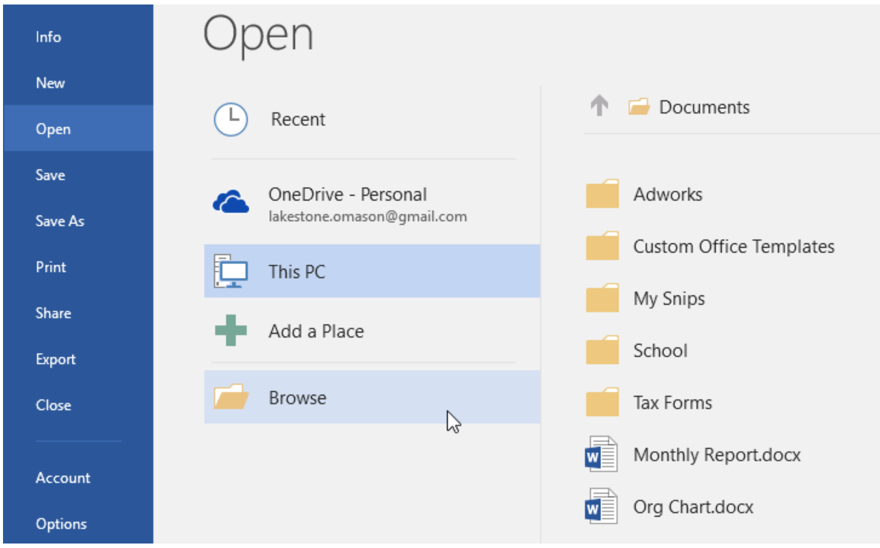

To open an existing document:

In addition to creating new documents, you'll often need to open a document that was previously saved.

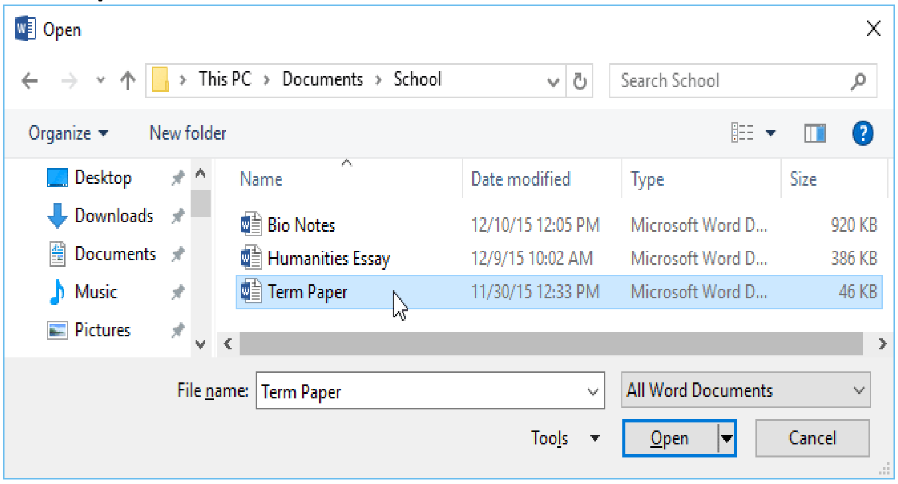
1. Navigate to **Backstage view**, then click **Open**.




2. Select **This PC**, then click **Browse**. Alternatively, you can choose **OneDrive** to open files stored on your OneDrive.




3. The **Open** dialog box will appear. Locate and select your **document**, then click **Open**.



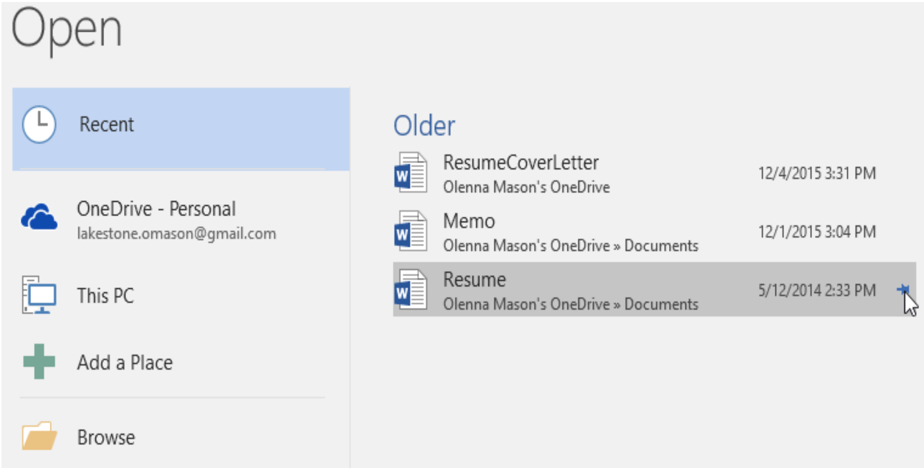

4. The selected document will appear.

Most features in Microsoft Office, including Word, are geared toward saving and sharing documents **online**. This is done with **OneDrive**, which is an online storage space for your documents and files. If you want to use OneDrive, make sure you’re signed in to Word with your Microsoft account. Review our lesson on Understanding OneDrive to learn more.

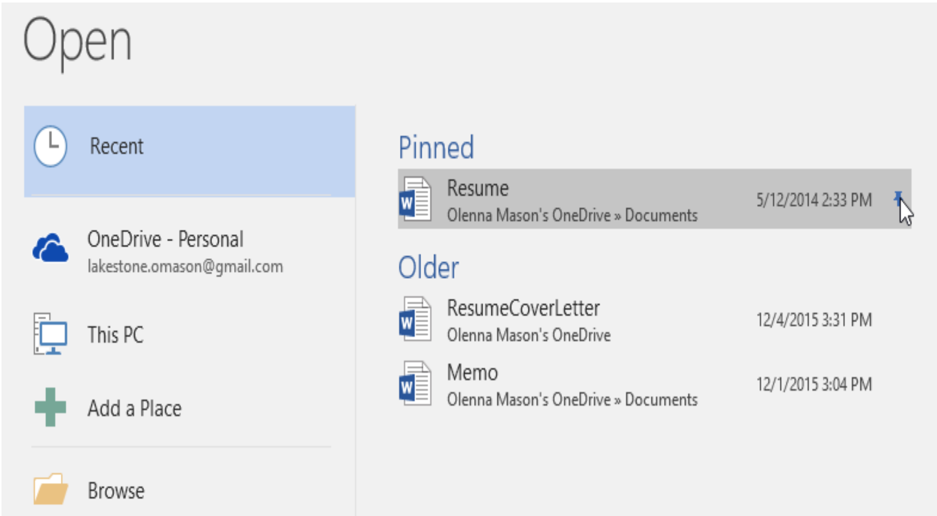
To pin a document:

If you frequently work with the **same document**, you can **pin it** to Backstage view for quick access.

1. Navigate to **Backstage view**, click **Open**, then select **Recent**.
2. A list of recently edited documents will appear. Hover the mouse over the **document** you want to pin, then click the **pushpin icon.**




3. The document will stay in Recent documents list until it is unpinned. To **unpin** a document, click the pushpin icon again.

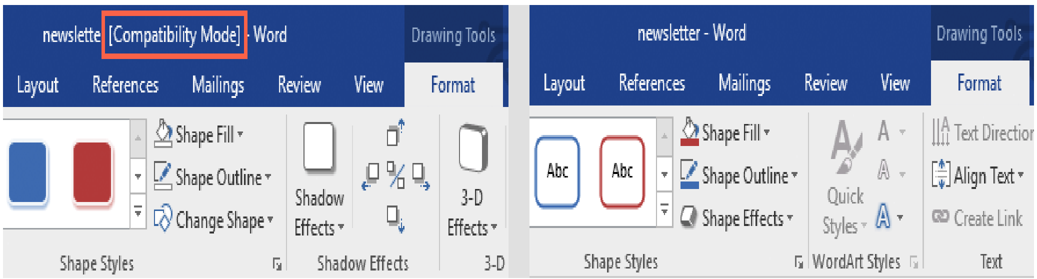



Compatibility Mode

Sometimes you may need to work with documents that were created in earlier versions of Microsoft Word, such as Word 2010 or Word 2007. When you open these types of documents, they will appear in **Compatibility Mode**.

Compatibility Mode **disables** certain features, so you'll only be able to access commands found in the program that was used to create the document. For example, if you open a document created in Word 2007 you can only use tabs and commands found in Word 2007.

In the image below, you can see how Compatibility Mode can affect which commands are available. Because the document on the left is in Compatibility Mode, it only shows commands that were available in Word 2007.



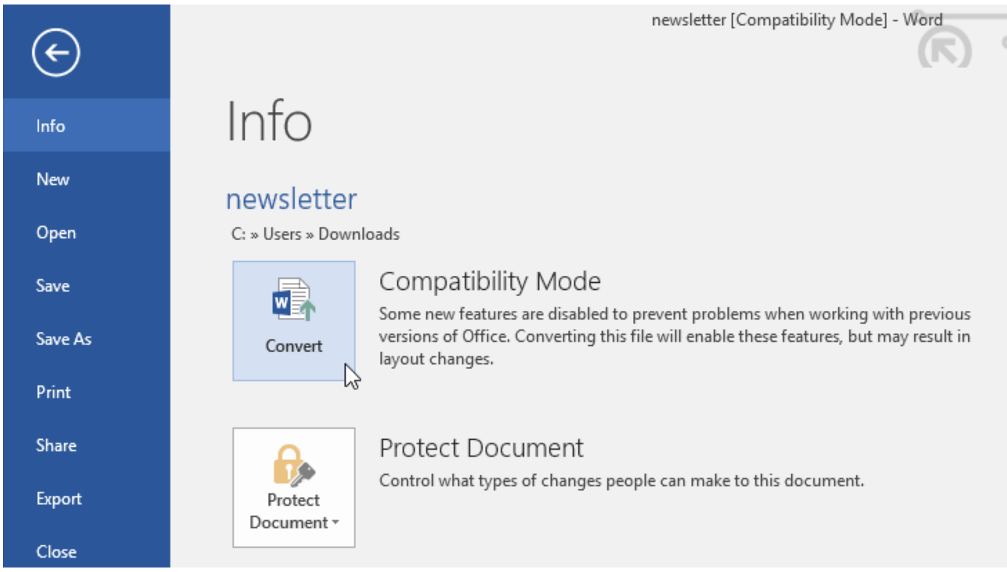
To exit Compatibility Mode, you'll need to **convert** the document to the current version type. However, if you're collaborating with others who only have access to an earlier version of Word, it's best to leave the document in Compatibility Mode so the format will not change.

You can review this support page from Microsoft to learn more about which features are disabled in Compatibility Mode.

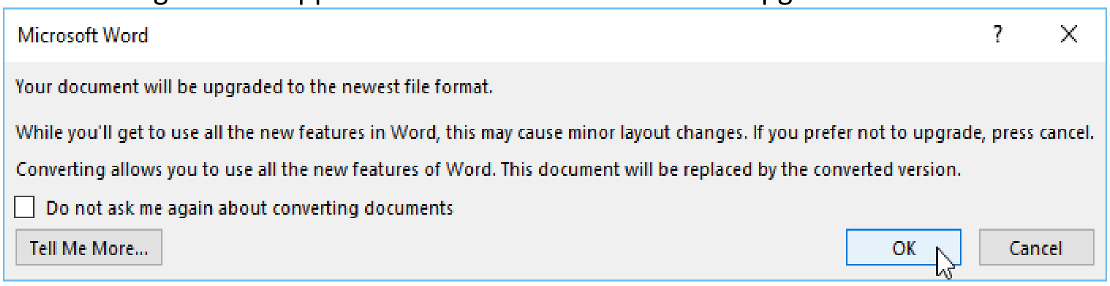
To convert a document:

If you want access to all Word 2016 features, you can **convert** the document to the 2016 file format.

1. Click the **File** tab to access backstage view, then locate and select the **Convert** command.




2. A dialog box will appear. Click **OK** to confirm the file upgrade.




3. The document will be converted to the newest file type.

Converting a file may cause some changes to the **original layout** of the document.

## Lesson 3: Saving and Sharing Documents

Introduction

When you create a new document in Word, you'll need to know how to save it so you can access and edit it later. As with previous versions of Word, you can save files to your computer. If you prefer, you can also save files to the cloud using OneDrive. You can even export and share documents directly from Word.

Save and Save As

Word offers two ways to save a file: Save and Save As. These options work in similar ways, with a few important differences.

Save: When you create or edit a document, you'll use the Save command to save your changes. You'll use this command most of the time. When you save a file, you'll only need to choose a file name and location the first time. After that, you can click the Save command to save it with the same name and location.
Save As: You'll use this command to create a copy of a document while keeping the original. When you use Save As, you'll need to choose a different name and/or location for the copied version.

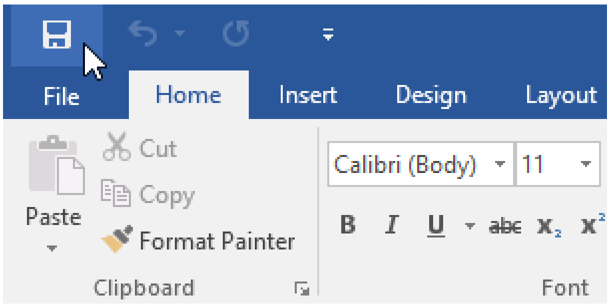
About OneDrive

Most features in Microsoft Office, including Word, are geared toward saving and sharing documents online. This is done with OneDrive, which is an online storage space for your documents and files. If you want to use OneDrive, make sure you're signed in to Word with your Microsoft account. Review our lesson on Understanding OneDrive to learn more.

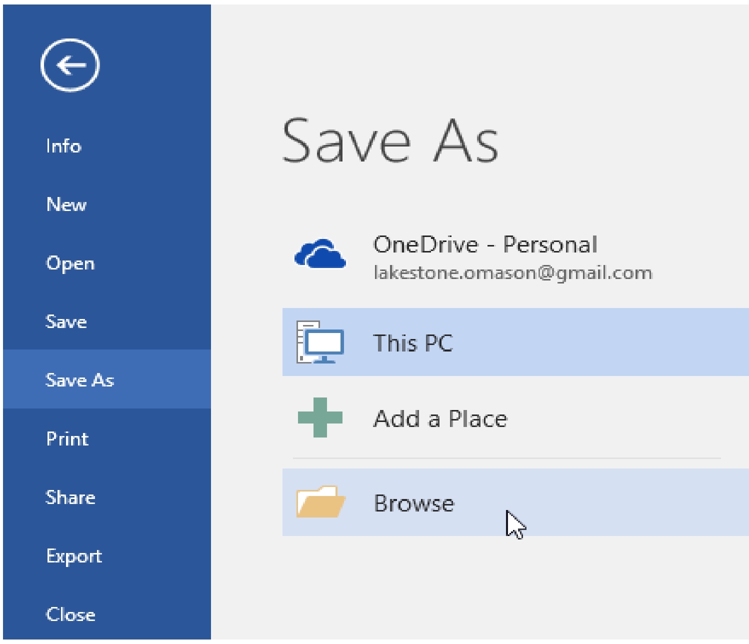
To save a document:

It's important to save your document whenever you start a new project or make changes to an existing one. Saving early and often can prevent your work from being lost. You'll also need to pay close attention to where you save the document so it will be easy to find later.

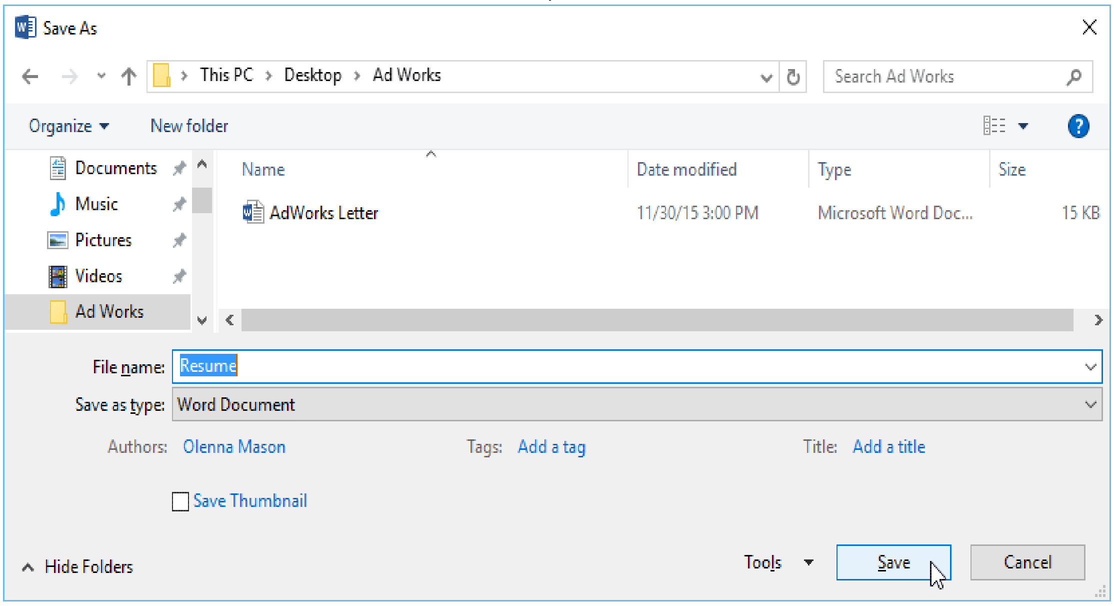
1. Locate and select the **Save** command on the **Quick Access Toolbar**.




2. If you're saving the file for the first time, the **Save As** pane will appear in **backstage view**.
3. You'll then need to choose **where to save** the file and give it a **file name**. Click **Browse** to select a location on your computer. Alternatively, you can click **OneDrive** to save the file to your OneDrive.




4. The **Save As** dialog box will appear. Select the **location** where you want to save the document.
5. Enter a **file name** for the document, then click **Save**.



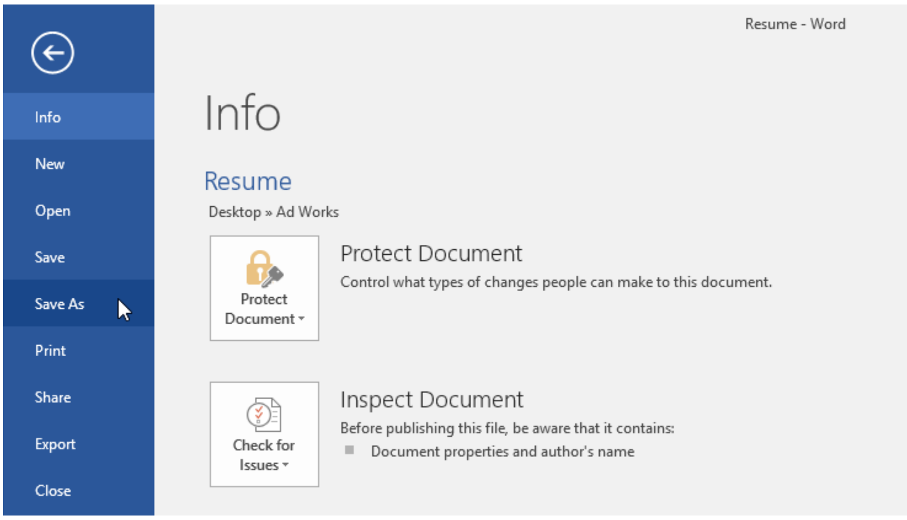

6. The document will be **saved**. You can click the **Save** command again to save your changes as you modify the document.

You can also access the **Save** command by pressing **Ctrl+S** on your keyboard.

Using Save As to make a copy

If you want to save a **different version** of a document while keeping the original, you can create a **copy**. For example, if you have a file named **Sales Report**, you could save it as **Sales Report 2** so you'll be able to edit the new file and still refer back to the original version.

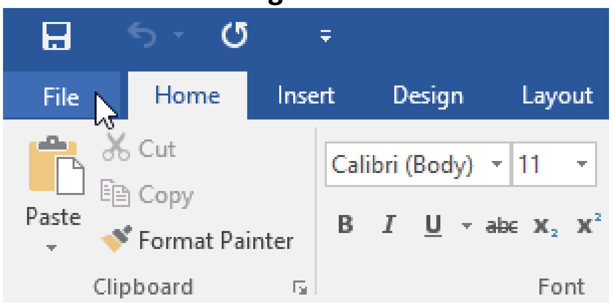
To do this, you'll click the **Save As** command in Backstage view. Just like when saving a file for the first time, you'll need to choose **where to save** the file and give it a new **file name**.



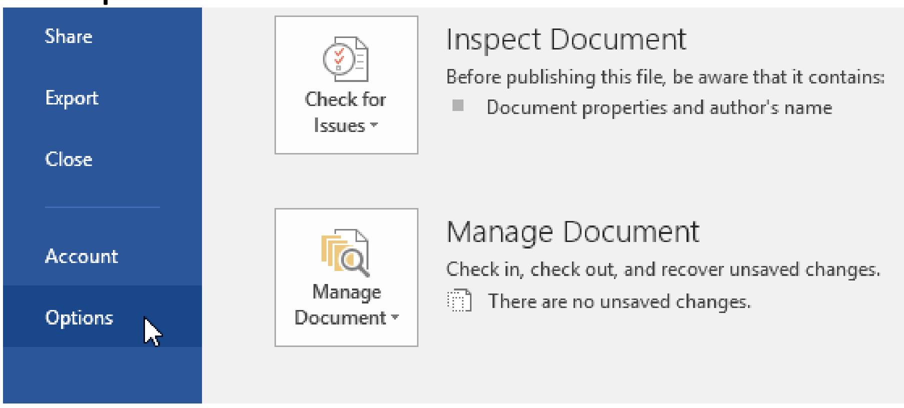

To change the default save location:

If you don't want to use **OneDrive**, you may be frustrated that OneDrive is selected as the default location when saving. If you find this inconvenient, you can change the **default save location** so **This PC** is selected by default.

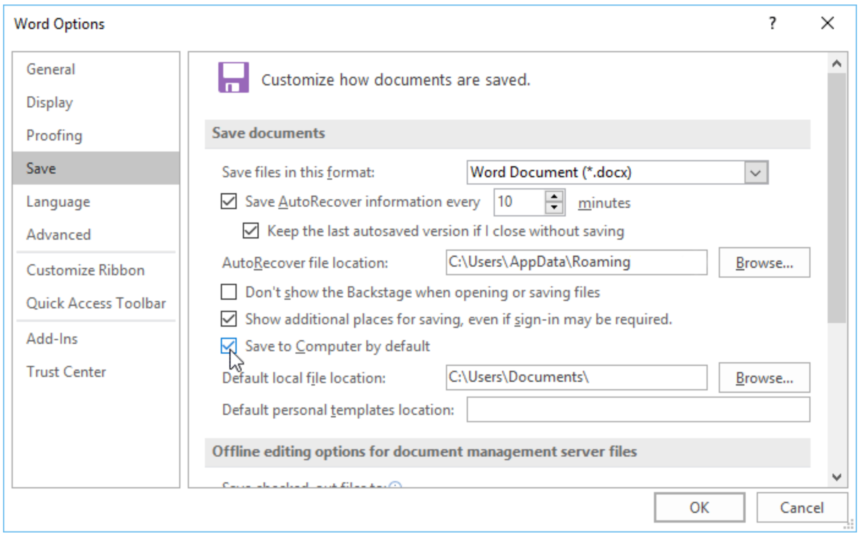
1. Click the **File** tab to access **backstage view**.




2. Click **Options**.




3. The **Word Options** dialog box will appear. Select **Save** on the left, **check the box** next to **Save to Computer by default**, then click **OK**. The default save location will be changed.

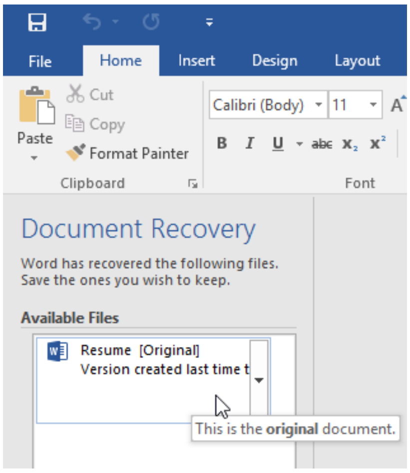



Auto Recover

Word automatically saves your documents to a temporary folder while you are working on them. If you forget to save your changes or if Word crashes, you can restore the file using **Auto Recover**.

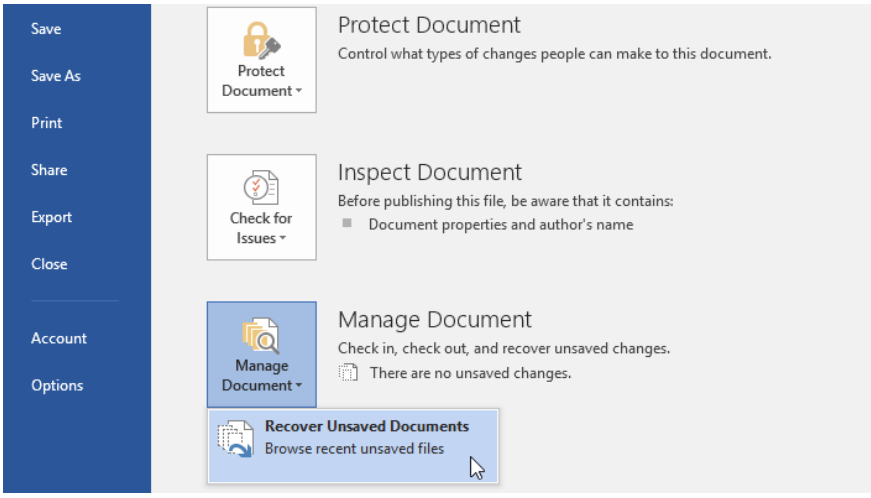
To use Auto Recover:

1. Open Word. If **AutoSaved versions** of a file are found, the **Document Recovery** pane will appear on the left.
2. Click to **open** an available file. The document will be **recovered**.




By default, Word AutoSaves every 10 minutes. If you are editing a document for less than 10 minutes, Word may not create an AutoSaved version.

If you don't see the file you need, you can browse all AutoSaved files from **backstage view**. Select the **File** tab, click **Manage Versions**, and then choose **Recover Unsaved Documents**.



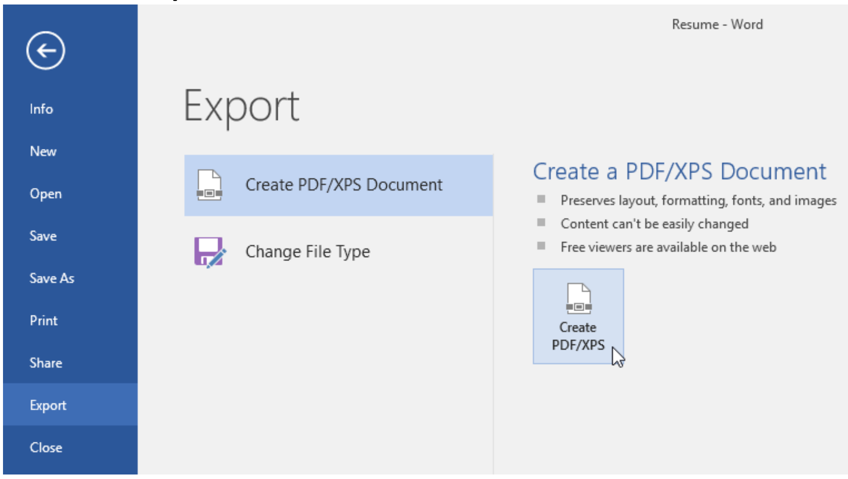

Exporting documents

By default, Word documents are saved in the **.docx** file type. However, there may be times when you need to use **another file type**, such as a **PDF** or **Word 97-2003 document**. It's easy to **export** your document from Word to a variety of file types.

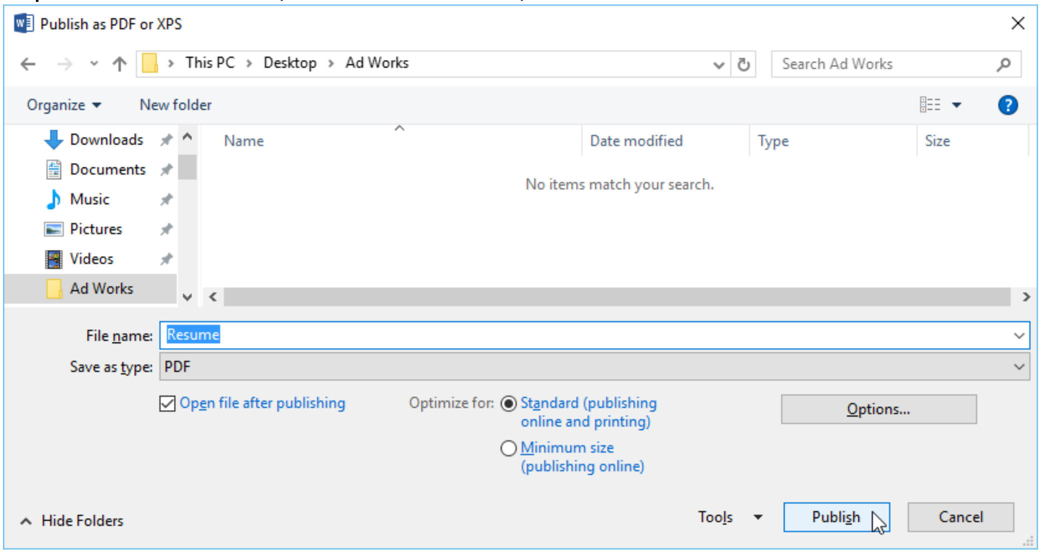
To export a document as a PDF file:

Exporting your document as an **Adobe Acrobat document**, commonly known as a **PDF file**, can be especially useful if you're sharing a document with someone who does not have Word. A PDF file will make it possible for recipients to view—but not edit—the content of your document.

1. Click the **File** tab to access **backstage view**, choose **Export**, then select **Create PDF/XPS**.



2. The **Save As** dialog box will appear. Select the **location** where you want to export the document, enter a **file name**, then click **Publish.**

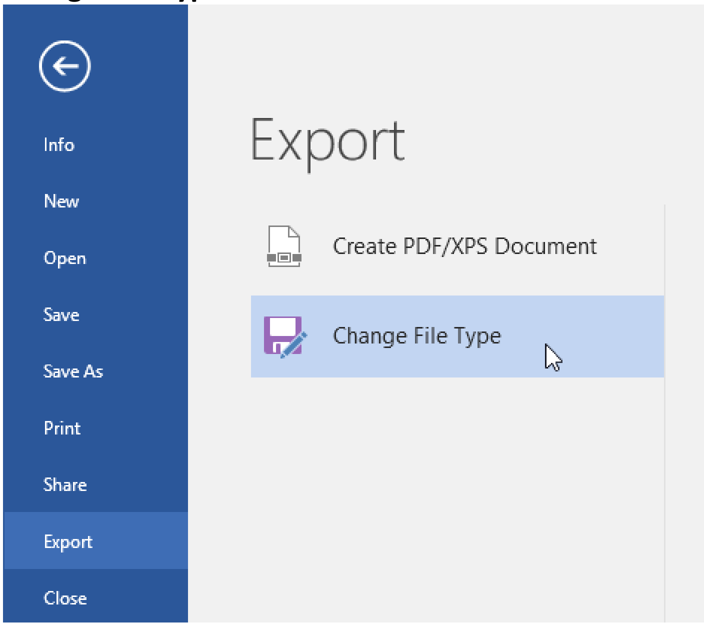



If you need to edit a PDF file, Word allows you to convert a PDF file into an editable document.

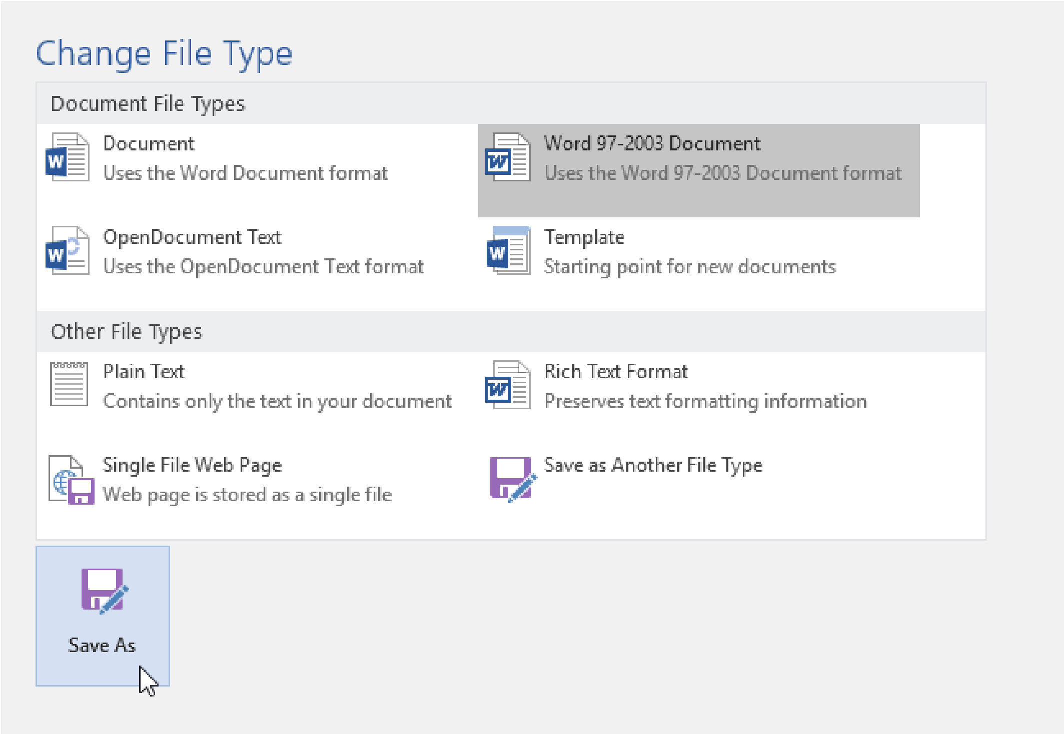
To export a document to other file types:

You may also find it helpful to export your document to other file types, such as a **Word 97-2003 Document** if you need to share with people using an older version of Word or as a **.txt file** if you need a **plain-text** version of your document.

1. Click the **File** tab to access **backstage view**, choose **Export**, then select **Change File Type**.

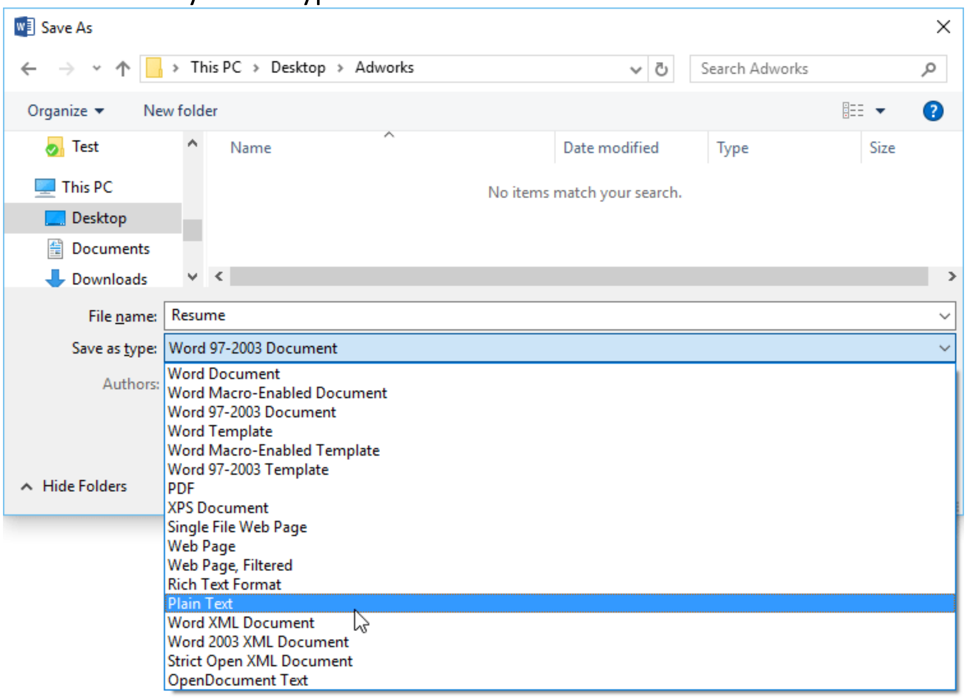



2. Select a **file type**, then click **Save As**.




3. The **Save As** dialog box will appear. Select the **location** where you want to export the document, enter a **file name**, and then click **Save**.

You can also use the **Save as type** drop-down menu in the **Save As** dialog box to save documents to a variety of file types.




Sharing documents

Word makes it easy to **share and collaborate** on documents using **OneDrive**. In the past, if you wanted to share a file with someone you could send it as an email attachment. While convenient, this system also creates **multiple versions** of the same file, which can be difficult to organize.

When you share a document from Word, you're actually giving others access to the **exact same file**. This lets you and the people you share with **edit the same document** without having to keep track of multiple versions.

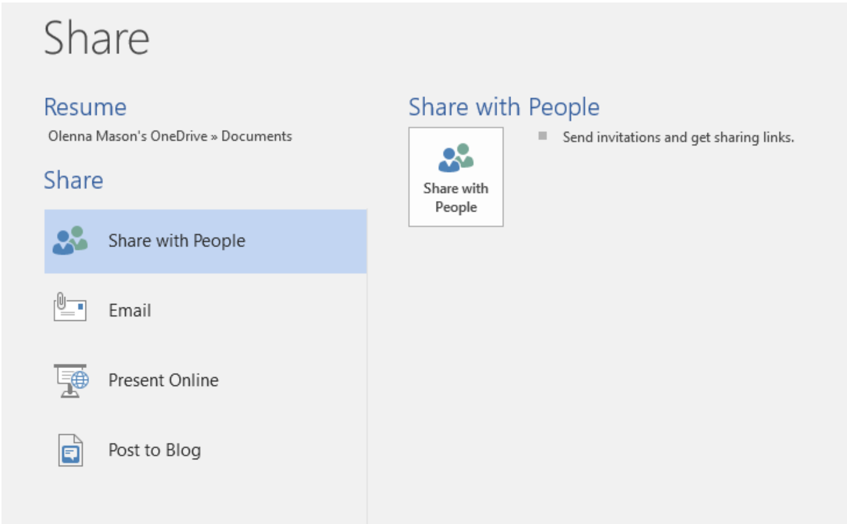
In order to share a document, it must first be **saved to your OneDrive**.

To share a document:

1. Click the **File** tab to access **backstage view**, then click **Share**.


2. The **Share** pane will appear.

Click the buttons in the interactive below to learn more about different ways to share a document.




## Lesson 4: Working with Text

### Text Basics

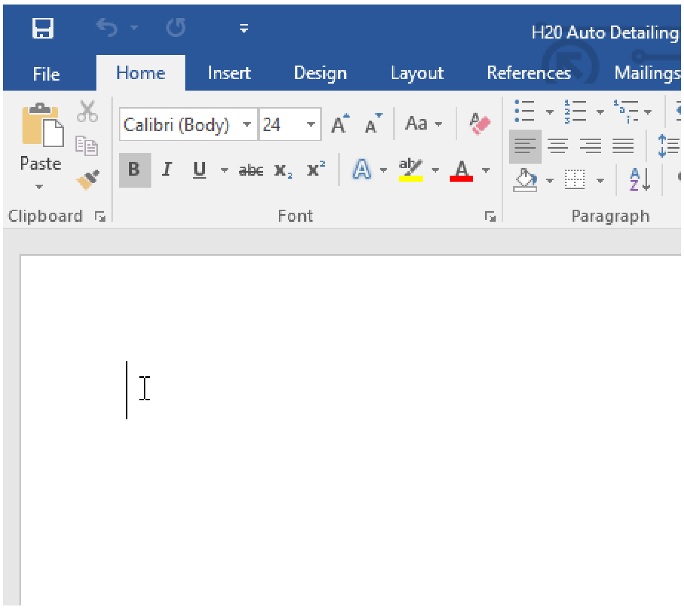
**Introduction**

If you're new to Microsoft Word, you'll need to learn the basics of typing, editing, and organizing text. Basic tasks include the ability to add, delete, and move text in your document, as well as how to cut, copy, and paste.

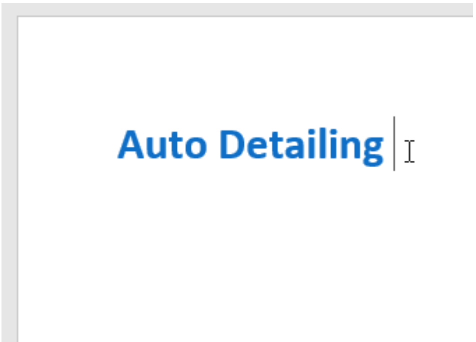
Using the insertion point to add text

The **insertion point** is the blinking vertical line in your document. It indicates where you can enter **text** on the page. You can use the insertion point in a variety of ways.

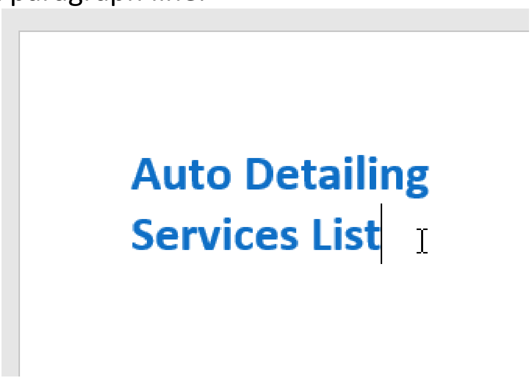
- **Blank document**: When a new blank document opens, the insertion point will appear in the top-left corner of the page. If you want, you can begin typing from this location.



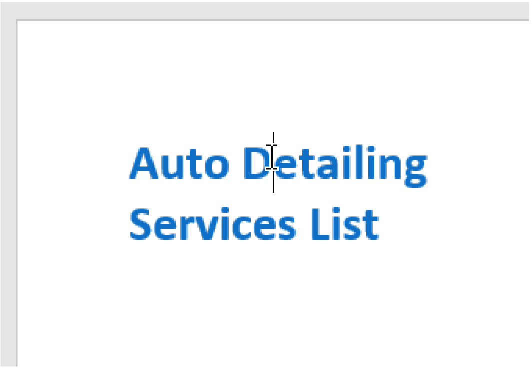

- **Adding spaces**: Press the **spacebar** to add **spaces** after a word or in between text.




- **New paragraph line**: Press **Enter** on your keyboard to move the insertion point to the next paragraph line.




- **Manual placement**: Once you begin typing, you can use the mouse to move the insertion point to a specific place in your document. Simply click the **location** in the text where you want to place it.

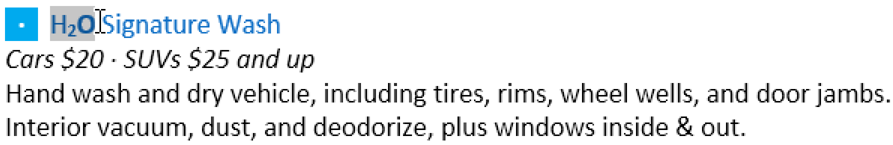



- **Arrow keys**: You can also use the arrow keys on your keyboard to move the insertion point. The **left** and **right** arrow keys will move between **adjacent characters** on the same line, while the **up** and **down** arrows will move between **paragraph lines**. You can also press **Ctrl+Left** or **Ctrl+Right** to quickly move between entire words.

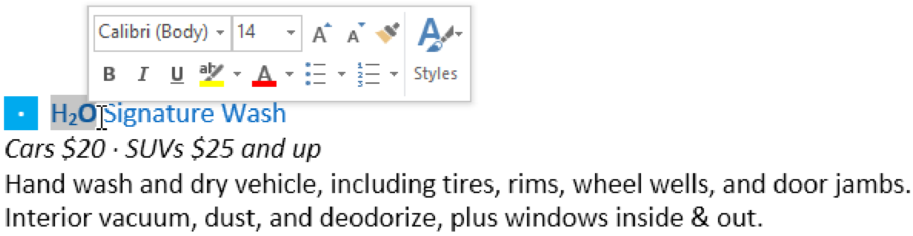
In a new blank document, you can double-click the mouse to move the insertion point elsewhere on the page.

Selecting text

Before you can move or format text, you'll need to **select it**. To do this, click and drag your mouse over the text, then release the mouse. A **highlighted box** will appear over the selected text.

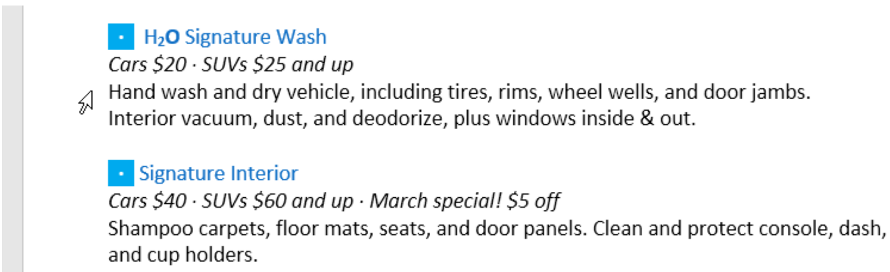



When you select text or images in Word, a **hover toolbar** with command shortcuts will appear. If the toolbar does not appear at first, try hovering the mouse over the selection.

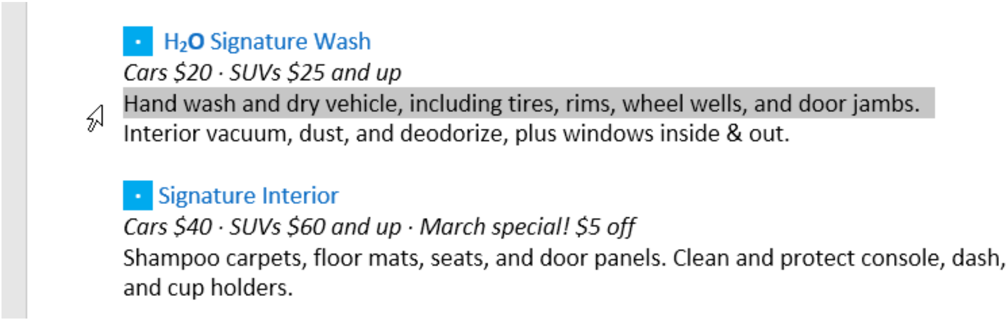



To select multiple lines of text:

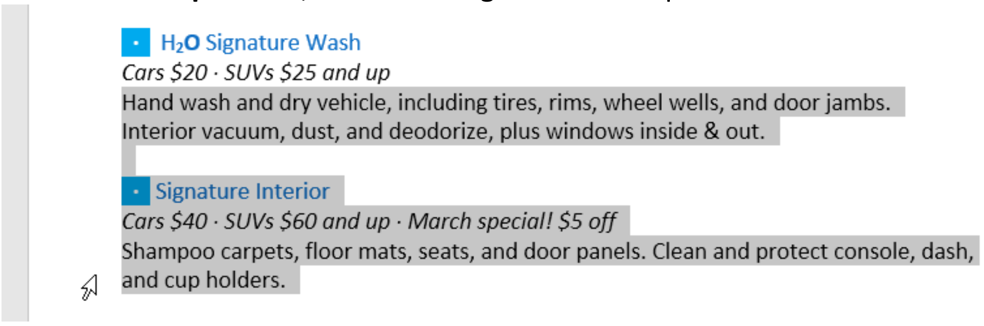
1. Move the mouse pointer to the left of any line so it becomes a **right slanted arrow**.



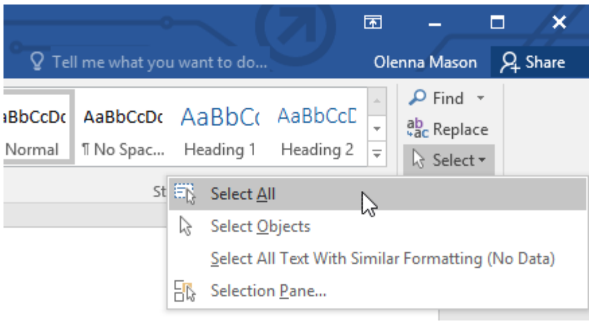

2. Click the mouse. The line will be selected.




3. To select **multiple lines**, click and drag the mouse up or down.




4. To **select all** of the text in your document, choose the **Select** command on the Home tab, then click **Select All**. Alternatively, you can press **Ctrl+A** on your keyboard.




Other shortcuts include **double-clicking** to select a word and **triple-clicking** to select an entire sentence or paragraph.

To delete text:

There are several ways to **delete**—or remove—text:

- To delete text to the **left** of the insertion point, press the **Backspace** key on your keyboard.
- To delete text to the **right** of the insertion point, press the **Delete** key on your keyboard.
- Select the **text** you want to remove, then press the **Delete** key.

If you select text and start typing, the selected text will automatically be deleted and replaced with the new text.

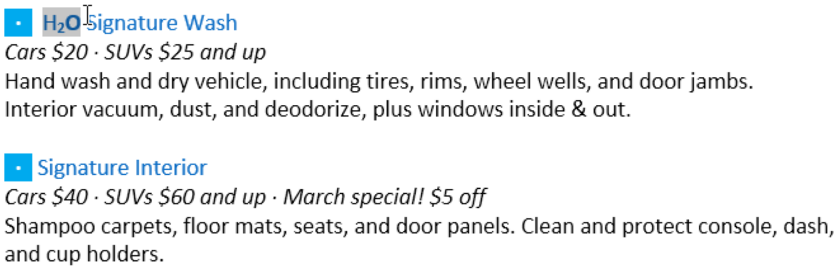
Copying and moving text

Word allows you to **copy** text that's already in your document and **paste** it in other places, which can save you a lot of time and effort. If you want to move text around in your document, you can **cut and paste** or **drag and drop**.

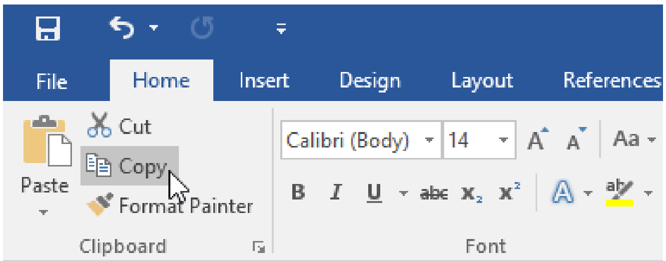
To copy and paste text:

1.

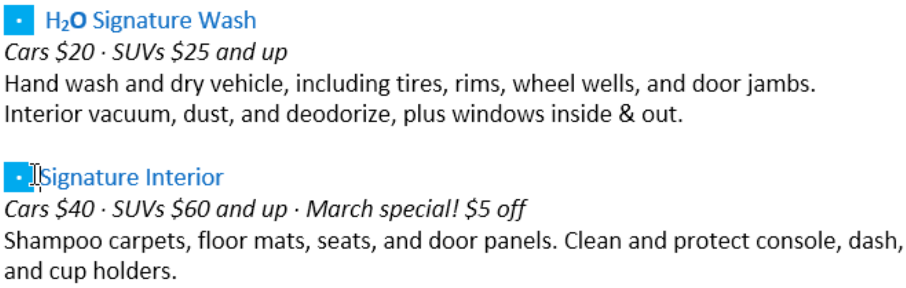
2. Select the **text** you want to copy.



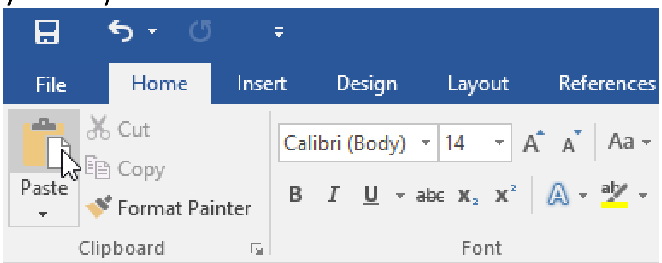

3. Click the **Copy** command on the **Home** tab. Alternatively, you can press **Ctrl+C** on your keyboard.



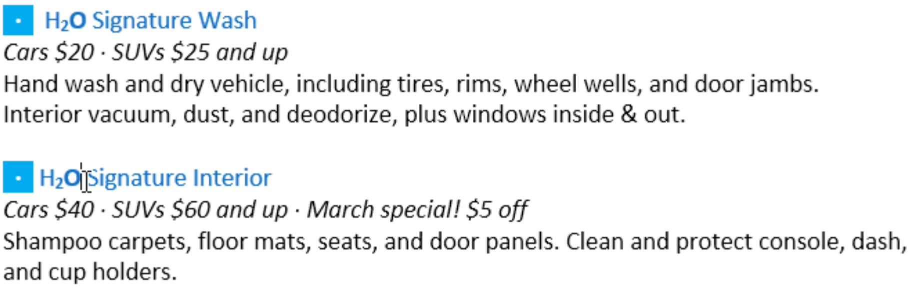

4. Place the insertion point where you want the text to appear.




5. Click the **Paste** command on the Home tab. Alternatively, you can press **Ctrl+V** on your keyboard.

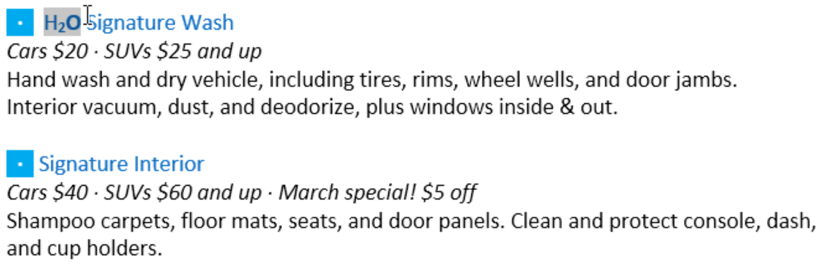



6. The text will appear.



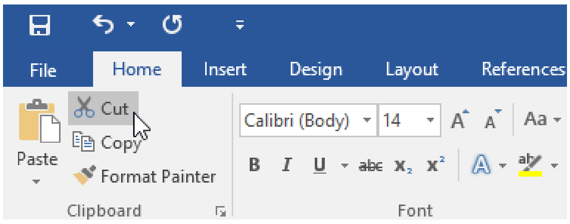

To cut and paste text:

1. Select the **text** you want to cut.

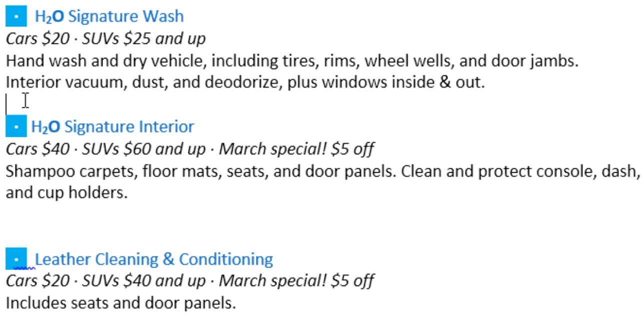

$H_2O$ Signature Wash
*Cars $20 · SUVs $25 and up*
Hand wash and dry vehicle, including tires, rims, wheel wells, and door jambs. Interior vacuum, dust, and deodorize, plus windows inside & out.

Signature Interior
*Cars $40 · SUVs $60 and up · March special! $5 off*
Shampoo carpets, floor mats, seats, and door panels. Clean and protect console, dash, and cup holders.

2. Click the **Cut** command on the **Home** tab. alternatively, you can press **Ctrl+X** on your keyboard.



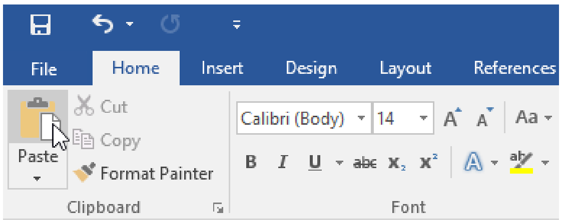

3. Place your insertion point where you want the text to appear.


$H_2O$ Signature Wash
*Cars $20 · SUVs $25 and up*
Hand wash and dry vehicle, including tires, rims, wheel wells, and door jambs. Interior vacuum, dust, and deodorize, plus windows inside & out.

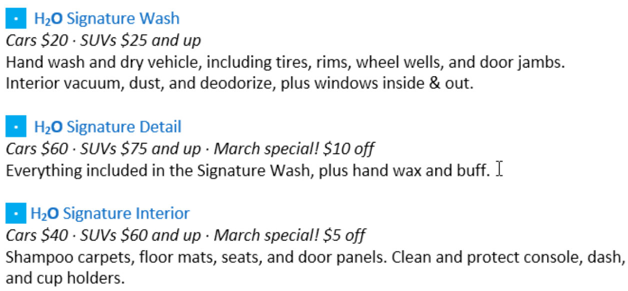
$H_2O$ Signature Interior
*Cars $40 · SUVs $60 and up · March special! $5 off*
Shampoo carpets, floor mats, seats, and door panels. Clean and protect console, dash, and cup holders.

Leather Cleaning & Conditioning
*Cars $20 · SUVs $40 and up · March special! $5 off*
Includes seats and door panels.

4. Click the **Paste** command on the **Home** tab. Alternatively, you can press **Ctrl+V** on your keyboard.




5. The text will appear.


$H_2O$ Signature Wash
*Cars $20 · SUVs $25 and up*
Hand wash and dry vehicle, including tires, rims, wheel wells, and door jambs. Interior vacuum, dust, and deodorize, plus windows inside & out.

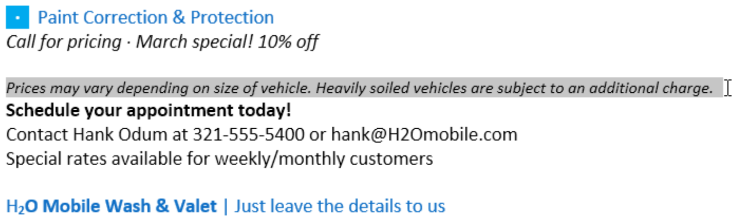
$H_2O$ Signature Detail
*Cars $60 · SUVs $75 and up · March special! $10 off*
Everything included in the Signature Wash, plus hand wax and buff.

$H_2O$ Signature Interior
*Cars $40 · SUVs $60 and up · March special! $5 off*
Shampoo carpets, floor mats, seats, and door panels. Clean and protect console, dash, and cup holders.

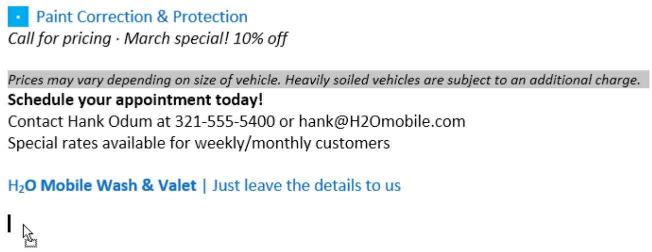
- You can also cut, copy, and paste by right-clicking your document and choosing the desired action from the drop-down menu. When you use this method to paste, you can choose from three options that determine how the text will be formatted: **Keep Source Formatting**, **Merge Formatting**, and **Keep Text Only**. You can hover the mouse over each icon to see what it will look like before you select it.

To drag and drop text:

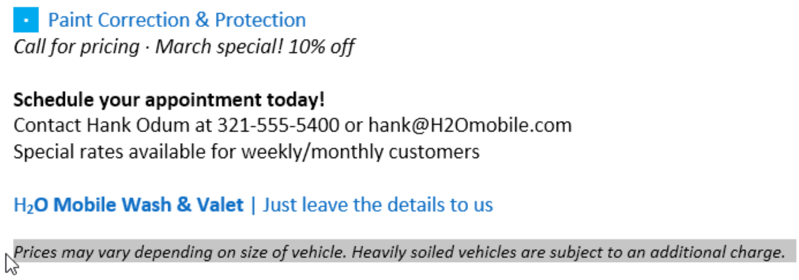
1. Select the **text** you want to move.




2. Click and drag the **text** to the location where you want it to appear. A small rectangle will appear below the arrow to indicate that you are moving text.




3. Release the mouse, and the text will appear.

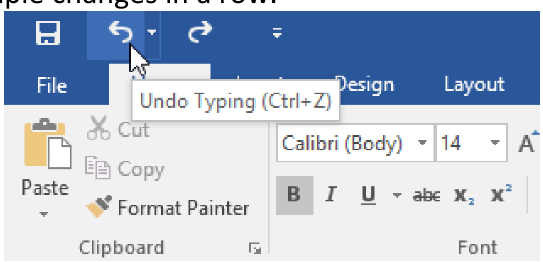



If text **does not appear** in the exact location you want, you can press the **Enter** key on your keyboard to move the text to a new line.

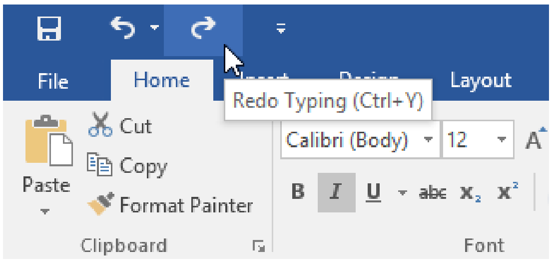
Undo and Redo

Let's say you're working on a document and accidentally delete some text. Fortunately, you won't have to retype everything you just deleted! Word allows you to **undo** your most recent action when you make a mistake like this.

To do this, locate and select the **Undo** command on the Quick Access Toolbar. Alternatively, you can press **Ctrl+Z** on your keyboard. You can continue using this command to undo multiple changes in a row.




By contrast, the **Redo** command allows you to reverse the last undo. You can also access this command by pressing **Ctrl+Y** on your keyboard.

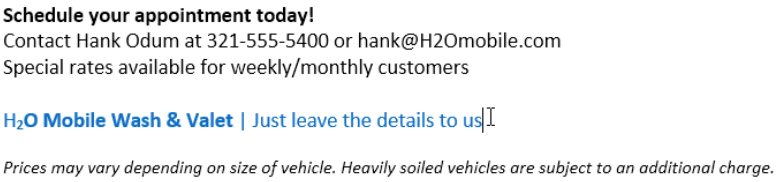



Symbols

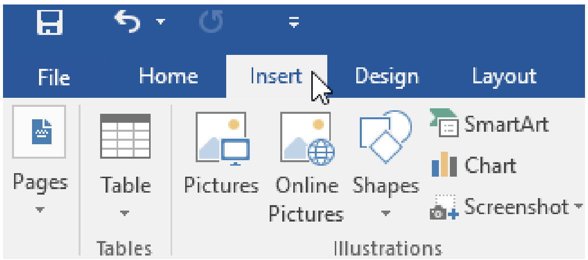
If you need to insert an unusual character that's not on your keyboard, such as a copyright (©) or trademark (™) symbol, you can usually find them with the **Symbol** command.

**To insert a symbol:**

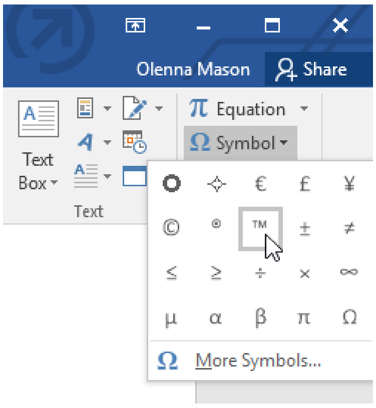
1. Place the insertion point where you want the symbol to appear.



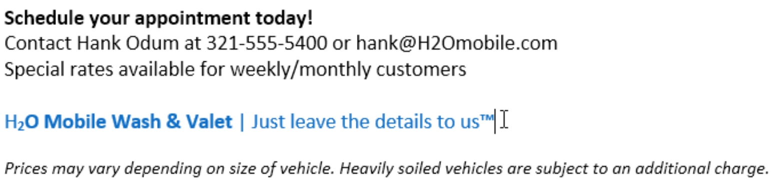

2. Click the **Insert** tab.




3. Locate and select the **Symbol** command, then choose the desired symbol from the drop-down menu. If you don't see the one you want, select **More Symbols**.




4. The symbol will appear in the document.



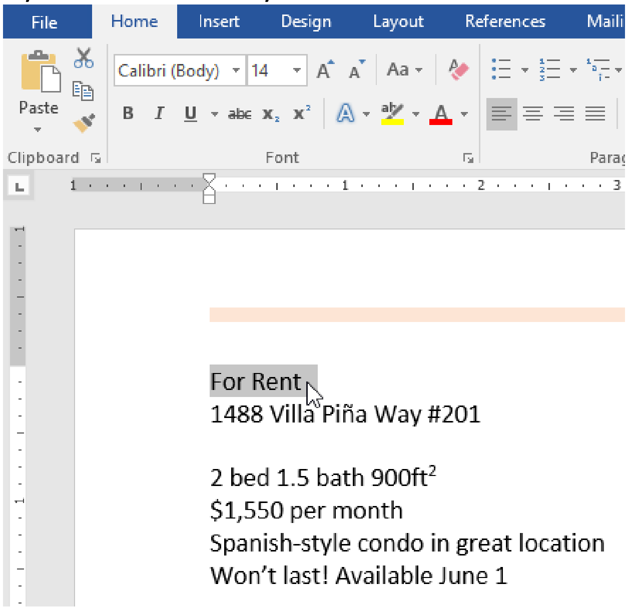
## Lesson 5: Formatting Text

Introduction

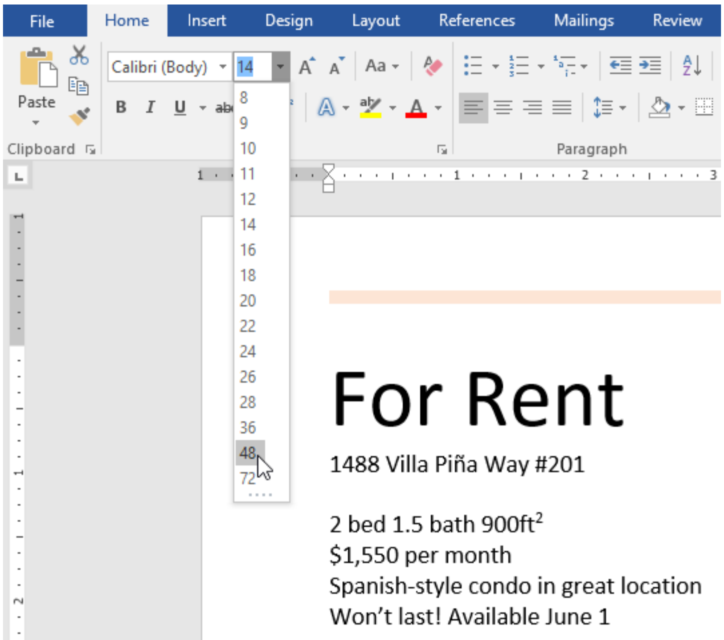
Formatted text can draw the reader's attention to specific parts of a document and emphasize important information. In Word, you have several options for adjusting text, including font, size, and color. You can also adjust the alignment of the text to change how it is displayed on the page.

To change the font size:

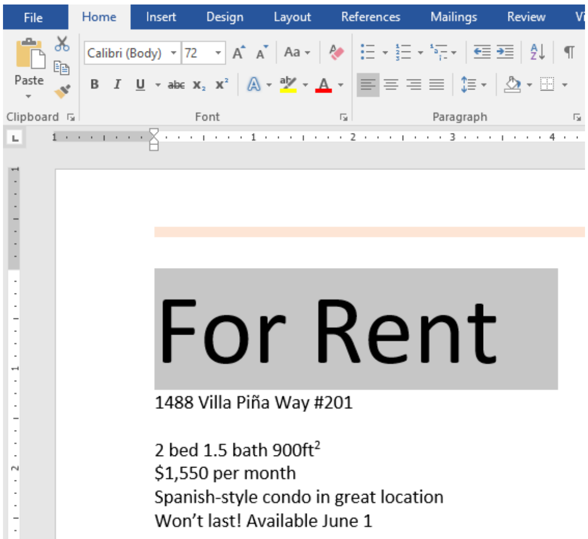
1. Select the text you want to modify.



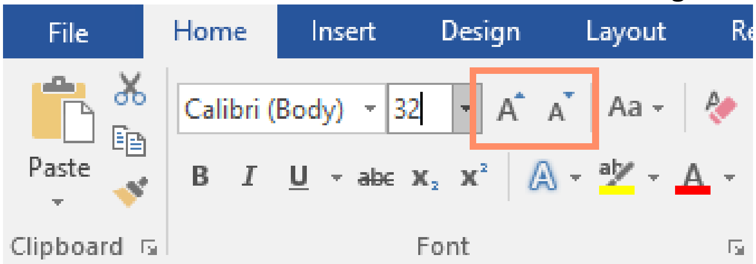

2. On the Home tab, click the Font size drop-down arrow. Select a font size from the menu. If the font size you need is not available in the menu, you can click the Font size box and type the desired font size, then press Enter.




3. The font size will change in the document.



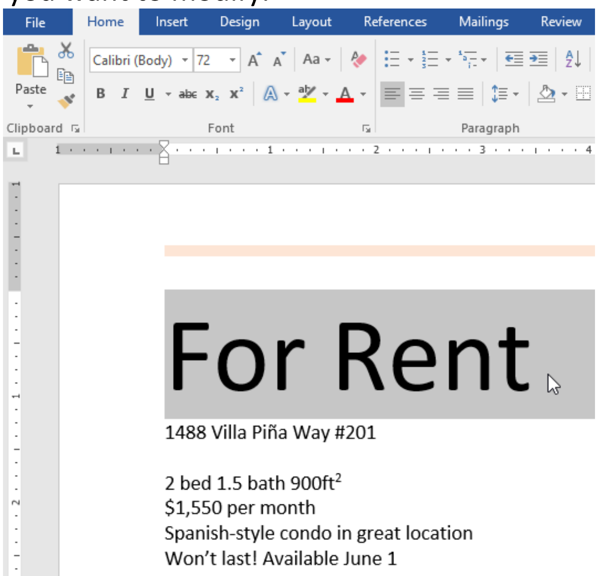

You can also use the Grow Font and Shrink Font commands to change the font size.



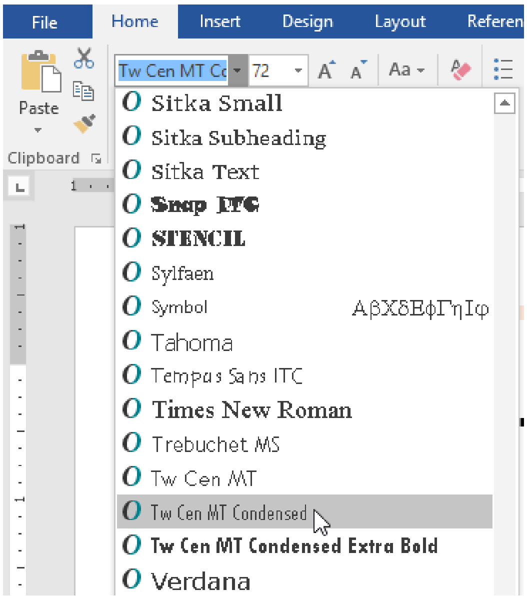

To change the font:

By default, the font of each new document is set to Calibri. However, Word provides many other fonts you can use to customize text.

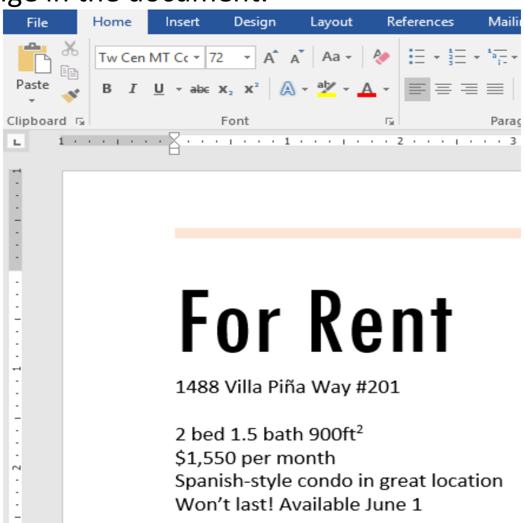
1. Select the text you want to modify.




2. On the Home tab, click the drop-down arrow next to the Font box. A menu of font styles will appear.
3. Select the font style you want to use.



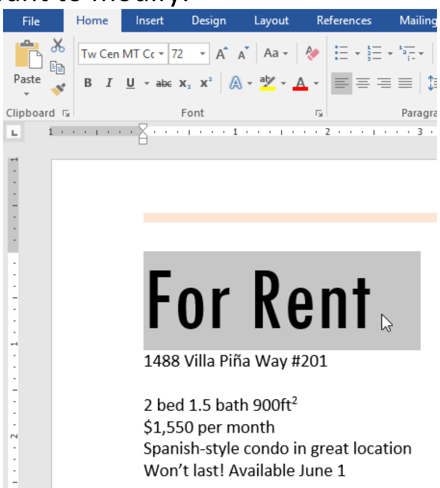

4. The font will change in the document.



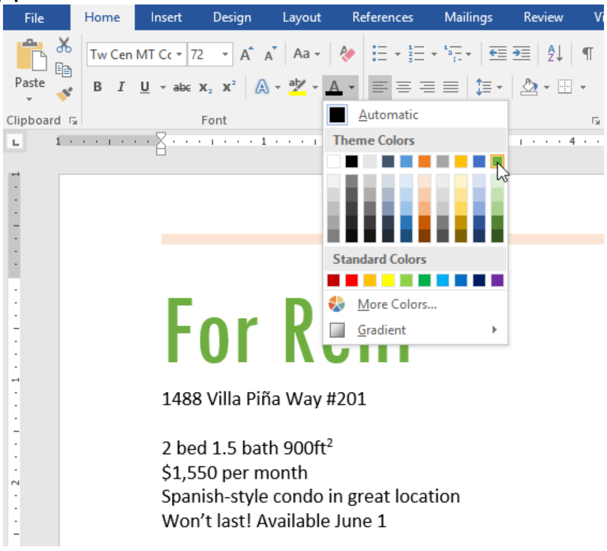

When creating a professional document or a document that contains multiple paragraphs, you'll want to select a font that's easy to read. Along with Calibri, standard reading fonts include Cambria, Times New Roman, and Arial.

To change the font color:

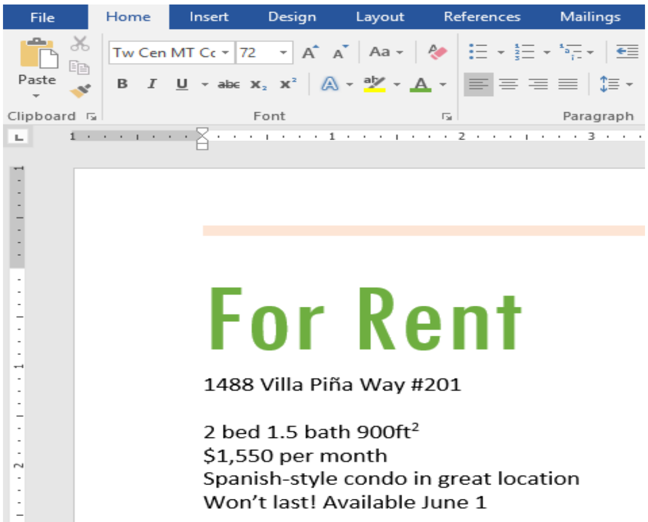
1. Select the text you want to modify.



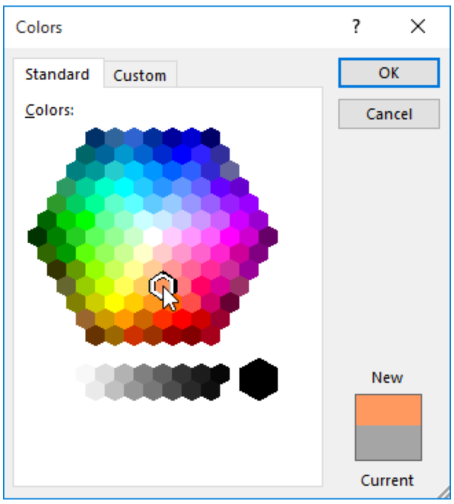
2. On the Home tab, click the Font Color drop-down arrow. The Font Color menu appears.




3. Select the font color you want to use. The font color will change in the document.



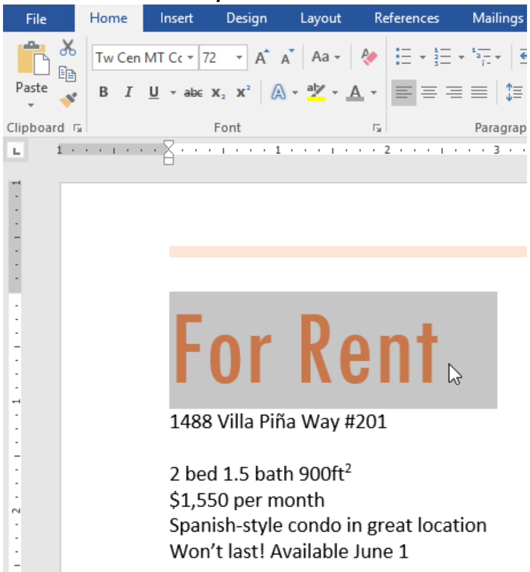

Your color choices aren't limited to the drop-down menu that appears. Select More Colors at the bottom of the menu to access the Colors dialog box. Choose the color you want, then click OK.



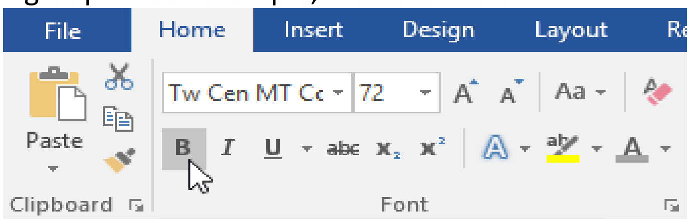
To use the Bold, Italic, and Underline commands:

The Bold, Italic, and Underline commands can be used to help draw attention to important words or phrases.

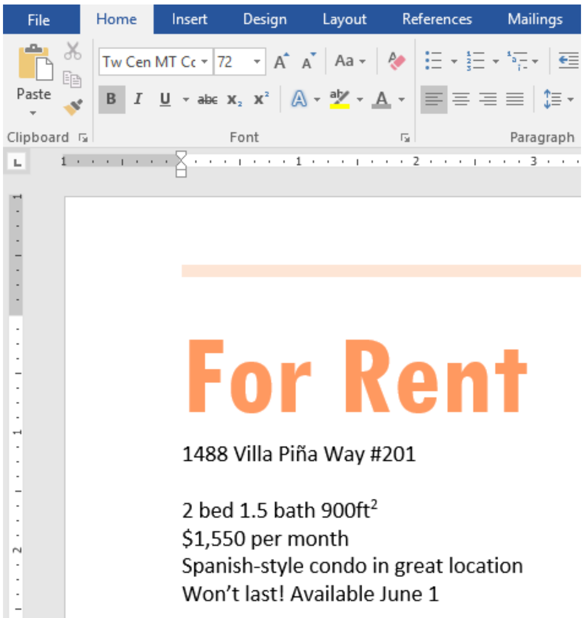
1. Select the text you want to modify.




2. On the Home tab, click the Bold (B), Italic (*I*), or Underline (U) command in the Font group. In our example, we'll click Bold.



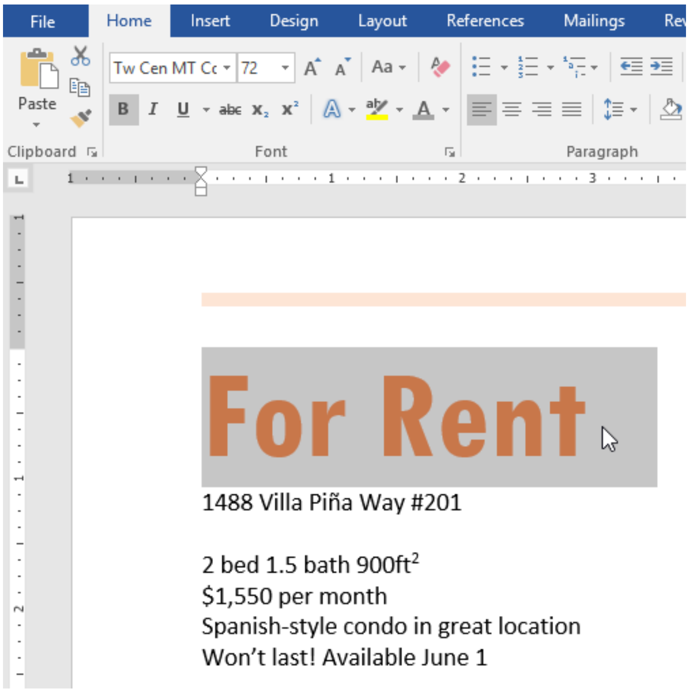

3. The selected text will be modified in the document.



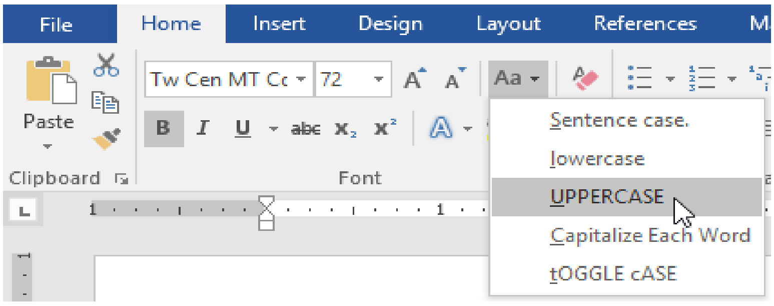

To change text case:

When you need to quickly change text case, you can use the Change Case command instead of deleting and retyping text.

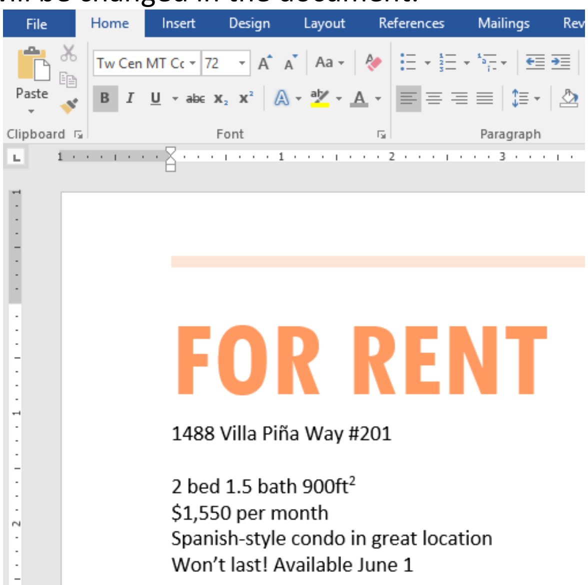
1. Select the text you want to modify.




2. On the Home tab, click the Change Case command in the Font group.
3. A drop-down menu will appear. Select the desired case option from the menu.



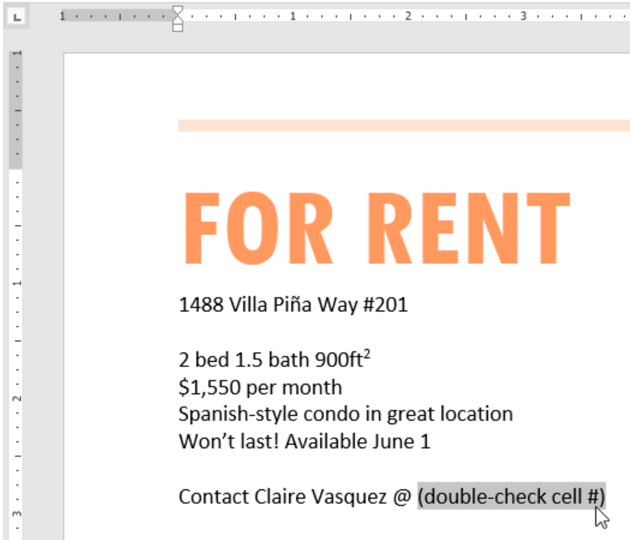

4. The text case will be changed in the document.



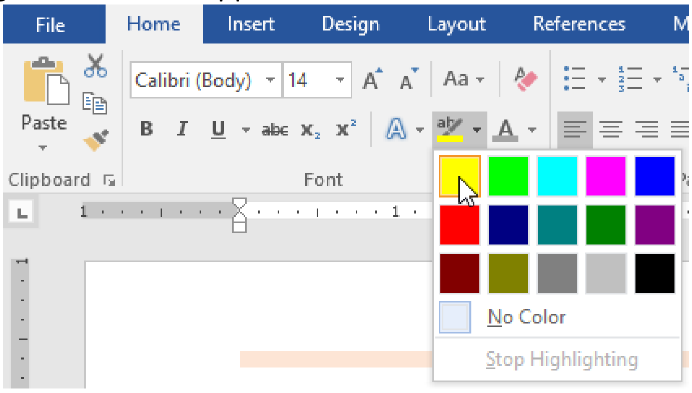

To highlight text:

Highlighting can be a useful tool for marking important text in your document.

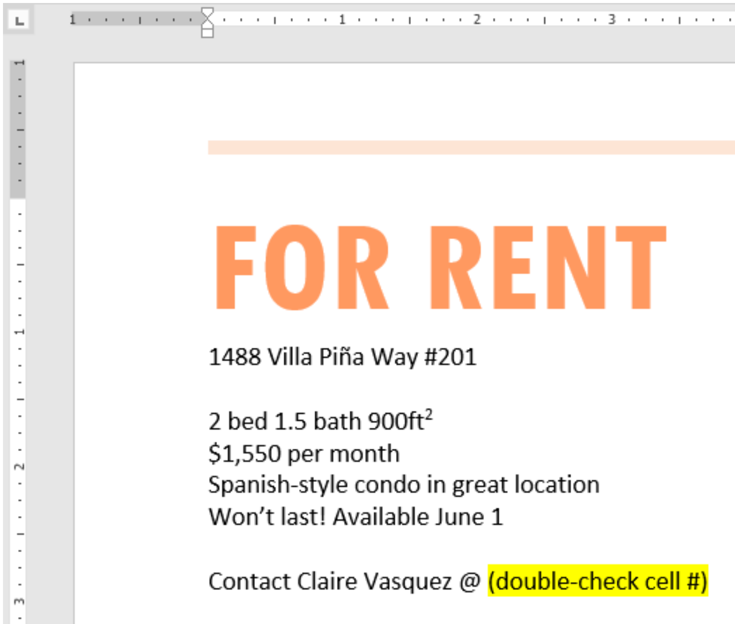
1. Select the text you want to highlight.



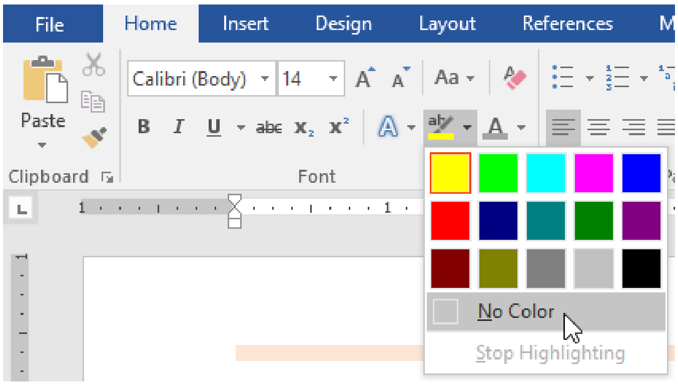

2. From the Home tab, click the Text Highlight Color drop-down arrow. The Highlight Color menu appears.




3. Select the desired highlight color. The selected text will then be highlighted in the document.




To remove highlighting, select the highlighted text, then click the Text Highlight Color drop-down arrow. Select No Color from the drop-down menu.

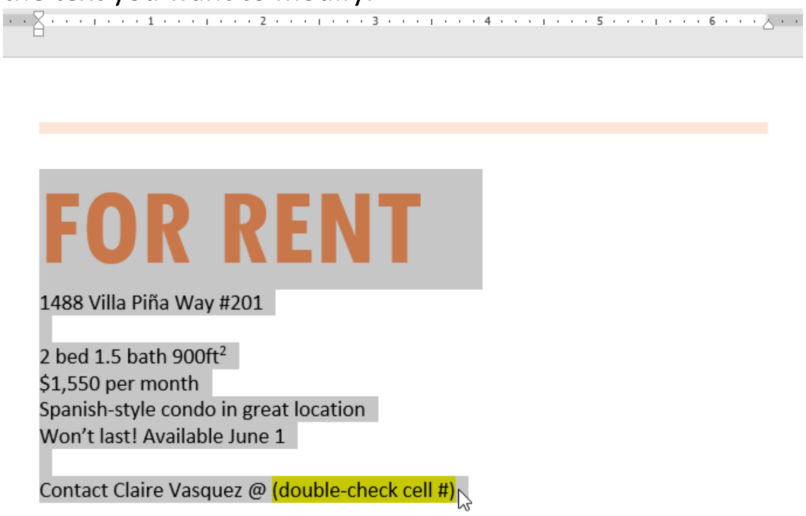



If you need to highlight several lines of text, changing the mouse into a highlighter may be a helpful alternative to selecting and highlighting individual lines. Click the Text Highlight Color command, and the cursor changes into a highlighter. You can then click and drag the highlighter over the lines you want to highlight.

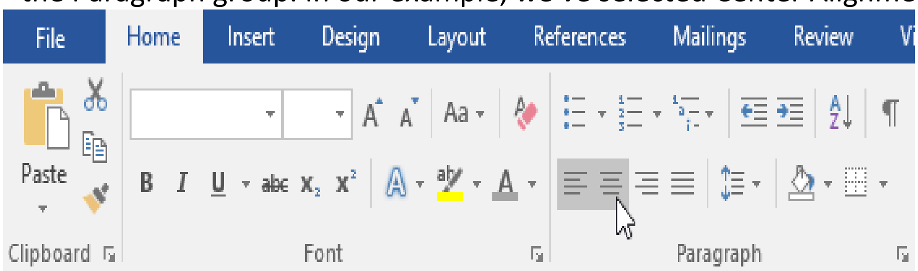
To change text alignment:

By default, Word aligns text to the left margin in new documents. However, there may be times when you want to adjust text alignment to the center or right.

1. Select the text you want to modify.




2. On the Home tab, select one of the four alignment options from the Paragraph group. In our example, we've selected Center Alignment.




3. The text will be realigned in the document.

# FOR RENT

1488 Villa Piña Way #201

2 bed 1.5 bath 900ft$^2$
$1,550 per month
Spanish-style condo in great location
Won't last! Available June 1

Contact Claire Vasquez @ (double-check cell #)

During the 4th quarter, Westbrook-Parker showed continued growth and exceeded profit expectations. The New Year is starting strong with January proving to be a profitable month.

Database software sales are up by 13%, subscriptions to our online database management applications are up by 21%, and capital expenditures in the marketing department have decreased since the 3rd quarter.

**Align Text Left:** This aligns all selected text to the left margin. The Align Text Left command is the most common alignment and is selected by default when a new document is created.

During the 4th quarter, Westbrook-Parker showed continued growth and exceeded profit expectations. The New Year is starting strong with January proving to be a profitable month.

Database software sales are up by 13%, subscriptions to our online database management applications are up by 21%, and capital expenditures in the marketing department have decreased since the 3rd quarter.

- Center: This aligns text an equal distance from the left and right margins.

During the 4th quarter, Westbrook-Parker showed continued growth and exceeded profit expectations. The New Year is starting strong with January proving to be a profitable month.

Database software sales are up by 13%, subscriptions to our online database management applications are up by 21%, and capital expenditures in the marketing department have decreased since the 3rd quarter.

- Align Text Right: This aligns all selected text to the right margin.

During the 4th quarter, Westbrook-Parker showed continued growth and exceeded profit expectations. The New Year is starting strong with January proving to be a profitable month.

Database software sales are up by 13%, subscriptions to our online database management applications are up by 21%, and capital expenditures in the marketing department have decreased since the 3rd quarter.

Justify: Justified text is equal on both sides. It lines up equally to the right and left margins. Many newspapers and magazines use full justification.

You can use Word's convenient Set as Default feature to save all of the formatting changes you've made and automatically apply them to new documents. To learn how to do this, read our article on Changing Your Default Settings in Word.

## Lesson 6: Using Find and Replace

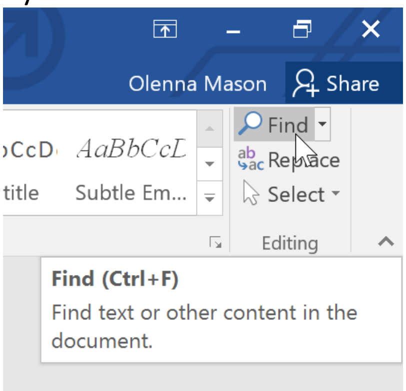
### Introduction

When you're working with longer documents, it can be difficult and time consuming to locate a specific word or phrase. Word can automatically search your document using the Find feature, and it allows you to quickly change words or phrases using Replace.

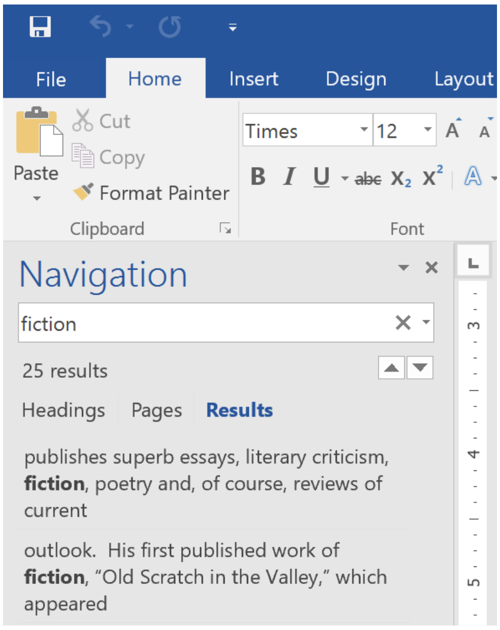
### To find text

In our example, we've written an academic paper and will use the Find command to locate all instances of a particular word.

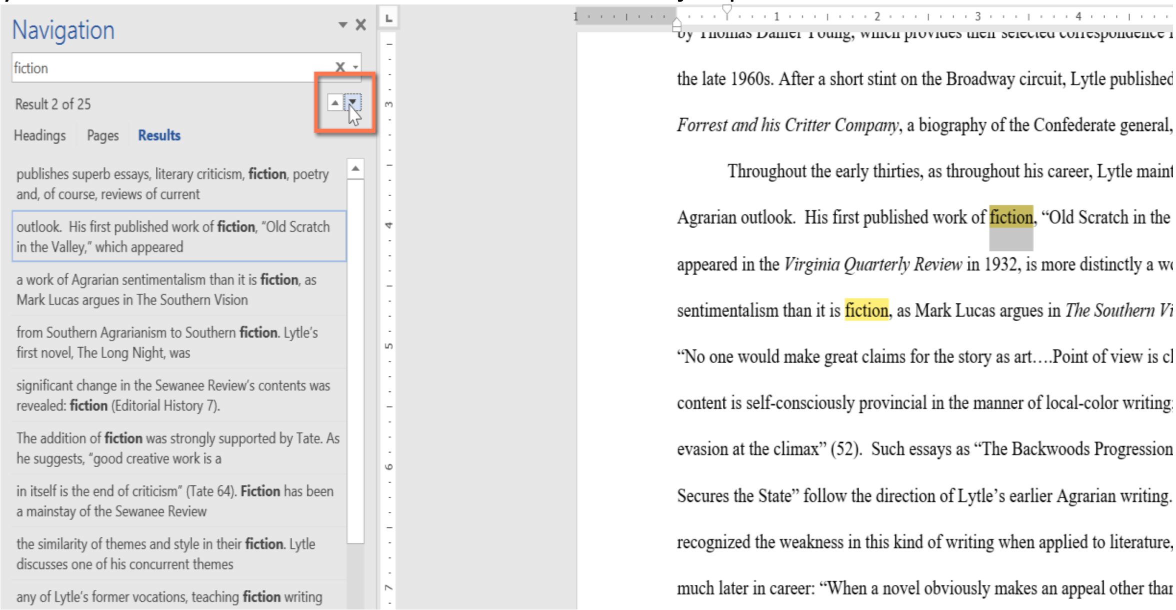
1. From the **Home** tab, click the **Find** command. Alternatively, you can press **Ctrl+F** on your keyboard.



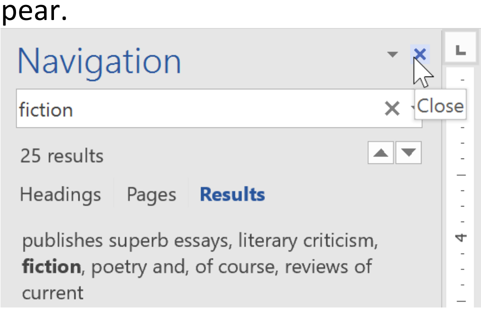

2. The **navigation pane** will appear on the left side of the screen.
3. Type the text you want to find in the field at the top of the navigation pane. In our example, we'll type the word we're looking for.



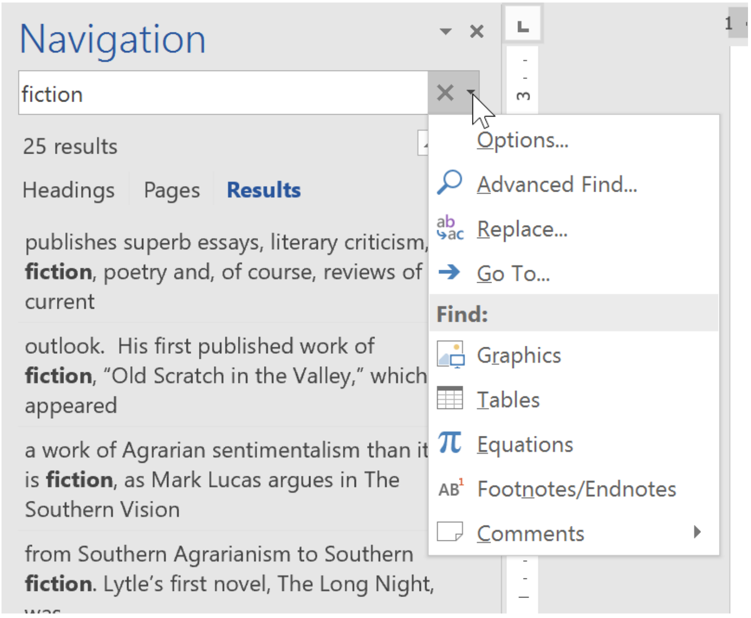

4. If the text is found in the document, it will be highlighted in yellow and a **preview of the results** will appear in the **navigation pane**. Alternatively, you can click one of the results below the arrows to jump to it.




5. When you are finished, click the **X** to close the navigation pane. The highlight will disappear.



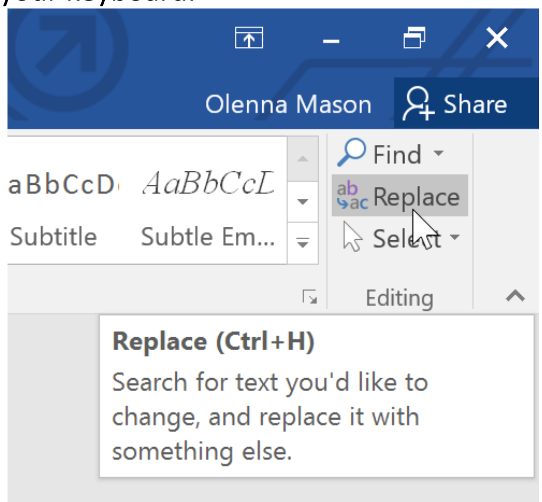

For more search options, click the drop-down arrow next to the search field.



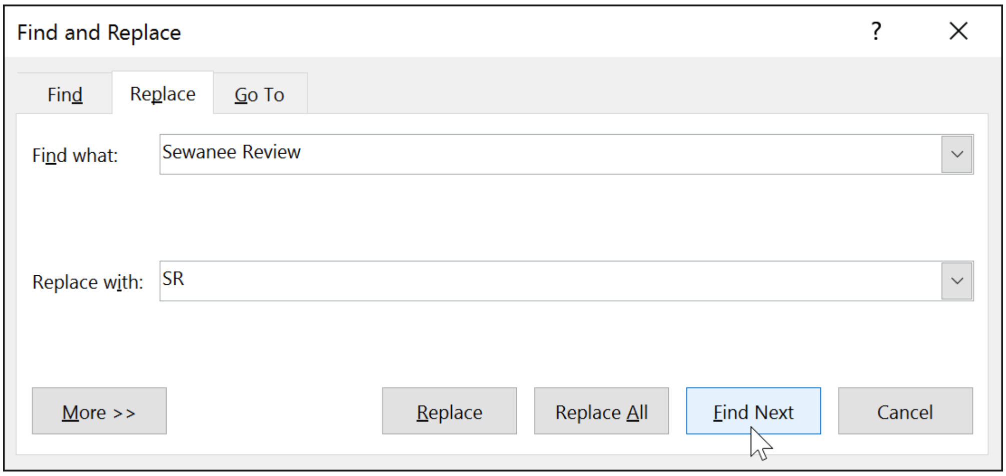

To replace text

At times, you may discover that you've made a mistake repeatedly throughout your document—such as misspelling a person's name—or that you need to exchange a particular word or phrase for another. You can use Word's **Find and Replace** feature to quickly make revisions. In our example, we'll use Find and Replace to change the title of a magazine so it is abbreviated.

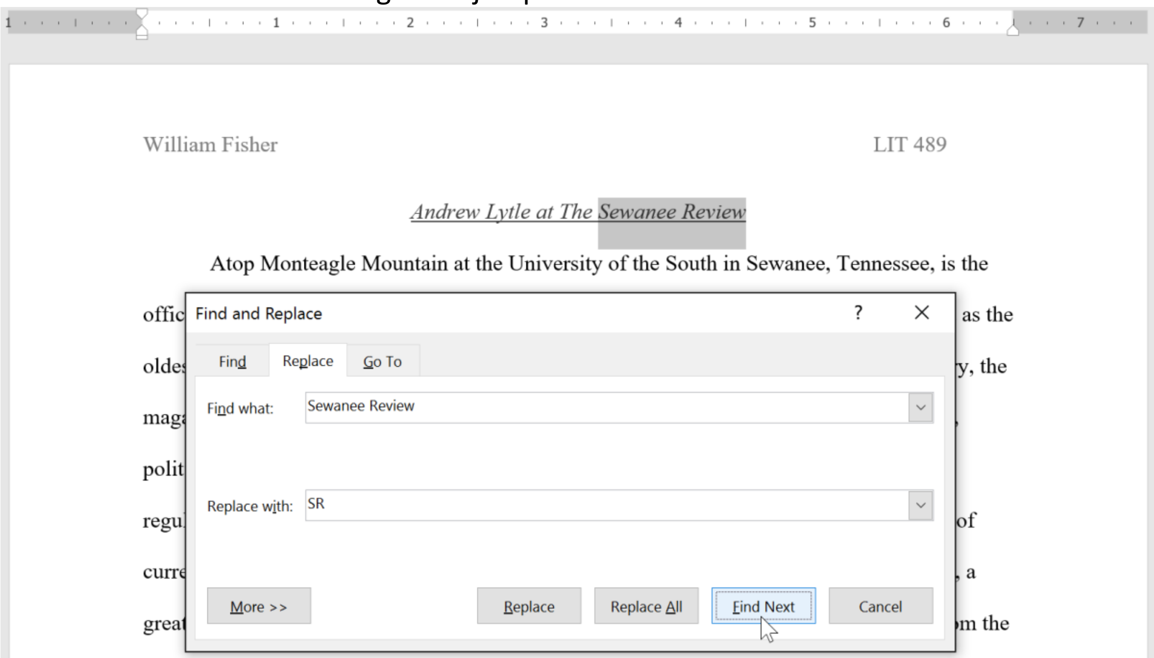
1. From the **Home** tab, click the **Replace** command. Alternatively, you can press **Ctrl+H** on your keyboard.



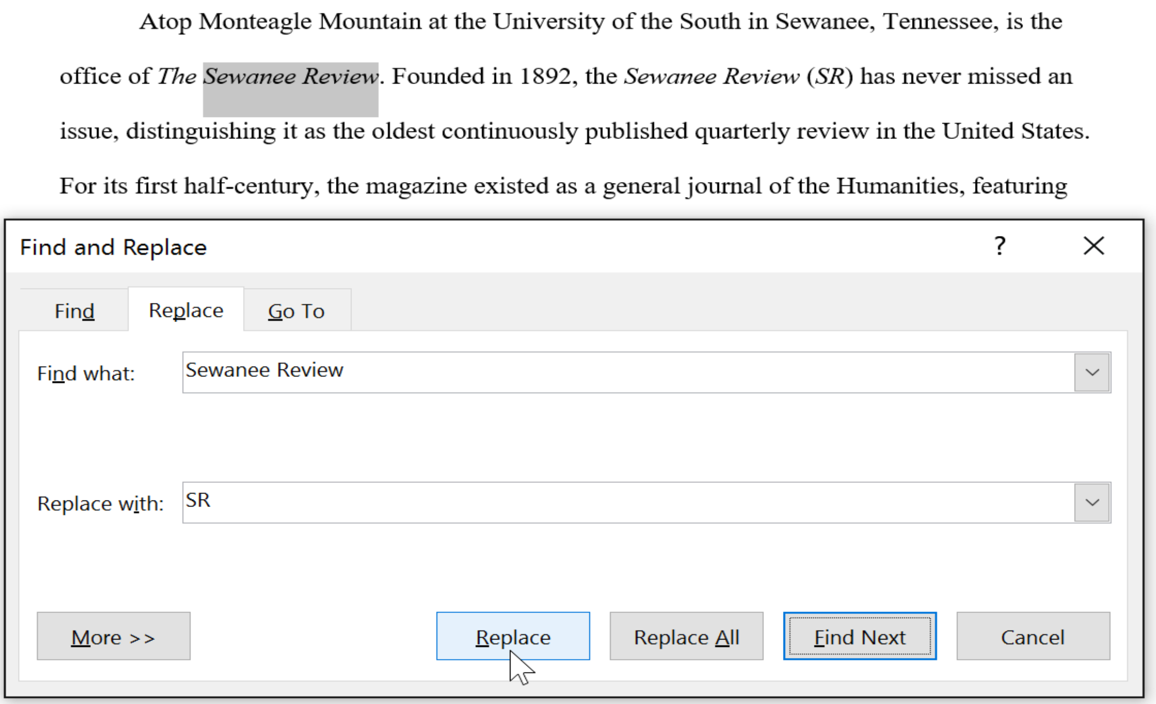

2. The **Find and Replace** dialog box will appear.
3. Type the text you want to find in the **Find what:** field.
4. Type the text you want to replace it with in the **Replace with:** field. Then click **Find Next**.



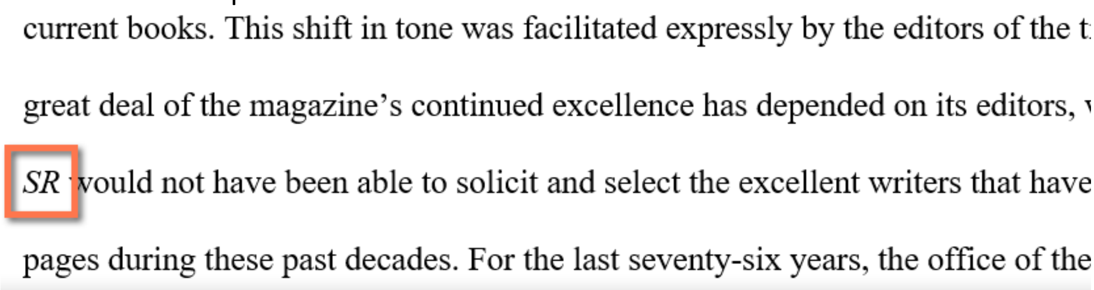

5. Word will find the first instance of the text and **highlight** it in gray.
6. **Review** the text to make sure you want to replace it. In our example, the text is part of the title of the paper and does not need to be replaced. We'll click **Find Next** again to jump to the next instance.




7. If you want to replace it, you can click **Replace** to change individual instances of text. Alternatively, you can click **Replace All** to replace every instance of the text throughout the document.

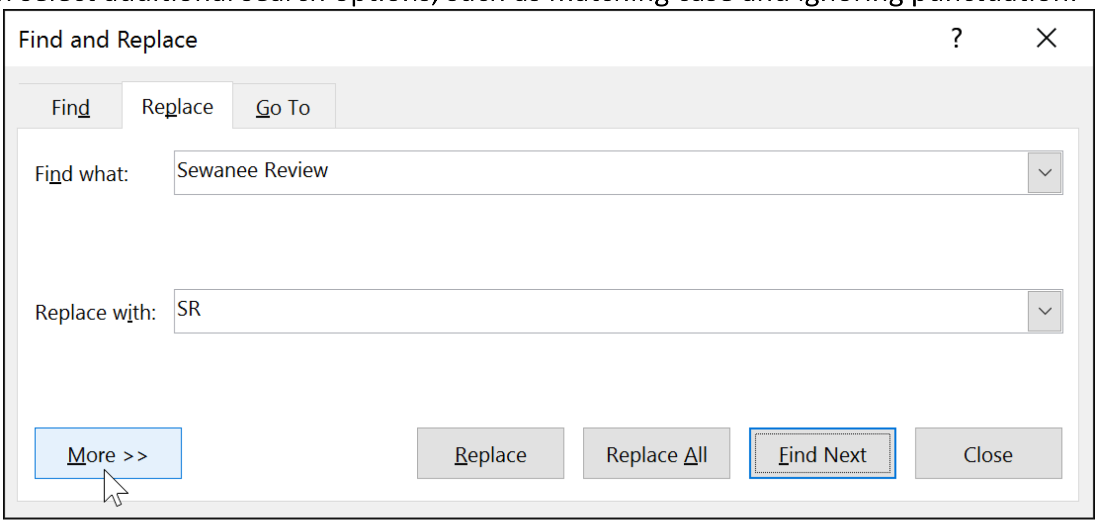



8. The text will be replaced.




9. When you're done, click **Close** or **Cancel** to close the dialog box.

For more search options, click **More** in the Find and Replace dialog box. From here, you can select additional search options, such as matching case and ignoring punctuation.




When it comes to using Replace All, it's important to remember that it could find matches you didn't anticipate and that you might not actually want to change. You should only use this option if you're absolutely sure it won't replace anything you didn't intend it to.

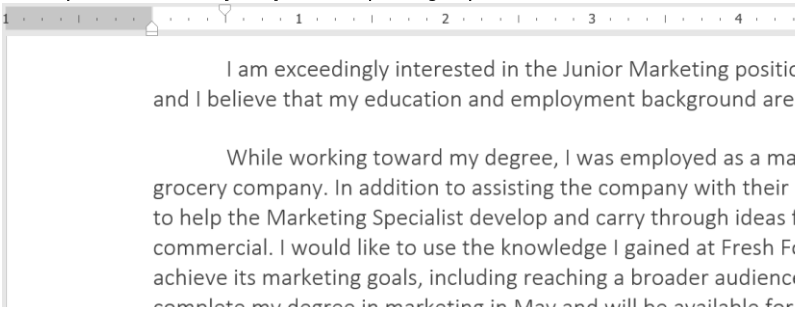
## Lesson 7: Indents and Tabs

### Introduction

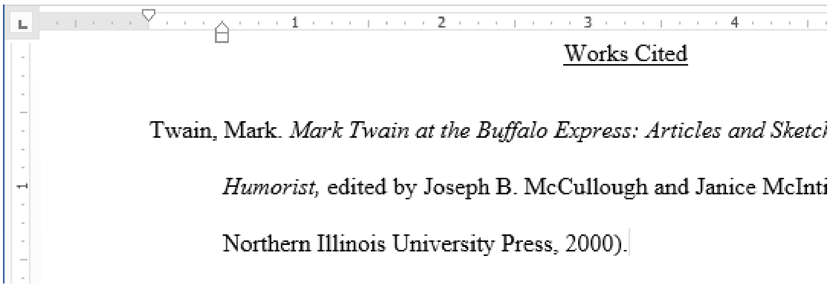
Indenting text adds structure to your document by allowing you to separate information. Whether you'd like to move a single line or an entire paragraph, you can use the tab selector and the horizontal ruler to set tabs and indents.

### Indenting text

In many types of documents, you may want to indent only the first line of each paragraph. This helps to **visually separate** paragraphs from one another.



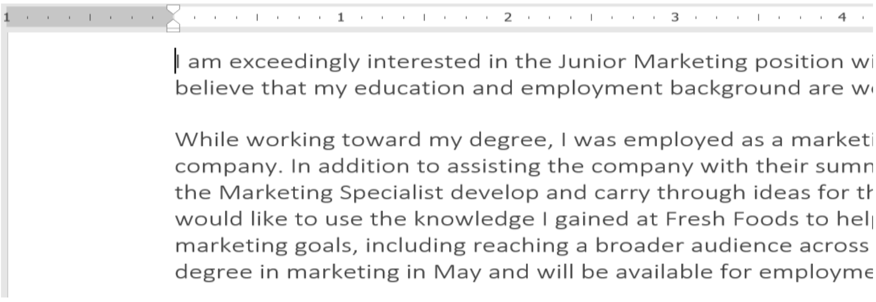

It's also possible to indent every line **except for the first line**, which is known as a **hanging indent**.



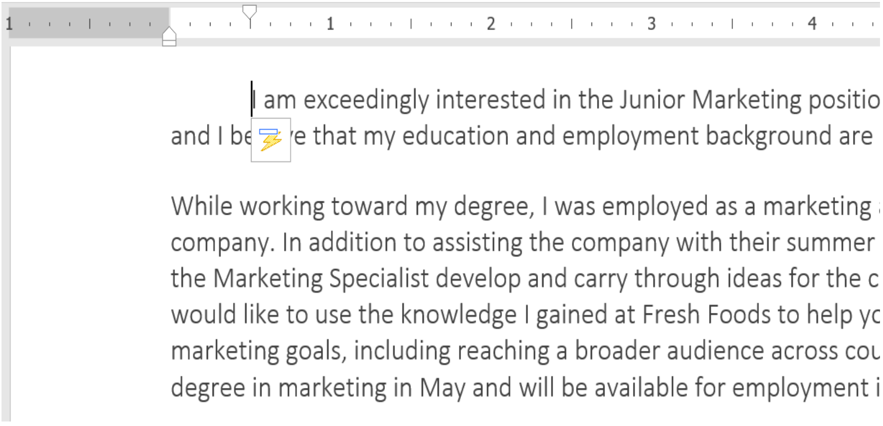

### To indent using the Tab key

A quick way to indent is to use the **Tab** key. This will create a first-line indent of **1/2 inch**.

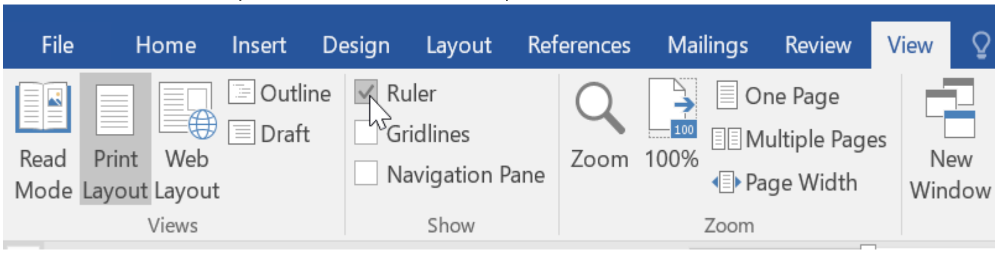
1. Place the insertion point **at the very beginning** of the paragraph you want to indent.




2. Press the **Tab** key. On the Ruler, you should see the **first-line indent marker** move to the right by **1/2 inch**.
3. The first line of the paragraph will be indented.

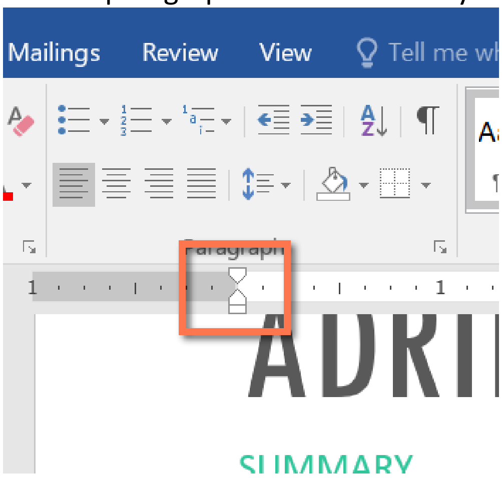



If you can't see the Ruler, select the **View** tab, then click the check box next to the **Ruler**.




Indent markers

In some cases, you may want to have more control over indents. Word provides **indent markers** that allow you to indent paragraphs to the location you want.

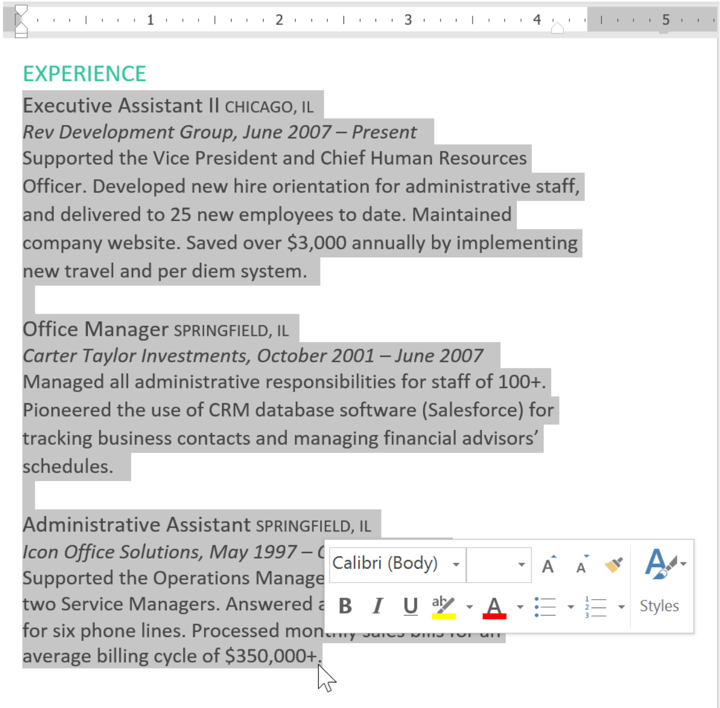



The indent markers are located to the left of the horizontal ruler, and they provide several indenting options:

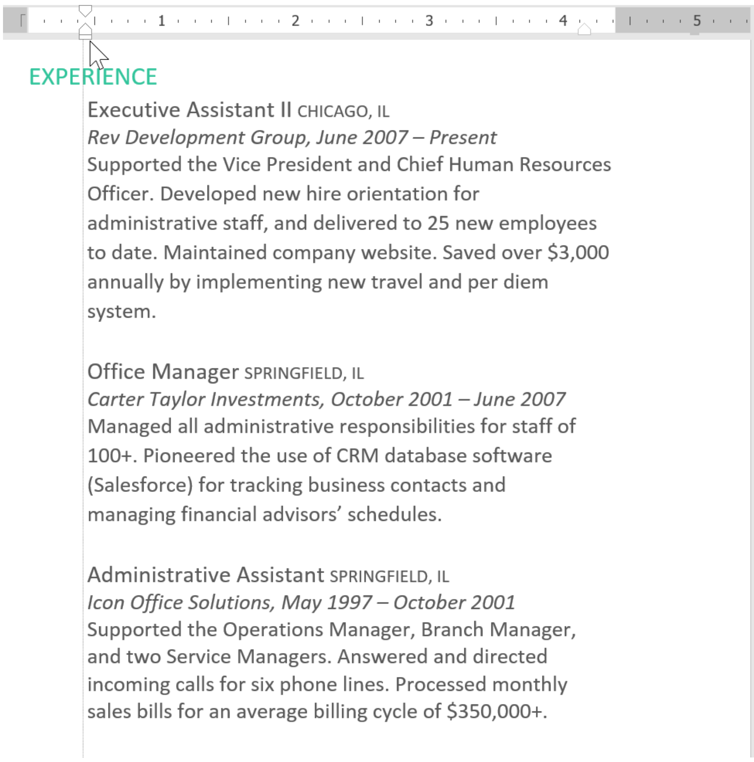
- **First-line indent marker** adjusts the first-line indent
- **Hanging indent marker** adjusts the hanging indent
- **Left indent marker** moves **both** the first-line indent and hanging indent markers at the same time (this will indent all lines in a paragraph)

To indent using the indent markers

1. Place the **insertion point** anywhere in the paragraph you want to indent, or select one or more paragraphs.




2. Click and drag the desired **indent marker**. In our example, we'll click and drag the left indent marker.

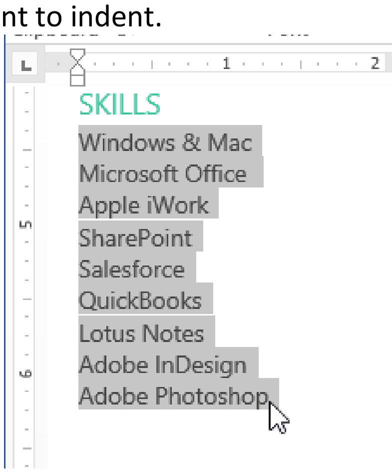



3. Release the mouse. The paragraphs will be indented.

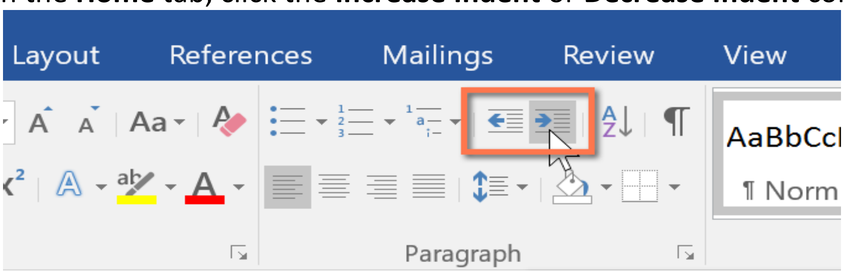

To indent using the Indent commands

If you want to indent multiple lines of text or all lines of a paragraph, you can use the **Indent commands**. The Indent commands will adjust the indent by **1/2-inch increments**.

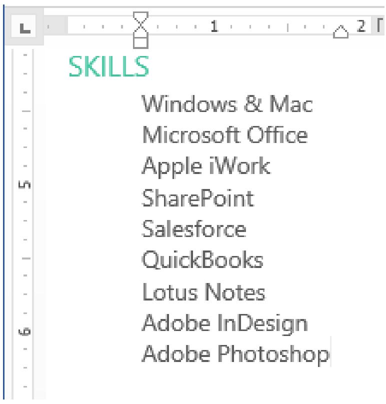
1. Select the text you want to indent.



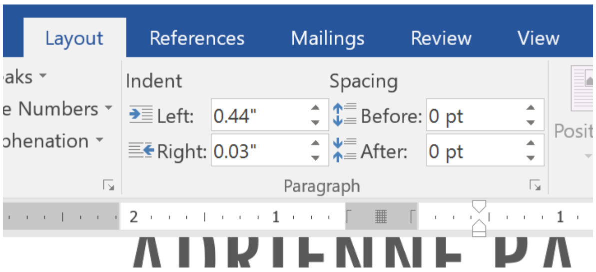

2. On the **Home** tab, click the **Increase Indent** or **Decrease Indent** command.




3. The text will indent.

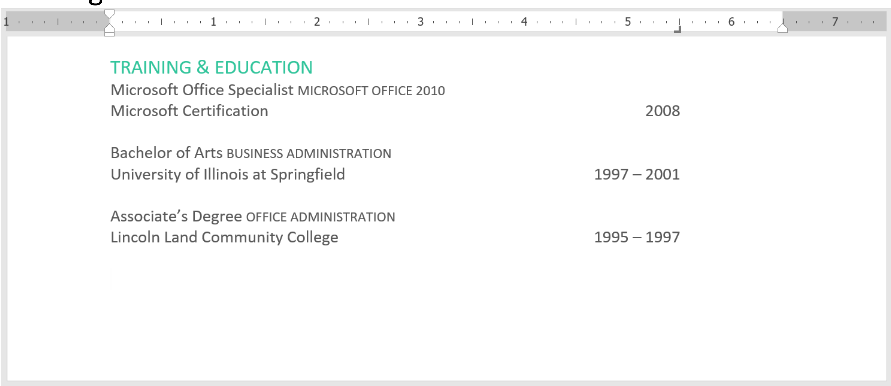



To customize the indent amounts, select the **Layout** tab near the desired values in the boxes under **Indent**.




Tabs

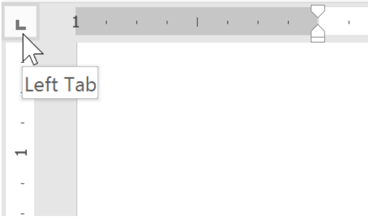
Using **tabs** gives you more control over the placement of text. By default, every time you press the Tab key, the insertion point will move **1/2 inch** to the right. Adding **tab stops** to the **Ruler** allows you to change the size of the tabs, and Word even allows you to apply more than one tab stop to a single line. For example, on a resume you could **left-align** the beginning of a line and **right-align** the end of the line by adding a **Right Tab**, as shown in the image below.




Pressing the Tab key can either add a **tab** or create a **first-line indent**, depending on where the insertion point is. Generally, if the insertion point is at the beginning of an existing paragraph, it will create a first-line indent; otherwise, it will create a tab.

The tab selector

The **tab selector** is located above the **vertical ruler** on the left. Hover the mouse over the tab selector to see the name of the active **tab stop**.



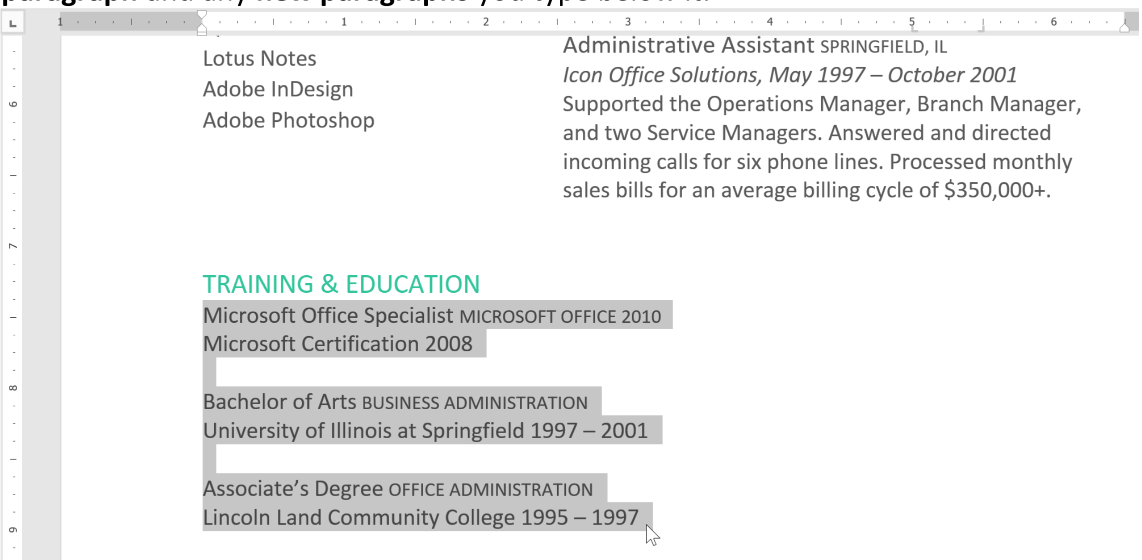

Types of tab stops:

- **Left Tab** left-aligns the text at the tab stop.
- **Center Tab** centers the text around the tab stop.
- **Right Tab** right-aligns the text at the tab stop.
- **Decimal Tab** aligns decimal numbers using the decimal point.
- **Bar Tab** draws a vertical line on the document.
- **First Line Indent** inserts the indent marker on the Ruler and indents the first line of text in a paragraph.
- **Hanging Indent** inserts the hanging indent marker and indents all lines other than the first line.

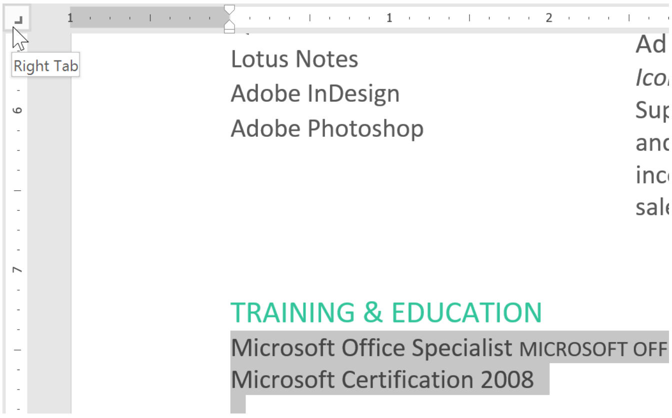
Although **Bar Tab**, **First Line Indent**, and **Hanging Indent** appear on the **tab selector**, they're not technically tabs.

To add tab stops

1. Select the paragraph or paragraphs you want to add tab stops to. If you don't select any paragraphs, the tab stops will apply to the **current paragraph** and any **new paragraphs** you type below it.




2. Click the **tab selector** until the tab stop you want to use appears. In our example, we'll select **Right Tab**.

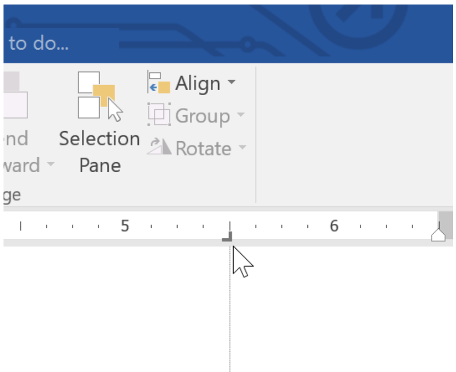



3. Click the **location on the horizontal ruler** where you want your text to appear (it helps to click on the **bottom edge** of the Ruler). You can add as many tab stops as you want.

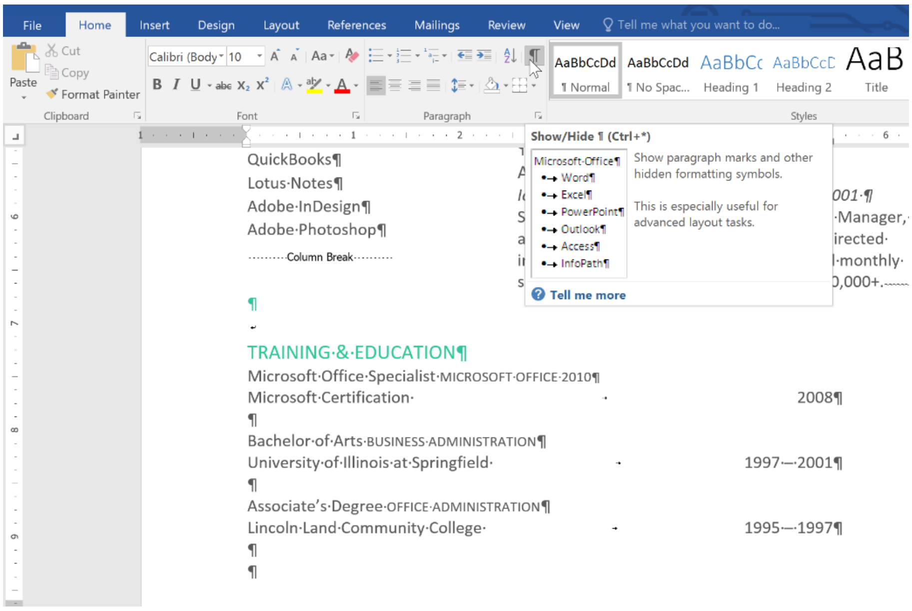

4. Place the **insertion point** in front of the **text** you want to tab, then press the **Tab** key. The text will jump to the next tab stop. In our example, we will move each date range to the tab stop we created.


Removing tab stops

It's a good idea to remove any tab stops you aren't using so they don't get in the way. To remove a tab stop, first select all of the text that uses the tab stop. Then click and drag it off of the Ruler.




Word can also display hidden formatting symbols such as spaces ( ·· ), paragraph marks ( ¶ ), and tabs (→) to help you see the formatting in your document. To show hidden formatting symbols, select the **Home** tab, then click the **Show/Hide** command.




## Lesson 8: Line and Paragraph Spacing

### Introduction

As you design your document and make formatting decisions, you will need to consider line and paragraph spacing. You can increase spacing to improve readability and reduce it to fit more text on the page.

### About line spacing

Line spacing is the space between each line in a paragraph. Word allows you to customize the line spacing to be single spaced (one line high), double spaced (two lines high), or any other amount you want. The default spacing in Word is 1.08 lines, which is slightly larger than single spaced.

In the images below, you can compare different types of line spacing. From left to right, these images show default line spacing, single spacing, and double spacing.

Line spacing is also known as leading (pronounced to rhyme with wedding).

### To format line spacing

Select the text you want to format.

On the Home tab, click the Line and Paragraph Spacing command, then select the desired line spacing.

The line spacing will change in the document.

### Fine tuning line spacing

Your line spacing options aren't limited to the ones in the Line and Paragraph Spacing menu. To adjust spacing with more precision, select Line Spacing Options from the menu to access the Paragraph dialog box. You'll then have a few additional options you can use to customize spacing.

<u>Exactly:</u> When you choose this option, the line spacing is measured in points, just like font size. For example, if you're using 12-point text, you could use 15-point spacing.

<u>At least:</u> Like the exactly option, this lets you choose how many points of spacing you want. However, if you have different sizes of text on the same line, the spacing will expand to fit the larger text.

<u>Multiple:</u> This option lets you type the number of lines of spacing you want. For example, choosing Multiple and changing the spacing to 1.2 will make the text slightly more spread

out than single-spaced text. If you want the lines to be closer together, you can choose a smaller value, like 0.9.

Paragraph spacing

Just as you can format spacing between lines in your document, you can adjust spacing before and after paragraphs. This is useful for separating paragraphs, headings, and subheadings.

To format paragraph spacing:

In our example, we'll increase the space before each paragraph to separate them a bit more. This will make it a little easier to read.

Select the paragraph or paragraphs you want to format.

On the Home tab, click the Line and Paragraph Spacing command. Click Add Space before Paragraph or Remove Space after Paragraph from the drop-down menu. In our example, we'll select Add Space before Paragraph.

The paragraph spacing will change in the document.

From the drop-down menu, you can also select Line Spacing Options to open the Paragraph dialog box. From here, you can control how much space there is before and after the paragraph.

You can use Word's convenient Set as Default feature to save all of the formatting changes you've made and automatically apply them to new documents. To learn how to do this, read our article on Changing Your Default Settings in Word.

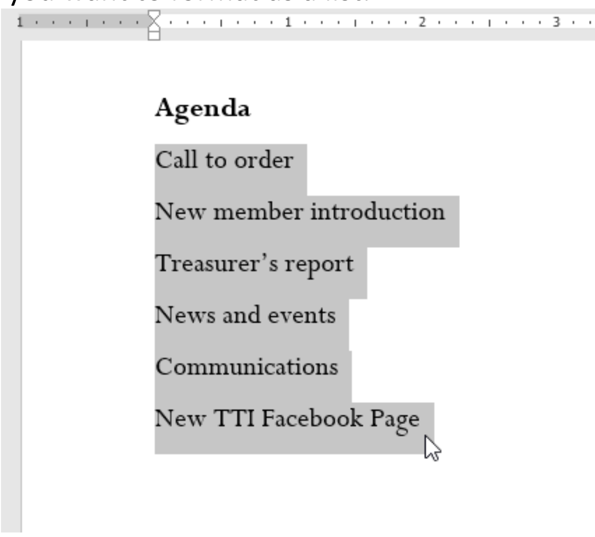
## Lesson 9: Lists

Introduction

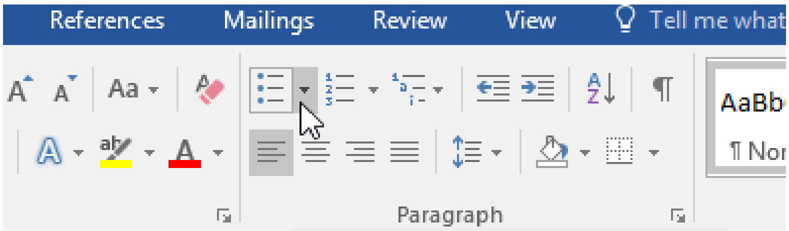
Bulleted and numbered lists can be used in your documents to outline, arrange, and emphasize text. In this lesson, you will learn how to modify existing bullets, insert new bulleted and numbered lists, select symbols as bullets, and format multilevel lists.

To create a bulleted list:

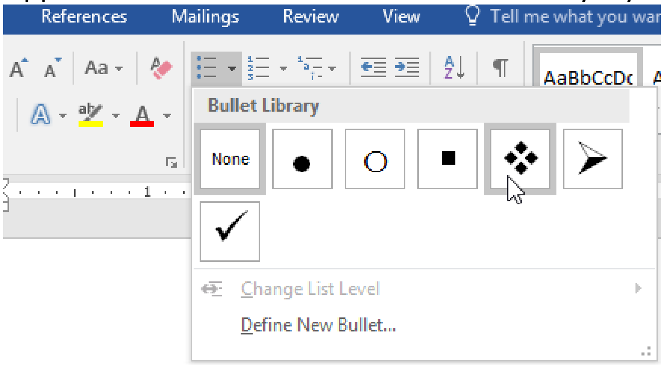
1. Select the text you want to format as a list.



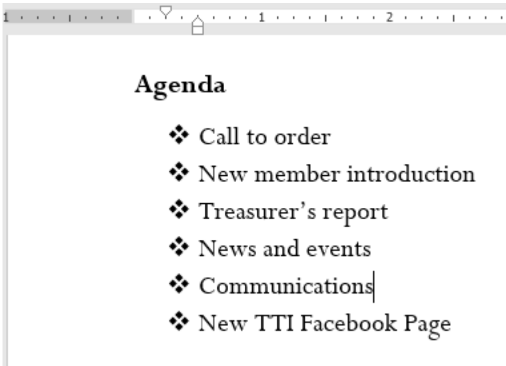

2. On the **Home** tab, click the **drop-down arrow** next to the **Bullets** command. A menu of bullet styles will appear.




3. Move the mouse over the various bullet styles. A live preview of the bullet style will appear in the document. Select the bullet style you want to use.

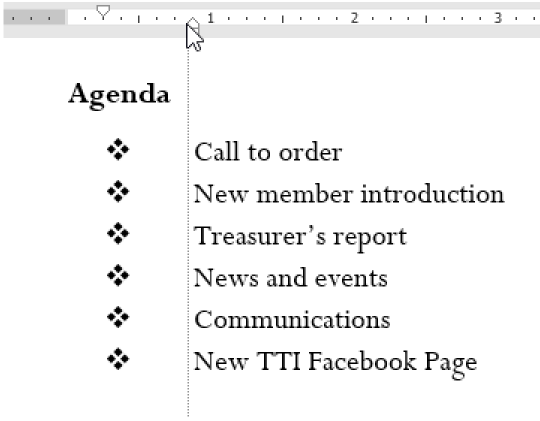



4. The text will be formatted as a bulleted list.




Options for working with lists

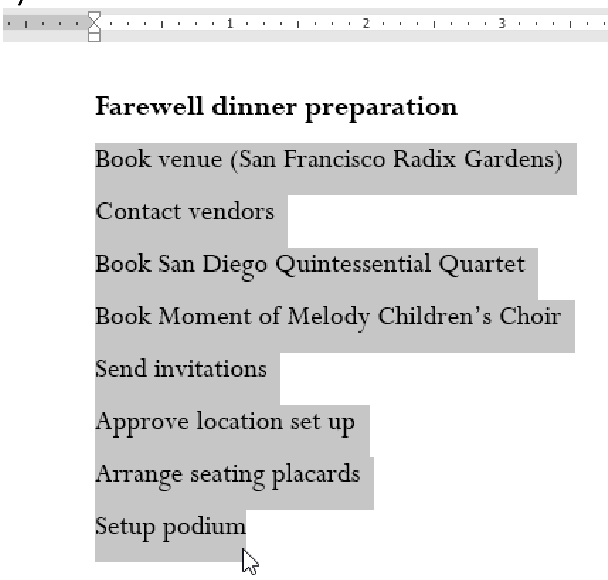
- To remove numbers or bullets from a list, select the list and click the **Bulleted** or **Numbered list** command.
- When you're editing a list you can press **Enter** to start a new line, and the new line will automatically have a bullet or number. When you've reached the end of your list, press **Enter** twice to return to normal formatting.
- By dragging the indent markers on the Ruler, you can customize the indenting of your list and the distance between the text and the bullet or number.



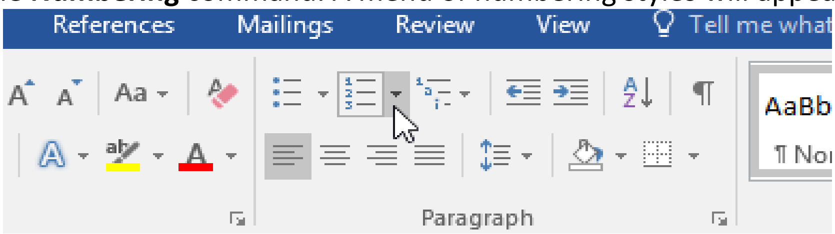

To create a numbered list:

When you need to organize text into a **numbered** list, Word offers several **numbering** options. You can format your list with **numbers**, **letters**, or **Roman numerals**.

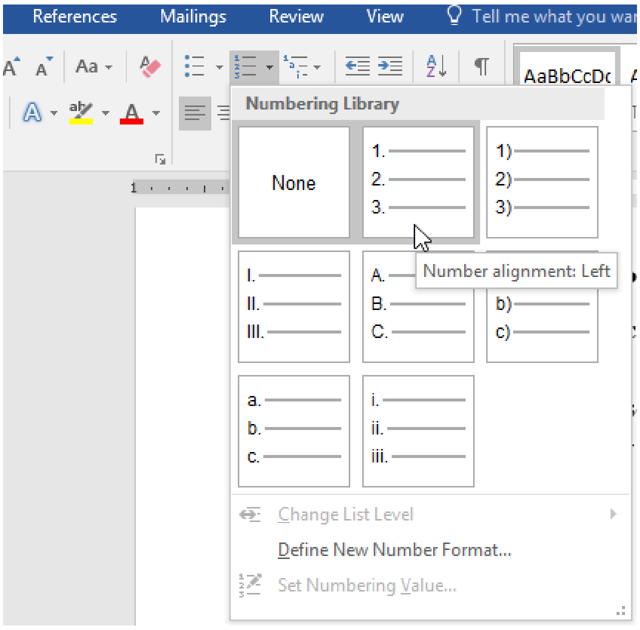
1. Select the text you want to format as a list.



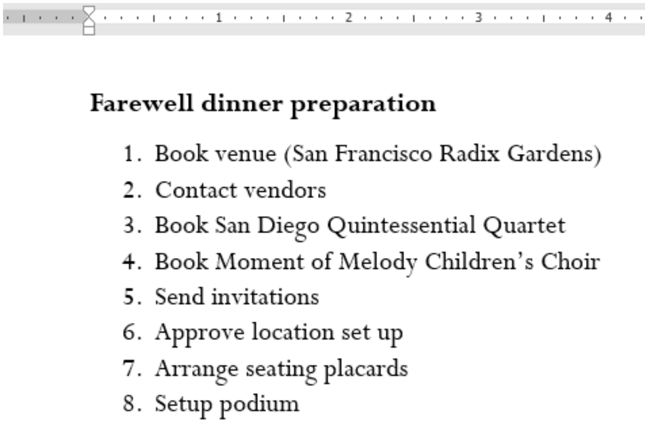

2. On the **Home** tab, click the **drop-down arrow** next to the **Numbering** command. A menu of numbering styles will appear.




3. Move the mouse over the various numbering styles. A live preview of the numbering style will appear in the document. Select the numbering style you want to use.




4. The text will format as a numbered list.



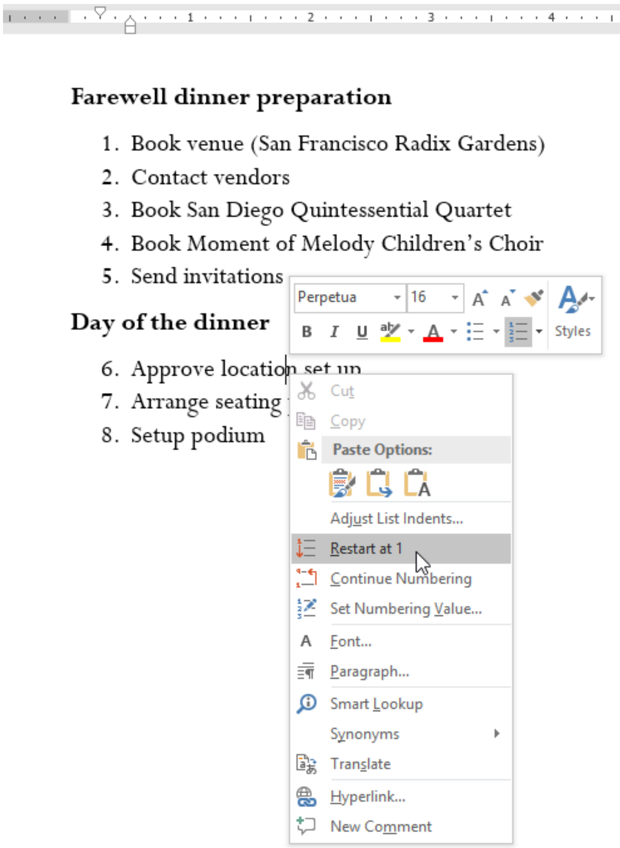
**Farewell dinner preparation**

1. Book venue (San Francisco Radix Gardens)
2. Contact vendors
3. Book San Diego Quintessential Quartet
4. Book Moment of Melody Children's Choir
5. Send invitations
6. Approve location set up
7. Arrange seating placards
8. Setup podium

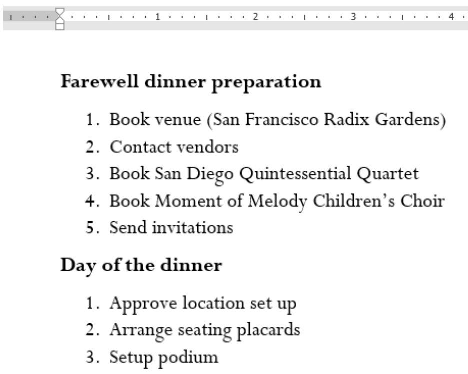
To restart a numbered list:

If you want to restart the numbering of a list, Word has a **Restart at 1** option. It can be applied to **numeric** and **alphabetical** lists.

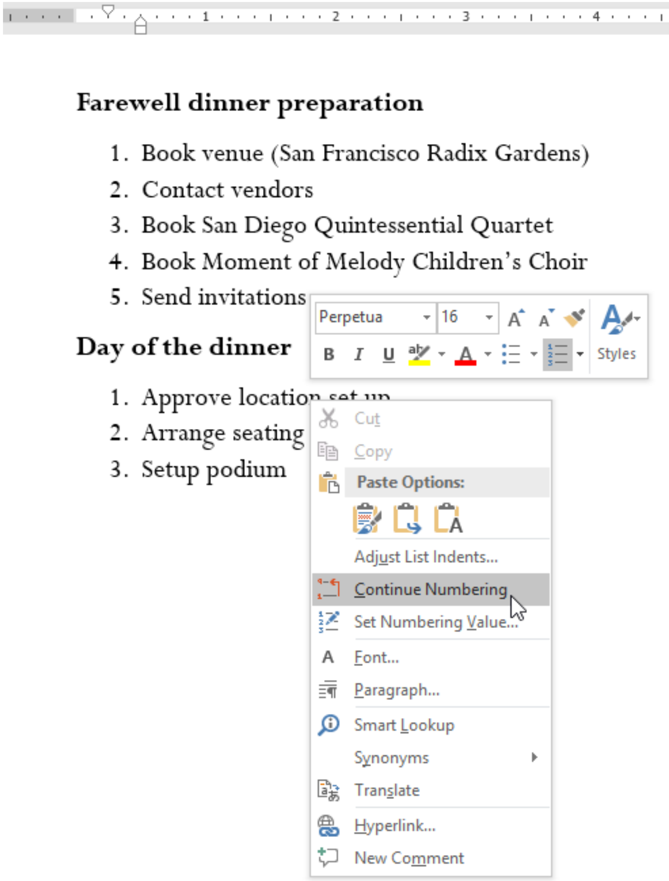
1. Right-click the **list item** you want to restart the numbering for, then select **Restart at 1** from the menu that appears.




2. The list numbering will restart.




You can also set a list to continue numbering from the previous list. To do this, right-click and select **Continue Numbering**.



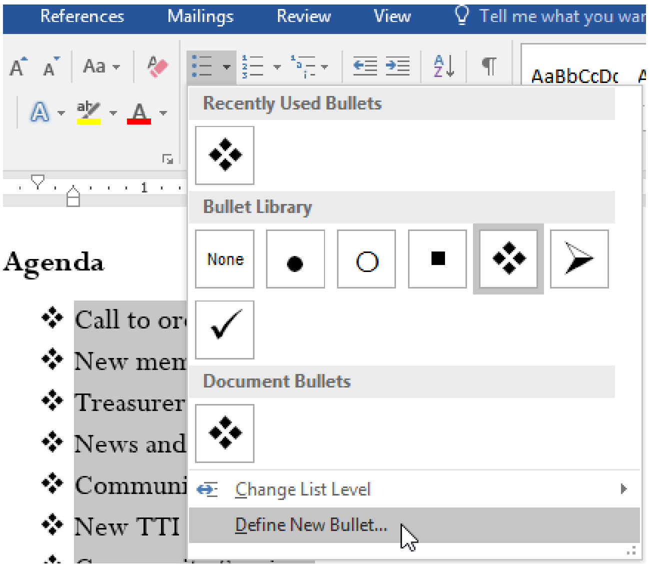

## Customizing bullets

Customizing the look of the bullets in your list can help you emphasize certain list items and personalize the design of your list. Word allows you to format bullets in a variety of ways. You can use **symbols** and different **colors**, or even upload a **picture** as a bullet.

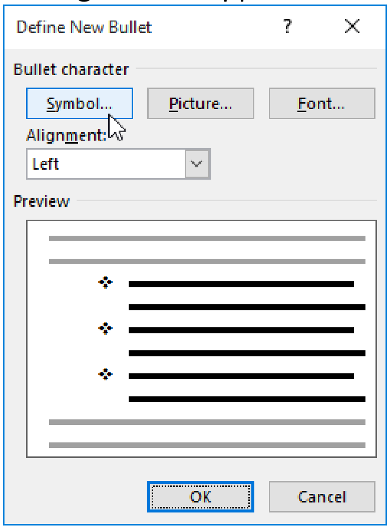
To use a symbol as a bullet:

1. Select an existing list you want to format.

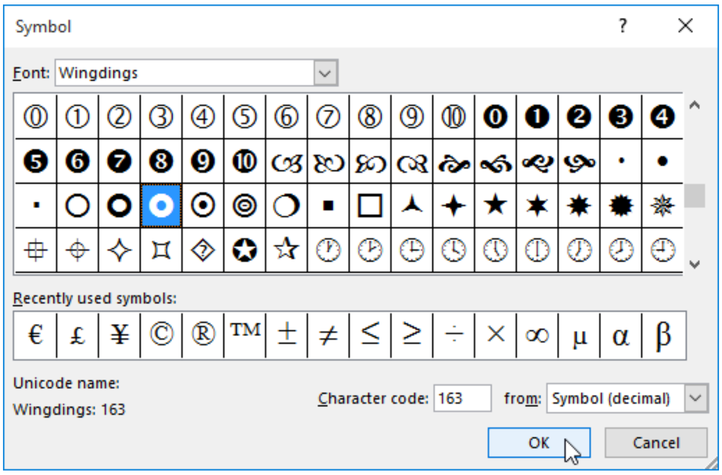
2. On the **Home** tab, click the **drop-down arrow** next to the **Bullets** command. Select **Define New Bullet** from the drop-down menu.



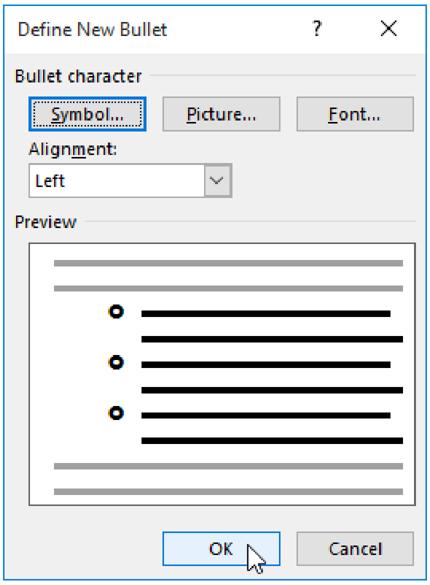

3. The **Define New Bullet** dialog box will appear. Click the **Symbol** button.




4. The **Symbol** dialog box will appear.
5. Click the **Font** drop-down box and select a font.
   The **Wingdings** and **Symbol** fonts are good choices because they have many useful symbols.
6. Select the desired symbol, then click **OK**.




7. The symbol will appear in the Preview section of the Define New Bullet dialog box. Click **OK**.

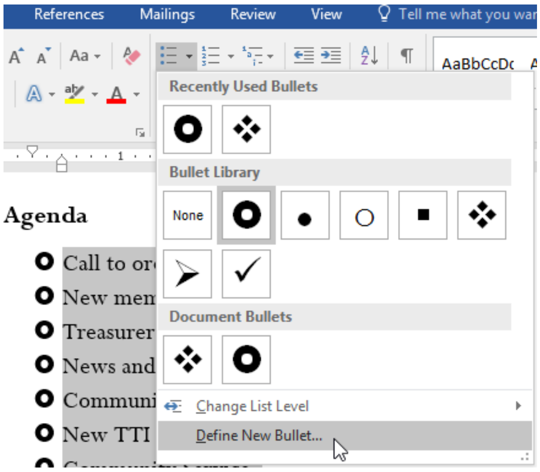



8. The symbol will appear in the list.

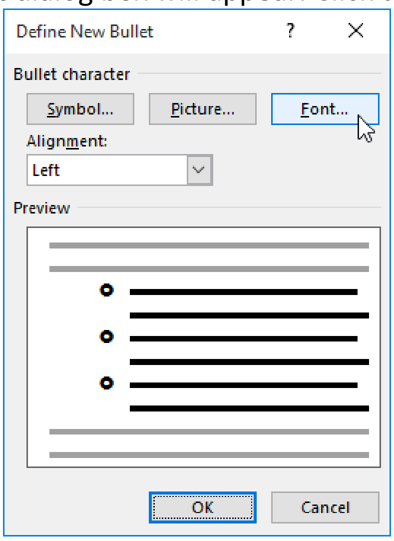

To change the bullet color:

1. Select an existing list you want to format.

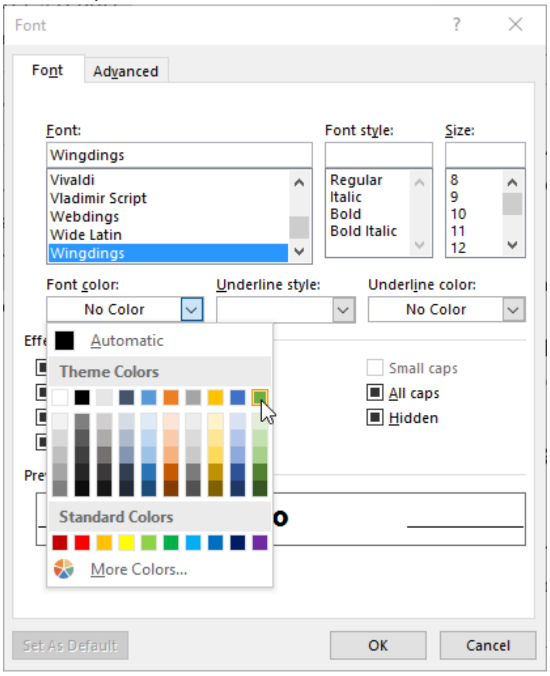

2. On the **Home** tab, click the **drop-down arrow** next to the **Bullets** command. Select **Define New Bullet** from the drop-down menu.



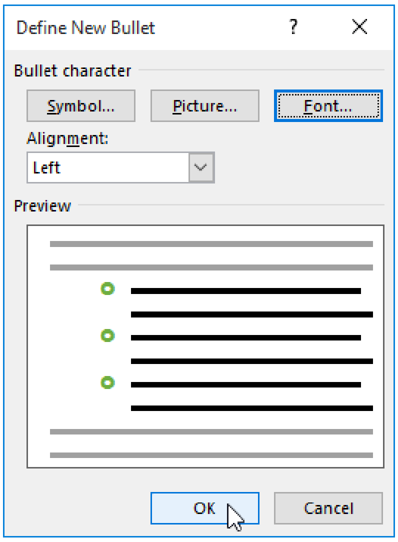

3. The **Define New Bullet** dialog box will appear. Click the **Font** button.



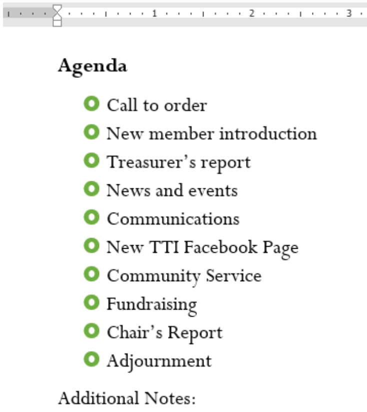
4. The **Font** dialog box will appear. Click the **Font Color** drop-down box. A menu of font colors will appear.
5. Select the desired color, then click **OK**.




6. The bullet color will appear in the Preview section of the Define New Bullet dialog box. Click **OK**.




7. The bullet color will change in the list.



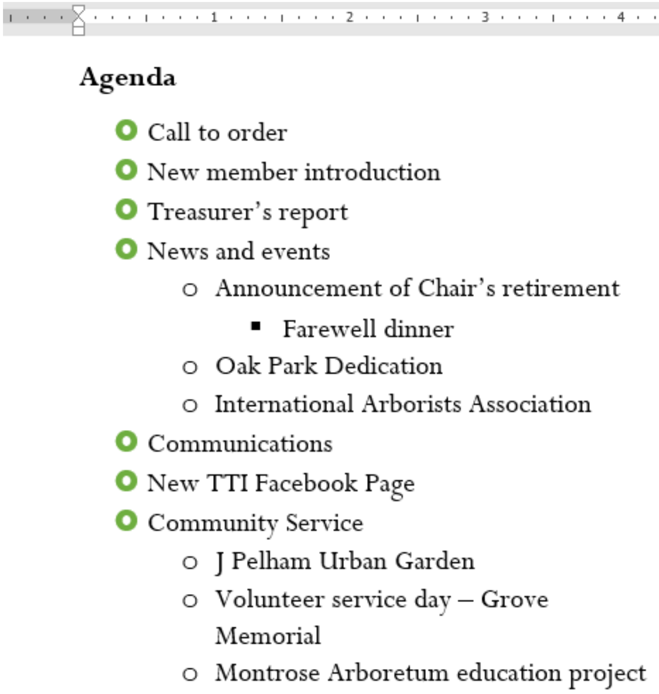
Agenda

- Call to order
- New member introduction
- Treasurer's report
- News and events
- Communications
- New TTI Facebook Page
- Community Service
- Fundraising
- Chair's Report
- Adjournment

Additional Notes:

### Multilevel lists

Multilevel lists allow you to create an **outline** with **multiple levels**. Any bulleted or numbered list can be turned into a multilevel list by using the **Tab** key.

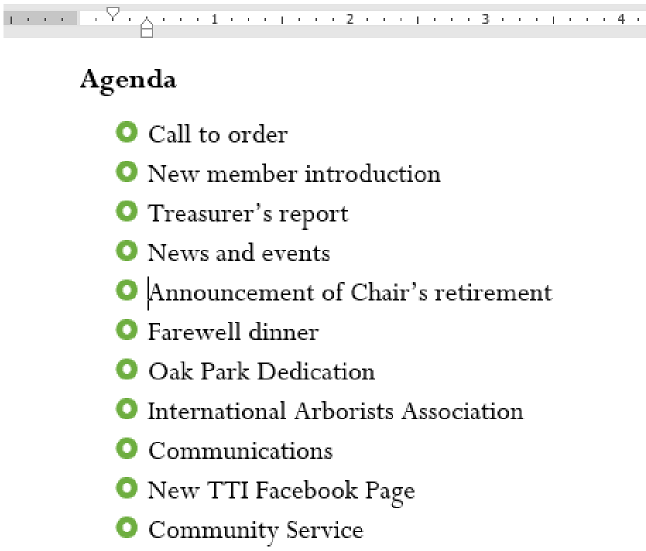


Agenda

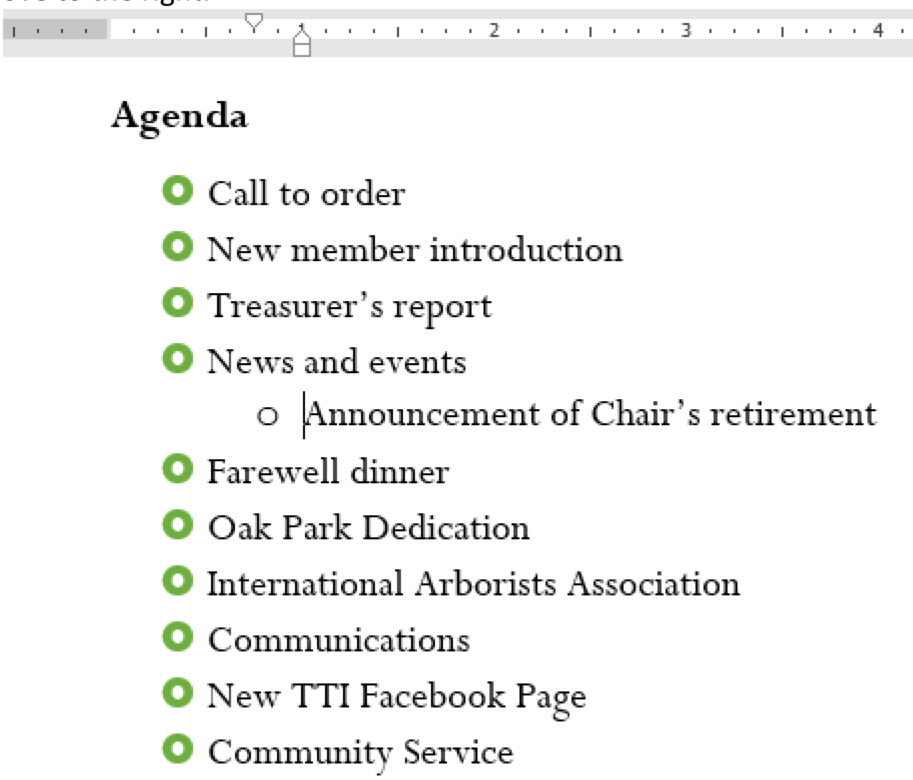
- Call to order
- New member introduction
- Treasurer's report
- News and events
    - Announcement of Chair's retirement
        - Farewell dinner
    - Oak Park Dedication
    - International Arborists Association
- Communications
- New TTI Facebook Page
- Community Service
    - J Pelham Urban Garden
    - Volunteer service day – Grove Memorial
    - Montrose Arboretum education project

### To create a multilevel list:

1. Place the **insertion point** at the beginning of the line you want to move.



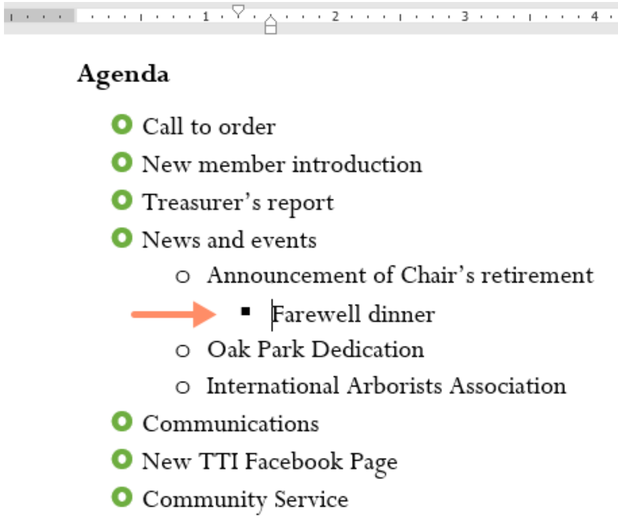

2. Press the **Tab** key to increase the indent level of the line. The line will move to the right.



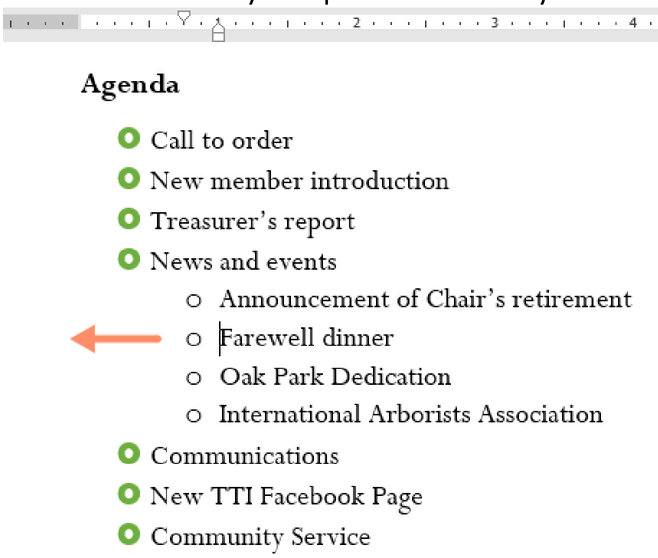

To increase or decrease an indent level:

You can make adjustments to the organization of a multilevel list by increasing or decreasing the indent levels. There are several ways to change the indent level.

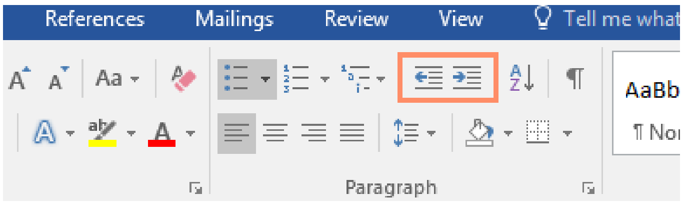
- To **increase** the indent by **more than one** level, place the insertion point at the beginning of the line, then press the **Tab** key until the desired level is reached.



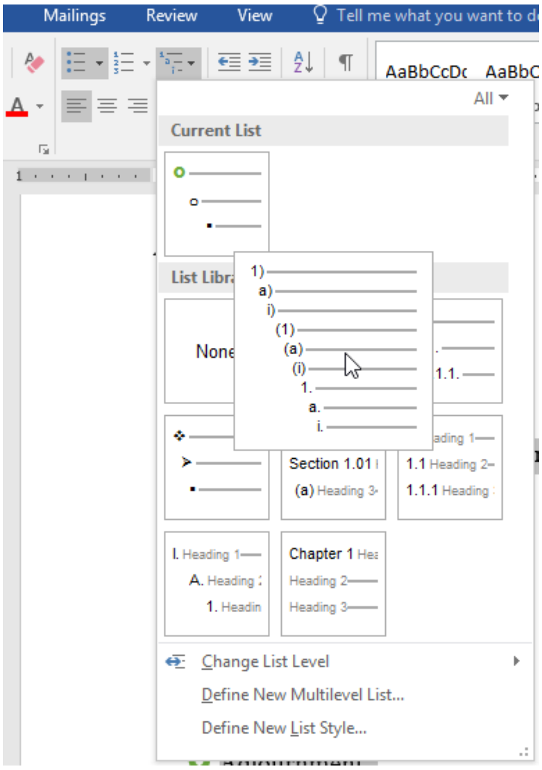

- To **decrease** the indent level, place the insertion point at the beginning of the line, then hold the **Shift** key and press the **Tab** key.




- You can also increase or decrease the levels of text by placing the insertion point anywhere in the line and clicking the **Increase Indent** or **Decrease Indent** commands.




When formatting a multilevel list, Word will use the default bullet style. To change the style of a multilevel list, select the list, then click the **Multilevel list** command on the **Home** tab.




## Lesson 10: Hyperlinks

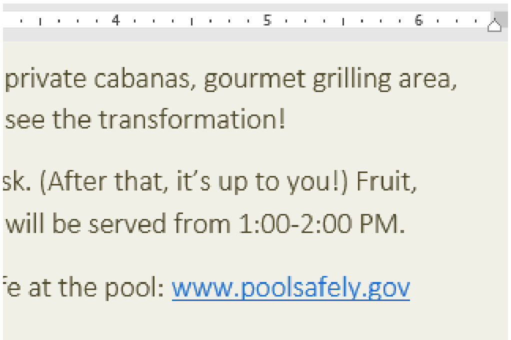
### Introduction

Adding hyperlinks to text can provide access to websites and email addresses directly from your document. There are a few ways to insert a hyperlink into your document. Depending on how you want the link to appear, you can use Word's automatic link formatting or convert text into a link.

### Understanding hyperlinks in Word

Hyperlinks have **two basic parts**: the address (URL) of the webpage and the **display text**. For example, the address could be **http://www.popsci.com**, and the display text could be **Popular Science Magazine**. When you create a hyperlink in Word, you'll be able to choose both the address and the display text.

Word often recognizes email and web addresses as you type and will automatically format them as hyperlinks after you press **Enter** or the **spacebar**. In the image below, you can see a hyperlinked web address.

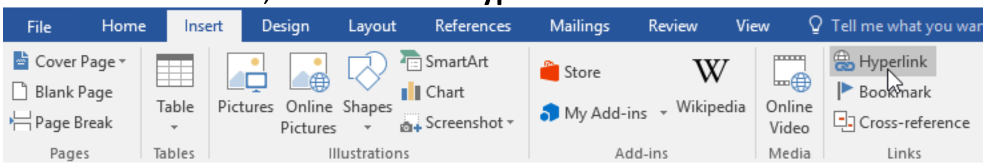



To follow a hyperlink in Word, hold the **Ctrl** key and click the **hyperlink**.


To format text with a hyperlink:

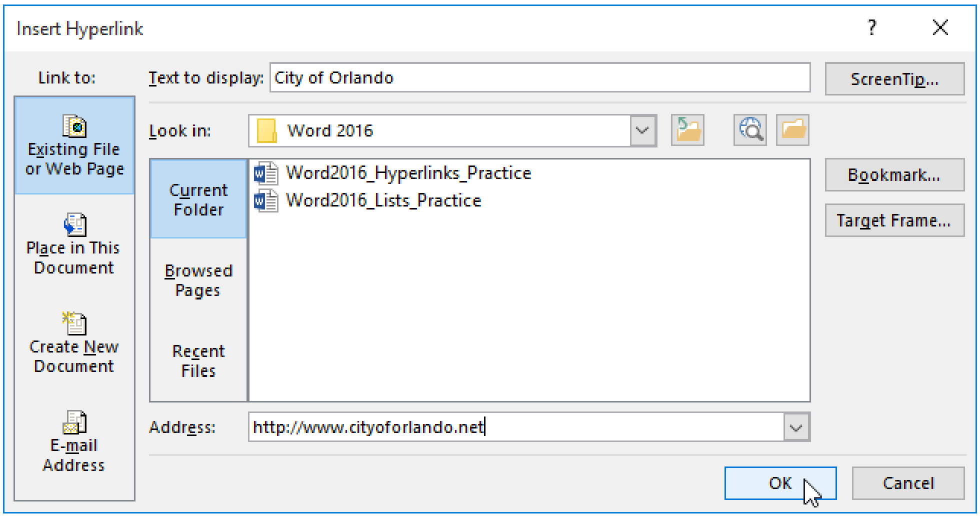
1. Select the text you want to format as a hyperlink.


2. Select the **Insert** tab, then click the **Hyperlink** command.

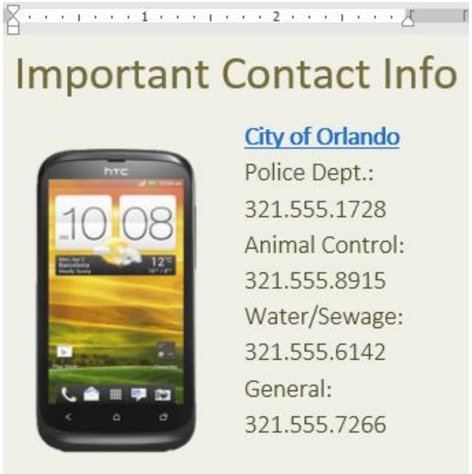



   Alternatively, you can open the Insert Hyperlink dialog box by right-clicking the selected text and selecting **Hyperlink...** from the menu that appears.

3. The **Insert Hyperlink** dialog box will appear. Using the options on the left side, you can choose to link to a **file**, **webpage**, **email address**, **document**, or a **place in the current document**.
4. The selected text will appear in the **Text to display:** field at the top. You can change this text if you want.
5. In the **Address**: field, type the address you want to link to, then click **OK**.



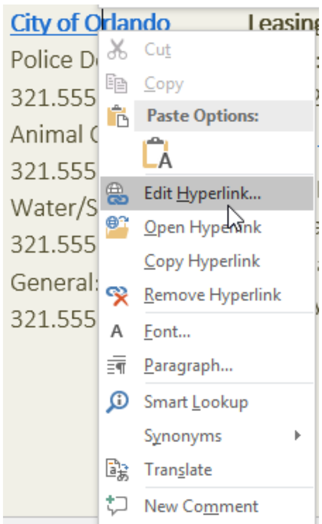

6. The text will then be formatted as a hyperlink.



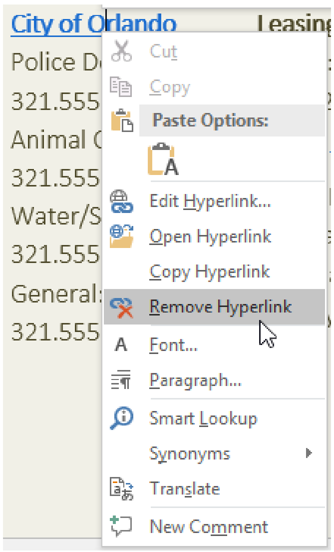

After you create a hyperlink, you should **test** it. If you've linked to a website, your web browser should automatically open and display the site. If it doesn't work, check the hyperlink address for misspellings.

Editing and removing hyperlinks

Once you've inserted a hyperlink, you can right-click the hyperlink to **edit**, **open**, **copy**, or **remove** it.



To remove a hyperlink, right-click the hyperlink and select **Remove Hyperlink** from the menu that appears.




## Lesson 11: Layout and Printing

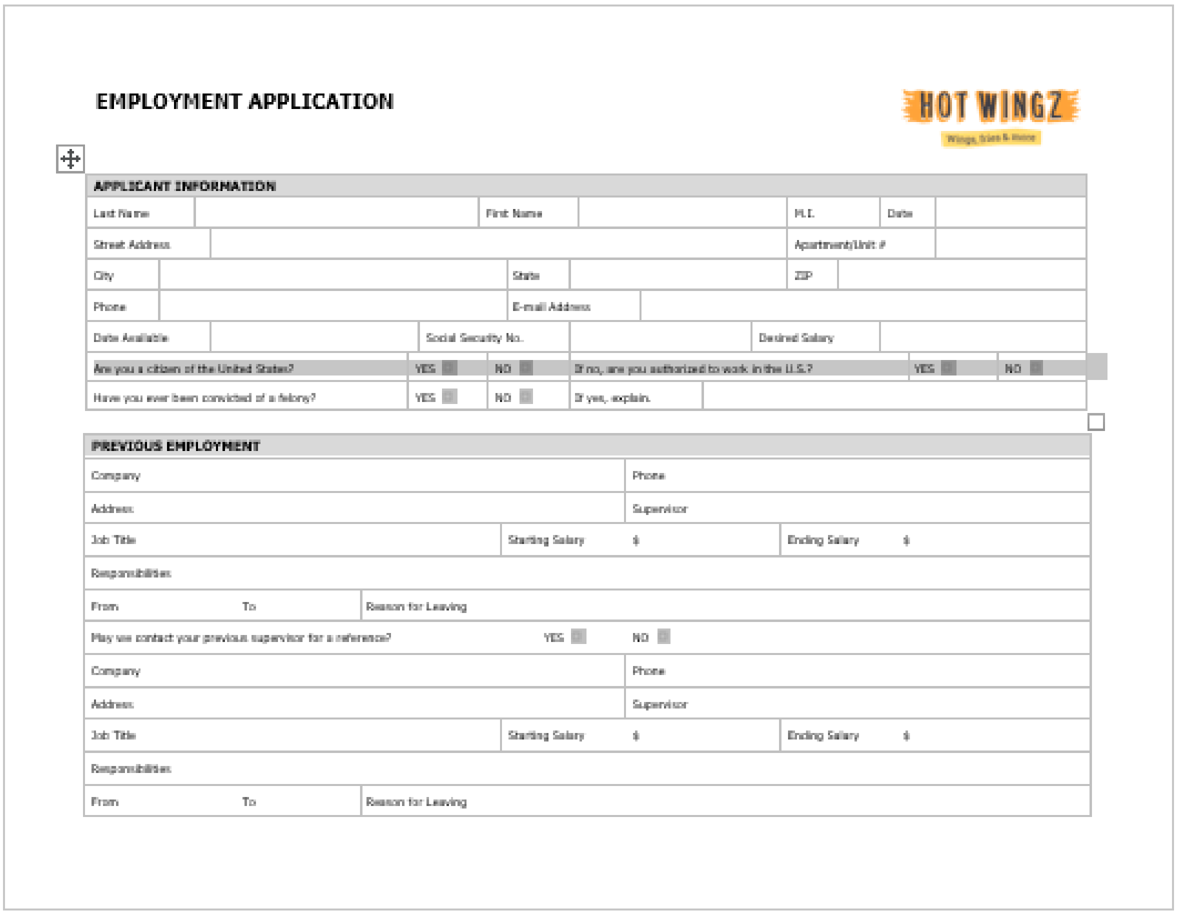
### Page Layout

Word offers a variety of page layout and formatting options that affect how content appears on the page. You can customize the page orientation, paper size, and page margins depending on how you want your document to appear.

### Page orientation

Word offers two page orientation options: **landscape** and **portrait**. Compare our example below to see how orientation can affect the appearance and spacing of text and images.

- Landscape means the page is oriented **horizontally**.



EMPLOYMENT APPLICATION

HOT WINGZ

| APPLICANT INFORMATION | | | | | | | |
|---|---|---|---|---|---|---|---|
| Last Name | | First Name | | M.I. | | Date | |
| Street Address | | | | Apartment/Unit # | | | |
| City | | State | | ZIP | | | |
| Phone | | E-mail Address | | | | | |
| Date Available | | Social Security No. | | Desired Salary | | | |
| Are you a citizen of the United States? | YES | NO | If no, are you authorized to work in the U.S.? | YES | NO | | |
| Have you ever been convicted of a felony? | YES | NO | If yes, explain. | | | | |

| PREVIOUS EMPLOYMENT | | | |
|---|---|---|---|
| Company | | Phone | |
| Address | | Supervisor | |
| Job Title | Starting Salary | $ | Ending Salary $ |
| Responsibilities | | | |
| From | To | Reason for Leaving | |
| May we contact your previous supervisor for a reference? | YES | NO | |
| Company | | Phone | |
| Address | | Supervisor | |
| Job Title | Starting Salary | $ | Ending Salary $ |
| Responsibilities | | | |
| From | To | Reason for Leaving | |

- Portrait means the page is oriented **vertically**.

EMPLOYMENT APPLICATION

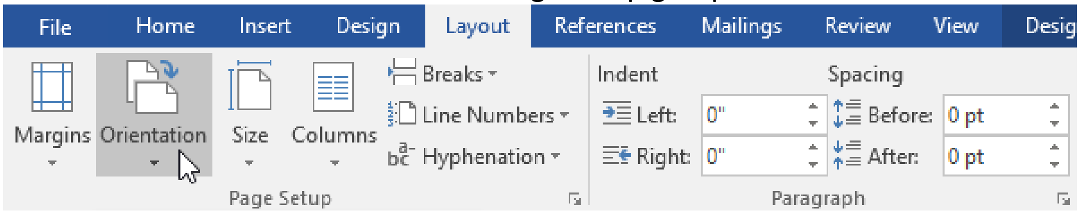
HOT WINGZ

| APPLICANT INFORMATION | | | | | | | |
|---|---|---|---|---|---|---|---|
| Last Name | | First Name | | M.I. | | Date | |
| Street Address | | | | Apartment/Unit # | | | |
| City | | State | | ZIP | | | |
| Phone | | E-mail Address | | | | | |
| Date Available | | Social Security No. | | Desired Salary | | | |
| Are you a citizen of the United States? | YES | NO | If no, are you authorized to work in the U.S.? | YES | NO | | |
| Have you ever been convicted of a felony? | YES | NO | If yes, explain. | | | | |

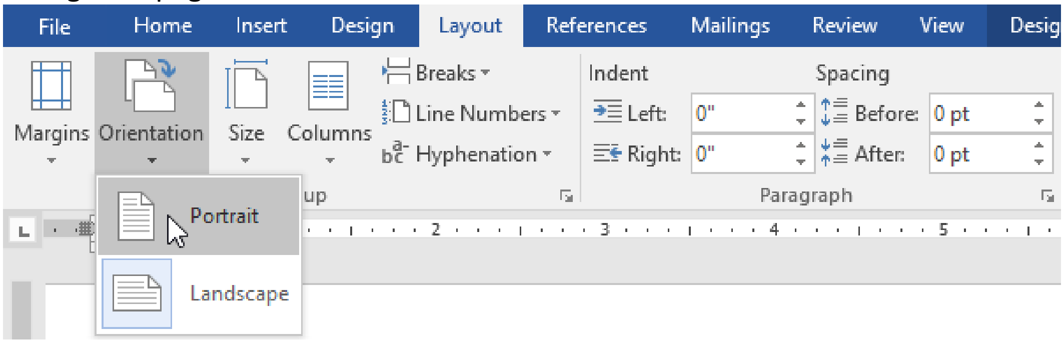
| PREVIOUS EMPLOYMENT | | | |
|---|---|---|---|
| Company | | Phone | |
| Address | | Supervisor | |
| Job Title | Starting Salary | $ | Ending Salary $ |
| Responsibilities | | | |
| From | To | Reason for Leaving | |
| May we contact your previous supervisor for a reference? | YES | NO | |
| Company | | Phone | |
| Address | | Supervisor | |
| Job Title | Starting Salary | $ | Ending Salary $ |
| Responsibilities | | | |
| From | To | Reason for Leaving | |
| May we contact your previous supervisor for a reference? | YES | NO | |
| Company | | Phone | |
| Address | | Supervisor | |
| Job Title | Starting Salary | $ | Ending Salary $ |
| Responsibilities | | | |
| From | To | Reason for Leaving | |
| May we contact your previous supervisor for a reference? | YES | NO | |

**To change page orientation:**

1. Select the **Layout** tab.
2. Click the **Orientation** command in the Page Setup group.




3. A drop-down menu will appear. Click either **Portrait** or **Landscape** to change the page orientation.




4. The page orientation of the document will be changed.

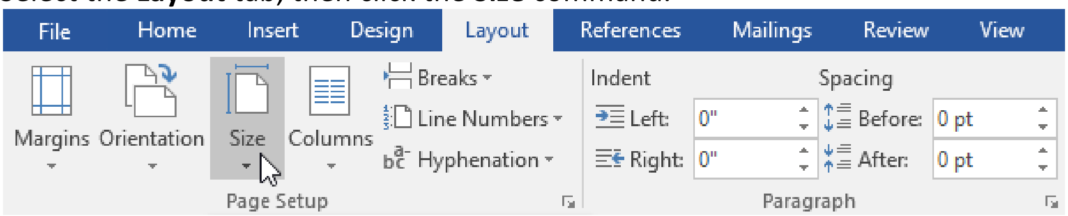
Page size

By default, the **page size** of a new document is 8.5 inches by 11 inches. Depending on your project, you may need to adjust your document's page size. It's important to note that before modifying the default page size, you should check to see which page sizes your printer can accommodate.

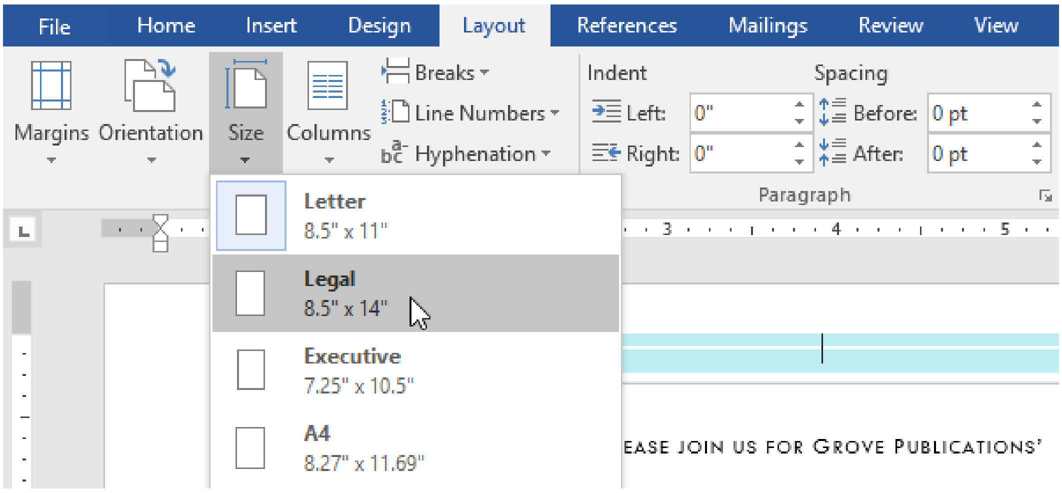
To change the page size:

Word has a variety of **predefined page sizes** to choose from.

1. Select the **Layout** tab, then click the **Size** command.




2. A drop-down menu will appear. The current page size is highlighted. Click the desired **predefined page size**.

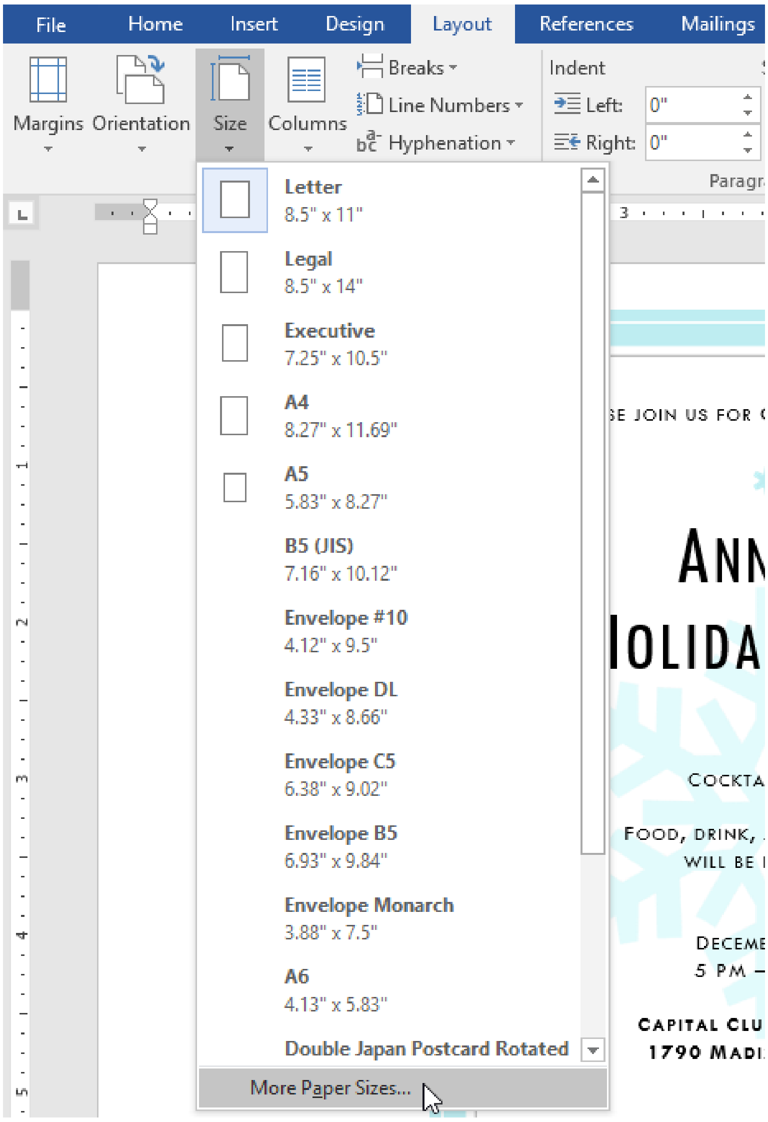



3. The page size of the document will be changed.

To use a custom page size:

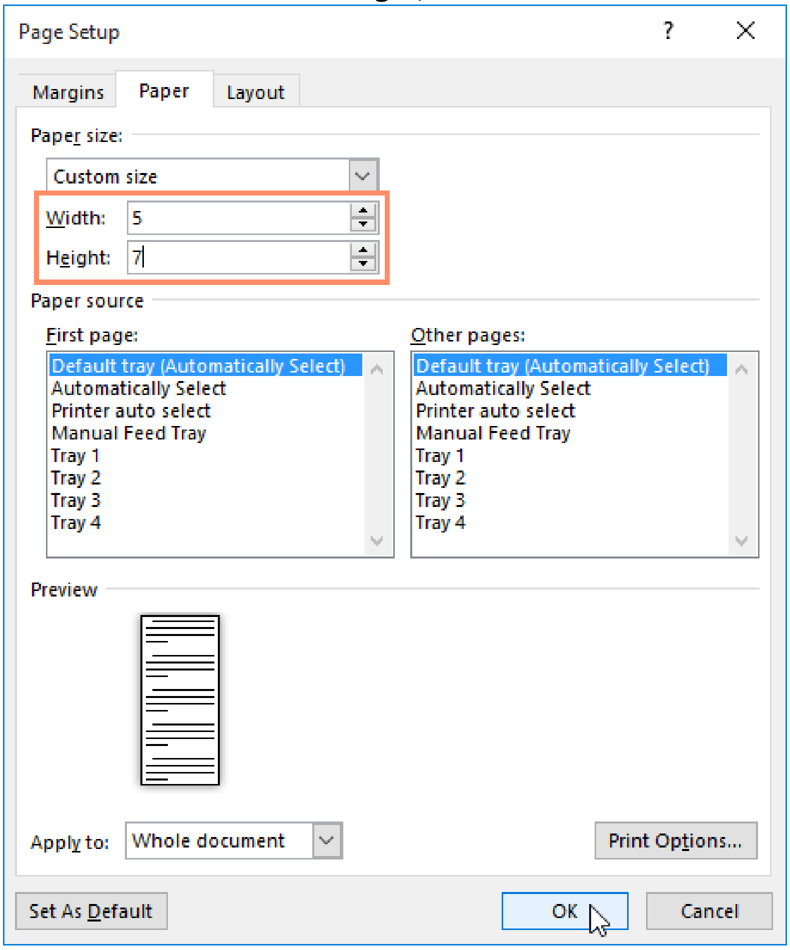
Word also allows you to customize the page size in the **Page Setup** dialog box.

1. From the **Layout** tab, click **Size**. Select **More Paper Sizes** from the drop-down menu.




2. The **Page Setup** dialog box will appear.

3. Adjust the values for **Width** and **Height**, then click **OK**.




4. The page size of the document will be changed.

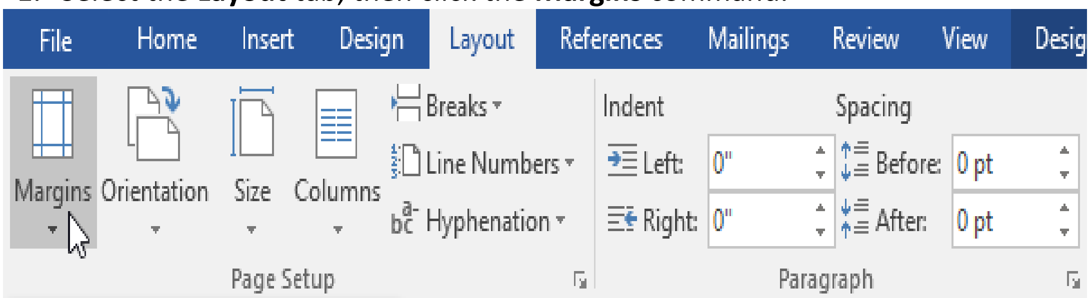
Page margins

A **margin** is the **space** between the text and the edge of your document. By default, a new document's margins are set to **Normal**, which means it has a one-inch space between the text and each edge. Depending on your needs, Word allows you to change your document's margin size.

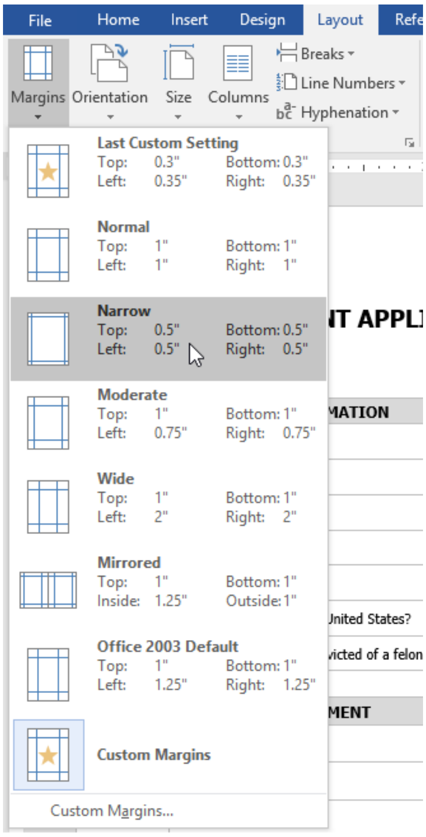
To format page margins:

Word has a variety of **predefined margin sizes** to choose from.

1. Select the **Layout** tab, then click the **Margins** command.




2. A drop-down menu will appear. Click the **predefined margin size** you want.

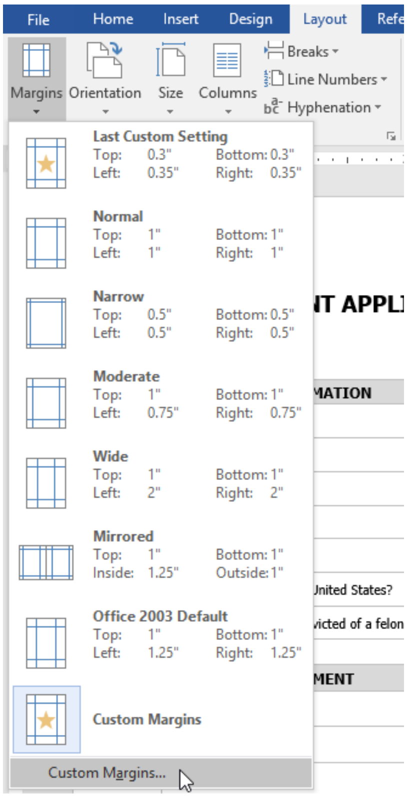



3. The margins of the document will be changed.

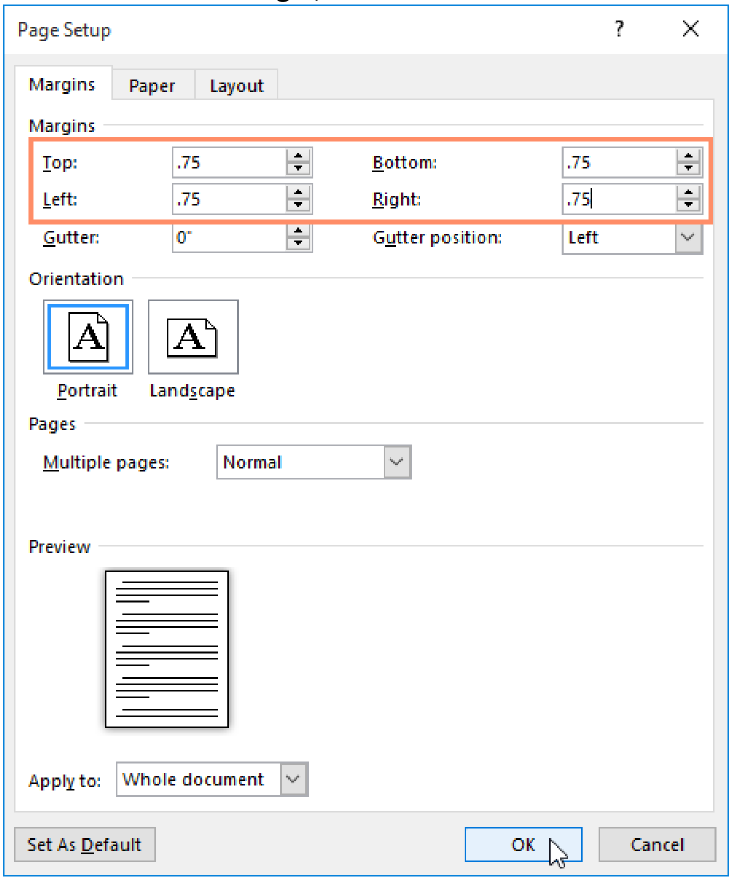
To use custom margins:

Word also allows you to customize the size of your margins in the **Page Setup** dialog box.

1. From the **Layout** tab, click **Margins**. Select **Custom Margins** from the drop-down menu.

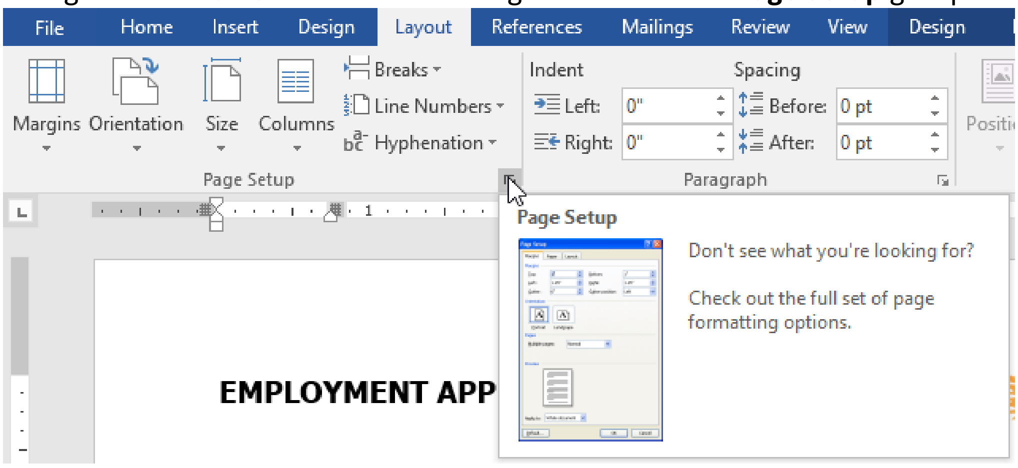


2. The **Page Setup** dialog box will appear.
3. Adjust the values for each margin, then click **OK**.




4. The margins of the document will be changed.

Alternatively, you can open the Page Setup dialog box by navigating to the Layout tab and clicking the small **arrow** in the bottom-right corner of the **Page Setup** group.



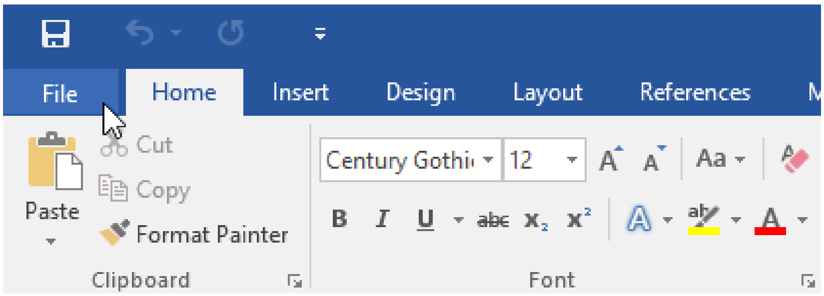

You can use Word's convenient **Set as Default** feature to **save** all of the **formatting** changes you've made and automatically apply them to new documents.

Printing Documents

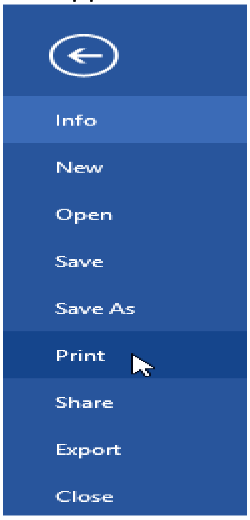
Once you've created your document, you may want to print it to view and share your work offline. It's easy to preview and print a document in Word using the Print pane.

To access the Print pane:

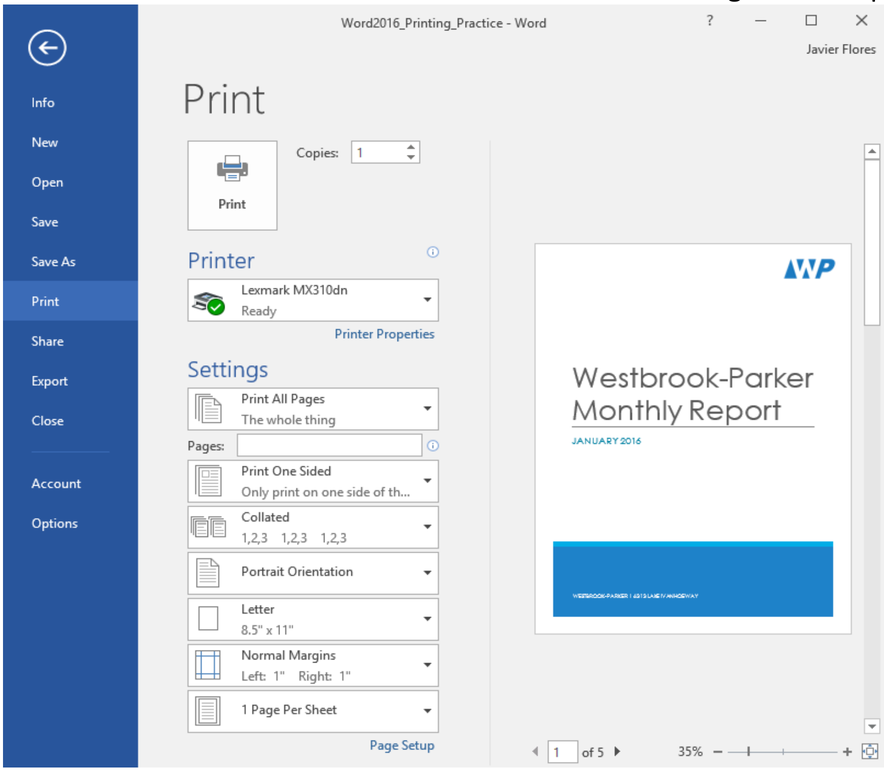
1. Select the **File** tab. **backstage view** will appear.




2. Select **Print**. The **Print** pane will appear.



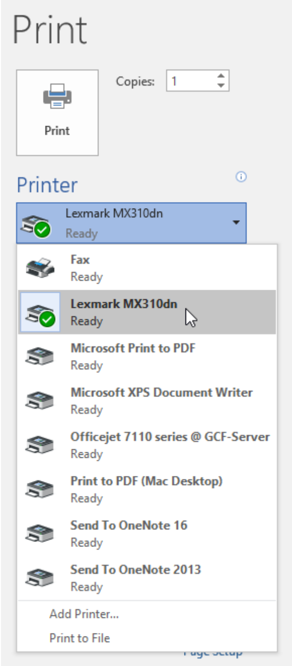

Click the buttons in the interactive below to learn more about using the Print pane.



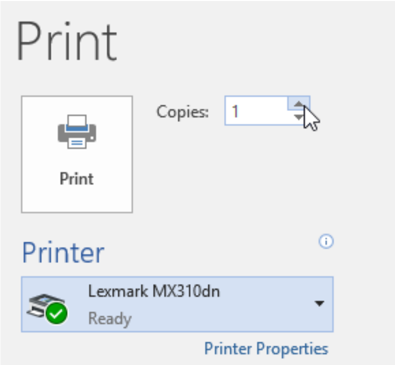

You can also access the Print pane by pressing **Ctrl+P** on your keyboard.

To print a document:

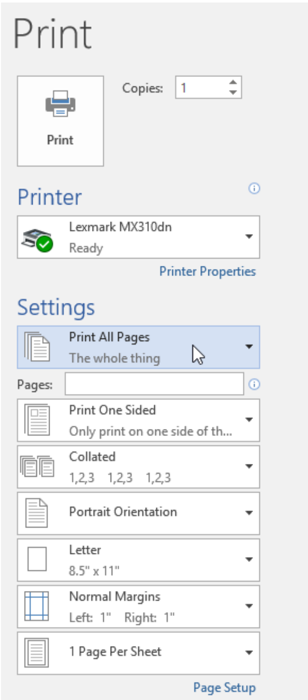
1. Navigate to the **Print** pane, then select the desired **printer**.



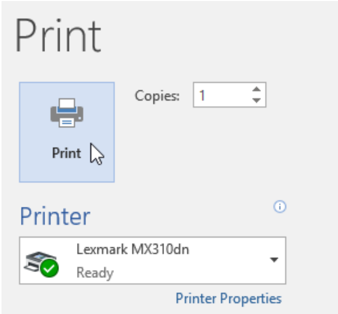

2. Enter the number of **copies** you want to print.




3. Select any additional **settings** if needed.



4. Click **Print**.



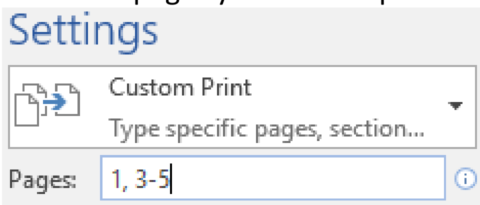

Custom printing

Sometimes you may find it unnecessary to print your entire document, in which case **custom printing** may be more suited for your needs. Whether you're printing **several individual pages** or a **range of pages**, Word allows you to **specify** exactly which pages you'd like to print.

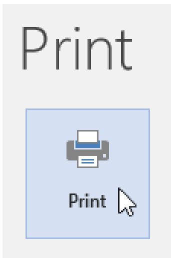
To custom print a document:

If you'd like to print individual pages or page ranges, you'll need to separate each entry with a **comma** (1, 3, 5-7, or 10-14 for example).

1. Navigate to the **Print** pane.
2. In the **Pages:** field, enter the pages you want to print.




3. Click **Print**.




If your document isn't printing the way you want, you may need to adjust some of the page layout settings.

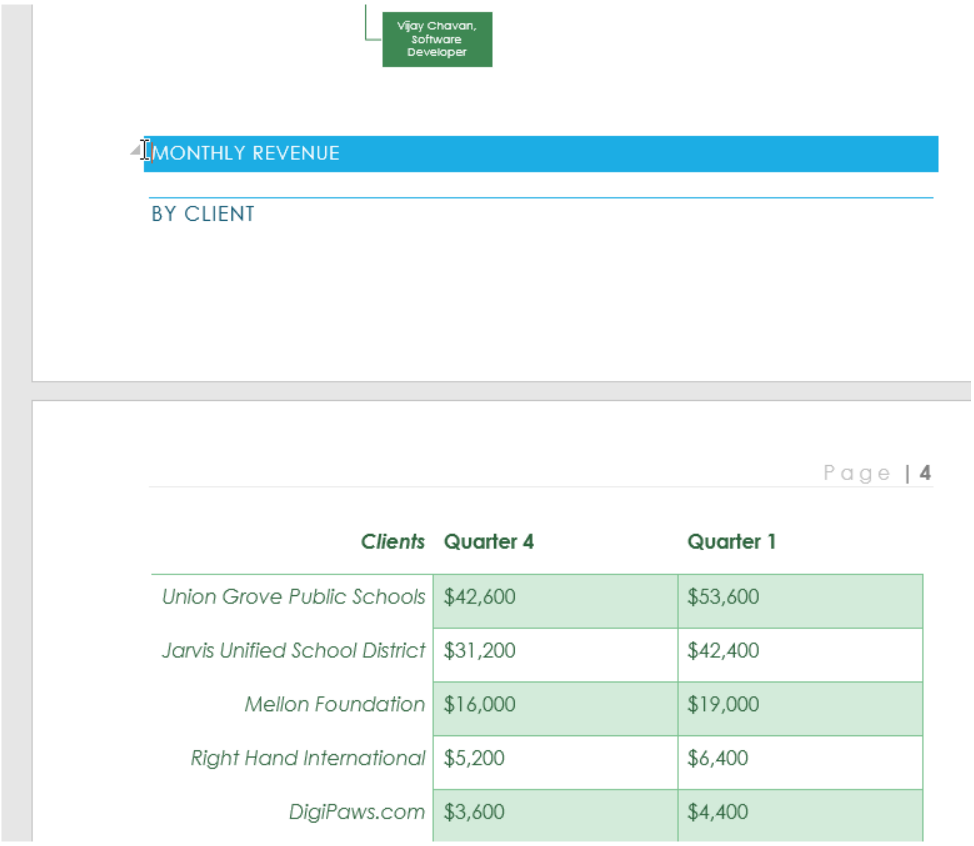
Breaks

When you're working on a multi-page document, there may be times when you want to have more control over how exactly the text flows. Breaks can be helpful in these cases. There are many types of breaks to choose from depending on what you need, including page breaks, section breaks, and column breaks.

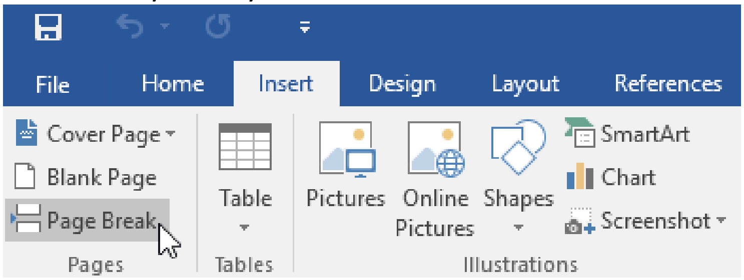
To insert a page break:

In our example, the section headers on page three (**Monthly Revenue** and **By Client**) are separated from the table on the page below. And while we could just press **Enter** until that text reaches the top of page four, it could easily be shifted around if we added or deleted something in another part of the document. Instead, we'll insert a **page break**.

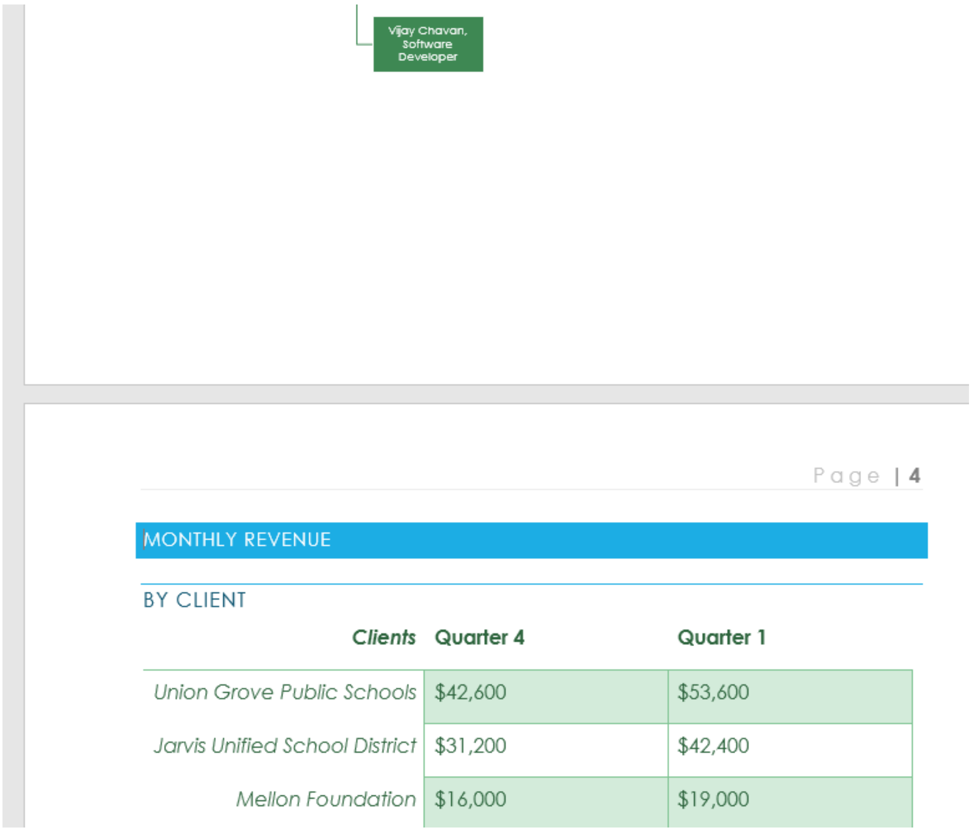
1. Place the **insertion point** where you want to create the page break. In our example, we'll place it at the beginning of our headings.



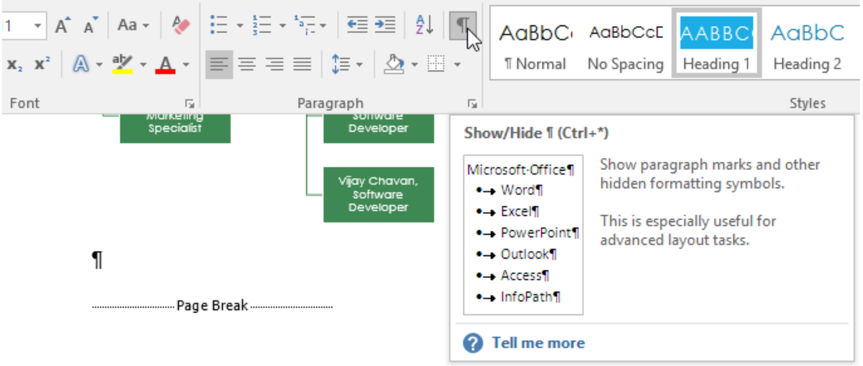

2. On the **Insert** tab, click the **Page Break** command. Alternatively, you can press **Ctrl+Enter** on your keyboard.




3. The page break will be inserted into the document, and the text will move to the next page.



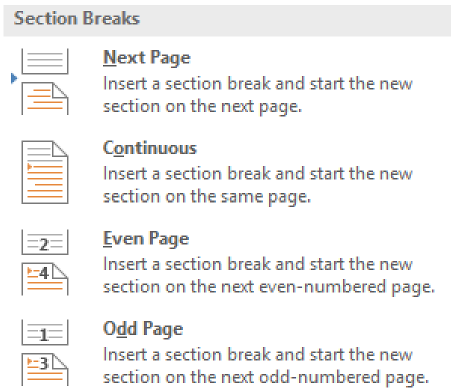

By default, breaks are **invisible**. If you want to see the breaks in your document, click the **Show/Hide** command on the **Home** tab.




## Section breaks

**Section breaks** create a **barrier** between different parts of a document, allowing you to format each section independently. For example, you may want one section to have two columns without adding columns to the entire document. Word offers several types of section breaks.

- **Next Page**: This option inserts a section break and moves text after the break to the next page of the document.
- **Continuous**: This option inserts a section break and allows you to continue working on the same page.
- **Even Page** and **Odd Page**: These options add a section break and move the text after the break to the next even or odd page. These options may be useful when you need to begin a new section on an even or odd page (for example, a new chapter of a book).




To insert a section break:

In our example, we'll add a section break to separate a paragraph from a two-column list.

1. Place the **insertion point** where you want to create the break. In our example, we'll place it at the beginning of the paragraph we want to separate from two-column formatting.

Page | 5

CLIENTS OVERVIEW

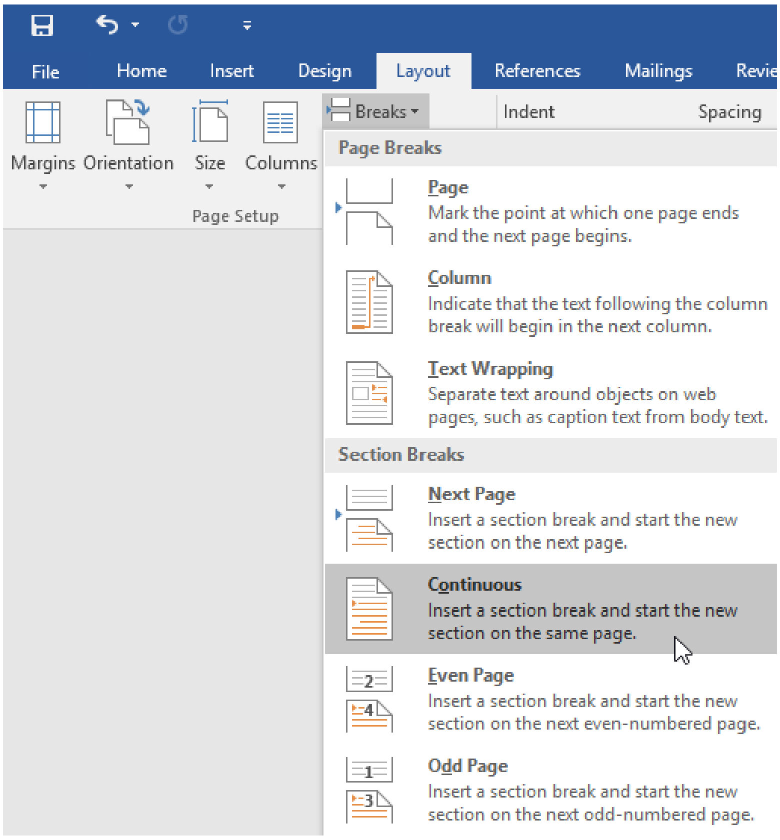
The company added 13 new clients to its roster between December 2015 and January 2016.

NEW CLIENTS

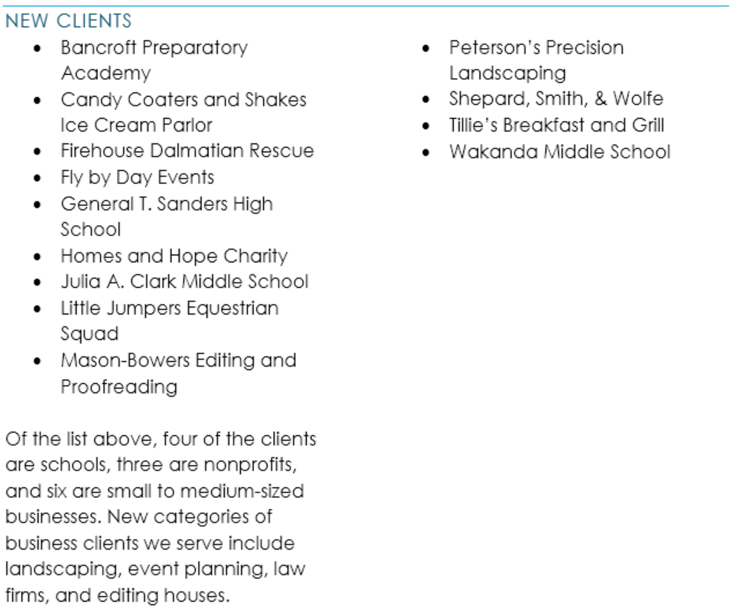
- Bancroft Preparatory Academy
- Candy Coaters and Shakes Ice Cream Parlor
- Firehouse Dalmatian Rescue
- Fly by Day Events
- General T. Sanders High School
- Homes and Hope Charity
- Julia A. Clark Middle School
- Little Jumpers Equestrian Squad
- Mason-Bowers Editing and Proofreading
- Peterson's Precision Landscaping
- Shepard, Smith, & Wolfe
- Tillie's Breakfast and Grill
- Wakanda Middle School

Of the list above, four of the clients are schools, three are nonprofits, and six are small to medium-sized businesses. New categories of business clients we serve include landscaping, event planning, law firms, and editing houses.

2. On the **Page Layout** tab, click the **Breaks** command, then select the desired section break from the drop-down menu. In our example, we'll select **Continuous** so our paragraph remains on the same page as the columns.



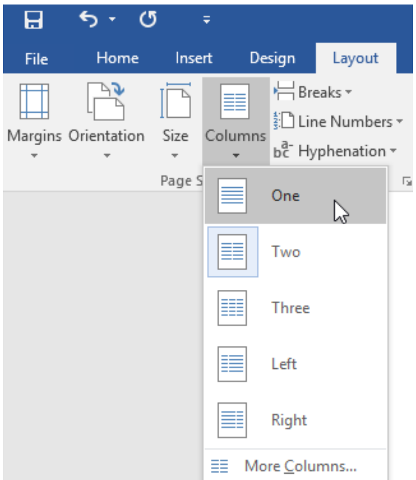

3. A section break will appear in the document.


NEW CLIENTS

- Bancroft Preparatory Academy
- Candy Coaters and Shakes Ice Cream Parlor
- Firehouse Dalmatian Rescue
- Fly by Day Events
- General T. Sanders High School
- Homes and Hope Charity
- Julia A. Clark Middle School
- Little Jumpers Equestrian Squad
- Mason-Bowers Editing and Proofreading
- Peterson's Precision Landscaping
- Shepard, Smith, & Wolfe
- Tillie's Breakfast and Grill
- Wakanda Middle School

Of the list above, four of the clients are schools, three are nonprofits, and six are small to medium-sized businesses. New categories of business clients we serve include landscaping, event planning, law firms, and editing houses.

4. The text **before** and **after** the section break can now be formatted separately. In our example, we'll apply one-column formatting to the paragraph.




5. The formatting will be applied to the current section of the document. In our example, the text above the section break uses two-column formatting, while the paragraph below the break uses one-column formatting.

NEW CLIENTS

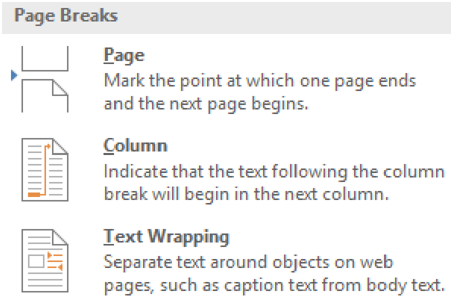
- Bancroft Preparatory Academy
- Candy Coaters and Shakes Ice Cream Parlor
- Firehouse Dalmatian Rescue
- Fly by Day Events
- General T. Sanders High School
- Homes and Hope Charity
- Julia A. Clark Middle School
- Little Jumpers Equestrian Squad
- Mason-Bowers Editing and Proofreading
- Peterson's Precision Landscaping
- Shepard, Smith, & Wolfe
- Tillie's Breakfast and Grill
- Wakanda Middle School

Of the list above, four of the clients are schools, three are nonprofits, and six are small to medium-sized businesses. New categories of business clients we serve include landscaping, event planning, law firms, and editing houses.

## Other types of breaks

When you want to format the appearance of columns or modify text wrapping around an image, Word offers additional break options that can help:

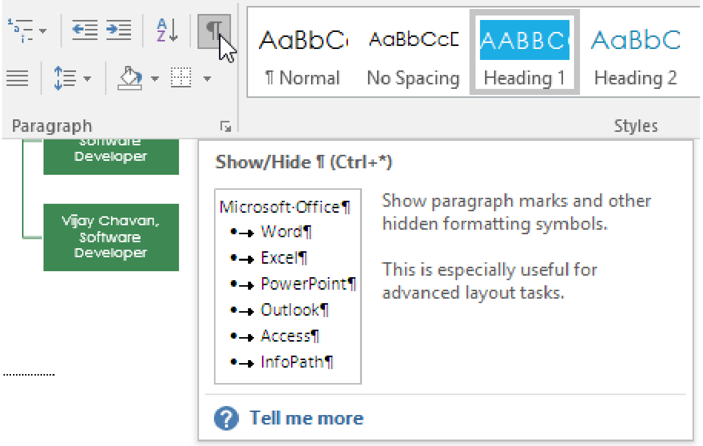
- **Column**: When creating multiple columns, you can apply a column break to balance the appearance of the columns. Any text following the column break will begin in the next column. To learn more about how to create columns in your document, visit our lesson on Columns.
- **Text wrapping**: When text has been wrapped around an image or object, you can use a text-wrapping break to end the wrapping and begin typing on the line below the image. Review our lesson on Pictures and Text Wrapping to learn more.



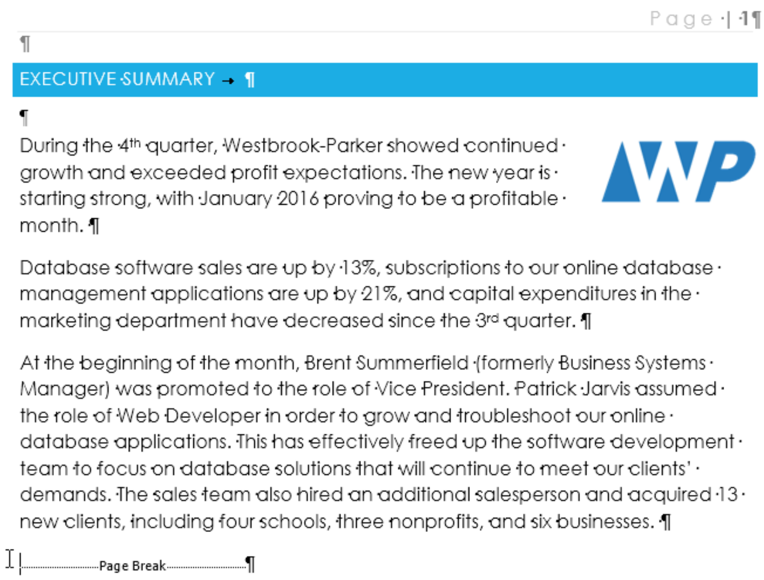

To delete a break:

By default, breaks are **hidden**. If you want to delete a break, you'll first need to show the breaks in your document.

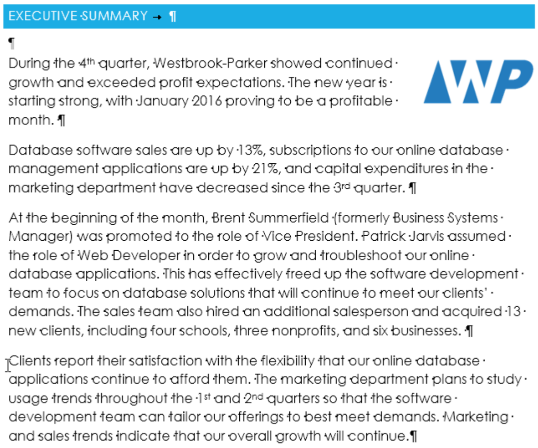
1. On the **Home** tab, click the **Show/Hide** command.




2. Locate the **break** you want to delete, then place the insertion point at the beginning of the break.




3. Press the **Delete** key. The break will be deleted from the document.



EXECUTIVE SUMMARY

During the 4th quarter, Westbrook-Parker showed continued growth and exceeded profit expectations. The new year is starting strong, with January 2016 proving to be a profitable month.

Database software sales are up by 13%, subscriptions to our online database management applications are up by 21%, and capital expenditures in the marketing department have decreased since the 3rd quarter.

At the beginning of the month, Brent Summerfield (formerly Business Systems Manager) was promoted to the role of Vice President. Patrick Jarvis assumed the role of Web Developer in order to grow and troubleshoot our online database applications. This has effectively freed up the software development team to focus on database solutions that will continue to meet our clients' demands. The sales team also hired an additional salesperson and acquired 13 new clients, including four schools, three nonprofits, and six businesses.

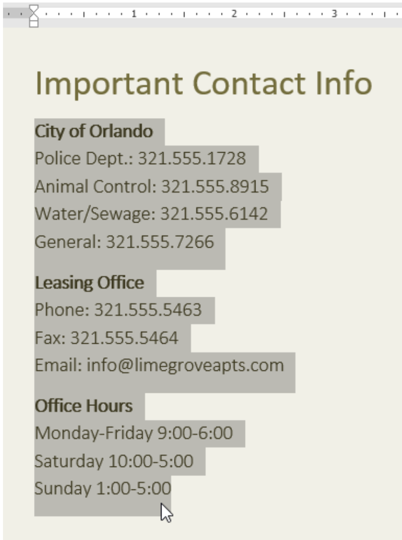
Clients report their satisfaction with the flexibility that our online database applications continue to afford them. The marketing department plans to study usage trends throughout the 1st and 2nd quarters so that the software development team can tailor our offerings to best meet demands. Marketing and sales trends indicate that our overall growth will continue.

Columns

Sometimes the information you include in your document is best displayed in columns. Not only can columns help improve readability, but some types of documents—like newspaper articles, newsletters, and flyers—are often written in column format. Word also allows you to adjust your columns by adding column breaks.

To add columns to a document:

1. Select the text you want to format.



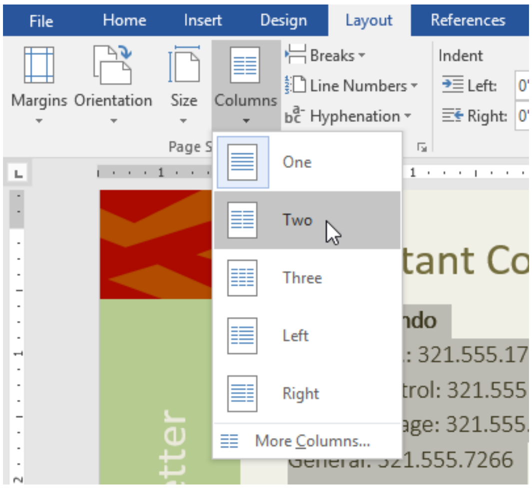
Important Contact Info

**City of Orlando**
Police Dept.: 321.555.1728
Animal Control: 321.555.8915
Water/Sewage: 321.555.6142
General: 321.555.7266

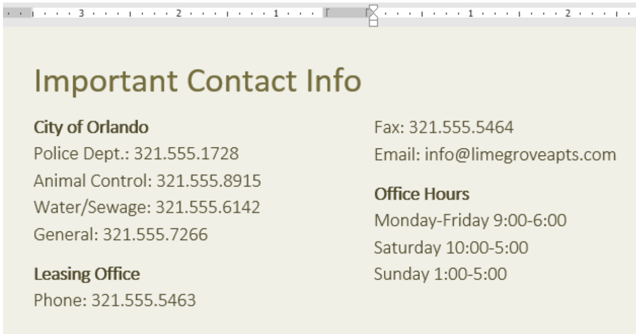
**Leasing Office**
Phone: 321.555.5463
Fax: 321.555.5464
Email: info@limegroveapts.com

**Office Hours**
Monday-Friday 9:00-6:00
Saturday 10:00-5:00
Sunday 1:00-5:00

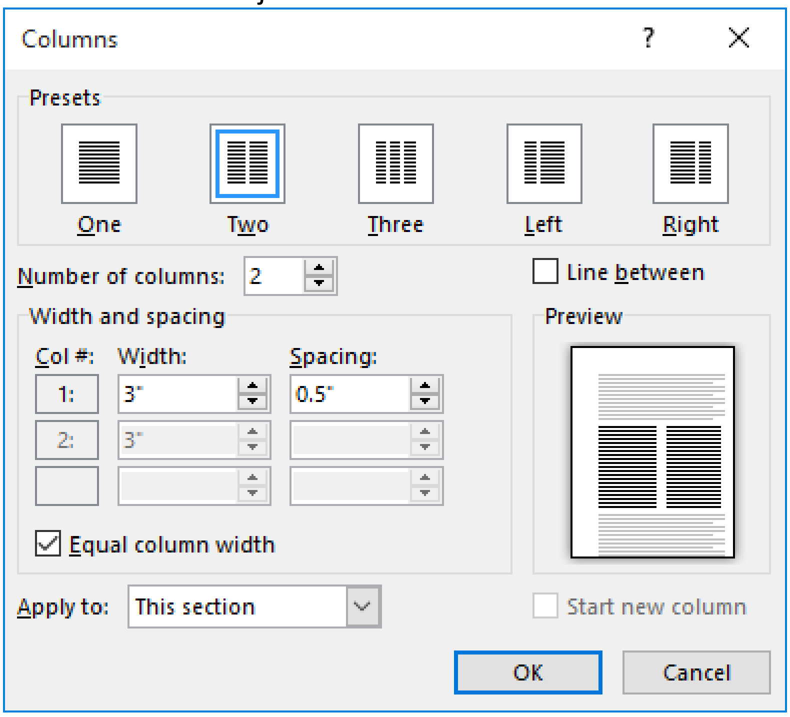
2. Select the **Layout** tab, then click the **Columns** command. A drop-down menu will appear.
3. Select the number of columns you want to create.



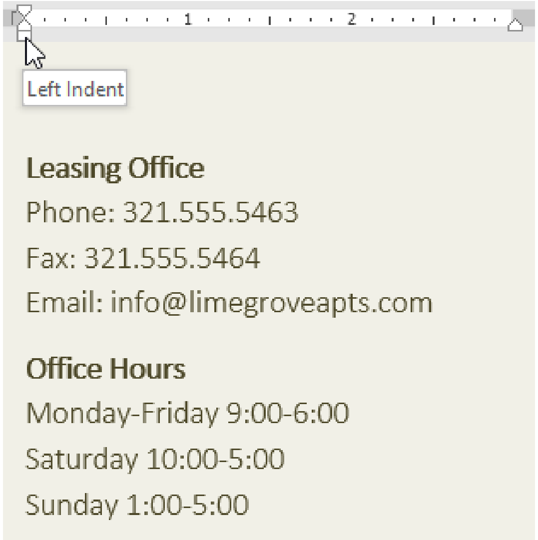

4. The text will format into columns.




Your column choices aren't limited to the drop-down menu that appears. Select **More Columns** at the bottom of the menu to access the **Columns** dialog box. Click the arrows next to **Number of columns:** to adjust the number of columns.

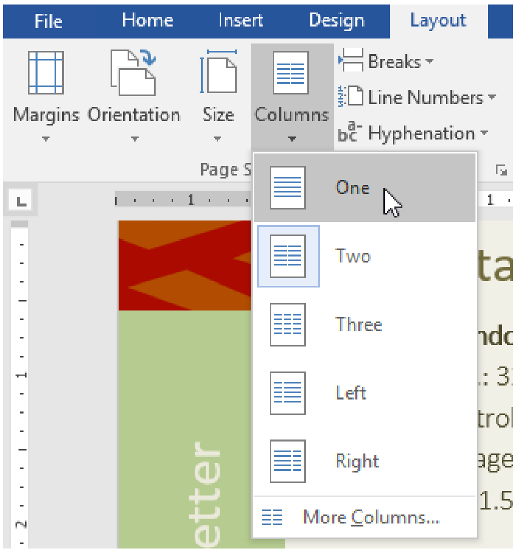



If you want to adjust the spacing and alignment of columns, click and drag the **indent markers** on the **Ruler** until the columns appear the way you want.




To remove columns:

To remove column formatting, place the insertion point anywhere in the columns, then click the **Columns** command on the **Layout** tab. Select **One** from the drop-down menu that appears.



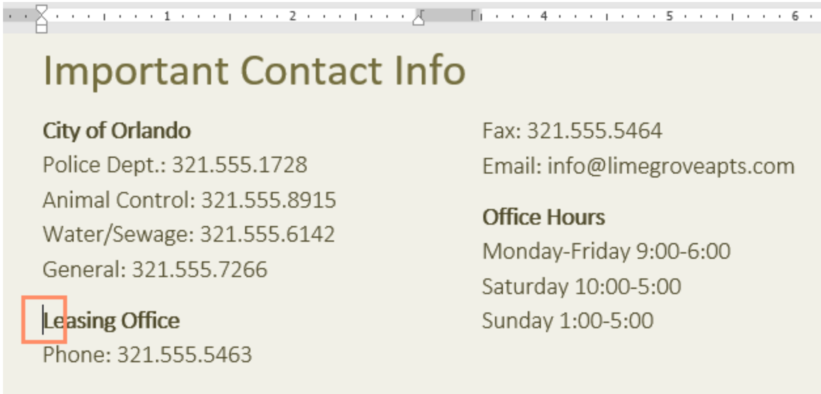

Adding column breaks

Once you've created columns, the text will automatically flow from one column to the next. Sometimes, though, you may want to control exactly where each column begins. You can do this by creating a **column break**.

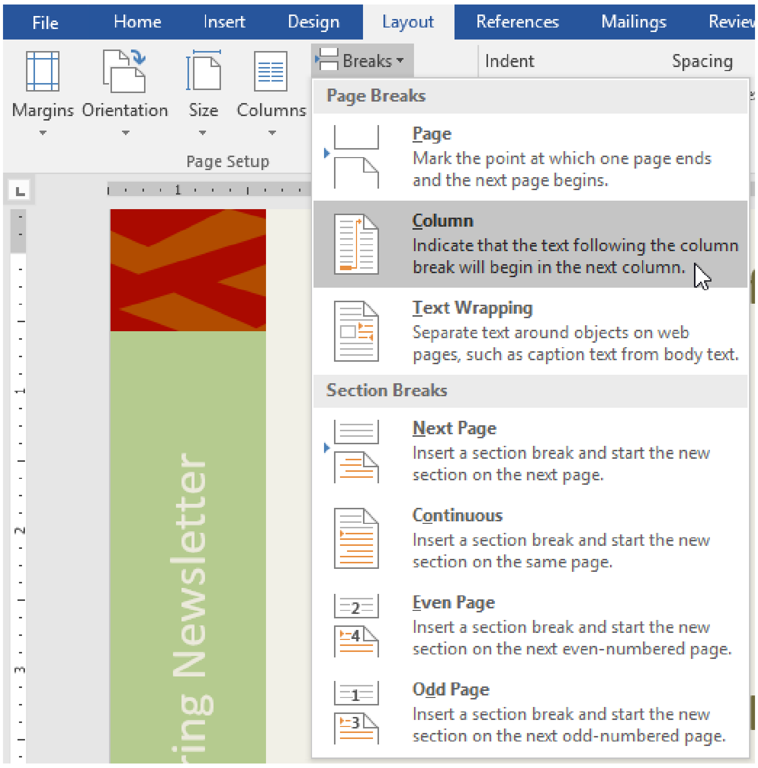
To add a column break:

In our example below, we'll add a column break that will move text to the beginning of the next column.

1. Place the **insertion point** at the beginning of the text you want to move.



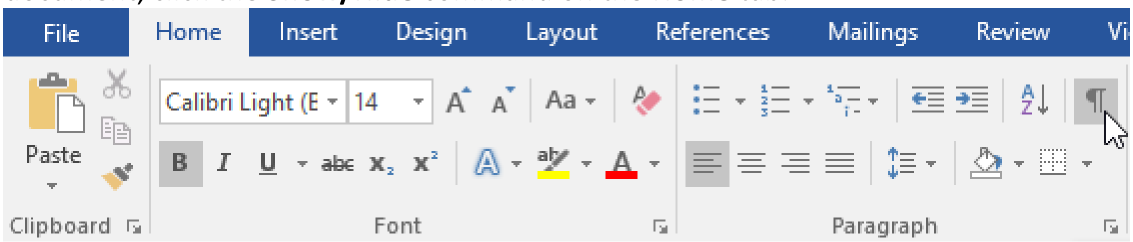

2. Select the **Layout** tab, then click the **Breaks** command. A drop-down menu will appear.
3. Select **Column** from the menu.



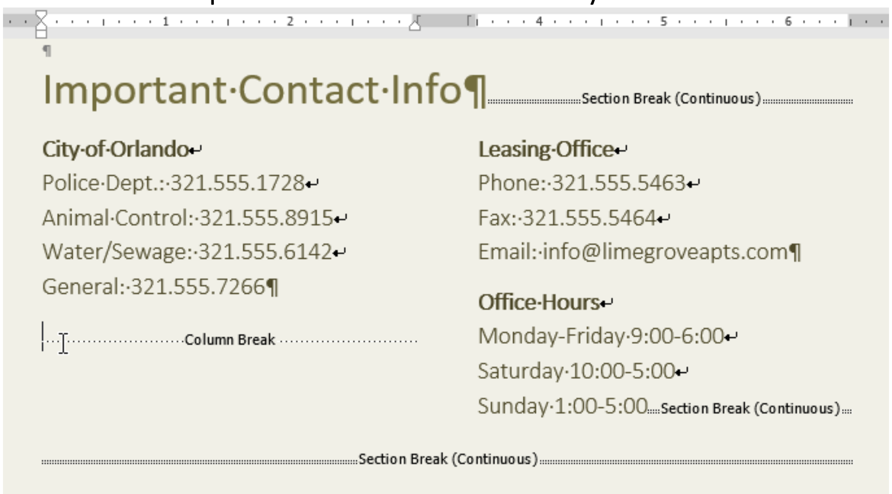

4. The text will move to the beginning of the column. In our example, it moved to the beginning of the next column.


To remove column breaks:

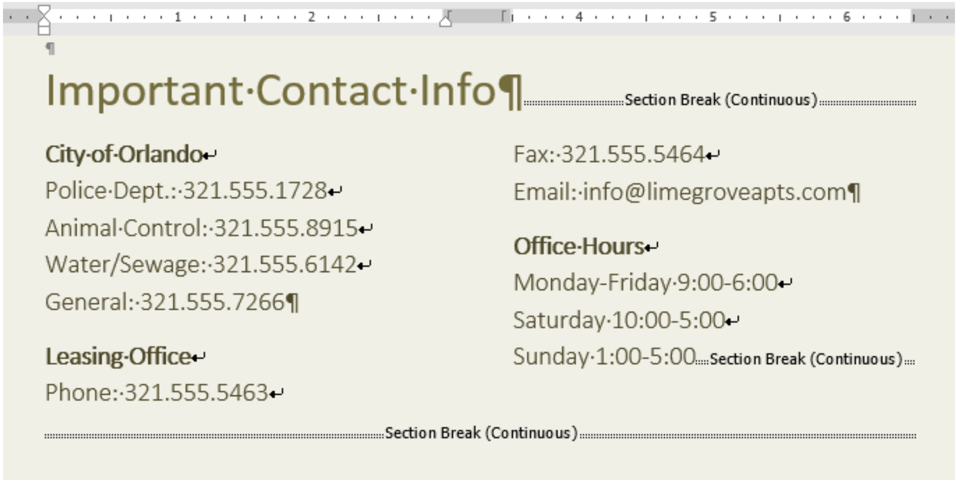
1. By default, breaks are hidden. If you want to show the breaks in your document, click the **Show/Hide** command on the **Home** tab.




2. Place the insertion point to the left of the break you want to delete.




3. Press the delete key to remove the break.



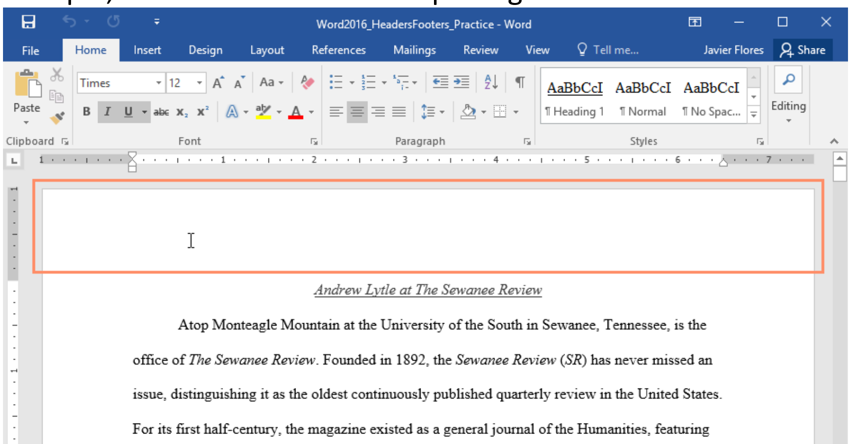

Headers and Footers

The header is a section of the document that appears in the top margin, while the footer is a section of the document that appears in the bottom margin. Headers and footers generally contain additional information such as page numbers, dates, an author's name, and footnotes, which can help keep longer documents organized and make them easier to read. Text entered in the header or footer will appear on each page of the document.

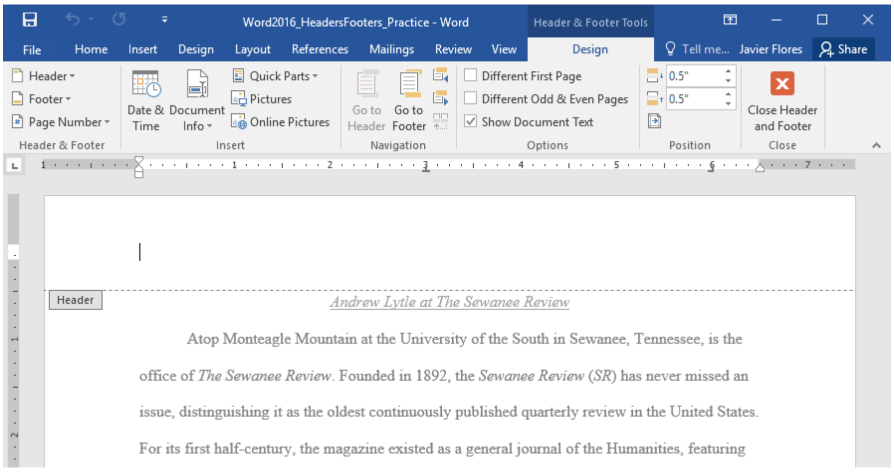
To create a header or footer:

In our example, we want to display the author's name at the top of each page, so we'll place it in the header.

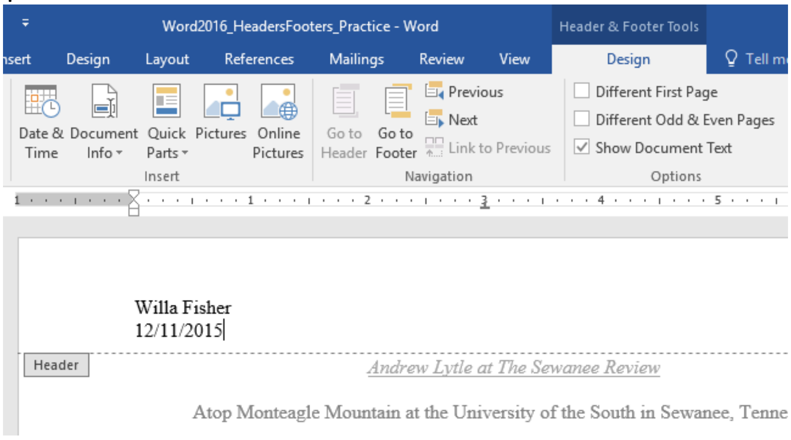
1. Double-click anywhere on the **top or bottom margin** of your document. In our example, we'll double-click the top margin.



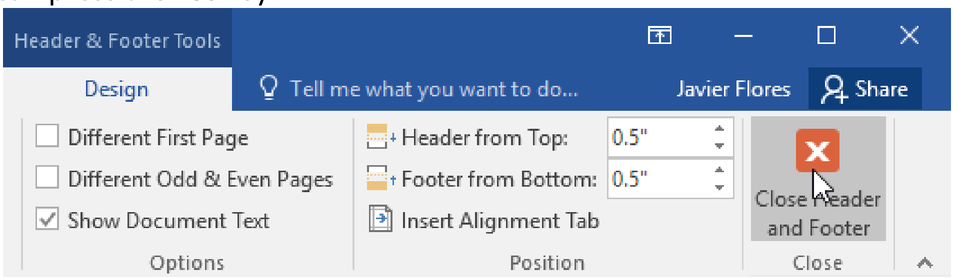

2. The header or footer will open, and a **Design** tab will appear on the right side of the **Ribbon**. The insertion point will appear in the header or footer.



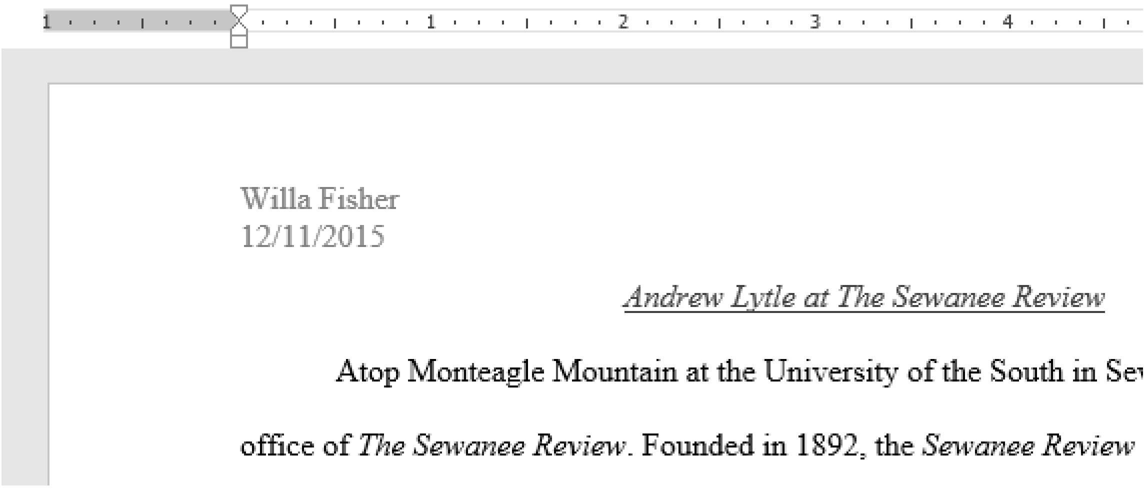

3. Type the **desired information** into the header or footer. In our example, we'll type the author's name and the date.




4. When you're finished, click **Close Header and Footer**. Alternatively, you can press the **Esc** key.



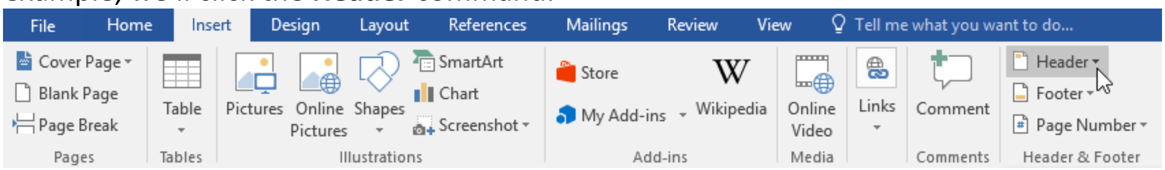

5. The header or footer text will appear.



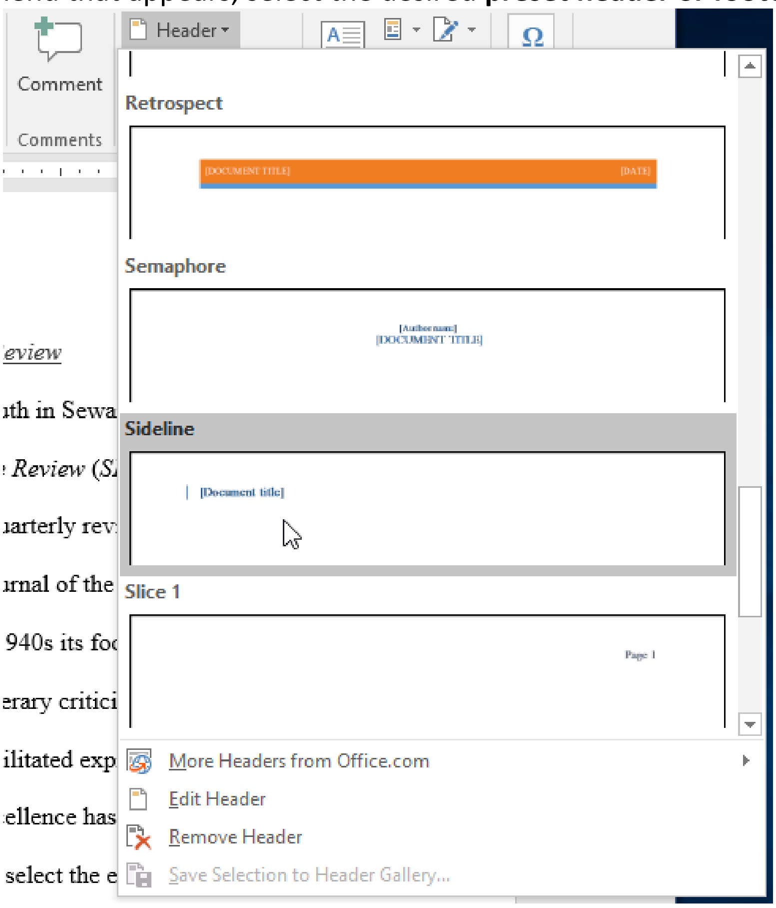

To insert a preset header or footer:

Word has a variety of **preset headers and footers** you can use to enhance your document's design and layout. In our example, we'll add a preset header to our document.

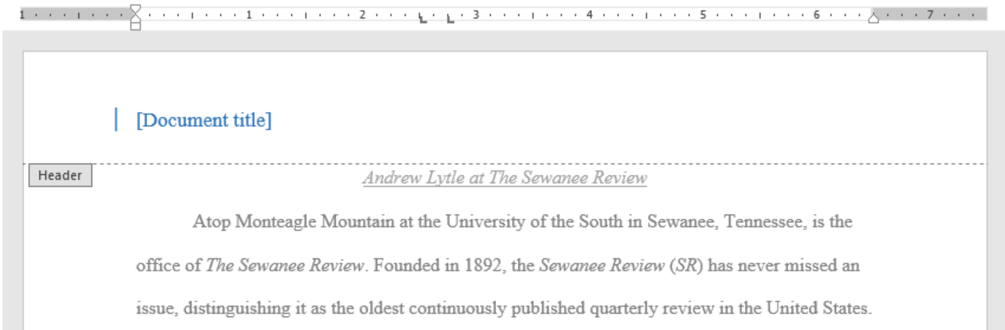
1. Select the **Insert** tab, then click the **Header** or **Footer** command. In our example, we'll click the **Header** command.



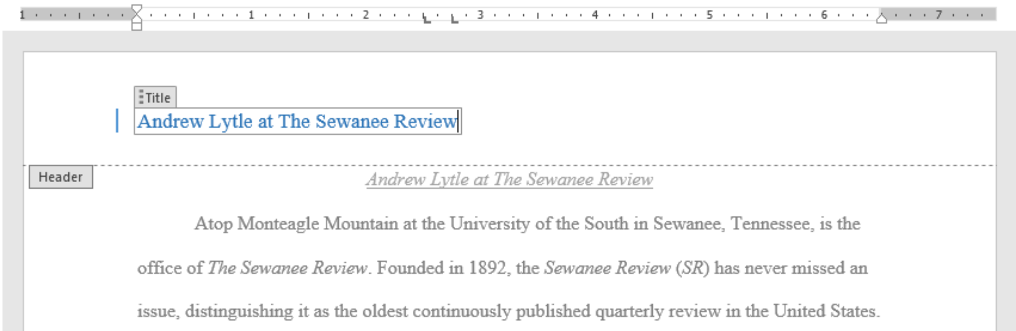

2. In the menu that appears, select the desired **preset header or footer**.



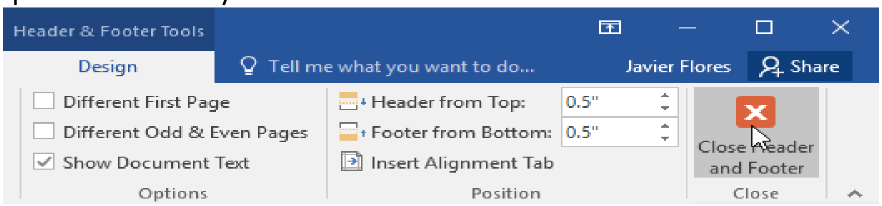
3. The header or footer will appear. Many preset headers and footers contain text placeholders called **Content Control** fields. These fields are good for adding information like the document title, author's name, date, and page number.



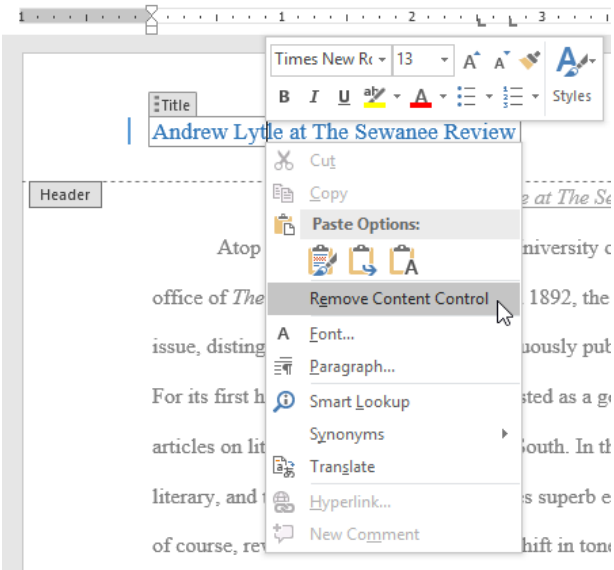

4. To edit a Content Control field, click it and type the **desired information**.




5. When you're finished, click **Close Header and Footer**. Alternatively, you can press the **Esc** key.

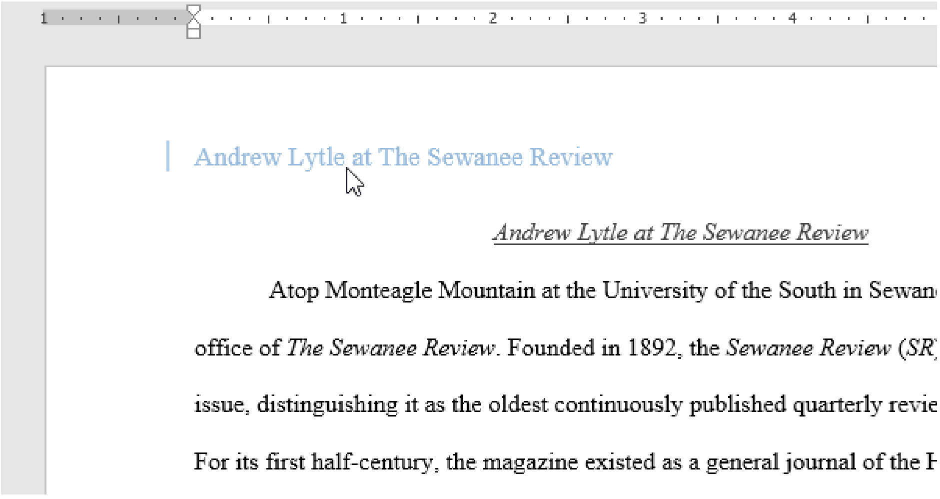



If you want to delete a Content Control field, right-click it and select **Remove Content Control** from the menu that appears.



Editing headers and footers

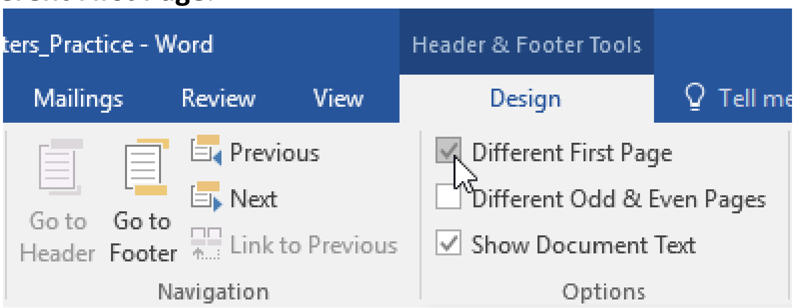
After you close the header or footer, it will still be visible, but it will be **locked**. Simply double-click a header or footer to **unlock** it, which will allow you to edit it.




Design tab options

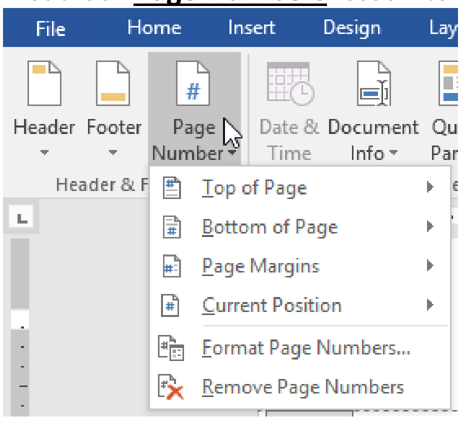
When your document's header and footer are unlocked, the **Design** tab will appear on the right side of the Ribbon, giving you various editing options:

- **Hide the first-page header and footer**: For some documents, you may not want the first page to show the header and footer, like if you have a cover page and want to start the page numbering on the second page. If you want to hide the first-page header and footer, check the box next to **Different First Page**.

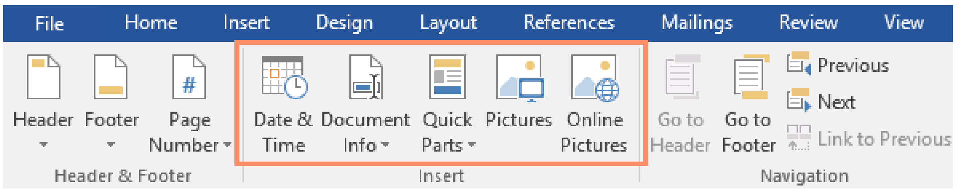



- **Remove the header or footer**: If you want to remove all information contained in the header, click the **Header** command and select **Remove Header** from the menu that appears. Similarly, you can remove a footer using the **Footer** command.


- **Page Number**: You can automatically number each page with the Page Number command. Read our **Page Numbers** lesson to learn more.




- **Additional options**: With the commands available in the Insert group, you can add the **date and time**, **document info**, **pictures**, and more to your header or footer.

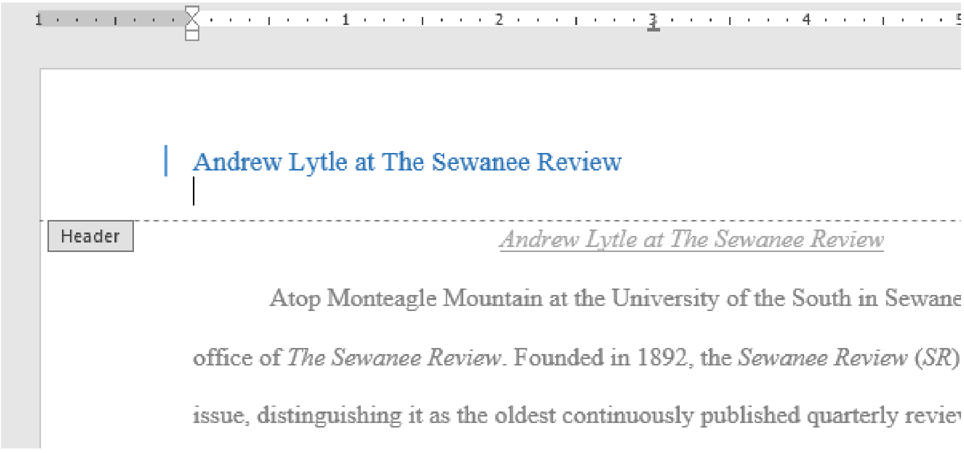



To insert the date or time into a header or footer:

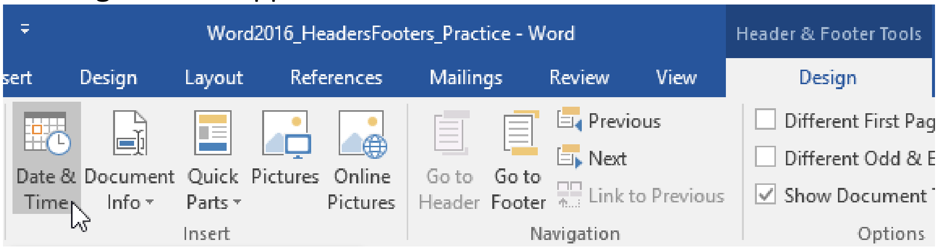
Sometimes it's helpful to include the **date or time** in the header or footer. For example, you may want your document to show the **date when it was created**.

On the other hand, you may want to show the **date when it was printed**, which you can do by setting it to **update automatically**. This is useful if you frequently update and print a document because you'll always be able to tell which version is the most recent.

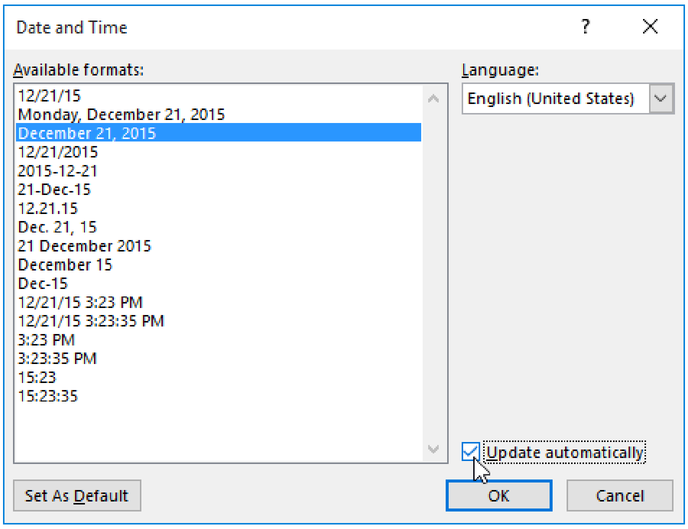
1. Double-click anywhere on the header or footer to **unlock** it. Place the **insertion point** where you want the date or time to appear. In our example, we'll place the insertion point on the line below the author's name.



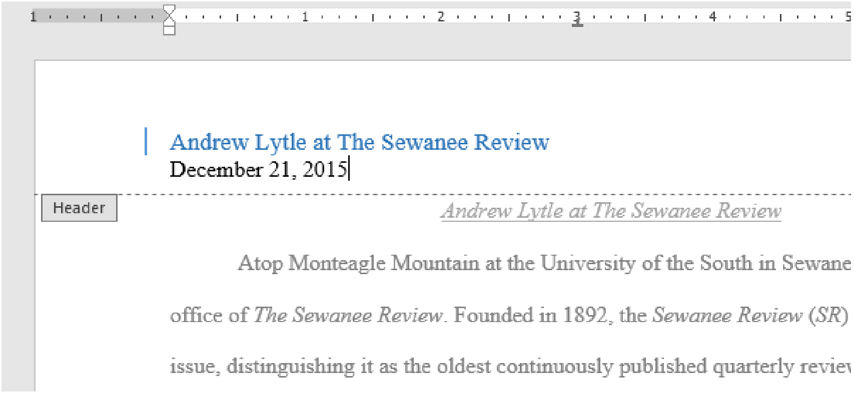

2. The **Design** tab will appear. Click the **Date & Time** command.




3. The **Date and Time** dialog box will appear. Select the desired **date** or **time format**.
4. Check the box next to **Update Automatically** if you want the date to change every time you open the document. If you don't want the date to change, leave this option unchecked.
5. Click **OK**.




6. The date will appear in the header.



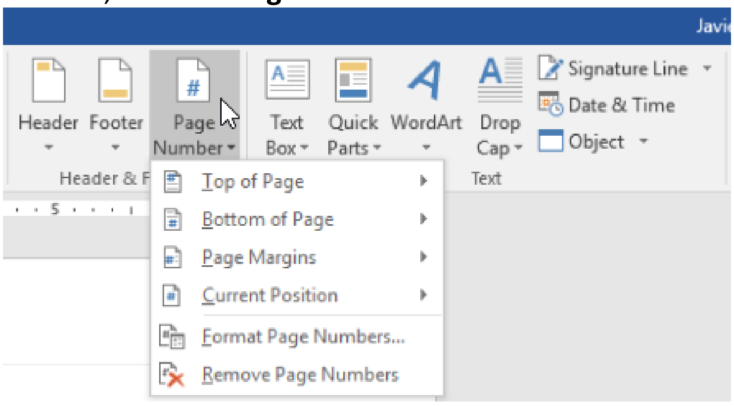

## Page Numbers

Page numbers can be used to automatically number each page in your document. They come in a wide range of number formats and can be customized to suit your needs. Page numbers are usually placed in the header, footer, or side margin. When you need to number some pages differently, Word allows you to restart page numbering.

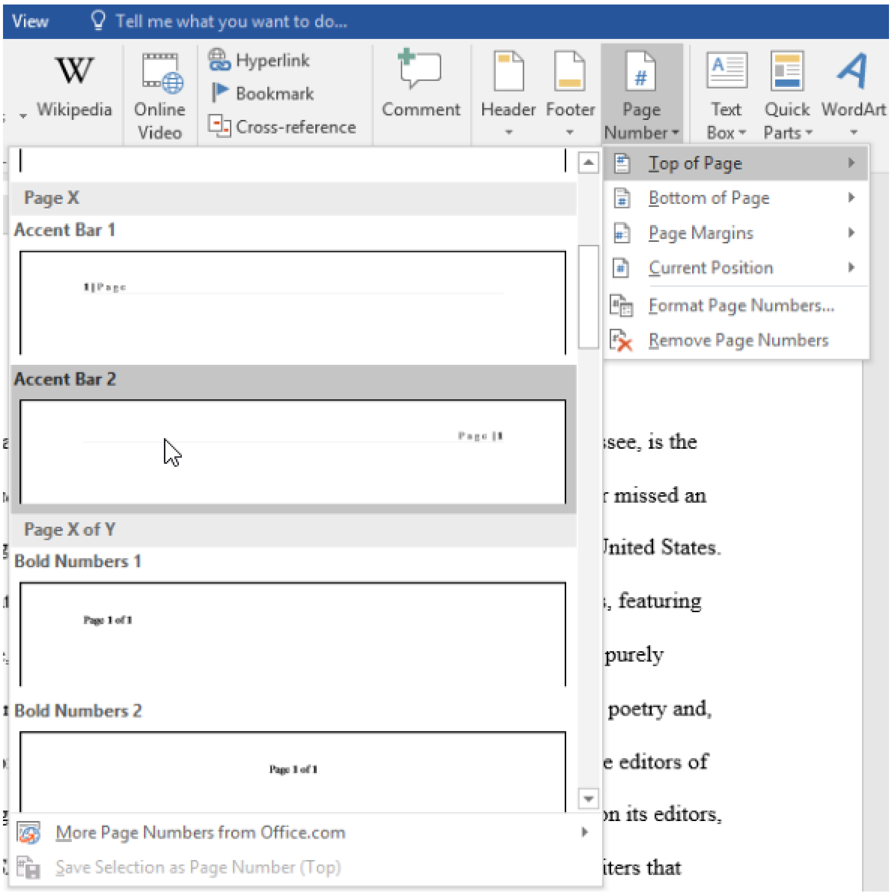
To add page numbers:

Word can automatically label each page with a page number and place it in a header, footer, or side margin. If you have an existing header or footer, it will be removed and replaced with the page number.

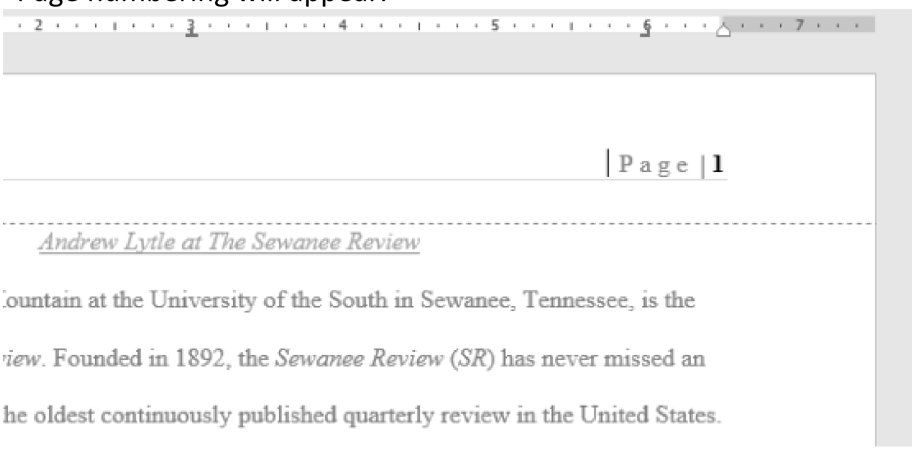
1. On the **Insert** tab, click the **Page Number** command.



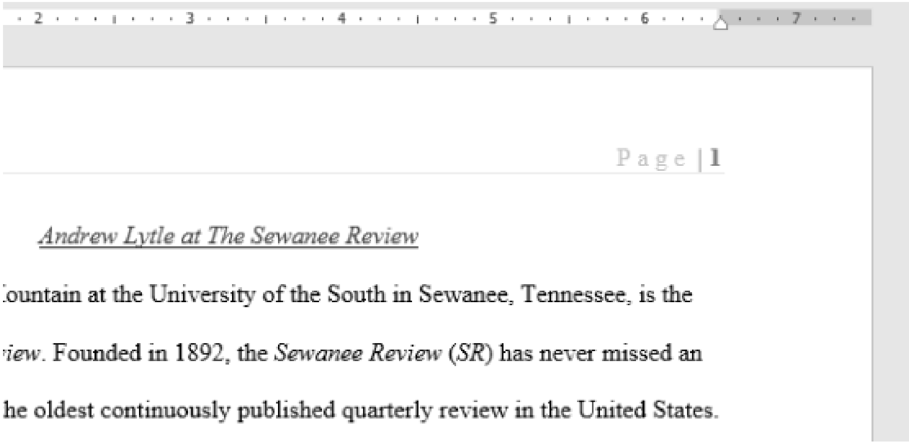

2. Open the **Top of Page**, **Bottom of Page**, or **Page Margin** menu, depending on where you want the page number to be positioned. Then select the desired style of header.




3. Page numbering will appear.




4. Press the **Esc** key to lock the header and footer.



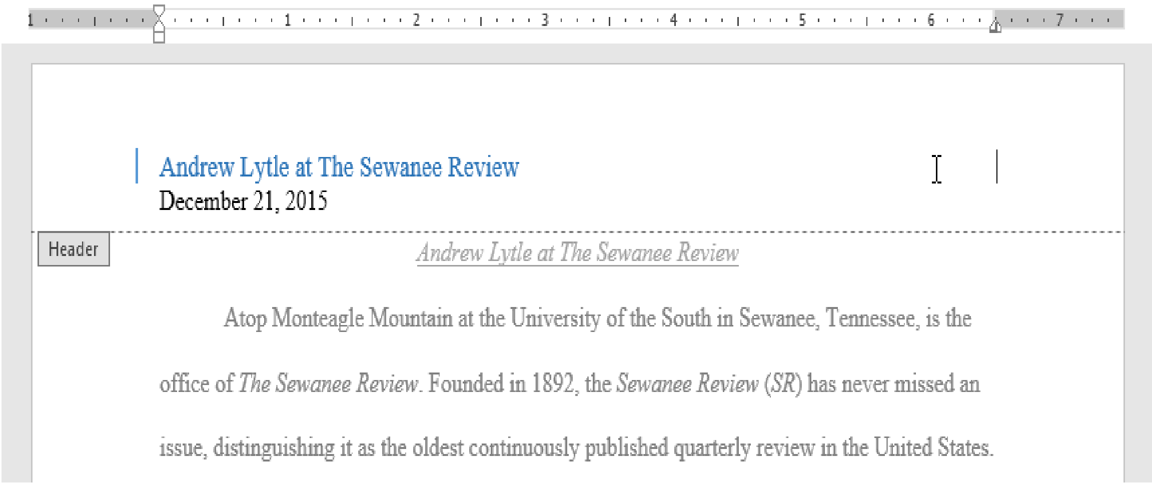

5. If you need to make any changes to your page numbers, simply double-click the header or footer to unlock it.

If you've created a page number in the **side margin**, it's still considered part of the **header** or **footer**. You won't be able to select the page number unless the header or footer is selected.

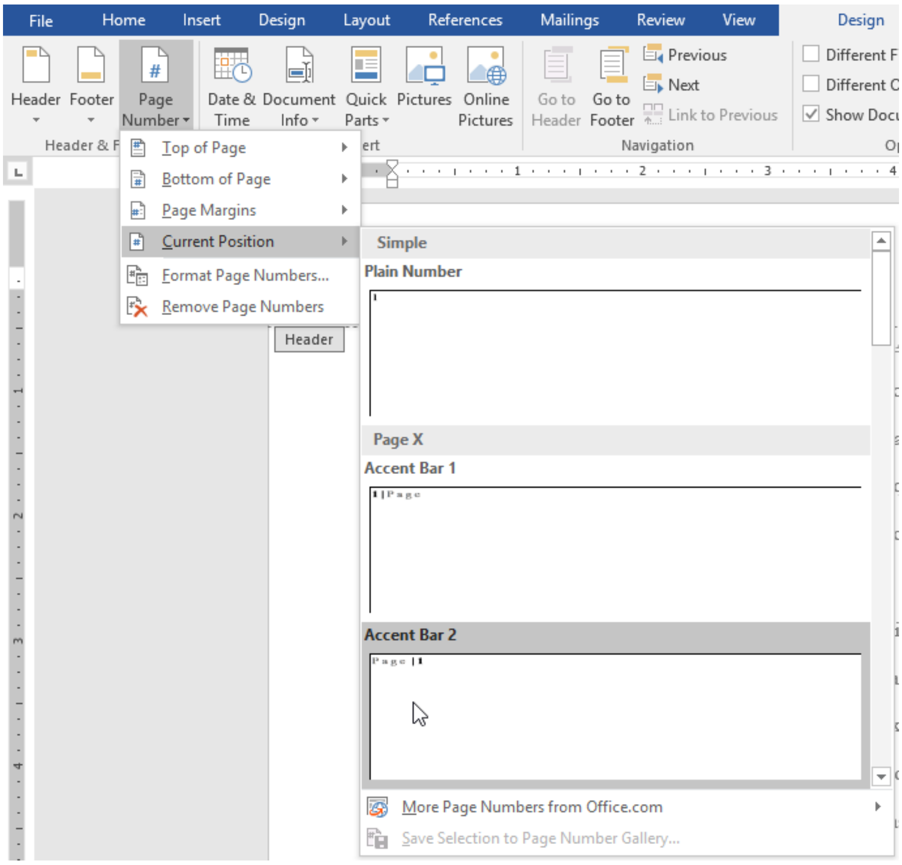
To add page numbers to an existing header or footer:

If you already have a header or footer and you want to add a page number to it, Word has an option to automatically insert the page number into the existing header or footer. In our example, we'll add page numbering to our document's header.

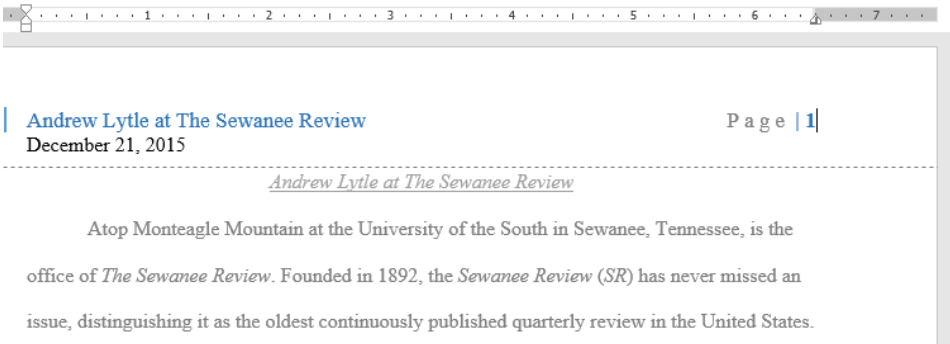
1. Double-click anywhere on the **header** or **footer** to **unlock** it.



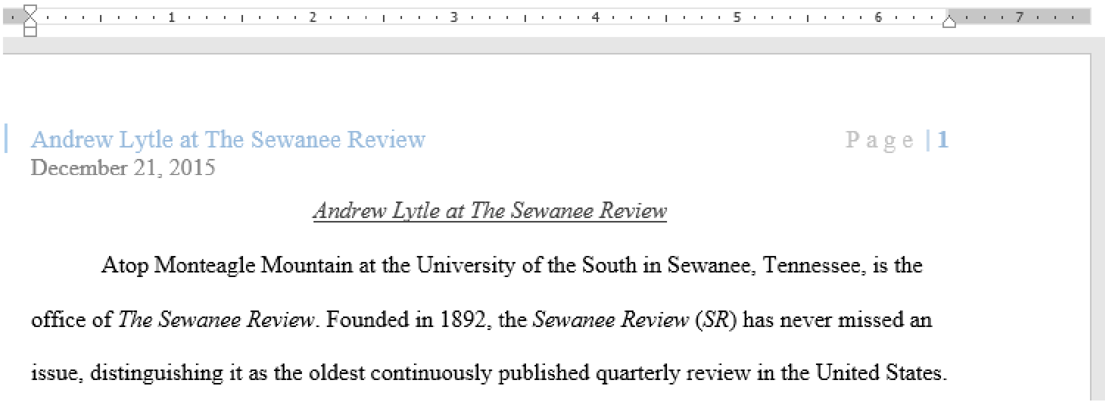

2. On the **Design** tab, click the **Page Number** command. In the menu that appears, hover the mouse over **Current Position** and select the desired **page numbering style**.




3. Page numbering will appear.




4. When you're finished, press the **Esc** key.

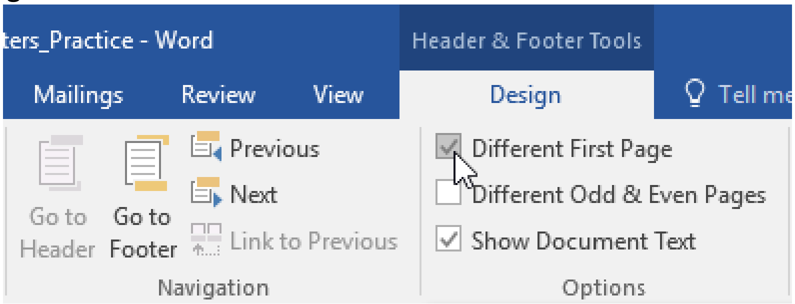



To hide the page number on the first page:

In some documents, you may not want the first page to show the page number. You can **hide the first page number** without affecting the rest of the pages.

1. Double-click the header or footer to unlock it.

2. From the Design tab, place a check mark next to **Different First Page**. The header and footer will disappear from the first page. If you want, you can type something new in the header or footer, and it will only affect the first page.

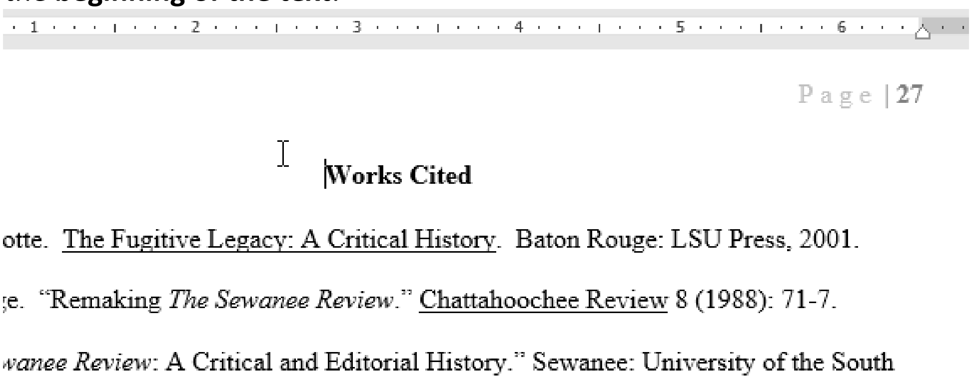



If you're unable to select **Different First Page**, it may be because an object within the header or footer is selected. Click in an empty area within the header or footer to make sure nothing is selected.

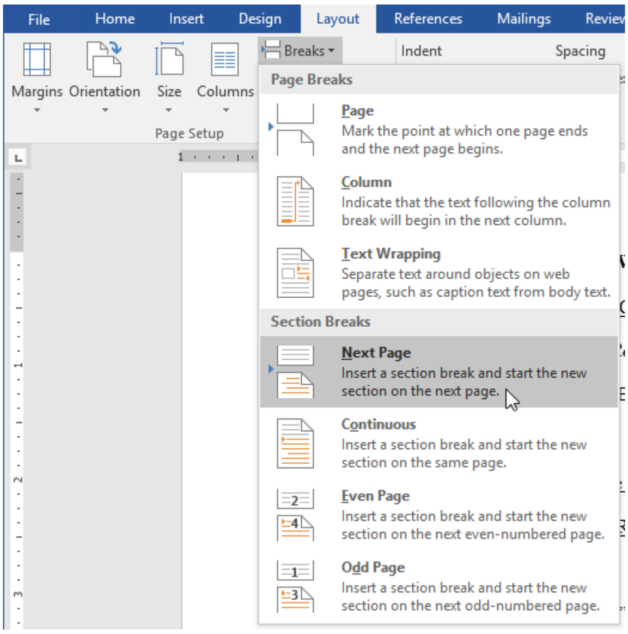
To restart page numbering:

Word allows you to restart page numbering on any page of your document. You can do this by inserting a section break and selecting the number you want to restart the numbering with. In our example, we'll restart the page numbering for our document's **Works Cited** section.

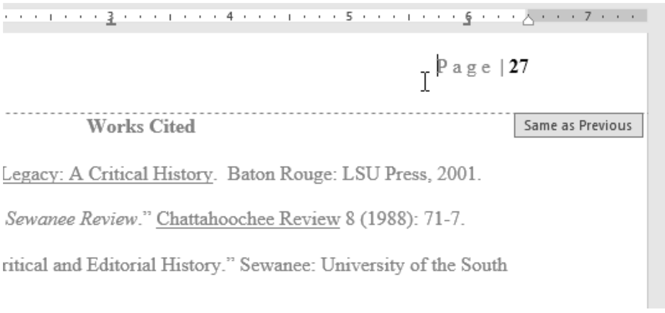
1. Place the **insertion point** at the **top of the page** you want to restart page numbering for. If there is text on the page, place the insertion point at the **beginning of the text**.



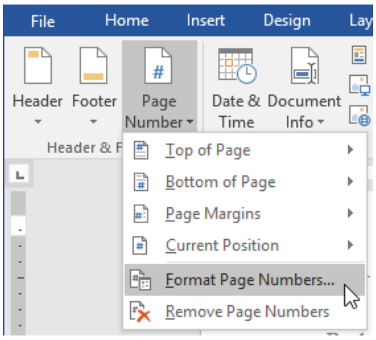

2. Select the **Layout** tab, then click the **Breaks** command. Select **Next Page** from the drop-down menu that appears.



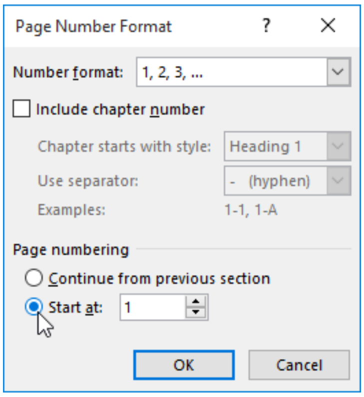

3. A section break will be added to the document.
4. Double-click the **header or footer** containing the page number you want to restart.



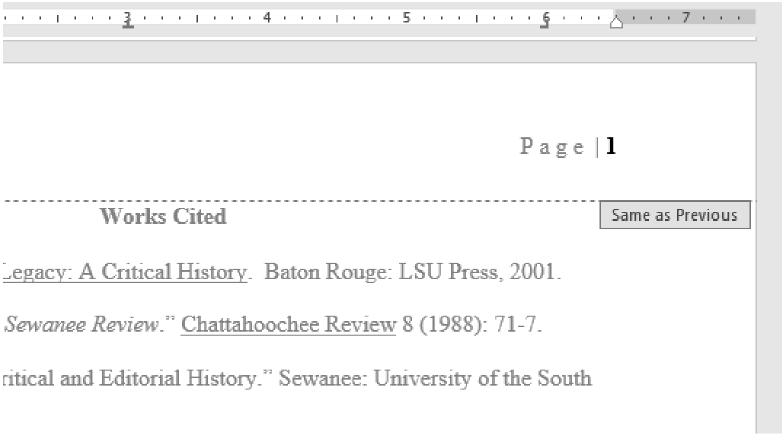

5. Click the **Page Number** command. In the menu that appears, select **Format Page Numbers**.




6. A dialog box will appear. Click the **Start at:** button. By default, it will start at **1**. If you want, you can change the number. When you're done, click **OK**.




7. The page numbering will restart.




## Lesson 12: Working with Objects

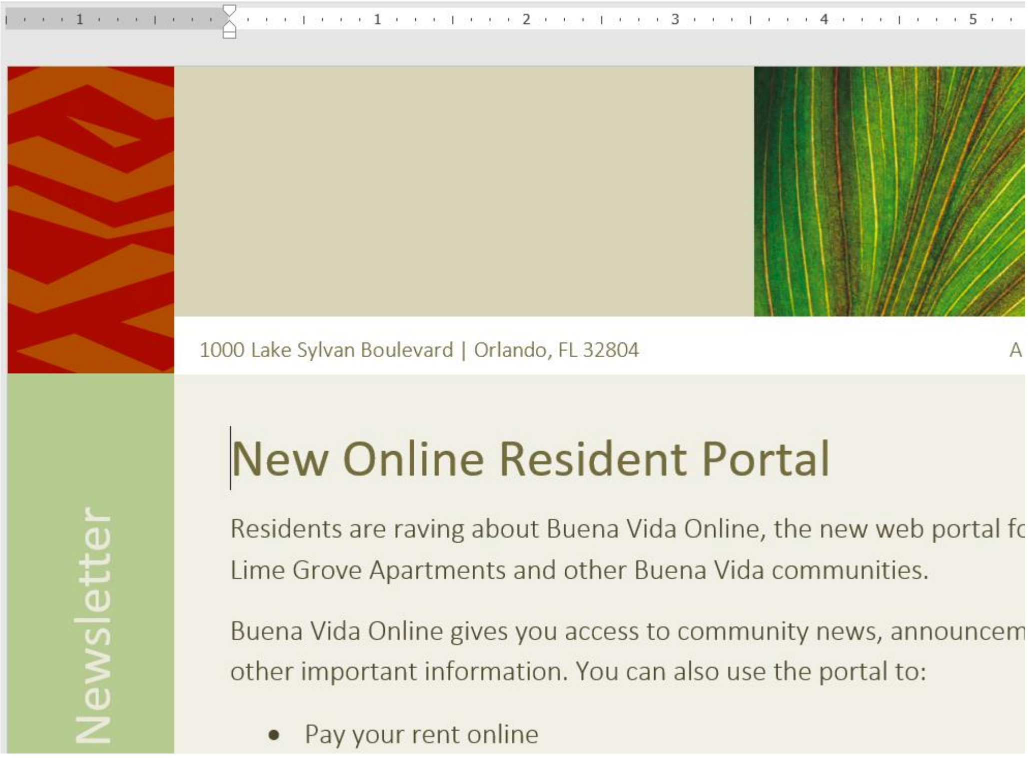
### Pictures and Text Wrapping

Adding pictures to your document can be a great way to illustrate important information and add decorative accents to existing text. Used in moderation, pictures can improve the overall appearance of your document.

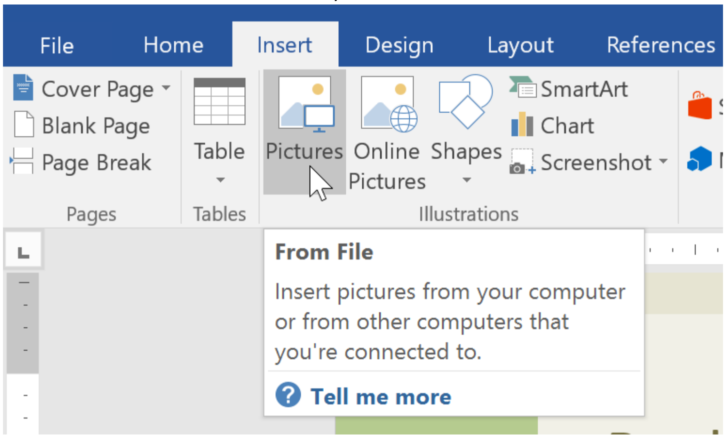
### To insert a picture from a file:

If you have a specific image in mind, you can **insert a picture from a file**. In our example, we'll insert a picture saved locally on our computer. If you'd like to work along with our example, right-click the image below and save it to your computer.

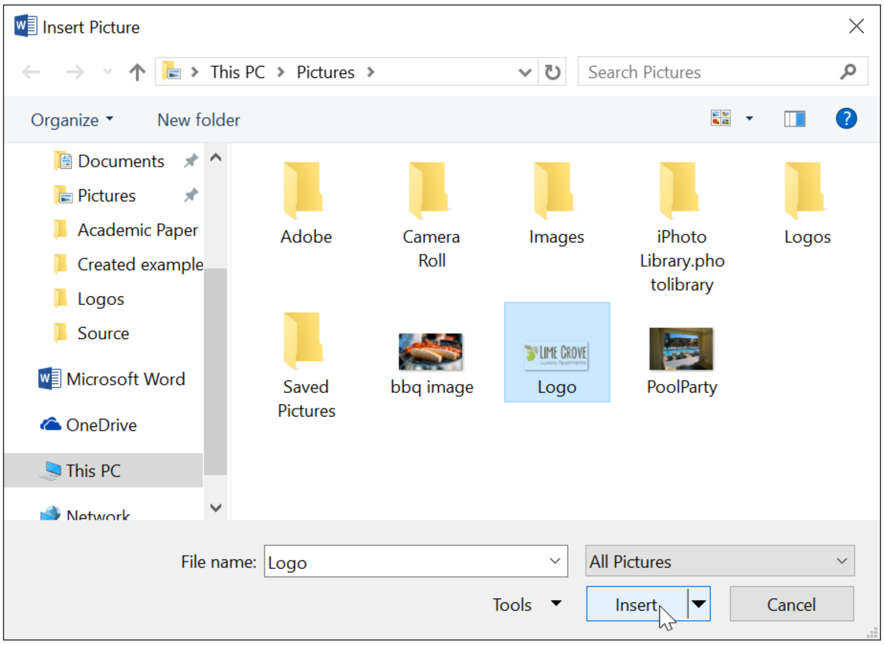

1. Place the **insertion point** where you want the image to appear.



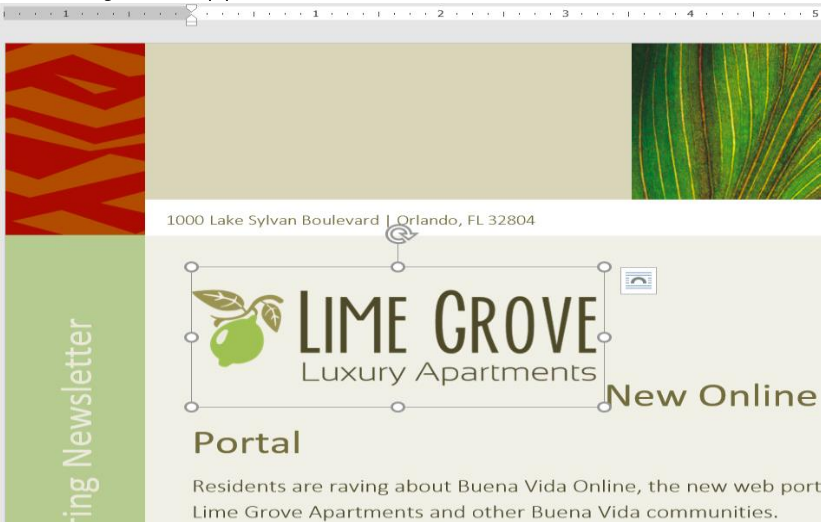

2. Select the **Insert** tab on the **Ribbon**, then click the **Pictures** command.




3. The **Insert Picture** dialog box will appear. Navigate to the folder where your image is located, then select the image and click **Insert**.




4. The image will appear in the document.




To resize an image, click and drag one of the **corner sizing handles**. The image will change size while keeping the same proportions. If you want to stretch it horizontally or vertically, you can use the **side sizing handles**.

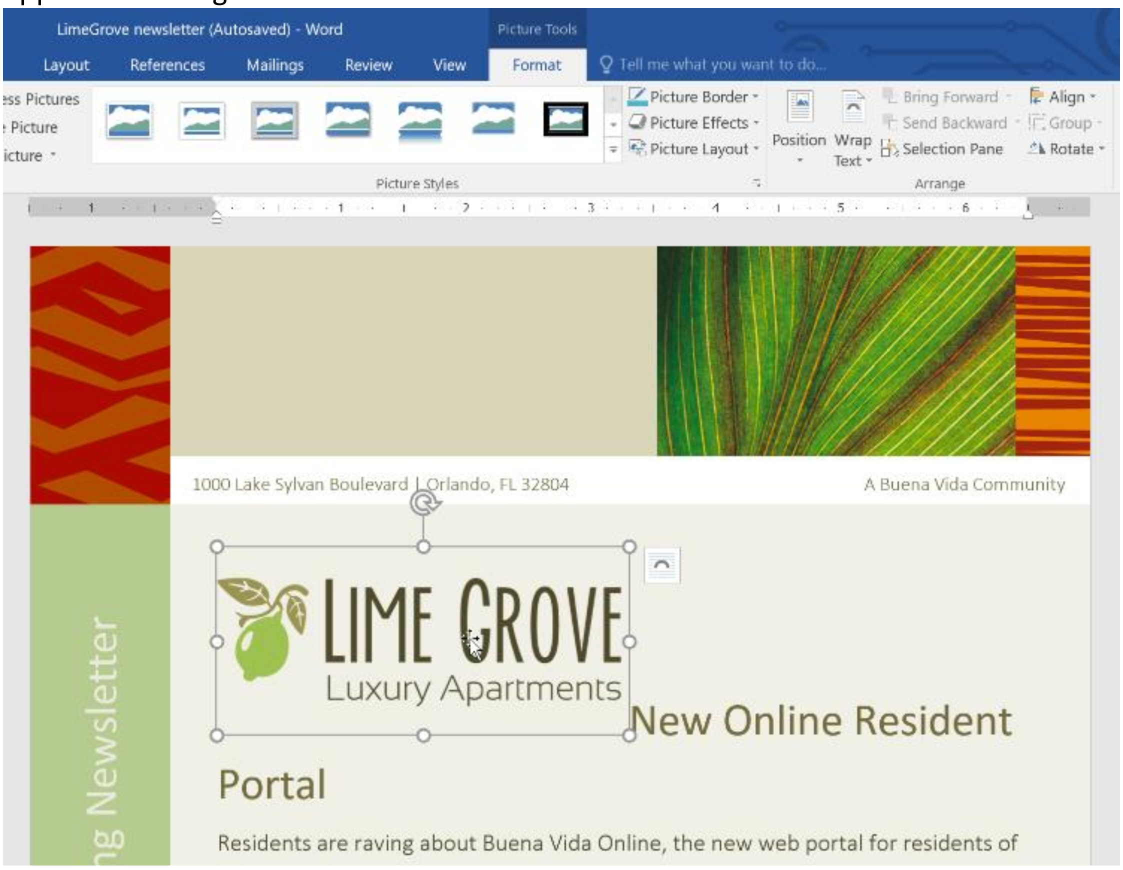

Page Break

**Changing text wrapping settings**

When you insert a picture from a file, you may notice that it's difficult to move it exactly where you want. This is because the **text wrapping** for the image is set to **In Line with Text**. You'll need to change the **text wrapping setting** if you want to move the image freely, or if you just want the text to wrap around the image in a more natural way.

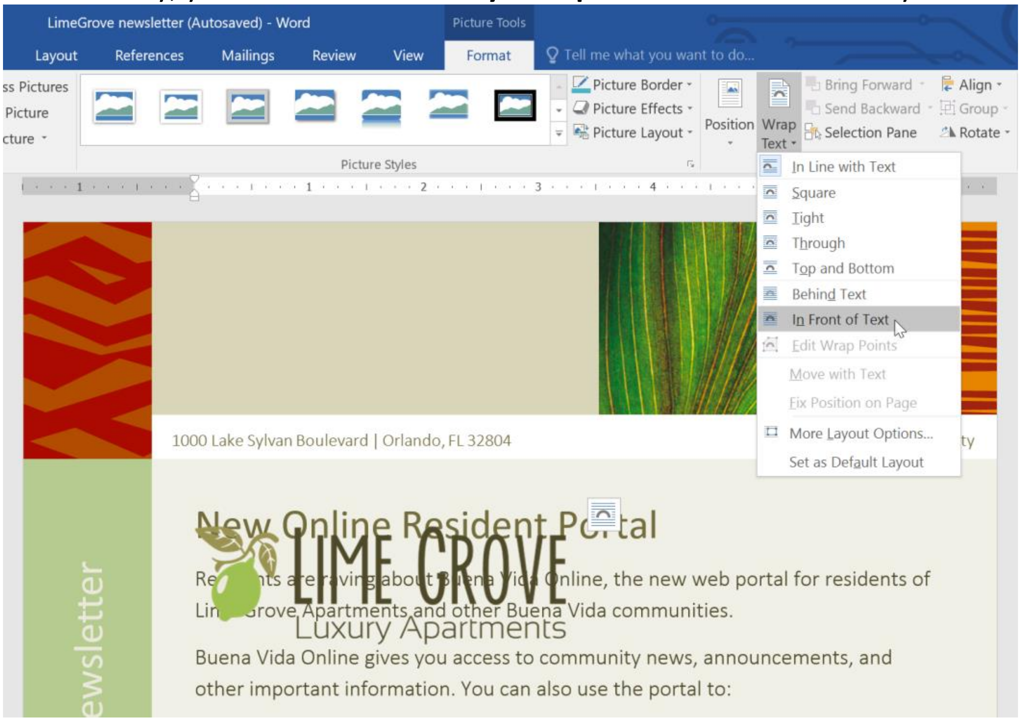
To wrap text around an image:

1. Select the **image** you want to wrap text around. The **Format** tab will appear on the right side of the Ribbon.

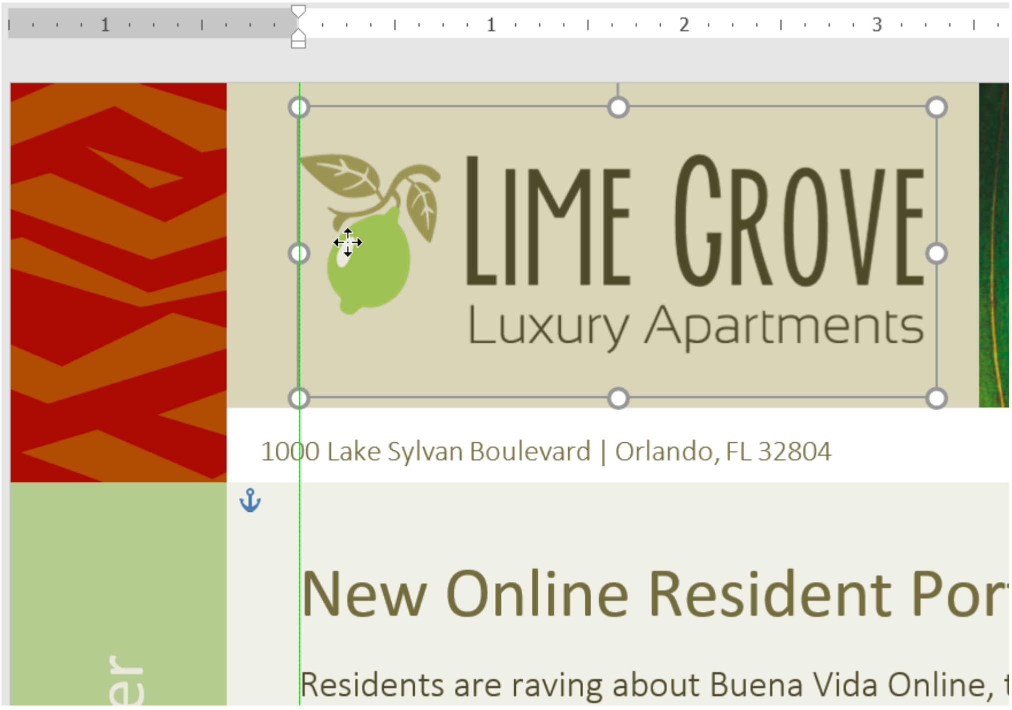



2. On the **Format tab**, click the **Wrap Text** command in the **Arrange** group. Then select the desired text wrapping option. In our example, we'll

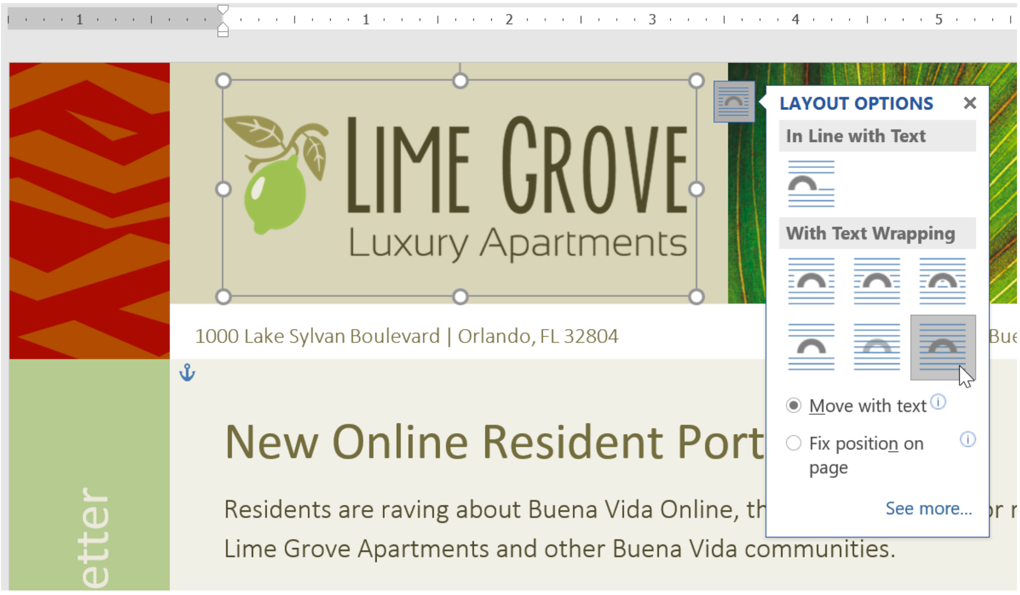
select **In Front of Text** so we can freely move it without affecting the text. Alternatively, you can select **More Layout Options** to fine tune the layout.



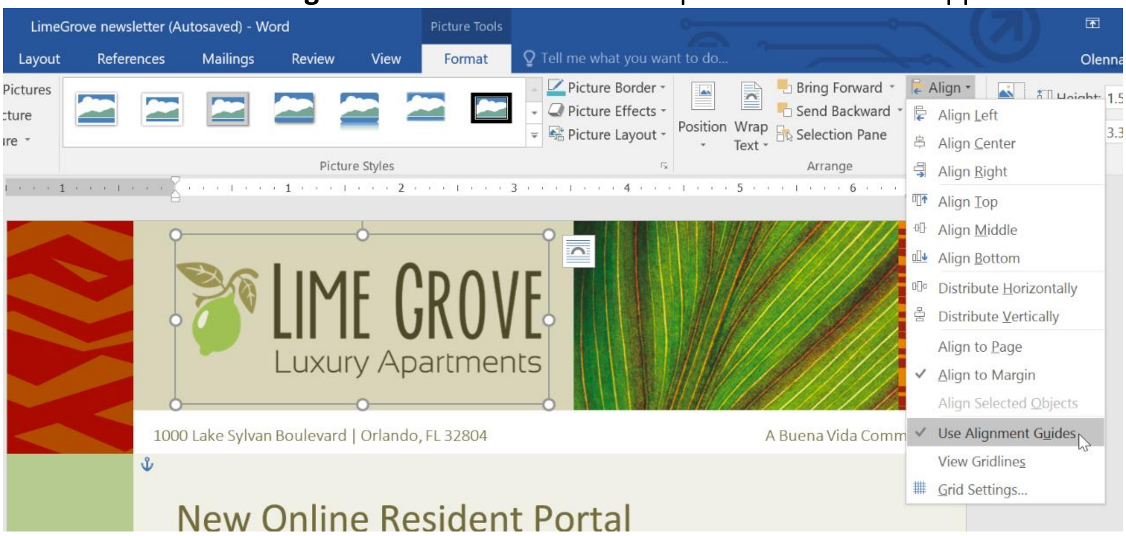

3. The text will wrap around the image. You can now **move** the image if you want. Just click and drag it to the desired **location**. As you move it, **alignment guides** will appear to help you align the image on the page.




Alternatively, you can access text wrapping options by selecting the image and clicking the **Layout Options** button that appears.

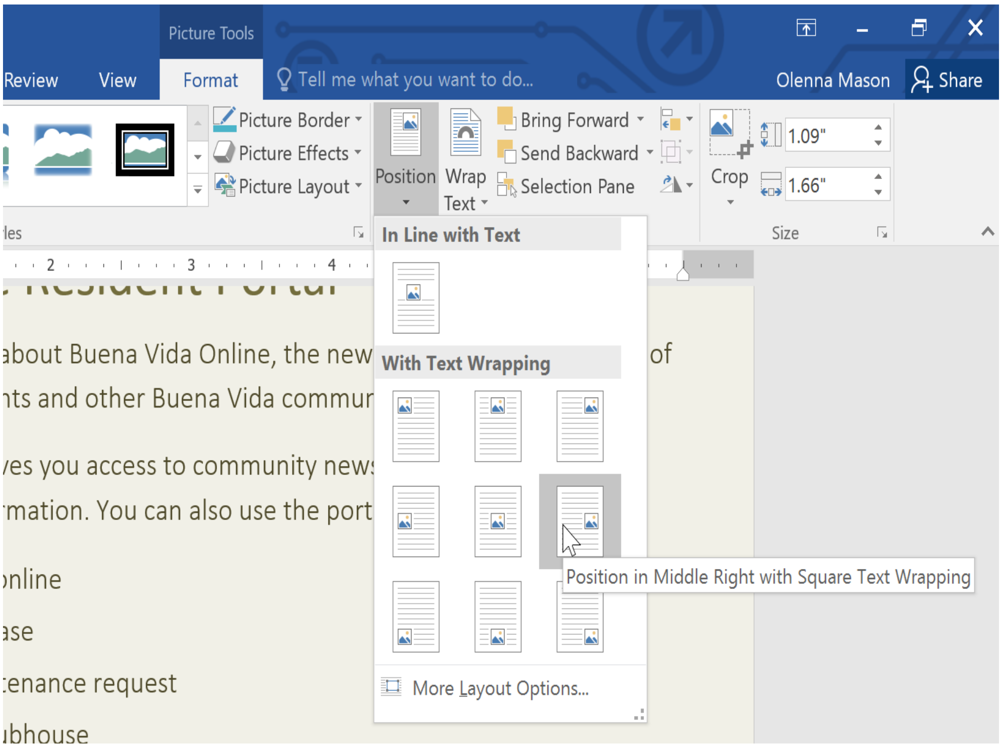



If the alignment guides do not appear, select the Page Layout tab, then click the Align command. Select **Use Alignment Guides** from the drop-down menu that appears.




## Using a predefined text wrapping setting

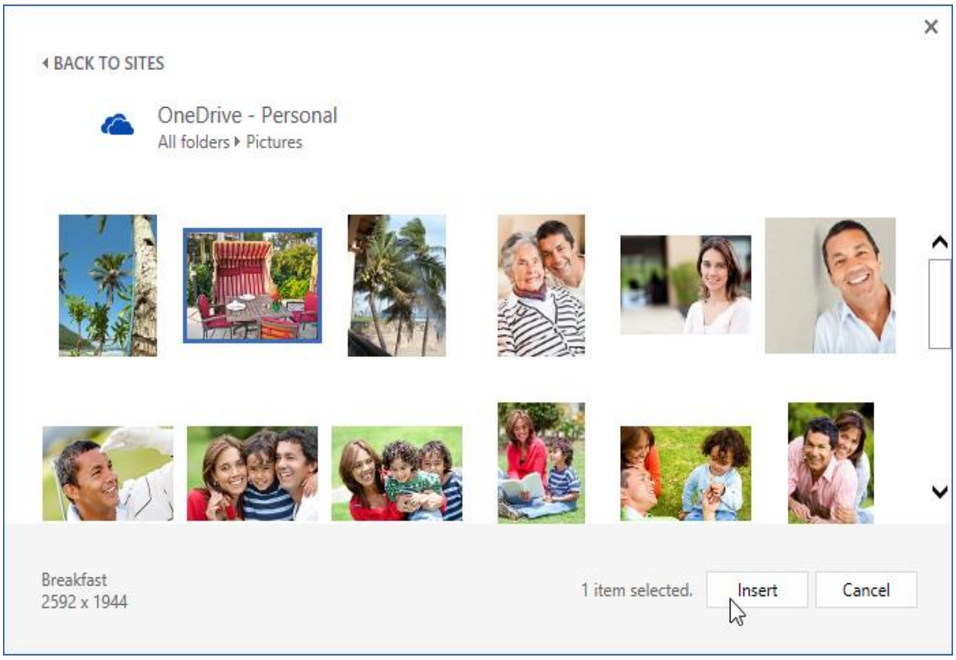
Predefined text wrapping allows you to quickly move the image to a specific location on the page. The text will automatically wrap around the object so it's still easy to read.



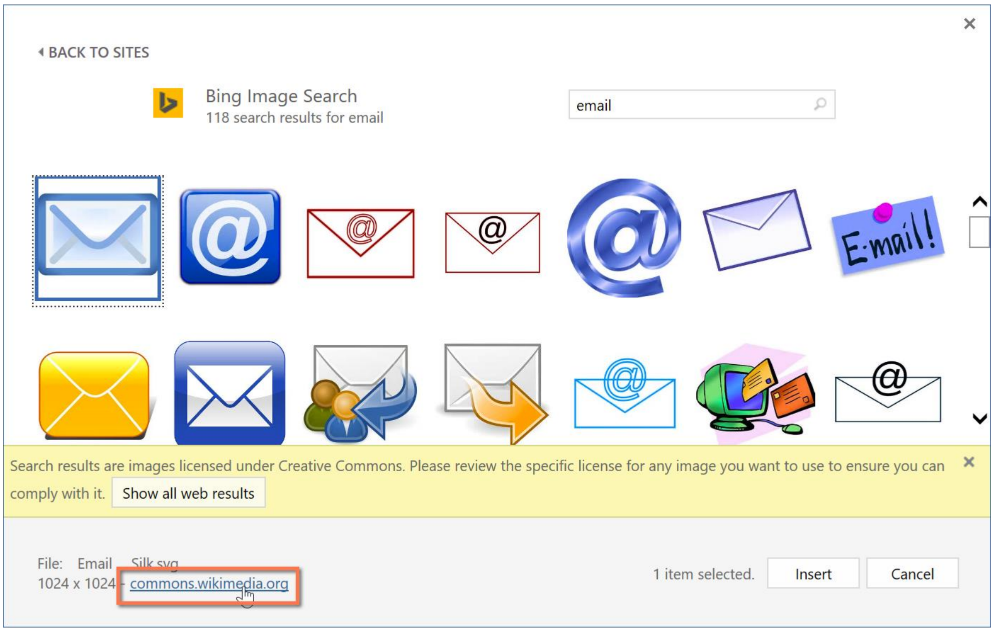

Inserting online pictures

If you don't have the picture you want on your computer, you can **find a picture online** to add to your document. Word offers two options for finding online pictures.

- **OneDrive**: You can insert an image stored on your OneDrive. You can also link other **online accounts** with your Microsoft account, such as Facebook and Flickr.

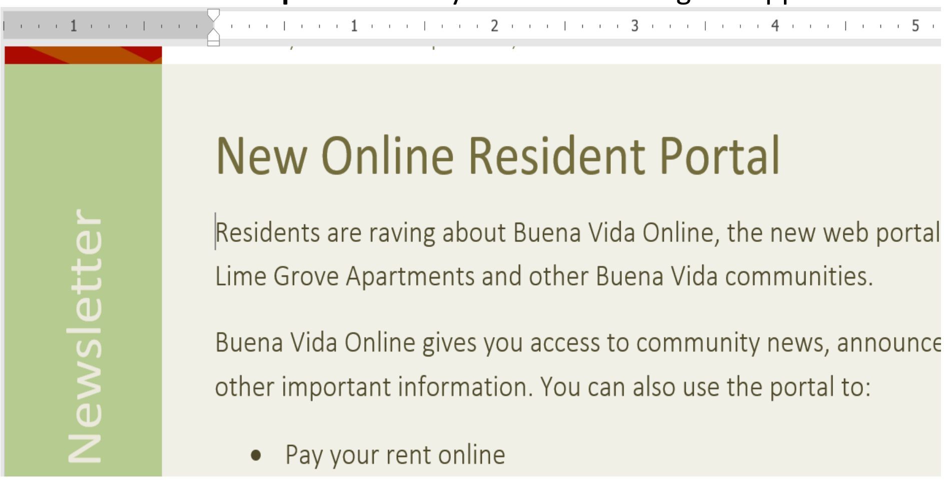



- **Bing Image Search**: You can use this option to search the Internet for images. By default, Bing only shows images that are licensed under **Creative Commons**, which means you can use them for your own projects. However, you should click the link to the image's website to see if there are any restrictions on how it can be used.

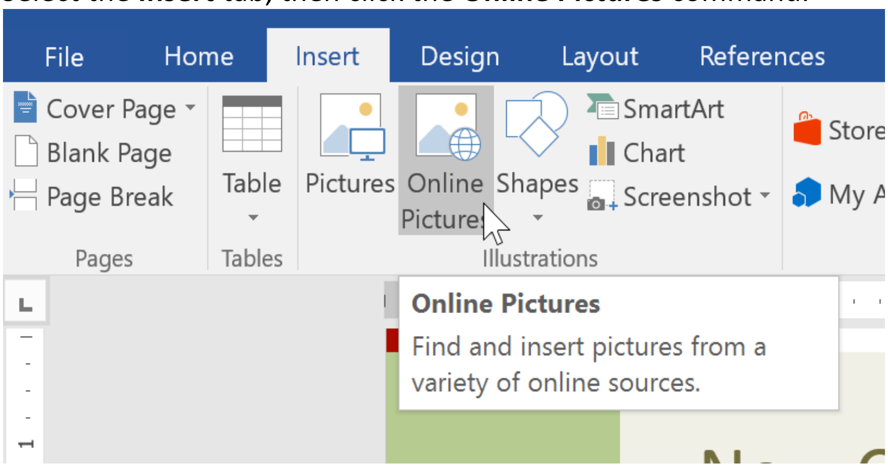



To insert an online picture:

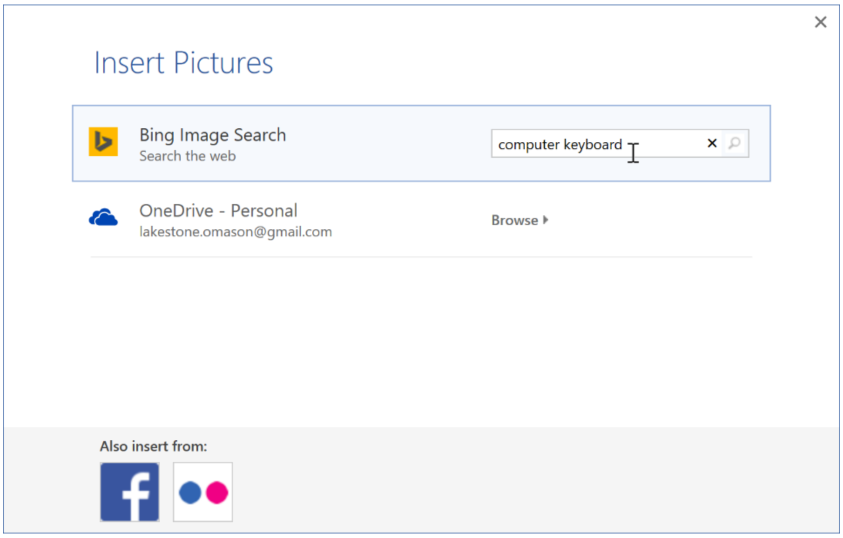
1. Place the **insertion point** where you want the image to appear.



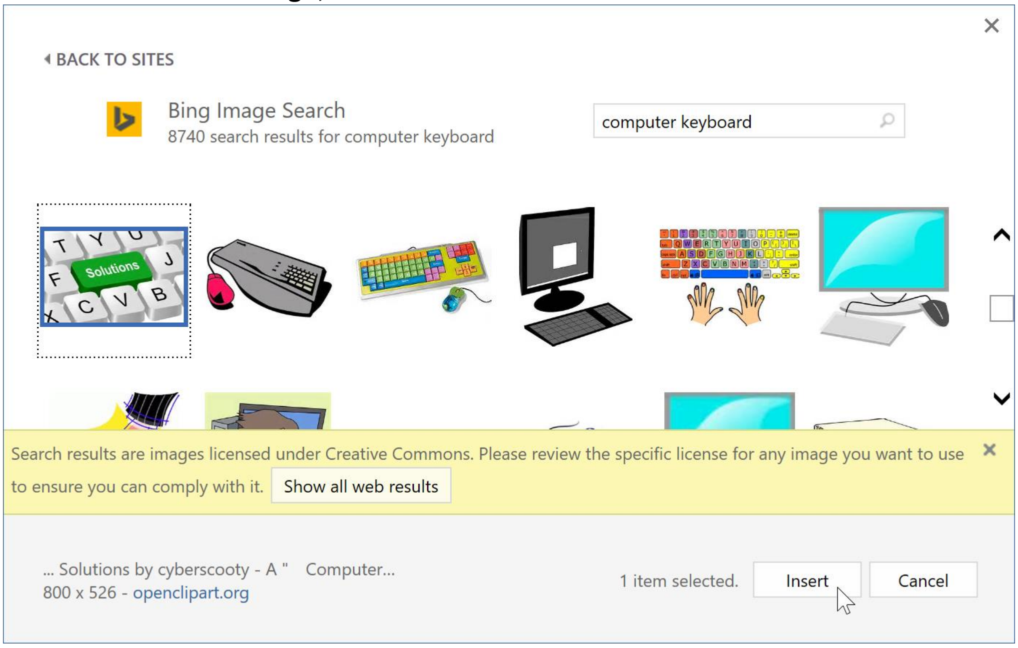

2. Select the **Insert** tab, then click the **Online Pictures** command.



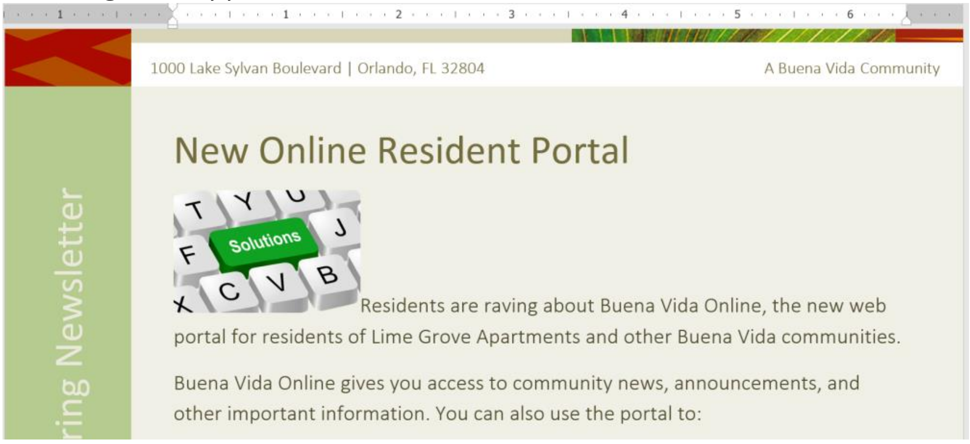

3. The Insert Pictures dialog box will appear.
4. Choose **Bing Image Search** or your **OneDrive**. In our example, we'll use Bing Image Search.




5. Press the **Enter** key. Your search results will appear in the box.
6. Select the desired image, then click **Insert**.




7. The image will appear in the document.



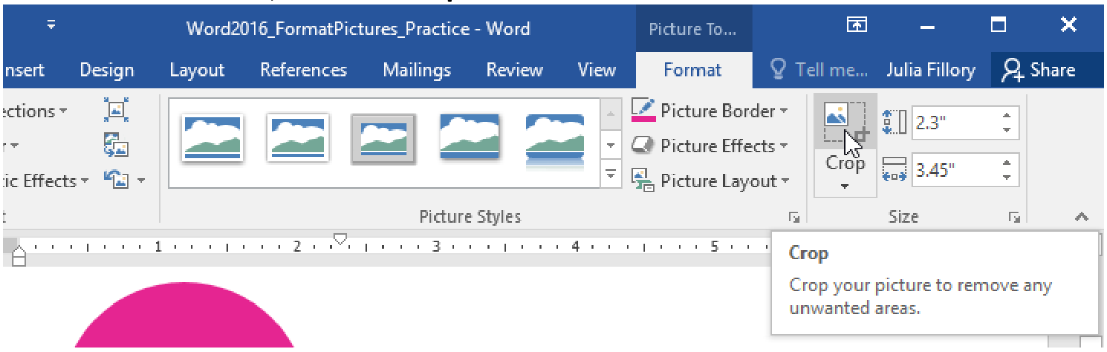
## Formatting Pictures

There are many ways to format pictures in Word. For instance, you can change the size or shape of an image to better suit your document. You can also enhance its appearance using Word's image adjustment tools.

To crop an image:

When you crop an image, part of the picture is **removed**. Cropping can be useful if you're working with an image that's too big and you want to focus on only **part** of it.

1. Select the image you want to crop. The **Format** tab will appear.
2. From the Format tab, click the **Crop** command.



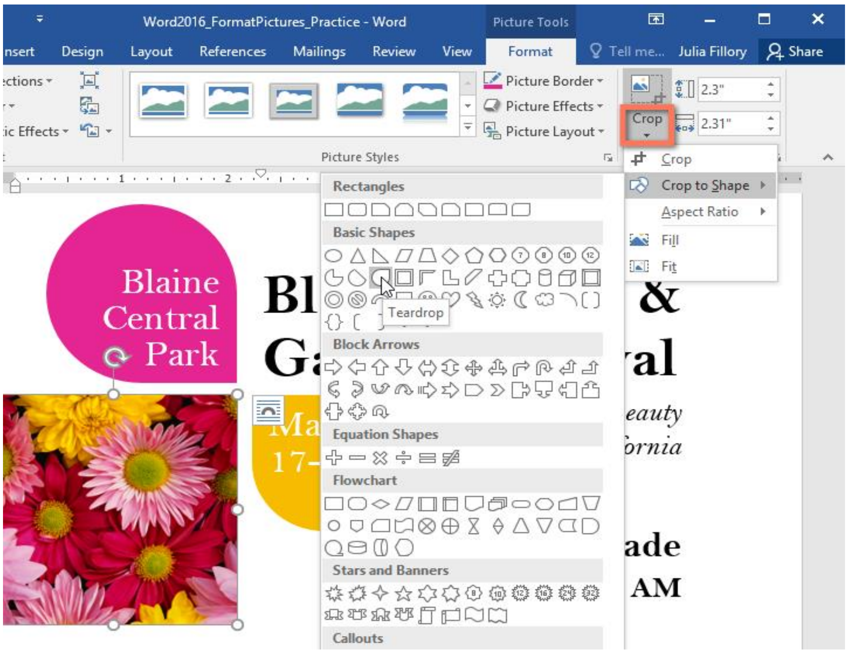

3. **Cropping handles** will appear on the sides and corners of the image. Click and drag **any handle** to crop the image. Because the cropping handles are near the resizing handles, be careful not to drag a resizing handle by mistake.


4. To confirm, click the **Crop** command again. The image will be cropped.


The corner handles are useful for simultaneously cropping the image **horizontally** and **vertically**.

To crop an image to a shape:

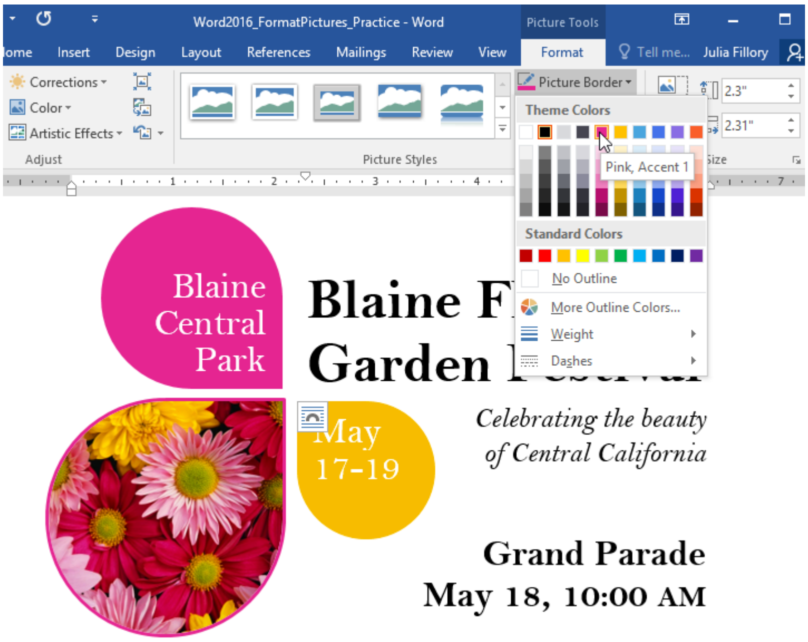
1. Select the image you want to crop, then click the **Format** tab.
2. Click the **Crop** drop-down arrow. Hover over **Crop to Shape**, then select the desired **shape** from the drop-down menu.




3. The image will be cropped to the chosen shape.


To add a border to a picture:

1. Select the picture you want to add a border to, then click the **Format** tab.
2. Click the **Picture Border** command. A drop-down menu will appear.
3. From here, you can select a **color**, **weight** (thickness), and whether the line is **dashed**.

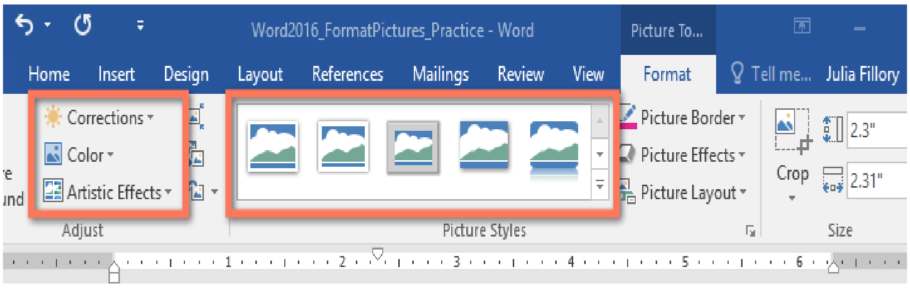



4. The border will appear around the image.

Making image adjustments

With Word's **image adjustment tools**, you can easily fine tune properties like color, contrast, saturation, and tone. Word also offers built-in **picture styles**, which can be used to add a frame, drop shadow, and other predefined effects.

When you're ready to adjust an image, simply select it. Then use the options below, which can be found on the **Format** tab.

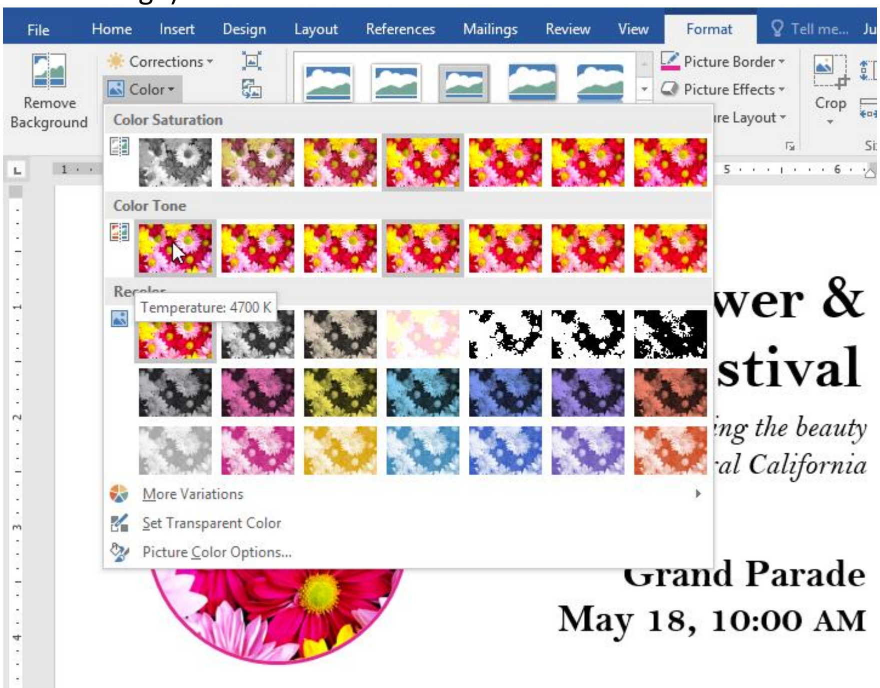



Corrections

From here, you can **sharpen or soften** the image to adjust how clear or blurry it appears. You can also adjust **brightness and contrast**, which affect the image's lightness and general intensity.


Color

Using this command, you can adjust the image's **saturation** (how vibrant the colors appear), **tone** (the color temperature of the image, from cool to warm), and **coloring** (the overall tint of the image).




Artistic Effects

Here, you can apply **special effects** to your image, such as pastel, watercolor, or glowing edges. Because the results are so bold, you may want to use these effects sparingly (especially in professional documents).

Picture Styles group

This group contains many different **predefined styles** that make image formatting even easier. Picture styles are designed to **frame** your image without changing its basic settings or effects.

Compressing pictures

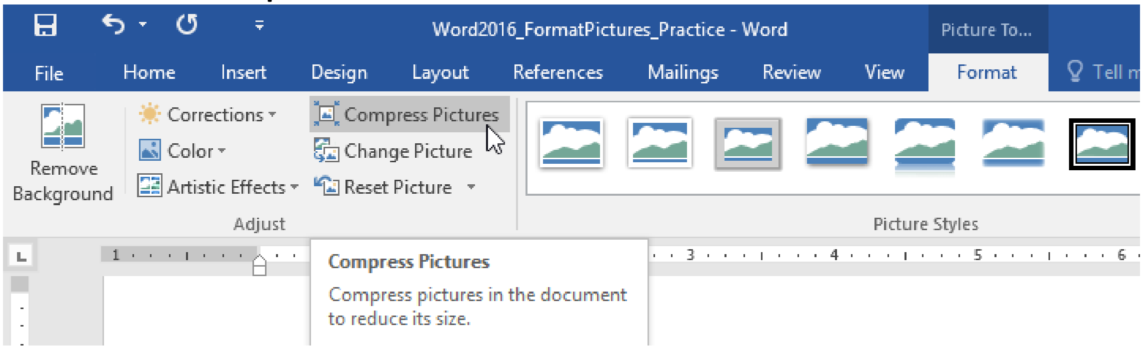
If you plan to email a document that contains pictures, you'll need to monitor its **file size**. Large, high-resolution images can cause your document to become very large, which may make it difficult to attach to an email. Additionally, **cropped areas** of pictures are saved within the document by default, which can add to the file size.

Thankfully, you can reduce your document's file size by **compressing** your pictures. This will lower their **resolution** and **delete cropped areas**.

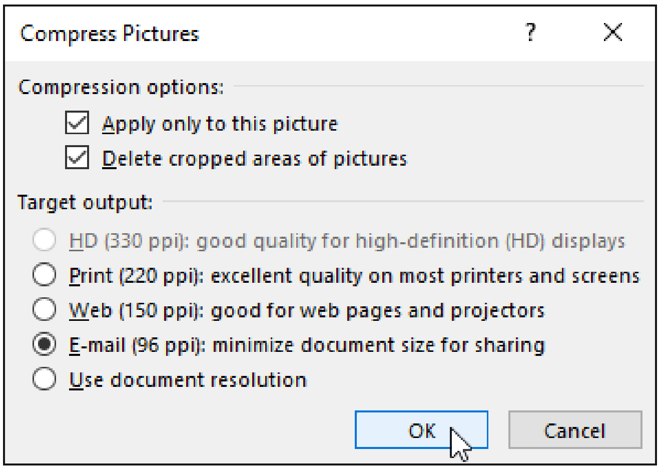
Compressing a picture may noticeably affect its quality (for instance, the image may become blurry or pixelated). Therefore, we recommend **saving an extra copy of your document** before you compress pictures. Alternatively, be prepared to use the **Undo command** if you're dissatisfied with the results.

To compress a picture:

1. Select the picture you want to compress, then navigate to the **Format** tab.
2. Click the **Compress Pictures** command.




3. A dialog box will appear. Check the box next to **Delete cropped areas of pictures**. You can also choose whether to apply the settings to **this picture only** or to all pictures in the document.
4. Choose a **Target output**. If you are emailing your document, you may want to select **Email**, which produces the smallest file size.
5. Click **OK**.

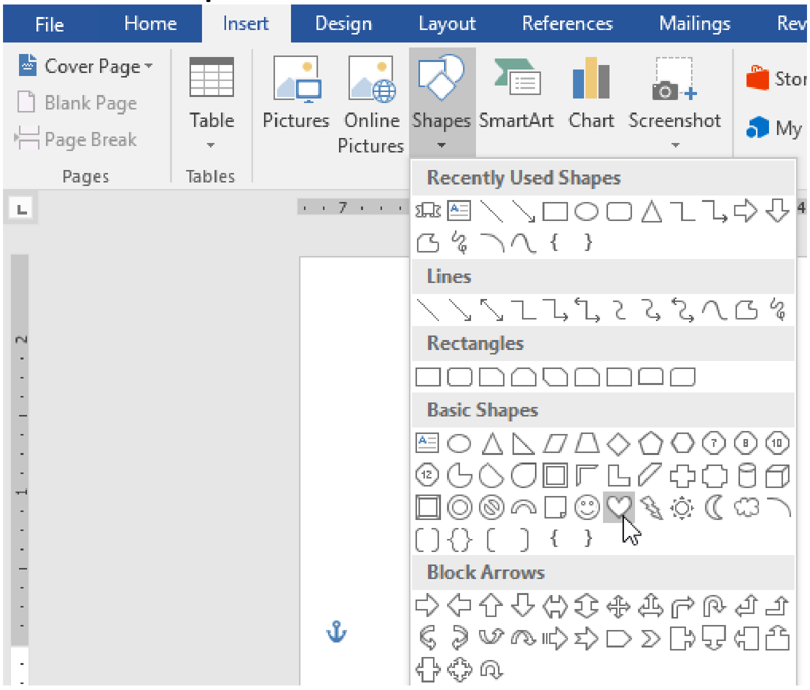



Shapes

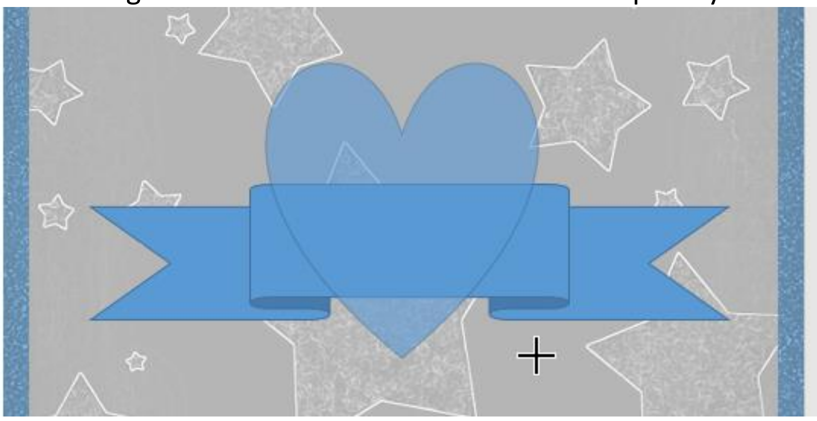
You can add a variety of shapes to your document, including arrows, callouts, squares, stars, and flowchart shapes. Want to set your name and address apart from the rest of your resume? Use a line. Need to create a diagram showing a timeline or process? Use flowchart shapes. While you may not need shapes in every document you create, they can add visual appeal and clarity.

To insert a shape:

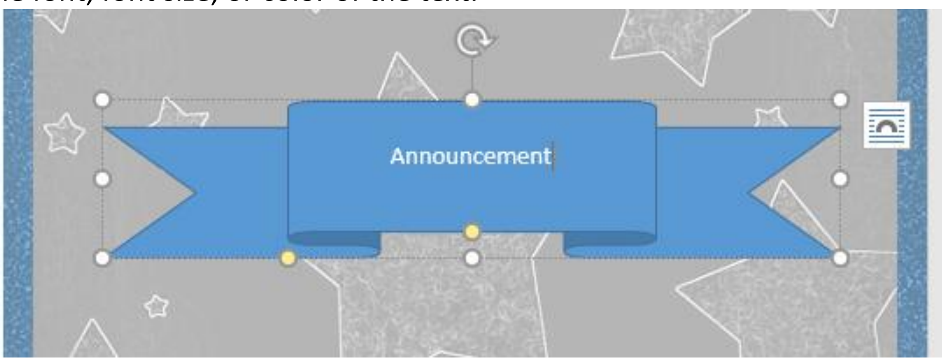
1. Select the **Insert** tab, then click the **Shapes** command. A drop-down menu of shapes will appear.
2. Select the desired **shape**.




3. Click and drag in the desired location to add the shape to your document.



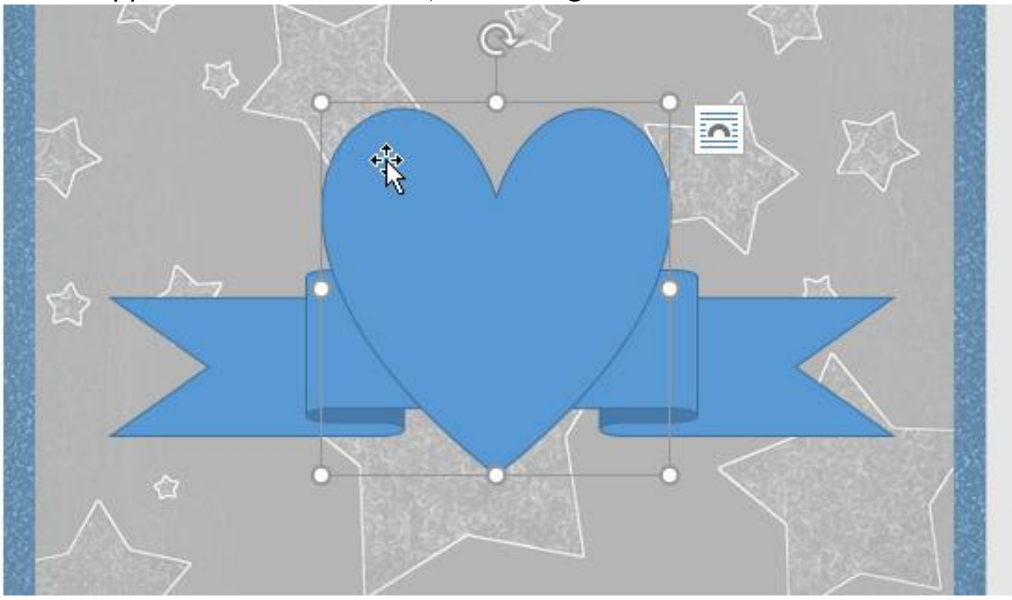
If you want, you can enter text in a shape. When the shape appears in your document, you can begin typing. You can then use the **formatting options** on the **Home** tab to change the font, font size, or color of the text.



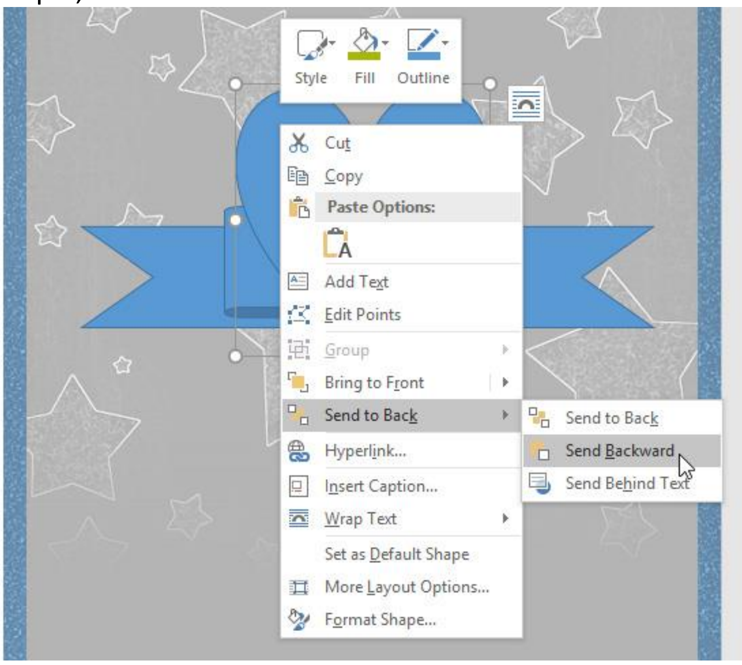
To change the order of shapes:

If one shape overlaps another, you may need to change the **ordering** so the correct shape appears in front. You can bring a shape to the **front** or send it to the **back**. If you have multiple images, you can use **Bring to Front** or **Send to Back** to fine tune the ordering. You can also move a shape **in front of** or **behind** text.

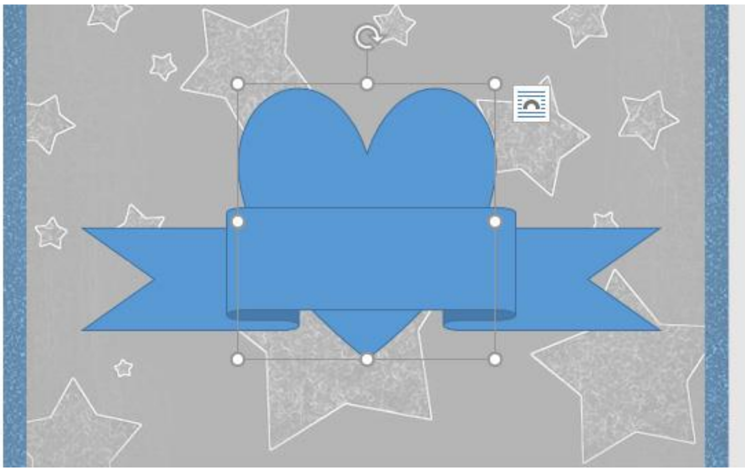
1. Right-click the **shape** you want to move. In our example, we want the heart to appear behind the ribbon, so we'll right-click the heart.



2. In the menu that appears, hover over **Bring to Front** or **Send to Back**. Several ordering options will appear. Select the desired ordering option. In this example, we'll choose **Send to Back**.

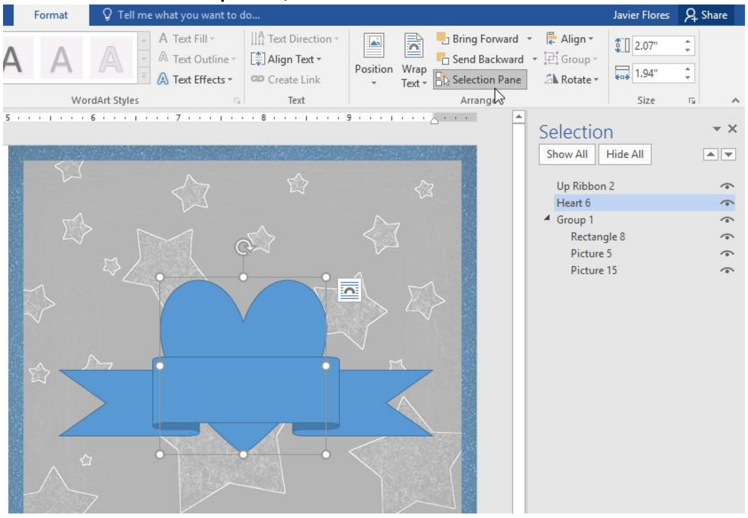



3. The order of the shapes will change.



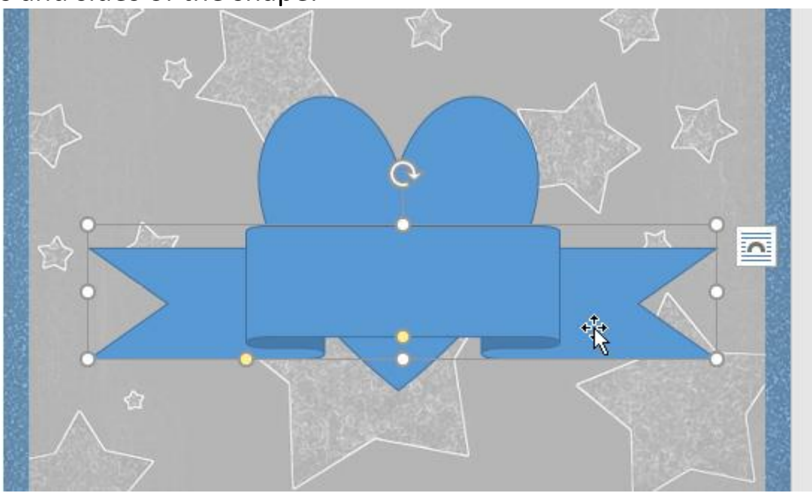
In some cases, the ordering option you select will not affect the ordering of the shapes. If this happens, try selecting the same option again or try a different option.

If you have several shapes placed on top of each other, it may be difficult to select an individual shape. The **Selection pane** allows you to select a shape and drag it to a new location. To access the Selection pane, click **Selection Pane** on the **Format** tab.

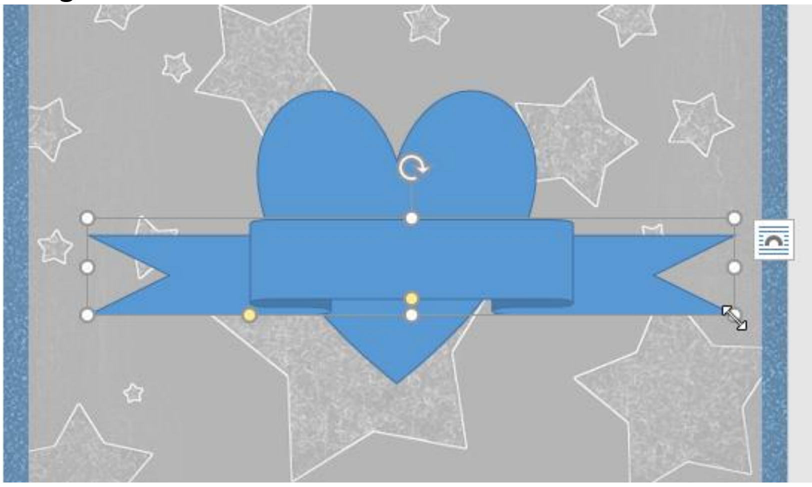



To resize a shape:

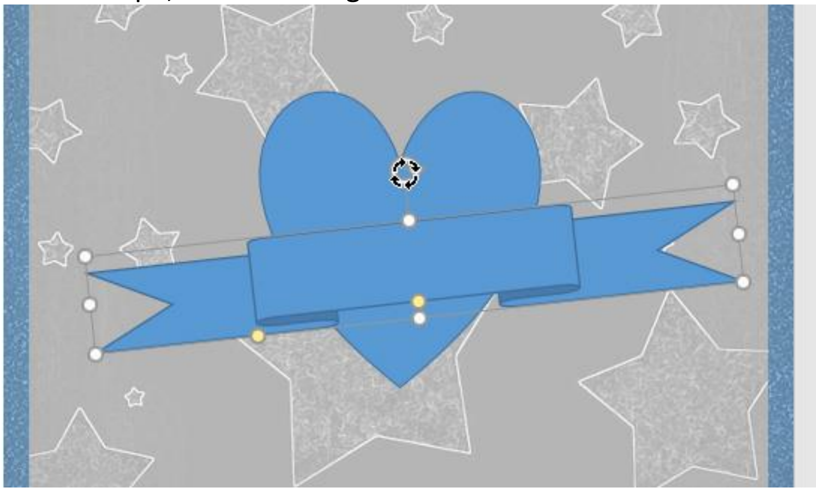
1. Select the shape you want to resize. **Sizing handles** will appear on the corners and sides of the shape.



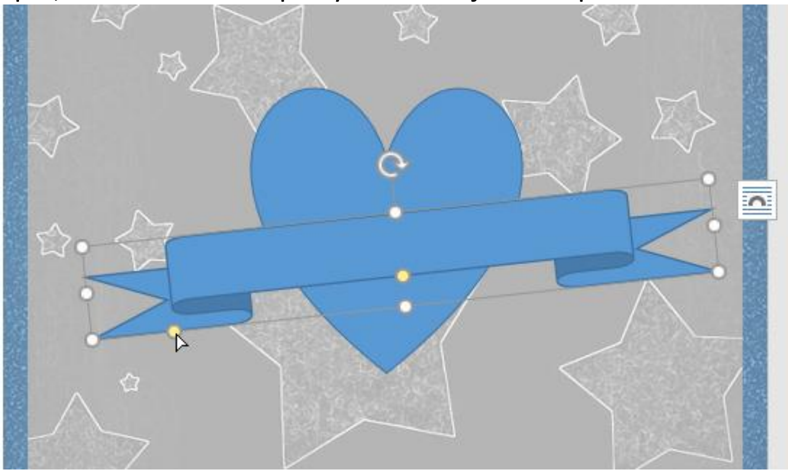
2. Click and drag the **sizing handles** until the shape is the desired size. You can use the corner sizing handles to change the shape's **height** and **width** at the same time.



3. To rotate the shape, click and drag the rotation handle.



Some shapes also have one or more **yellow handles** that can be used to modify the shape. For example, with banner shapes you can adjust the position of the folds.



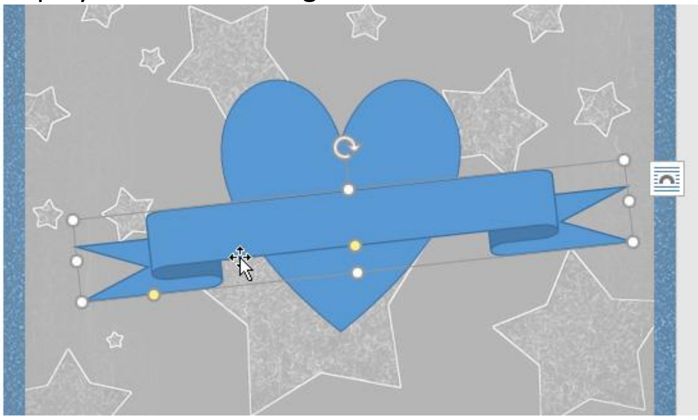
Modifying shapes

Word allows you to modify your shapes in a variety of ways so you can tailor them to your projects. You can **change** a shape into a **different shape**, **format a shape's style and color**, and add various **effects**.

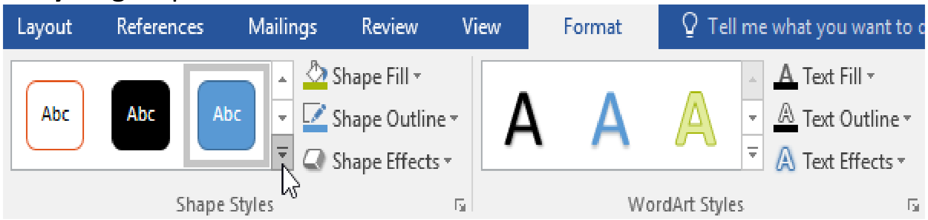
To change the shape style:

Choosing a **shape style** allows you to apply preset colors and effects to quickly change the appearance of your shape.

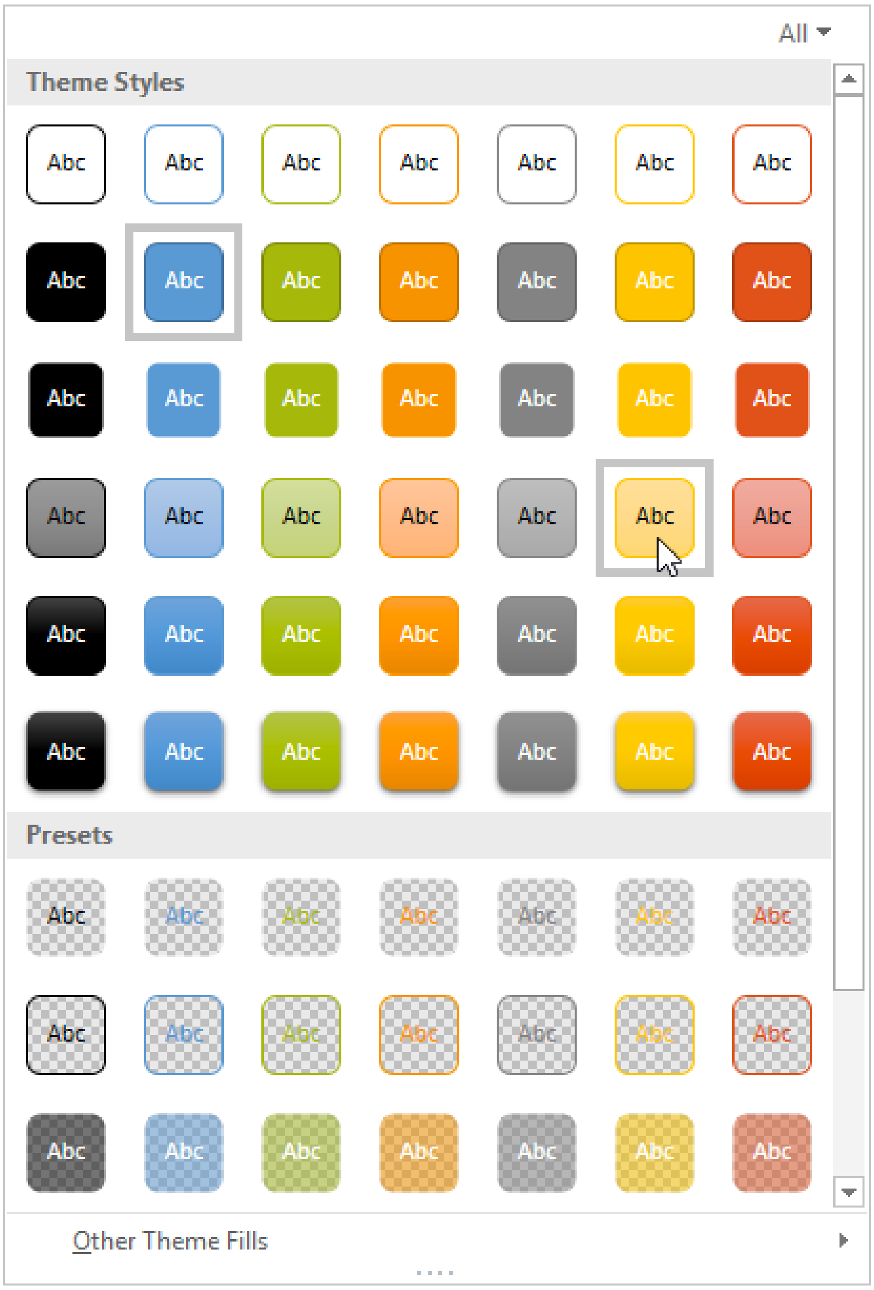
1. Select the shape you want to change.



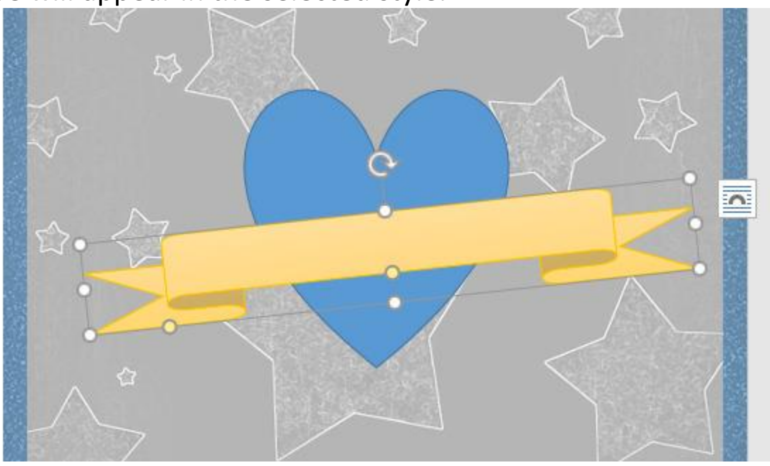
2. On the **Format** tab, click the **More** drop-down arrow in the **Shape Styles** group.




3. A drop-down menu of styles will appear. Select the **style** you want to use.

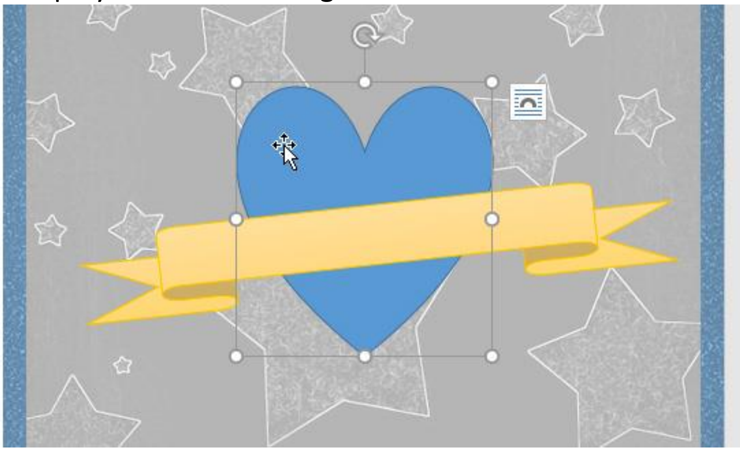



4. The shape will appear in the selected style.

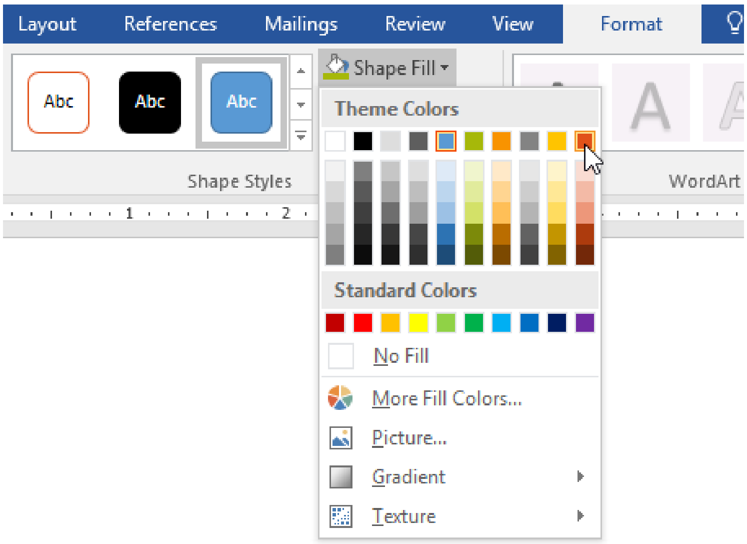


To change the shape fill color:

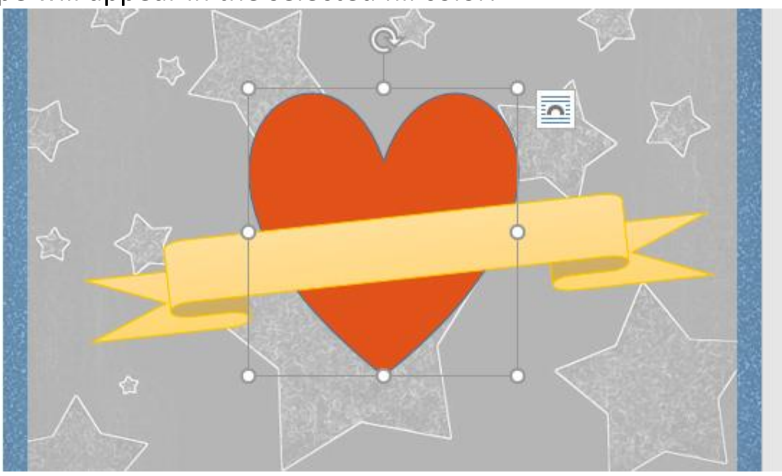
1. Select the shape you want to change.



2. On the **Format** tab, click the **Shape Fill** drop-down arrow. Select the **color** you want to use. To view more color options, select **More Fill Colors**.



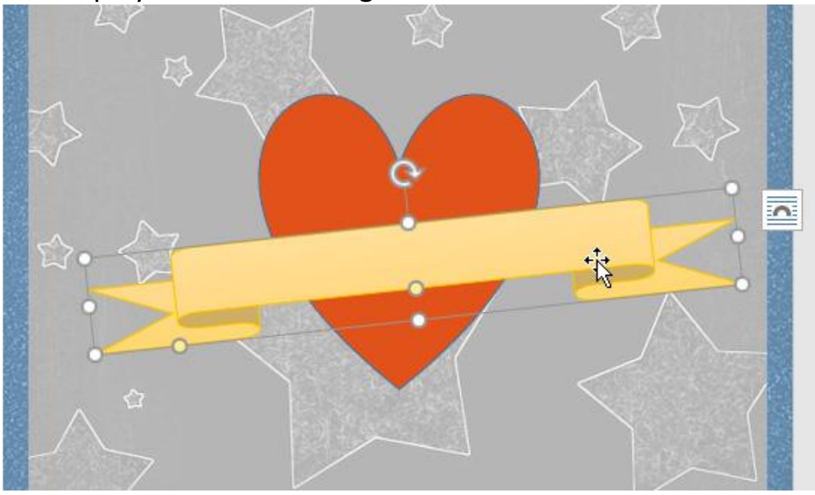

3. The shape will appear in the selected fill color.



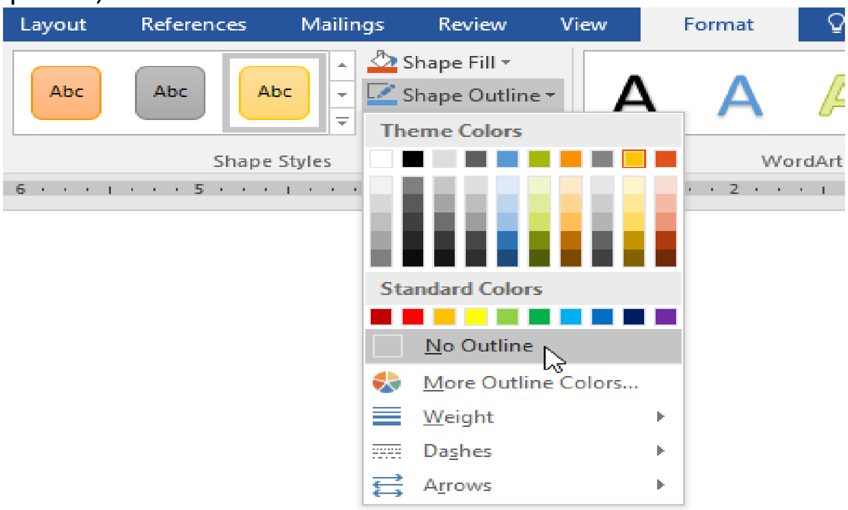
If you want to use a different type of fill, select **Gradient** or **Texture** from the drop-down menu. You can also select **No Fill** to make it transparent.

To change the shape outline:

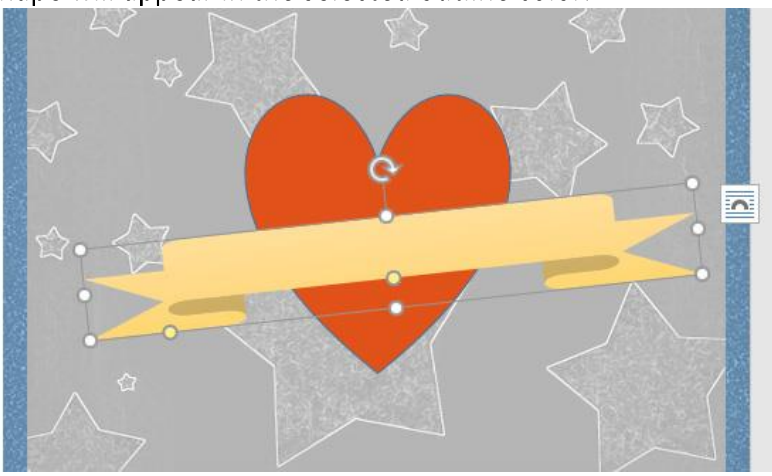
1. Select the shape you want to change.



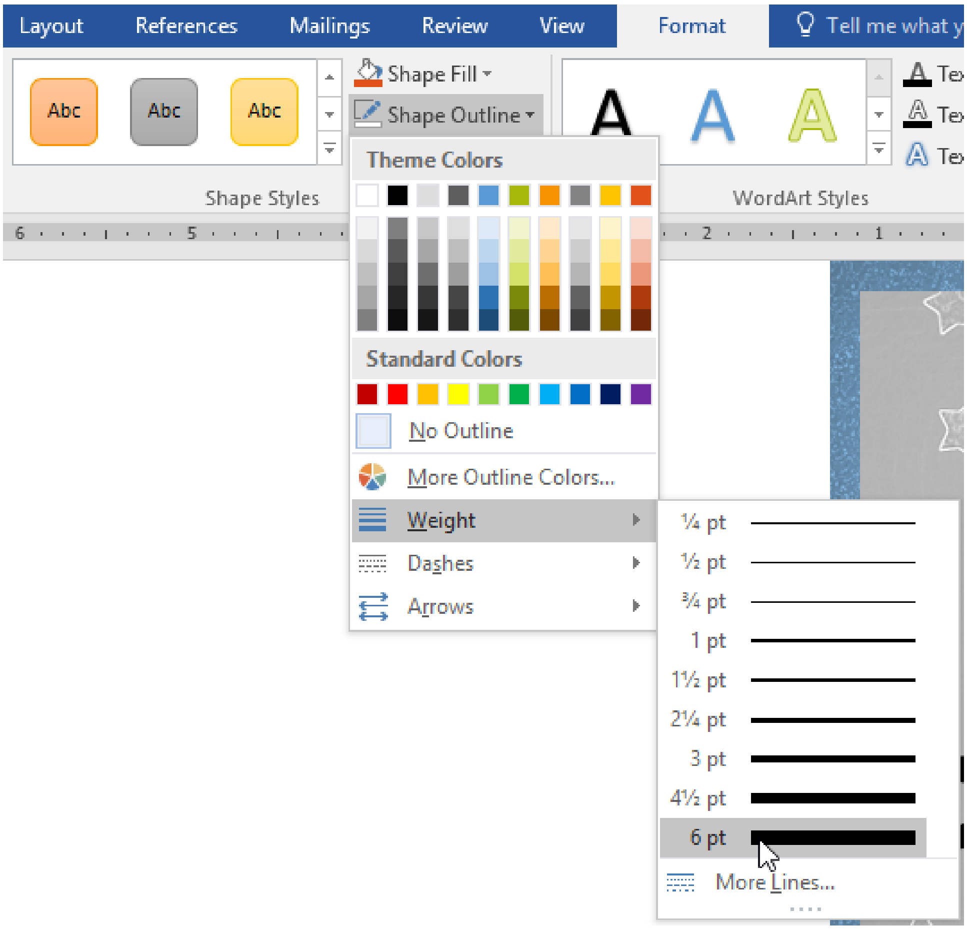
2. On the **Format** tab, click the **Shape Outline** drop-down arrow. The **Shape Outline** menu will appear.
3. Select the **color** you want to use. If you want to make the outline transparent, select **No Outline**.




4. The shape will appear in the selected outline color.

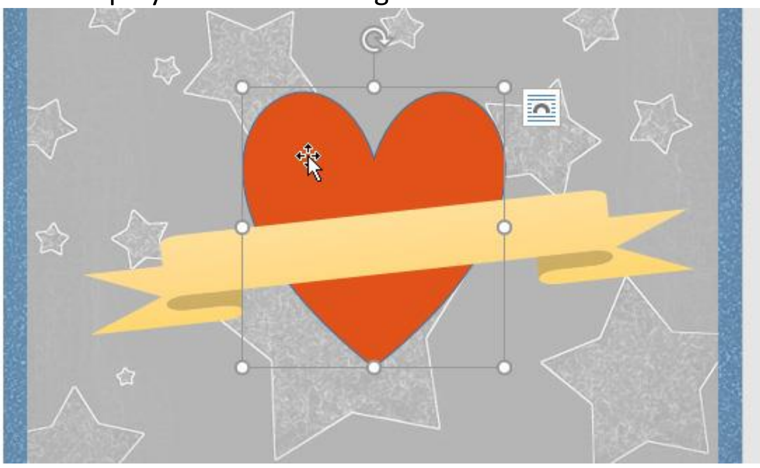


From the drop-down menu, you can change the outline **color**, **weight** (thickness), and whether it is a **dashed** line.

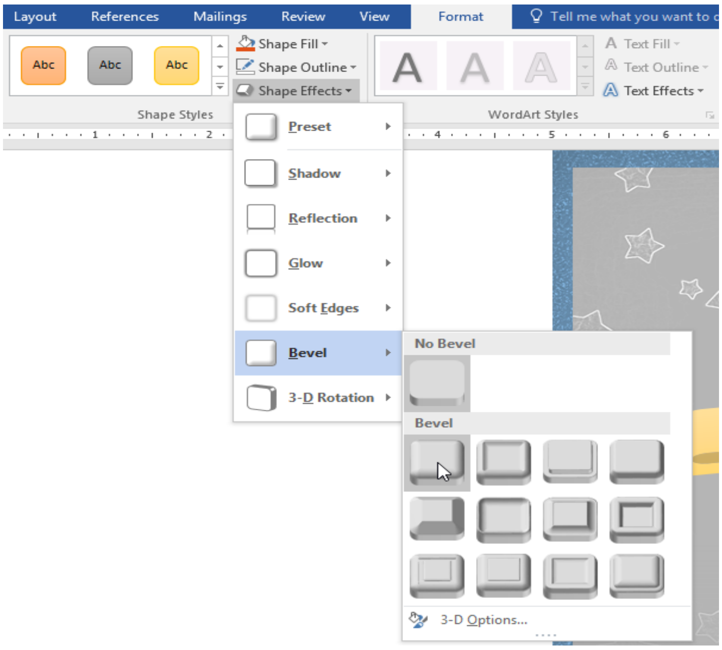



To add shape effects:

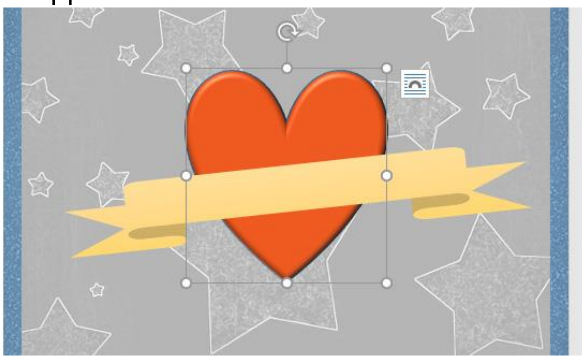
1. Select the shape you want to change.



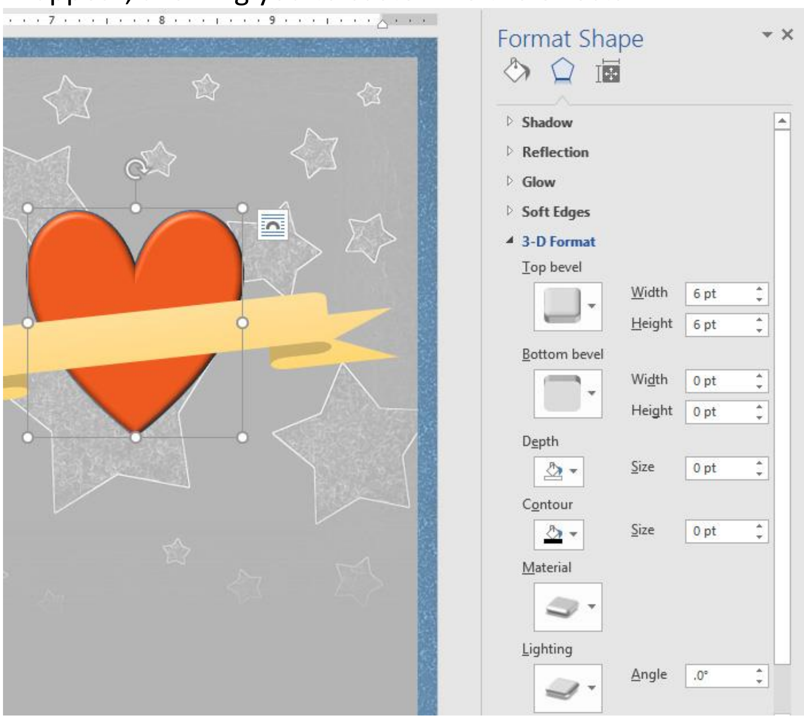
2. On the **Format** tab, click the **Shape Effects** drop-down arrow. In the menu that appears, hover the mouse over the style of effect you want to add, then select the desired preset effect.




3. The shape will appear with the selected effect.

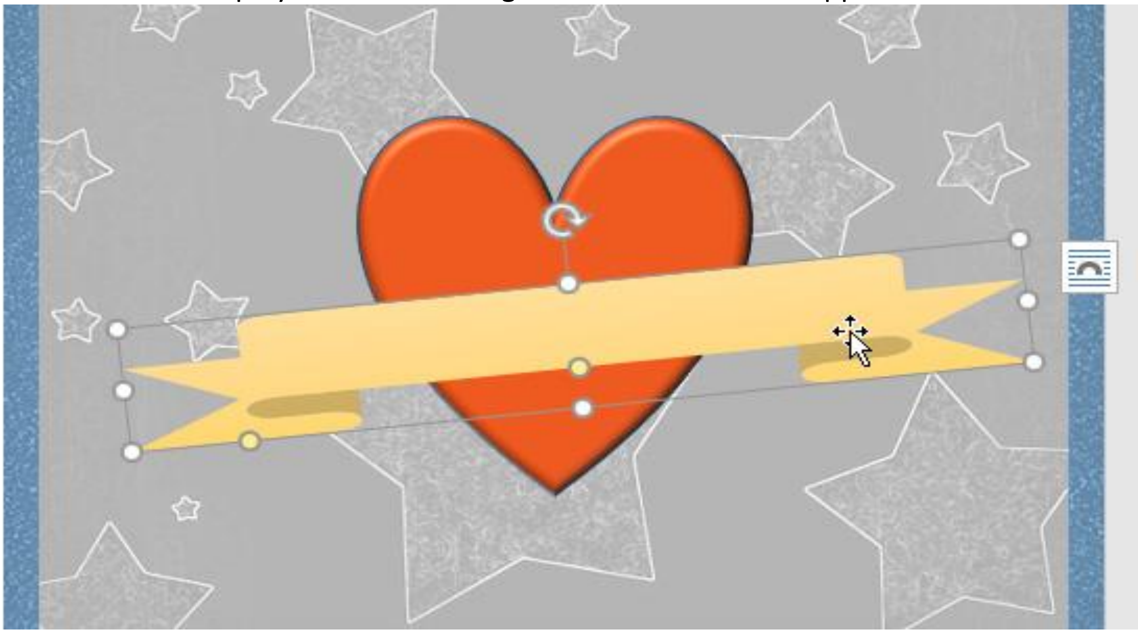


To further adjust your shape effects, select **Options** at the end of each menu. The Format Shape pane will appear, allowing you to customize the effects.

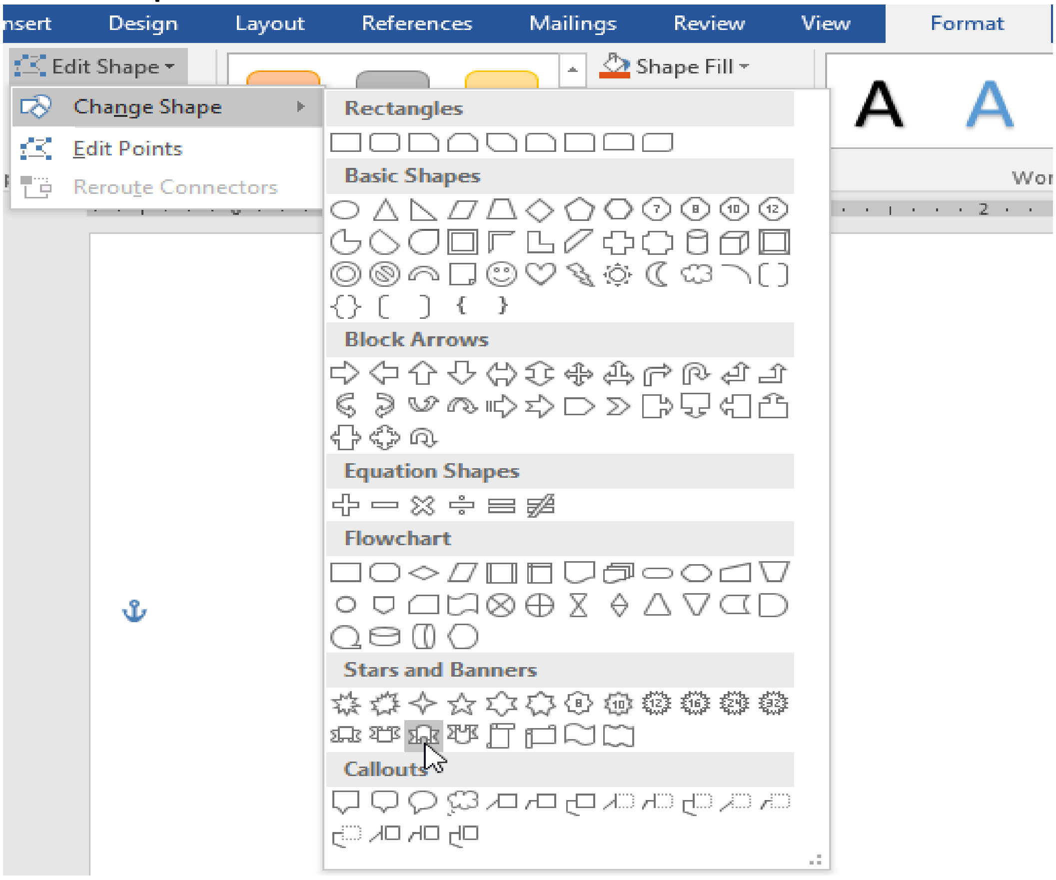


To change to a different shape:

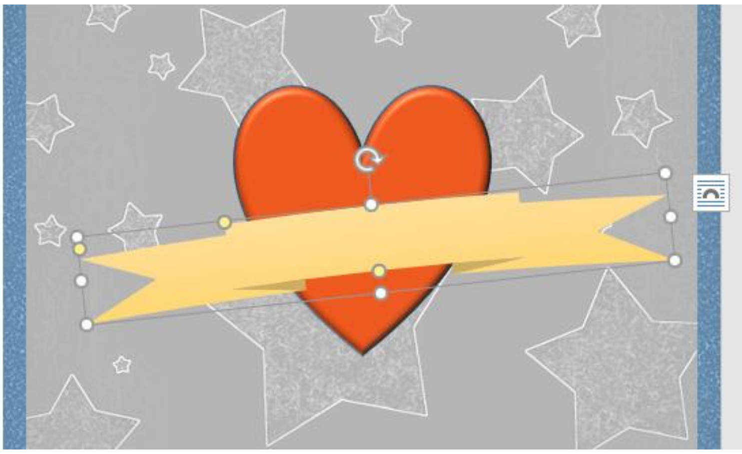
1. Select the shape you want to change. The **Format** tab will appear.



2. On the **Format** tab, click the **Edit Shape** command. In the menu that appears, hover the mouse over **Change Shape**, then select the desired **shape**.




3. The new shape will appear.

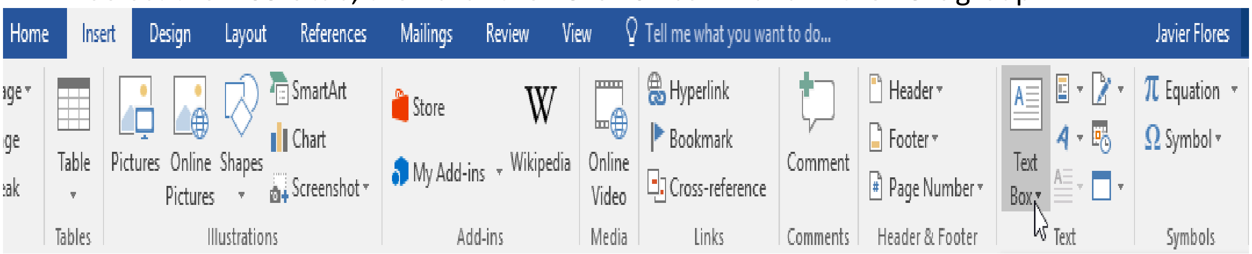


Text Boxes

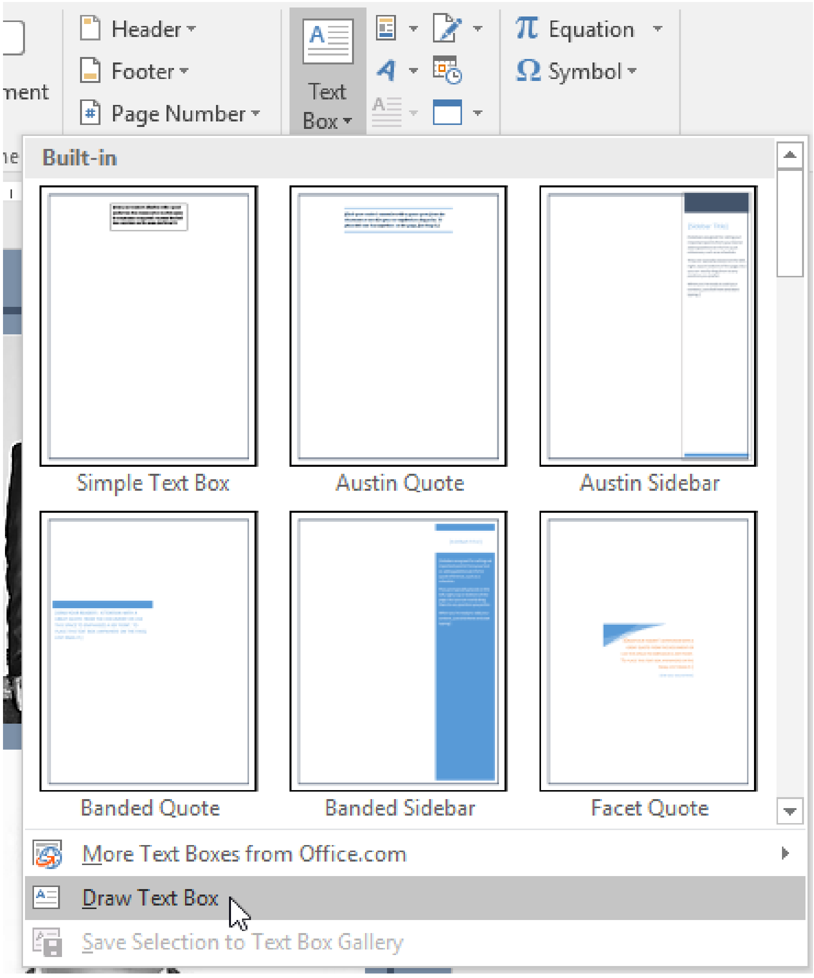
Text boxes can be useful for drawing attention to specific text. They can also be helpful when you need to move text around in your document. Word allows you to format text boxes and the text within them with a variety of styles and effects.

To insert a text box:

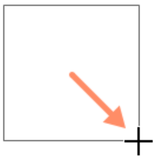
1. Select the **Insert** tab, then click the **Text Box** command in the **Text** group.




2. A drop-down menu will appear. Select **Draw Text Box**.




3. Click and drag anywhere on the document to create the text box.

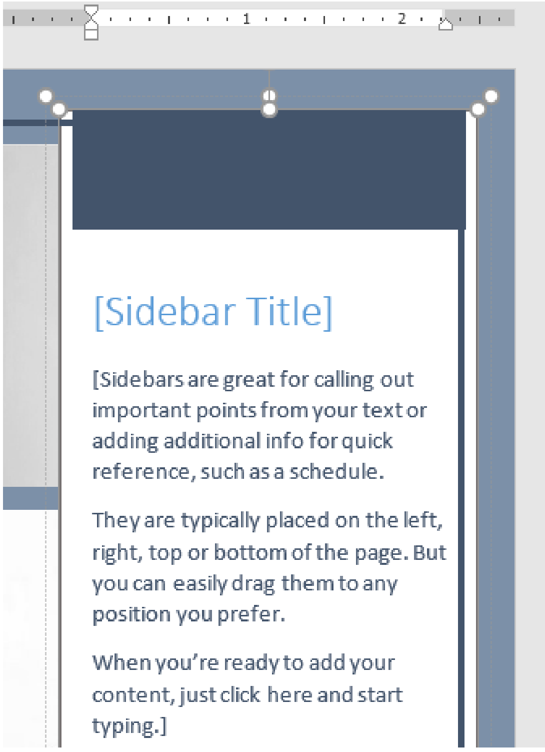


4. The insertion point will appear inside the text box. You can now type to create text inside the text box.


5. If you want, you can select the text and then change the **font**, **color**, and **size** by using the commands on the **Format** and **Home** tabs. To learn more about using these formatting commands, see our **Formatting Text** lesson.


6. Click anywhere outside the text box to return to your document.

You can also select one of the **built-in** text boxes that have predefined colors, fonts, positions, and sizes. If you choose this option, the text box will appear automatically, so you will not need to draw it.




To move a text box:

1. Click the **text box** you want to move.
2. Hover the mouse over one of the edges of the text box. The mouse will change into a **cross with arrows**.
3. Click and drag the text box to the desired **location**.


To resize a text box:

1. Click the **text box** you want to resize.
2. Click and drag any of the **sizing handles** on the corners or sides of the text box until it is the desired size.

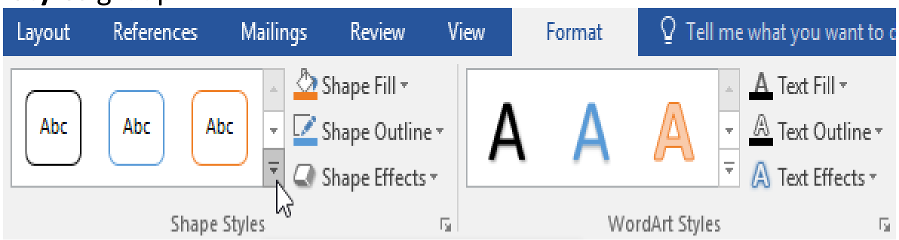

Modifying text boxes

Word offers several options for changing the way text boxes appear in your document. You can change the **shape**, **style**, and **color** of text boxes or add various effects.

To change the shape style:

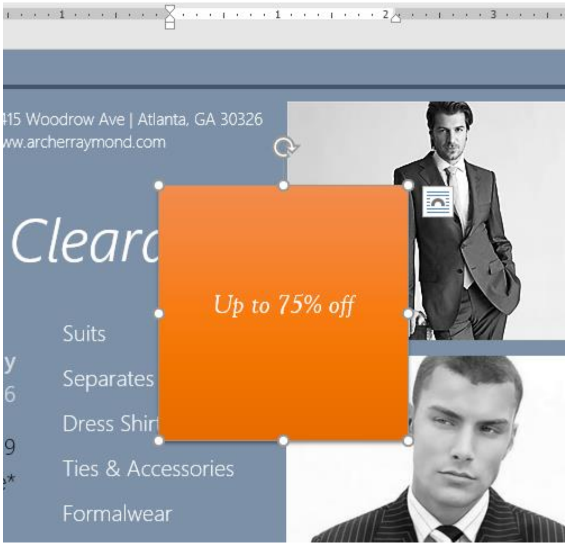
Choosing a **shape style** allows you to apply preset colors and effects to quickly change the appearance of your text box.

1. Select the text box you want to change.
2. On the **Format** tab, click the **More** drop-down arrow in the **Shape Styles** group.




3. A drop-down menu of styles will appear. Select the **style** you want to use.


4. The text box will appear in the selected style.

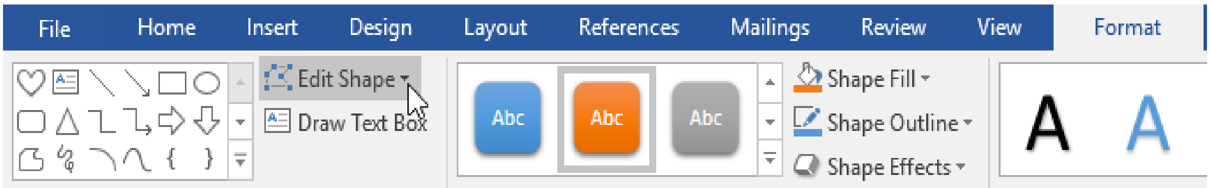



If you want to have more control over text box formatting, you can use any of the shape formatting options such as **Shape Fill** and **Shape Outline**. To learn more, see our **Shapes** lesson.

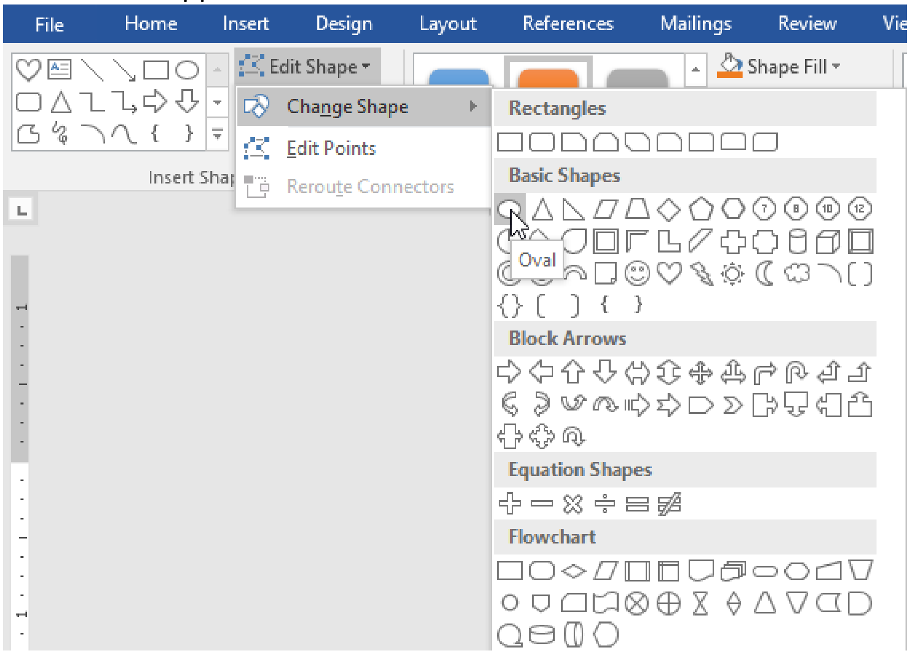
To change the text box shape:

Changing the shape of a text box can be a useful option for creating an interesting look in your document.

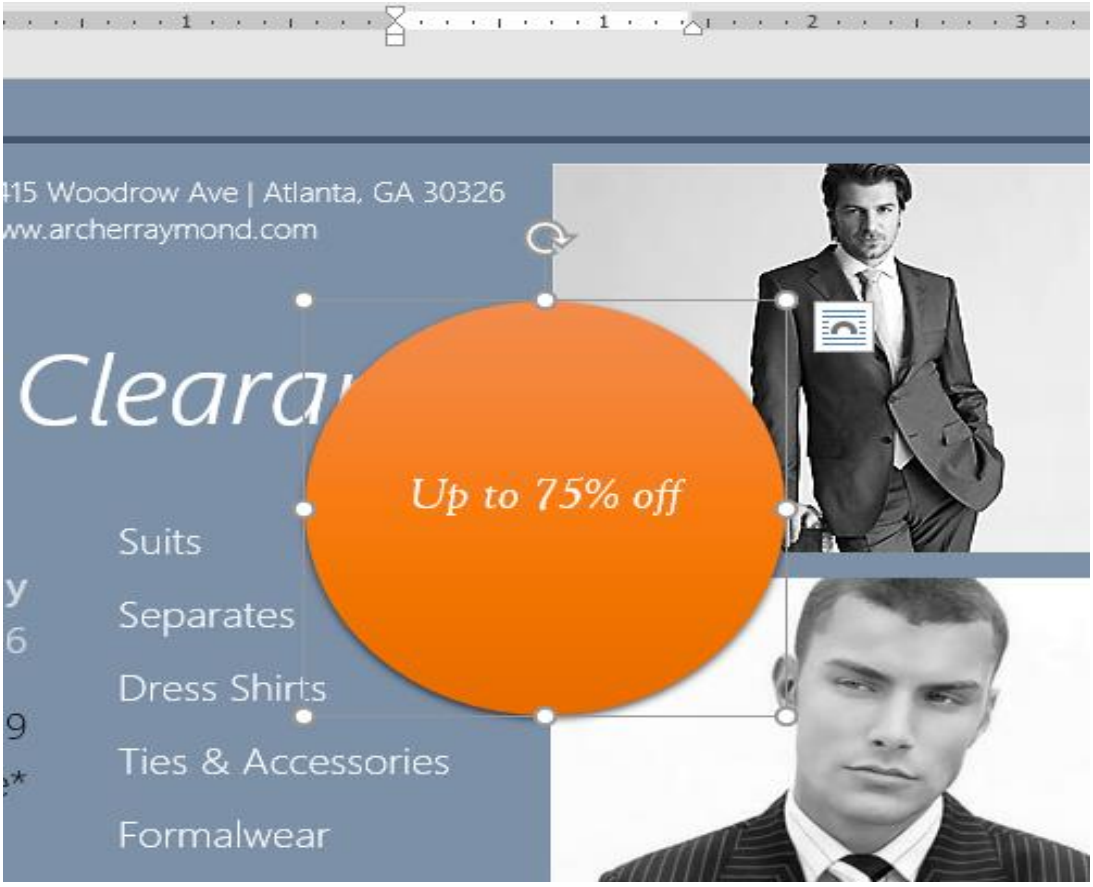
1. Select the text box you want to change. The **Format** tab will appear.
2. From the **Format** tab, click the **Edit Shape** command.




3. Hover the mouse over **Change Shape**, then select the desired **shape** from the menu that appears.




4. The text box will appear formatted as the shape.

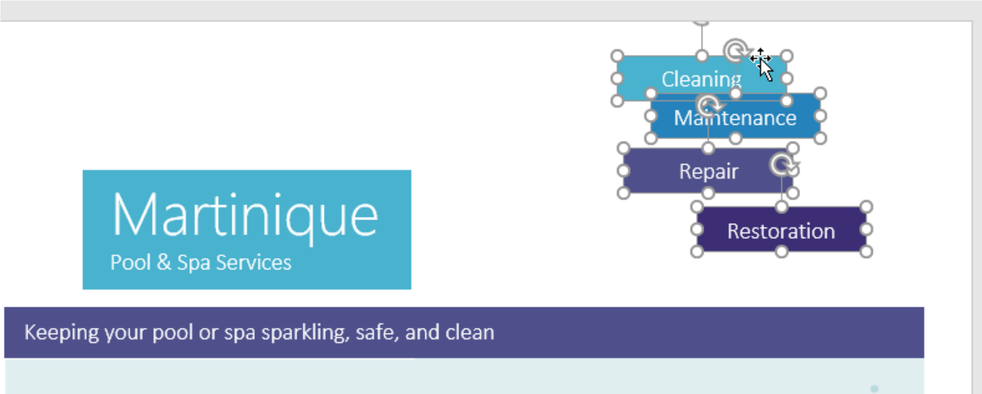


## Aligning, Ordering, and Grouping Objects

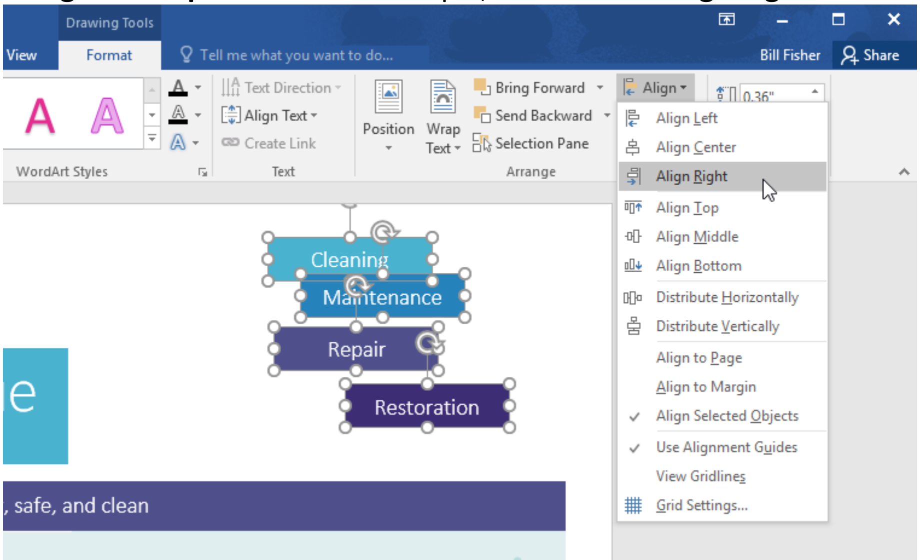
There may be times when your documents have multiple objects, such as pictures, shapes, and text boxes. You can arrange the objects any way you want by aligning, grouping, ordering, and rotating them in various ways.

To align two or more objects:

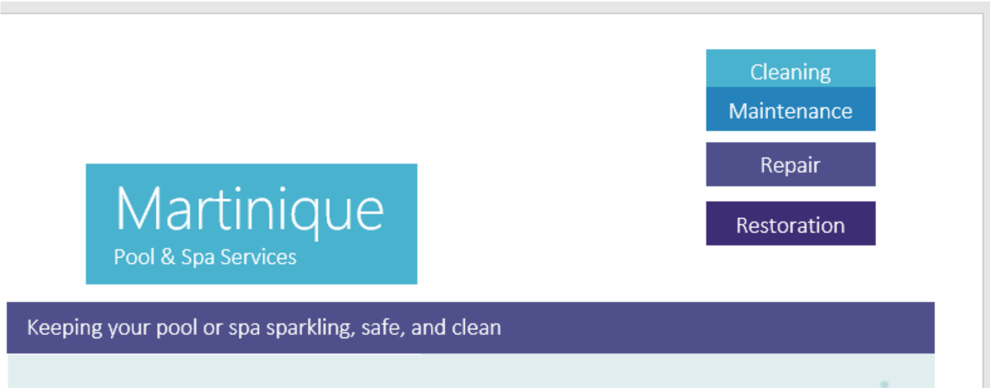
1. Hold the **Shift** (or **Ctrl**) key and click the objects you want to align. In our example, we'll select the four shapes on the right.




2. From the **Format** tab, click the **Align** command, then select one of the **alignment options**. In our example, we'll choose **Align Right**.




3. The objects will be aligned based on the selected option. In our example, the shapes are now aligned with each other.

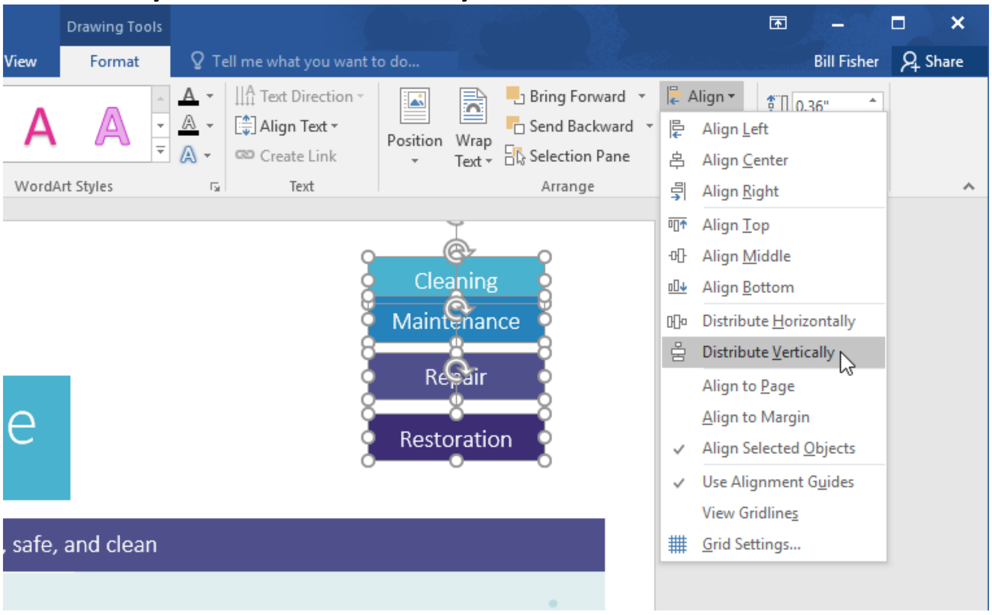


Note that the **Align Selected Objects** option is selected by default, which allows you to align objects without moving them to a different part of the page. However, if you want to move the objects the top or bottom of the page, select **Align to Page** or **Align to Margin** before choosing an alignment option.

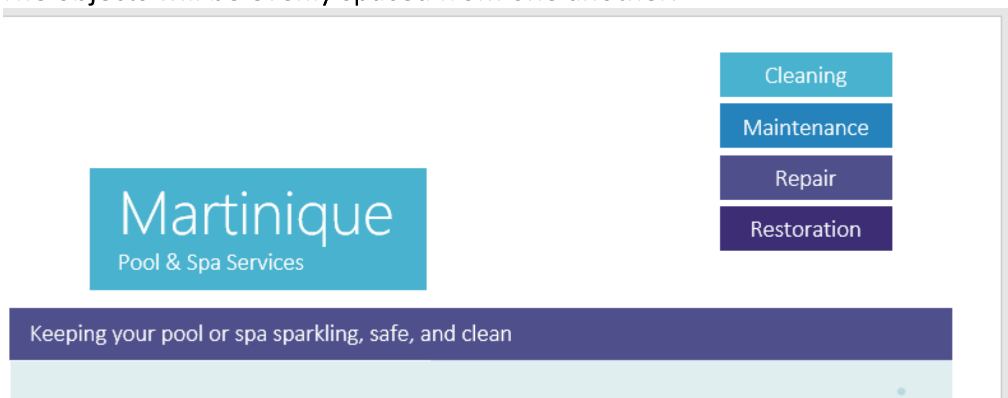
To distribute objects evenly:

If you have arranged your objects in a row or column, you may want them to be an **equal distance** from one another for a neater appearance. You can do this by **distributing the objects** horizontally or vertically.

1. Hold the **Shift** (or **Ctrl**) key and click the objects you want to distribute.
2. On the **Format** tab, click the **Align** command, then select **Distribute Horizontally** or **Distribute Vertically**.




3. The objects will be evenly spaced from one another.

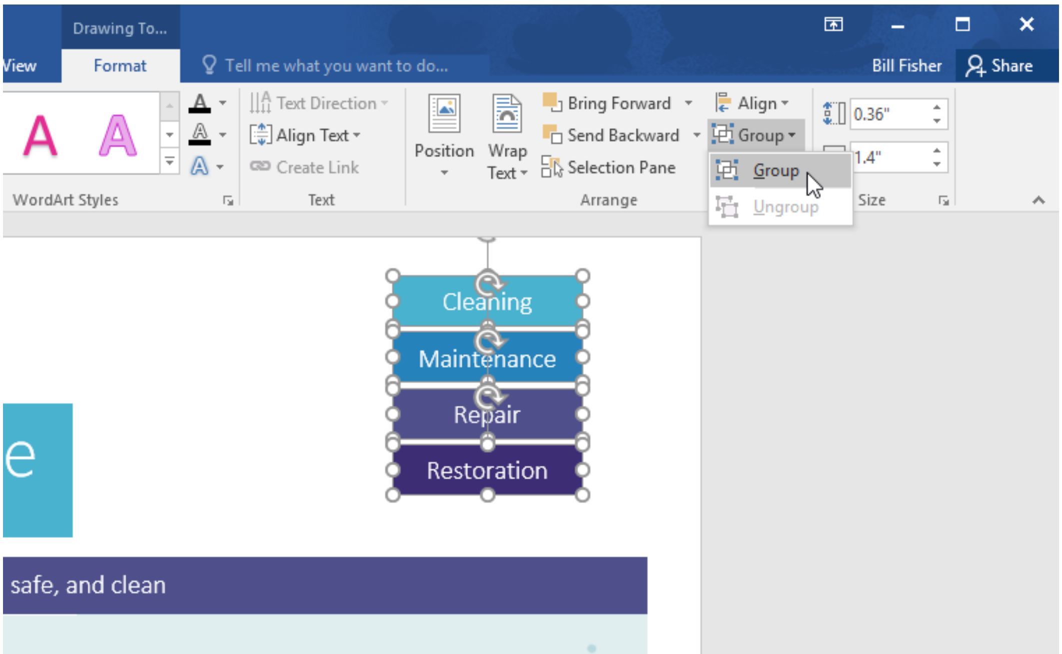



Grouping objects

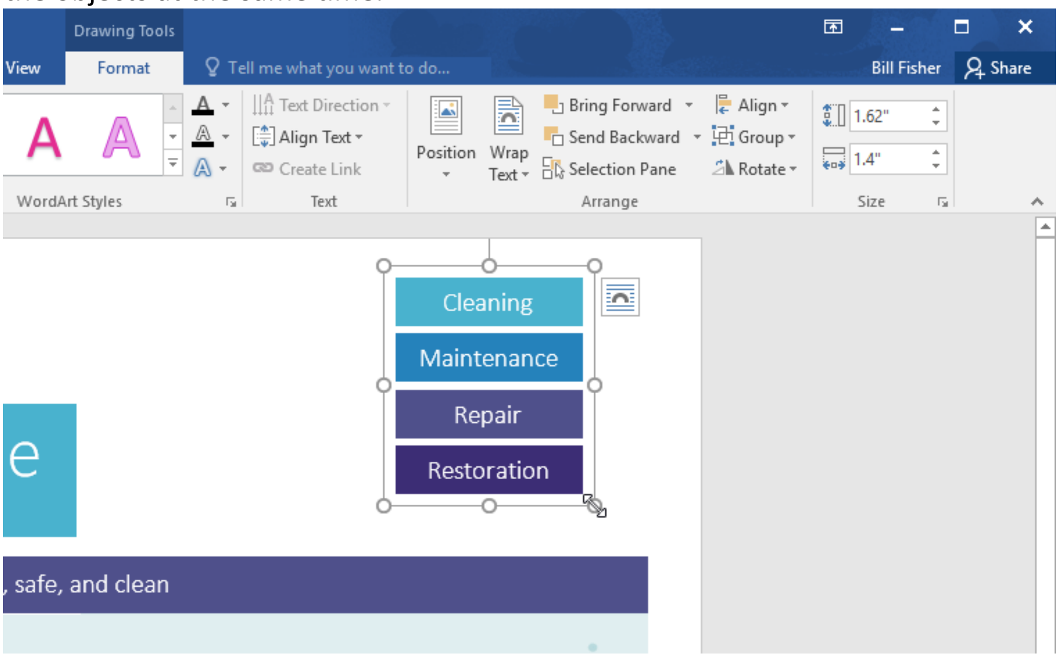
At times, you may want to **group** multiple objects into **one object** so they will stay together. This is usually easier than selecting them individually, and it also allows you to resize and move all of the objects at the same time.

To group objects:

1. Hold the **Shift** (or **Ctrl**) key and click the objects you want to group.
2. Click the **Group** command on the **Format** tab, then select **Group**.

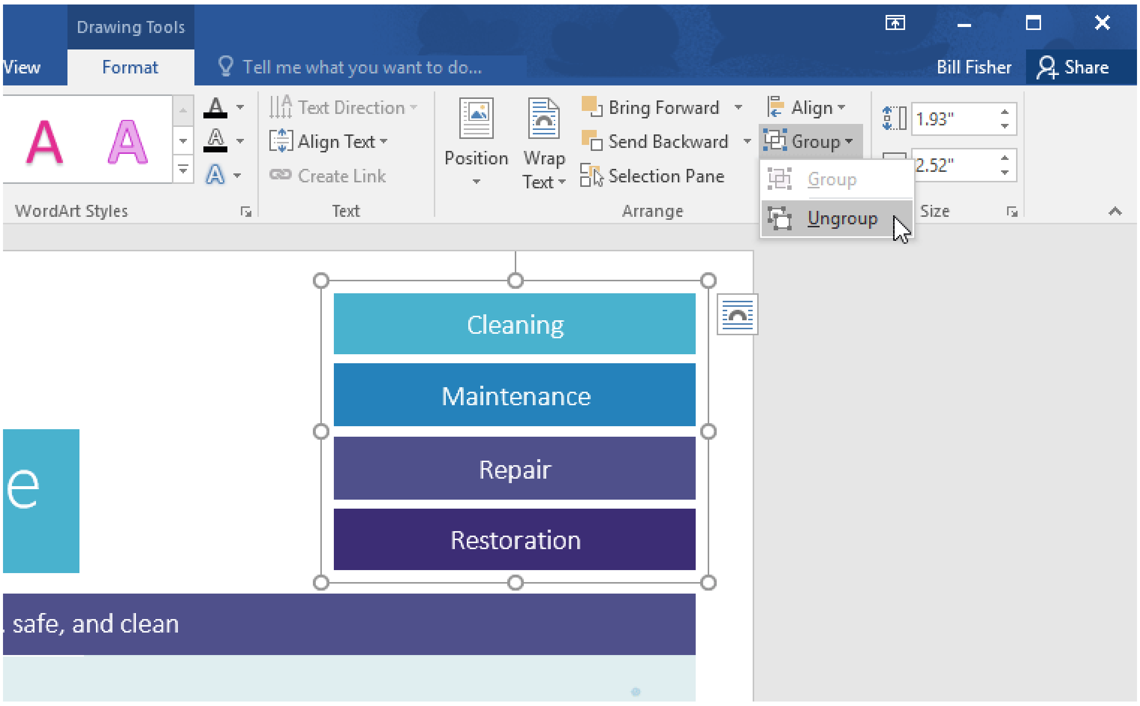



3. The selected objects will now be grouped. There will be a **single box with sizing handles** around the entire group so you can move or resize all of the objects at the same time.




To ungroup objects:

1. Select the grouped object. From the **Format** tab, click the **Group** command and select **Ungroup**.



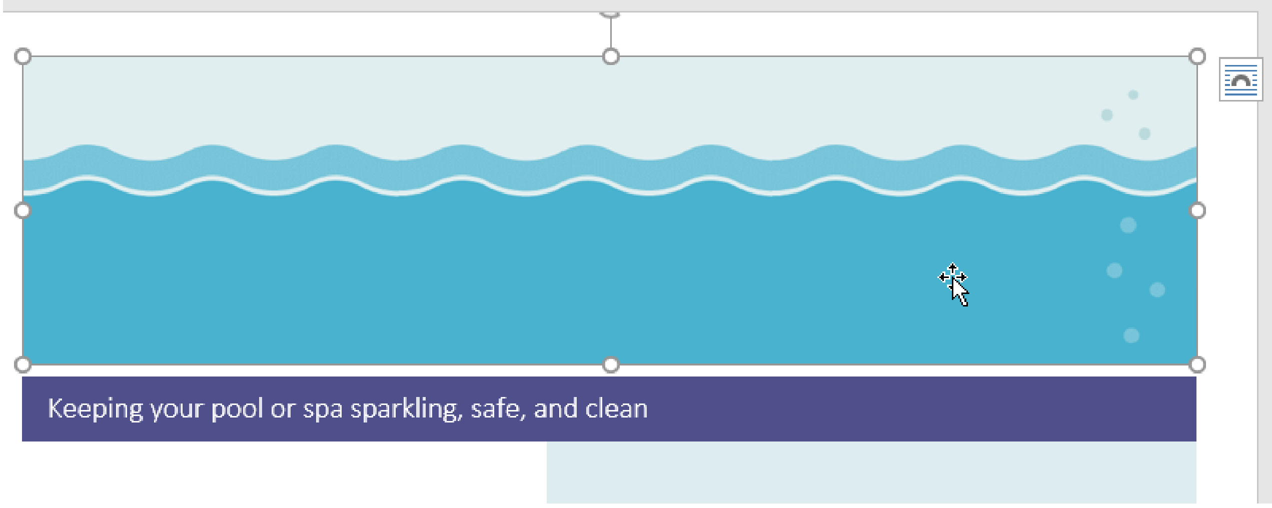

2. The objects will be ungrouped.


Ordering objects

In addition to aligning objects, Word gives you the ability to **arrange objects** in a **specific order**. The ordering is important when two or more objects **overlap** because it determines which objects are in the **front** or the **back**.

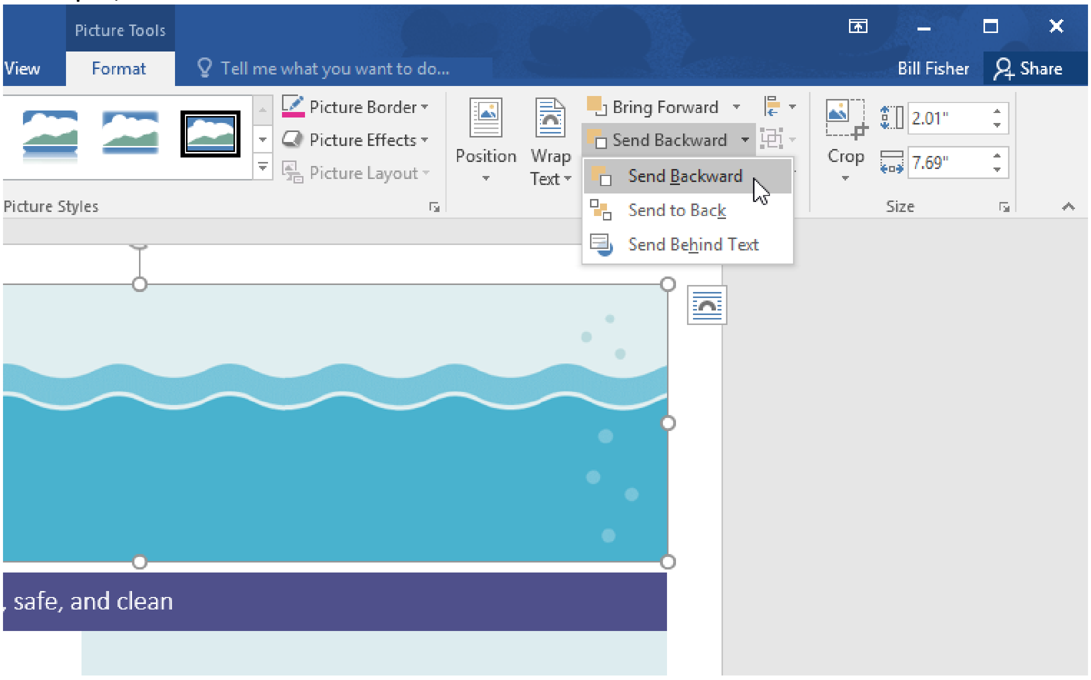
Understanding levels

Objects are placed on different **levels** according to the **order** in which they were inserted into a document. In the example below, if we move the wave’s image to the beginning of the document, it covers up several of the text boxes. That's because the image is currently on the highest—or top—level. However, we can **change its level** to put it behind the other objects.

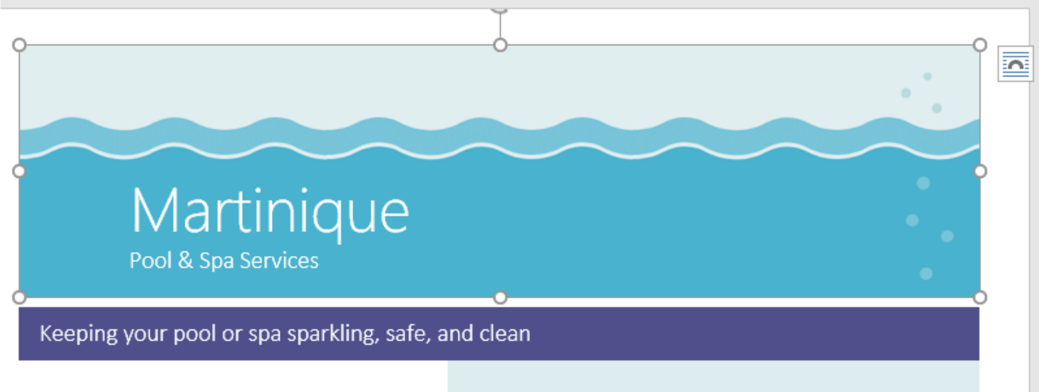



To change an object's level:

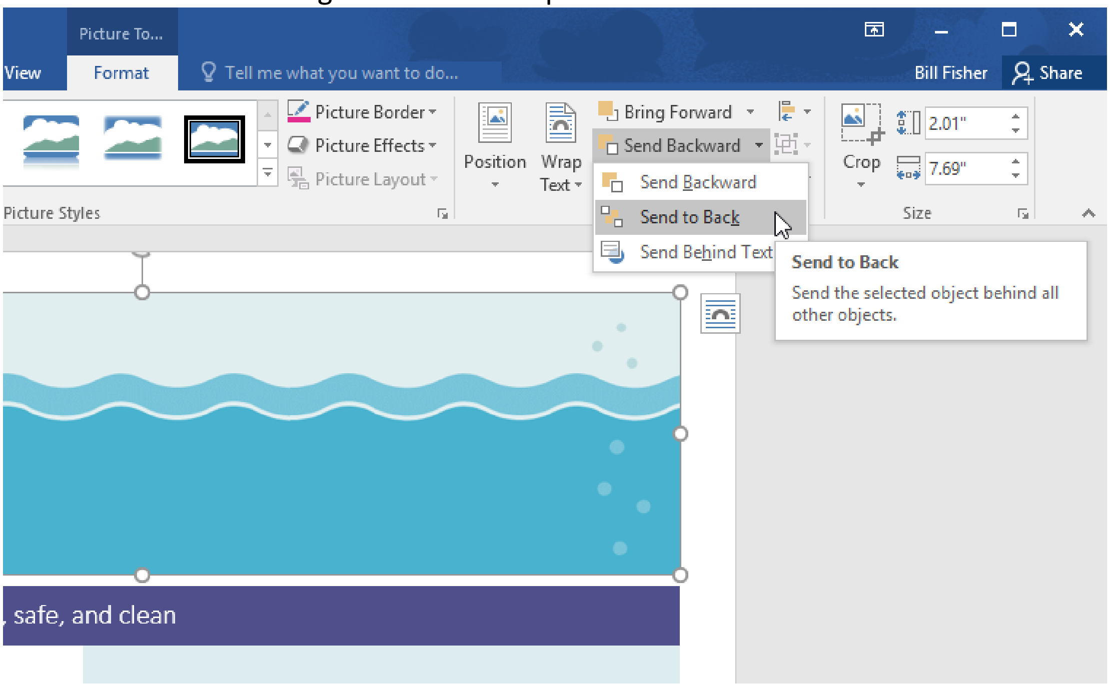
1. Select the object you want to move. In our example, we'll select the image of the waves.
2. From the **Format** tab, click the **Bring Forward** or **Send Backward** command to change the object's ordering by **one level**. In our example, we'll select **Send Backward**.



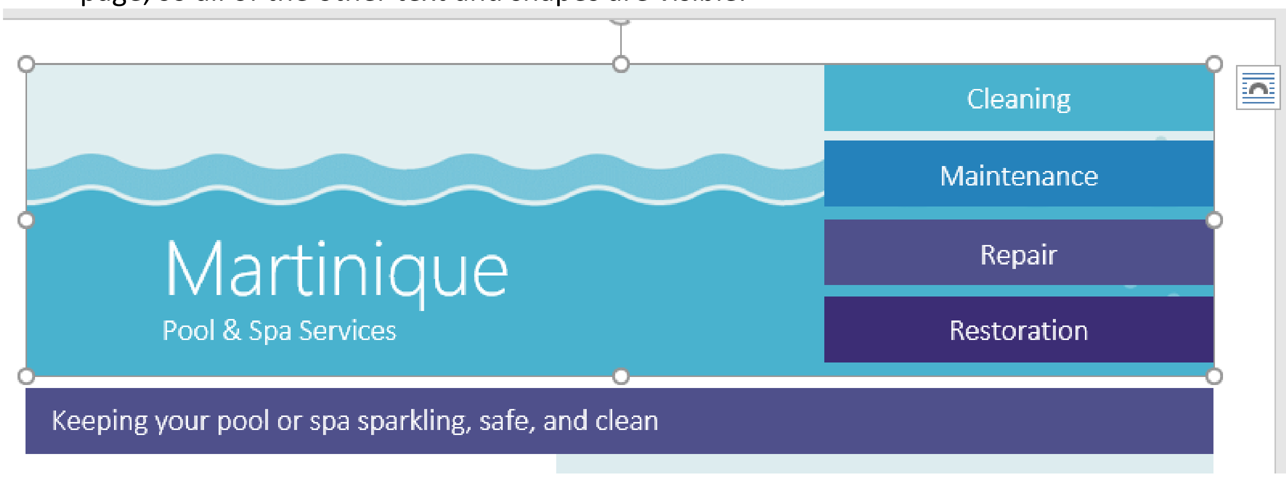

3. The objects will be reordered. In our example, the image is now behind the text on the left, but it's still covering the shapes on the right.



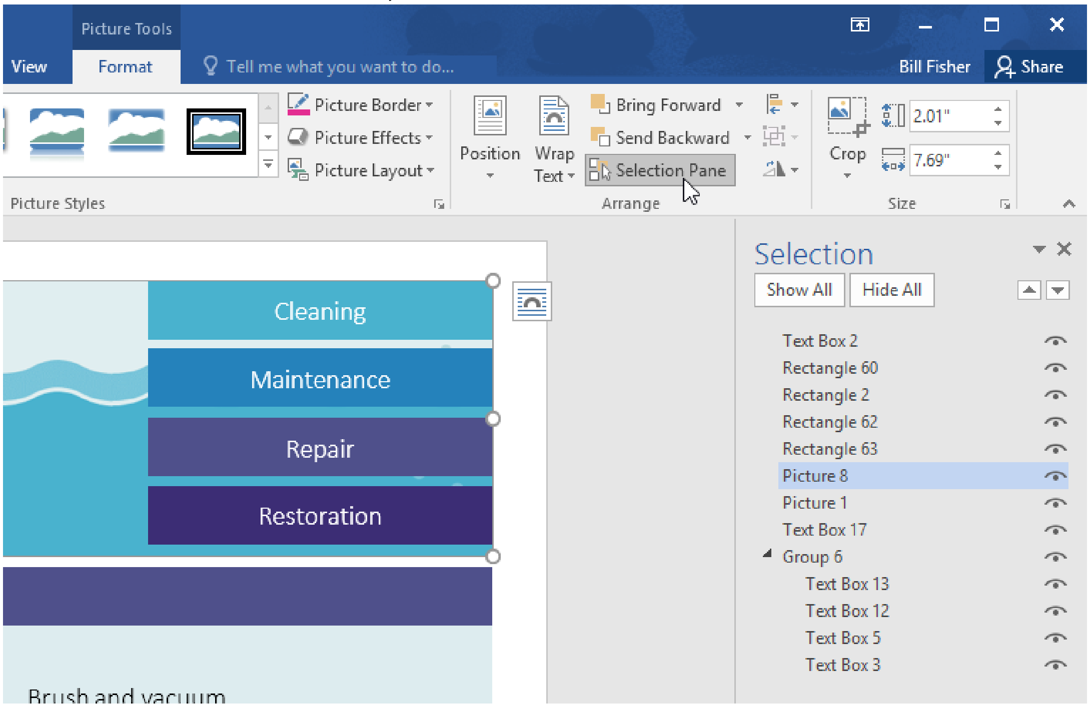

4. If you want to move an object behind or in front of several objects, it's usually faster to use **Bring Forward** or **Send Backward** instead of clicking the other ordering command multiple times.




5. In our example, the image has been moved behind everything else on the page, so all of the other text and shapes are visible.



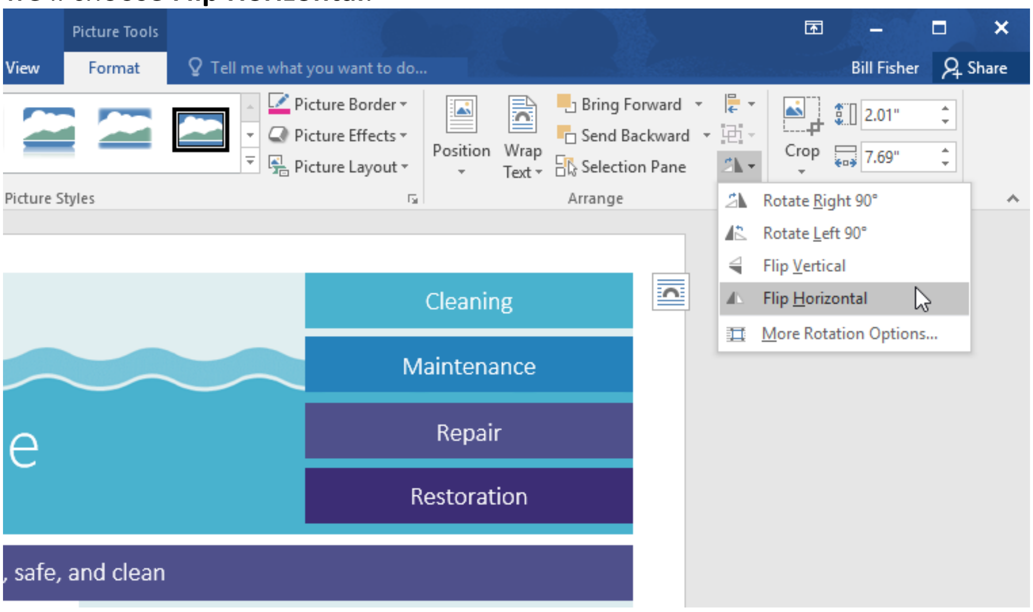
If you have several objects placed on top of each other, it may be difficult to select an individual object. The **Selection Pane** allows you to easily drag an object to a different level. To view the Selection Pane, click **Selection Pane** on the **Format** tab.



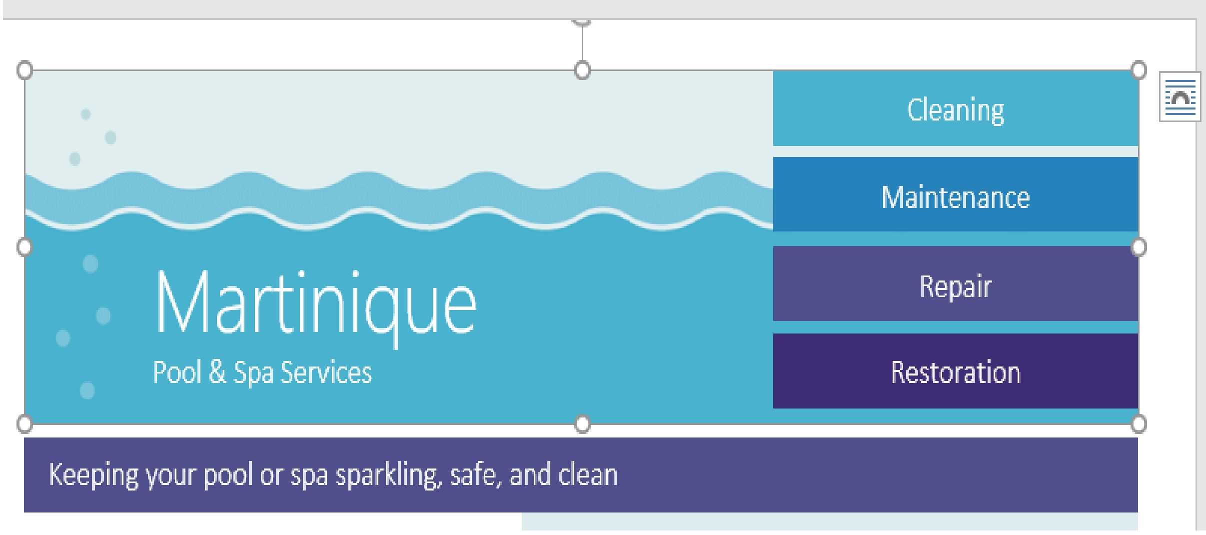

To rotate or flip an object:

If you need to turn an object so it faces a different direction, you can **rotate it** to the left or right, or you can **flip it** horizontally or vertically.

1. With the desired object selected, click the **Rotate** command on the **Format** tab, then choose the desired **rotation option**. In our example, we'll choose **Flip Horizontal**.




2. The object will be rotated. In our example, we can now see the bubbles on the left that were previously hidden behind the text boxes.

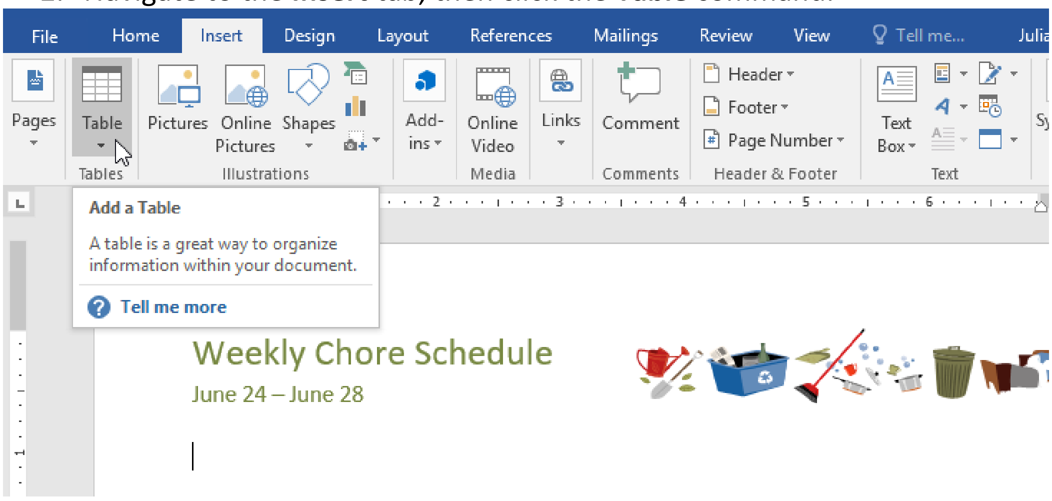



Tables

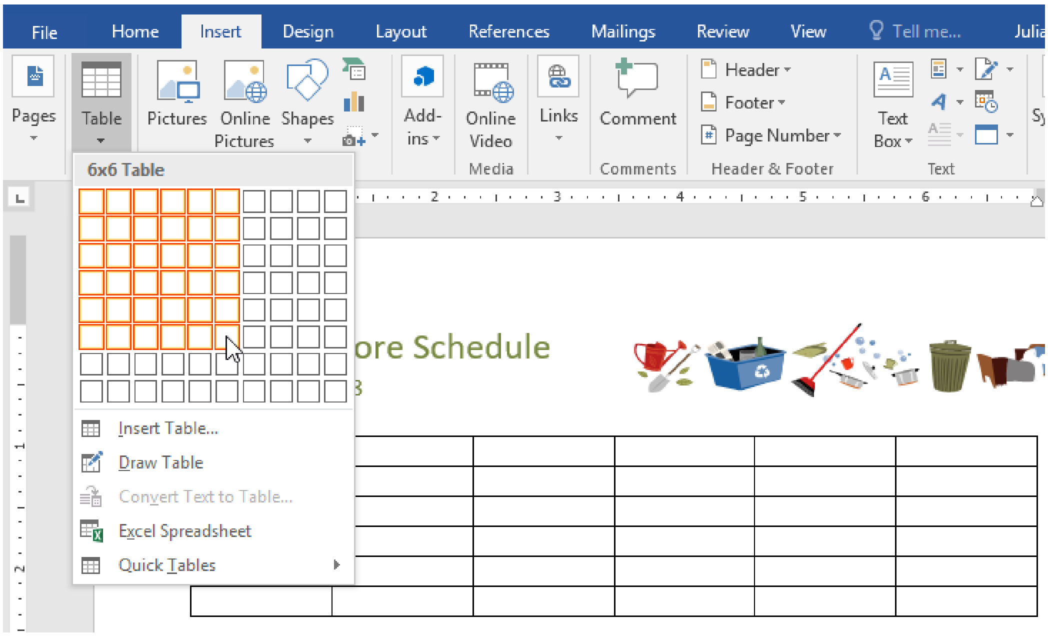
A table is a grid of cells arranged in rows and columns. Tables can be used to organize any type of content, whether you're working with text or numerical data. In Word, you can quickly insert a blank table or convert existing text to a table. You can also customize your table using different styles and layouts.

To insert a blank table:

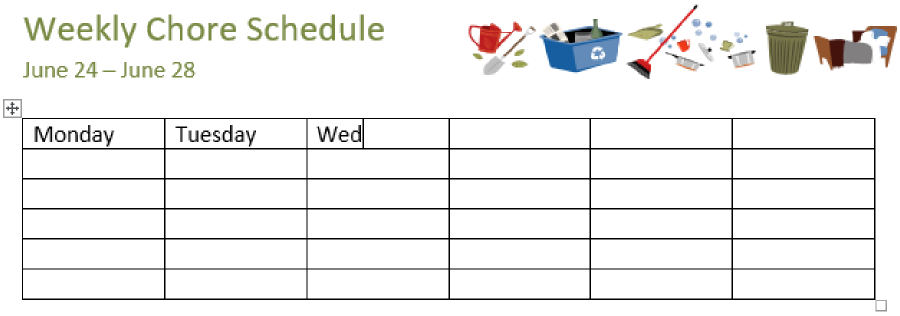
1. Place the insertion point where you want the table to appear.
2. Navigate to the **Insert** tab, then click the **Table** command.




3. This will open a drop-down menu that contains a grid. Hover over the grid to select the number of **columns and rows** you want.




4. Click the grid to **confirm** your selection, and a table will appear.
5. To **enter text**, place the insertion point in any cell, then begin typing.



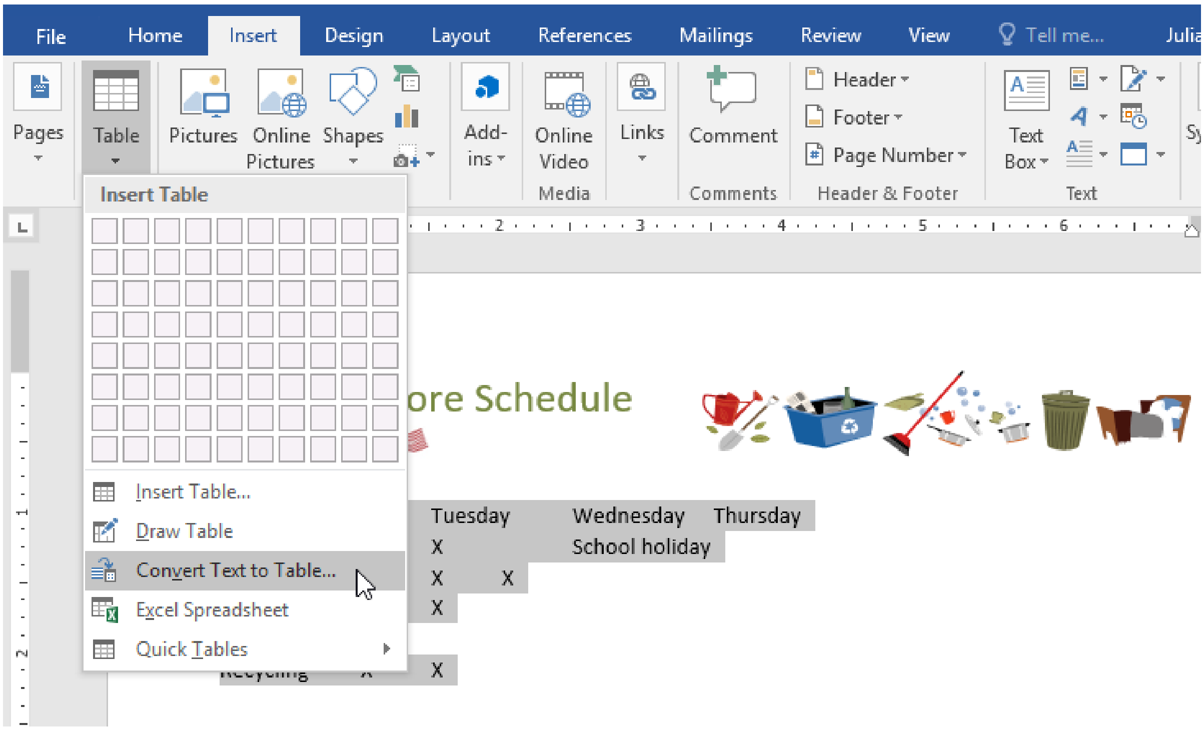

To navigate between cells, use the **Tab** key or **arrow** keys on your keyboard. If the insertion point is in the last cell, pressing the **Tab** key will automatically create a new row.

To convert existing text to a table:

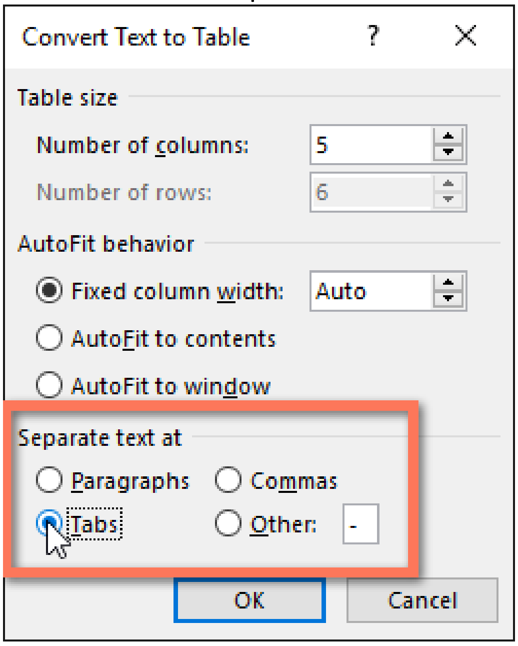
In the example below, each line of text contains part of a **checklist**, including chores and days of the week. The items are separated by **tabs**. Word can convert this information into a table, using the tabs to separate the data into columns.

1. Select the text you want to **convert** to a table. If you're using our practice file, you can find this text on page 2 of the document.

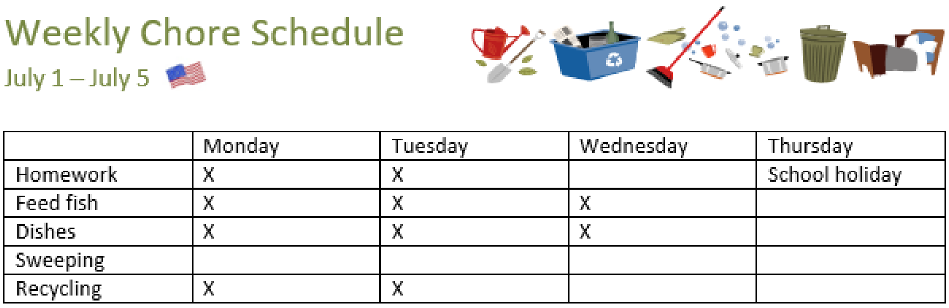

2. Go to the **Insert** tab, then click the **Table** command.
3. Select **Convert Text to Table** from the drop-down menu.




4. A dialog box will appear. Choose one of the options under **Separate text at**. This is how Word knows what to put into each column.




5. Click **OK**. The text will appear in a table.



Weekly Chore Schedule

July 1 – July 5

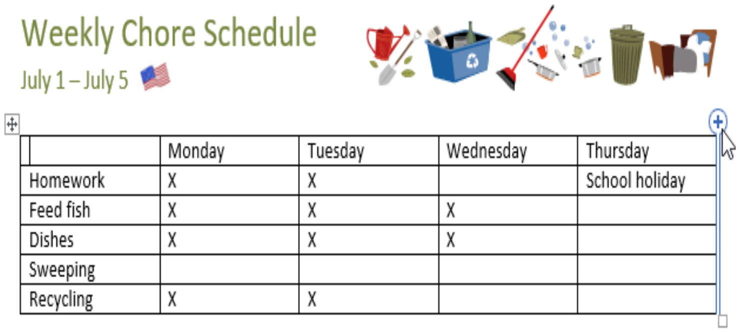
| | Monday | Tuesday | Wednesday | Thursday |
|---|---|---|---|---|
| Homework | X | X | | School holiday |
| Feed fish | X | X | X | |
| Dishes | X | X | X | |
| Sweeping | | | | |
| Recycling | X | X | | |

## Modifying tables

You can easily change the appearance of your table once you've added one to your document. There are several options for customization, including **adding rows or columns** and changing the **table style**.

To add a row or column:

1. Hover outside the table where you want to add a row or column. Click the **plus sign** that appears.

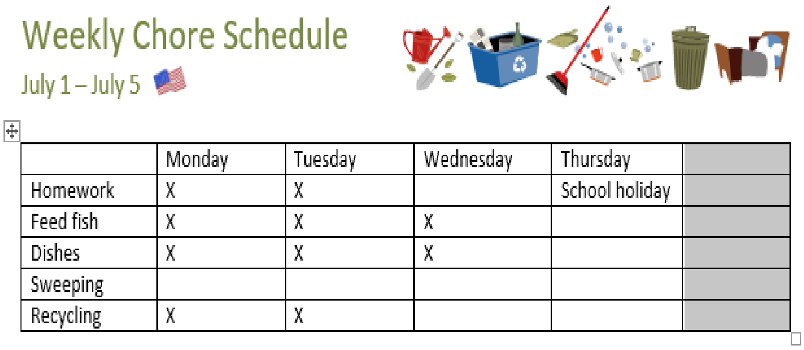


Weekly Chore Schedule

July 1 – July 5

| | Monday | Tuesday | Wednesday | Thursday |
|---|---|---|---|---|
| Homework | X | X | | School holiday |
| Feed fish | X | X | X | |
| Dishes | X | X | X | |
| Sweeping | | | | |
| Recycling | X | X | | |

2. A new row or column will be added to the table.

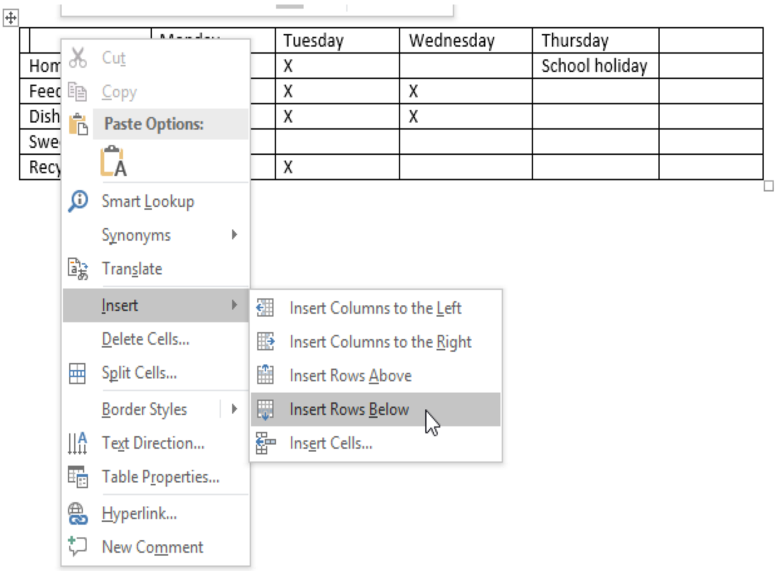


Weekly Chore Schedule

July 1 – July 5

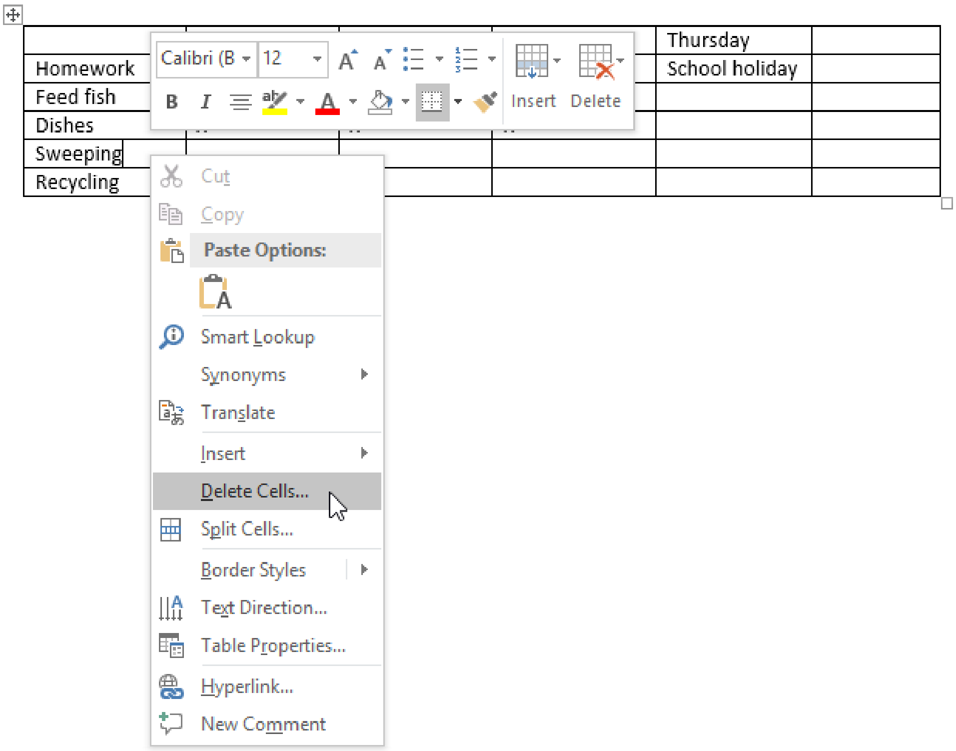
| | Monday | Tuesday | Wednesday | Thursday | |
|---|---|---|---|---|---|
| Homework | X | X | | School holiday | |
| Feed fish | X | X | X | | |
| Dishes | X | X | X | | |
| Sweeping | | | | | |
| Recycling | X | X | | | |

Alternatively, you can **right-click** the table, then hover over **Insert** to see various row and column options.

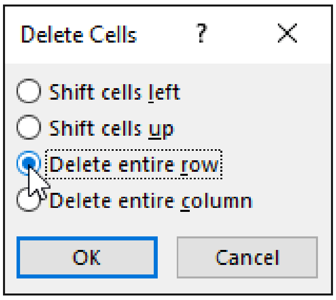



To delete a row or column:

1. Place the insertion point in the **row** or **column** you want to delete.
2. Right-click, then select **Delete Cells** from the menu.




3. A dialog box will appear. Choose **Delete entire row** or **Delete entire column**, then click **OK**.

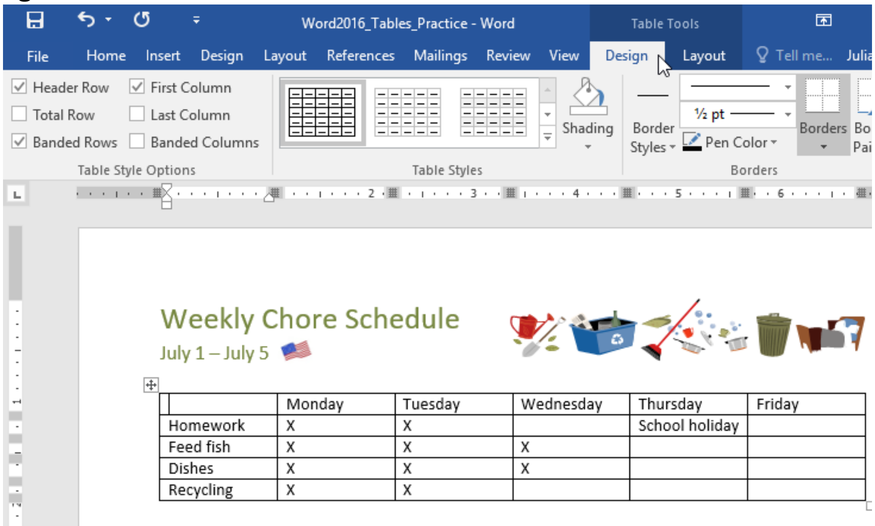



4. The row or column will be deleted.

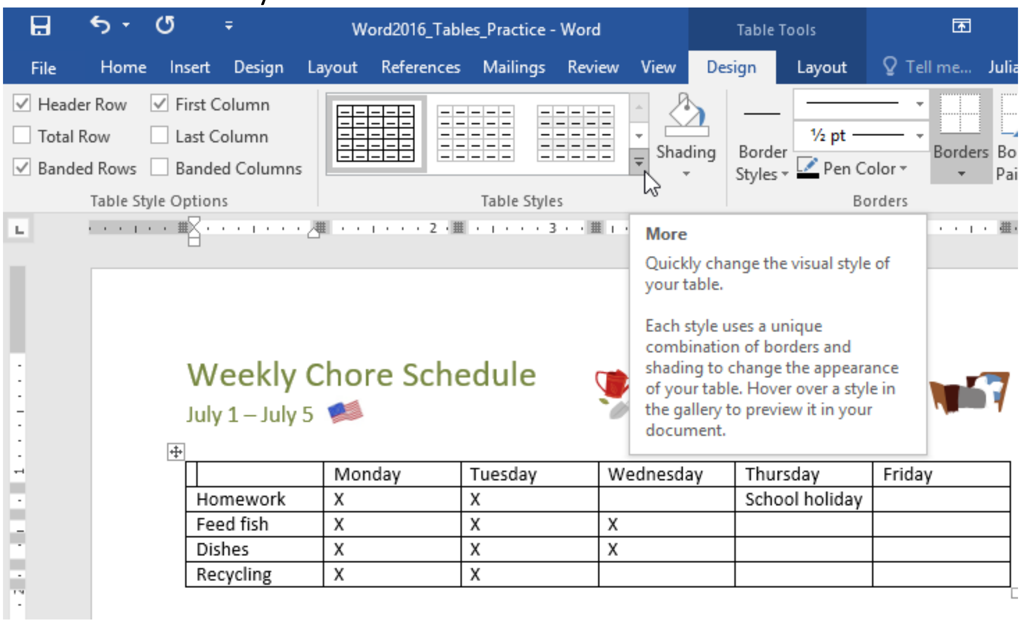
To apply a table style:

Table styles let you change the **look and feel** of your table instantly. They control several design elements, including color, borders, and fonts.

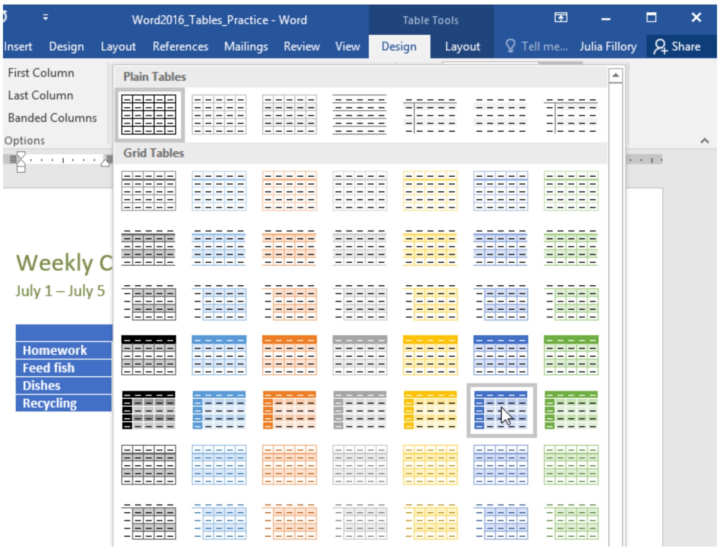
1. Click anywhere in your table to select it, then click the **Design** tab on the far right of the Ribbon.



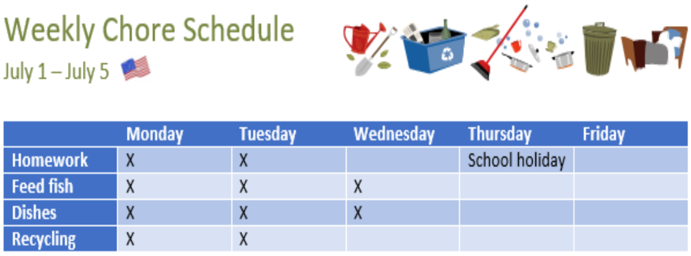

2. Locate the **Table Styles** group, then click the **More** drop-down arrow to see the full list of styles.




3. Select the **table style** you want.




4. The table style will appear.

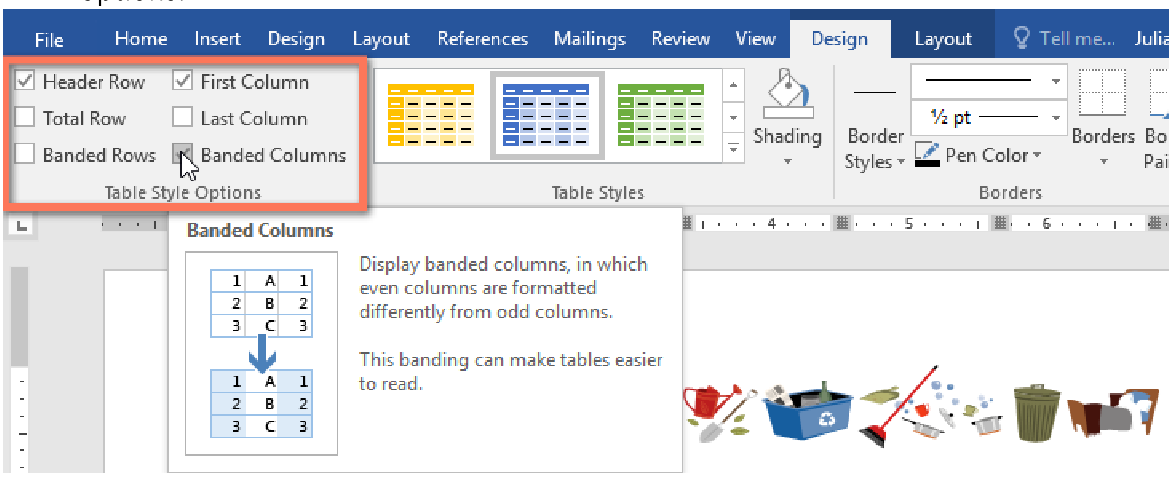



| | Monday | Tuesday | Wednesday | Thursday | Friday |
|---|---|---|---|---|---|
| Homework | X | X | | School holiday | |
| Feed fish | X | X | X | | |
| Dishes | X | X | X | | |
| Recycling | X | X | | | |

To modify table style options:

Once you've chosen a table style, you can turn various options **on** or **off** to change its appearance. There are six options: **Header Row**, **Total Row**, **Banded Rows**, **First Column**, **Last Column**, and **Banded Columns**.

1. Click anywhere in your table, then navigate to the **Design** tab.
2. Locate the **Table Style Options** group, then **check** or **uncheck** the desired options.




3. The table style will be modified.

Weekly Chore Schedule

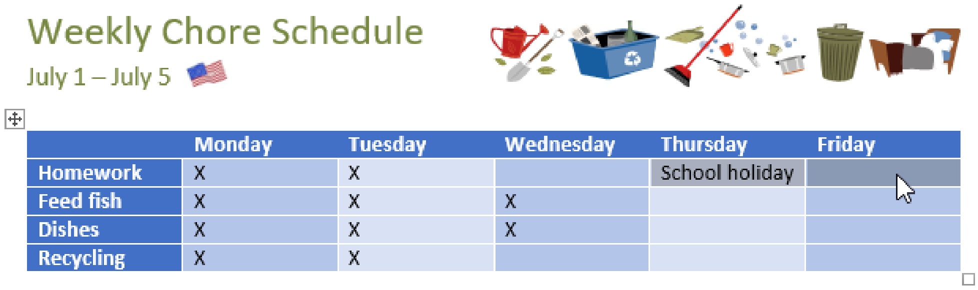
July 1 – July 5

| | Monday | Tuesday | Wednesday | Thursday | Friday |
|---|---|---|---|---|---|
| Homework | X | X | | School holiday | |
| Feed fish | X | X | X | | |
| Dishes | X | X | X | | |
| Recycling | X | X | | | |

Depending on the **Table Style** you've chosen, certain **Table Style Options** may have a different effect. You might need to experiment to get the look you want.

To apply borders to a table:

1. Select the **cells** you want to apply a border to.

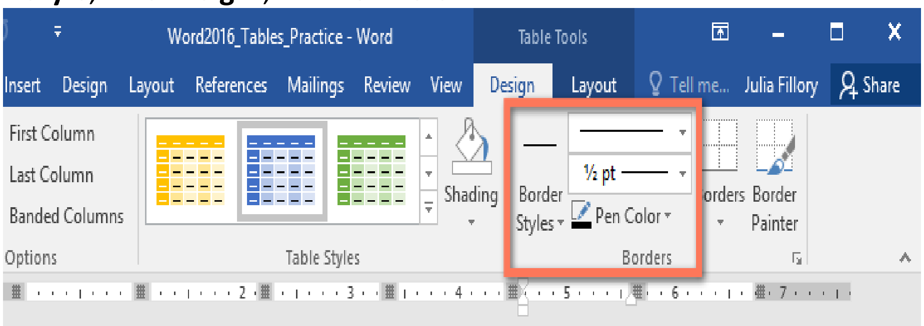


Weekly Chore Schedule

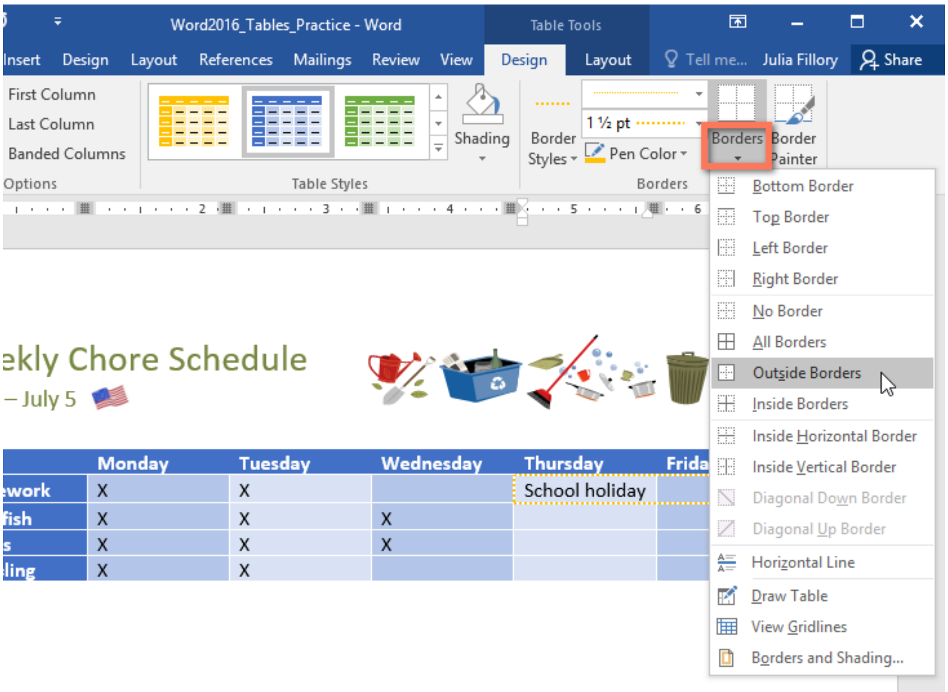
July 1 – July 5

| | Monday | Tuesday | Wednesday | Thursday | Friday |
|---|---|---|---|---|---|
| Homework | X | X | | School holiday | |
| Feed fish | X | X | X | | |
| Dishes | X | X | X | | |
| Recycling | X | X | | | |

2. Use the commands on the **Design** tab to choose the desired **Line Style**, **Line Weight**, and **Pen Color**.




3. Click the **drop-down** arrow below the **Borders** command.
4. Choose a **border type** from the menu.

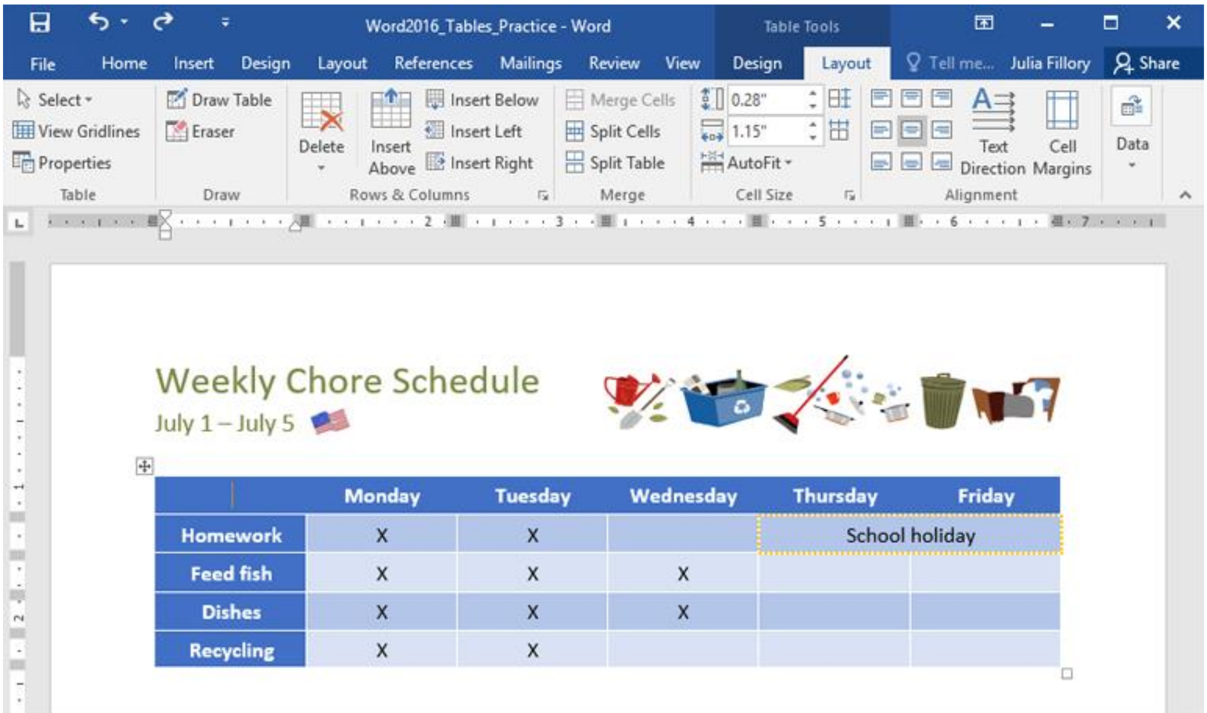



5. The border will be applied to the selected cells.


Modifying a table using the Layout tab

In Word, the **Layout** tab appears whenever you select your table. You can use the options on this tab to make a variety of modifications.

Click the buttons in the interactive below to learn more about Word's table layout controls.



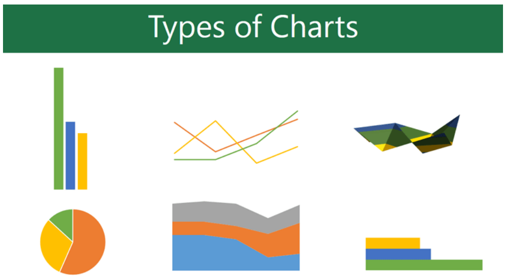

## Charts

A chart is a tool you can use to communicate information graphically. Including a chart in your document can help you illustrate numerical data—such as comparisons and trends—so it's easier for the reader to understand.

## Types of charts

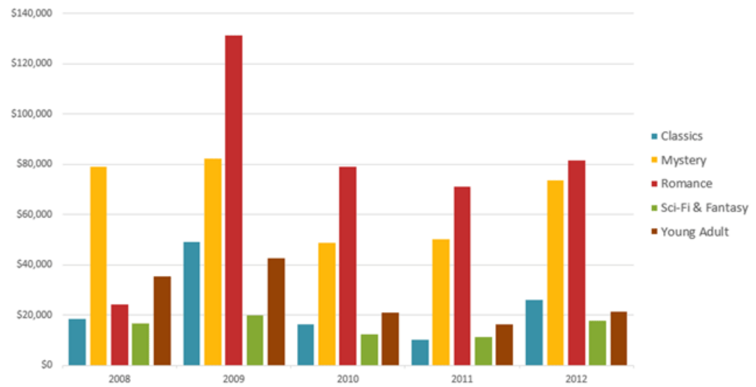
There are several **types** of charts to choose from. To use charts effectively, you'll need to understand what makes each one unique.

Click the arrows in the slideshow below to learn more about the types of charts in Word.



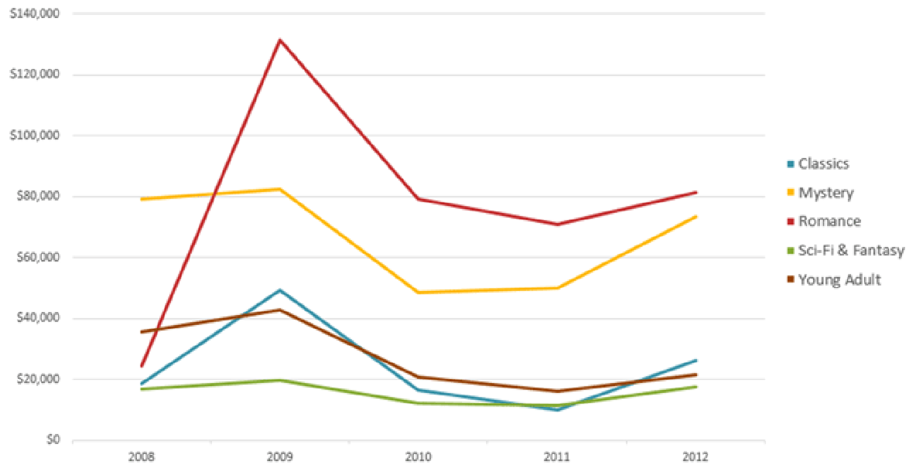

Word has a variety of chart types, each with its own advantages. Click the arrows to see some of the different types of charts available in Word.

# Column



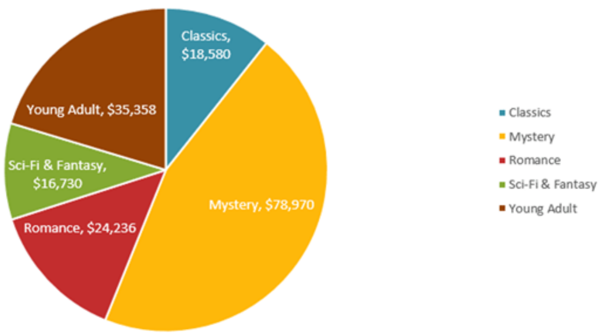

- **Column charts** use vertical bars to represent data. They can work with many different types of data, but they're most frequently used for comparing information.

# Line



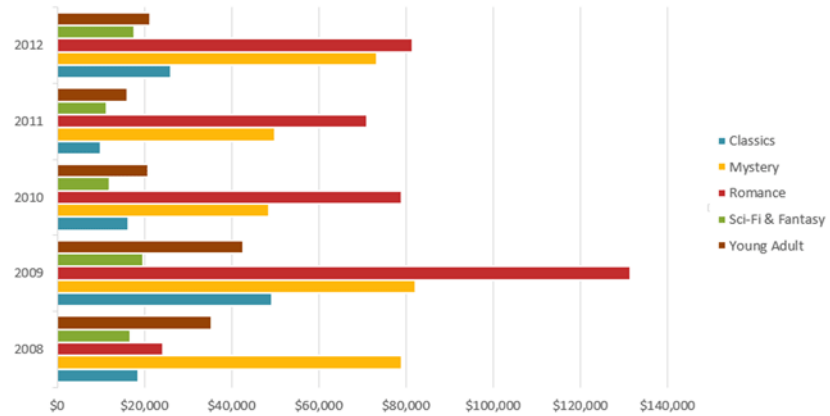

- **Line charts** are ideal for showing trends. The data points are connected with lines, making it easy to see whether values are increasing or decreasing over time.

# Pie



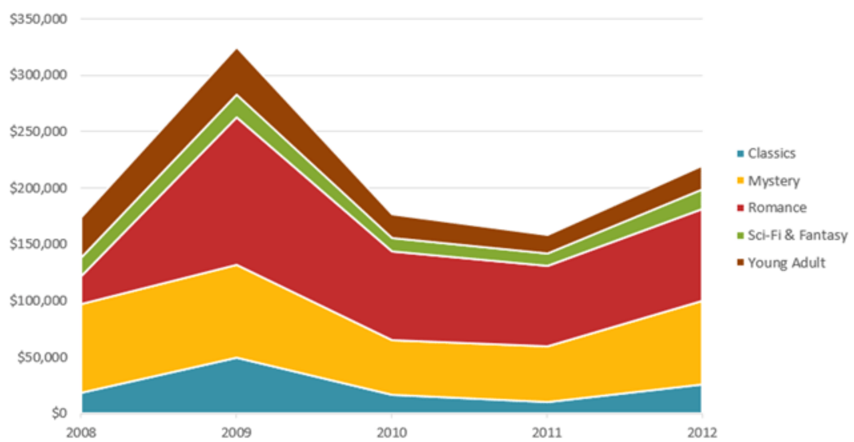

- **Pie charts** make it easy to compare proportions. Each value is shown as a slice of the pie, so it's easy to see which values make up the percentage of a whole.

# Bar



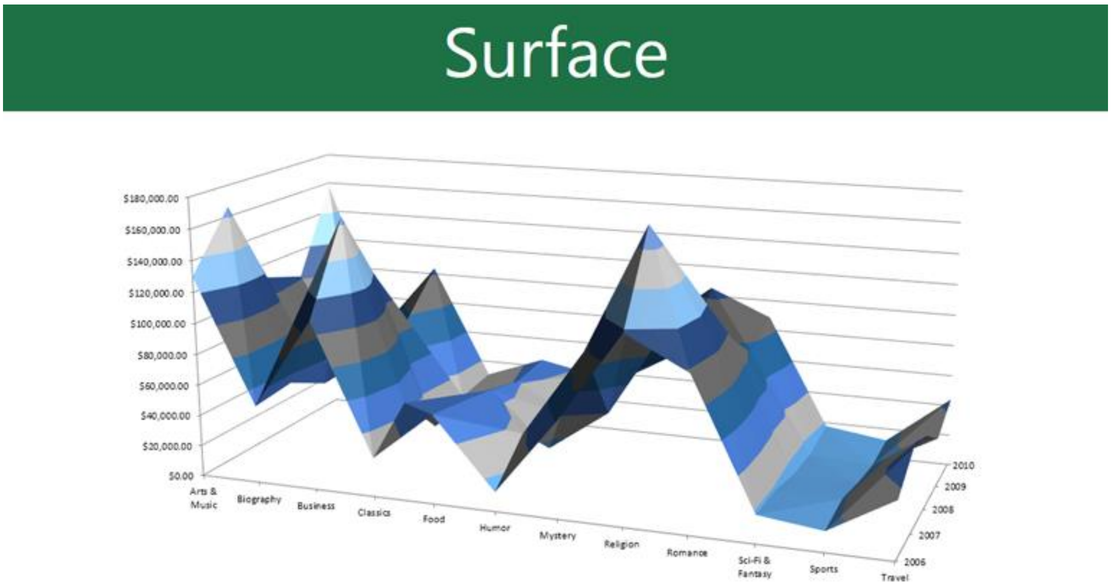

- **Bar charts** work just like column charts, but they use horizontal rather than vertical bars.

# Area




- 

**Area charts** are similar to line charts, except the areas under the lines are filled in.

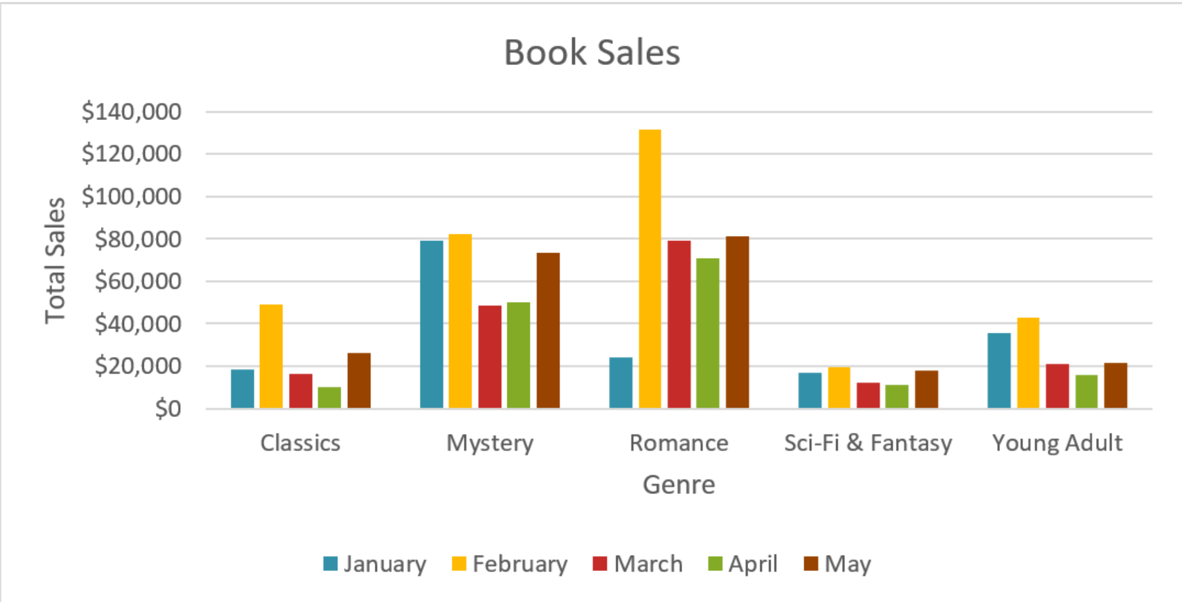



- **Surface charts** allow you to display data across a 3D landscape. They work best with large data sets, allowing you to see a variety of information at the same time.

Identifying the parts of a chart

In addition to chart types, you'll need to understand how to **read a chart**. Charts contain several different elements—or parts—that can help you interpret data.

Click the buttons in the interactive below to learn about the different parts of a chart.



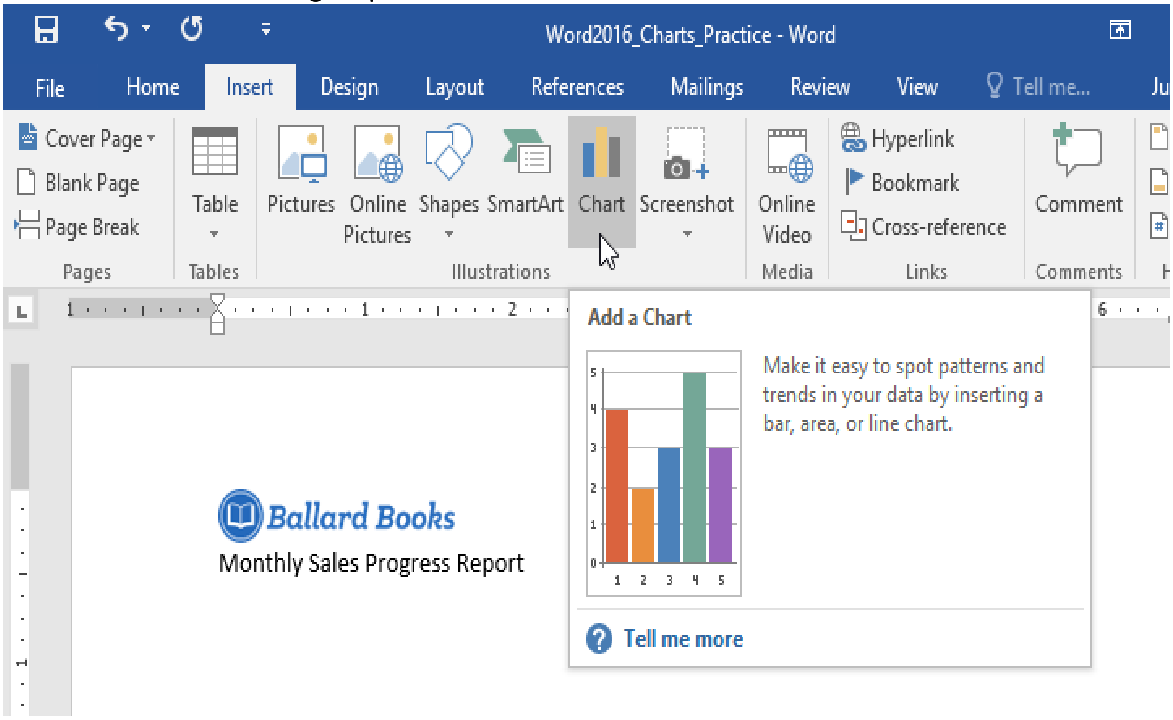

Inserting charts

Word utilizes a separate **spreadsheet window** for entering and editing chart data, much like a spreadsheet in Excel. The process of entering data is fairly simple, but if you're unfamiliar with Excel, you might want to review our Cell Basics lesson.

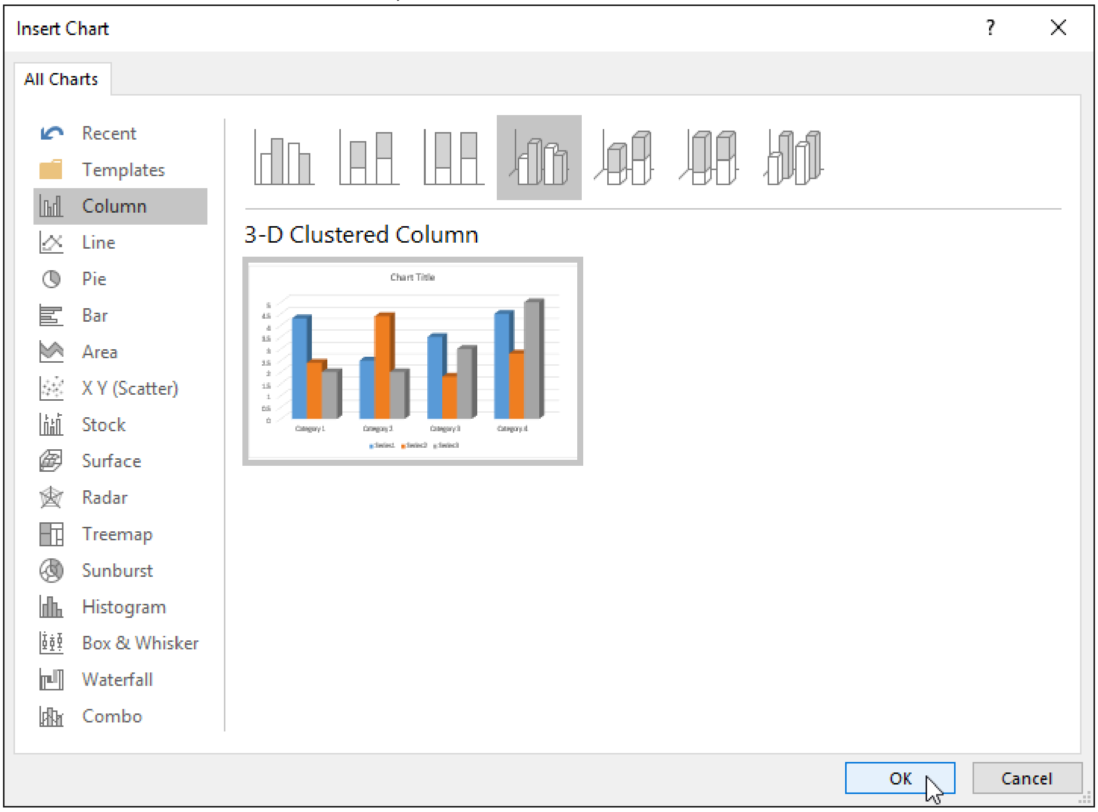
To insert a chart:

1. Place the **insertion point** where you want the chart to appear.

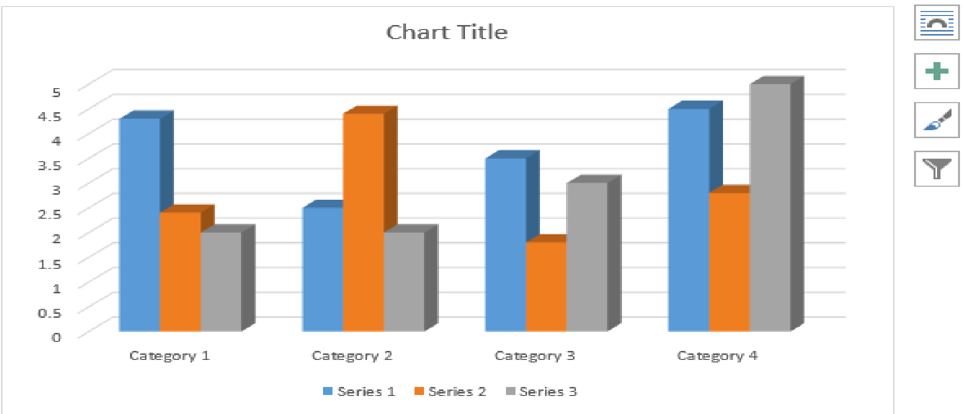
2. Navigate to the **Insert** tab, then click the **Chart** command in the **Illustrations** group.

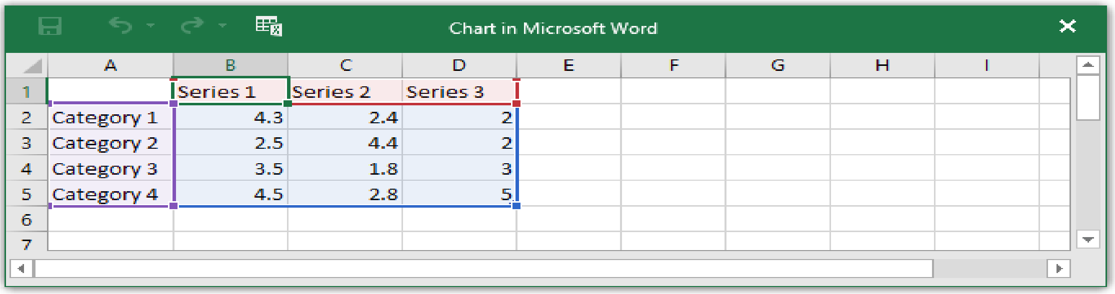



3. A dialog box will appear. To view your options, choose a **chart type** from the left pane, then browse the **charts** on the right.
4. Select the desired **chart**, then click **OK**.

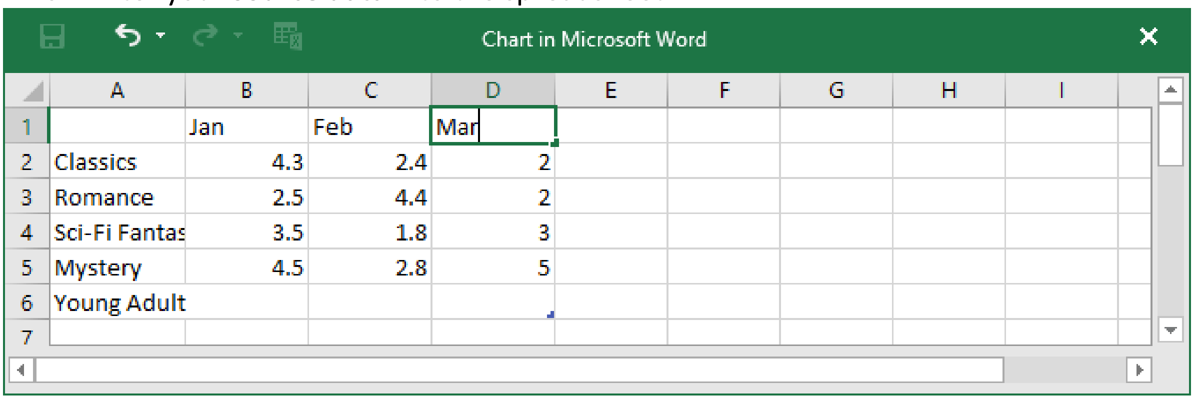



5. A chart and spreadsheet window will appear. The text in the spreadsheet is merely a **placeholder** that you'll need to replace with your own source data. The source data is what Word will use to create the chart.

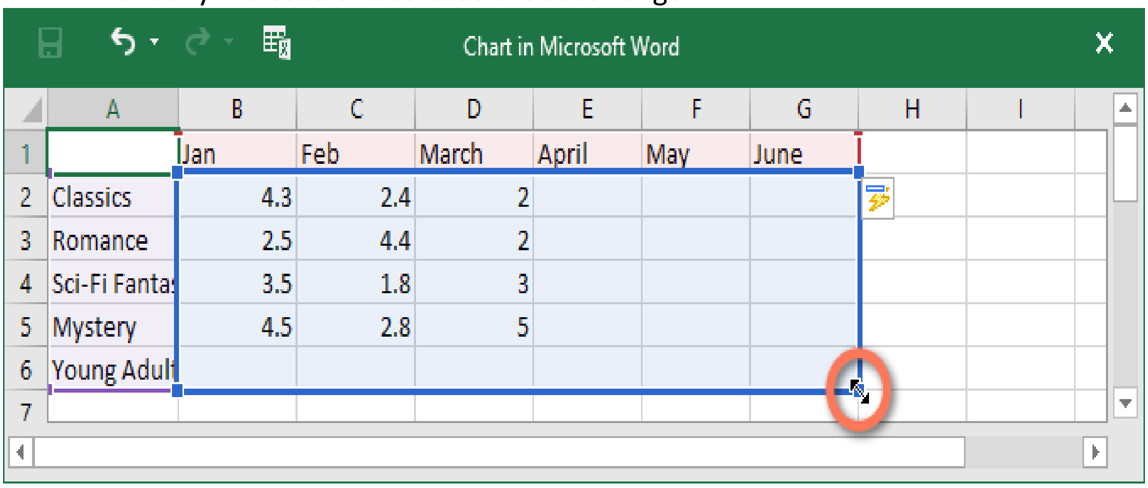


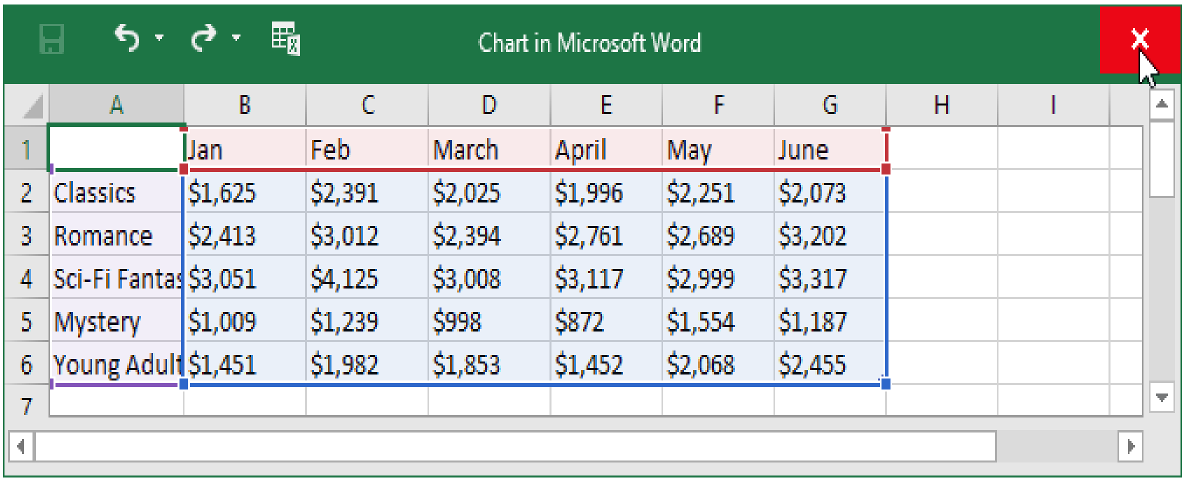

6. Enter your **source data** into the spreadsheet.




7. Only the data enclosed in the **blue box** will appear in the chart. If necessary, click and drag the **lower-right corner** of the blue box to manually increase or decrease the data range.

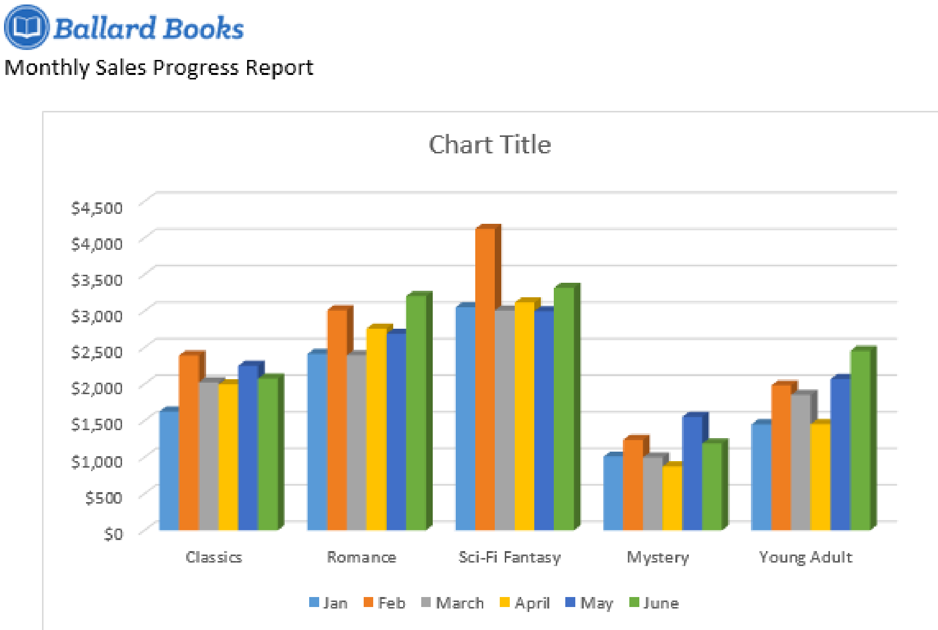



8. When you're done, click **X** to close the spreadsheet window.

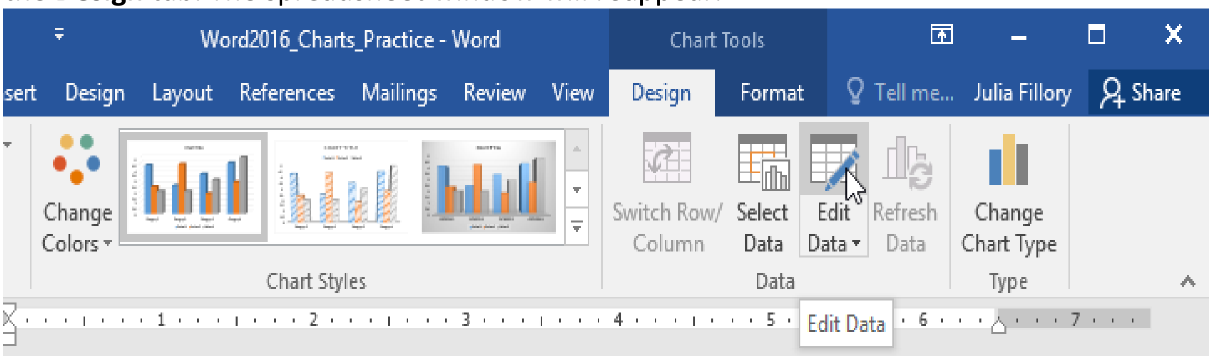



| | A | B | C | D | E | F | G | H | I |
|---|---|---|---|---|---|---|---|---|---|
| 1 | | Jan | Feb | March | April | May | June | | |
| 2 | Classics | $1,625 | $2,391 | $2,025 | $1,996 | $2,251 | $2,073 | | |
| 3 | Romance | $2,413 | $3,012 | $2,394 | $2,761 | $2,689 | $3,202 | | |
| 4 | Sci-Fi Fanta | $3,051 | $4,125 | $3,008 | $3,117 | $2,999 | $3,317 | | |
| 5 | Mystery | $1,009 | $1,239 | $998 | $872 | $1,554 | $1,187 | | |
| 6 | Young Adult | $1,451 | $1,982 | $1,853 | $1,452 | $2,068 | $2,455 | | |
| 7 | | | | | | | | | |

9. The chart will be complete.




To edit your chart again, simply select it, then click the **Edit Data** command on the **Design** tab. The spreadsheet window will reappear.




## Creating charts with existing Excel data

If you already have data in an **existing Excel file** that you'd like to use in Word, you can **copy and paste** it instead of entering it by hand. Just open the spreadsheet in Excel, copy the data, then paste it as the source data in Word.

You can also **embed** an existing Excel chart into your Word document. This is useful if you know you're going to be updating your Excel file later; the chart in Word will update automatically any time a change is made.

Read our guide on Embedding an Excel Chart for more information.

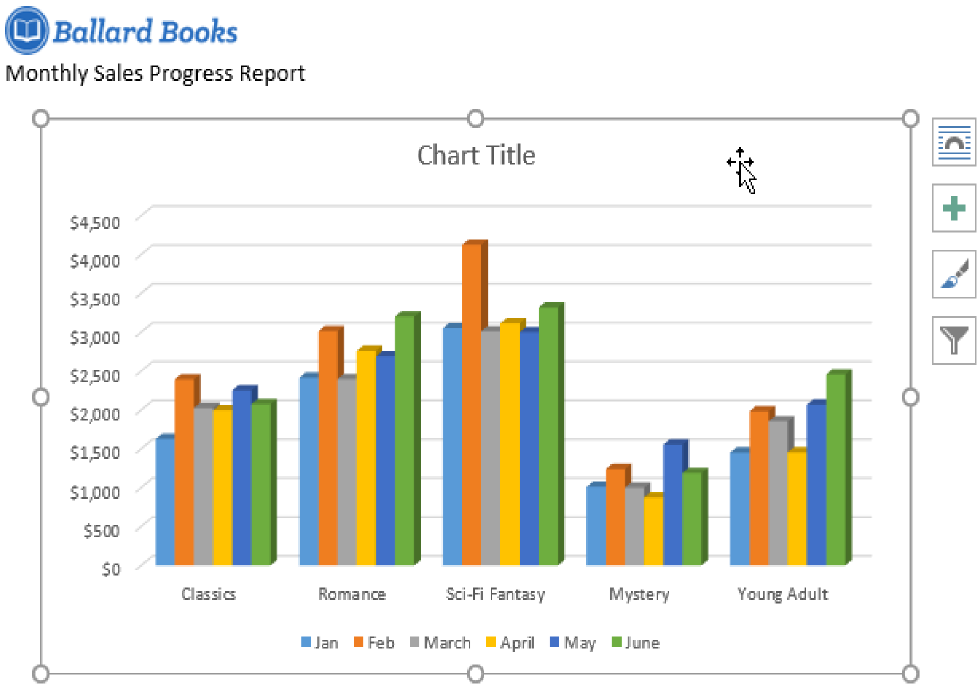
Modifying charts with chart tools

There are many ways to customize and organize your chart in Word. For example, you can quickly change the **chart type**, **rearrange** the data, and even change the chart's **appearance**.

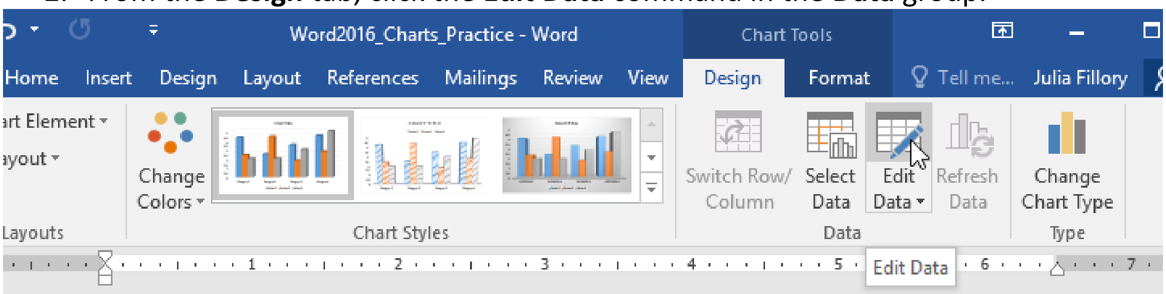
To switch row and column data:

Sometimes you may want to change the way your chart data is **grouped**. For example, in the chart below the data is grouped **by genre**, with columns for **each month**. If we switched the rows and columns, the data would be grouped **by month** instead. In both cases, the chart contains the same data—it's just presented in a different way.

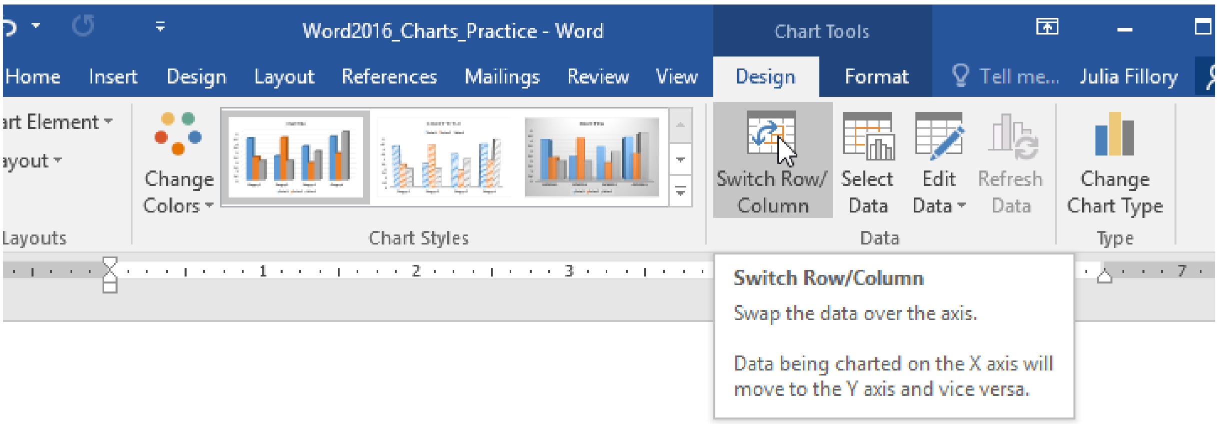
1. Select the **chart** you want to modify. The **Design** tab will appear on the right side of the Ribbon.



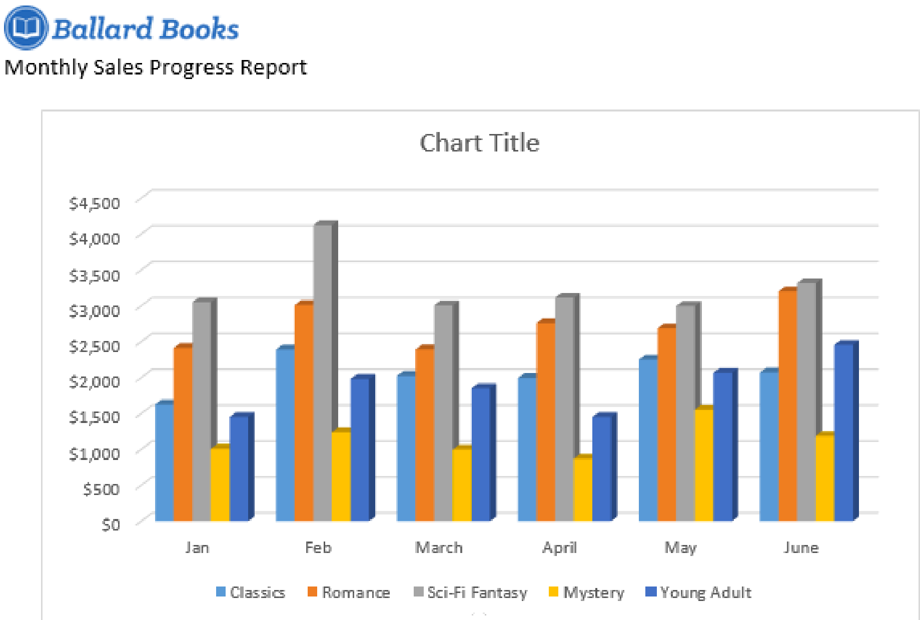

2. From the **Design** tab, click the **Edit Data** command in the **Data** group.




3. Click the **chart** again to reselect it, then click the **Switch Row/Column** command.



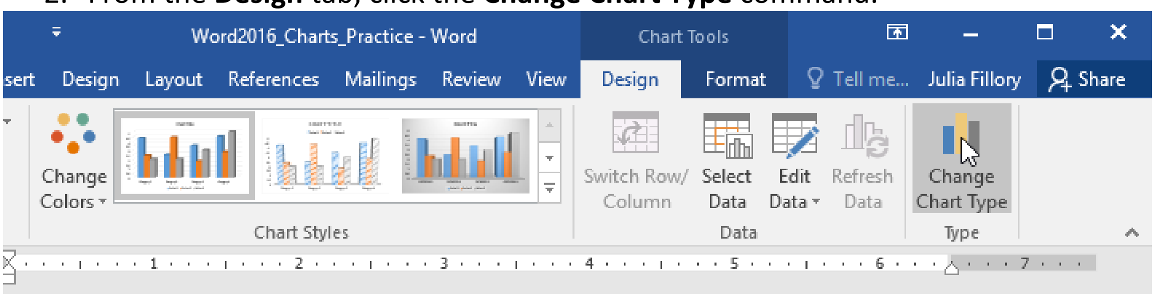

4. The rows and columns will be **switched**. In our example, the data is now grouped by month, with columns for each genre.



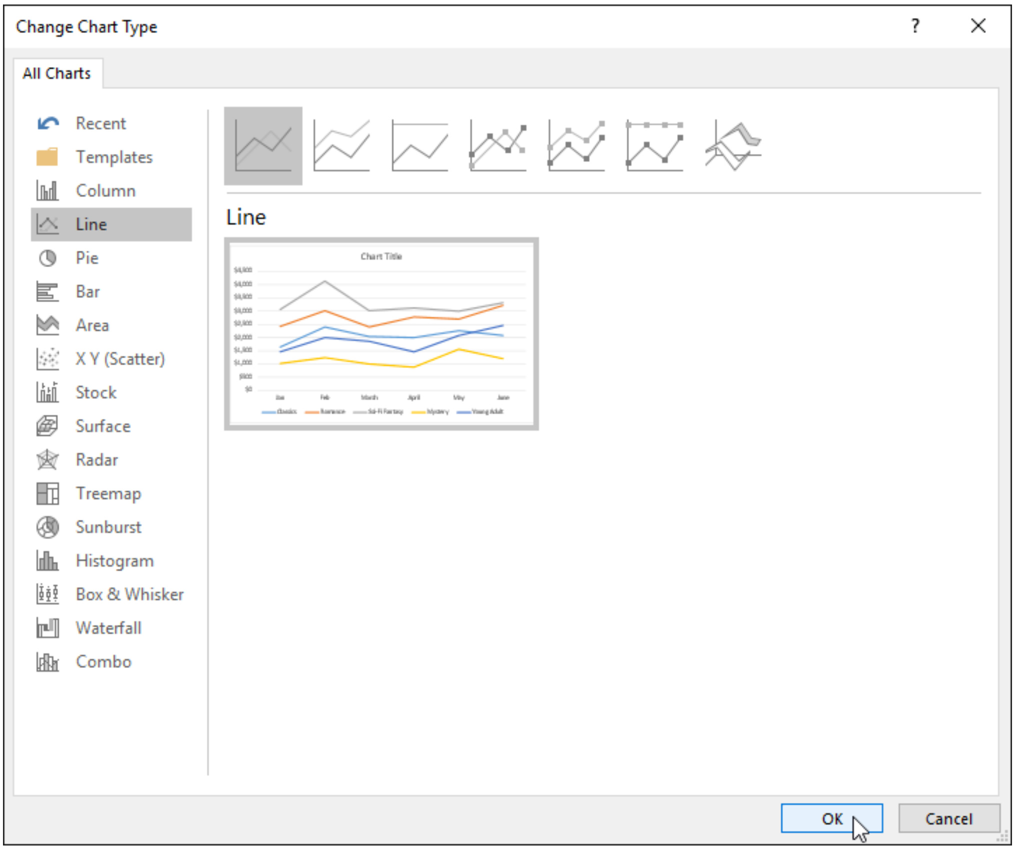

To change the chart type:

If you find that your chosen **chart type** isn't suited to your data, you can change it to a different one. In our example, we'll change the chart type from a **column** chart to a **line** chart.

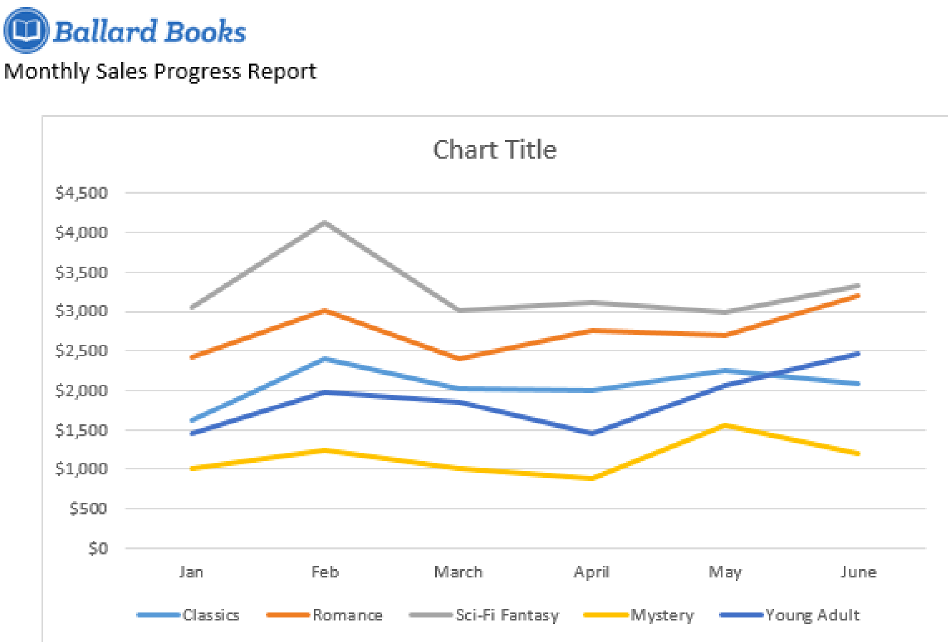
1. Select the **chart** you want to change. The **Design** tab will appear.
2. From the **Design** tab, click the **Change Chart Type** command.




3. A dialog box will appear. Select the desired **chart**, then click **OK**.



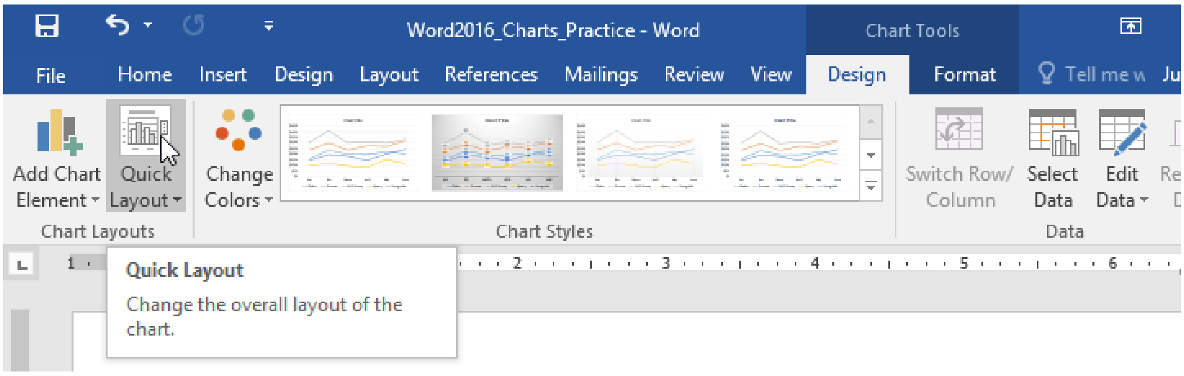

4. The new chart type will be applied. In our example, the line chart makes it easier to see trends over time.



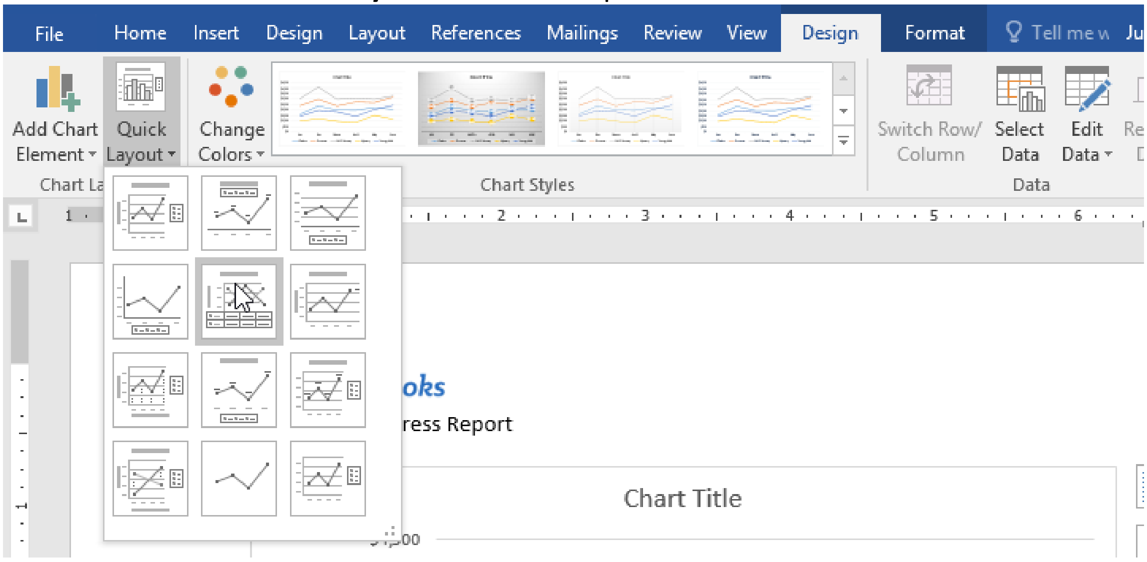

To change the chart layout:

To change the arrangement of your chart, try choosing a different **layout**. Layout can affect several elements, including the chart title and data labels.

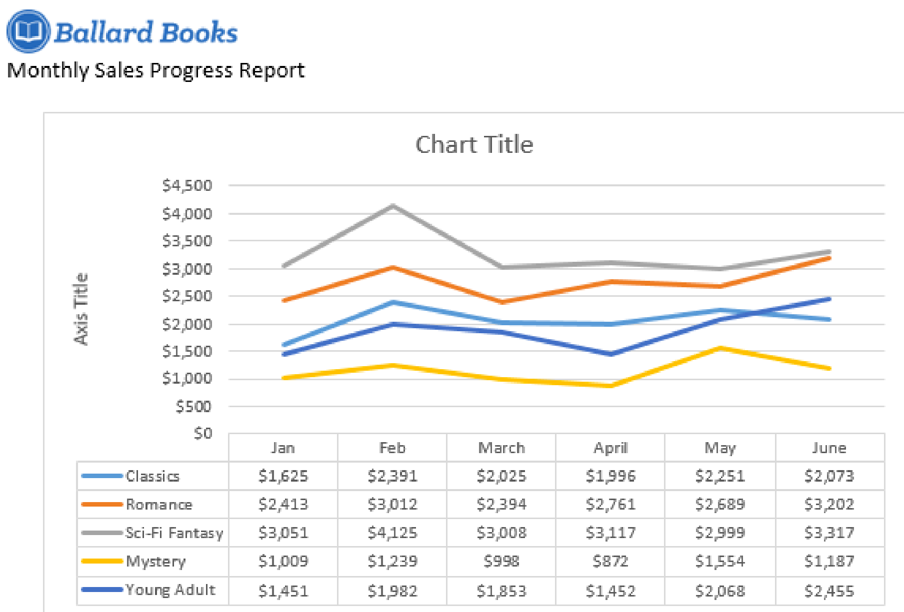
1. Select the **chart** you want to modify. The **Design** tab will appear.
2. From the **Design** tab, click the **Quick Layout** command.




3. Choose the desired **layout** from the drop-down menu.



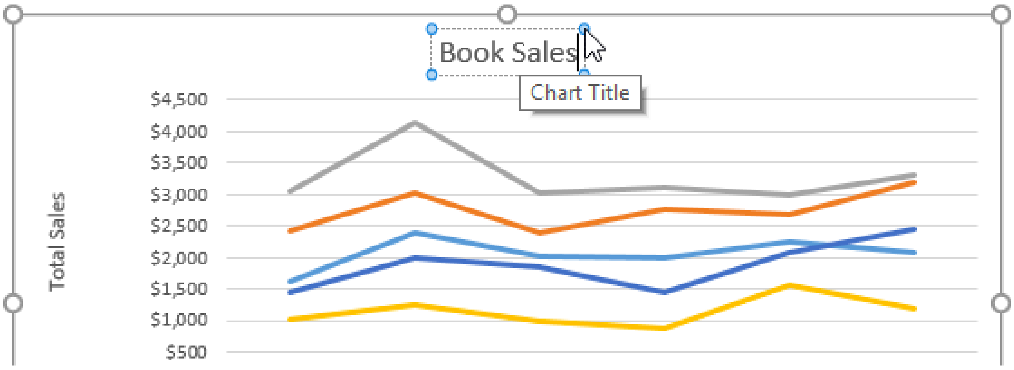

4. The chart will update to reflect the new layout.




| | Jan | Feb | March | April | May | June |
|---|---|---|---|---|---|---|
| Classics | $1,625 | $2,391 | $2,025 | $1,996 | $2,251 | $2,073 |
| Romance | $2,413 | $3,012 | $2,394 | $2,761 | $2,689 | $3,202 |
| Sci-Fi Fantasy | $3,051 | $4,125 | $3,008 | $3,117 | $2,999 | $3,317 |
| Mystery | $1,009 | $1,239 | $998 | $872 | $1,554 | $1,187 |
| Young Adult | $1,451 | $1,982 | $1,853 | $1,452 | $2,068 | $2,455 |

If you don't see a chart layout that has exactly what you need, you can click the **Add Chart Element** command on the **Design** tab to add **axis titles**, **gridlines**, and other chart elements.

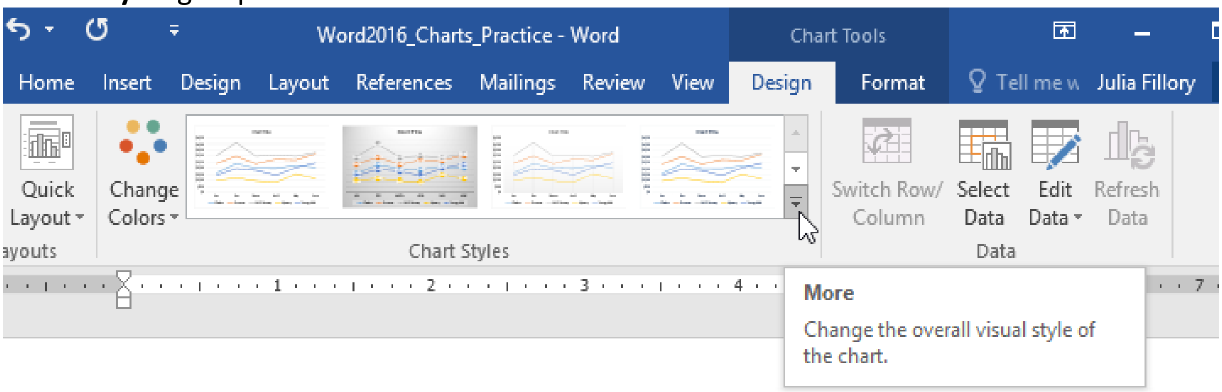
To fill in a placeholder (such as the **chart title** or **axis title**), click the element and enter your text.



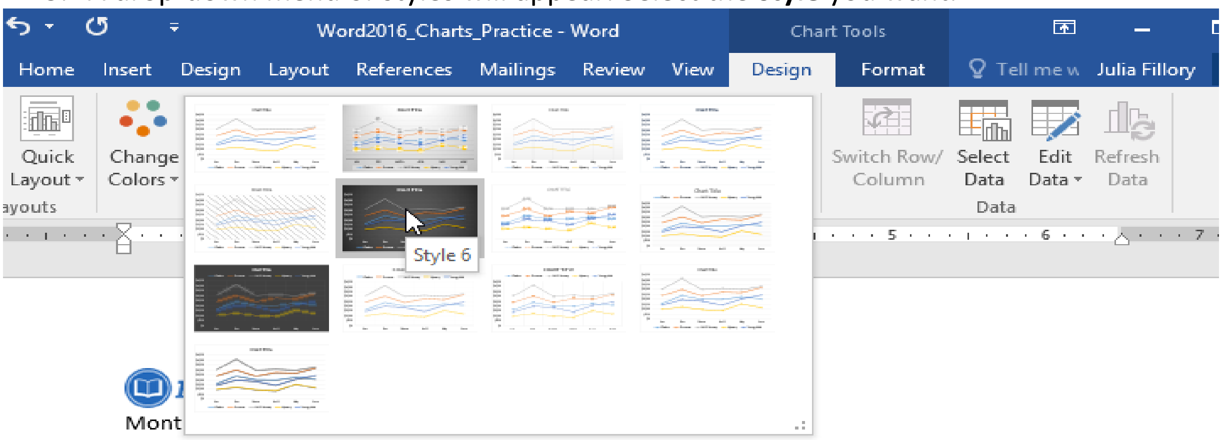

To change the chart style:

Word's **chart styles** give you an easy way to change your chart's design, including the color, style, and certain layout elements.

1. Select the **chart** you want to modify. The **Design** tab will appear.
2. From the **Design** tab, click the **More** drop-down arrow in the **Chart Styles** group.




3. A drop-down menu of styles will appear. Select the **style** you want.




4. The chart style will be applied.


For even faster customization, use the formatting shortcuts to the right of your chart. These allow you to adjust the **chart style**, **chart elements**, and even add **filters** to your


data.

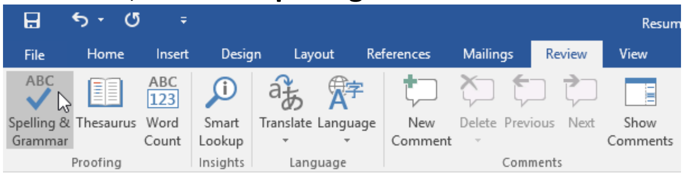
## Lesson 13: Collaboration and Reviewing

### Checking Spelling and Grammar

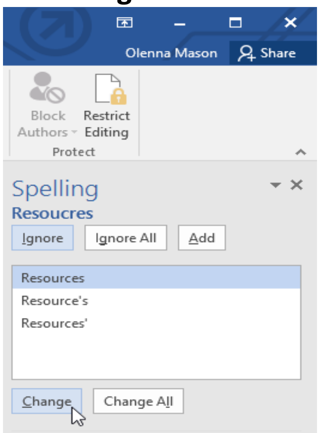
Worried about making mistakes when you type? Don't be. Word provides you with several proofing features—including the Spelling and Grammar tool—that can help you produce professional, error-free documents.

To run a Spelling and Grammar check:

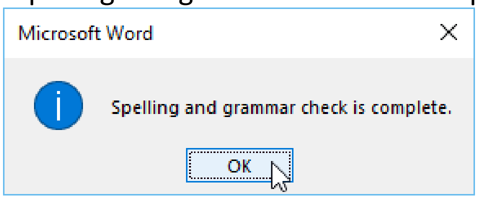
1. From the **Review** tab, click the **Spelling & Grammar** command.




2. The **Spelling and Grammar** pane will appear on the right. For each error in your document, Word will try to offer one or more **suggestions**. You can select a suggestion and click **Change** to correct the error.




3. Word will move through each error until you have reviewed all of them. After the last error has been reviewed, a dialog box will appear confirming that the spelling and grammar check is complete. Click **OK**.




If no suggestions are given, you can manually type the correct spelling in your document.

### Ignoring "errors"

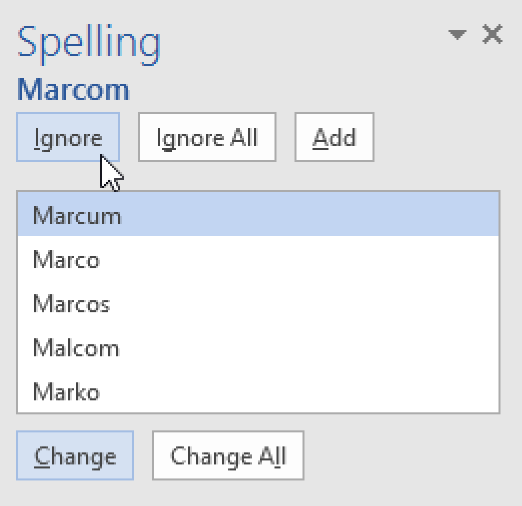
The spelling and grammar check is **not always correct**. Particularly with grammar, there are many errors Word will not notice. There are also times when the spelling and grammar check will say something is an error when it's actually not. This often happens with names and other proper nouns, which may not be in the dictionary.

If Word says something is an error, you can choose not to change it. Depending on whether it's a spelling or grammatical error, you can choose from several options.

For spelling "errors":

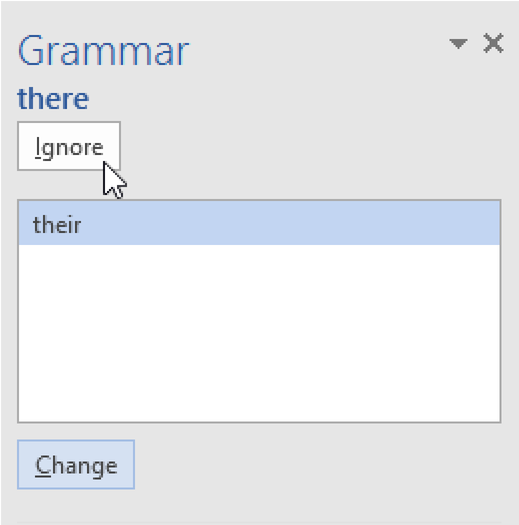
- **Ignore:** This will skip the word without changing it.
- **Ignore All:** This will skip the word without changing it, and it will also skip all other instances of the word in the document.

- **Add:** This adds the word to the dictionary so it will never come up as an error. Make sure the word is spelled correctly before choosing this option.

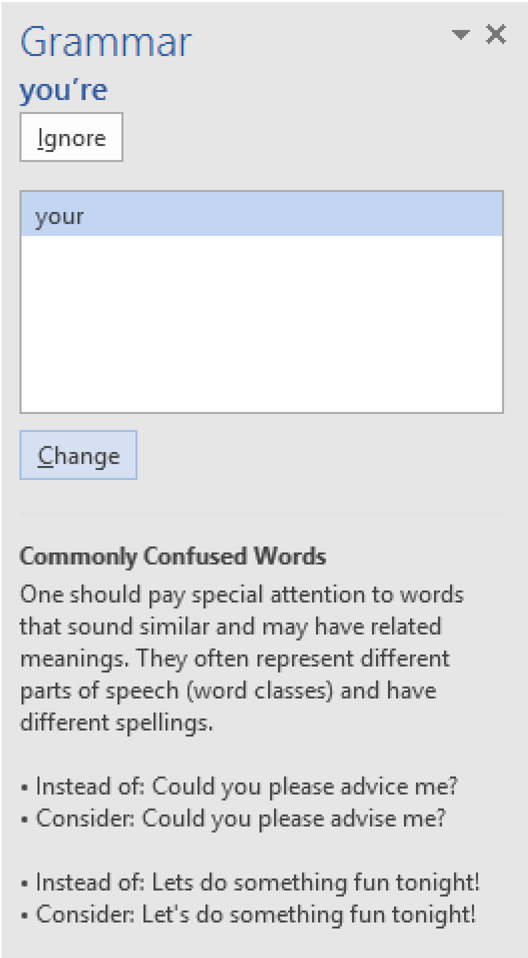



For grammar "errors":

- **Ignore:** This will skip the word or phrase without changing it.



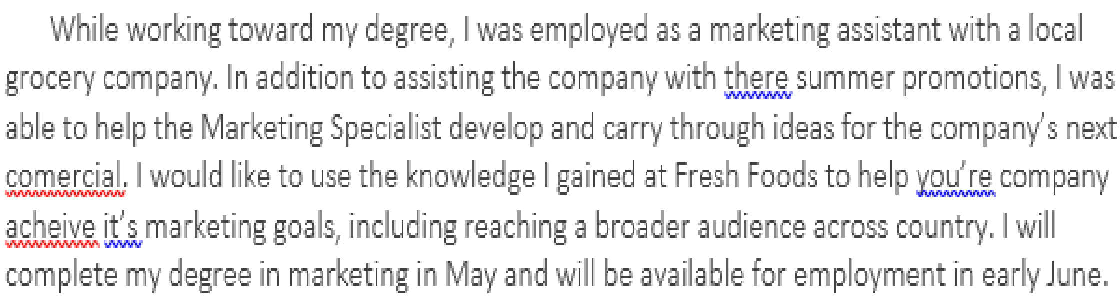

For some grammatical errors, Word will provide an explanation for why it thinks something is incorrect. This can help you determine whether you want to change or ignore it.




Automatic spelling and grammar checking

By default, Word automatically checks your document for **spelling and grammar** errors, so you may not even need to run a separate check. These errors are indicated by **colored wavy lines**.

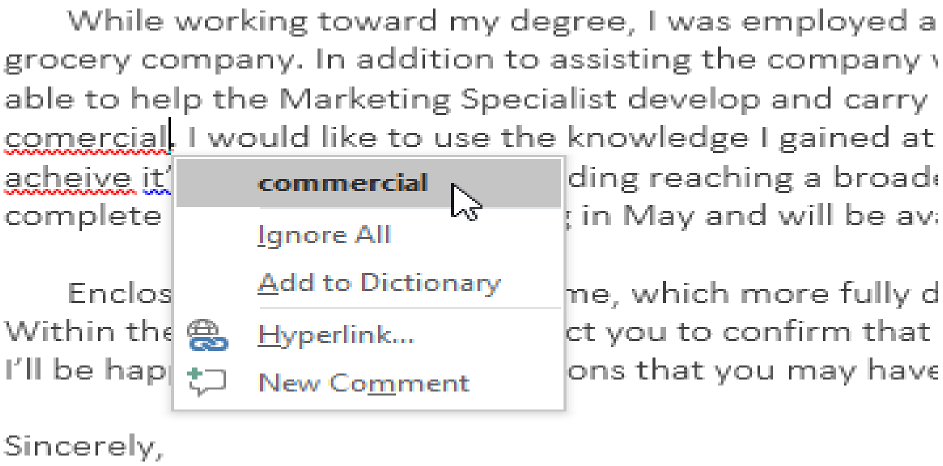
- The **red line** indicates a misspelled word.
- The **blue line** indicates a grammatical error, including misused words.




A **misused word**—also known as a contextual spelling error—occurs when a word is spelled correctly but used incorrectly. For example, if you used the phrase **Deer Mr. Theodore** at the beginning of a letter, **deer** would be a contextual spelling error. **Deer** is spelled correctly, but it is used incorrectly in the letter. The correct word is **dear**.

To correct spelling errors:

1. Right-click the **underlined word**, then select the **correct spelling** from the list of suggestions.

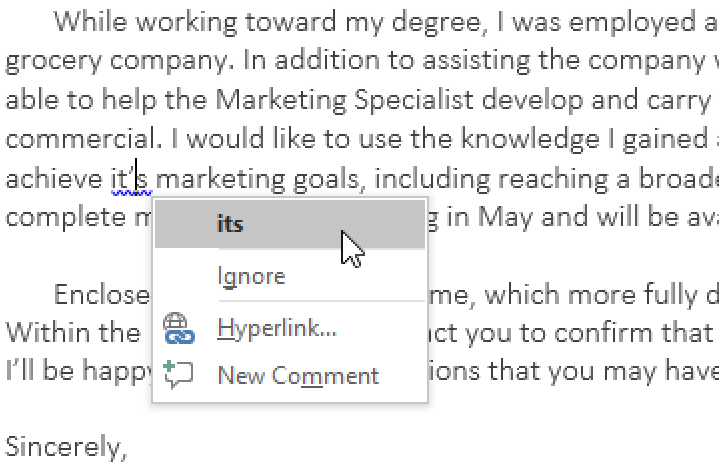



2. The corrected word will appear in the document.

You can also choose to **Ignore All** instances of an underlined word or add it to the **dictionary**.

To correct grammar errors:

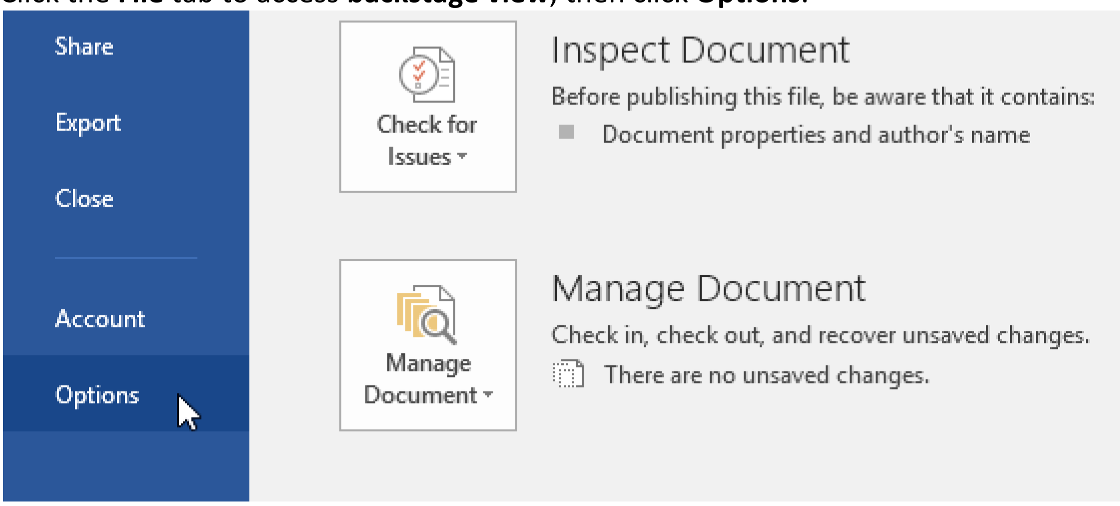
1. Right-click the **underlined word or phrase**, then select the **correct spelling or phrase** from the list of suggestions.



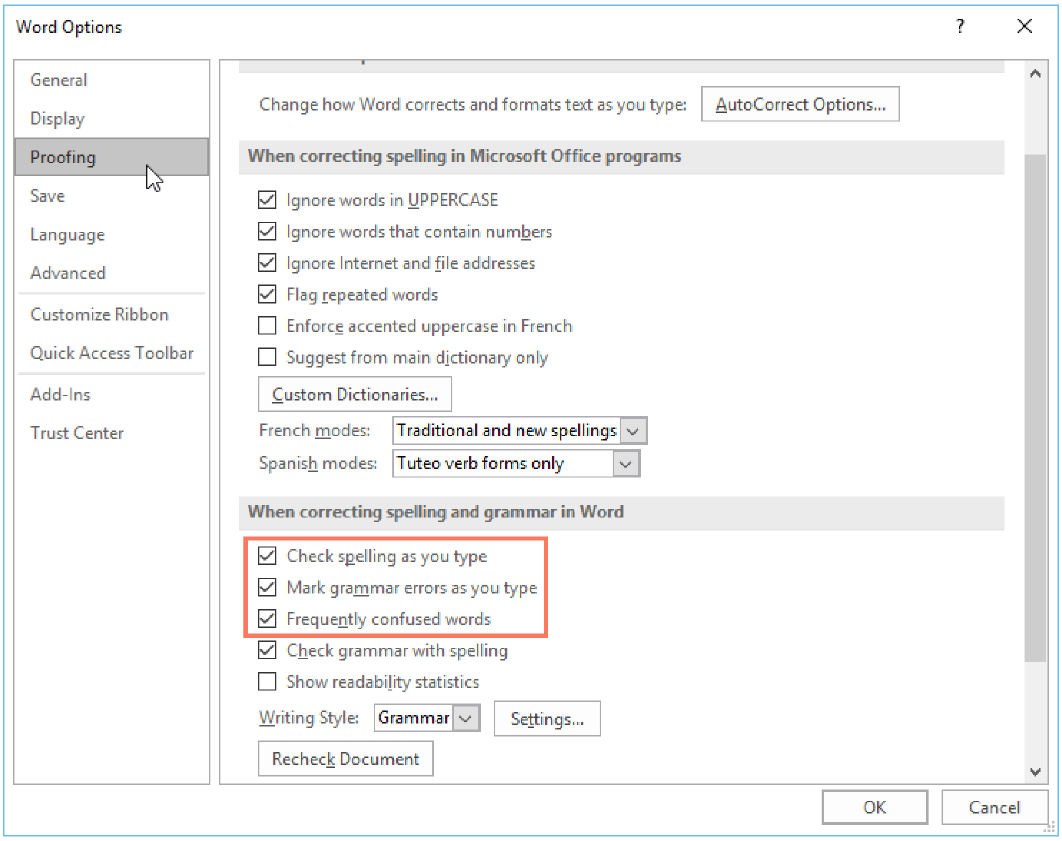

2. The corrected phrase will appear in the document.

To change the automatic spelling and grammar check settings:

1. Click the **File** tab to access **backstage view**, then click **Options**.



2. A dialog box will appear. On the left side of the dialog box, select **Proofing**. From here, you have several options to choose from. For example, if you don't want Word to mark **spelling errors**, **grammar errors**, or **frequently confused words** automatically, simply uncheck the desired option.

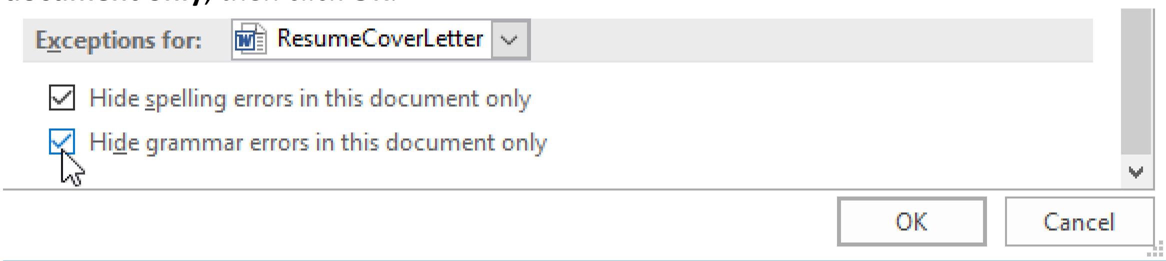



If you've turned off the automatic spelling and/or grammar checks, you can still go to the **Review** tab and click the **Spelling & Grammar** command to run a new check.

To hide spelling and grammar errors in a document:

If you're sharing a document like a resume with someone, you might not want that person to see the red and blue lines. Turning off the automatic spelling and grammar checks only applies to your computer, so the lines may still show up when someone else views your document. Fortunately, Word allows you to hide spelling and grammar errors so the lines will not show up on any computer.

1. Click the **File** tab to go to **backstage view**, then click **Options**.
2. A dialog box will appear. Select **Proofing**, then check the box next to **Hide spelling errors in this document only** and **Hide grammar errors in this document only**, then click **OK**.




3. The lines in the document will be hidden.

## Track Changes and Comments

Let's say someone asks you to proofread or collaborate on a document. If you had a printed copy, you might use a red pen to cross out sentences, mark misspellings, and add comments in the margins. Word allows you to do all of these things electronically using the Track Changes and Comments features.

### Understanding Track Changes

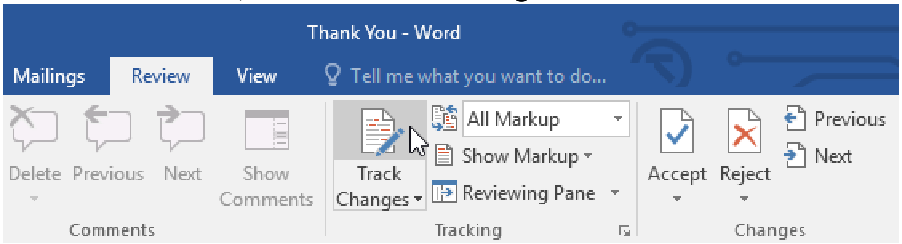
When you turn on **Track Changes**, every change you make to the document will appear as a colored **markup**. If you delete text, it won't disappear—instead, the text will be **crossed out**. If you add text, it will be **underlined**. This allows you to see edits before making the changes permanent.

> ~~To Whom It May Concern:~~ Dear Mr. Powell:
>
> Thank you for taking the time to meet with me last Thursday about the Sales Associate position. I enjoyed meeting with you and touring the facility. I was very impressed with the layout of the showroom and with the competence of the staff at ~~your company.~~Quality Furnishings. I would love the chance to work in such a productive and ~~very~~ supportive atmosphere.

If there are multiple reviewers, each person will be assigned a different markup color.

**To turn on Track Changes:**

1. From the **Review** tab, click the **Track Changes** command.




2. Track Changes will be turned on. From this point on, any changes you make to the document will appear as colored markups.

> To Whom It May Concern:
>
> Thank you for taking the time to meet with me last Thursday about the Sales Associate position. I enjoyed meeting with you and touring the facility. I was very impressed with the layout of the showroom and with the competence of the staff at ~~your company~~Quality Furnishings. I would love the chance to work in such a productive and ~~very~~ supportive atmosphere.

### Reviewing changes

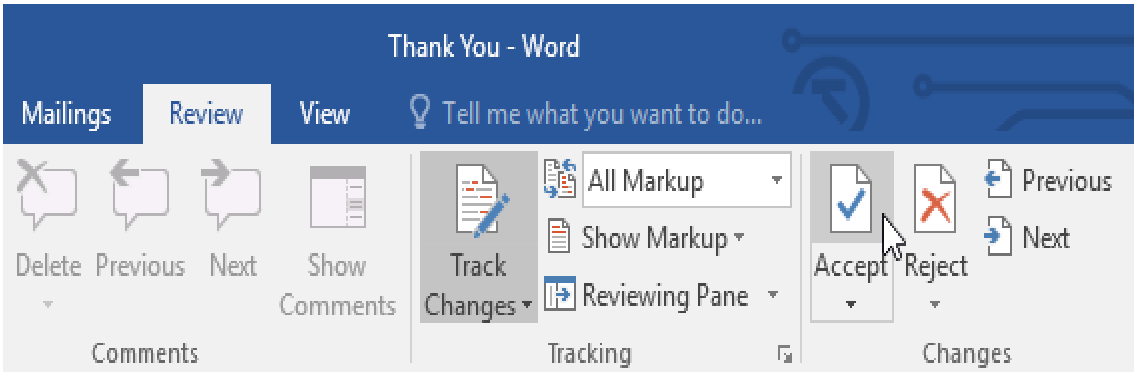
Tracked changes are really just suggested changes. To become permanent, they must be **accepted**. On the other hand, the original author may disagree with some of the tracked changes and choose to **reject** them.

To accept or reject changes:

1. Select the change you want to accept or reject.

> To Whom It May Concern:
>
> Thank you for taking the time to meet with me last Thursday about the Sales Associate position. I enjoyed meeting with you and touring the facility. I was very impressed with the layout of the showroom and with the competence of the staff at ~~your company~~Quality Furnishings. I would love the chance to work in such a productive and ~~very~~ supportive atmosphere.

2. From the **Review** tab, click the **Accept** or **Reject** command.

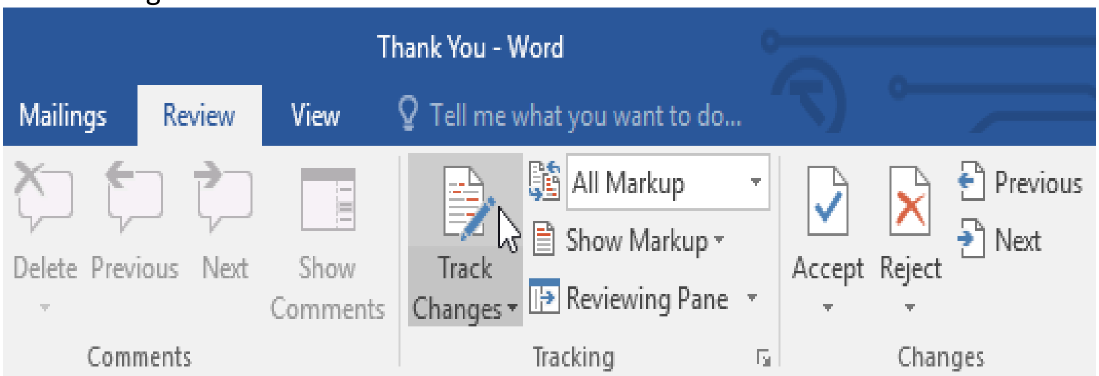



3. The markup will disappear, and Word will automatically jump to the next change. You can continue accepting or rejecting each change until you have reviewed all of them.

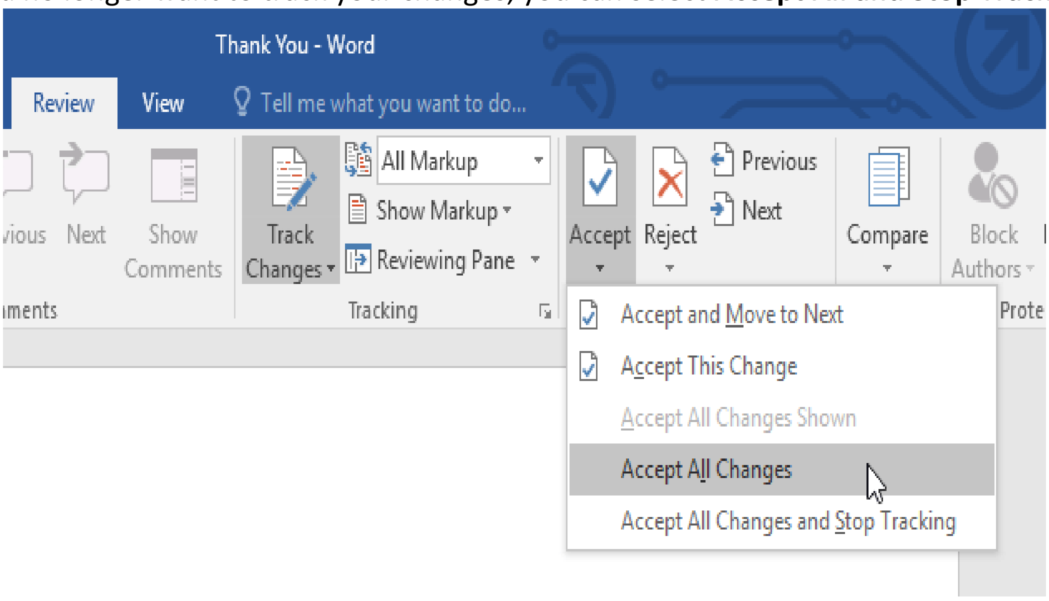
To Whom It May Concern:

Thank you for taking the time to meet with me last Thursday about the Sales Associate position. I enjoyed meeting with you and touring the facility. I was very impressed with the layout of the showroom and with the competence of the staff at ~~your company~~Quality Furnishings. I would love the chance to work in such a productive and ~~very~~ supportive atmosphere.

4. When you're finished, click the **Track Changes** command to **turn off** Track Changes.




To accept all changes at once, click the **Accept** drop-down arrow, then select **Accept All**. If you no longer want to track your changes, you can select **Accept All and Stop Tracking**.



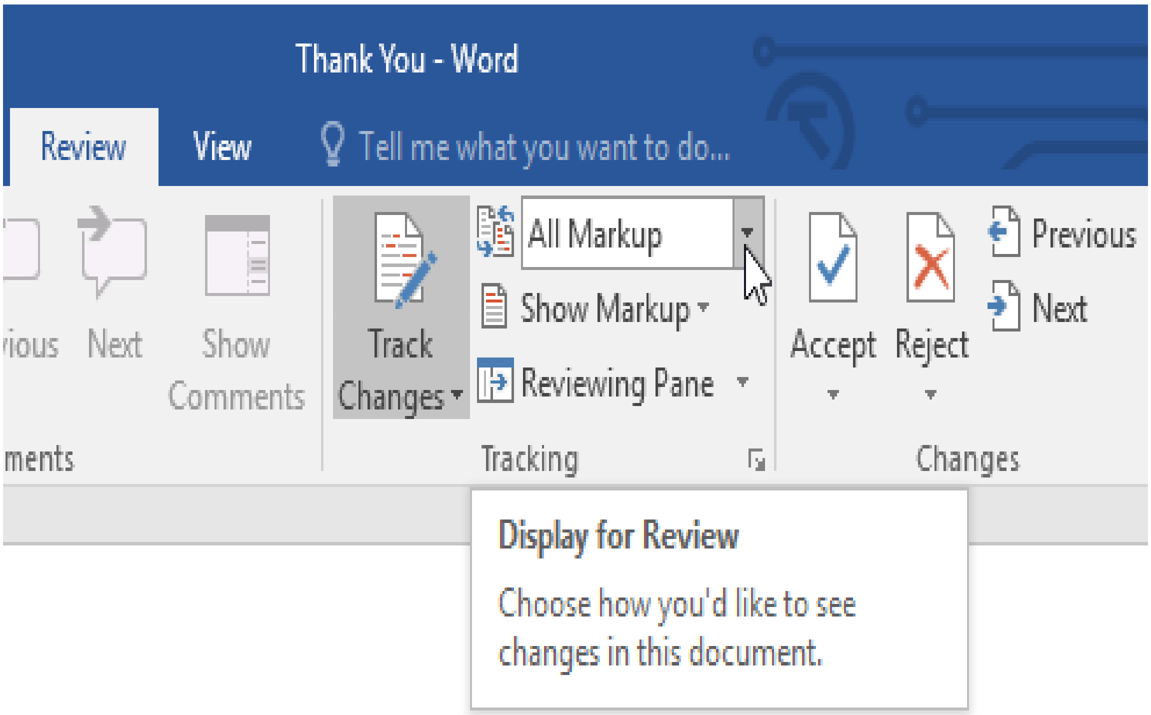
Track Changes viewing options

If you have a lot of tracked changes, they may become distracting if you're trying to read through a document. Fortunately, Word provides a few ways to customize how tracked changes appear:

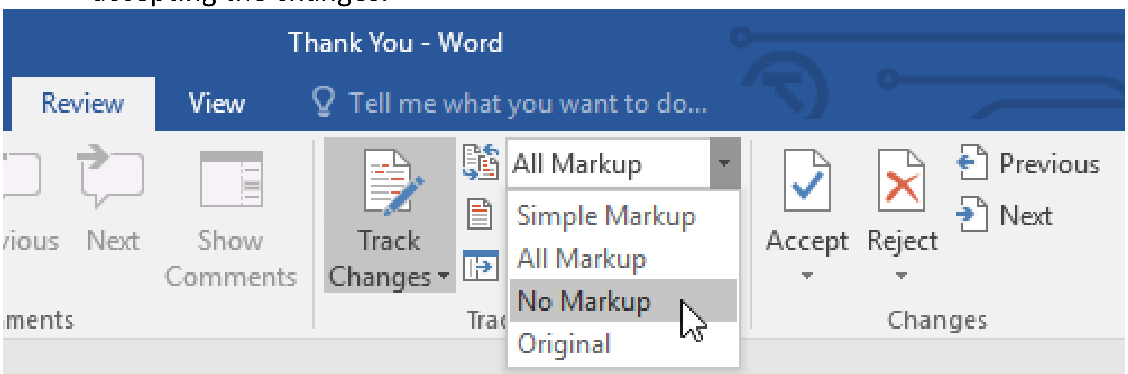
- **Simple Markup**: This shows the final version without inline markups. Red markers will appear in the left margin to indicate where a change has been made.
- **All Markup**: This shows the final version with inline markups.
- **No Markup**: This shows the final version and hides all markups.
- **Original**: This shows the original version and hides all markups.

To hide tracked changes:

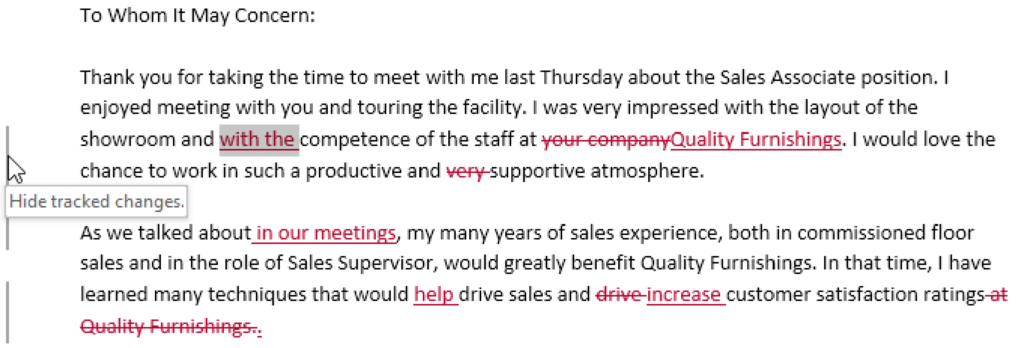
1. From the **Review** tab, click the **Display for Review** command. The Display for Review command is located to the right of the Track Changes command.




2. Select the desired option from the drop-down menu. In our example, we'll select **No Markup** to preview the final version of the document before accepting the changes.



You can also click the marker in the left margin to switch between **Simple Markup** and **All Markup**.



To Whom It May Concern:

Thank you for taking the time to meet with me last Thursday about the Sales Associate position. I enjoyed meeting with you and touring the facility. I was very impressed with the layout of the showroom and with the competence of the staff at ~~your company~~Quality Furnishings. I would love the chance to work in such a productive and ~~very~~ supportive atmosphere.



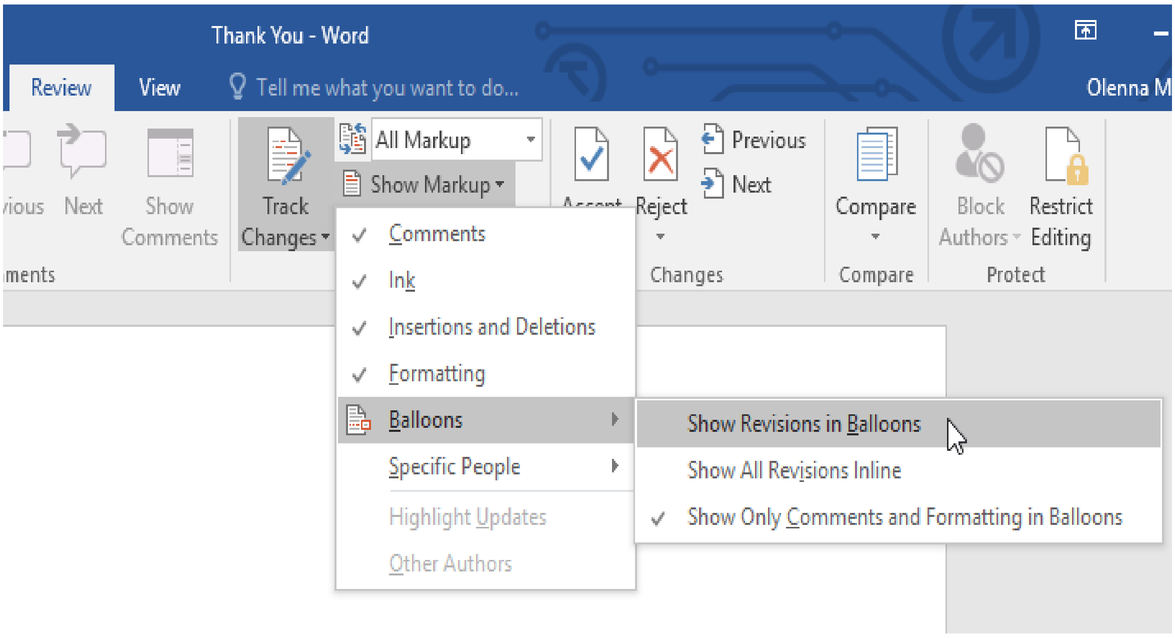
As we talked about in our meetings, my many years of sales experience, both in commissioned floor sales and in the role of Sales Supervisor, would greatly benefit Quality Furnishings. In that time, I have learned many techniques that would help drive sales and ~~drive~~ increase customer satisfaction ratings ~~at Quality Furnishings.~~.

Remember that hiding Track Changes is not the same as **reviewing changes**. You will still need to **accept** or **reject** the changes before sending out the final version of your document.

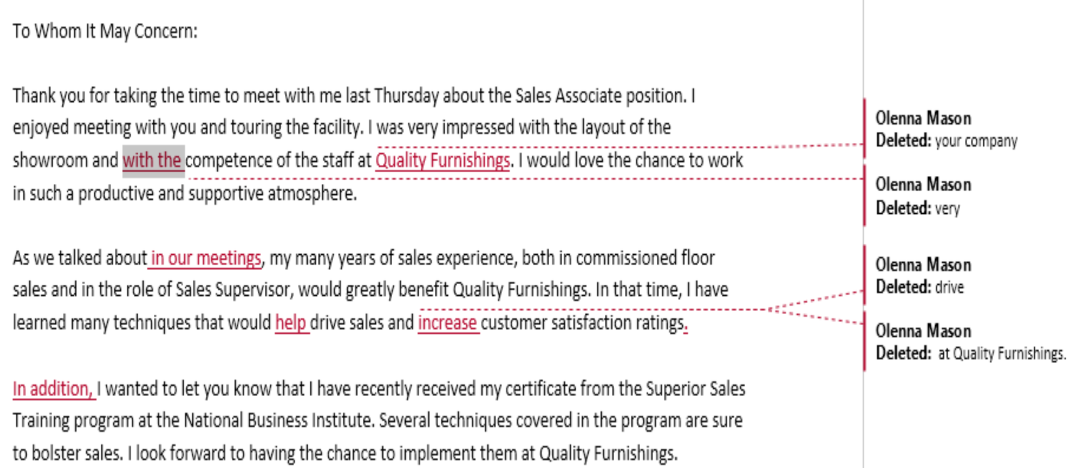
To show revisions in balloons:

By default, most revisions appear **inline**, meaning the text itself is marked. You can also choose to show the revisions in **balloons**, which moves most revisions to the right margin. Removing inline markups can make the document easier to read, and balloons also give you more detailed information about some markups.

1. From the **Review** tab, click **Show Markup > Balloons > Show Revisions in Balloons**.




2. Most revisions will appear in the right margin, although any added text will still appear inline.



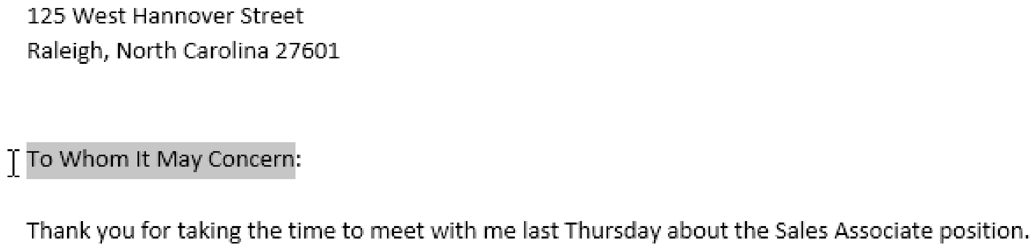

To go back to **inline** markups, you can select either **Show All Revisions Inline** or **Show Only Comments and Formatting in Balloons**.

Comments

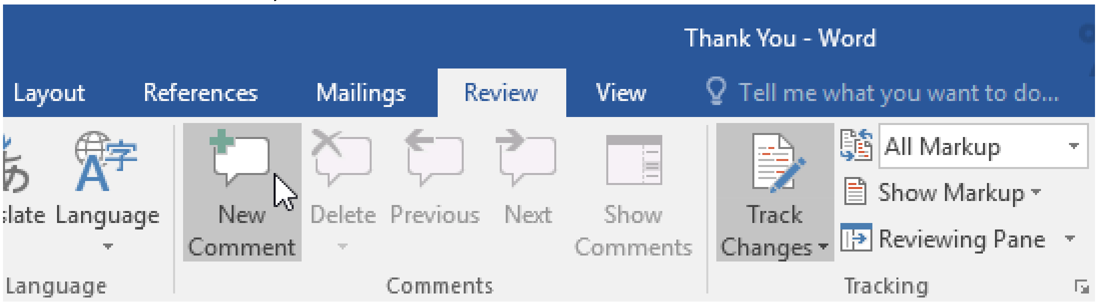
Sometimes you may want to add a **comment** to provide feedback instead of editing a document. While it's often used in combination with Track Changes, you don't necessarily need to have Track Changes turned on to add comments.

To add comments:

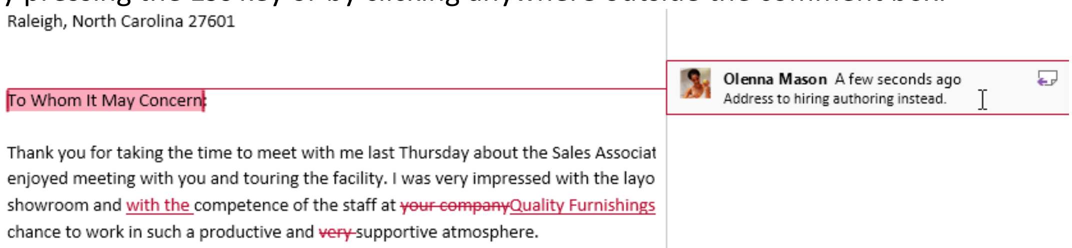
1. **Highlight some text**, or place the **insertion point** where you want the comment to appear.




2. From the **Review** tab, click the **New Comment** command.

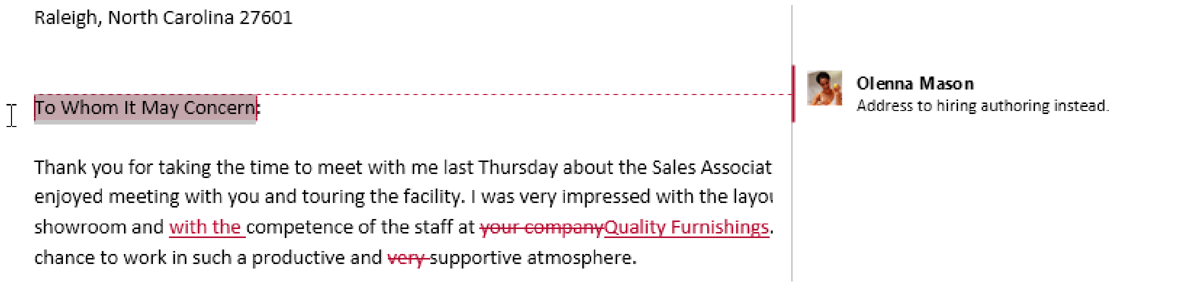



3. Type your comment. When you're done, you can close the comment box by pressing the **Esc** key or by clicking anywhere outside the comment box.

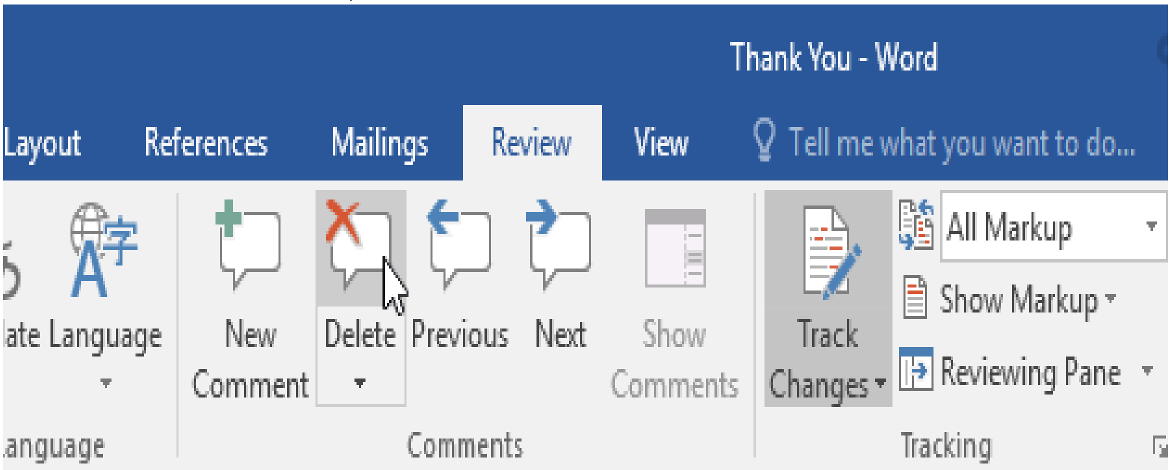



To delete comments:

1. Select the comment you want to delete.

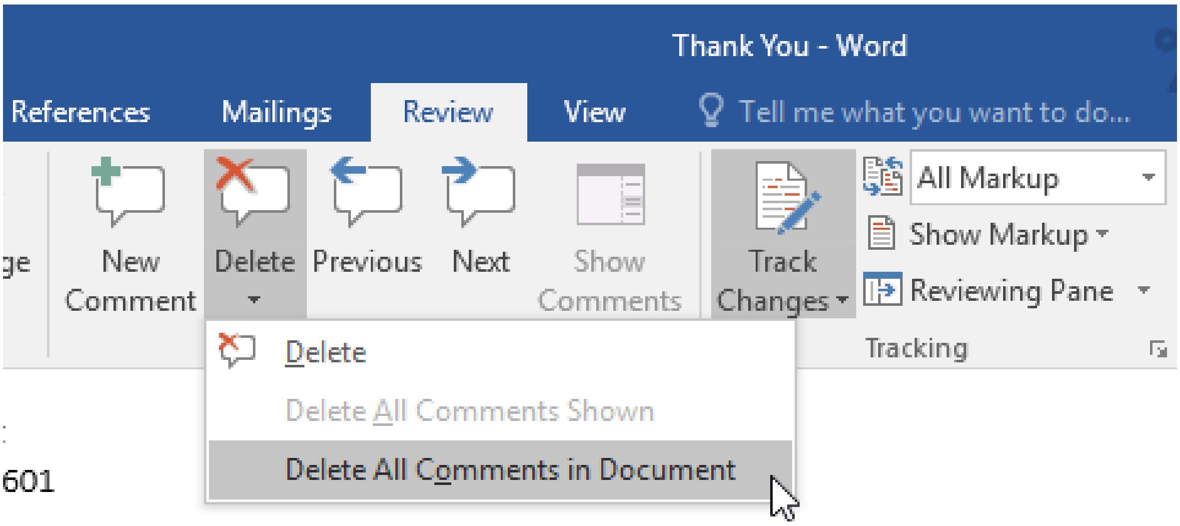



2. From the **Review** tab, click the **Delete** command.




3. The comment will be deleted.

To delete all comments, click the **Delete** drop-down arrow and select **Delete All Comments in Document**.

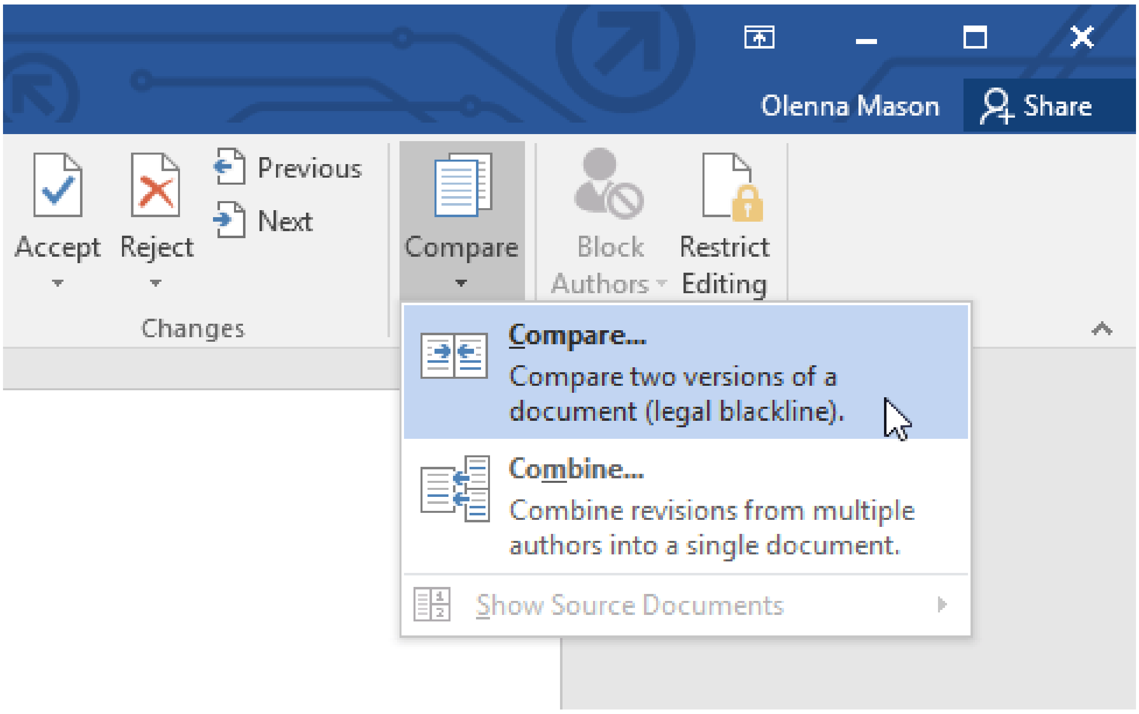



Comparing documents

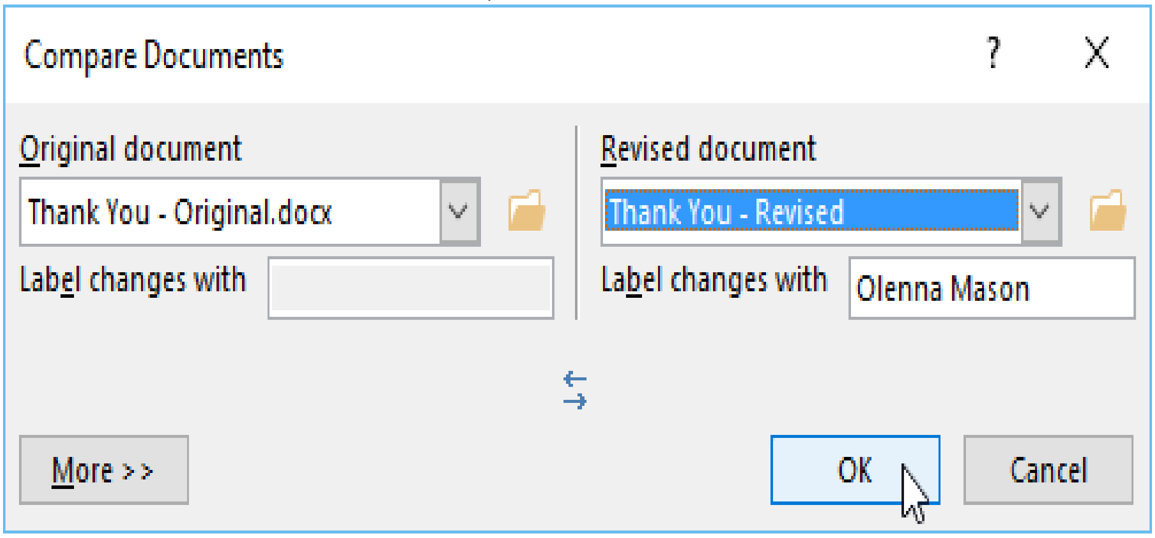
If you edit a document without tracking changes, it's still possible to use reviewing features such as **Accept** and **Reject**. You can do this by **comparing** two versions of the document. All you need is the **original** document and the **revised** document (the documents must also have different file names).

To compare two documents:

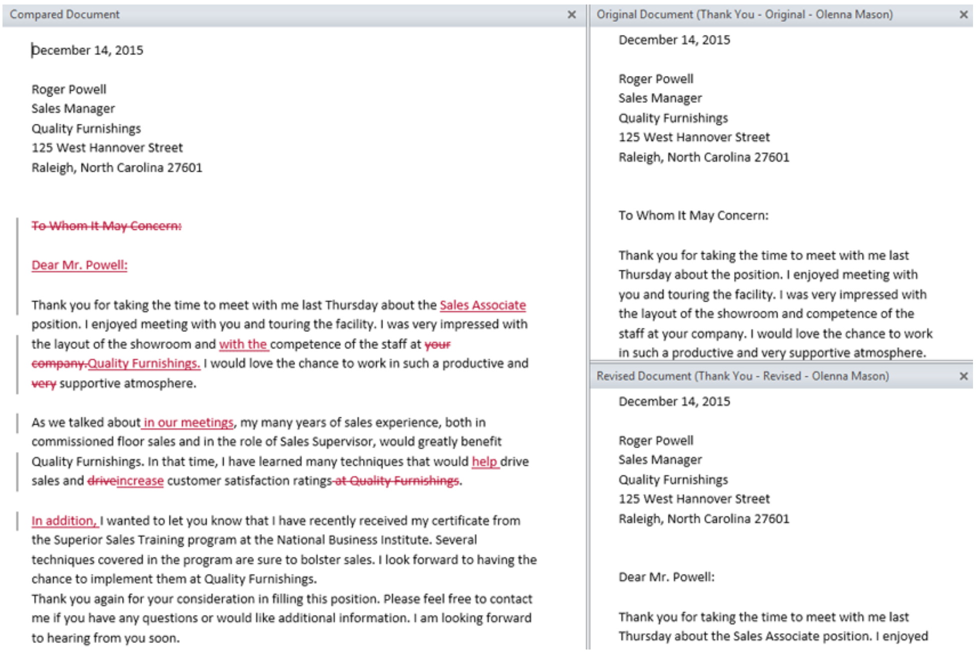
1. From the **Review** tab, click the **Compare** command, then select **Compare** from the drop-down menu.




2. A dialog box will appear. Choose your **Original document** by clicking the drop-down arrow and selecting the document from the list. If the file is not in the list, click the **Browse** button to locate it.
3. Choose the **Revised document**, then click **OK**.




4. Word will compare the two files to determine what was changed and then create a new document. The changes will appear as colored **markups**, just like **Track Changes**. You can then use the **Accept** and **Reject** commands to finalize the document.




## Inspecting and Protecting Documents

Before sharing a document, you'll want to make sure it doesn't include any information you want to keep private. You may also want to discourage others from editing your file. Fortunately, Word includes several tools to help inspect and protect your document.

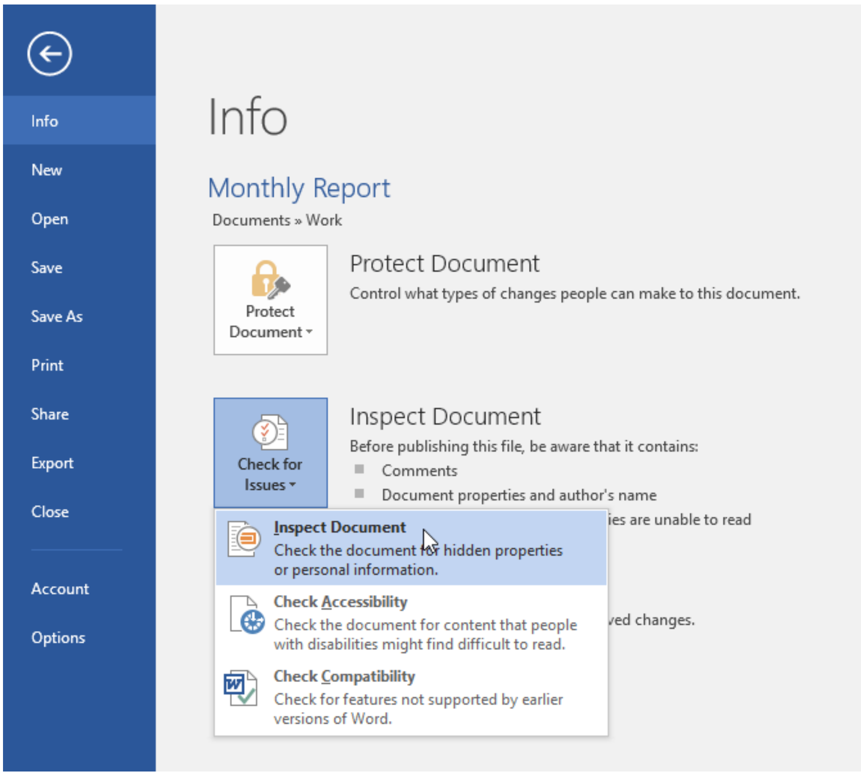
### Document Inspector

Whenever you create or edit a document, certain **personal information** may be added to the file automatically—for example, information about the document's author. You can use **Document Inspector** to remove this type of information before sharing a document with others.

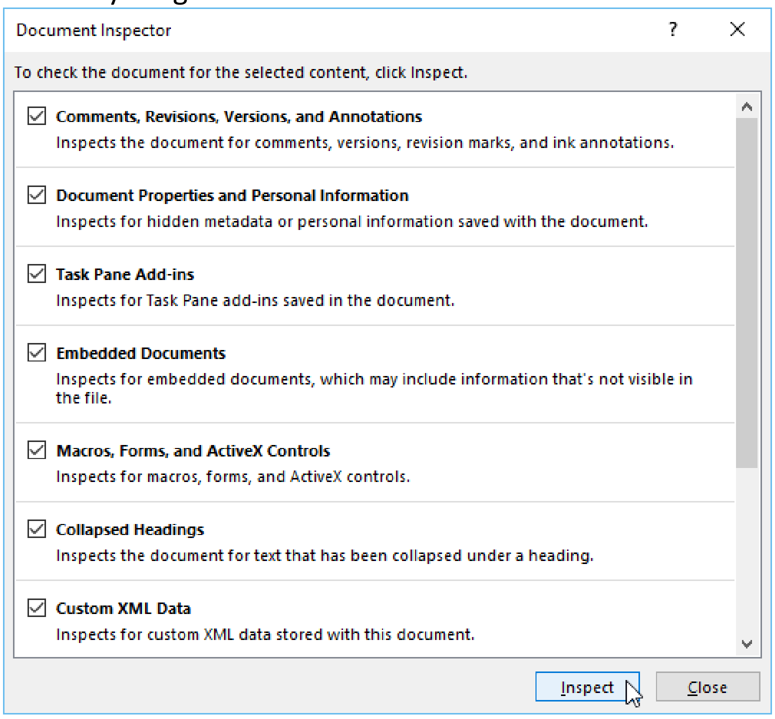
Because some changes may be permanent, it's a good idea to use **Save As** to create a backup copy of your document before using Document Inspector.

To use Document Inspector:

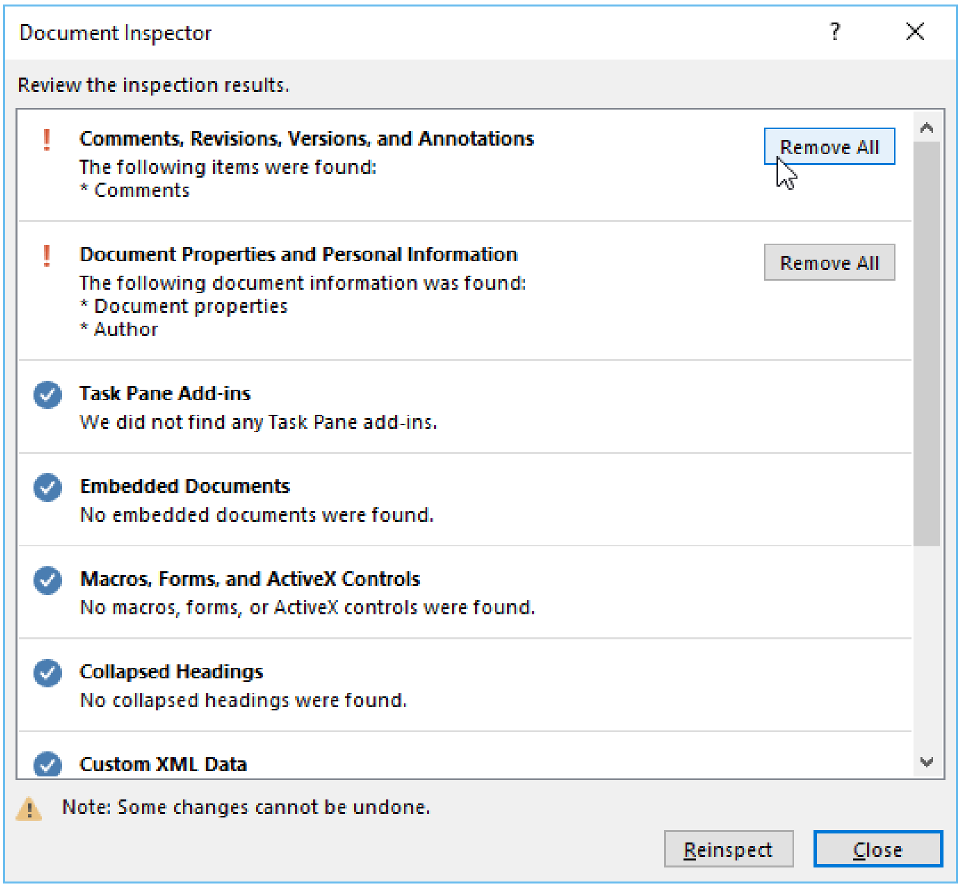
1. Click the **File** tab to go to **Backstage view**.
2. From the **Info** pane, click **Check for Issues**, then select **Inspect Document** from the drop-down menu.




3. **Document Inspector** will appear. Check or uncheck the boxes, depending on the content you want to review, then click **Inspect**. In our example, we'll leave everything selected.




4. The inspection results will show an **exclamation mark** for any categories where it found potentially sensitive data, and it will also have a **Remove All** button for each of these categories. Click **Remove All** to remove the data.



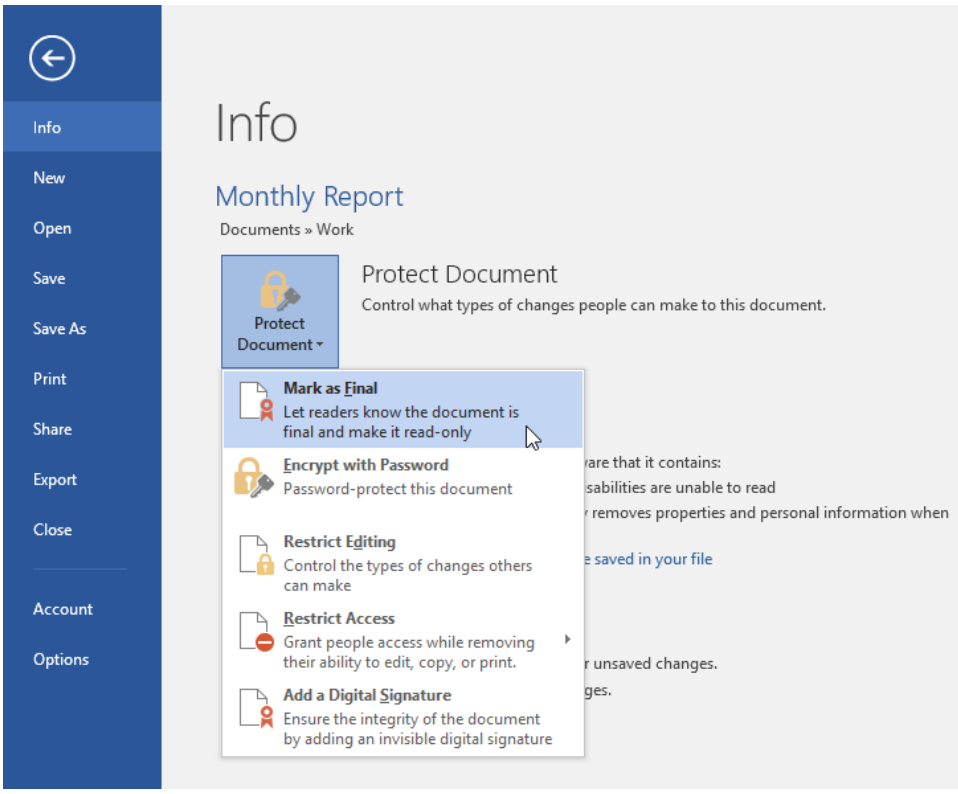

5. When you're done, click **Close**.

Protecting your document

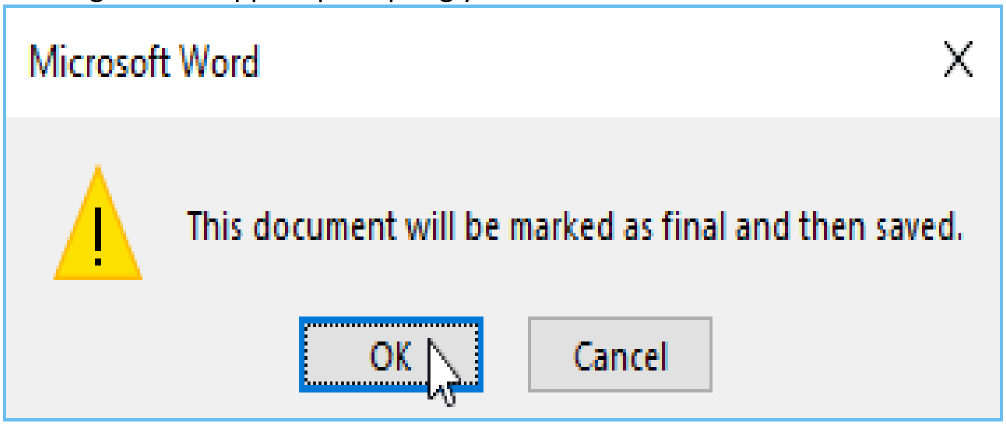
By default, anyone with access to your document will be able to open, copy, and edit its content unless you **protect** it. There are several ways to protect a document, depending on your needs.

**To protect your document:**

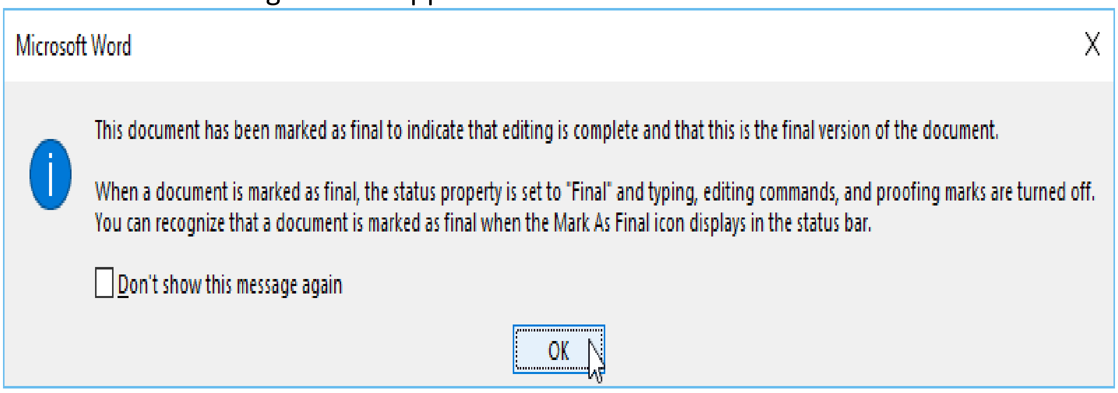
1. Click the **File** tab to go to **Backstage view**.
2. From the **Info** pane, click the **Protect Document** command.
3. In the drop-down menu, choose the option that best suits your needs. In our example, we'll select **Mark as Final**. Marking your document as final is a good way to discourage others from editing the file, while other options give you more control if you need it.



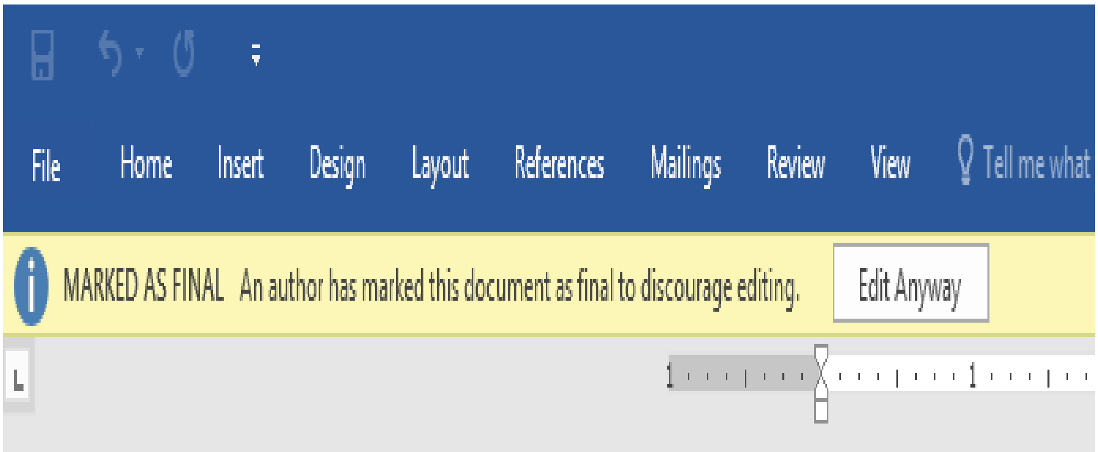

4. A dialog box will appear prompting you to save. Click **OK**.




5. Another dialog box will appear. Click **OK**.




6. The document will be **marked as final**. Whenever others open the file, a bar will appear at the top to discourage them from editing the document.




Marking a document as final will not actually prevent others from editing it because they can just select **Edit Anyway**. If you want to prevent people from editing the document, you can use the **Restrict Access** option instead.

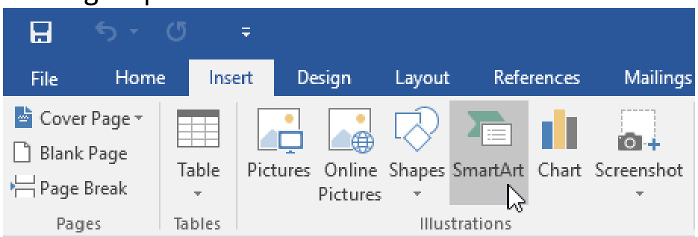
## Lesson 14: Doing More with Word

SmartArt Graphics

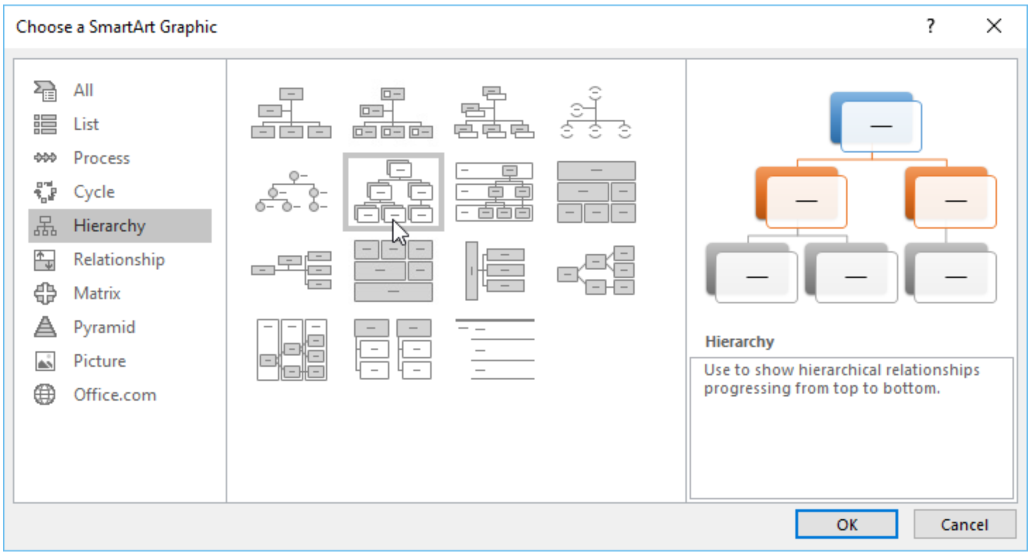
SmartArt allows you to communicate information with graphics instead of just using text. There are a variety of styles to choose from, which you can use to illustrate many different types of ideas.

To insert a SmartArt graphic:

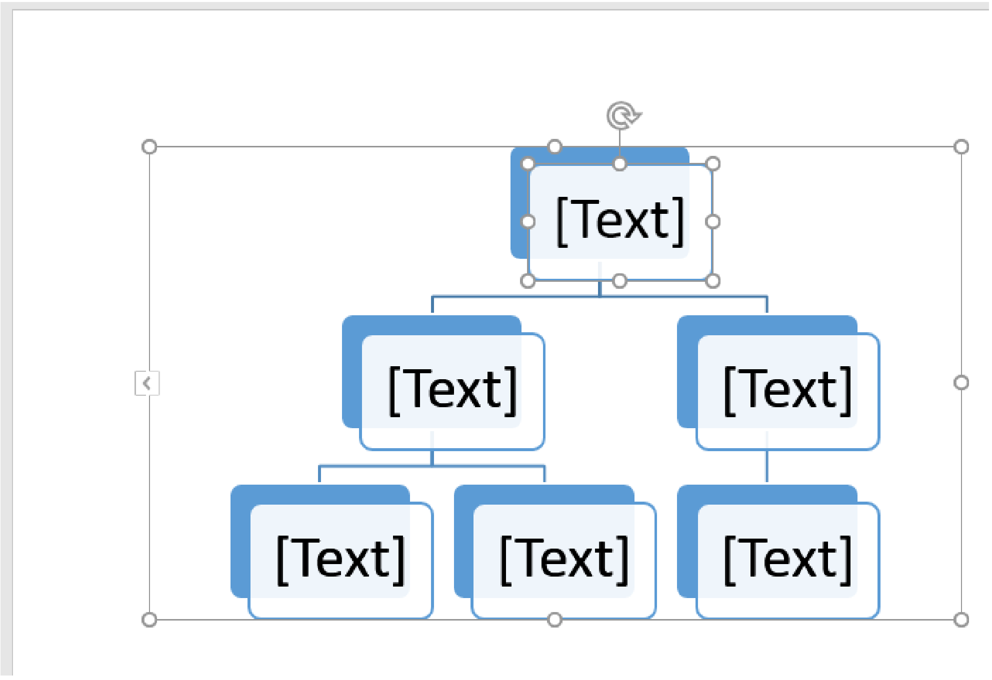
1. Place the insertion point in the document where you want the SmartArt graphic to appear.
2. From the **Insert** tab, select the **SmartArt** command in the **Illustrations** group.




3. A dialog box will appear. Select a **category** on the left, choose the desired SmartArt graphic, then click **OK**.

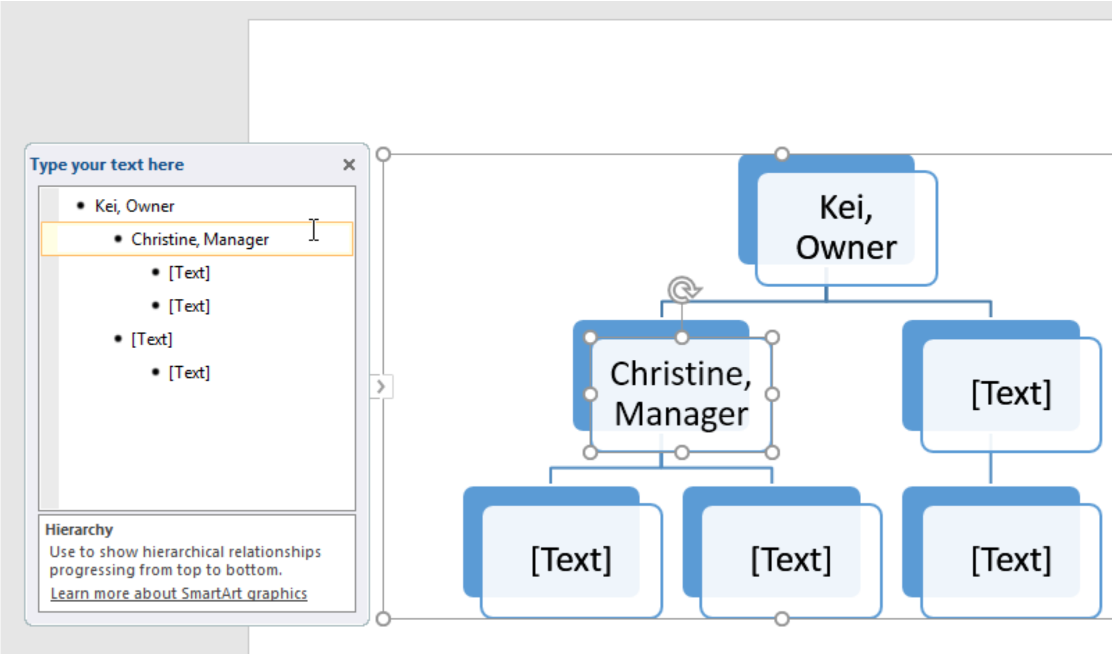



4. The SmartArt graphic will appear in your document.

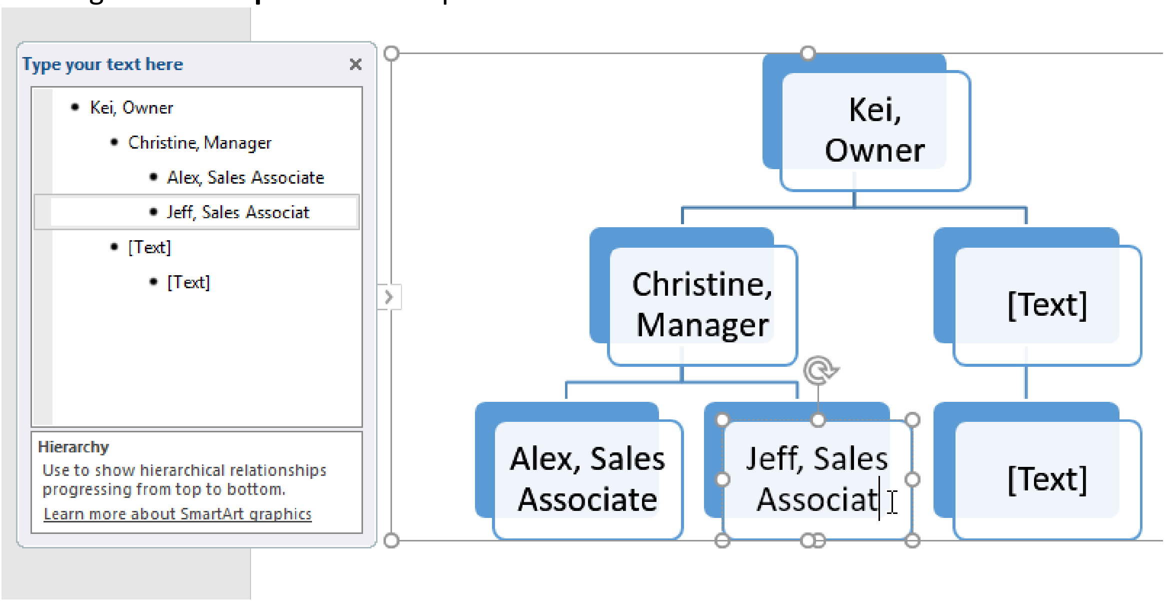



To add text to a SmartArt graphic:

1. Select the SmartArt graphic. The **text pane** should appear on the left side. If it doesn't appear, you can click the small arrow on the left edge of the graphic.
2. Enter text next to each bullet in the text pane. The text will appear in the corresponding shape. It will be resized automatically to fit inside the shape.



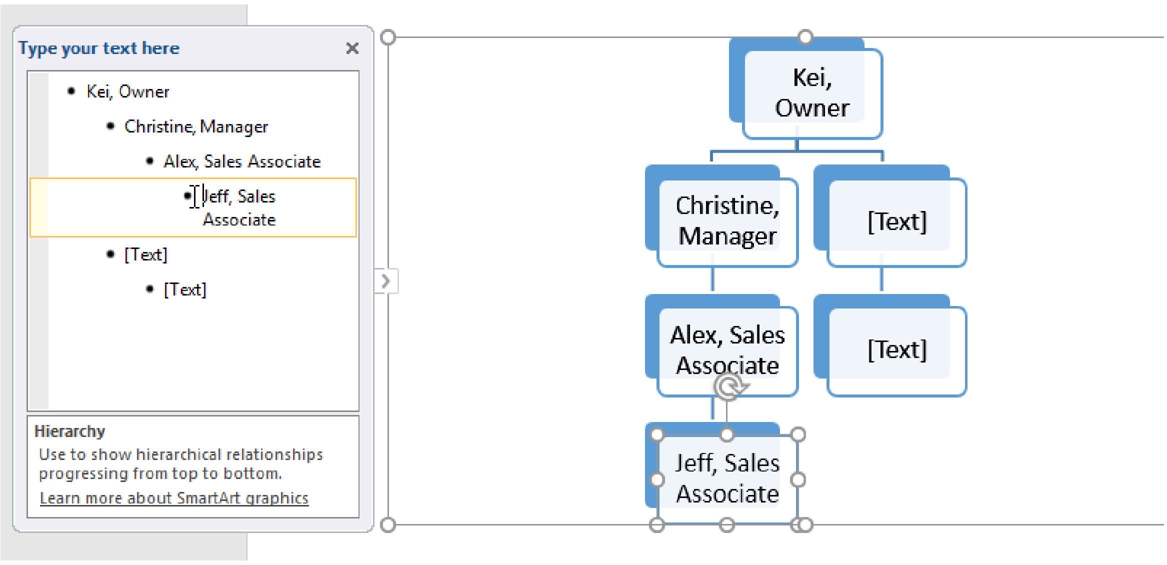

You can also add text by clicking the desired shape and then typing. This works well if you only need to add text to a **few shapes**. However, for more complex SmartArt graphics, working in the **text pane** is often quicker and easier.



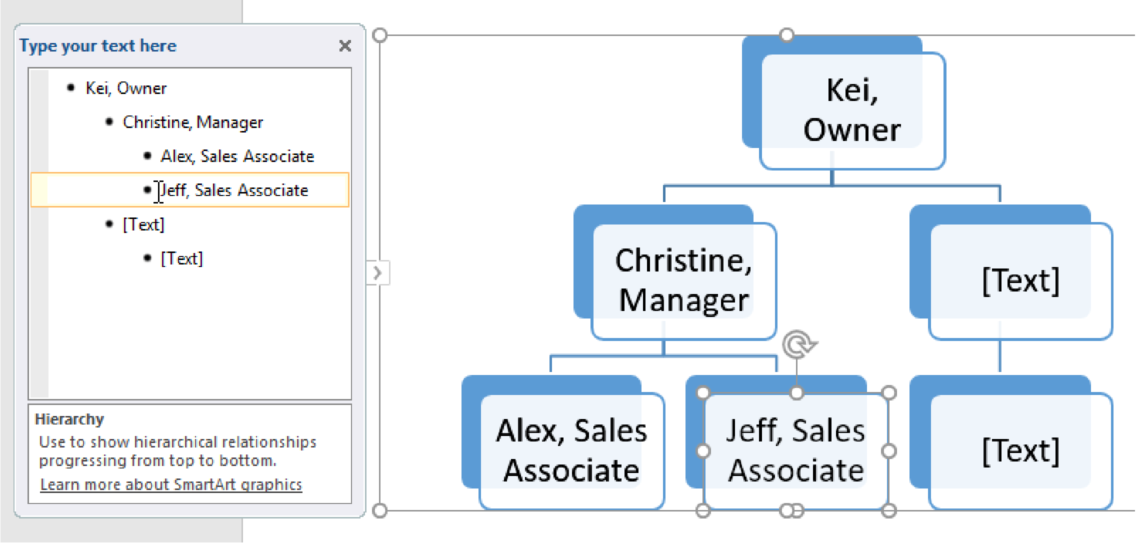

To reorder, add, and delete shapes:

It's easy to add new shapes, change their order, and even delete shapes from your SmartArt graphic. You can do all of this in the text pane, and it's a lot like creating an outline with a **multilevel list**. For more information on multilevel lists, you may want to review our **Lists** lesson.

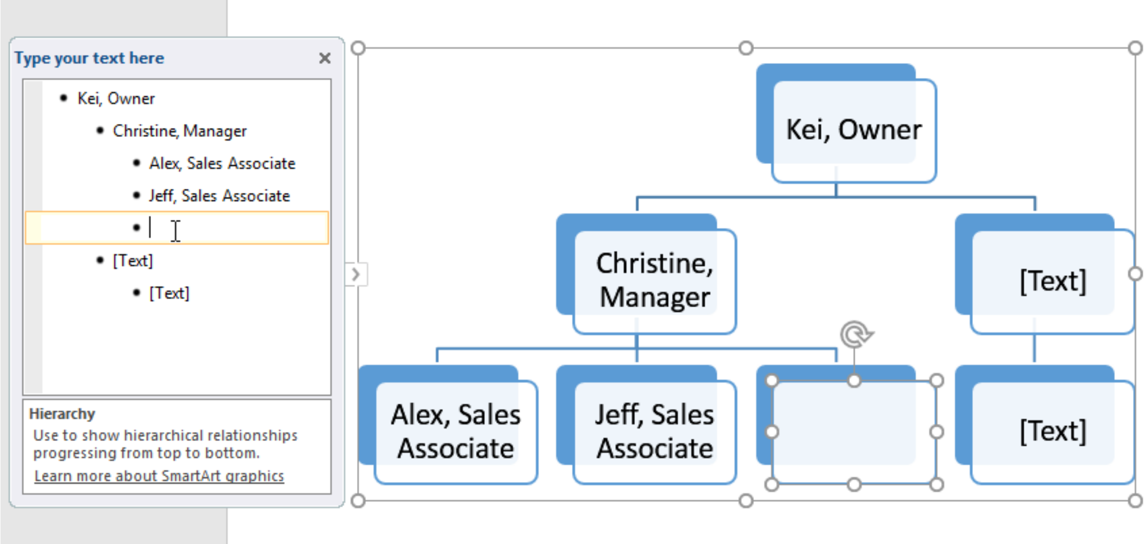
- To **demote a shape**, select the desired bullet, then press the **Tab** key. The bullet will move to the right, and the shape will move down one level.



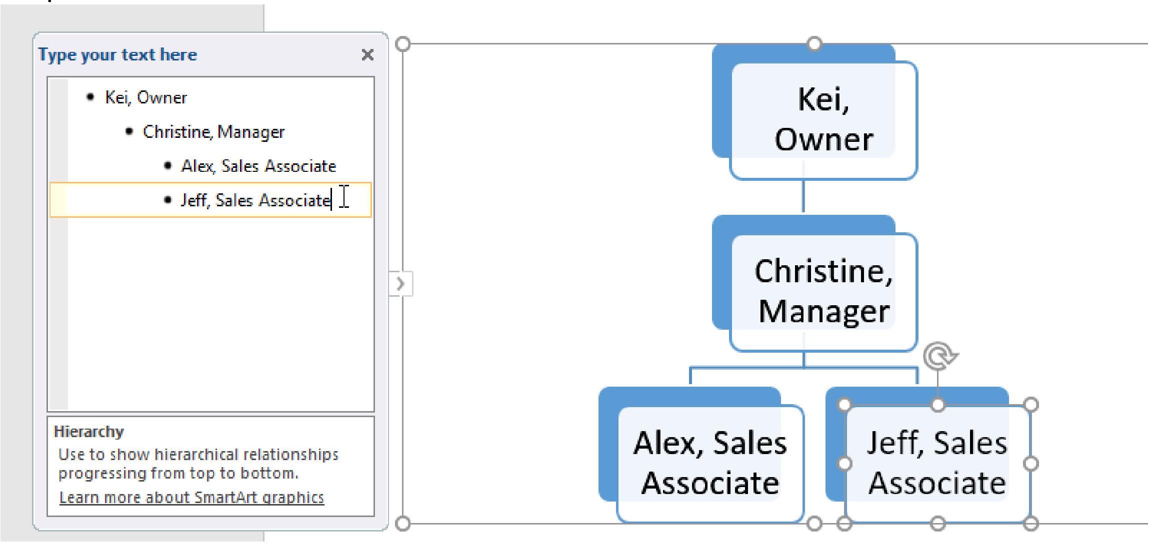

- To **promote a shape**, select the desired bullet, then press the **Backspace** key (or **Shift+Tab**). The bullet will move to the left, and the shape will move up one level.




- To **add a new shape**, place the insertion point after the desired bullet, then press **Enter**. A new bullet will appear in the text pane, and a new shape will appear in the graphic.



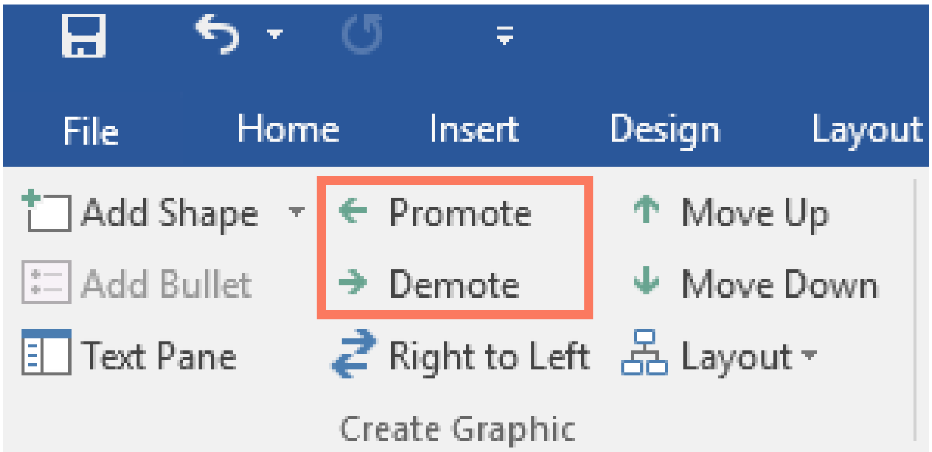

- To **remove a shape**, keep pressing **Backspace** until the bullet is deleted. The shape will then be removed. In our example, we'll delete all of the shapes without text.



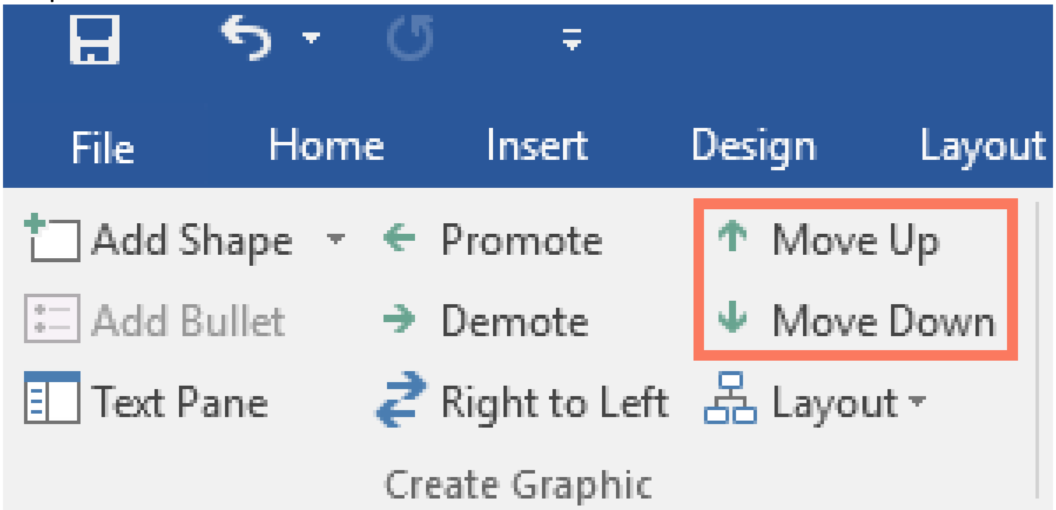

Organizing SmartArt from the Design tab

If you'd prefer not to use the text pane to organize your SmartArt, you can use the commands on the **Design** tab in the **Create Graphic** group. Just select the shape you want to modify, then choose the desired command.

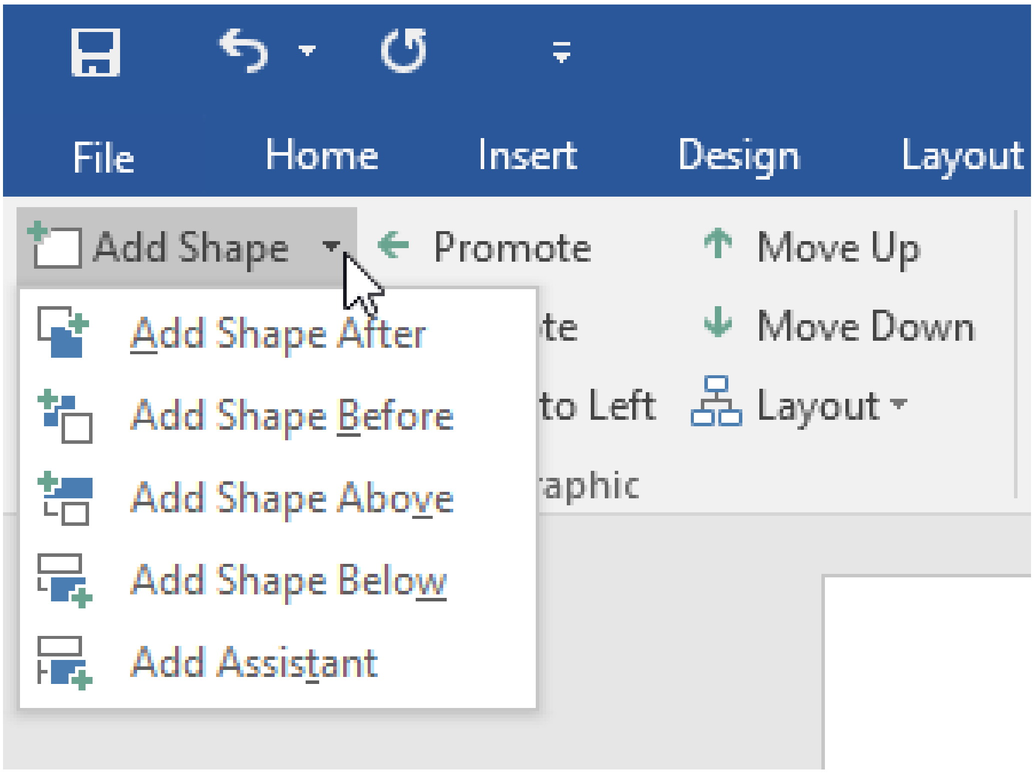
- **Promote** and **Demote**: Use these commands to move a shape up or down between levels.




- **Move Up** and **Move Down**: Use these commands to change the order of shapes on the same level.




- **Add Shape**: Use this command to add a new shape to your graphic. You can also click the drop-down arrow for more exact placement options.

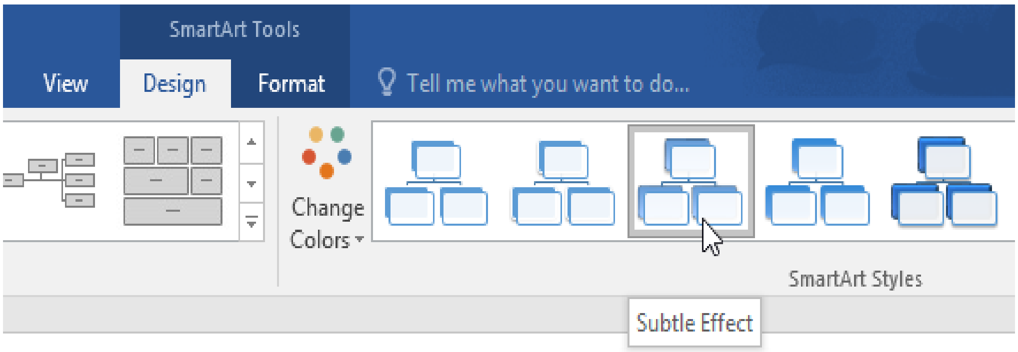


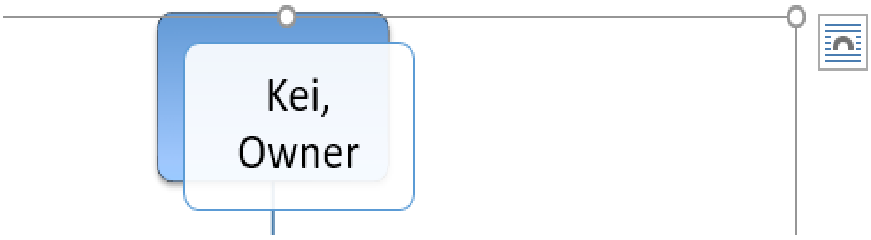

In our example, we've been organizing a graphic with a hierarchical layout. Not all SmartArt graphics use this type of layout, so remember that these commands may work differently (or not at all) depending on the layout of your graphic.

Customizing SmartArt

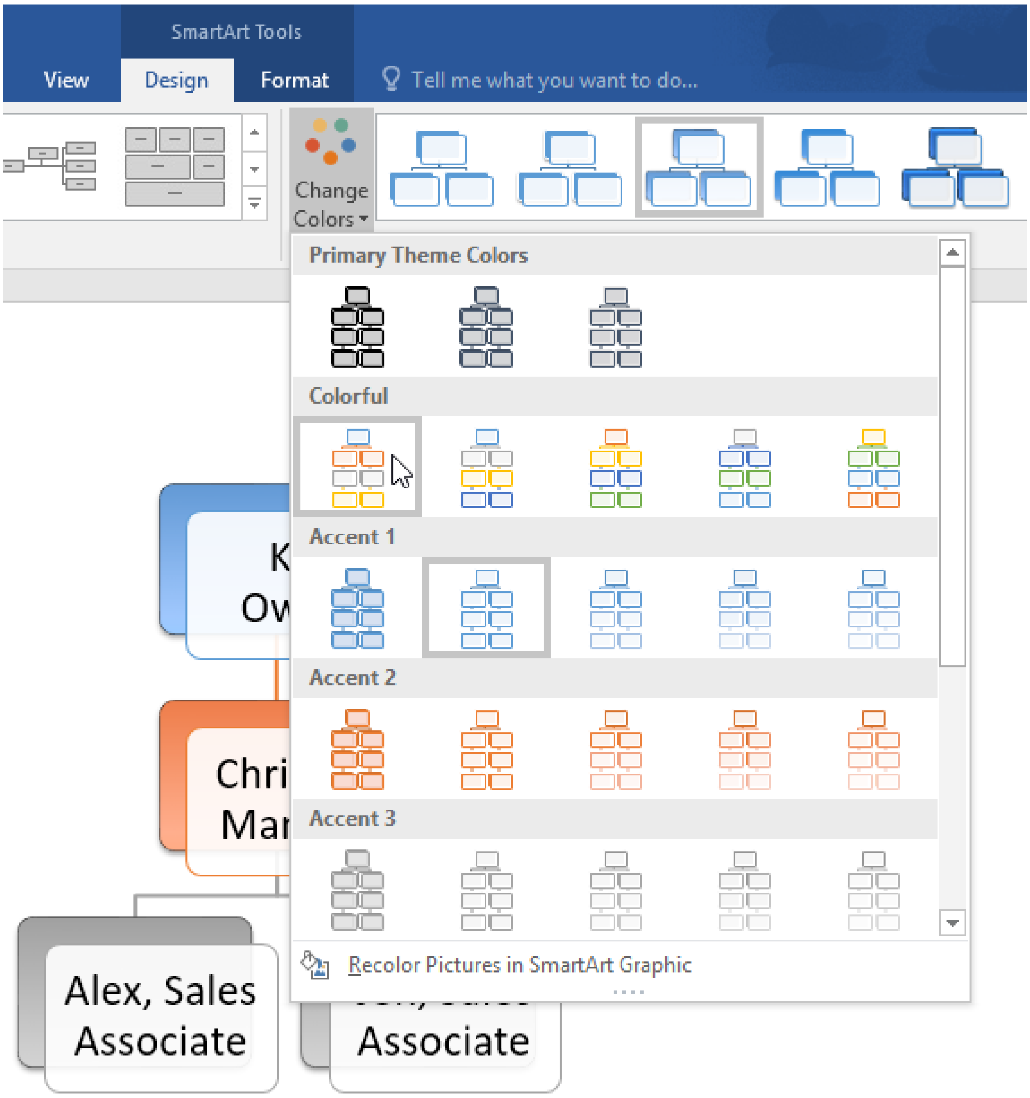
After inserting SmartArt, there are several things you might want to change about its appearance. Whenever you select a SmartArt graphic, the **Design** and **Format** tabs will appear on the right side of the Ribbon. From there, it's easy to edit the **style** and **layout** of a SmartArt graphic.

- There are several **SmartArt styles**, which allow you to quickly modify the look and feel of your SmartArt. To change the style, select the **desired style** from the **SmartArt styles** group.

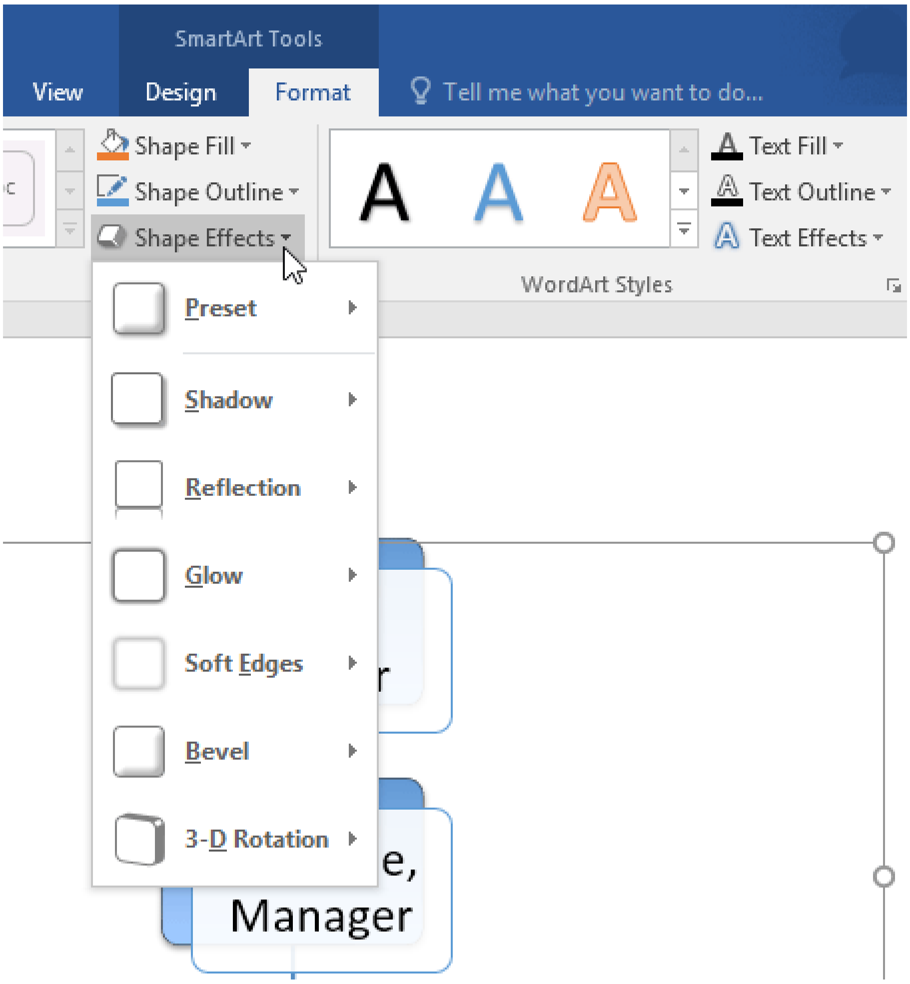



- You have a variety of **color schemes** to use with SmartArt. To change the colors, click the **Change Colors** command and choose the desired option from the drop-down menu.

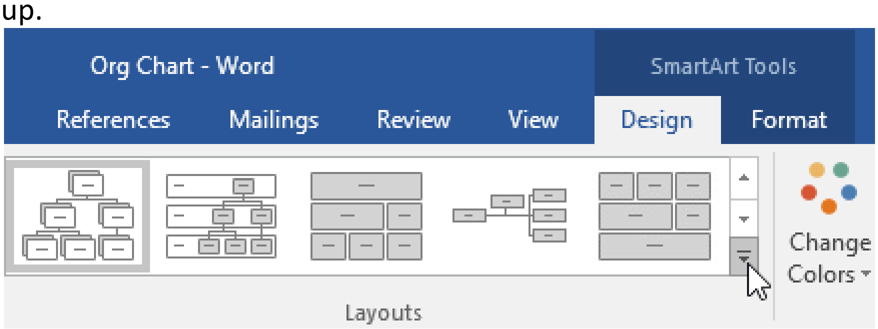



- You can also customize each shape independently. Just select any shape in the graphic, then choose the desired option from the **Format** tab.

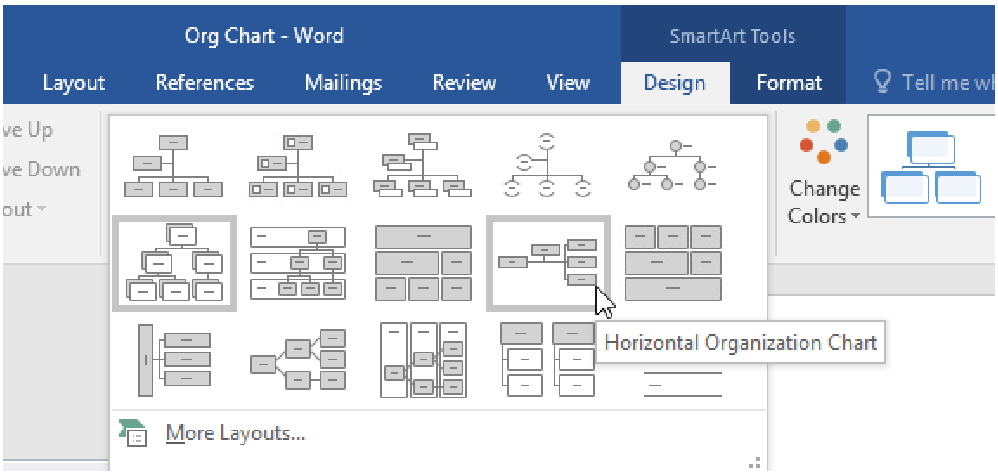



To change the SmartArt layout:
If you don't like the way your information is organized within a SmartArt graphic, you can always change its **layout** to better fit your content.

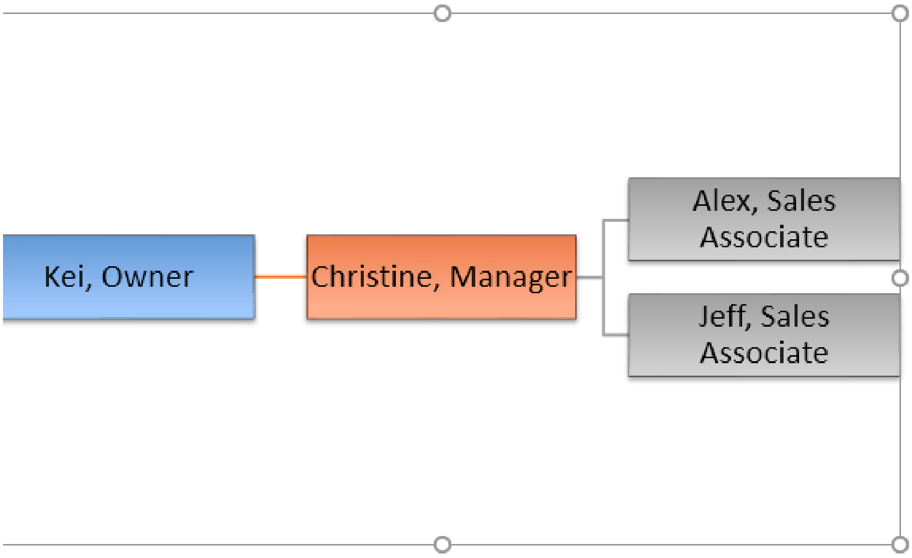
1. From the **Design** tab, click the **More** drop-down arrow in the Layouts group.




2. Choose the desired layout, or click **More Layouts** to see even more options.




3. The selected layout will appear.




If the new layout is too different from the original, some of your text may not appear. Before deciding on a new layout, check carefully to make sure no important information will be lost.

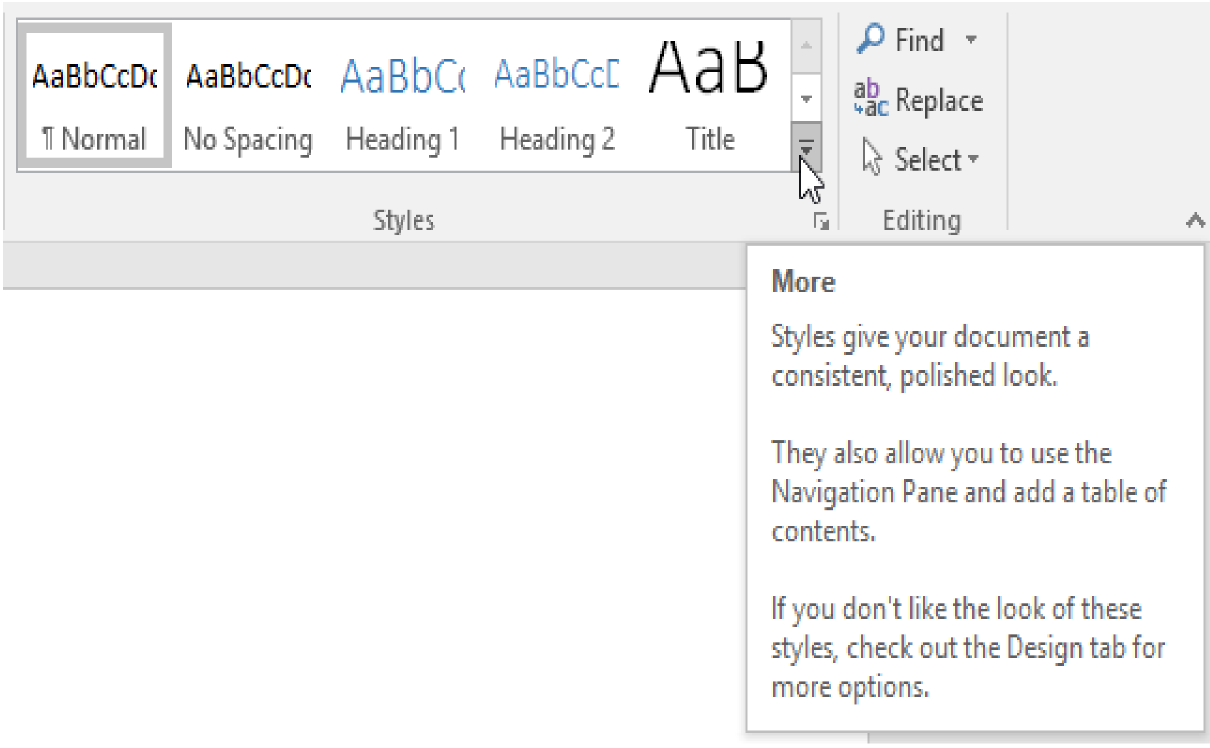
## Applying and Modifying Styles

A style is a predefined combination of font style, color, and size that can be applied to any text in your document. Styles can help your documents achieve a more professional look and feel. You can also use styles to quickly change several things in your document at the same time.

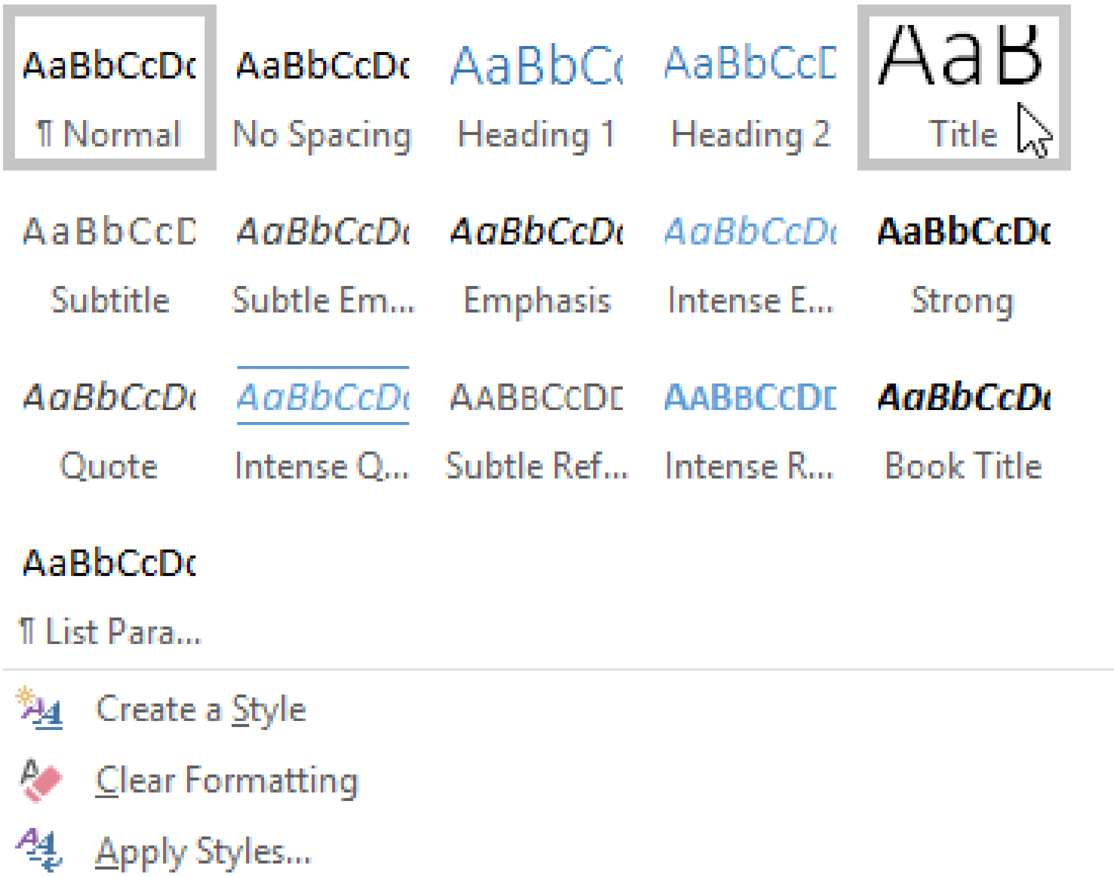
To apply a style:

1. Select the text you want to format, or place your cursor at the beginning of the line.


2. In the **Styles** group on the **Home** tab, click the **More** drop-down arrow.




3. Select the **desired style** from the drop-down menu.



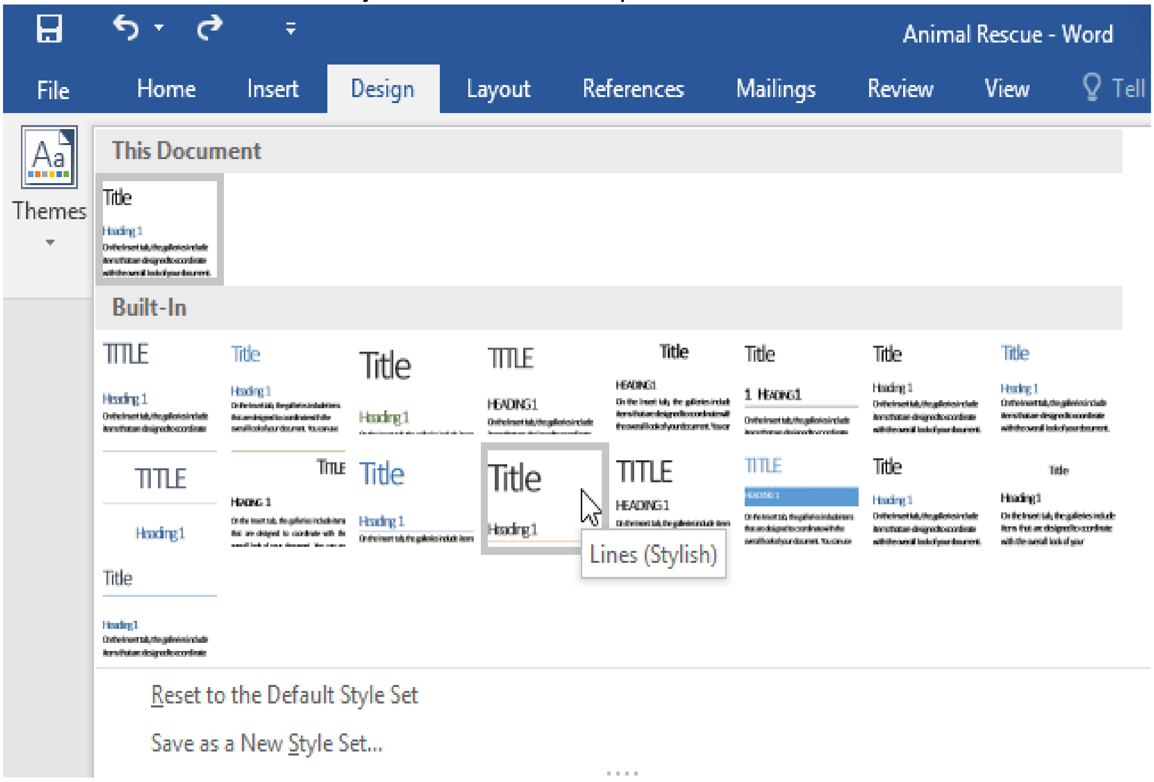

4. The text will appear in the selected style.


To apply a style set:

**Style sets** include a combination of title, heading, and paragraph styles. Style sets allow you to **format all elements** in your document at once instead of modifying each element separately.

1. From the **Design** tab, click the **More** drop-down arrow in the **Document Formatting** group.

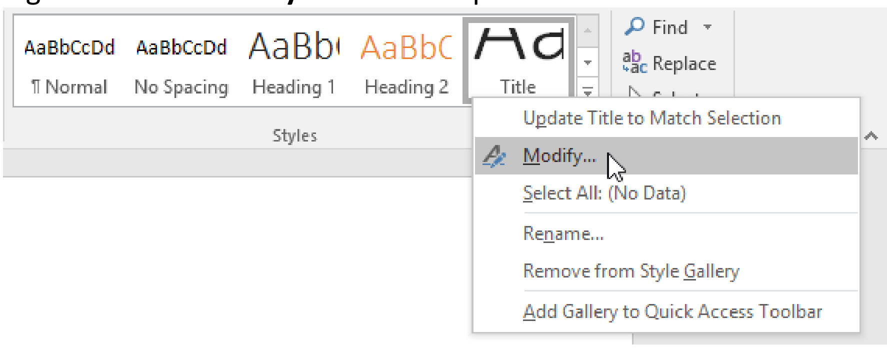

2. Choose the **desired style set** from the drop-down menu.



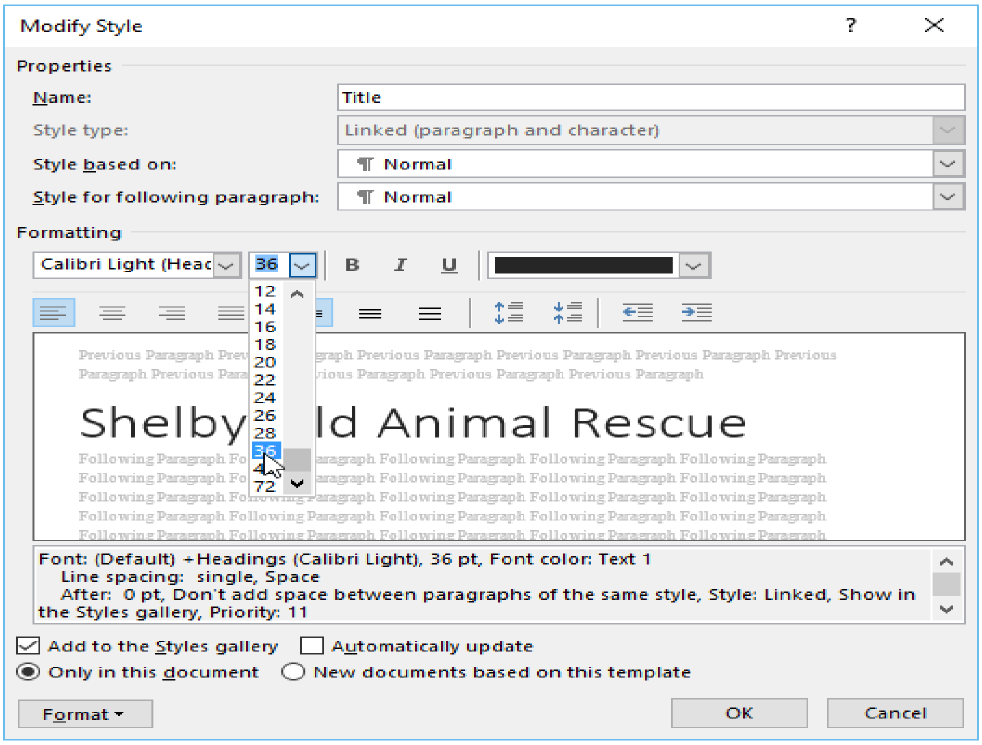

3. The selected style set will be applied to your entire document.


To modify a style:

1. In the **Styles** group on the **Home** tab, right-click the **style** you want to change and select **Modify** from the drop-down menu.

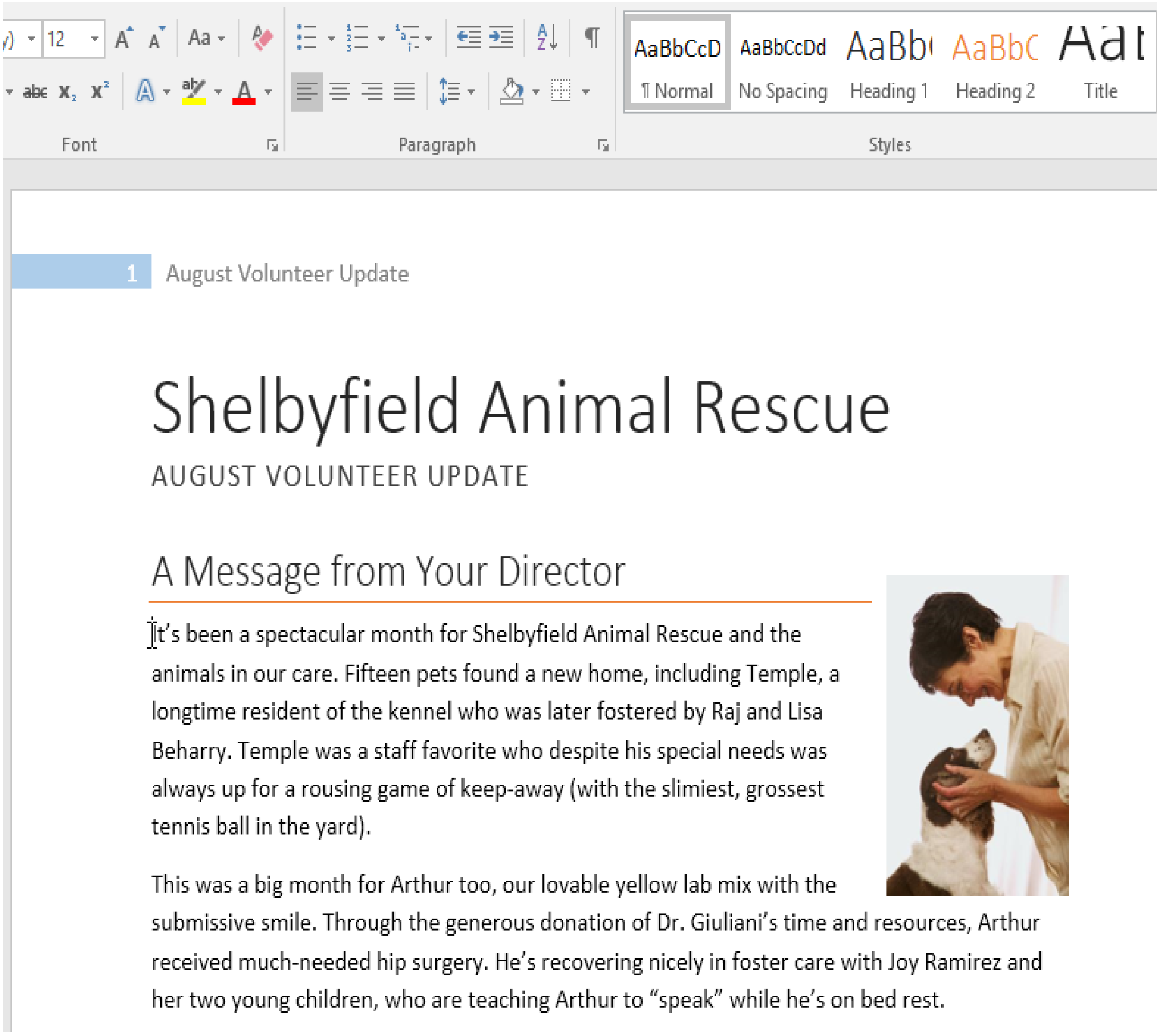



2. A dialog box will appear. Make the **desired formatting changes**, such as font style, size, and color. If you want, you can also change the **name** of the style. Click **OK** to save your changes.



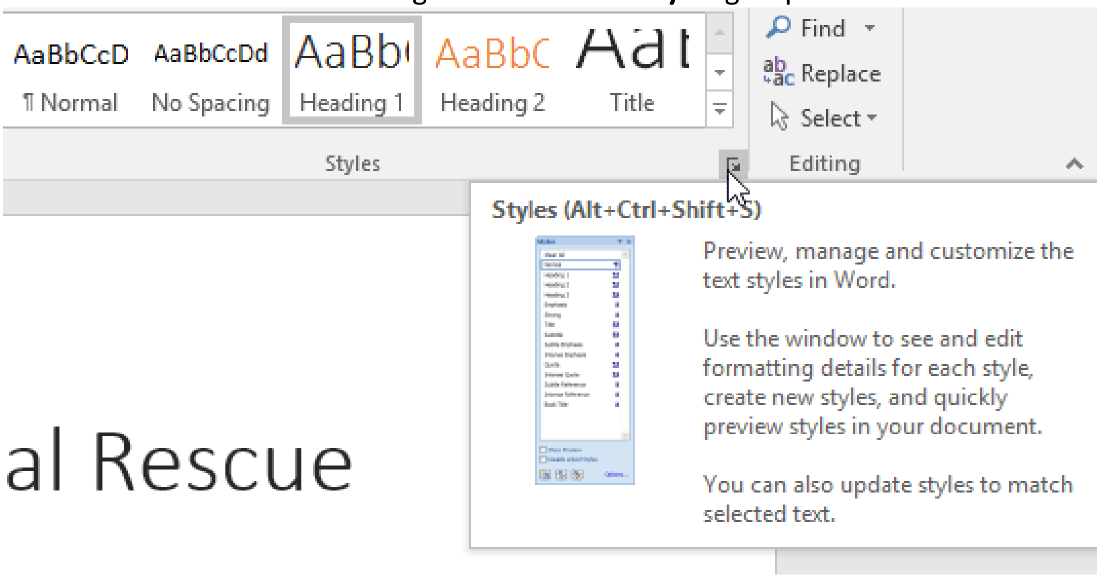

3. The style will be modified.


When you modify a style, you're changing **every instance** of that style in the document. In the example below, we've modified the **Normal** style to use a larger font size. Because both paragraphs use the Normal style, they've been updated automatically to use the new size.

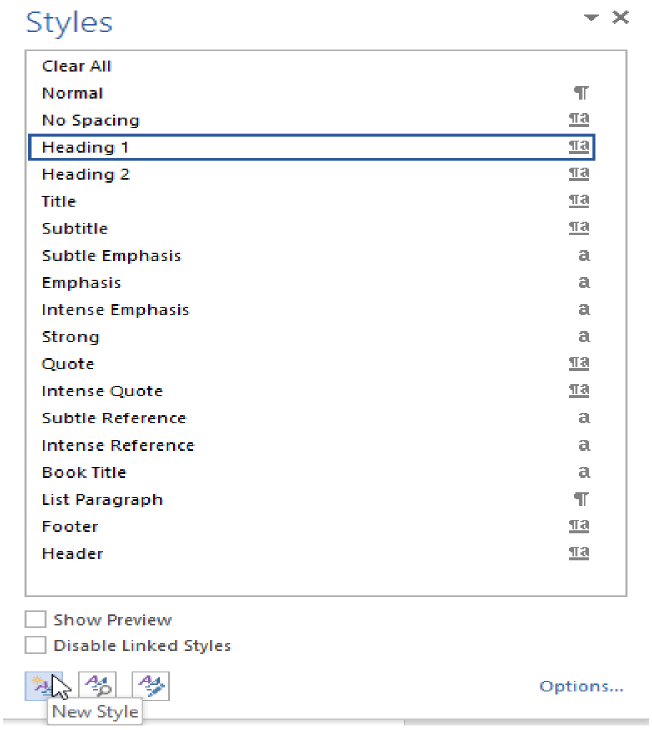



To create a new style:

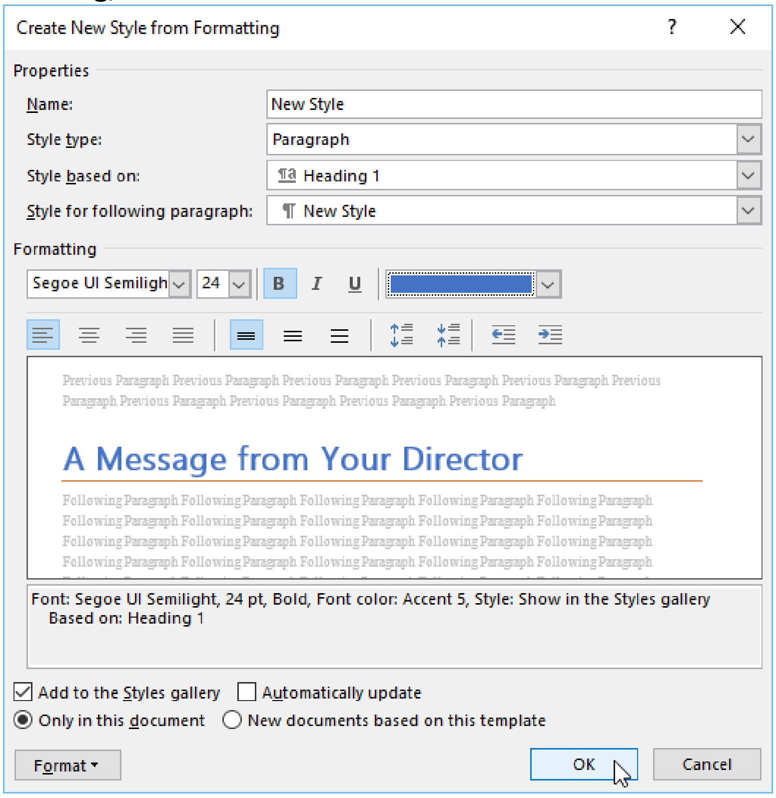
1. Click the **arrow** in the bottom-right corner of the **Styles** group.



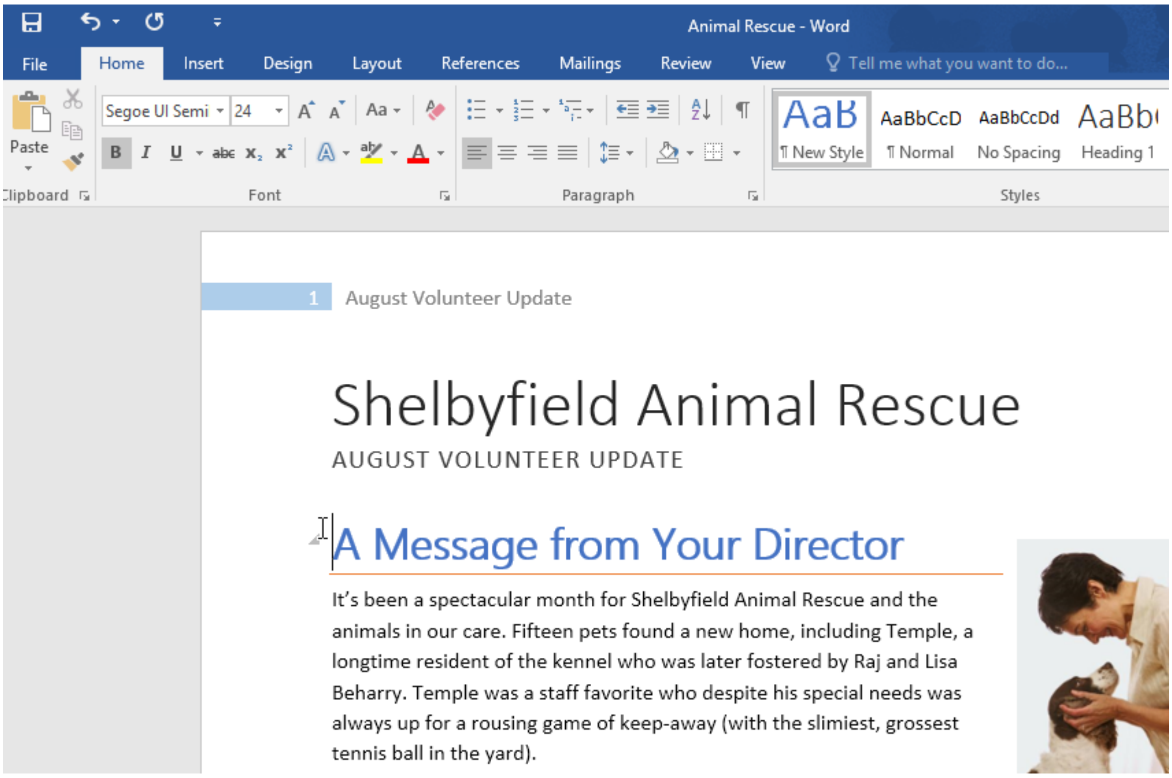

2. The **Styles** task pane will appear. Select the **New Style** button at the bottom of the task pane.




3. A dialog box will appear. Enter a **name** for the style, choose the **desired text formatting**, then click **OK**.




4. The new style will be applied to the currently selected text. It will also appear in the **Styles** group.



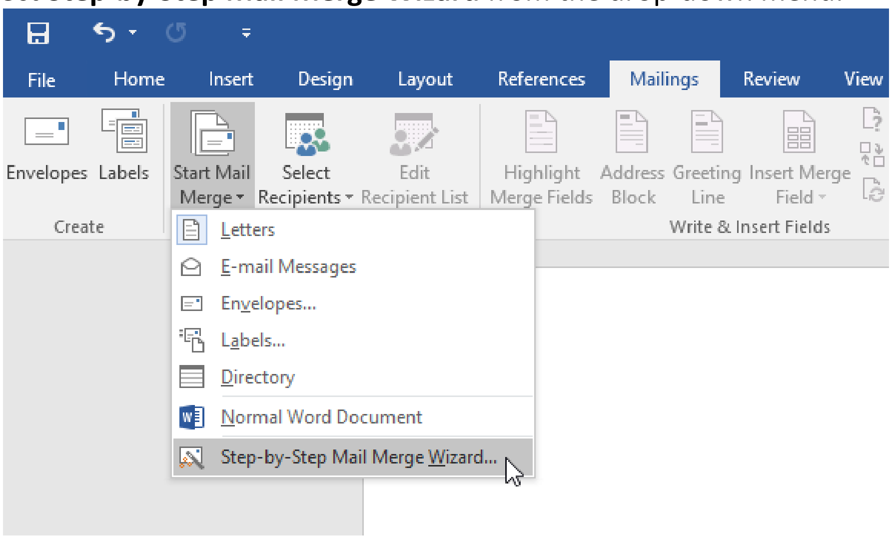

You can also use styles to create a table of contents for your document. To learn how, review our article on How to Create a Table of Contents in Microsoft Word.

Mail Merge

Mail Merge is a useful tool that allows you to produce multiple letters, labels, envelopes, name tags, and more using information stored in a list, database, or spreadsheet. When performing a Mail Merge, you will need a Word document (you can start with an existing one or create a new one) and a recipient list, which is typically an Excel workbook.

To use Mail Merge:

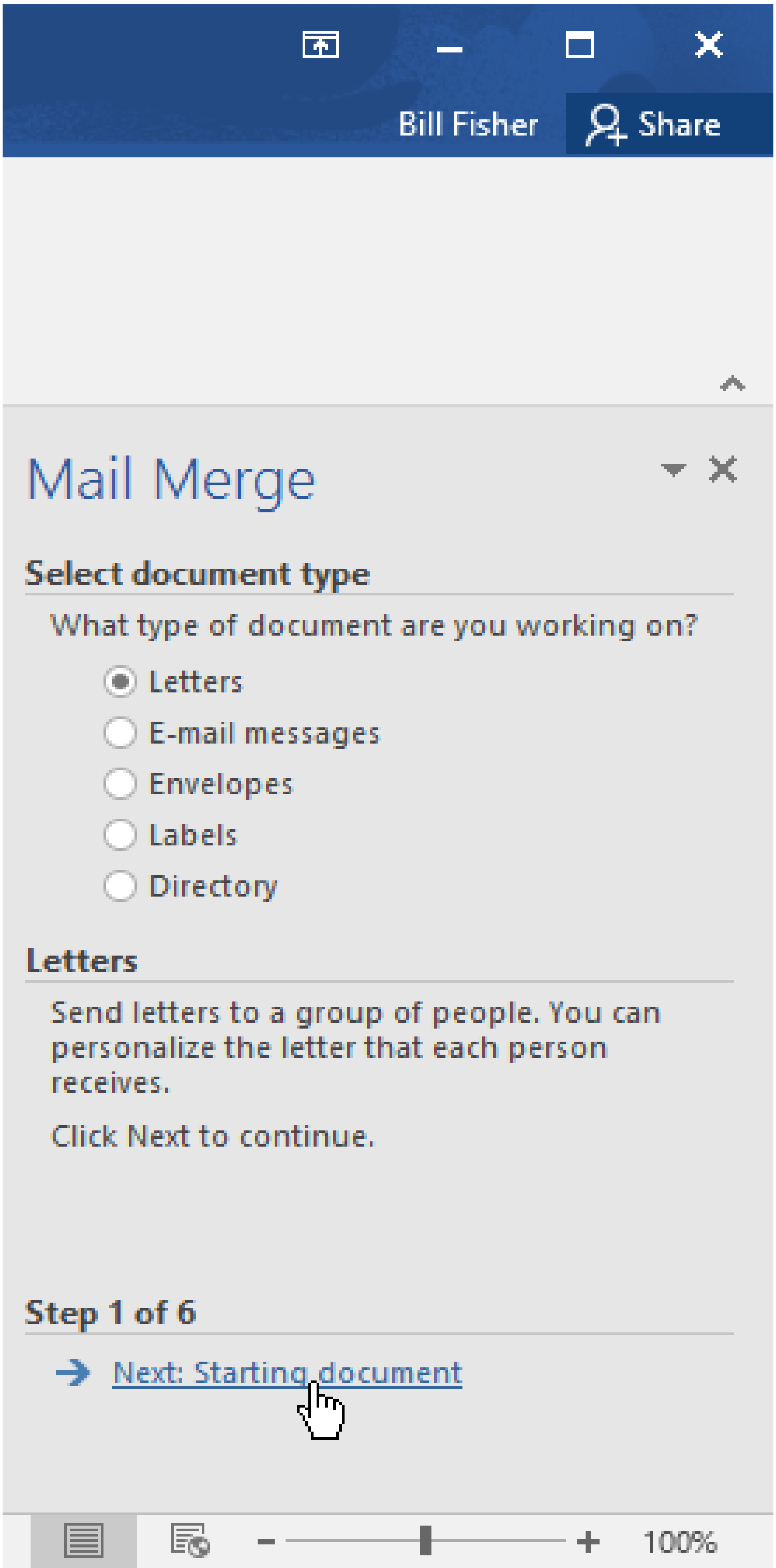
1. Open an **existing** Word document, or create a **new** one.
2. From the **Mailings** tab, click the **Start Mail Merge** command and select **Step-by-Step Mail Merge Wizard** from the drop-down menu.



The Mail Merge pane will appear and guide you through the **six main steps** to complete a merge. The following example demonstrates how to create a form letter and merge the letter with a **recipient list**.

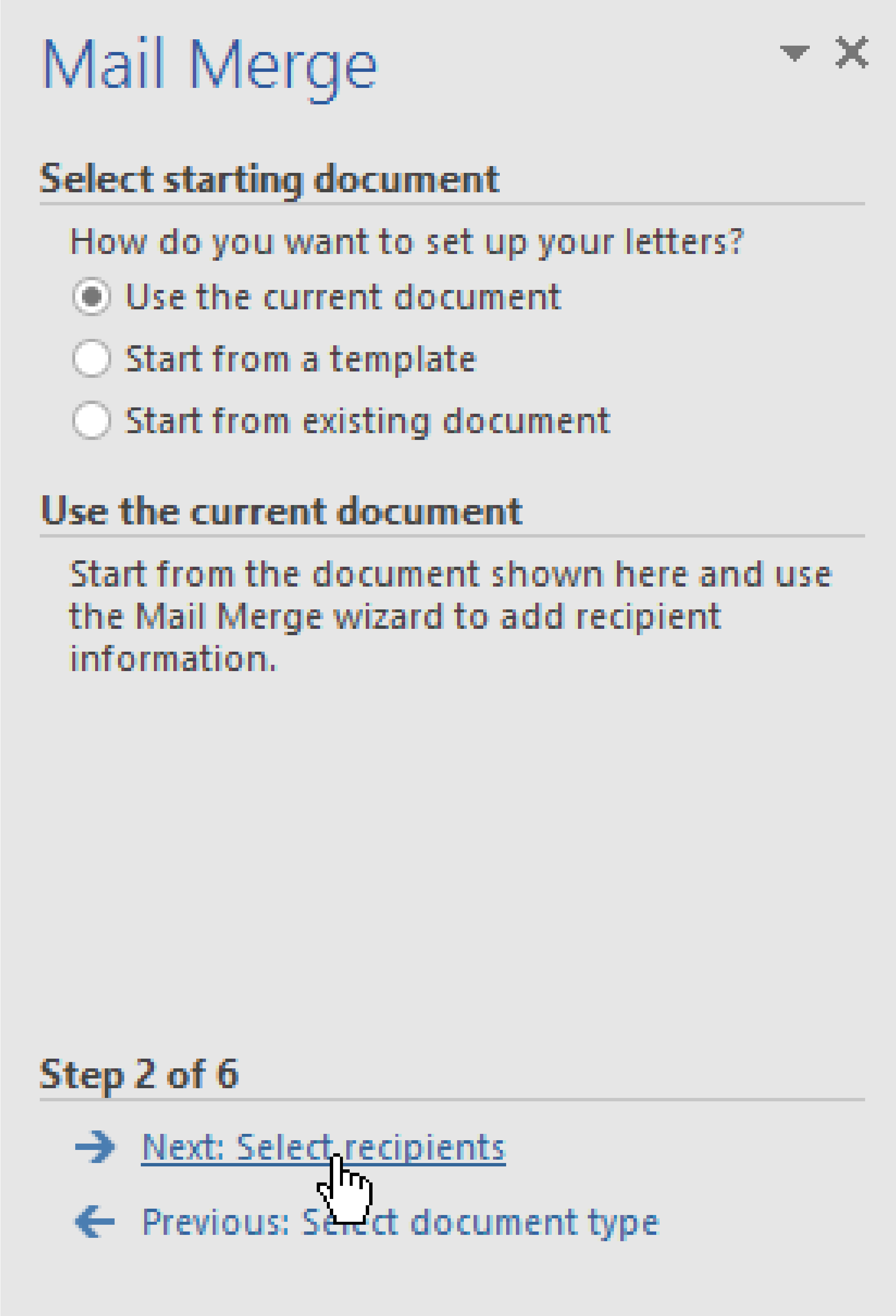
Step 1:

- From the Mail Merge task pane on the right side of the Word window, choose the **type** of document you want to create. In our example, we'll select **Letters**. Then click **Next: Starting document** to move to Step 2.


Bill Fisher
Share
Mail Merge
Select document type
What type of document are you working on?
Letters
E-mail messages
Envelopes
Labels
Directory
Letters
Send letters to a group of people. You can personalize the letter that each person receives.
Click Next to continue.
Step 1 of 6
Next: Starting document
100%

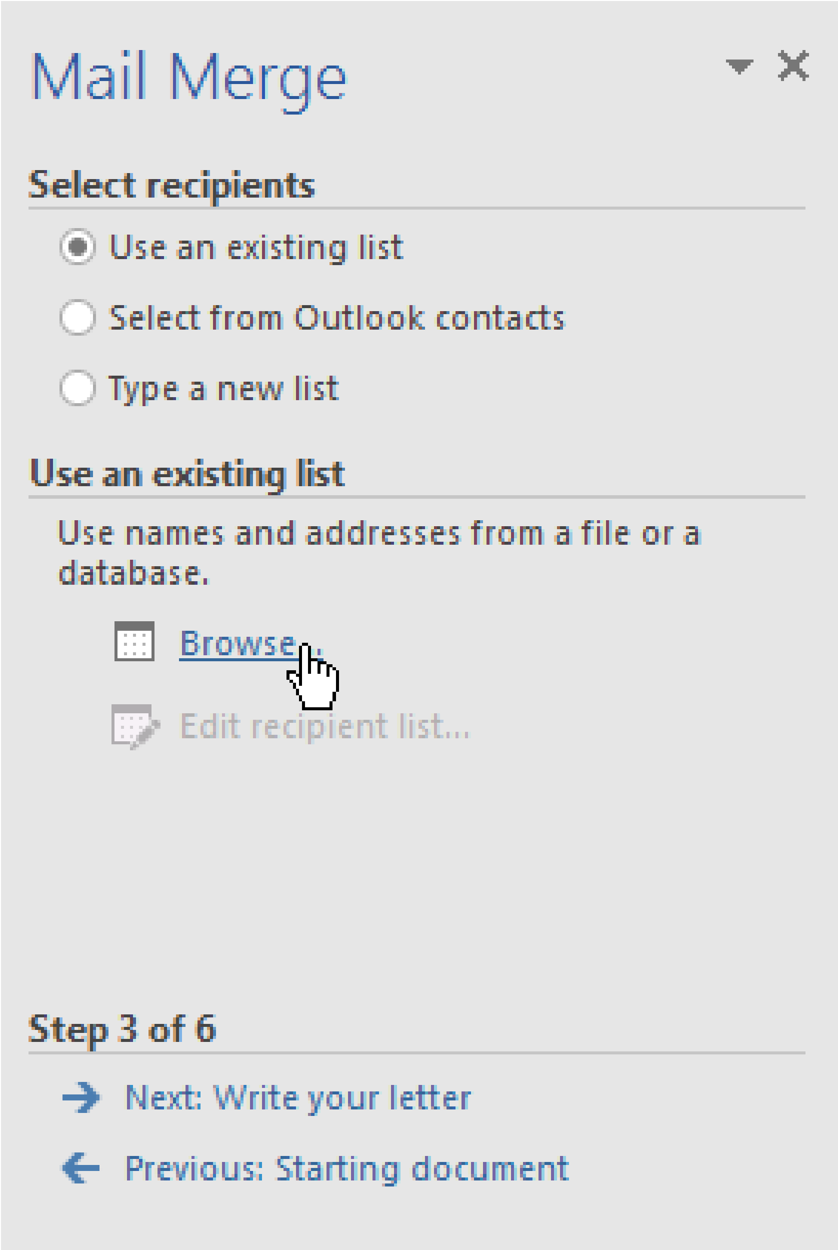
Step 2:

- Select **Use the current document**, then click **Next: Select recipients** to move to Step 3.

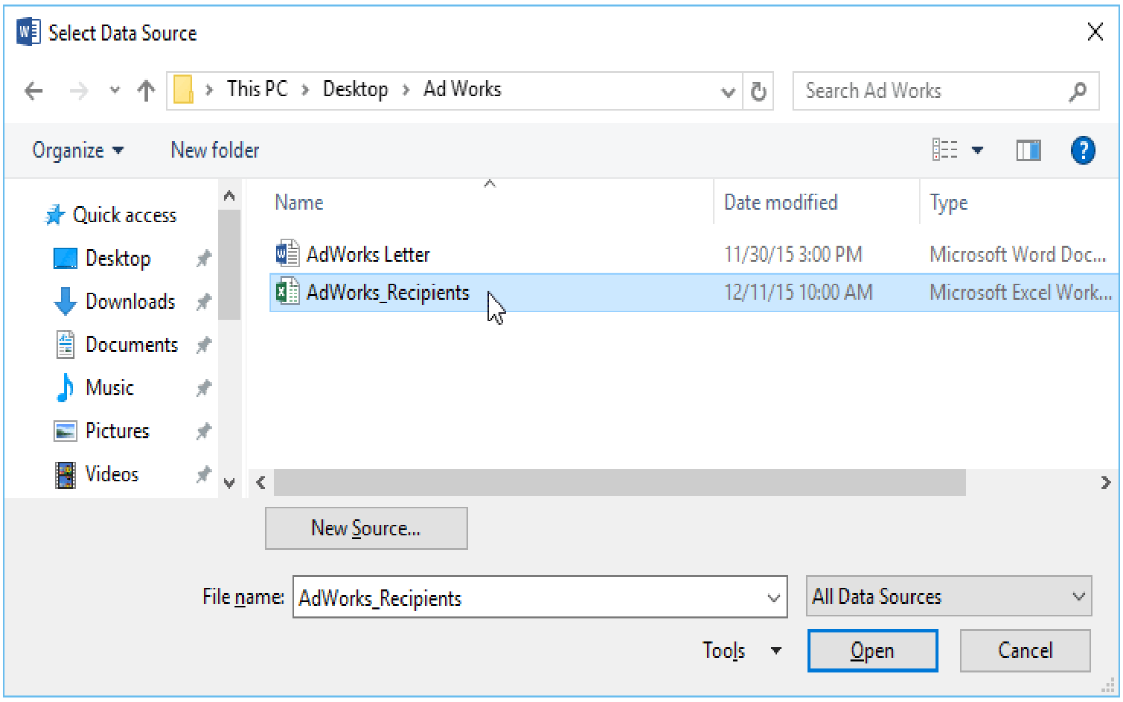



Step 3:
Now you'll need an address list so Word can automatically place each address into the document. The list can be in an existing file, such as an **Excel workbook**, or you can **type a new address list** from within the Mail Merge Wizard.

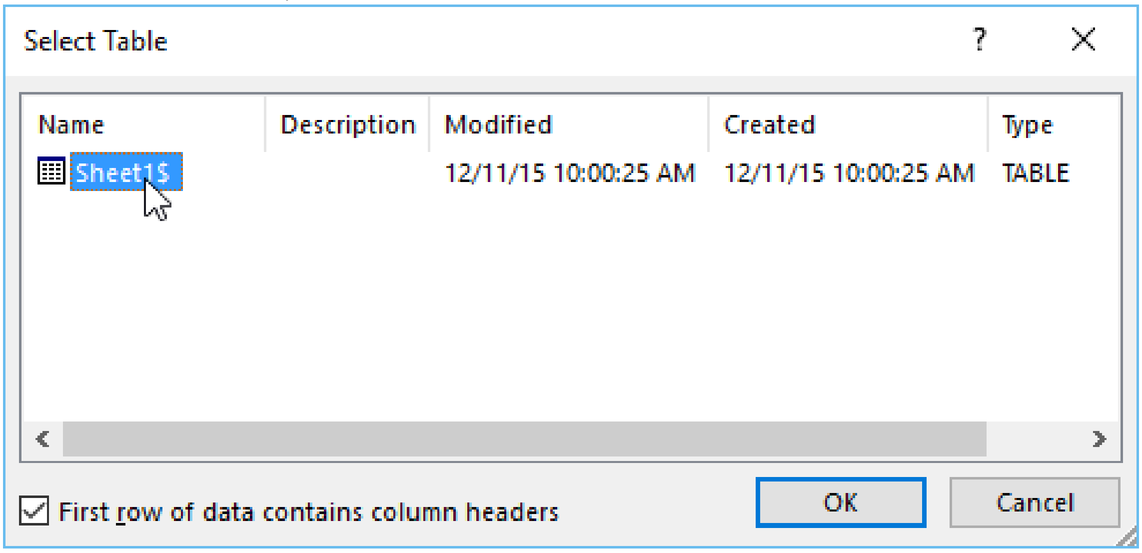
1. Select **Use an existing list**, then click **Browse** to select the file.



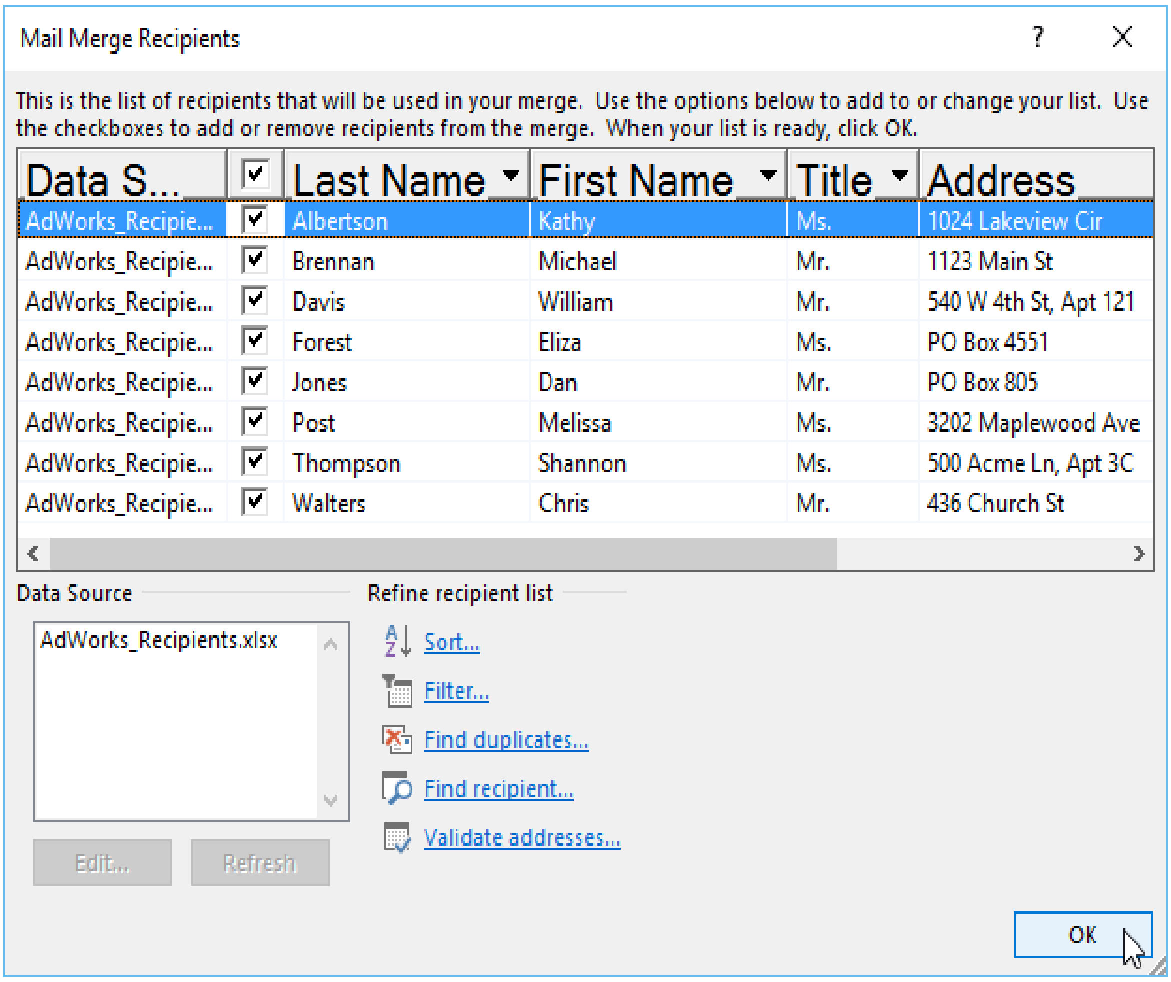

2. Locate your file, then click **Open**.



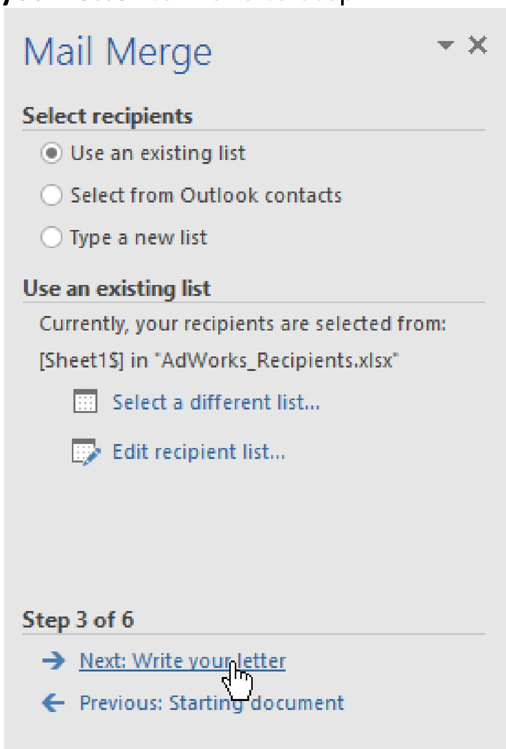

3. If the address list is in an Excel workbook, select the **worksheet** that contains the list, then click **OK**.




4. In the **Mail Merge Recipients** dialog box, you can **check** or **uncheck** each box to control which recipients are included in the merge. By default, all recipients should be selected. When you're done, click **OK**.




5. Click **Next: Write your letter** to move to Step 4.

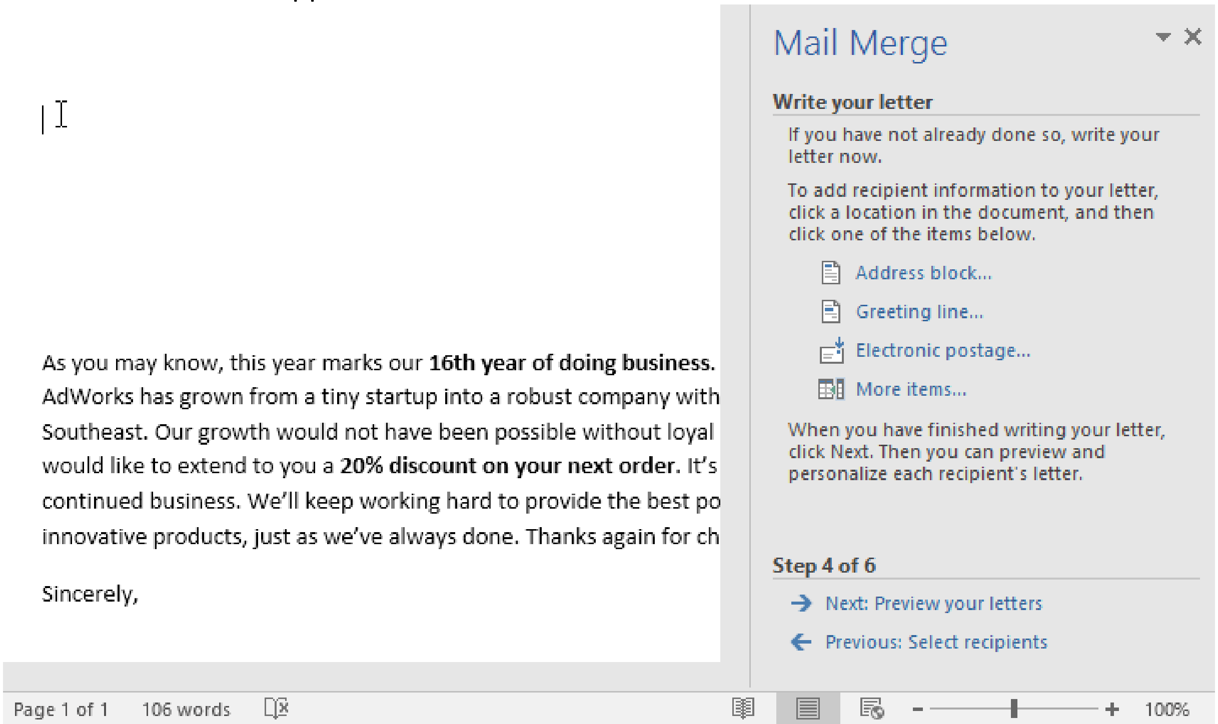



If you don't have an existing address list, you can click the **Type a new list** button and click **Create**, then type your address list manually.

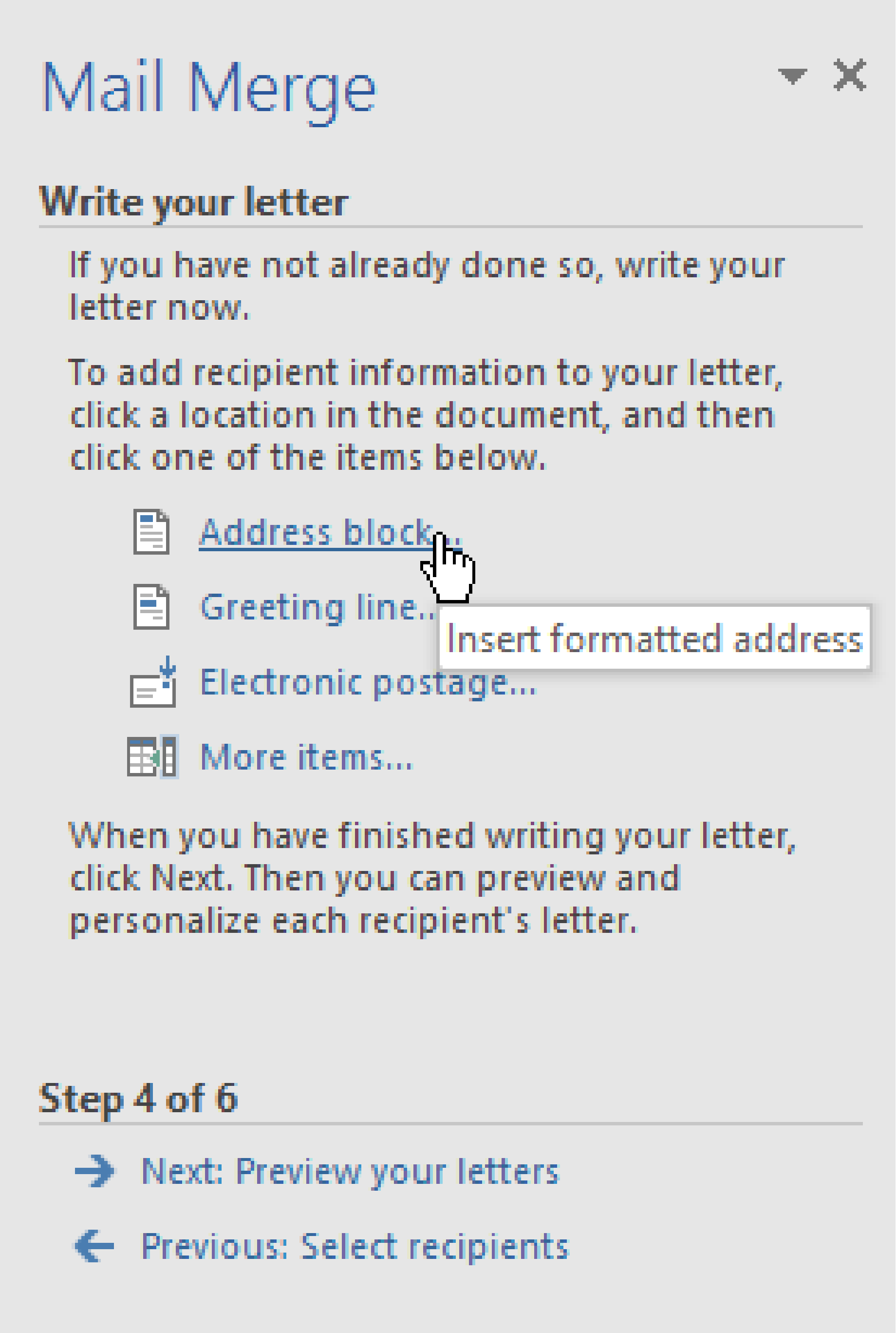
Step 4:
Now you're ready to write your letter. When it's printed, each copy of the letter will basically be the same; only the **recipient data** (such as the **name** and **address**) will be different. You'll need to add **placeholders** for the recipient data so Mail Merge knows exactly where to add the data.

To insert recipient data:

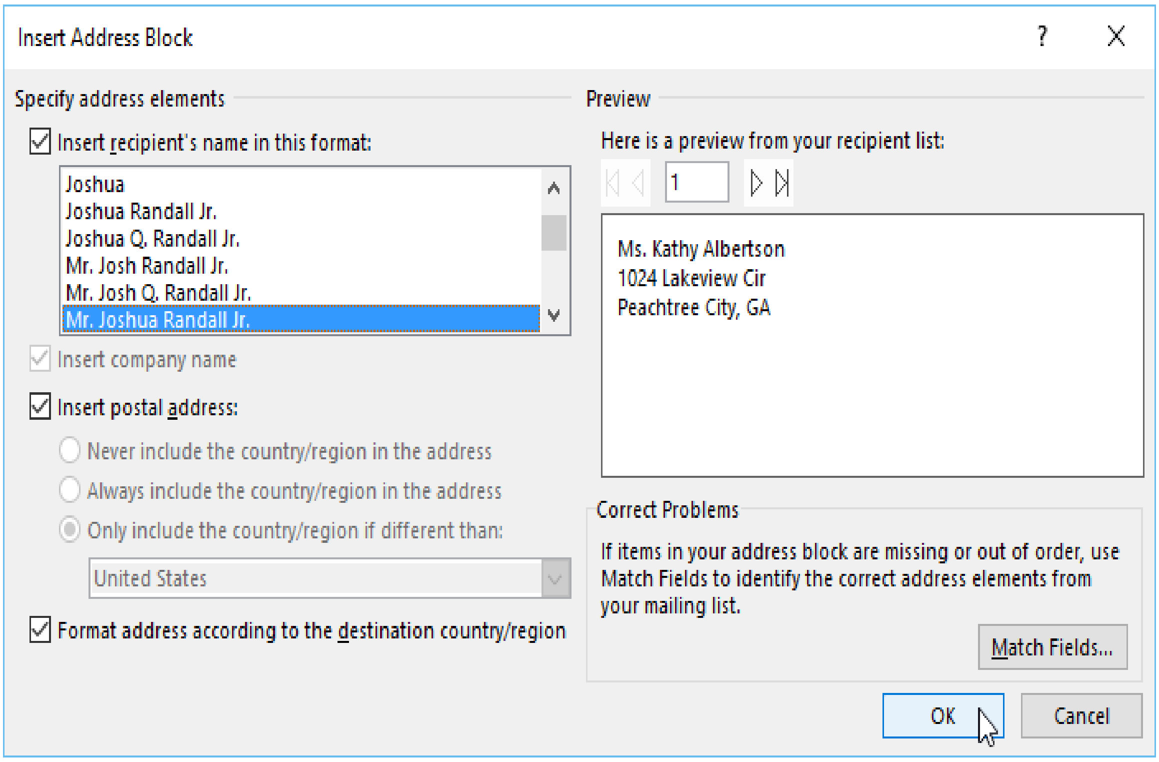
1. Place the insertion point in the document where you want the information to appear.



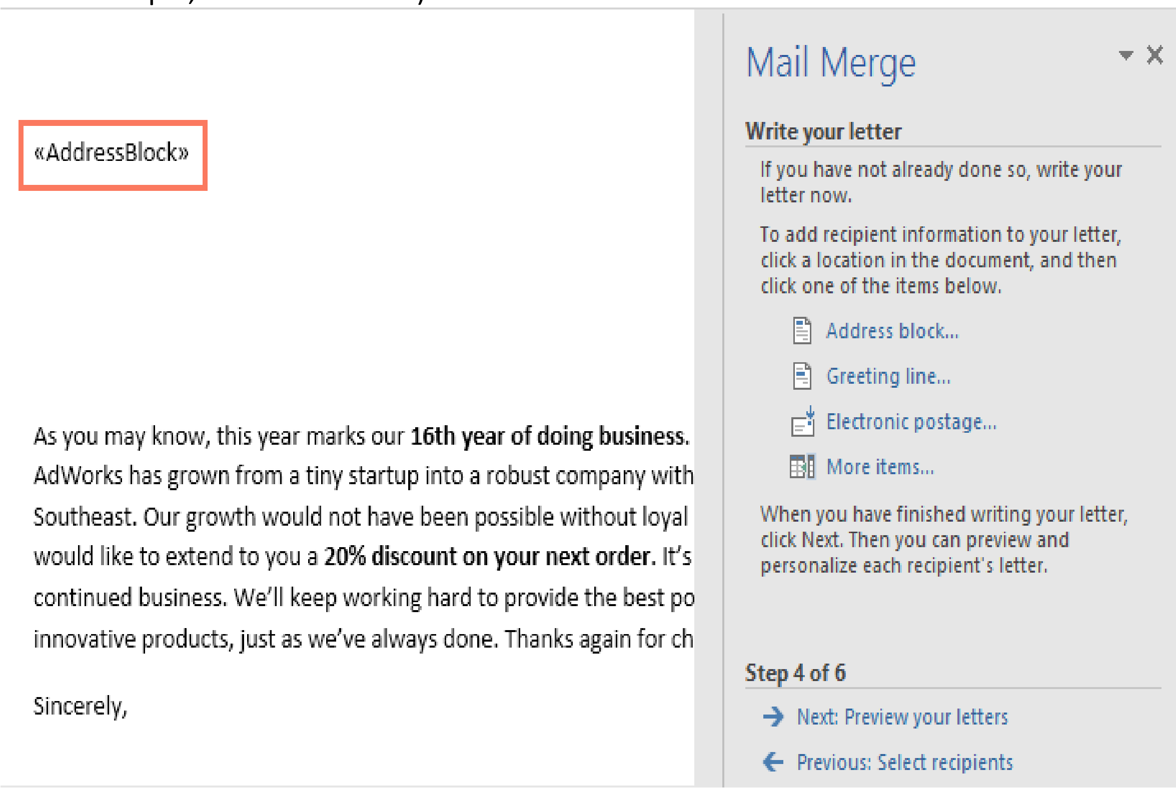

2. Choose one of the **placeholder** options. In our example, we'll select **Address block**.



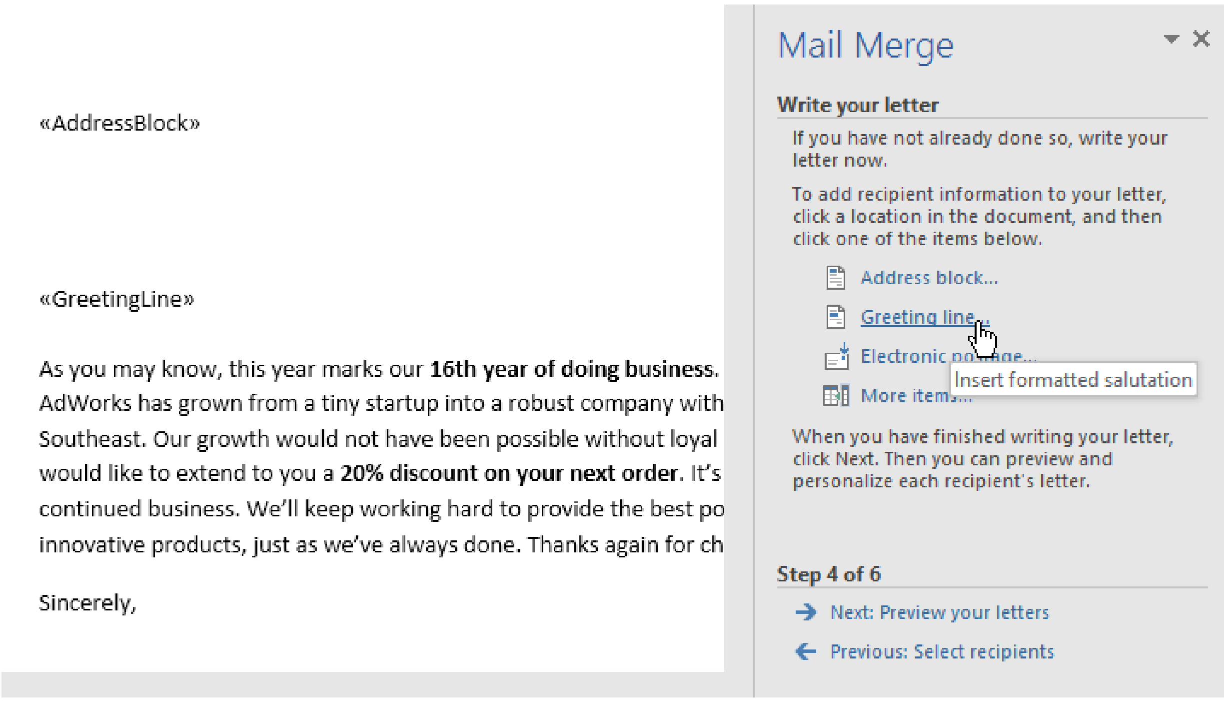

3. Depending on your selection, a dialog box may appear with various customization options. Select the desired options, then click **OK**.



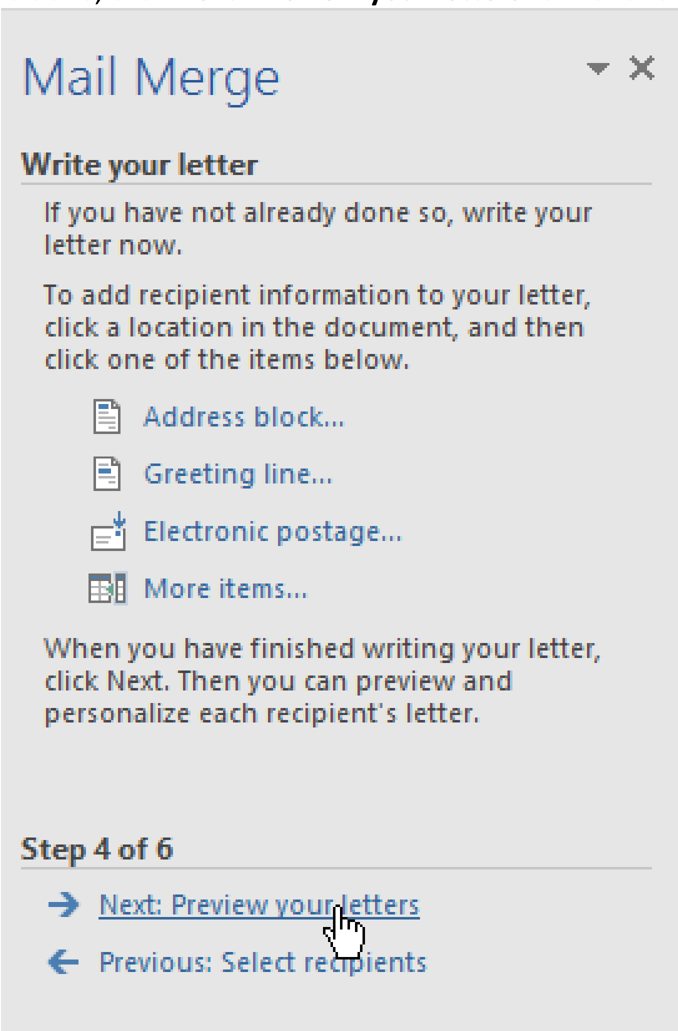

4. A placeholder will appear in your document (for example, **«AddressBlock»**).




5. Add any other placeholders you want. In our example, we'll add a **Greeting line** placeholder just above the body of the letter.




6. When you're done, click **Next: Preview your letters** to move to Step 5.

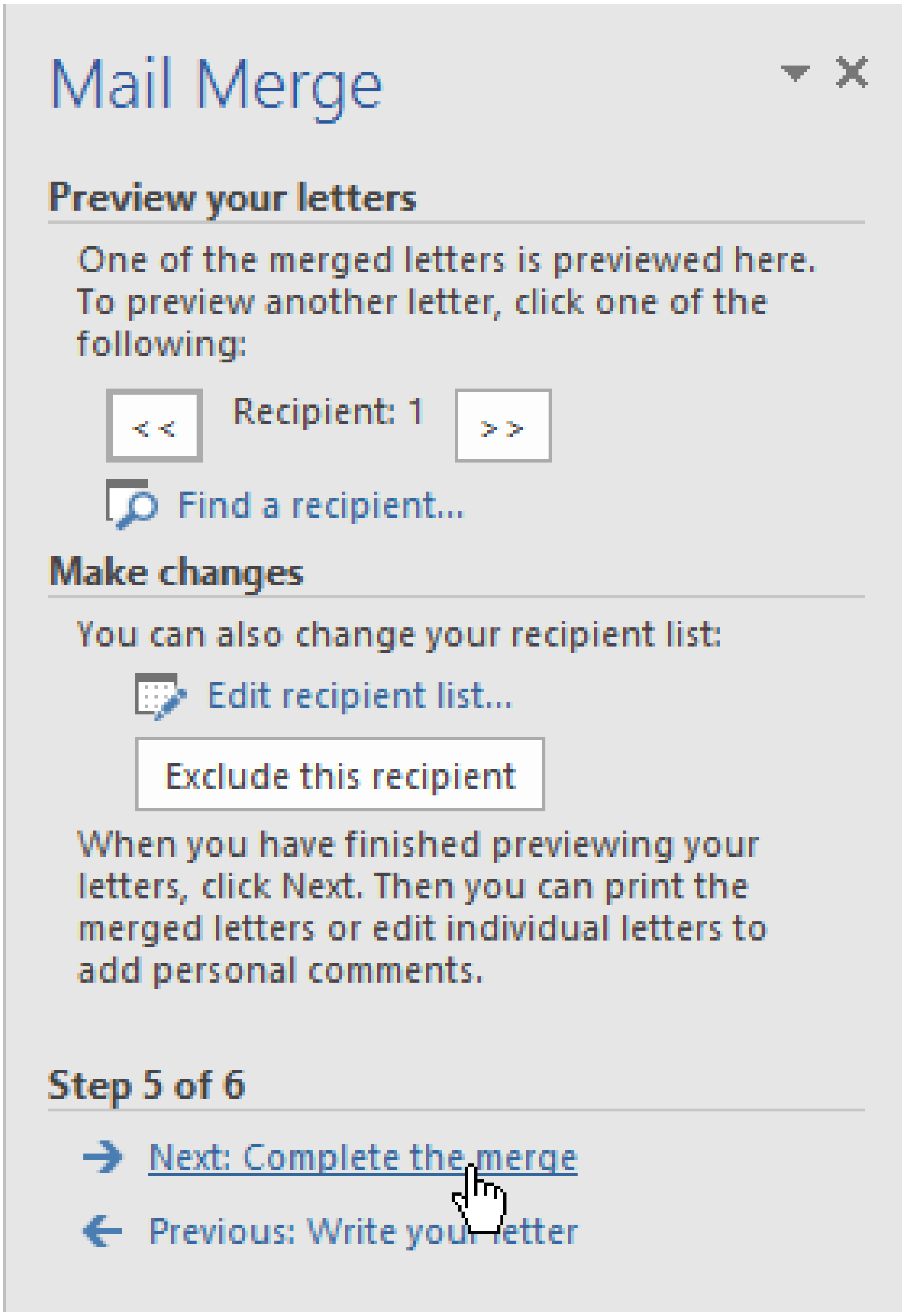


For some letters, you'll only need to add an **Address block** and **Greeting line**. But you can also add more placeholders (such as recipients' names or addresses) in the body of the letter to personalize it even further.

Step 5:

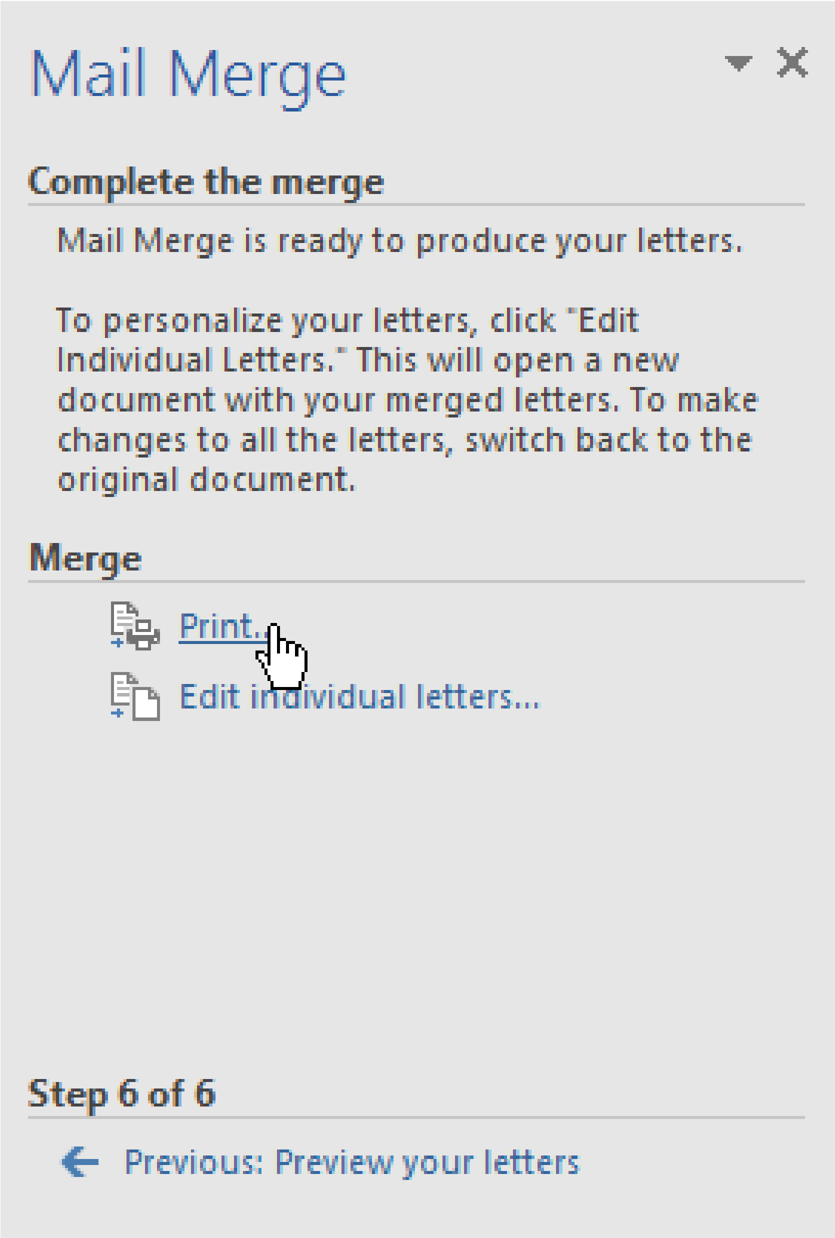
1. Preview the letters to make sure the information from the recipient list appears correctly in the letter. You can use the left and right scroll arrows to view each version of the document.


2. If everything looks correct, click **Next: Complete the merge** to move to Step 6.

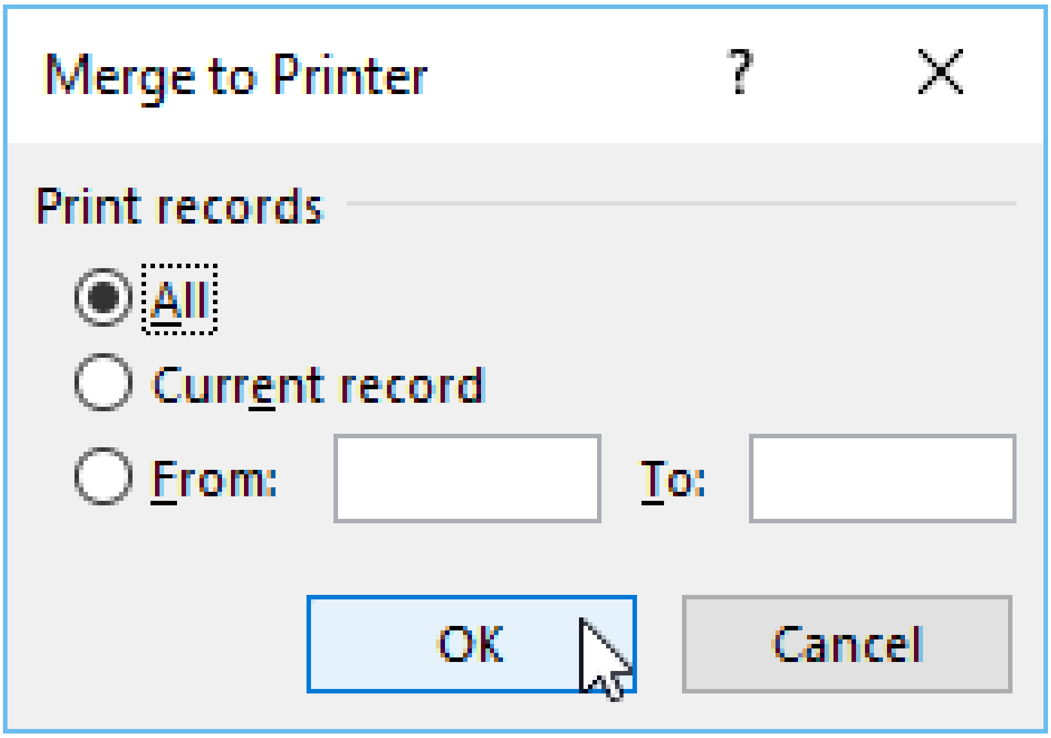



Step 6:

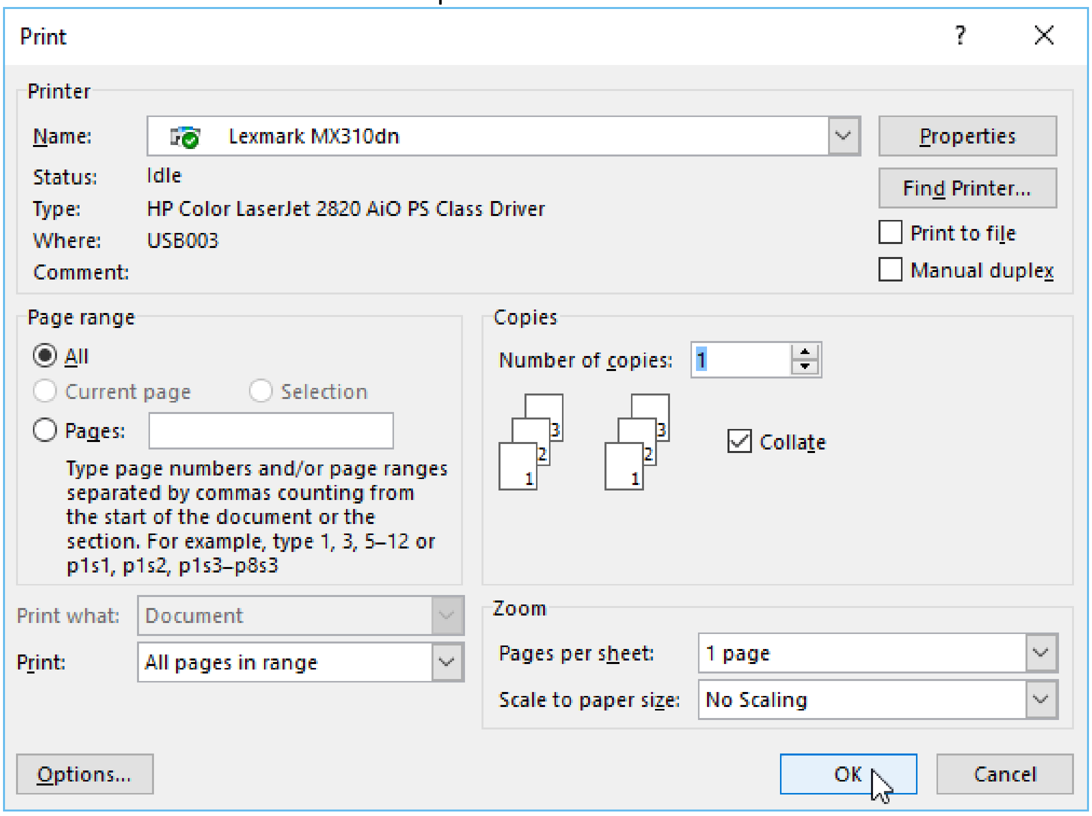
1. Click **Print** to print the letters.




2. A dialog box will appear. Decide if you want to print **All** of the letters, the current document (record), or only a select group, then click **OK**. In our example, we'll print all of the letters.




3. The **Print** dialog box will appear. Adjust the print settings if needed, then click **OK**. The letters will be printed.



# MODULE 3: MICROSOFT EXCEL (BASIC TO ADVANCE)

**EXCEL BASICS**

## Lesson 1 – Getting Started with Excel

**Overview:**

Excel is a spreadsheet program that allows you to store, organize, and analyze information. Microsoft Excel is one of the most used software applications of all time. Hundreds of millions of people around the world use Microsoft Excel. You can use Excel to enter all sorts of data and perform financial, mathematical or statistical calculations.

Microsoft Excel is an office use application designed by Microsoft. It comes with Office Suite with several other Microsoft applications, such as Word, PowerPoint, Access, Outlook, and OneNote, etc. It is supported in Windows as well as Mac operating system too.

Microsoft Excel is one of the most suitable spreadsheet programs that help us to store and represent the data in tabular form, manage and manipulate data, create optically logical charts, and more. Excel provides you the worksheet to create a new document in it. You can save the Excel file with **.xls** extension.

**Exploring the excel 2016 environment**

**Open** Excel by using the **Start** menu or by **double-clicking** the Desktop icon for Excel 2016.

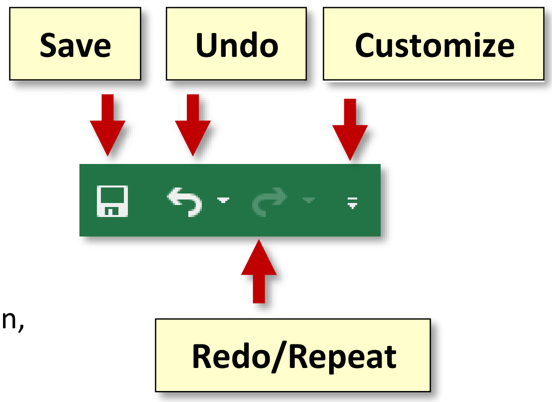
### Title Bar

1. **Note** the Title Bar section which has **window controls** at the right end, as in other Microsoft Officeprograms.
2. **Note** that a blank workbook opens with a default file name of **Book1**.

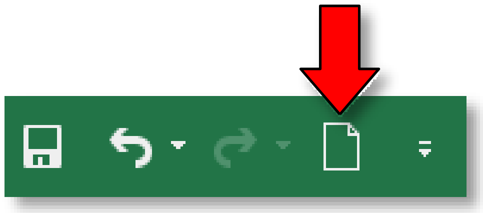
### Quick Access Toolbar

The **Quick Access Toolbar** is located all the way to the lefton the Title Bar. It contains frequently used commands and can be customized using the drop-down menu.

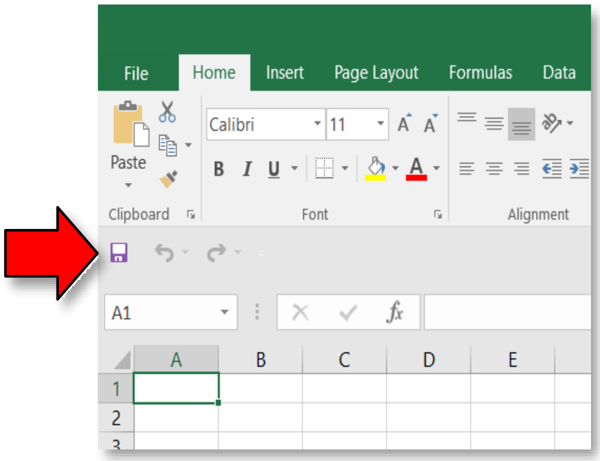
1. **Point** to each small icon to view its ScreenTip.
2. **Be aware** that the **Undo** and **Repeat** buttons commands are not located anywhere else in the application except for on the Quick Access Toolbar.
3. **Click** the **Customize Quick Access Toolbar** button,



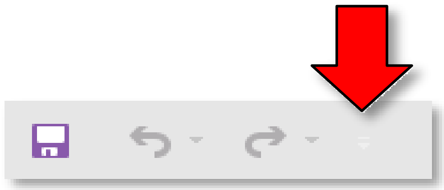
**Check New** on the menu. **Notice** how a **new button** has appeared.



4. **Click** the **Customize Quick Access Toolbar** button again and **select Show below the Ribbon**. Thisrepositions the toolbar to be **below** the ribbon.




5. **Note** that when the toolbar is below the ribbon, its customize button is **very difficult to see**, due toits white color.



6. **Move** the Quick Access Toolbar back above the ribbon by **clicking** the **customize** button and **selecting Show above the Ribbon**.

## Ribbon

The ribbon contains all of the tools that you use to interact with yourMicrosoft Excel file. It is located at the top of the window. All of theprograms in the Microsoft Office suite have one.

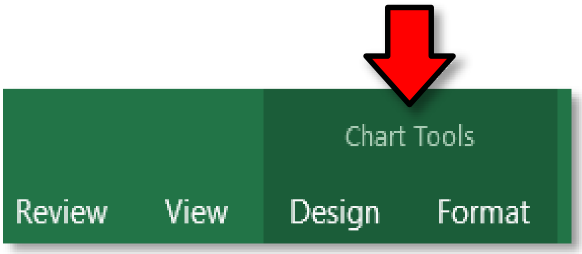
The ribbon has a number of **tabs**, each of which contains **buttons**, which are organized into **groups**. **Try clicking** on other tabs to **view** their buttons (do not click the File tab yet), and then **return** to Hometab.

## Active Tab

By default, Excel will open with the **Home** tab active on the Ribbon. **Note** how the Active tab has awhite background, and the Inactive tabs have the opposite.

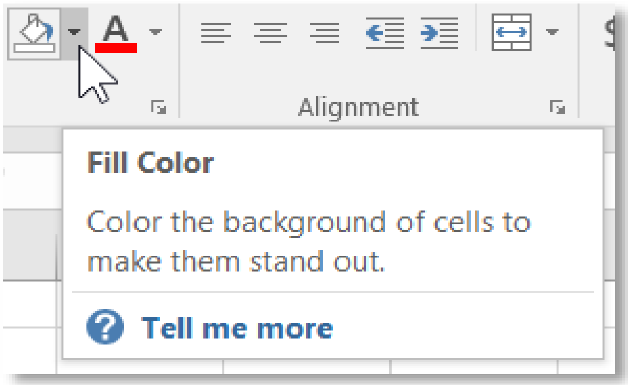

## Contextual Tabs

Contextual tabs are displayed when certain objects, such as an images and charts, are selected. They contain additional options for modifying the object. Contextual tabs stand out because they are darkerin color and are located to the right of all the other tabs. As soon as we start being productive in the program, we will see contextual tabs appear.




## Groups and Buttons

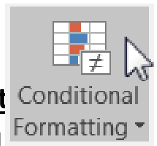
On each tab, the **buttons** (a.k.a. commands or tools) are organized into **Groups**. The groups havenames, but the names are not clickable.
**Hover** over some active buttons on the Home tab to **observe** **ScreenTips**. The ScreenTips display thename of the button, along with a short description of what the button does.



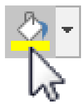
## Buttons with Arrows

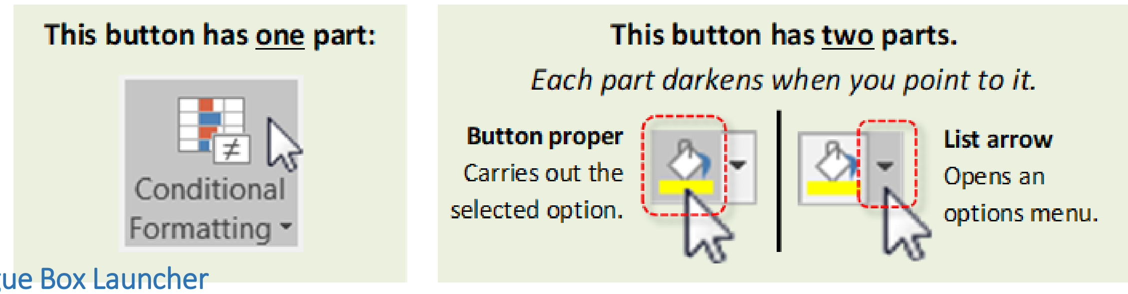
**Note** that some buttons have images on them and some have images *and an arrow*. The arrow indicates that more information is needed to carry out the function of the button. Some arrowedbuttons have two parts: the button proper and the list arrow.

- A **one-part arrowed button**, called a **menu button**, will darken completely when you point toit:
    1. In the **Styles group**, **point** to the **Conditional Formatting** button.
    2. **Note** there is no difference in shading between the left and right of thebutton when you point to each section.




- On a **two-part arrowed butt** **split button**, only one section at a time will darkenwhen you
    1. In the **Font group**, **point** to the left part of the **Fill Color** button. This is the“**button proper**” section of the button. **Note** how it is darkened separately from the arrow portion of the button.
    2. **Point** to the **right portion**, the section with the arrow. This is the “**list arrow**”section of the button. **Note** how it is darkened separately from the left portion.
    3. The **button proper** is the section of a two-part button that will carry out the defaultoption or the last used option.
    4. The **list arrow** section will open an options menu.






## Dialogue Box Launcher

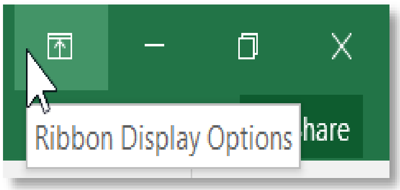
On some groups there is a La her button which will open a **dialogue box or side panel** with relatedbut less common commands.

**Click** a launcher button, and then **close** the dialogue box.

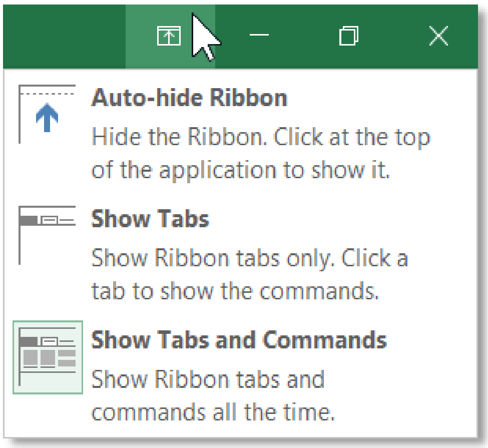
## Ribbon Display Options button

This button provides options that will hide the ribbon from view. The main benefit to this is that itallows your spreadsheet to take up more of the screen.

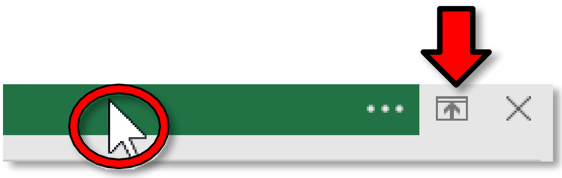
1. **Locate** the **Ribbon Display Options** button (to the left of the window control buttons).



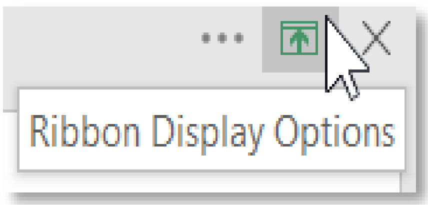

2. **Click** on it. Three options appear.




3. **Click Auto-hide Ribbon**. This option essentially makes Excel go into "full screen" mode. It hidesnot only the ribbon, but also the Quick Access Toolbar, title bar, and Window Controls.
4. To get the ribbon to **show** after Auto-hiding it:
   a. **Point** to the **top-center** of the screen and **click**. (Clicking the three dots does the samething.) The full ribbon can be seen and used. However, as as soon as the body of the spreadsheet is clicked it will hide again.



   b. **Click** in the middle of the document. **Notice** how the ribbon **hides** again.
5. To get a partial display of the ribbon to stay in view:
   a. **Click** the "mini" **Ribbon Display Options** button on the top right.




   b. **Click Show Tabs**. **Note** this option has brought back our Quick Access Toolbar, title bar, Window Controls, and *part* of the ribbon; only the **Tabs** are visible. The buttons are not.
   c. **Click** the **Home** tab. **Notice** how the buttons come into view.

d. **Click** in the middle of the spreadsheet. **Notice** how the buttons disappear again.

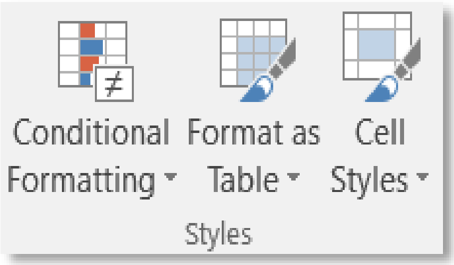
> **Note:** A shortcut for changing to the "Show Tabs" view is to **double-click** the Active Tab. If the buttons in the ribbon suddenly disappear, then you may have done this by accident.

6. To get the entire ribbon to stay in view:
   a. Click Ribbon Display Options
   b. **Click Show Tabs and Commands**. This option keeps **entire** ribbon visible at all times. It isthe **default** option. We will keep this option selected for the remainder of class.

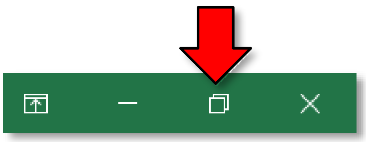
### Dynamic Resizing

If you use Excel on other computers, be aware that the button placement on the Ribbon might look **slightly different**. For instance, a button might be a different size or be positioned in a slightly different place. The reason for this is that the Ribbon auto-adjusts itself based on the size of the Excelwindow.

1. **Notice** what the buttons in the **Styles** group currently look like.




2. **Click** the **Restore Down** button.



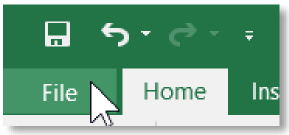
3. **Notice** how the buttons look different now. Rest assured, they are still the same buttons.


4. **Click** the **Maximize** button to bring the window back to full screen.

### File Tab

The File tab provides a **Backstage** view of your document. Backstage view gives you various options forsaving, opening a file, printing, or sharing your document. Instead of just a menu, it is a full-page view which makes it easier to work with.

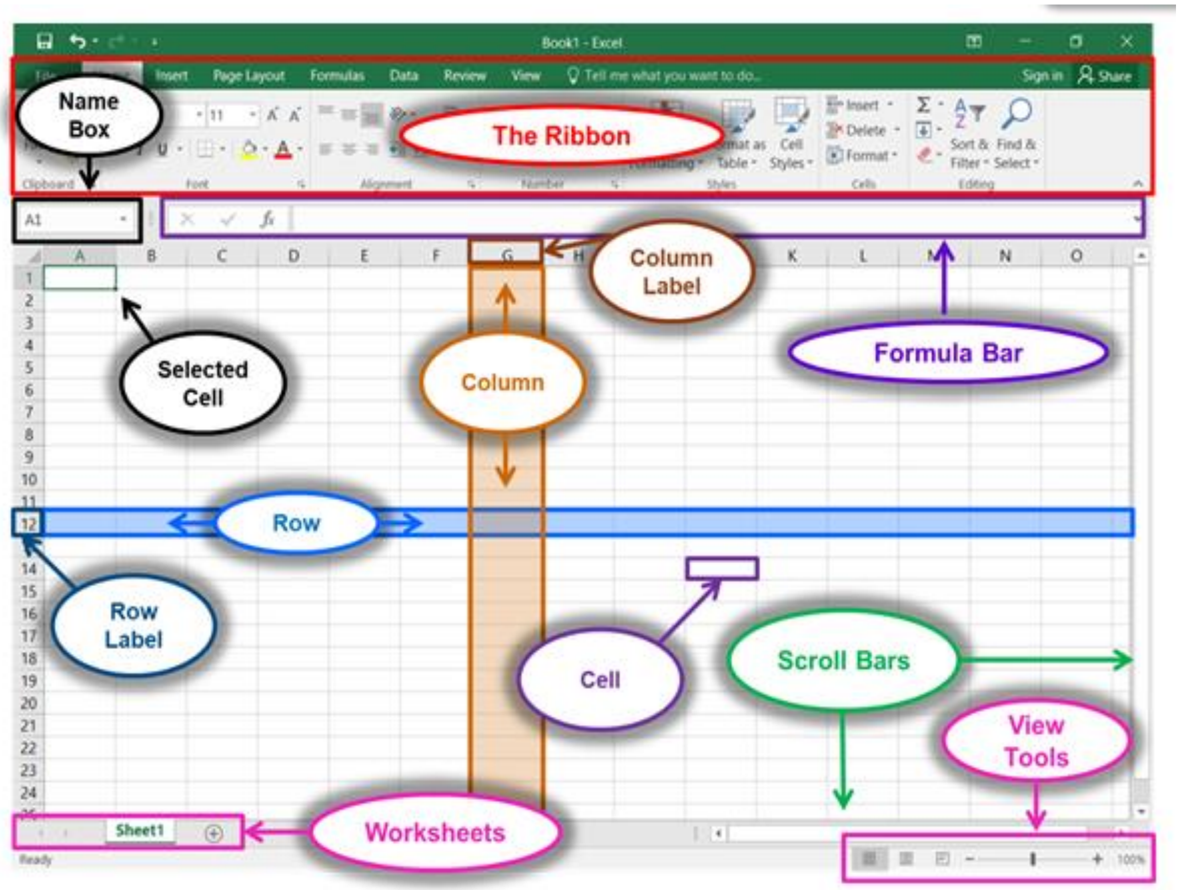
1. **Click** the **File** tab.




2. **Notice** that the Ribbon and the spreadsheet are no longer in view. **Note** the commands on the leftside of the screen that you use to perform actions **TO** a document rather than **IN** a document.
3. Other things you can do in the **Backstage** view:
   a. **Click** the **Info** menu option. The **Info** section of the File tab offers an easy to use interface forinspecting documents for hidden properties or personal information.
   b. **Click** the **New** menu option. In this view you can create a new Blank document, or choose froma large selection of Templates.
   c. **Click** the **Open** menu option. The **Open** pane is used to open existing files on your computer.
      i. It immediately presents you with a list of documents that you have **recently** opened, so you can quickly find and open them again. The computers in the Computer lab have thisfeature turned off for privacy reasons.
      ii. Clicking **OneDrive** allows you to open a file that is stored in OneDrive, which isMicrosoft's internet cloud service.
      iii. Clicking **Browse** opens a File Explorer dialog, which allows you to find the file on yourcomputer. We will be using this option in class.
   d. **Notice** the two "save" menu options: **Save** and **Save As**. There is a difference between thesesettings, which we will explain shortly.
4. To return to the spreadsheet from the backstage view, **click** the large, left pointingarrow in the top-left corner of the screen.

Workspace:

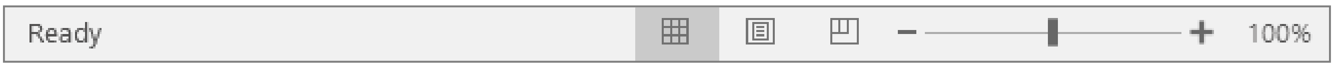
**Open** Excel and locate the parts of the Excel window.




- **Name Box**: Displays the currently selected sell.
- **Formula Bar:** Displays the number, text, or formula that is in the currently selected cell, and allows you to edit it. It behaves just like a text box.
- **Selected Cell:** The selected cell has a dark border around it.
- **Column:** Columns run vertically (top to bottom).
- **Column Label:** Identifies each column with a letter. Clicking on a column label selects the entire column.
- **Row:** Rows run horizontally (left to right).
- **Row Label:** Identifies each row with a number. Clicking on a row label selects the entire row.
- **Cell:** The intersection of a row and column.
- **Worksheets:** The worksheets contained in the workbook are displayed at the bottom-left of the screen. Click on a worksheet to view it.
- **Scroll Bars:** Used to view other parts of a worksheet when the entire worksheet cannot fit on the screen.
- **View Tools:** See Status Bar next

## Status Bar

The status bar is located below the document window area.



**Current Information**

The **left end** gives current information about the spreadsheet.  Excel doesn't have much informationhere.

## Views

At the **right end** are shortcuts to the different **views** that are available. Each view displays thespreadsheet in a different way, allowing you to carry out various tasks more efficiently.

| | |
|---|---|
| **Normal** | This is the view we will be working in throughout this course.  It simply displays the grid of cells that make up your spreadsheet. |
| **Page Layout** | Shows what your spreadsheet will look like when printed on paper. |
| **Page Break Preview** | Allows you to add page breaks to your spreadsheet so you can bettercontrol what parts of the spreadsheet are printed on each page. |

## Zoom Slider

Also at the right end of the Status Bar is the Zoom Slider. This allows you to adjust how large the spreadsheet is displayed on the screen. It does not adjust the actual size of the text—just how big orsmall they are rendered on the screen (like moving a newspaper away from or closer to your eyes).


**Creating an Excel Document and Saving It**

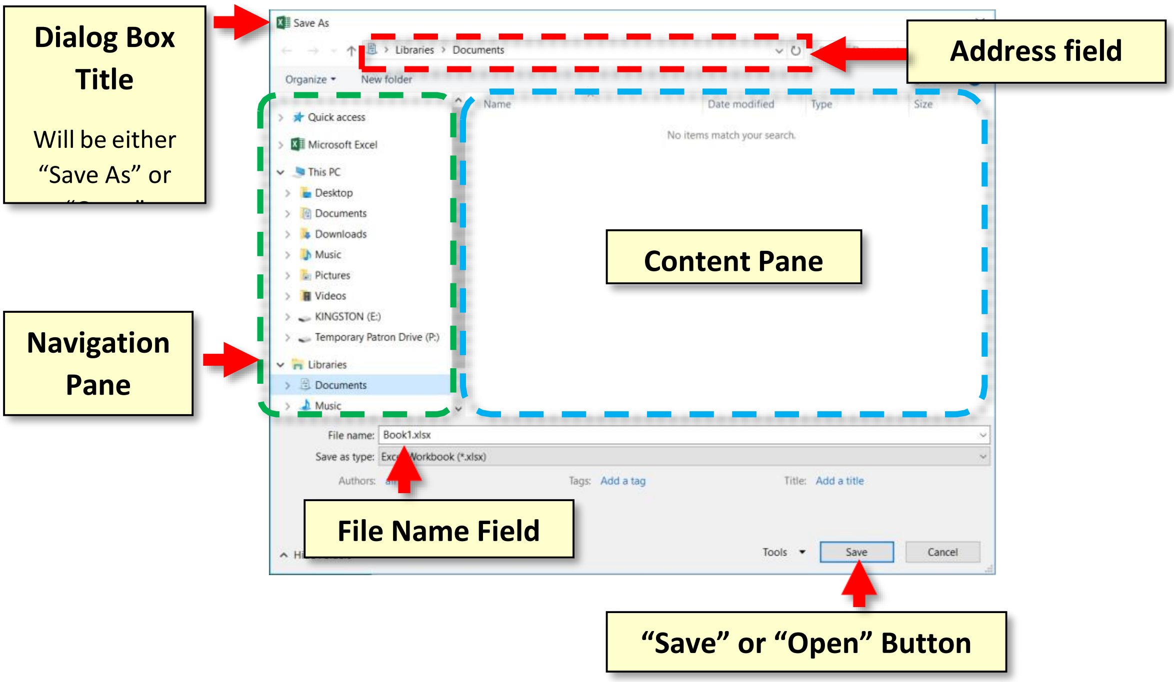
Creating an Excel file

1. When Excel opens, it will display a blank worksheet ready for you to enter data. The data that you enter and the formatting that you use become your document.
2. In cell **A1**, type "My first spreadsheet."
3. Each spreadsheet you create is temporary unless you save it as a file with a unique name and location.

Saving the File

1. **Click** the **File** tab.
2. **Click** the **Save As** button. (We use *Save As* instead of *Save* the **first** time we save a file or whenever we want to save an existing file under a different name or change where we savethe file.)
3. Click Browse.

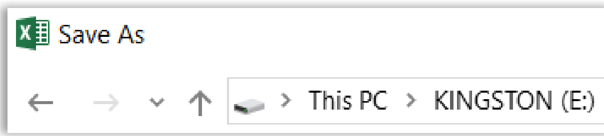
4. **Notice** that a smaller window appears in front of our work. This small window is called a **dialog box**. Because the computer needs to know more than just "OK, save," the dialog box is where wetell it *how* we want to save our work.




5. When it comes to saving, there are two important things to *identify* for the computer:
    1. The **location** where the file is going to be saved to.
    2. What **name** you want to give the file.
6. The **location** where it will be saved is displayed for us in the **Address field**. In this case, **note** thatthe **Documents directory** is the **default** save location, but we want to save our file to the **flash** drive.
7. **Notice** other available folders and devices can be seen in the left pane, called the **navigation pane**.If we wanted to save to one of these alternate locations, we would have to click on it.
8. **Find** the location labeled **Kingston (E:)** and **click** on it. Kingston is the name of the company thatcreated our flash drive.

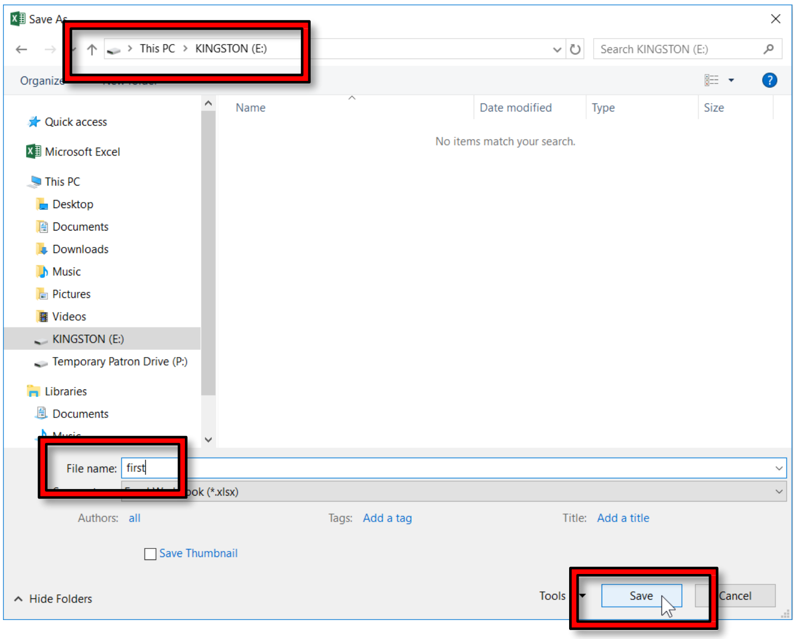
> **Note:** If you are taking this class from home and do not have a flash drive, use "Documents" as the location to save your files.

9. Your address field should now read **Computer > Kingston E:)**.




10. Now we need to name our file. **Notice** that the file name field is located towards the bottom of thedialogue box.

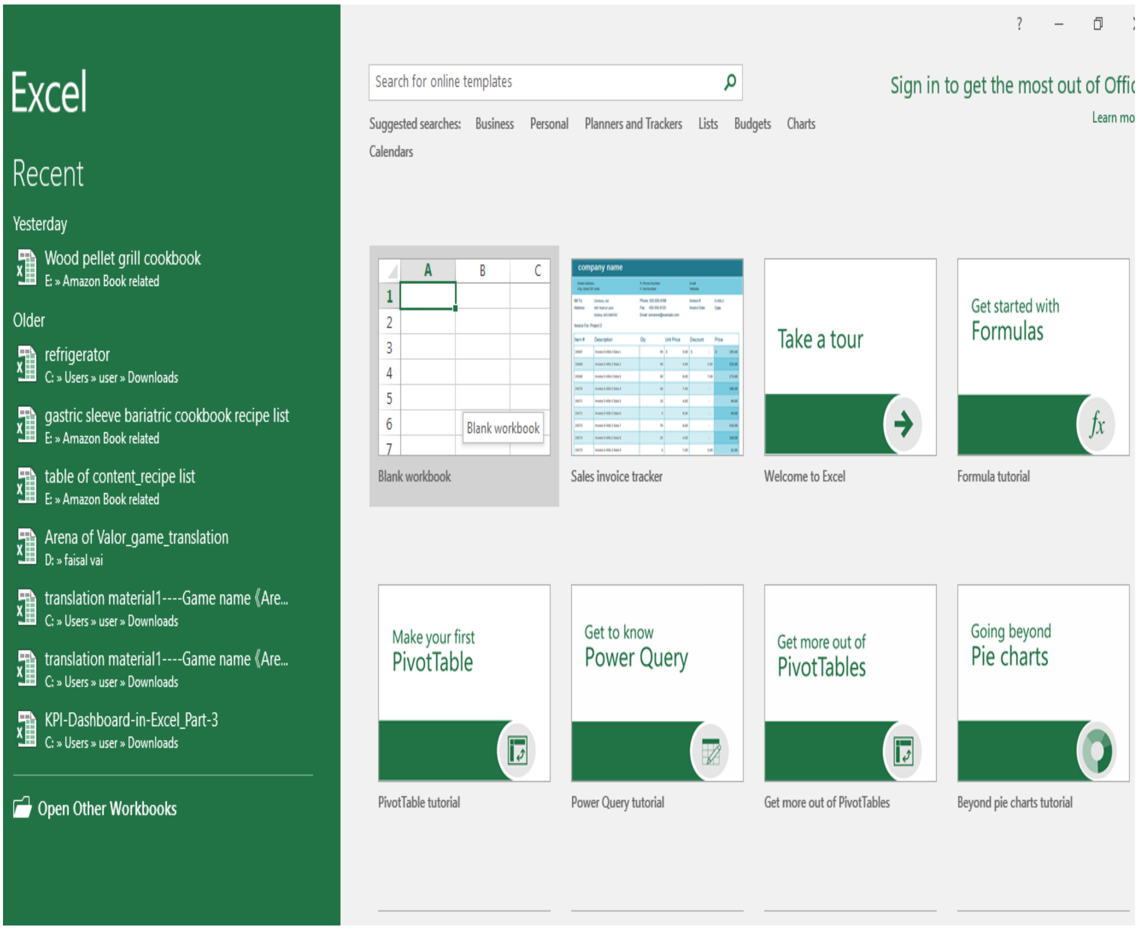
11. **Click** in the File Name box and the words will be highlighted. Then **enter** the word **first** to nameyour file ‘first’.
12. Once we have given the computer **a file name** and a **save location**, we are ready to save. At thispoint, your Save As dialog box should look like the image below. To save, you will **click** the **Save** button.



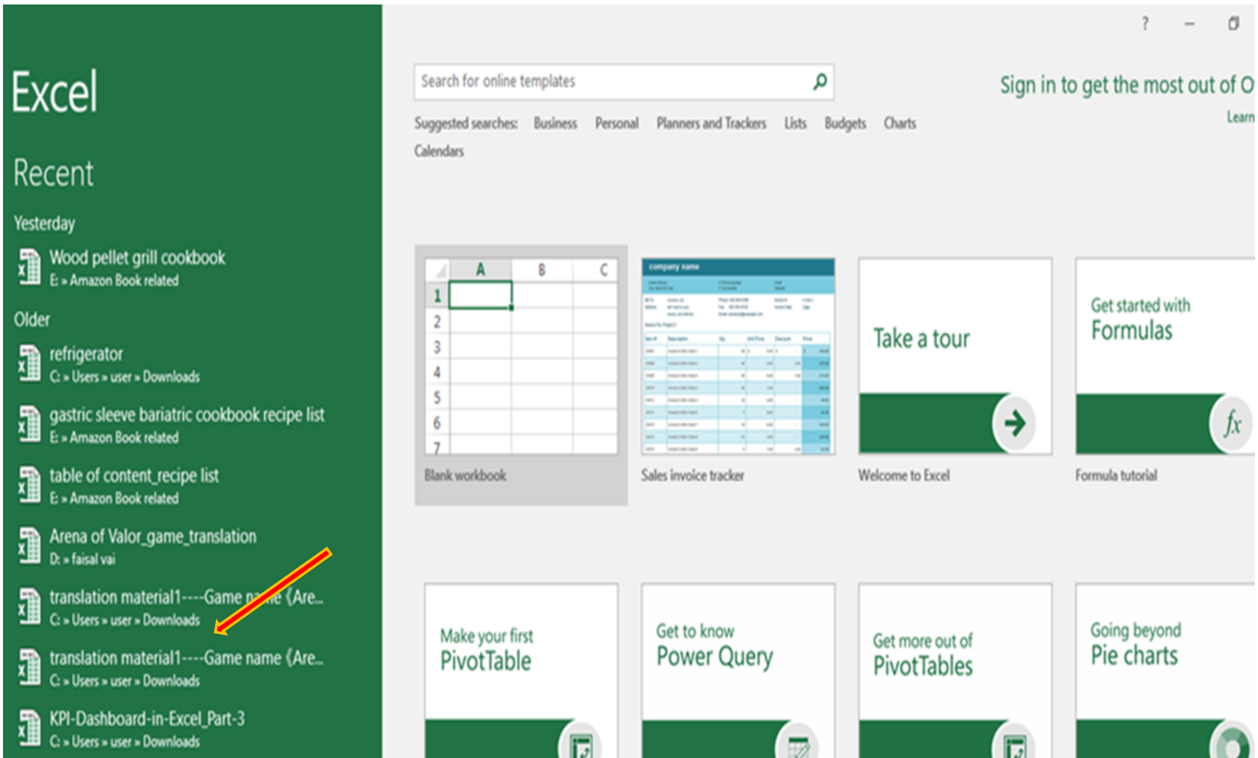

13. Your Excel window will still be open but **notice** the title bar will now show the file name **first.xlsx**.


Opening a spreadsheet

When you first open Excel (by double-clicking the icon or selecting it from the Start menu), the application will ask what you want to do.




If you want to open a new spreadsheet, click Blank workbook.
To open an existing spreadsheet (like the example workbook you just downloaded), click Open Other Workbooks in the lower-left corner, then click Browse on the left side of the resulting window.



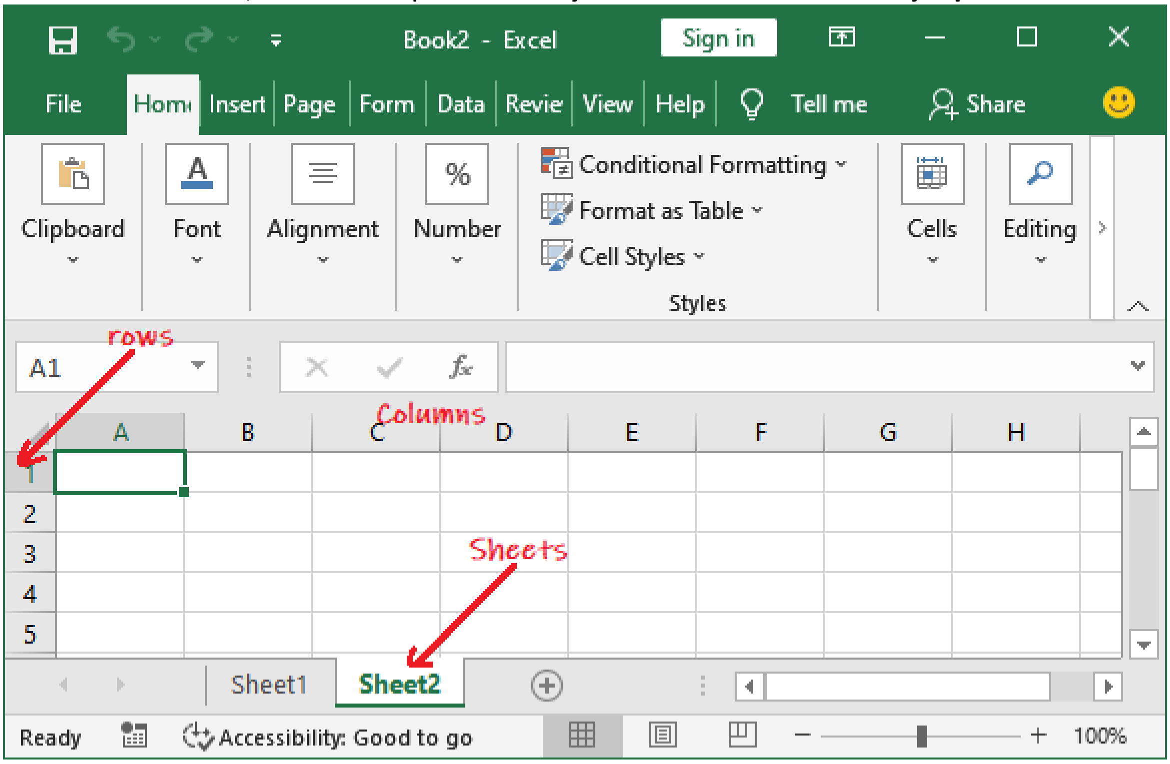
Then use the file explorer to find the workbook you're looking for, select it, and click Open.

**Differences between Workbook and worksheet:**

Worksheet

A worksheet is made of rows and columns that intersect each other to form cells where data is entered. It is capable of performing multiple tasks like calculations, data analysis, and integrating data.

In Excel worksheet, **rows** are represented **by numbers** and **columns by alphabets**.




An Excel Workbook is a collection of several worksheet. A single Excel workbook can consist of several sheets, named **Sheet1, Sheet2, and Sheet3… SheetN**. You can add one or more sheets to your Excel document.

**Note: There's something we should clear up before we move on.**

**Workbooks vs. spreadsheets**

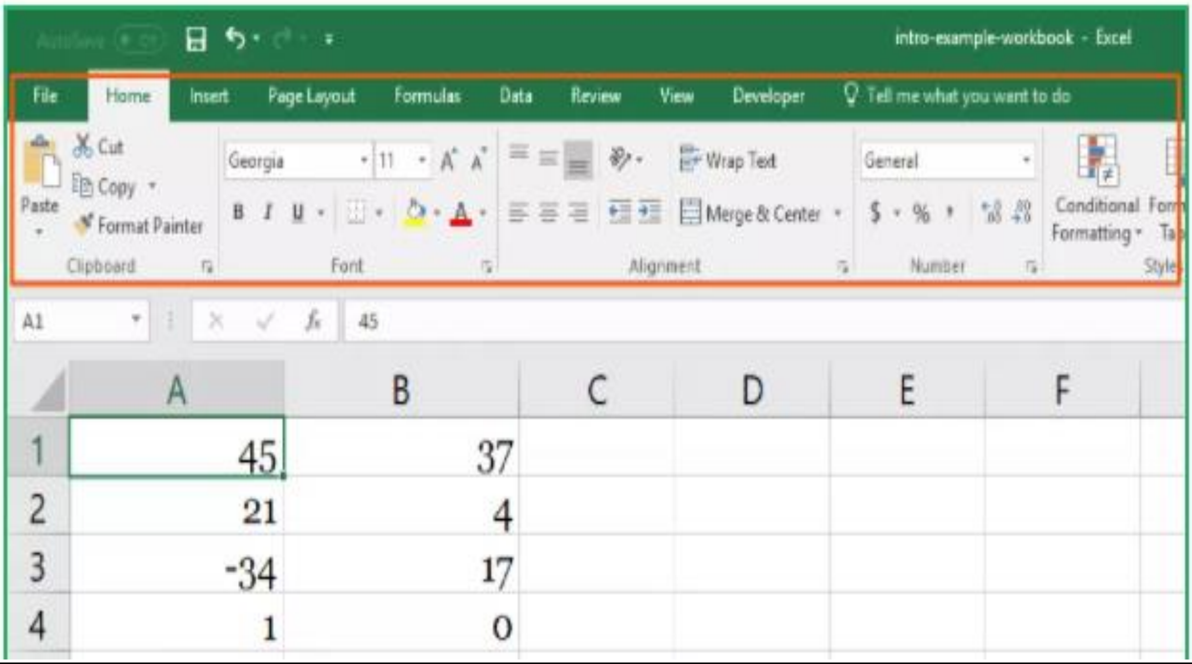
A workbook is an Excel file. It usually has a file extension of .XLSX (if you're using an older version of Excel, it could be .XLS).

A spreadsheet or worksheet is a single sheet inside a workbook. There can be many sheets inside of a workbook, and they're accessed via the tabs at the bottom of the screen.

**Working with the Ribbon**

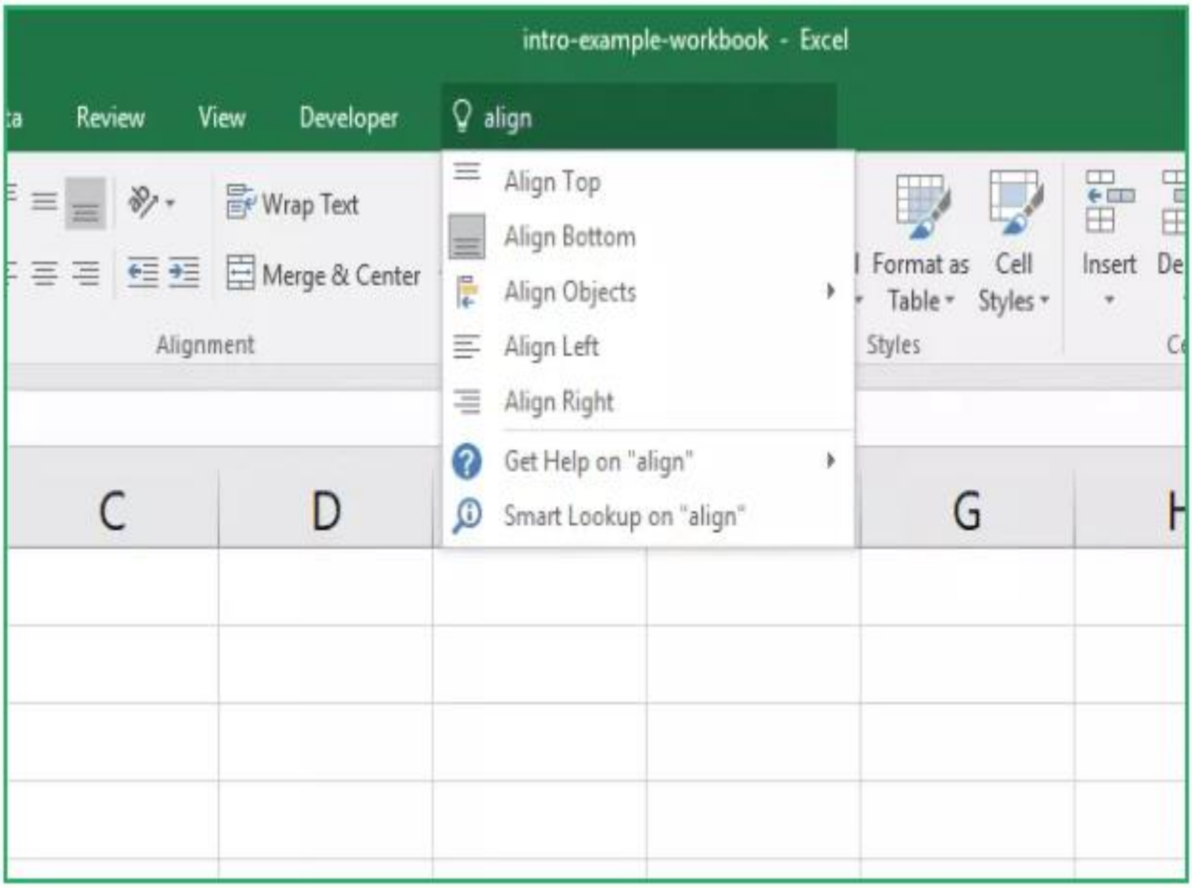
The Ribbon is the central control panel of Excel. You can do just about everything you need to directly from the Ribbon.

Where is this powerful tool? At the top of the window:




There are a number of tabs, including Home, Insert, Data, Review, and a few others. Each tab contains different buttons.

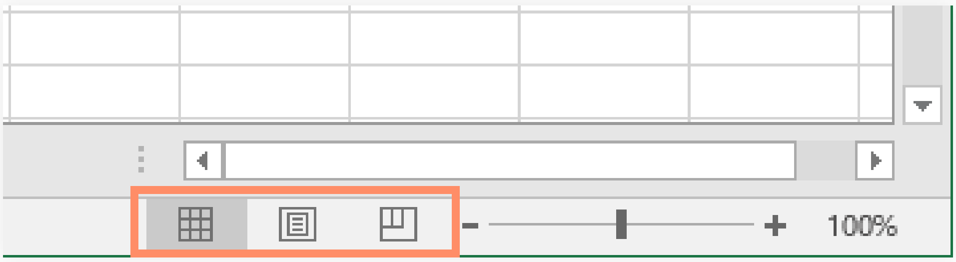
There's also a very useful search bar in the Ribbon. It says Tell me what you want to do. Just type in what you're looking for, and Excel will help you find it.



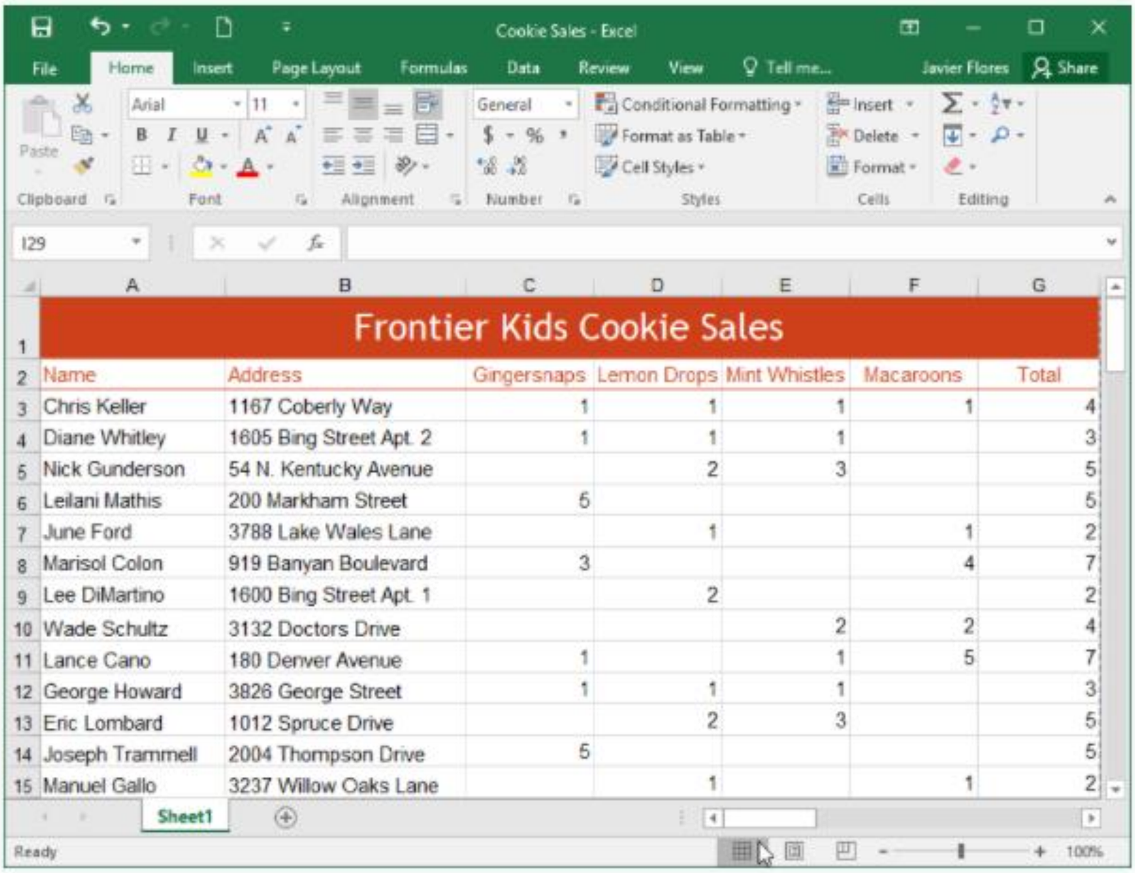

Most of the time, you'll be in the Home tab of the Ribbon. But Formulas and Data are also very useful (we'll be talking about formulas shortly).

Worksheet views

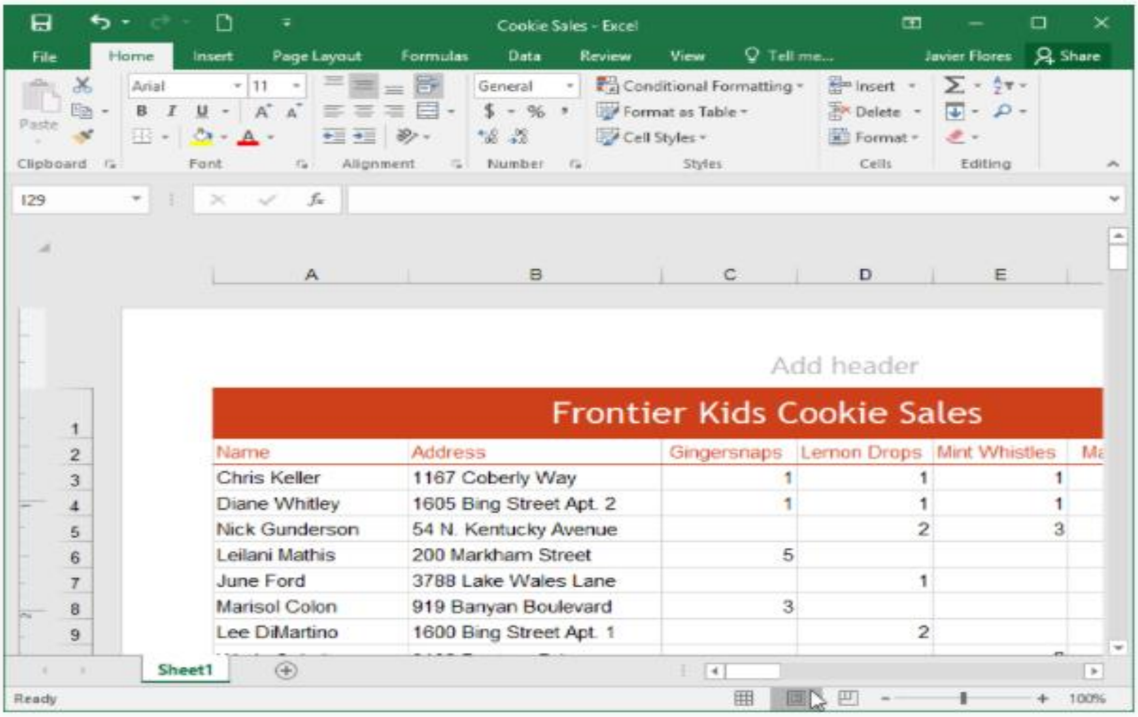
Excel has a variety of viewing options that change how your workbook is displayed. These views can be useful for various tasks, especially if you're planning to print the spreadsheet. To change worksheet views, locate the commands in the bottom-right corner of the Excel window and select Normal view, Page Layout view, or Page Break view.



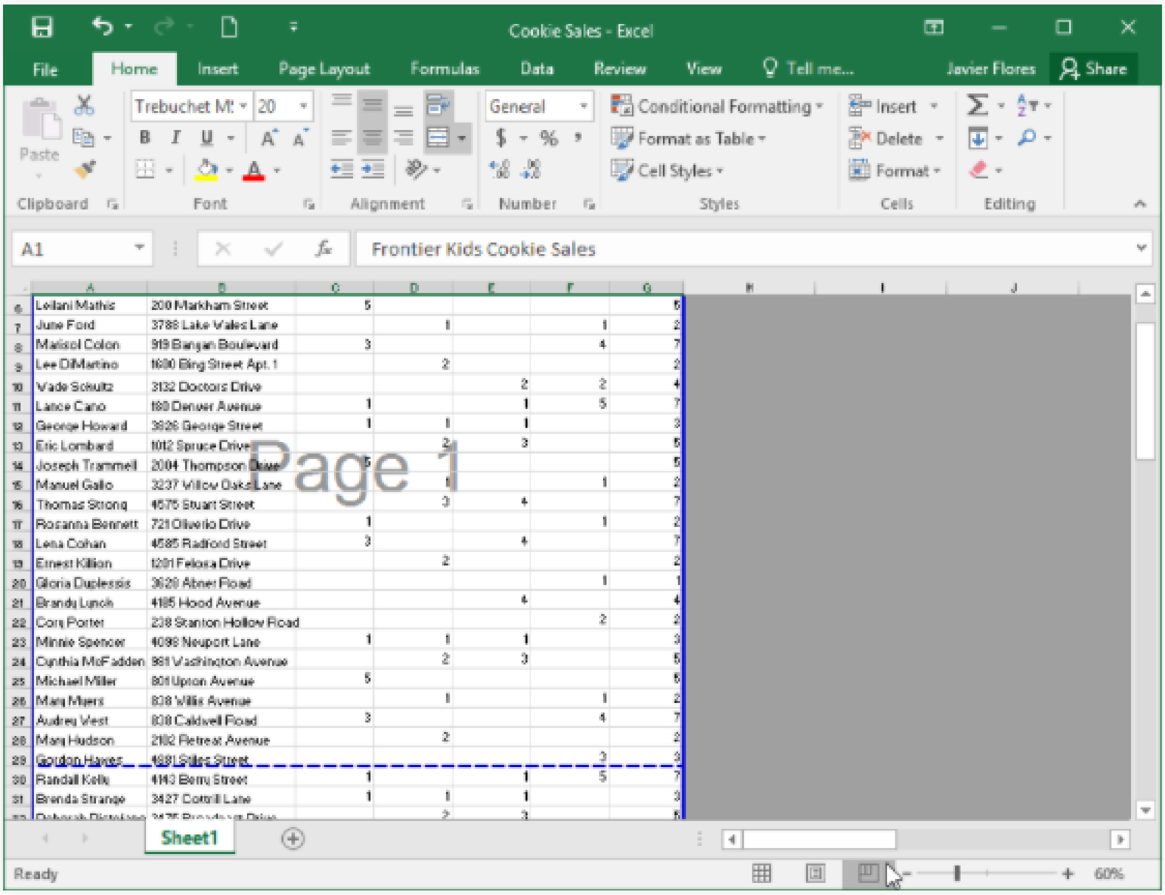

Normal view is the default view for all worksheets in Excel.



Page Layout view displays how your worksheets will appear when printed. You can also add headers and footers in this view.



Page Break view allows you to change the location of page breaks, which is especially helpful when printing a lot of data from Excel.

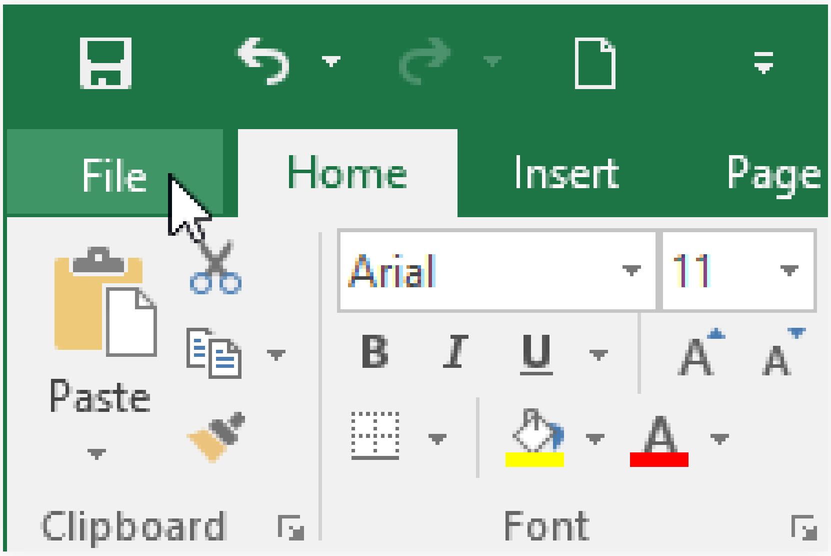


Backstage view

Backstage view gives you various options for saving, opening a file, printing, and sharing your workbooks.

To access backstage view:

Click the File tab on the Ribbon. Backstage view will appear.




## Lesson 2 - Data Entry, Data Editing, and Number Formatting

Entering data

Now it’s time to enter some data!

And while entering data is one of the most central and important things you can do in Excel, it’s almost effortless.

Just click into a blank cell and start typing.

You can also copy (Ctrl + C), cut (Ctrl + X), and paste (Ctrl + V) any data you’d like (or read our full guide on copying and pasting here).

Try copying and pasting the data from the example spreadsheet into another column.

You can also copy data from other programs into Excel.

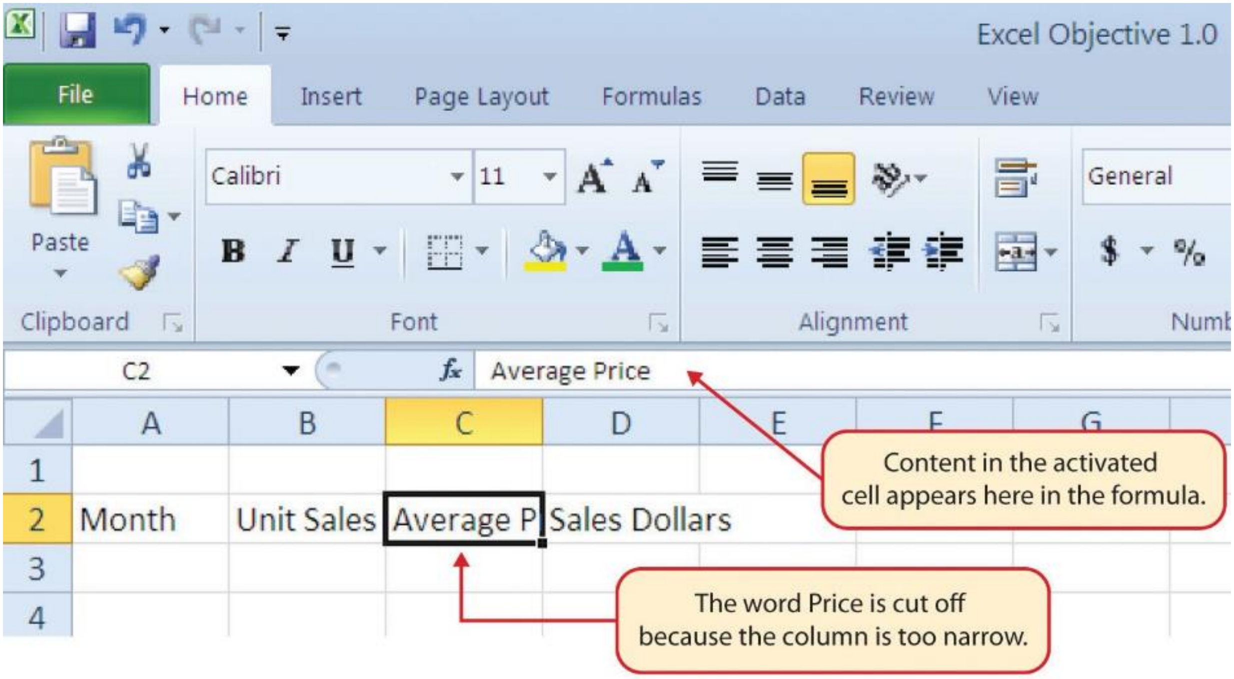
**Steps:**

The following steps explain how the column headings in Row 2 are typed into the worksheet:

1. Click cell location A2 on the worksheet.
2. Type the word **Month**.
3. Press the RIGHT ARROW key. This will enter the word into cell A2 and activate the next cell to the right.
4. Type **Unit Sales** and press the RIGHT ARROW key.
5. Repeat step 4 for the words **Average Price** and then again for **Sales Dollars**.

**Figure 1.15** shows how your worksheet should appear after you have typed the column headings into Row 2. Notice that the word **Price** in cell location C2 is not visible. This is because the column is too narrow to fit the entry you typed. We will examine formatting techniques to correct this problem in the next section.

Figure 1.15 Entering Column Headings into a Worksheet




Column Headings

It is critical to include column headings that accurately describe the data in each column of a worksheet. In professional environments, you will likely be sharing Excel workbooks with coworkers. Good column headings reduce the chance of someone misinterpreting the data contained in a worksheet, which could lead to costly errors depending on your career.

1. Click cell location B3.
2. Type the number **2670** and press the ENTER key. After you press the ENTER key, cell B4 will be activated. Using the ENTER key is an efficient way to enter data vertically down a column.
3. Enter the following numbers in cells B4 through B14: **2160**, **515, 590, 1030, 2875, 2700, 900, 775, 1180, 1800**, and **3560**.
4. Click cell location C3.
5. Type the number **9.99** and press the ENTER key.
6. Enter the following numbers in cells C4 through C14: **12.49, 14.99, 17.49, 14.99, 12.49, 9.99, 19.99, 19.99, 19.99, 17.49**, and **14.99**.
7. Activate cell location D3.
8. Type the number 26685 and press the ENTER key.
9. Enter the following numbers in cells D4 through D14: **26937, 7701, 10269, 15405, 35916, 26937, 17958, 15708, 23562, 31416**, and **53370**.
10. When finished, check that the data you entered matches **Figure 1.16**.

Avoid Formatting Symbols When Entering Numbers

When typing numbers into an Excel worksheet, it is best to avoid adding any formatting symbols such as dollar signs and commas. Although Excel allows you to add these symbols while typing numbers, it slows down the process of entering data. It is more efficient to use Excel's formatting features to add these symbols to numbers after you type them into a worksheet.

Data Entry

It is very important to proofread your worksheet carefully, especially when you have entered numbers. Transposing numbers when entering data manually into a worksheet is a common error. For example, the number **563** could be transposed to **536.** Such errors can seriously compromise the integrity of your workbook.

**Figure 1.16** shows how your worksheet should appear after entering the data. Check your numbers carefully to make sure they are accurately entered into the worksheet.

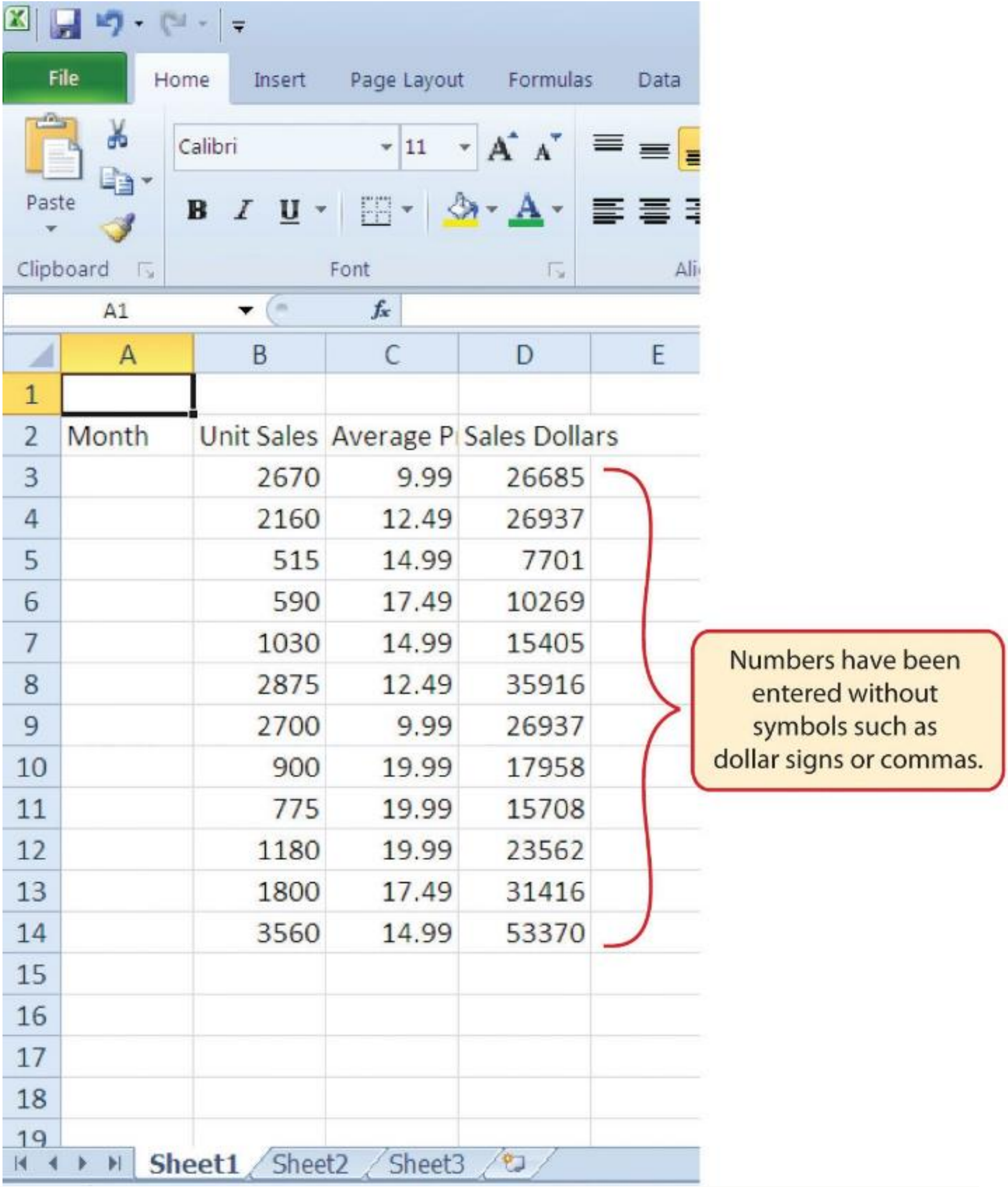
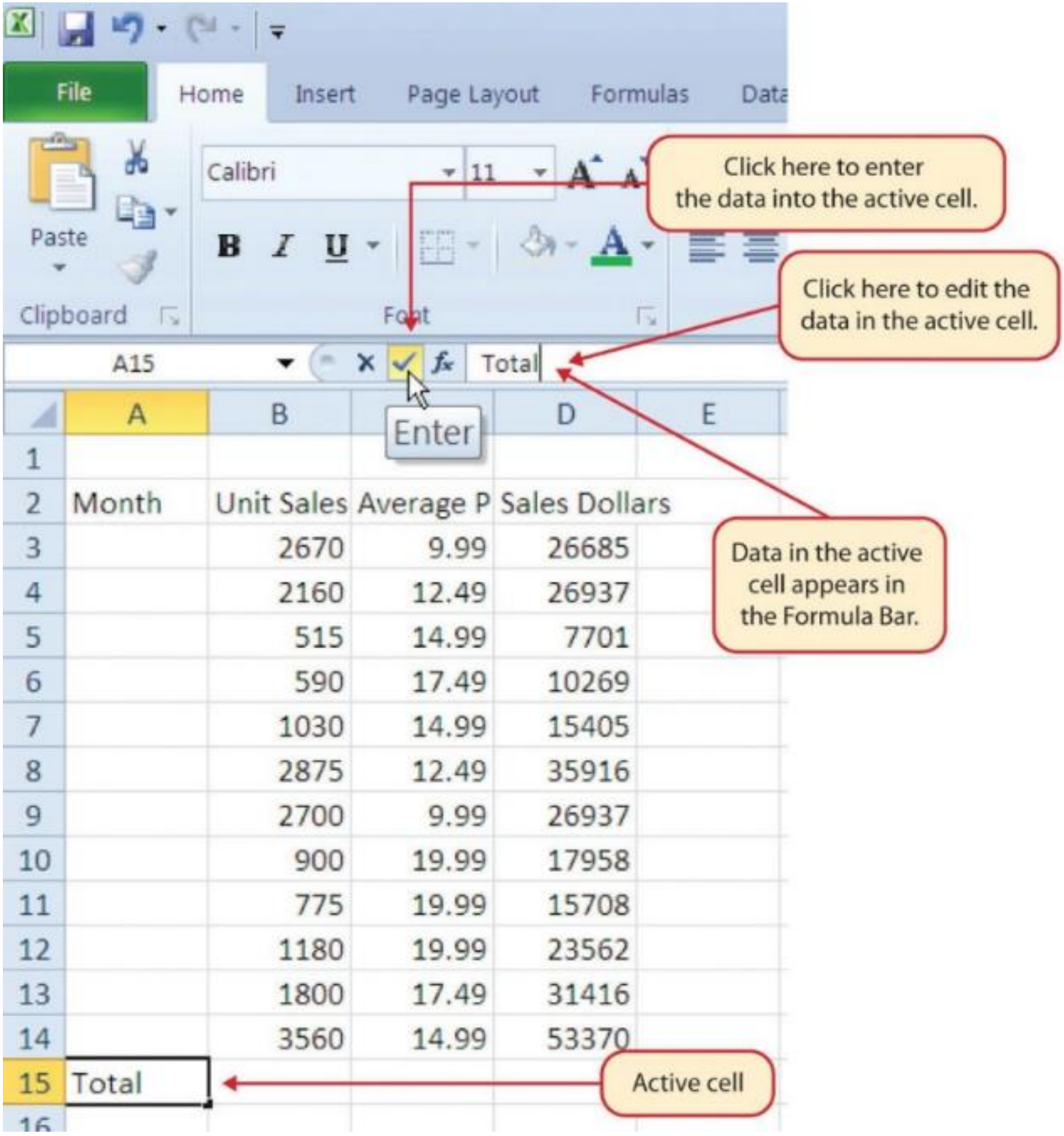



Figure 1.16 Completed Data Entry for Columns B, C, and D

EDITING DATA

Data that has been entered in a cell can be changed by double clicking the cell location or using the Formula Bar. You may have noticed that as you were typing data into a cell location, the data you typed appeared in the Formula Bar. The Formula Bar can be used for entering data into cells as well as for editing data that already exists in a cell. The




following steps provide an example of entering and then editing data that has been entered into a cell location:

1. Click cell A15 in the Sheet1 worksheet.
2. Type the abbreviation **Tot** and press the ENTER key.
3. Click cell A15.
4. Move the mouse pointer up to the Formula Bar. You will see the pointer turn into a cursor. Move the cursor to the end of the abbreviation **Tot** and left click.
5. Type the letters **al** to complete the word Total.
6. Click the checkmark to the left of the Formula Bar (see **Figure 1.17**). This will enter the change into the cell.
   Figure 1.17 Using the Formula Bar to Edit and Enter Data
7. Double click cell A15.
8. Add a space after the word Total and type the word **Sales**.
9. Press the ENTER key.

Keyboard Shortcuts: Editing Data in a Cell

- Activate the cell that is to be edited and press the F2 key on your keyboard.

## Lesson 3 - Data and cell Formatting

FORMATTING DATA AND CELLS

Enhancing the visual appearance of a worksheet is a critical step in creating a valuable tool for you or your coworkers when making key decisions. There are accepted professional formatting standards when spreadsheets contain only currency data. For this course, we will use the following Excel Guidelines for Formatting. The first figure displays how to use accounting number format when ALL figures are currency. Only the first row of data and the totals should be formatted with the Accounting format. The other data should be formatted with Comma style. There also needs to be a Top Border above the numbers in the total row. If any of the numbers have cents, you need to format all of the data with two decimal places.

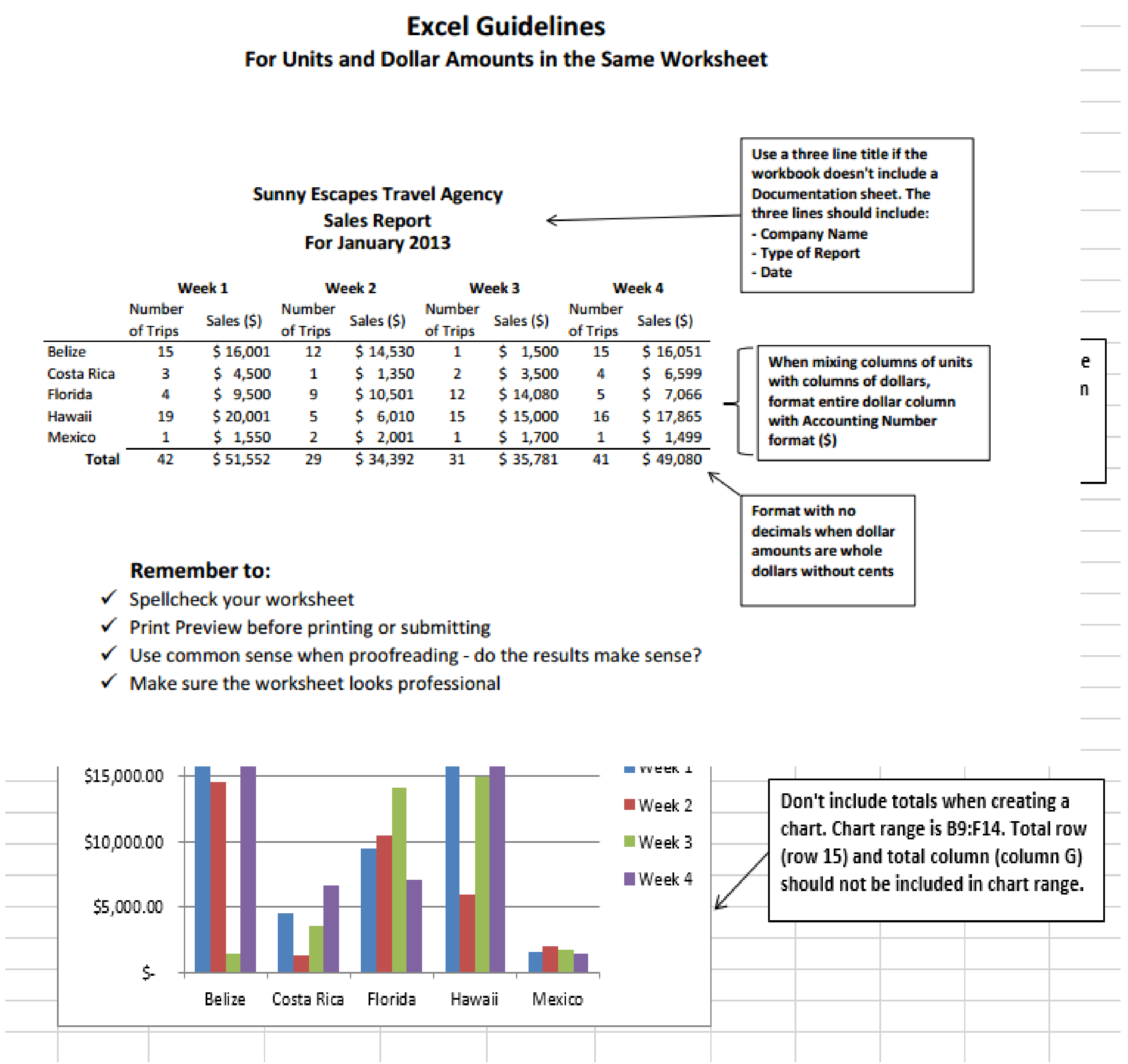



Figure 1.31a

Often, your Excel spreadsheet will contain values that are both currency and non-currency in nature. When that is the case, you'll want to use the guidelines in the following figure:

Figure 1.31b

The following steps demonstrate several fundamental formatting skills that will be applied to the workbook that we are developing for this chapter. Several of these formatting skills are identical to ones that you may have already used in other Microsoft applications such as Microsoft® Word® or Microsoft® PowerPoint®.

1. Highlight the range A2:D2 in the **Sheet1** worksheet by placing the mouse pointer over cell A2 and left clicking and dragging to cell D2. Click the Bold button in the Font group of commands in the Home tab of the ribbon.

2. Click the Border button in the Font group of commands in the Home tab of the Ribbon (see **Figure 1.32**). Select the Bottom Border option from the list to achieve the goal of a border on the bottom of row 2 below the column headings.

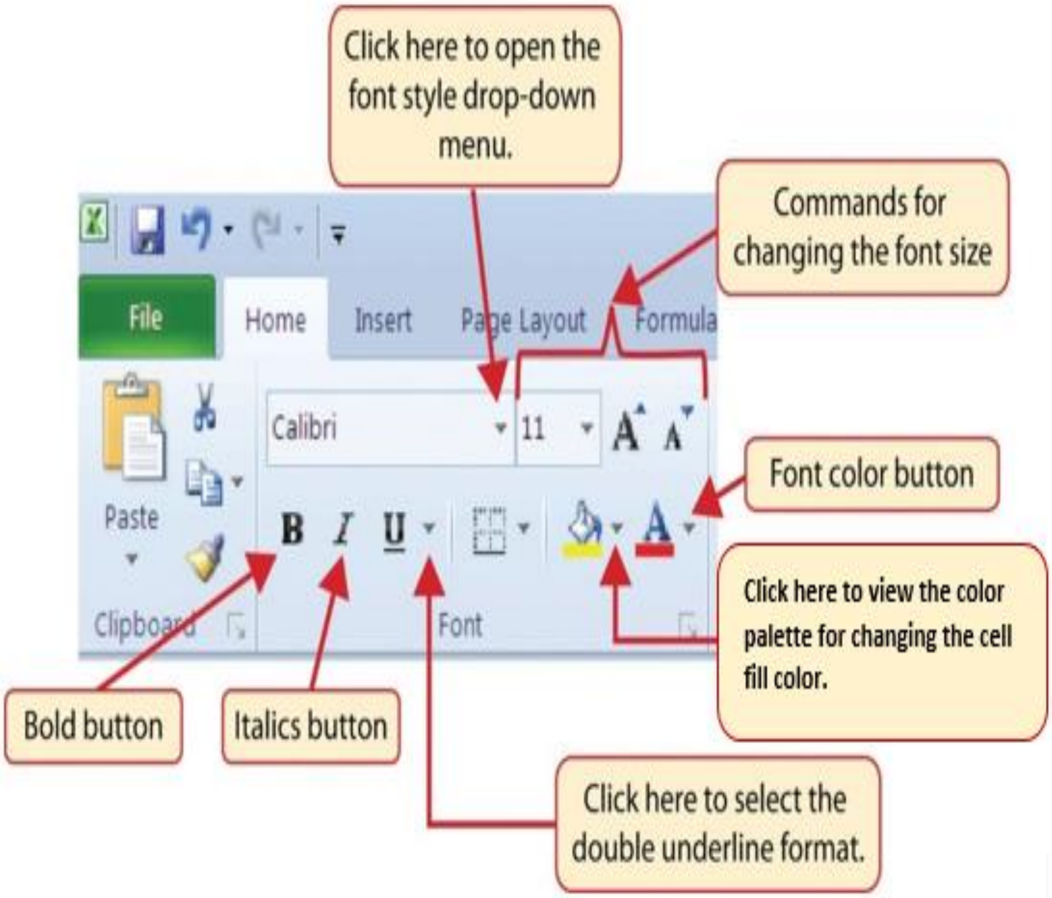



Figure 1.32 Font Group of Commands

Keyboard Shortcuts: Bold Format

- Hold the CTRL key while pressing the letter B on your keyboard.

3. Highlight the range A15:D15 by placing the mouse pointer over cell A15 and left clicking and dragging to cell D15.
4. Click the Bold button in the Font group of commands in the Home tab of the Ribbon.
5. Click the Border button in the Font group of commands in the Home tab of the Ribbon (see **Figure 1.32**). Select the Top Border option from the list to achieve the goal of a border on the top of row 15 where totals will eventually display.

Keyboard Shortcuts: Italics Format

- Hold the CTRL key while pressing the letter I on your keyboard.

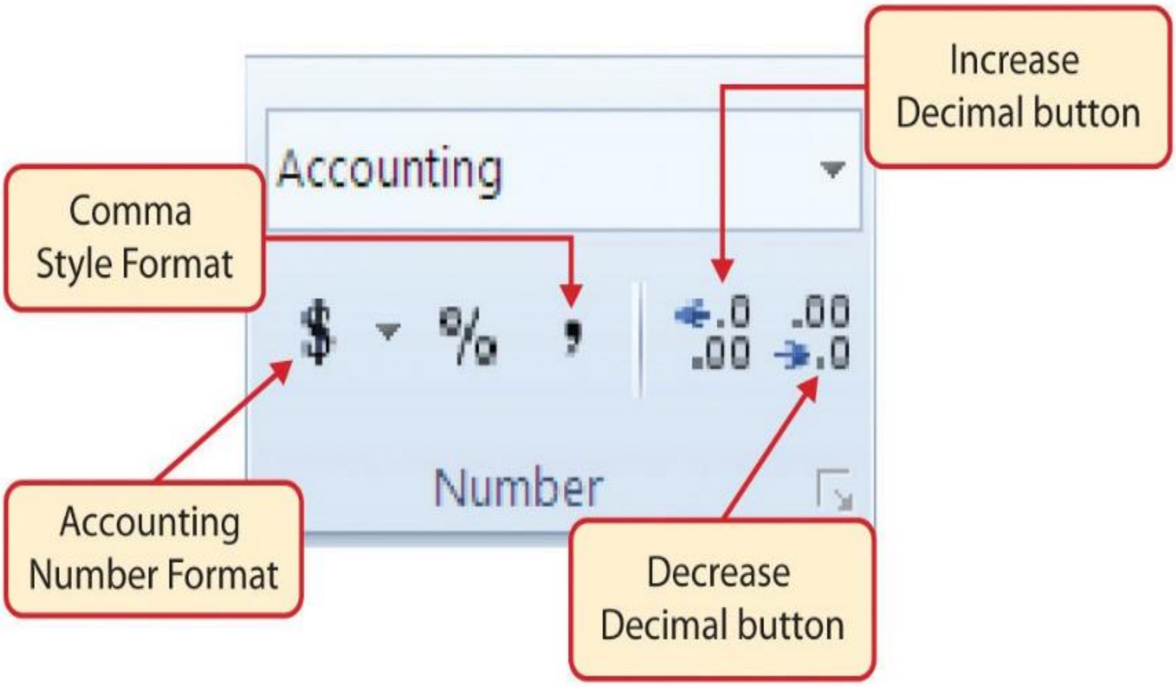
Keyboard Shortcuts: Underline Format

- Hold the CTRL key while pressing the letter U on your keyboard.

Format Column Headings and Totals

Applying formatting enhancements to the column headings and column totals in a worksheet is a very important technique, especially if you are sharing a workbook with other people. These formatting techniques allow users of the worksheet to clearly see the column headings that define the data. In addition, the column totals usually contain the most important data on a worksheet with respect to making decisions, and formatting techniques allow users to quickly see this information.

1. Highlight the range B3:B14 by placing the mouse pointer over cell B3 and left clicking and dragging down to cell B14.
2. Click the Comma Style button in the Number group of commands in the Home tab of the Ribbon. This feature adds a comma as well as two decimal places. (see **Figure**



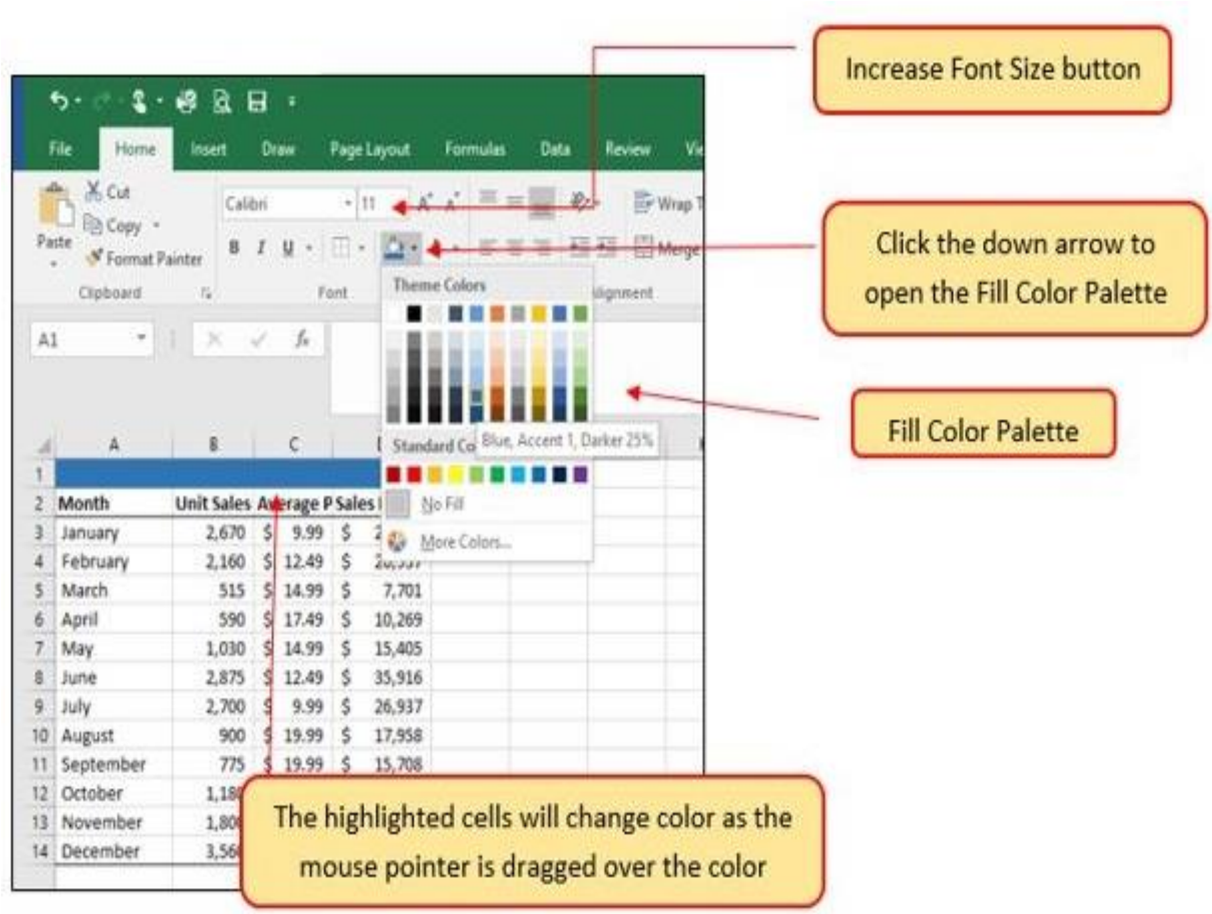

**1.33**).

Figure 1.33 Number Group of Commands

3. Since the figures in this range do not include cents, click the Decrease Decimal button in the Number group of commands in the Home tab of the Ribbon two times (see **Figure 1.33**).
4. The numbers will also be reduced to zero decimal places.
5. Highlight the range C3:C14 by placing the mouse pointer over cell C3 and left clicking and dragging down to cell C14.
6. Click the Accounting Number Format button in the Number group of commands in the Home tab of the Ribbon (see **Figure 1.33**). This will add the US currency symbol and two decimal places to the values. This format is common when working with pricing data. As discussed above in the Formatting Data and Cells section, you will want to use Accounting format on all values in this range since the worksheet contains non-currency as well as currency data.
7. Highlight the range D3:D14 by placing the mouse pointer over cell D3 and left clicking and dragging down to cell D14.

8. Again, select the Accounting Number Format; this will add the US currency symbol to the values as well as two decimal places.
9. Click the Decrease Decimal button in the Number group of commands in the Home tab of the Ribbon.
10. This will add the US currency symbol to the values and reduce the decimal places to zero since there are no cents in these figures.
11. Highlight the range A1:D1 by placing the mouse pointer over cell A1 and left clicking and dragging over to cell D1.
12. Click the down arrow next to the Fill Color button in the Font group of commands in the Home tab of the Ribbon (see **Figure 1.34**). This will prepare the range for a worksheet title.

Figure 1.34 Fill Color Palette




13. Click the Blue, Accent 1, Darker 25% color from the palette (see **Figure 1.34**). Notice that as you move the mouse pointer over the color palette, you will see a preview of how the color will appear in the highlighted cells. Experiment with this feature.
14. Click on A1 and enter the worksheet title: General Merchandise World and click on the check mark in the formula bar to enter this information.
15. Since the black font is difficult to read on the blue background, you'll change the font color to be more visible. Click the down arrow next to the Font Color button in the

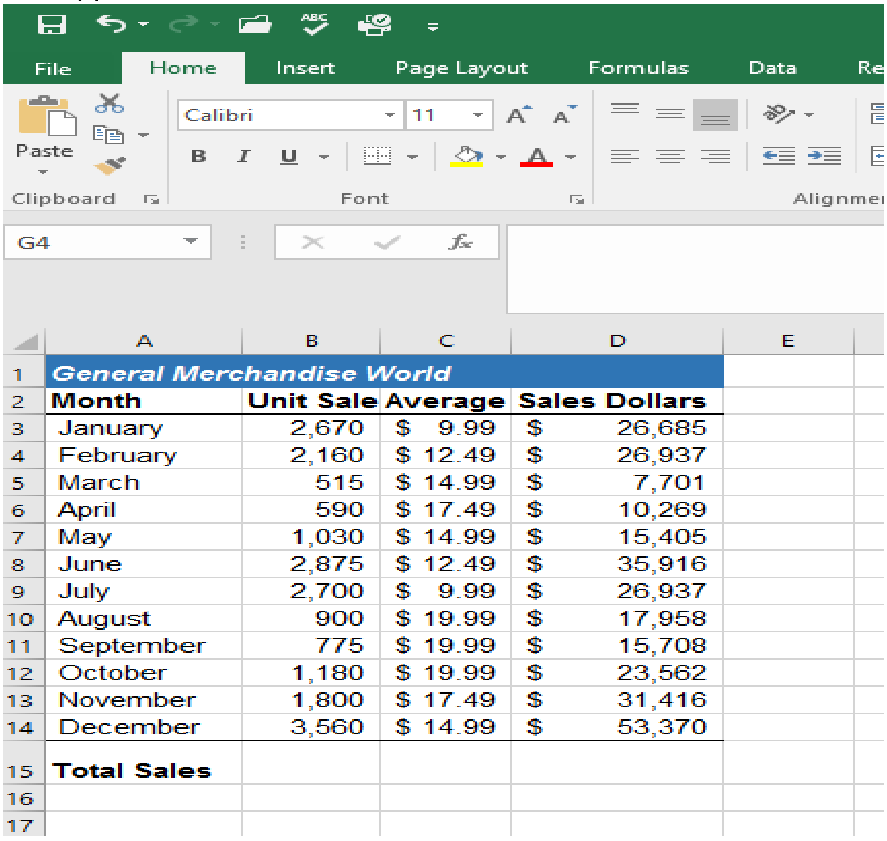
Font group of commands in the Home tab of the Ribbon; select White as the font color for this range (see **Figure 1.32**).

16. Highlight the range A1:D1 by placing the mouse pointer over cell A1 and and dragging across to cell D1.
17. Click the drop-down arrow on the right side of the Font button in the Home tab of the Ribbon; select Arial as the font for this range. (see **Figure 1.32**).
18. Notice that as you move the mouse pointer over the font style options, you can see the font change in the highlighted cells.
19. Expand the column width of Column D to 14 characters.

Pound Signs (####) Appear in Columns

When a column is too narrow for a long number, Excel will automatically convert the number to a series of pound signs (####). In the case of words or text data, Excel will only show the characters that fit in the column. However, this is not the case with numeric data because it can give the appearance of a number that is much smaller than what is actually in the cell. To remove the pound signs, increase the width of the column.

**Figure 1.35** shows how the Sheet1 worksheet should appear after the formatting techniques are applied.




| | A | B | C | D |
|---|---|---|---|---|
| 1 | *General Merchandise World* | | | |
| 2 | **Month** | **Unit Sale** | **Average** | **Sales Dollars** |
| 3 | January | 2,670 | $ 9.99 | $ 26,685 |
| 4 | February | 2,160 | $ 12.49 | $ 26,937 |
| 5 | March | 515 | $ 14.99 | $ 7,701 |
| 6 | April | 590 | $ 17.49 | $ 10,269 |
| 7 | May | 1,030 | $ 14.99 | $ 15,405 |
| 8 | June | 2,875 | $ 12.49 | $ 35,916 |
| 9 | July | 2,700 | $ 9.99 | $ 26,937 |
| 10 | August | 900 | $ 19.99 | $ 17,958 |
| 11 | September | 775 | $ 19.99 | $ 15,708 |
| 12 | October | 1,180 | $ 19.99 | $ 23,562 |
| 13 | November | 1,800 | $ 17.49 | $ 31,416 |
| 14 | December | 3,560 | $ 14.99 | $ 53,370 |
| 15 | **Total Sales** | | | |
| 16 | | | | |
| 17 | | | | |

Figure 1.35 Formatting Techniques Applied

## DATA ALIGNMENT (WRAP TEXT, MERGE CELLS, AND CENTER)

The skills presented in this segment show how data are aligned within cell locations. For example, text and numbers can be centered in a cell location, left justified, right justified, and so on. In some cases you may want to stack multiword text entries vertically in a cell instead of expanding the width of a column. This is referred to as wrapping text. These skills are demonstrated in the following steps:

1. Highlight the range B2:D2 by placing the mouse pointer over cell B2 and left clicking and dragging over to cell D2.
2. Click the Center button in the Alignment group of commands in the Home tab of the Ribbon (see **Figure 1.36**). This will center the column headings in each cell location.

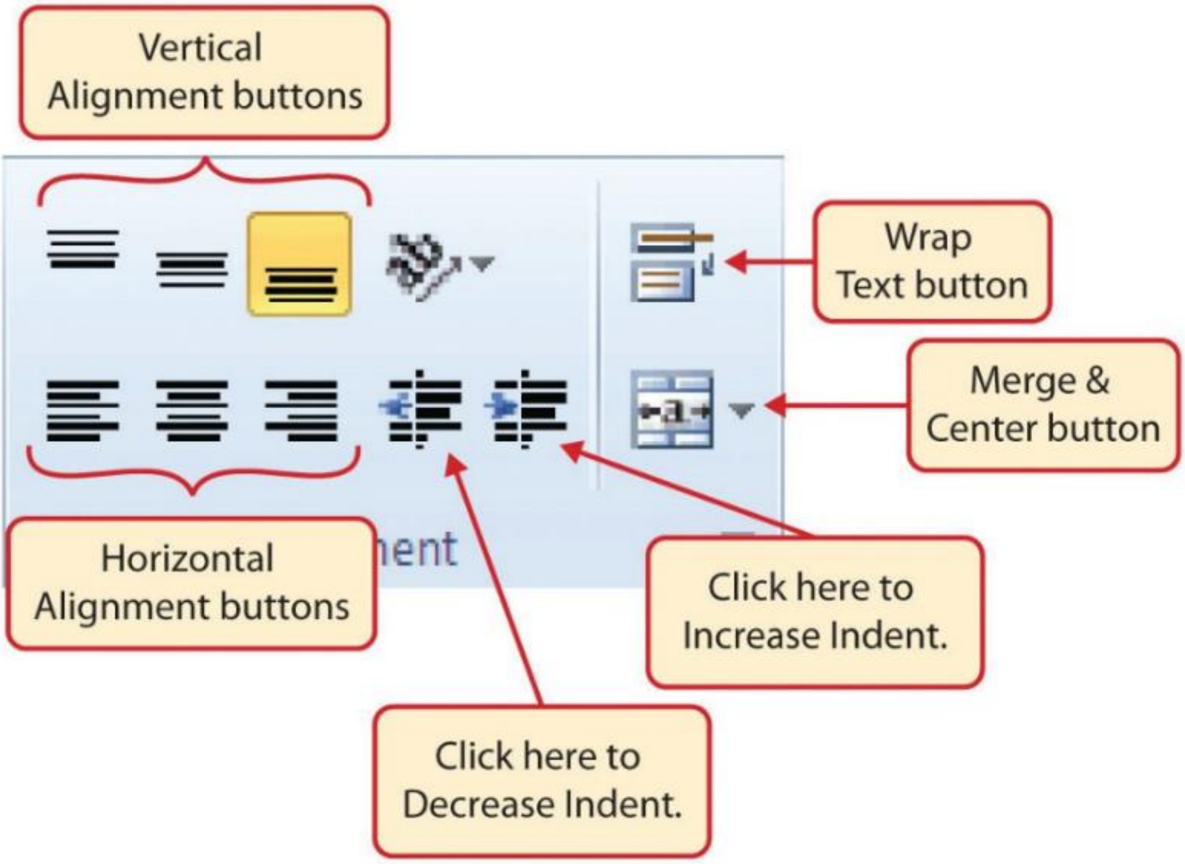



Figure 1.36 Alignment Group in Home Tab

3. Click the Wrap Text button in the Alignment group (see **Figure 1.36**). The height of Row 2 automatically expands, and the words that were cut off because the columns were too narrow are now stacked vertically.

Keyboard Shortcuts: Wrap Text

- Press the ALT key and then the letters H and W one at a time.

Wrap Text

The benefit of using the Wrap Text command is that it significantly reduces the need to expand the column width to accommodate multiword column headings. The problem with increasing the column width is that you may reduce the amount of data that can fit on a piece of paper or one screen. This makes it cumbersome to analyze the data in the worksheet and could increase the time it takes to make a decision.

4. Highlight the range A1:D1 by placing the mouse pointer over cell A1 and left clicking and dragging over to cell D1.
5. Click the down arrow on the right side of the Merge & Center button in the Alignment group of commands in the Home tab of the Ribbon.
6. Left click the Merge & Center option (see **Figure 1.37**). This will create one large cell location running across the top of the data set.

Keyboard Shortcuts: Merge Commands

- Merge & Center: Press the ALT key and then the letters H, M, and C one at a time.
- Merge Cells: Press the ALT key and then the letters H, M, and M one at a time.
- Unmerge Cells: Press the ALT key and then the letters H, M, and U one at a time.

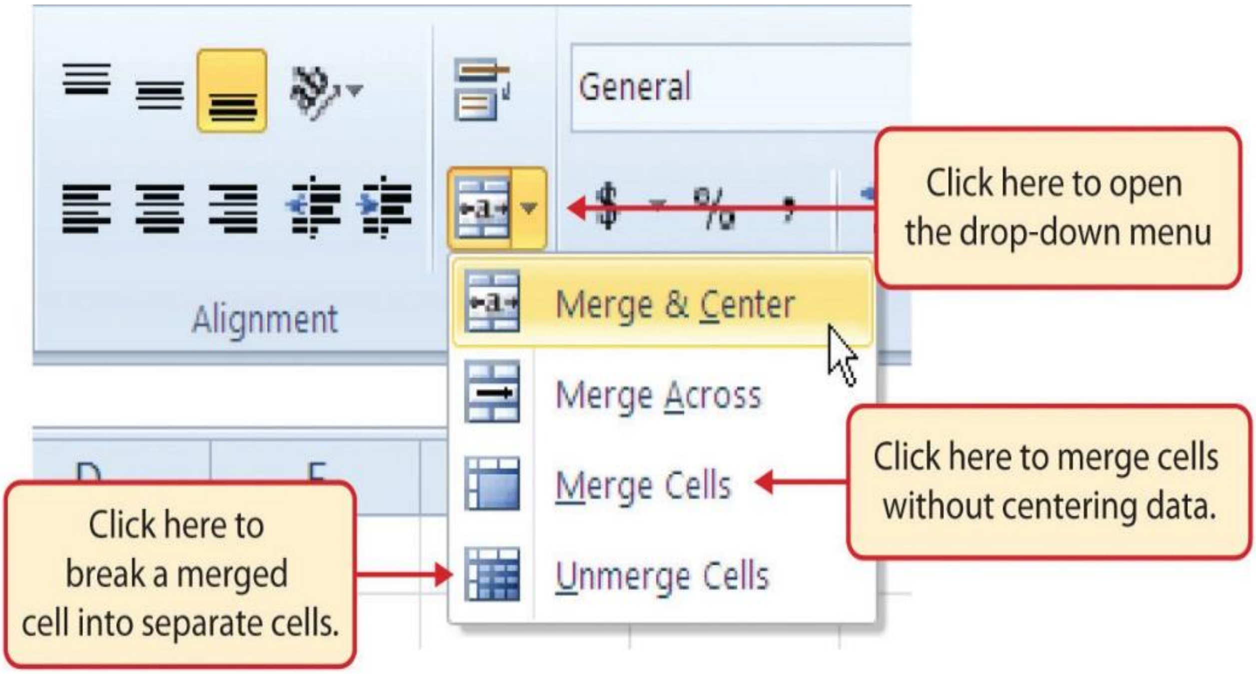



Figure 1.37 Merge Cell Drop-Down Menu

Merge & Center

One of the most common reasons the Merge & Center command is used is to center the title of a worksheet directly above the columns of data. Once the cells above the column headings are merged, a title can be centered above the columns of data. It is very difficult to center the title over the columns of data if the cells are not merged.

**Figure 1.38** shows the Sheet1 worksheet with the data alignment commands applied. The reason for merging the cells in the range A1:D1 will become apparent in the next segment.

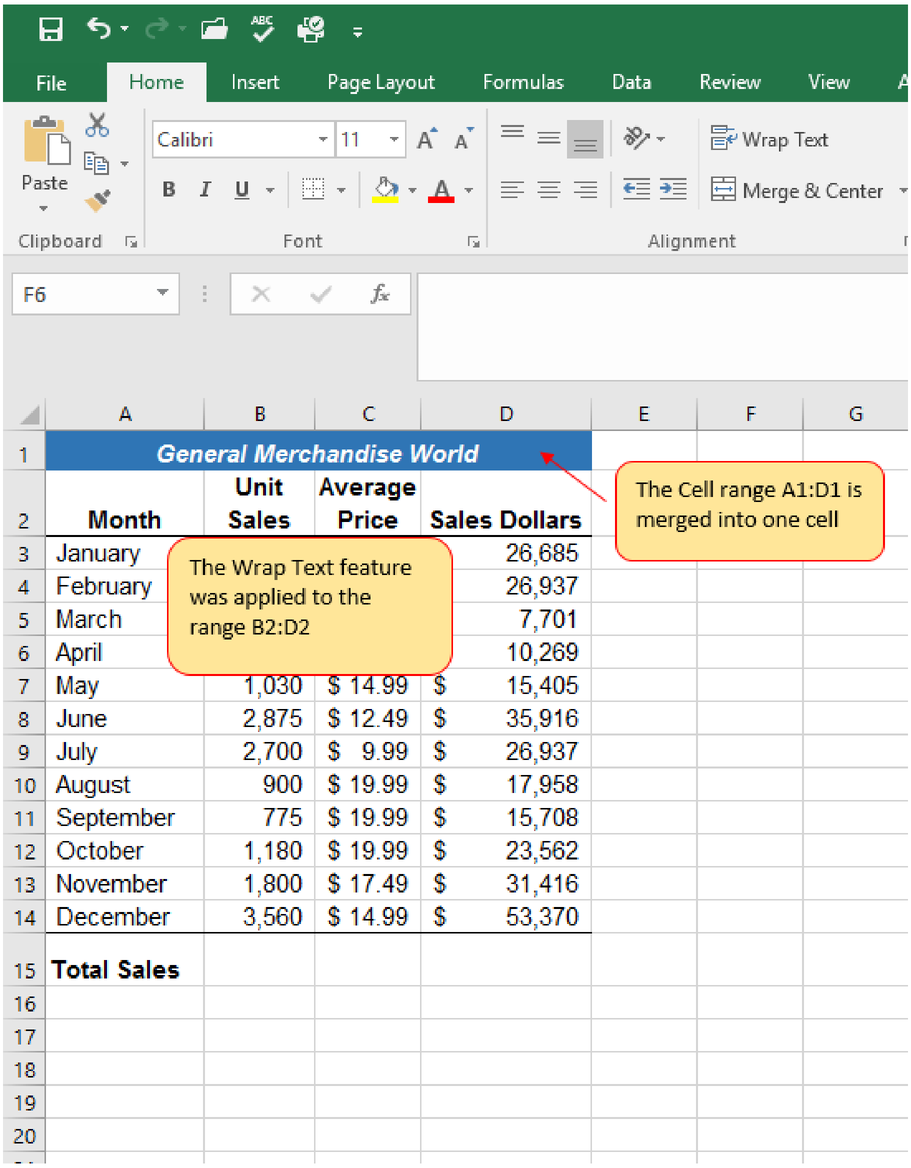


Figure 1.38 Sheet1 with Data Alignment Features Added

Wrap Text

1. Activate the cell or range of cells that contain text data.
2. Click the Home tab of the Ribbon.
3. Click the Wrap Text button.

Merge Cells

1. Highlight a range of cells that will be merged.
2. Click the Home tab of the Ribbon.
3. Click the down arrow next to the Merge & Center button.
4. Select an option from the Merge & Center list.

ENTERING MULTIPLE LINES OF TEXT

In the Sheet1 worksheet, the cells in the range A1:D1 were merged for the purposes of adding a title to the worksheet. This worksheet will contain both a title and a subtitle. The following steps explain how you can enter text into a cell and determine where you want the second line of text to begin:

1. Activate cell A1 in the Sheet1 worksheet by placing the mouse pointer over cell A1 and clicking the left mouse button. Since the cells were merged, clicking cell A1 will automatically activate the range A1:D1. Position your mouse to the end of the title, directly after the “d” in the word “World” and double-click to get a cursor (flashing I-beam).
2. Hold down the ALT key and press the ENTER key. This will start a new line of text in this cell location.
3. Type the text **Retail Sales (in millions)** and press the ENTER key.
4. Select cell A1. Then click the Italics and Bold buttons in the Font group of commands in the Home tab of the Ribbon.
5. Increase the height of Row 1 to 30 points. Once the row height is increased, all the text typed into the cell will be visible (see **Figure 1.39**).

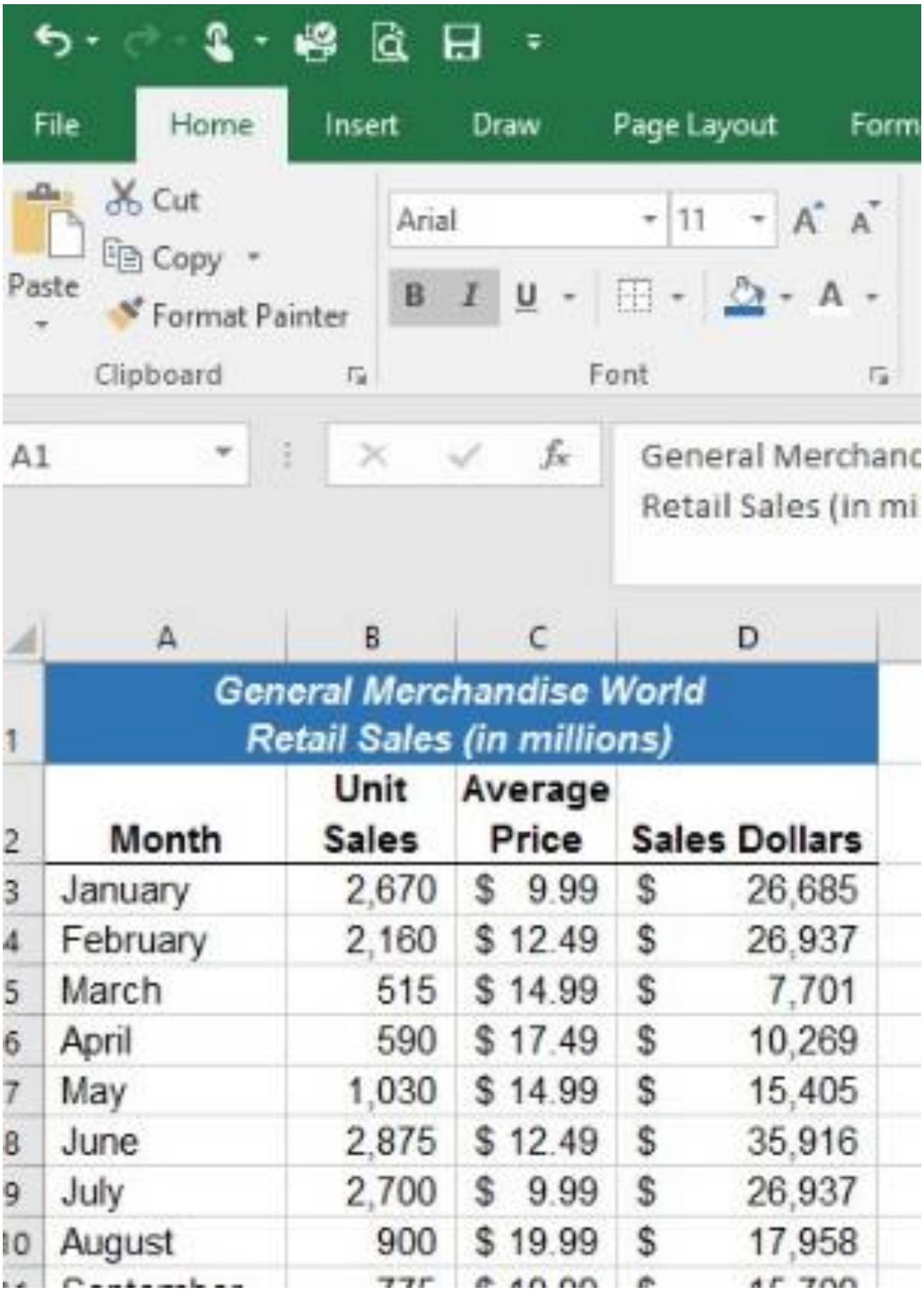


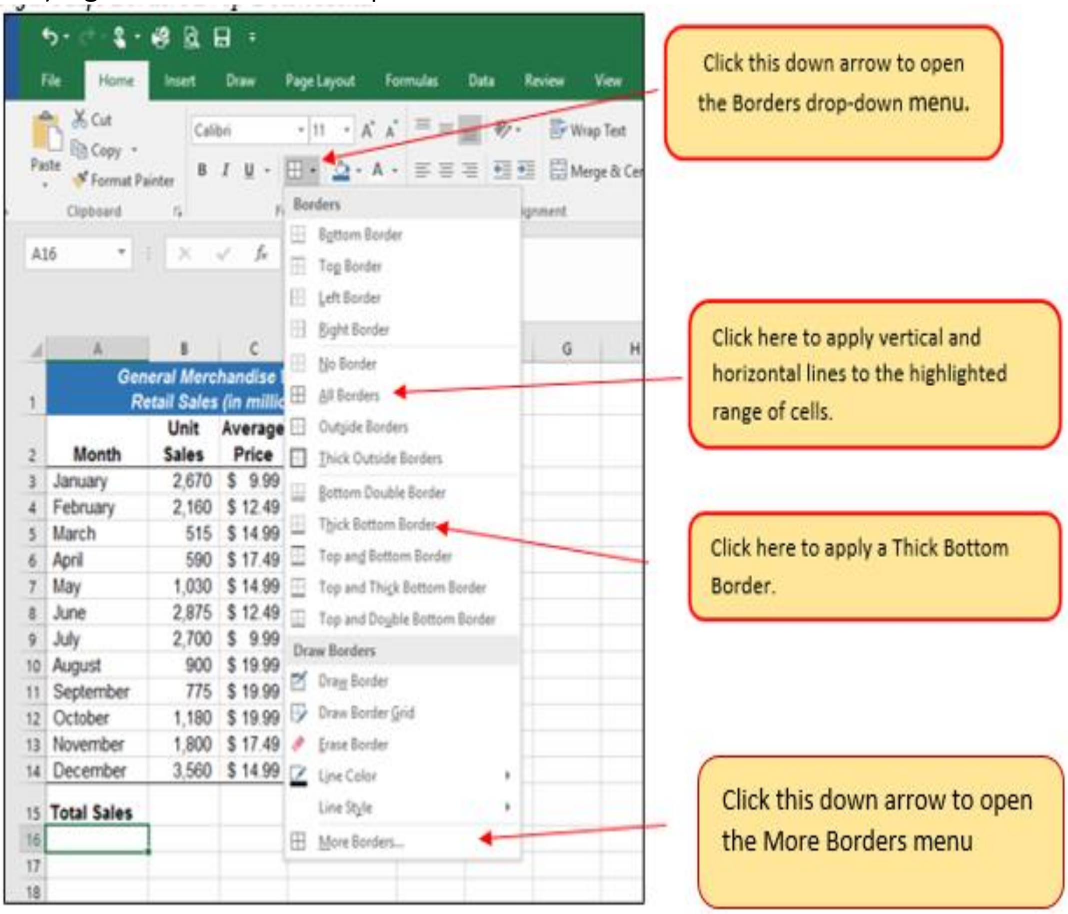
Figure 1.39 Title & Subtitle Added to the Worksheet

Entering Multiple Lines of Text
1. Activate a cell location.
2. Type the first line of text.
3. Hold down the ALT key and press the ENTER key.
4. Type the second line of text and press the ENTER key.

## BORDERS (ADDING LINES TO A WORKSHEET)

In Excel, adding custom lines to a worksheet is known as adding borders. Borders are different from the grid lines that appear on a worksheet and that define the perimeter of the cell locations. The Borders command lets you add a variety of line styles to a worksheet that can make reading the worksheet much easier. The following steps illustrate methods for adding preset borders and custom borders to a worksheet:

1. Click the down arrow to the right of the Borders button in the Font group of commands in the Home page of the Ribbon to view border options. (see **Figure 1.40**).Figure 1.40 Borders Drop-Down Menu




2. Highlight the range A1:D15. Left click the All Borders option from the Borders drop-down menu (see **Figure 1.40**). This will add vertical and horizontal lines to the range A1:D15.
3. Highlight the range A2:D2 by placing the mouse pointer over cell A2 and left clicking and dragging over to cell D2.
4. Click the down arrow to the right of the Borders button.
5. Left click the Thick Bottom Border option from the Borders drop-down menu.
6. Highlight the range A14:D14 and apply a Thick Bottom Border from the drop-down menu. The thick border will help maintain the Excel Formatting Guidelines.
7. Highlight the range A1:D15.
8. Click the down arrow to the right of the Borders button.
9. Click More Borders… at the bottom of the List.
10. This will open the Format Cells dialog box (see **Figure 1.41**). You can access all formatting commands in Excel through this dialog box.
11. In the Style section of the Borders tab, left click the thickest line style (see **Figure 1.41**).
12. Left click the Outline button in the Presets section (see **Figure 1.41**).

13. Click the OK button at the bottom of the dialog box (see **Figure 1.41**).

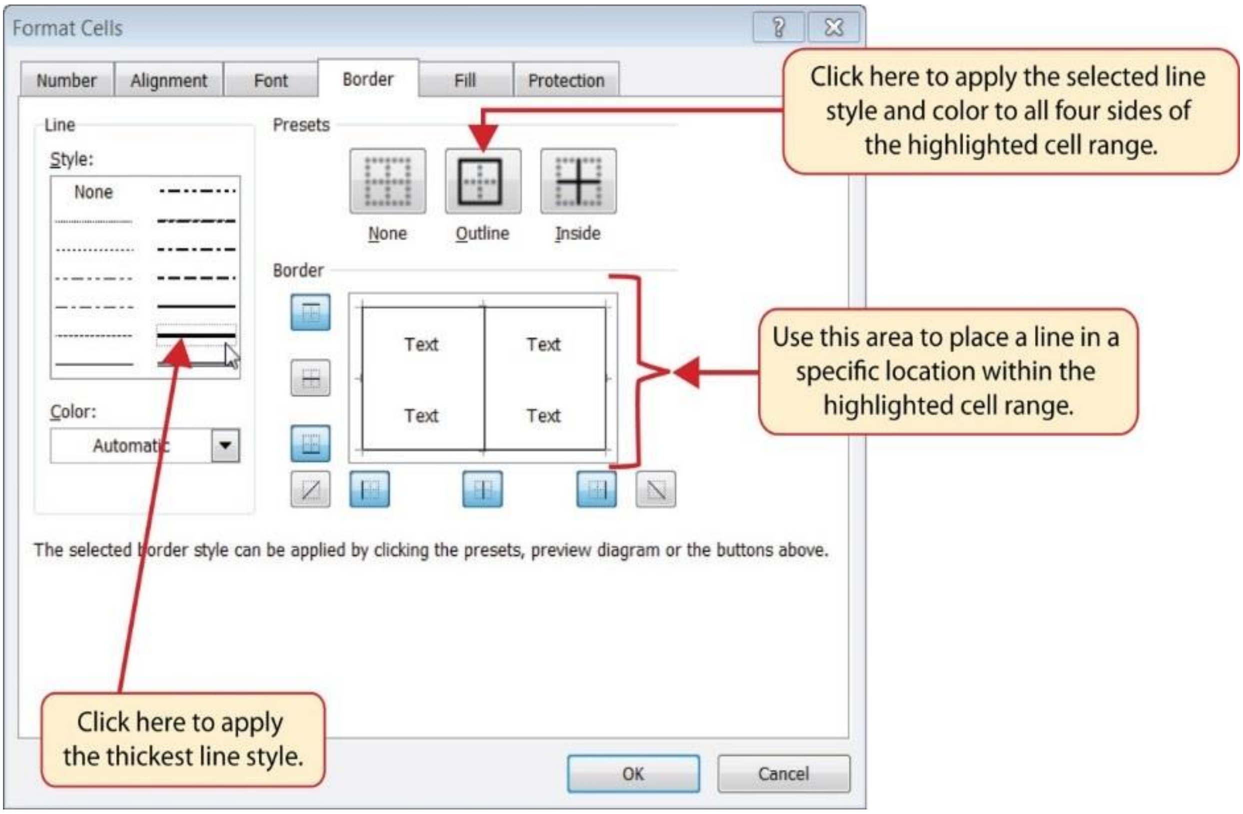
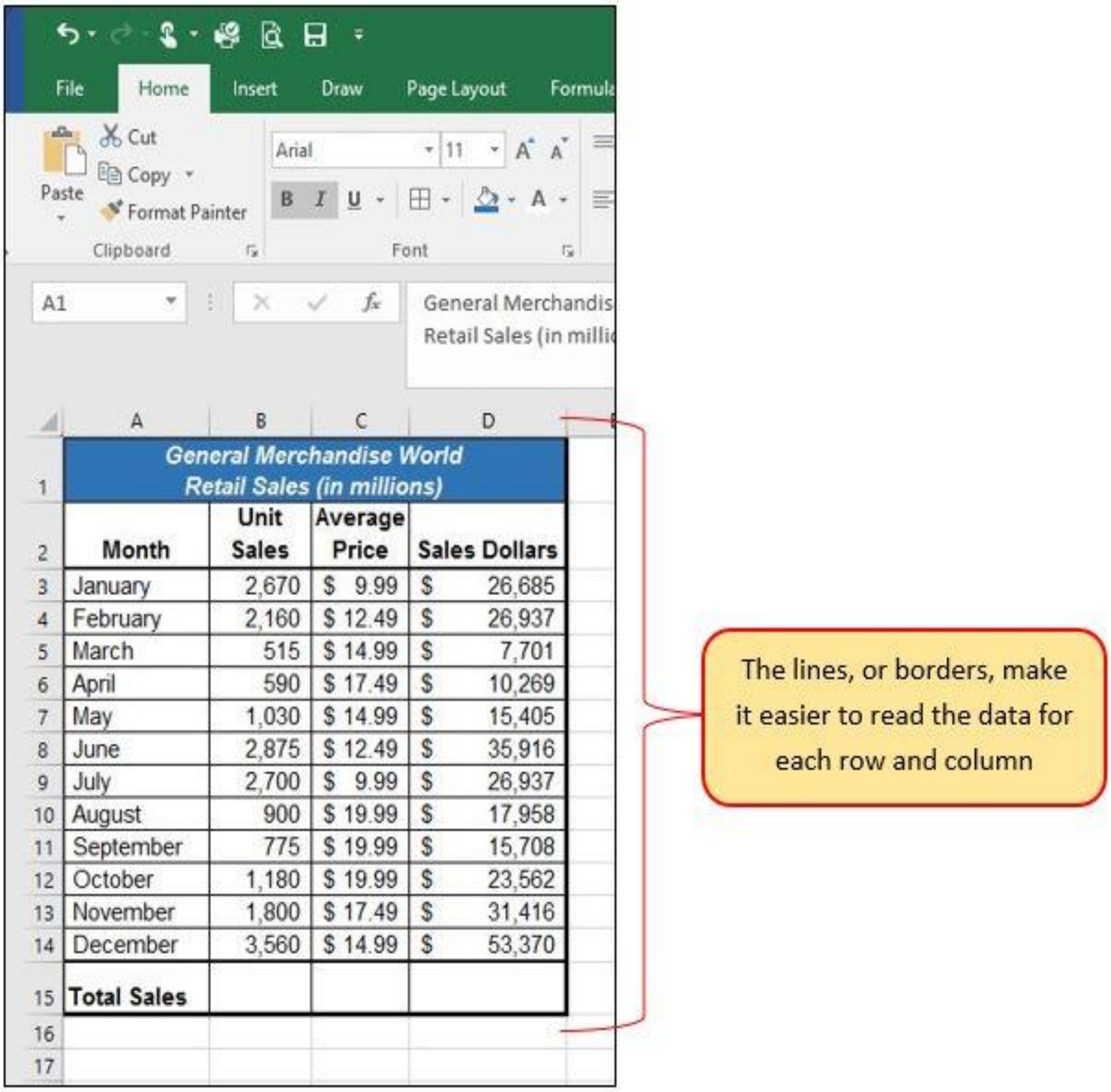


Figure 1.41 Borders Tab of the Format Cells Dialog Box




| | A | B | C | D |
|---|---|---|---|---|
| 1 | General Merchandise World<br>Retail Sales (in millions) | | | |
| 2 | Month | Unit Sales | Average Price | Sales Dollars |
| 3 | January | 2,670 | $ 9.99 | $ 26,685 |
| 4 | February | 2,160 | $ 12.49 | $ 26,937 |
| 5 | March | 515 | $ 14.99 | $ 7,701 |
| 6 | April | 590 | $ 17.49 | $ 10,269 |
| 7 | May | 1,030 | $ 14.99 | $ 15,405 |
| 8 | June | 2,875 | $ 12.49 | $ 35,916 |
| 9 | July | 2,700 | $ 9.99 | $ 26,937 |
| 10 | August | 900 | $ 19.99 | $ 17,958 |
| 11 | September | 775 | $ 19.99 | $ 15,708 |
| 12 | October | 1,180 | $ 19.99 | $ 23,562 |
| 13 | November | 1,800 | $ 17.49 | $ 31,416 |
| 14 | December | 3,560 | $ 14.99 | $ 53,370 |
| 15 | Total Sales | | | |
| 16 | | | | |
| 17 | | | | |

Figure 1.42 Borders Added to the Sheet1 Worksheet

Preset Borders

1. Highlight a range of cells that require borders.
2. Click the Home tab of the Ribbon.
3. Click the down arrow next to the Borders button.
4. Select an option from the preset borders list.

Custom Borders

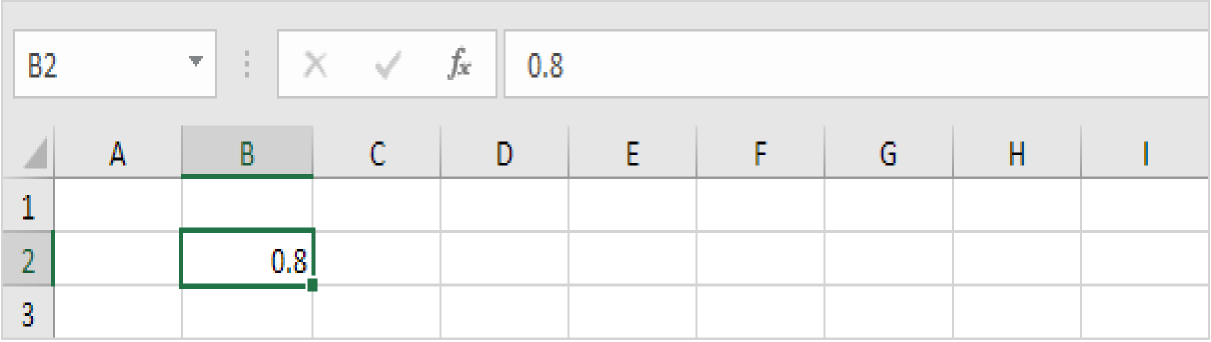
1. Highlight a range of cells that require borders.
2. Click the Home tab of the Ribbon.
3. Click the down arrow next to the Borders button.
4. Select the More Borders option at the bottom of the options list.
5. Select a line style and line color.
6. Select a placement option.
7. Click the OK button on the dialog box.

## Lesson 4 - Working with Cells and Ranges in Excel

### Format Cells

When we format cells in Excel, we change the appearance of a number without changing the number itself. We can apply a number format (0.8, $0.80, 80%, etc) or other formatting (alignment, font, border, etc).

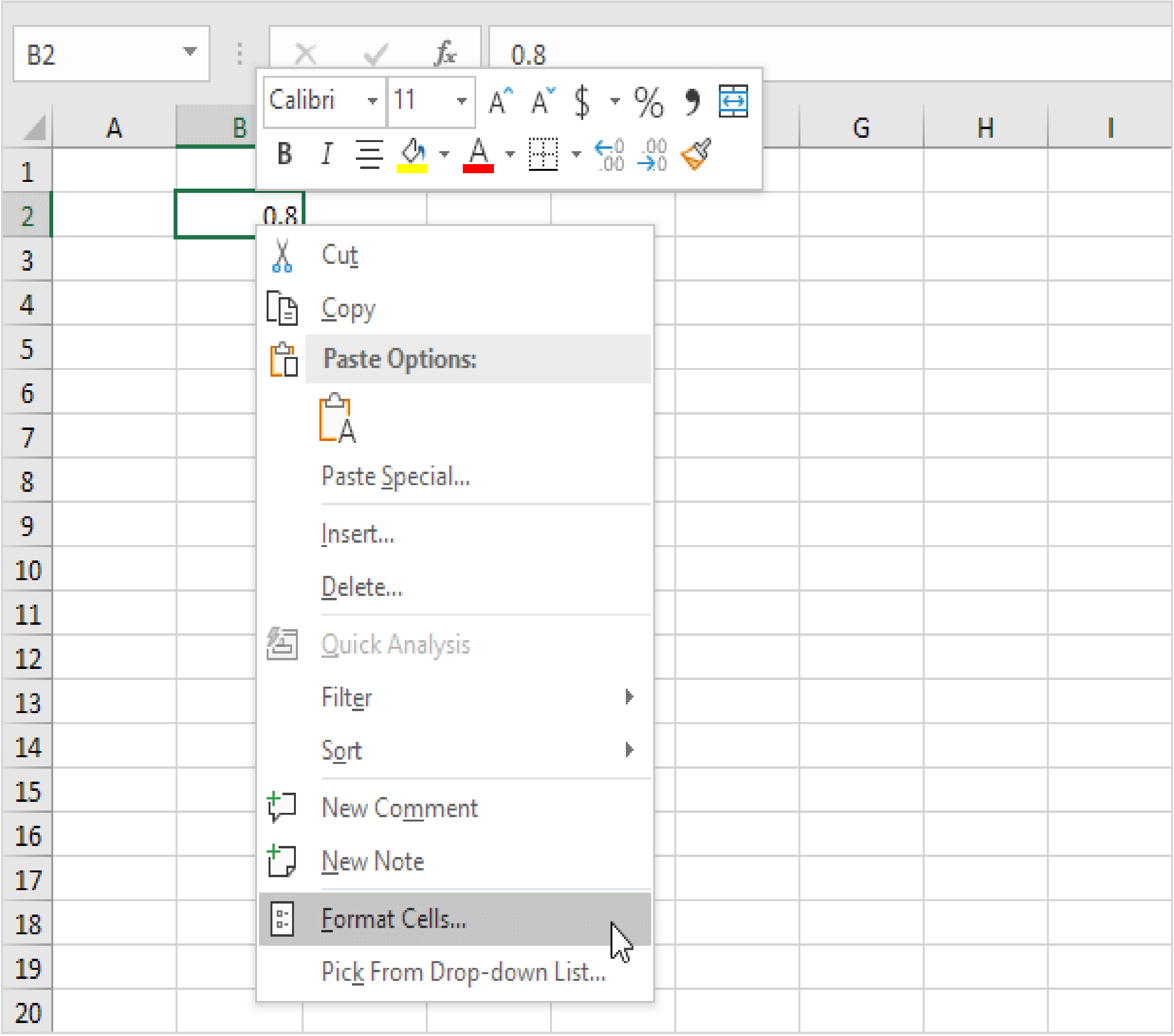
1. Enter the value 0.8 into cell B2.




By default, Excel uses the General format (no specific number format) for numbers. To apply a number format, use the 'Format Cells' dialog box.

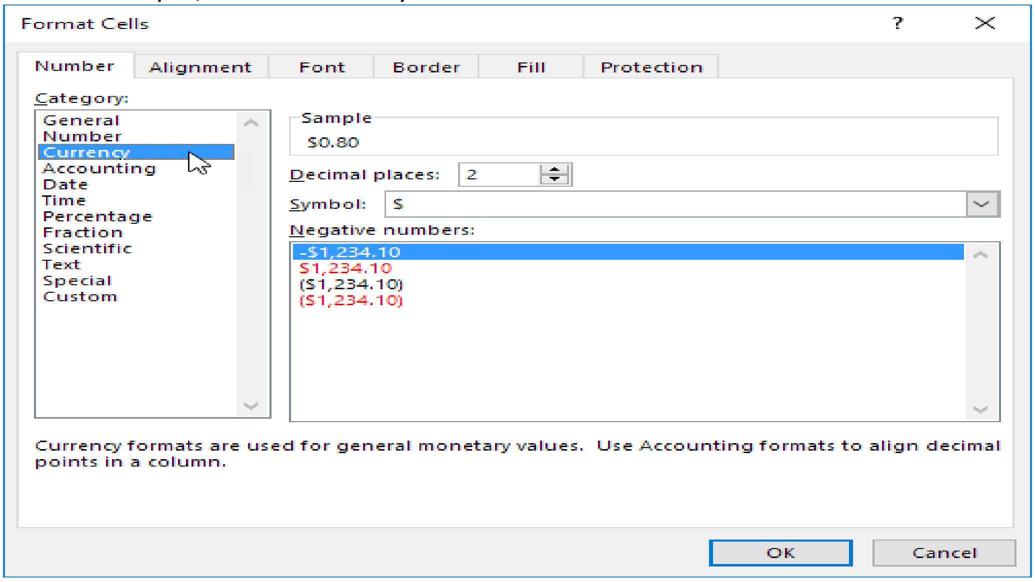
2. Select cell B2.

3. Right click, and then click Format Cells (or press CTRL + 1).



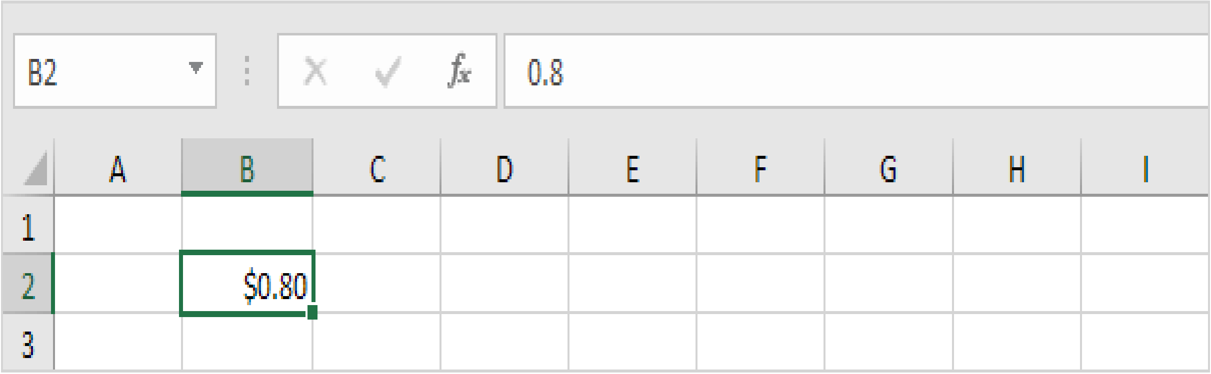

The 'Format Cells' dialog box appears.

4. For example, select Currency.

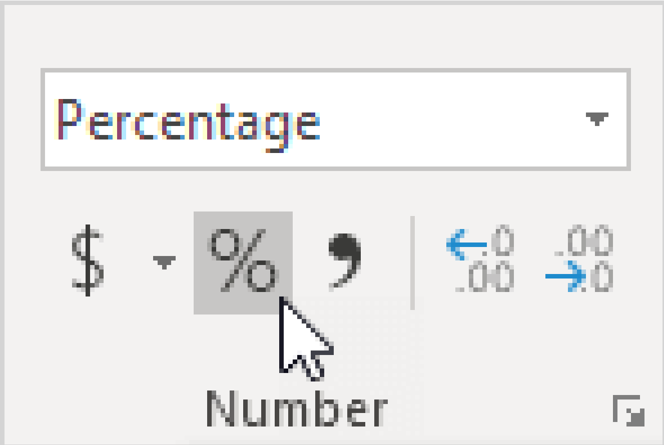



Note: Excel gives you a life preview of how the number will be formatted (under Sample).

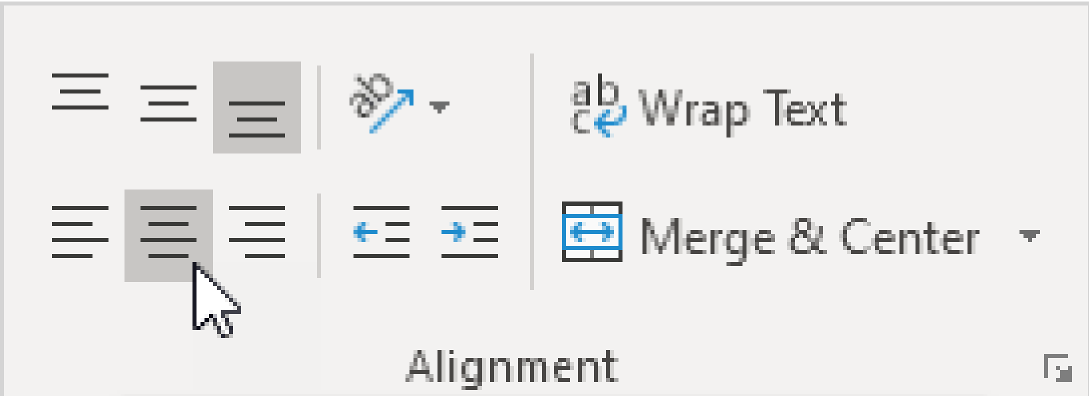
5. Click OK.



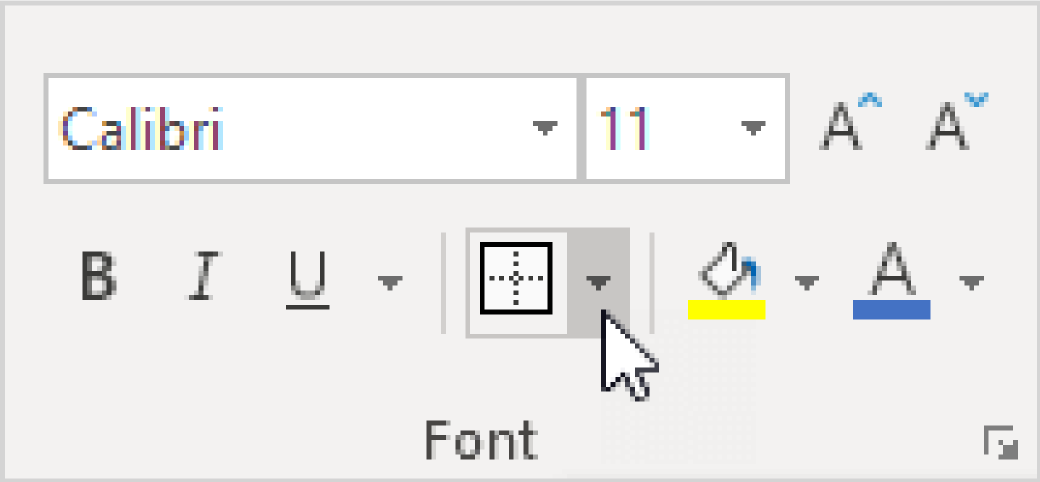

Cell B2 still contains the number 0.8. We only changed the appearance of this number.
The most frequently used formatting commands are available on the Home tab.
6. On the Home tab, in the Number group, click the percentage symbol to apply a Percentage format.



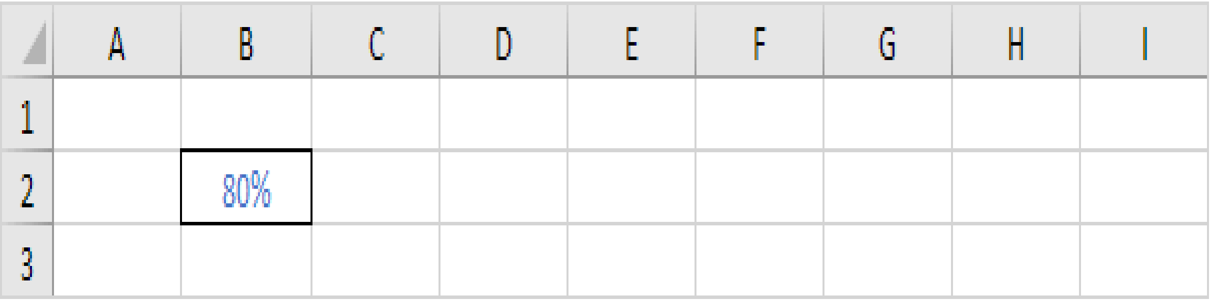

7. On the Home tab, in the Alignment group, center the number.




8. On the Home tab, in the Font group, add outside borders and change the font color to blue.



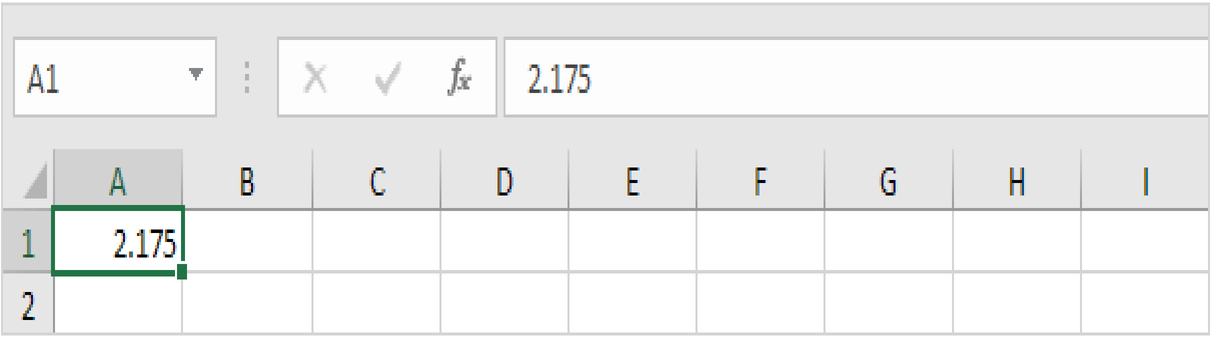

Result:



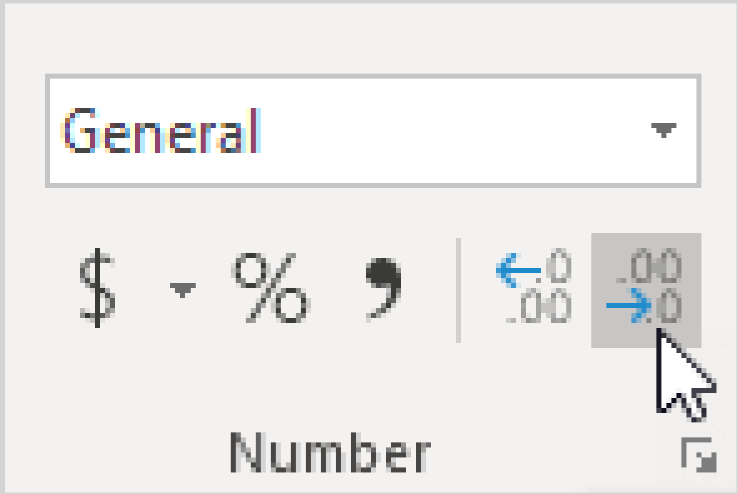

Decimal Places

Learn how to show fewer decimal places in Excel without changing the number itself. You can also round a number.

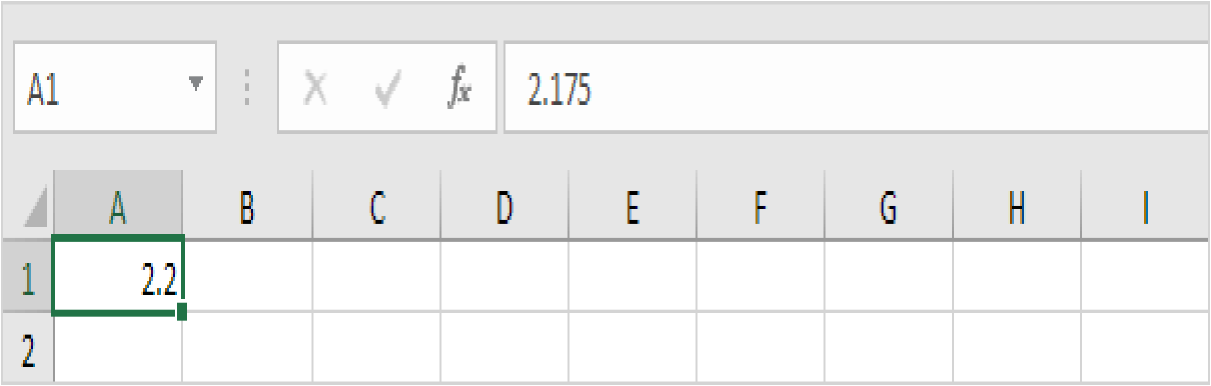
1. Enter the value 2.175 into cell A1.




2. On the Home tab, in the Number group, click the Decrease Decimal button twice.

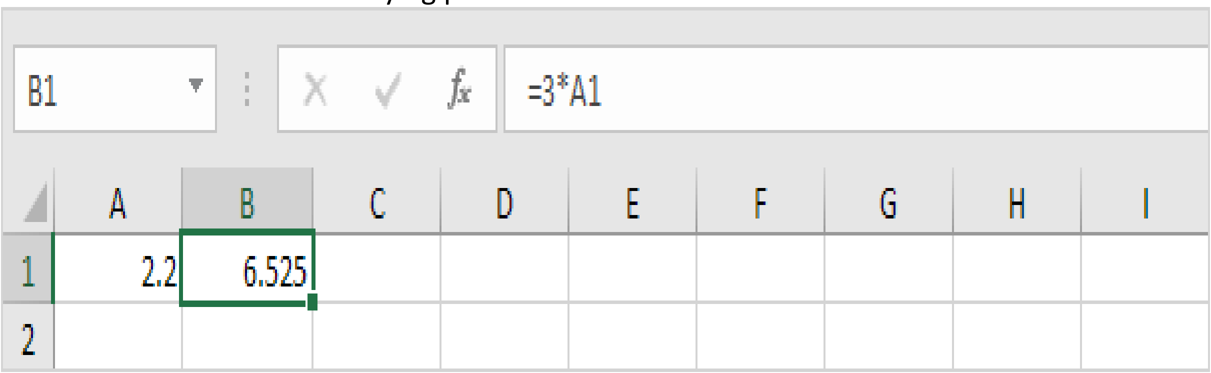



Result:




Note: if you look at the formula bar, you can see that cell A1 still contains the value 2.175.

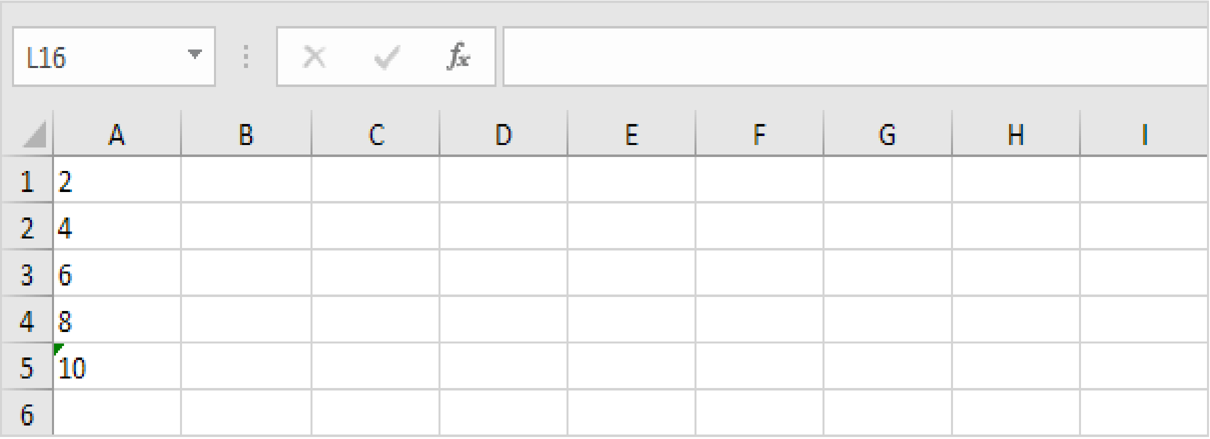
3. We can still use this underlying precise value in calculations.



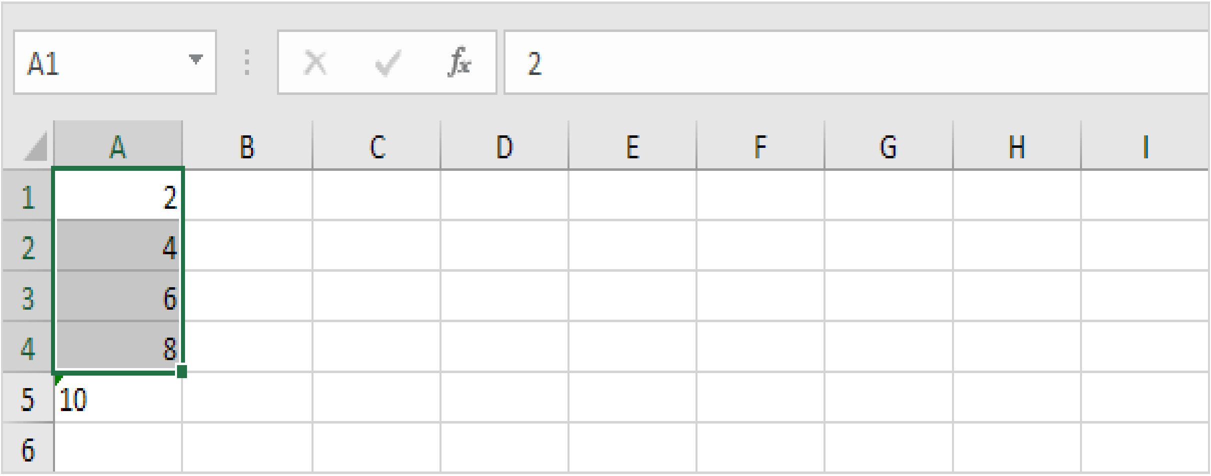

Note: if you want to use 2.2 to get a result of 6.6, round the value in cell A1.

## Text to Numbers

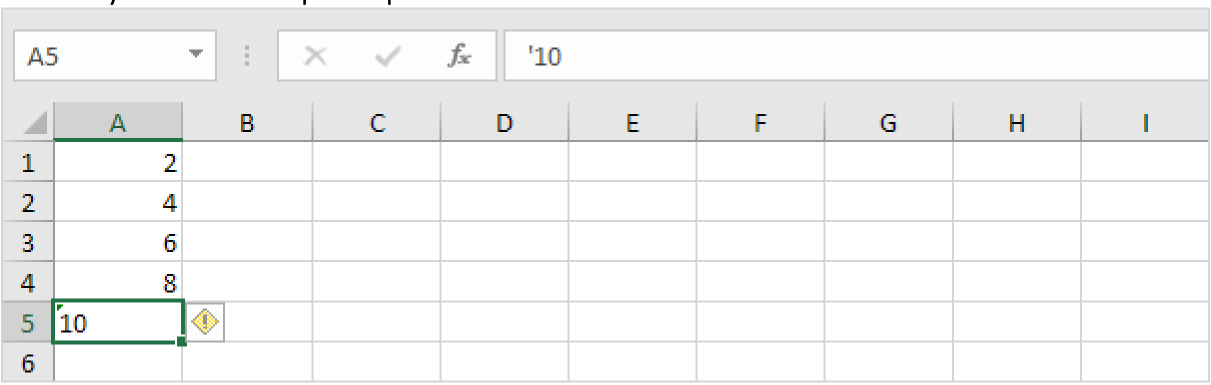
By default, text is left-aligned and numbers are right-aligned. This example teaches you how to convert 'text strings that represent numbers' to numbers.



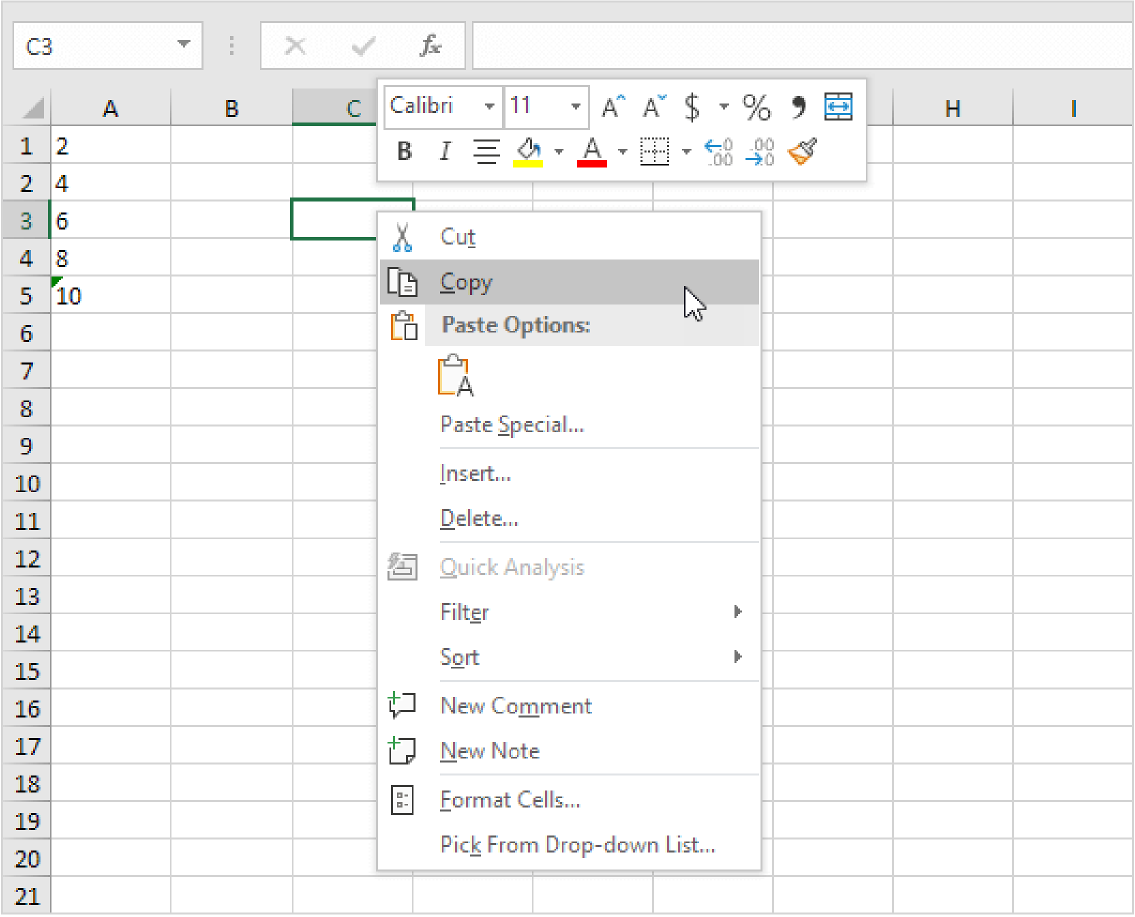

1. Select the range A1:A4 and change the number format to General.




2. Numbers preceded by an apostrophe are also treated as text. Select cell A5 and manually remove the apostrophe.

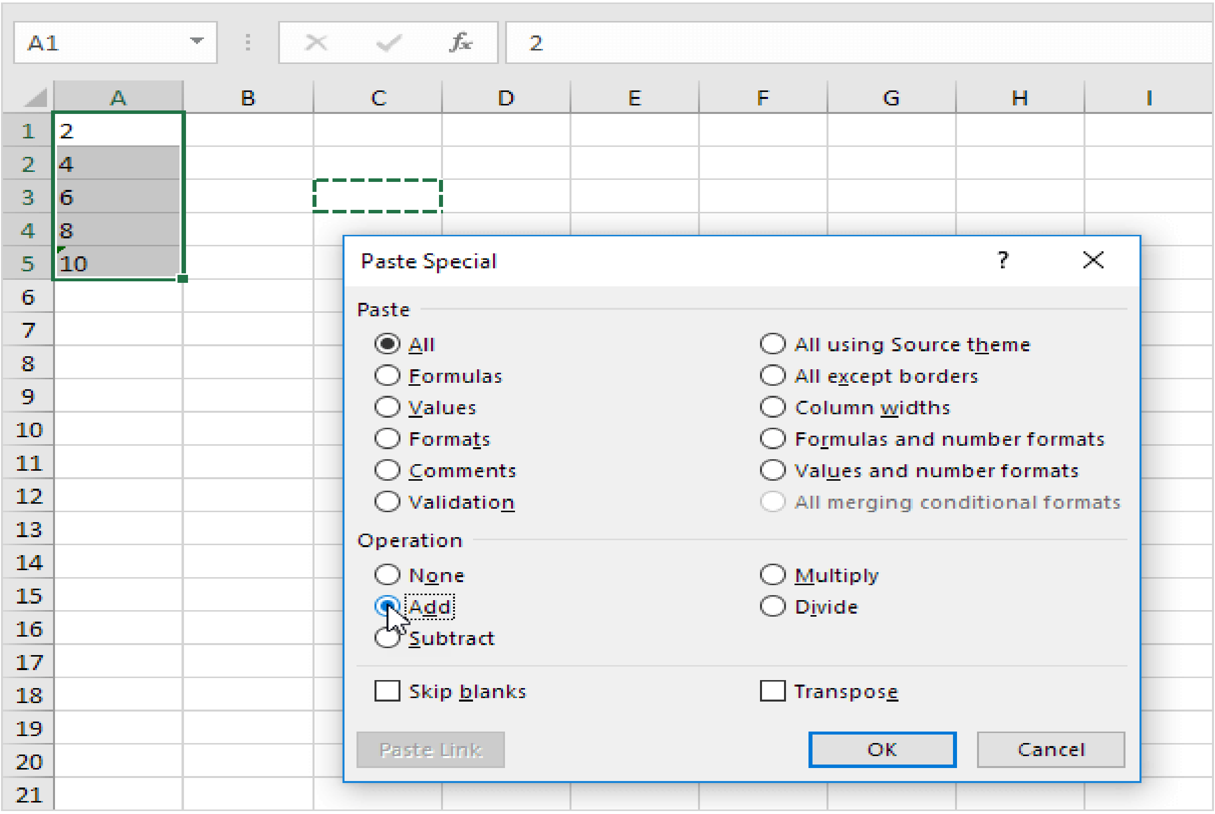



3a. you can also combine step 1 and 2 by adding an empty cell to the range A1:A5. By doing this, you let Excel know that these text strings are numbers. Copy an empty cell.



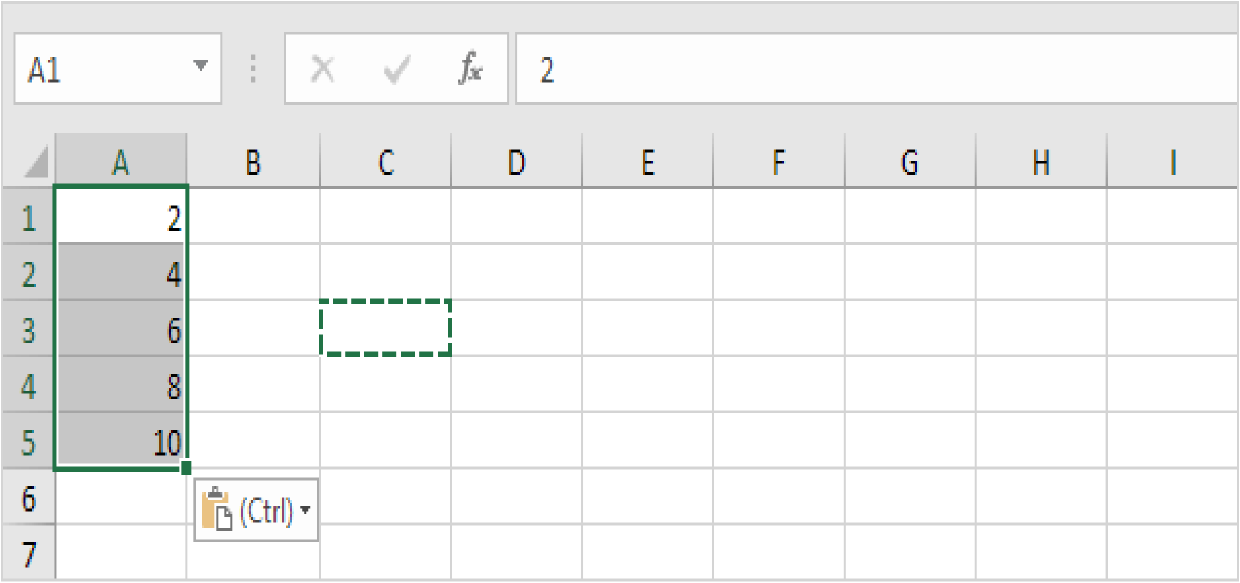

3b. Select the range A1:A5, right click, and then click Paste Special.

3c. Click Add.

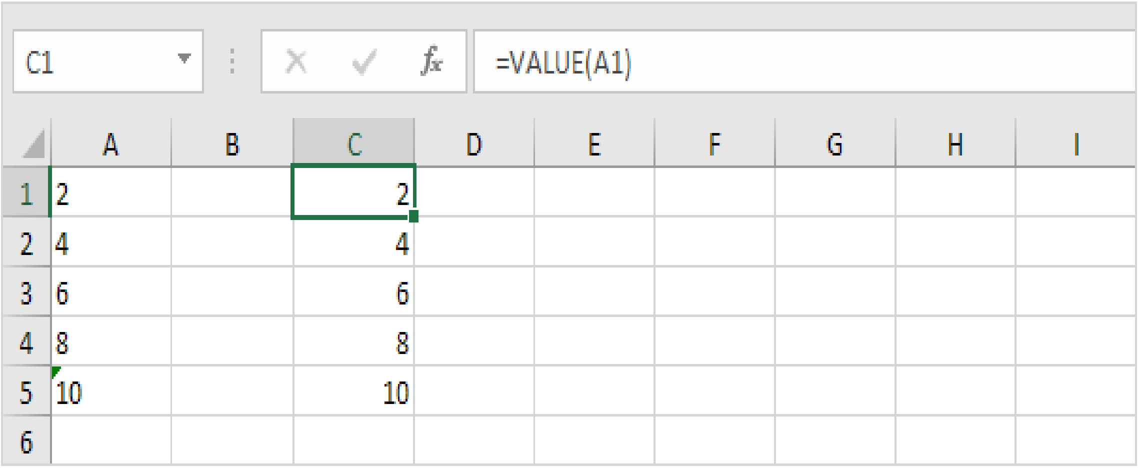


3d. Click OK.

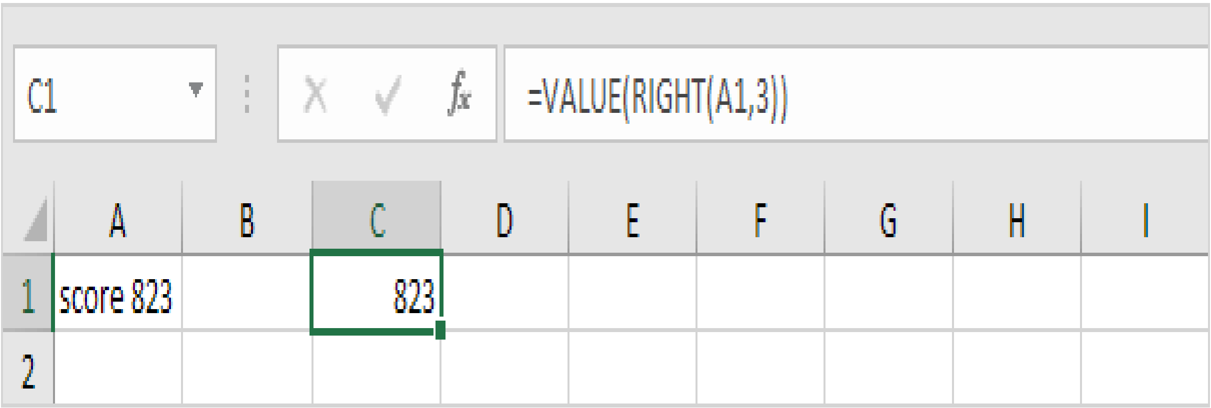
Result. All numbers are right-aligned and treated as numbers.




4a. you can also use the VALUE function.

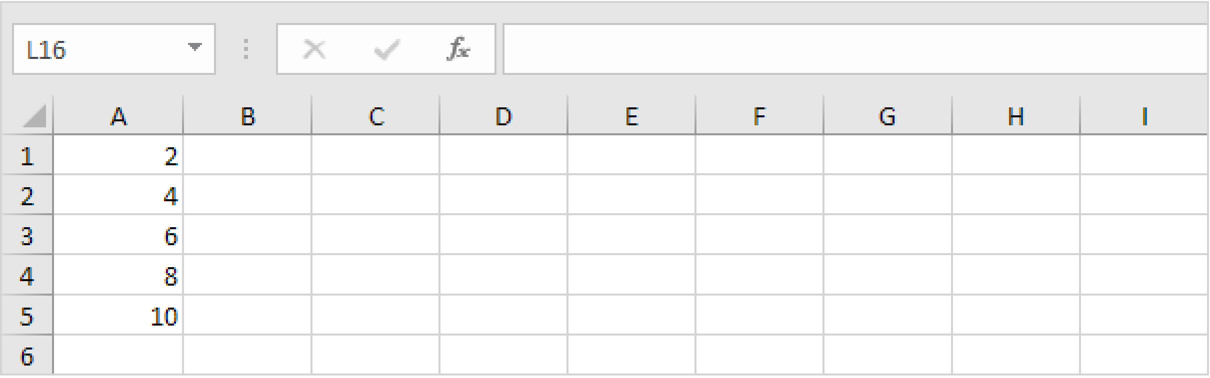



4b. here's another example. Use the RIGHT function (or any other text function) to extract characters from a text string and then use the VALUE function to convert these characters to a number.

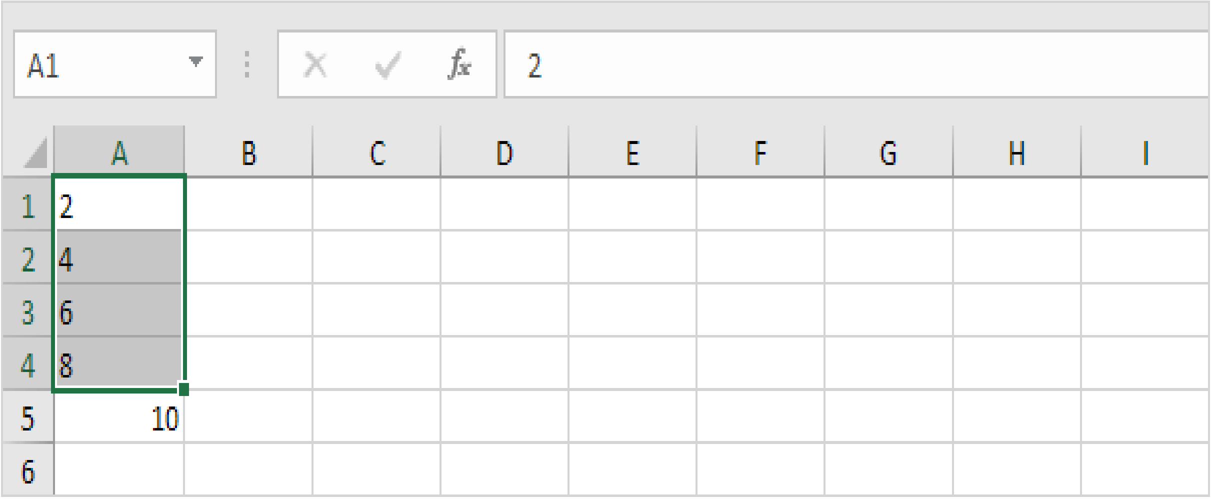



Numbers to Text

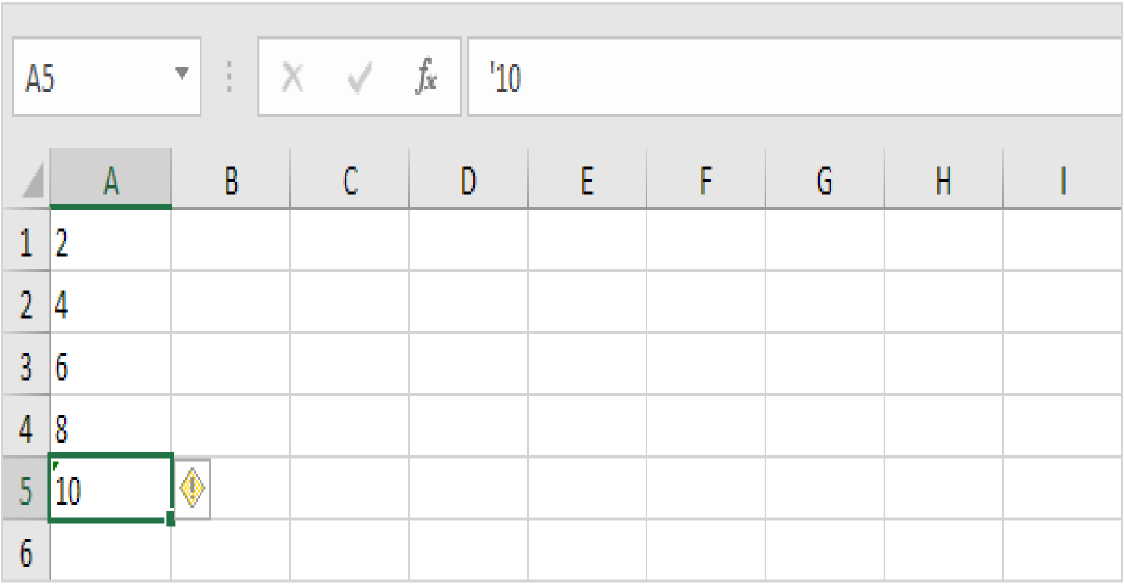
By default, numbers are right-aligned and text is left-aligned. This example teaches you how to convert numbers to 'text strings that represent numbers'.



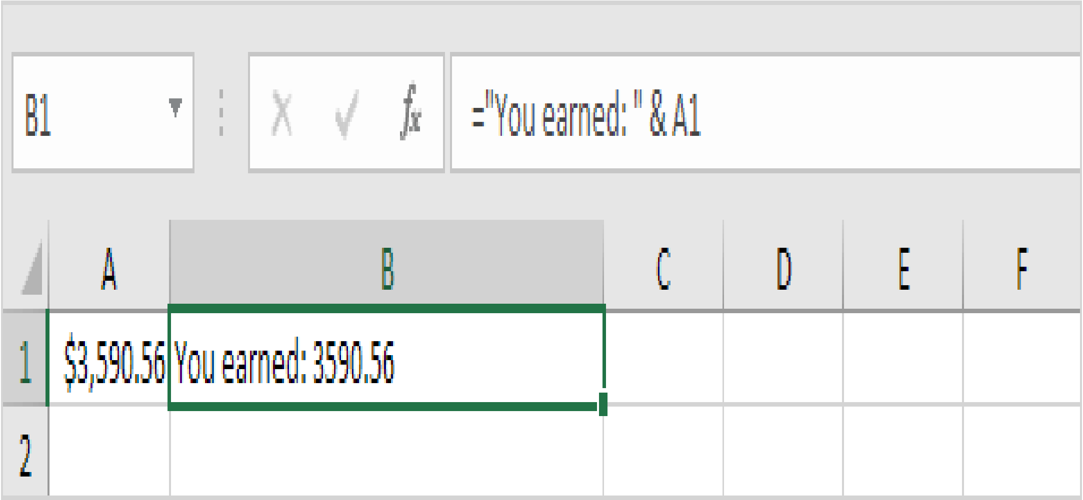

1. Select the range A1:A4 and change the number format to Text.



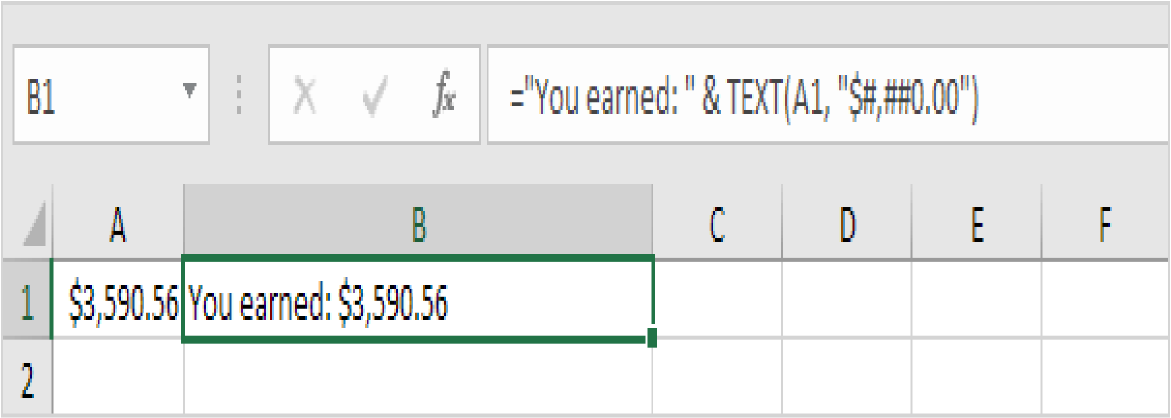

2. Precede a number by an apostrophe and it will also be treated as text.




3a. If you add text to a number and still want to format this number, use the TEXT function. Without using the TEXT function this would be the result.

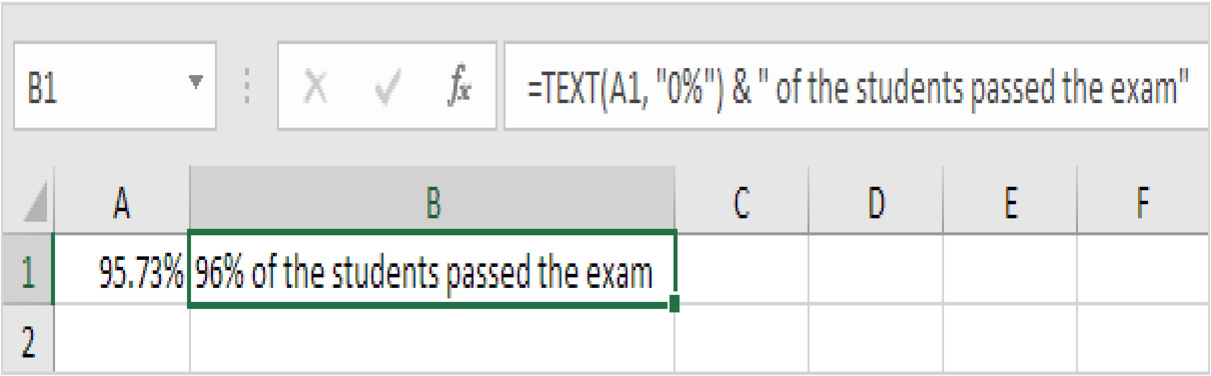



3b. With the TEXT function.



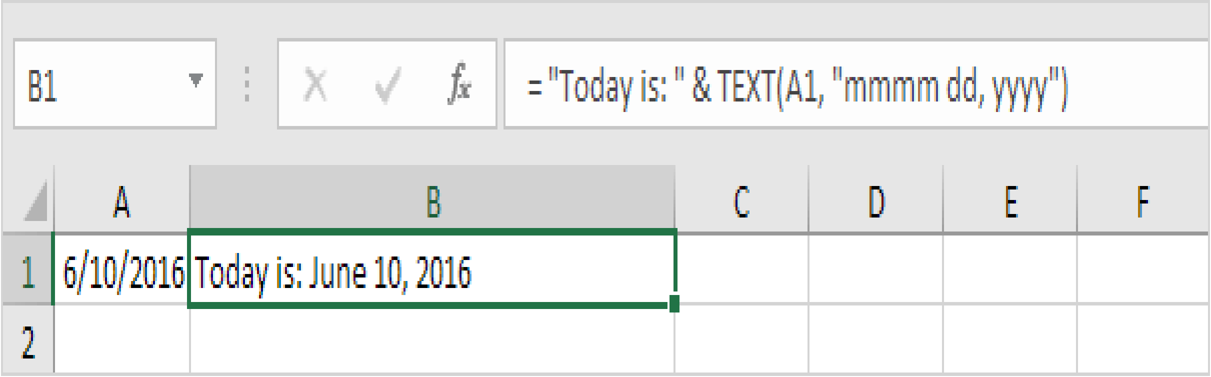

Note: #,## is used to add comma's to large numbers.

3c. Here's another example. Apply a percentage format.




Note: use 0 to display the nearest integer value. Use 0.0 for one decimal place. Use 0.00 for two decimal places, etc.

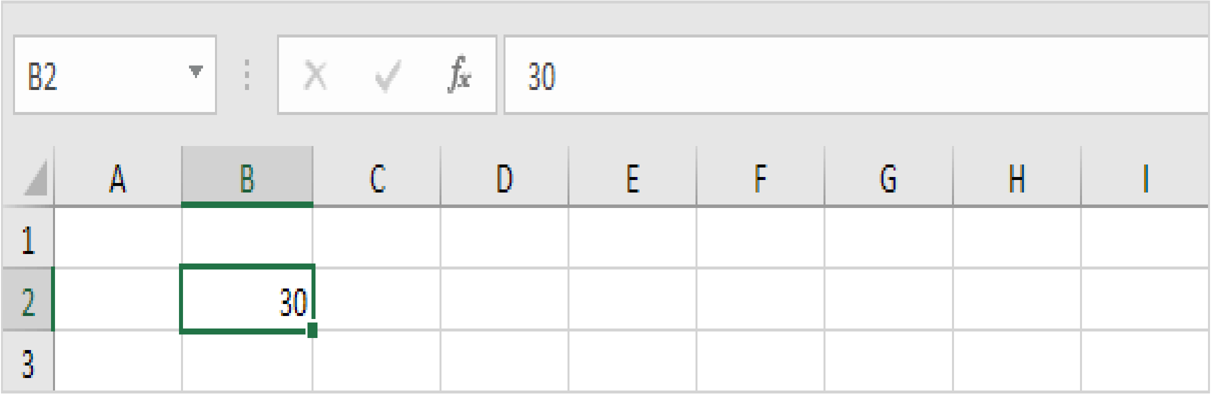
3d. And another example. Format a date.



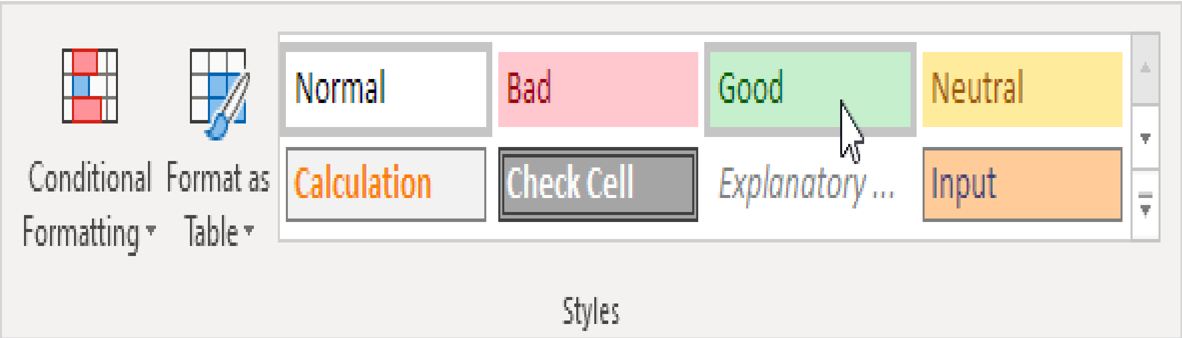

Note: use less/more m's, d's and y's to change the appearance of the date. Visit our page about the TEXT function for many more examples.

Cell Styles

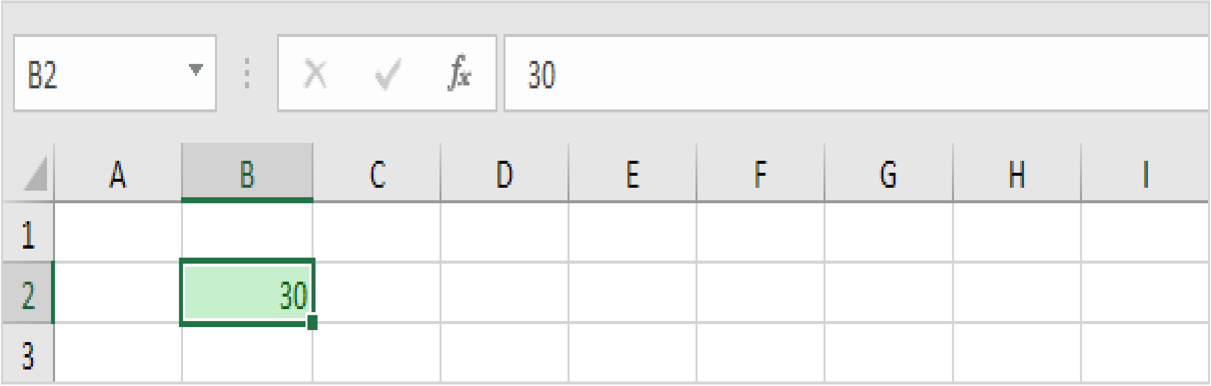
Quickly format a cell by choosing a cell style. You can also create your own cell style.
Quickly format a range of cells by choosing a table style.
1. For example, select cell B2 below.




2. On the Home tab, in the Styles group, choose a cell style.

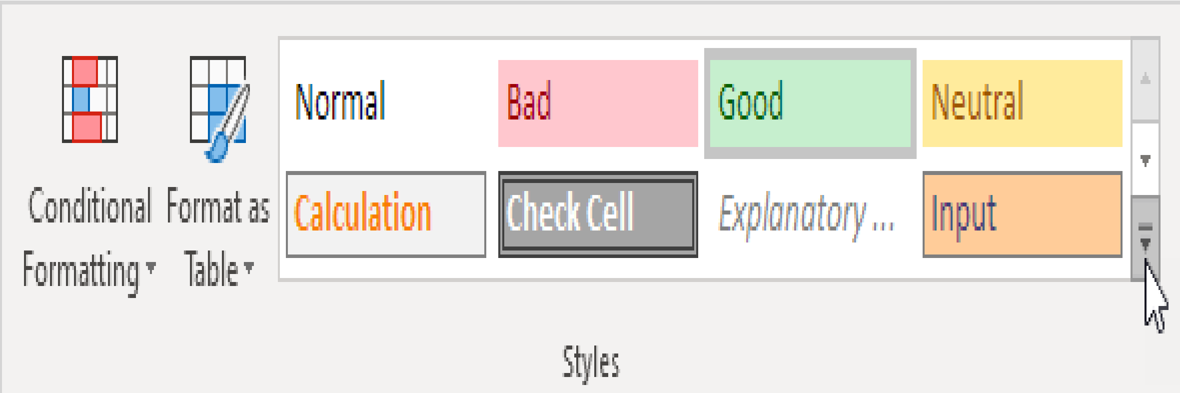



Result.



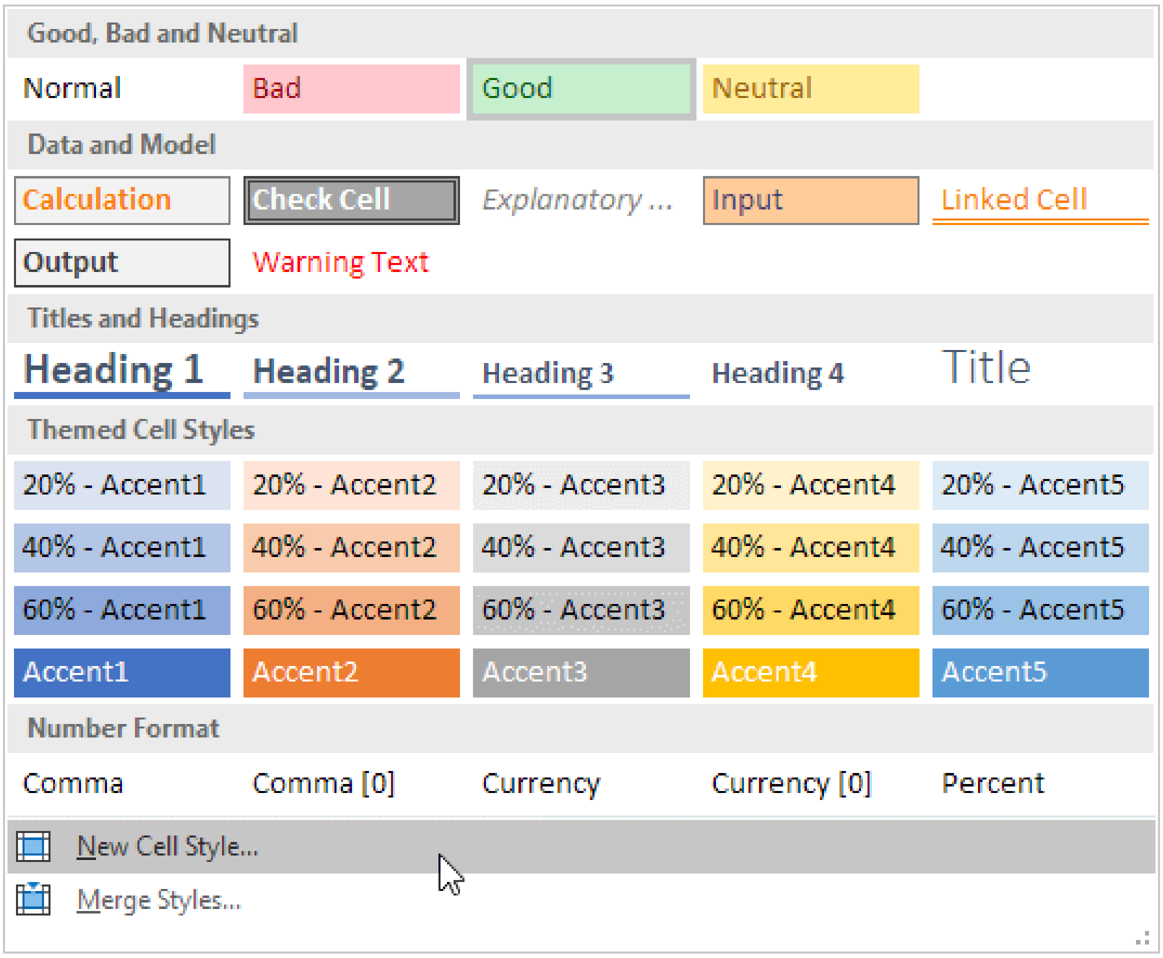

To create your own cell style, execute the following steps.

3. On the Home tab, in the Styles group, click the bottom right down arrow.

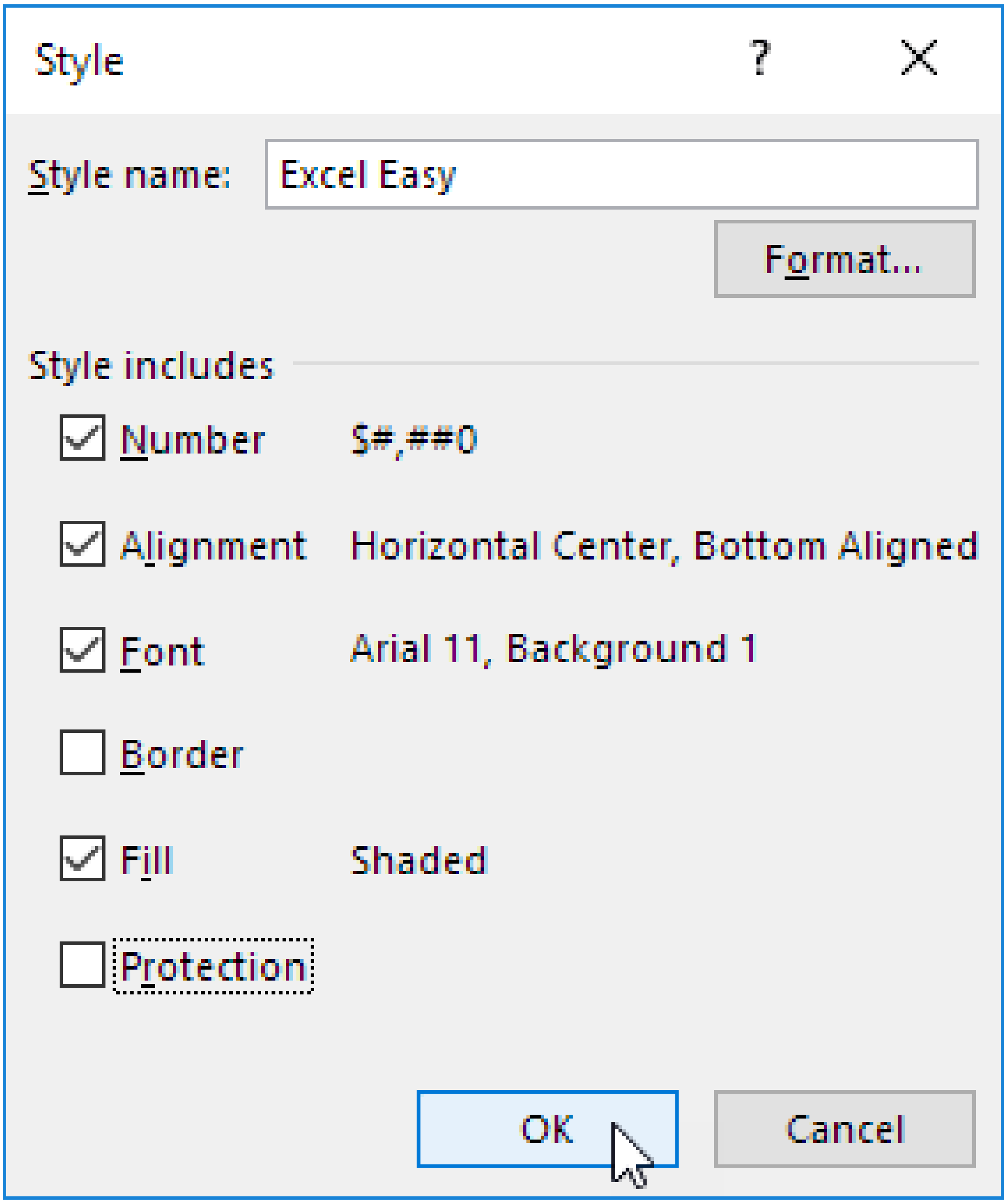



Here you can find many more cell styles.

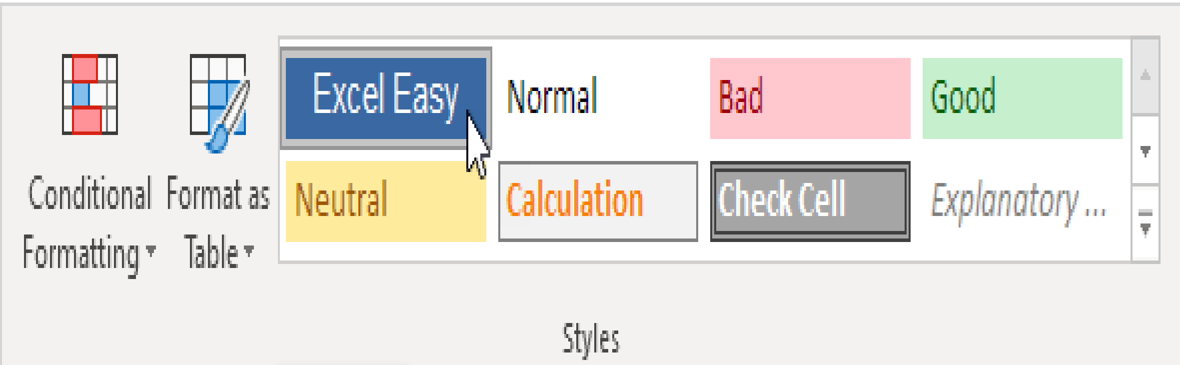
4. Click New Cell Style.



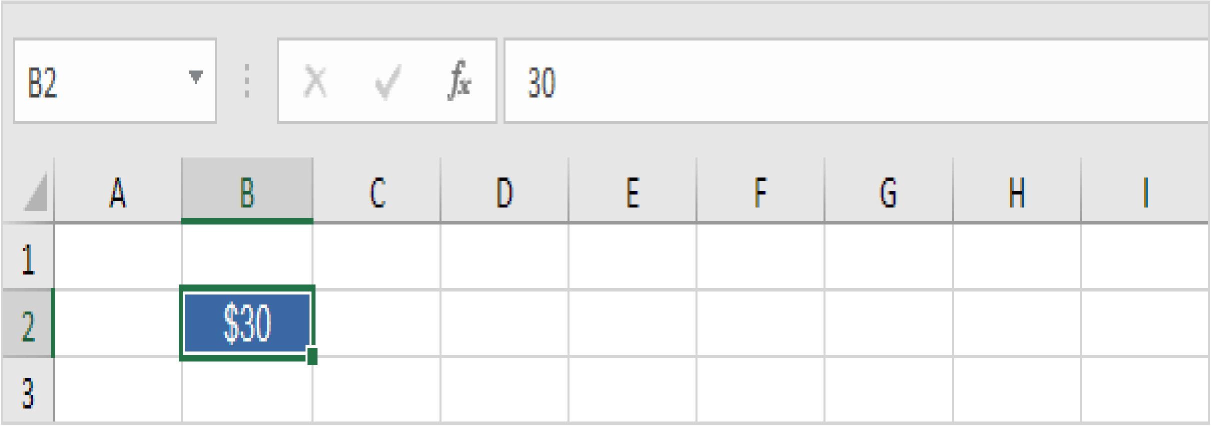

5. Enter a name and click the Format button to define the Number Format, Alignment, Font, Border, Fill and Protection of your cell style. Simply uncheck a check box if you don't want to control this type of formatting.
6. Click OK.




7. On the Home tab, in the Styles group, apply your own cell style.




Result.



Note: right click a cell style to modify or delete it. Modifying a cell style affects all cells in a workbook that use that cell style. This can save a lot of time. A cell style is stored in the workbook where you create it. Open a new workbook and click on Merge Styles (under New Cell Style) to import a cell style (leave the old workbook with the cell style open).

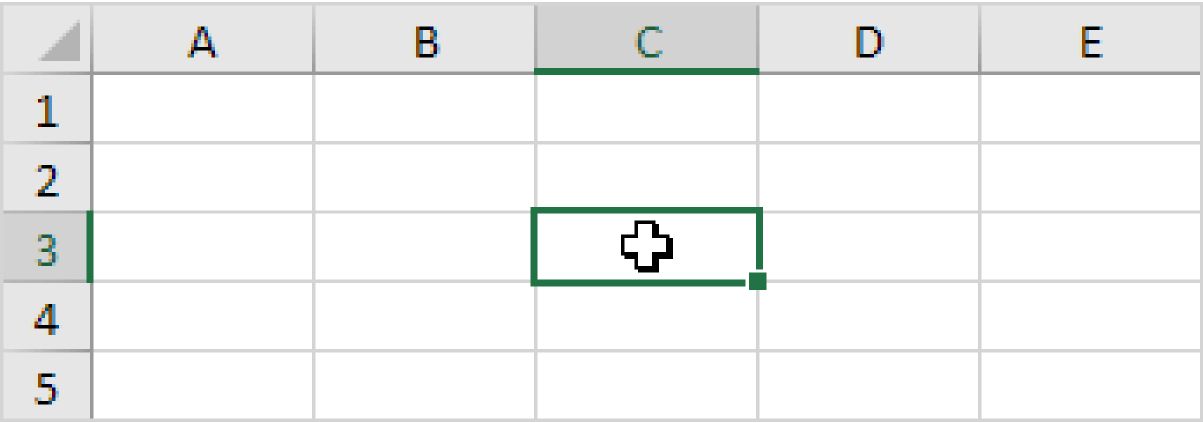
Range

A range in Excel is a collection of two or more cells. This chapter gives an overview of some very important range operations.

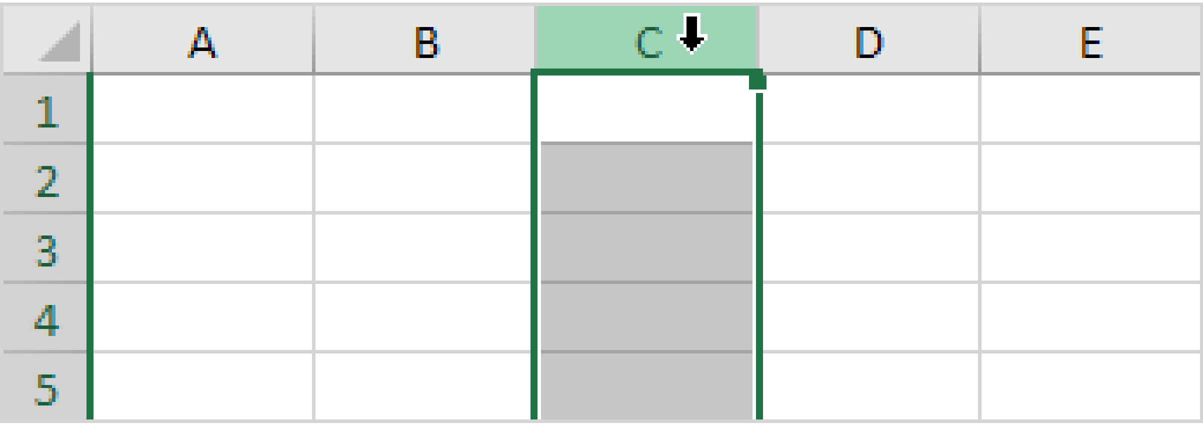
Cell, Row, Column

Let's start by selecting a cell, row and column.

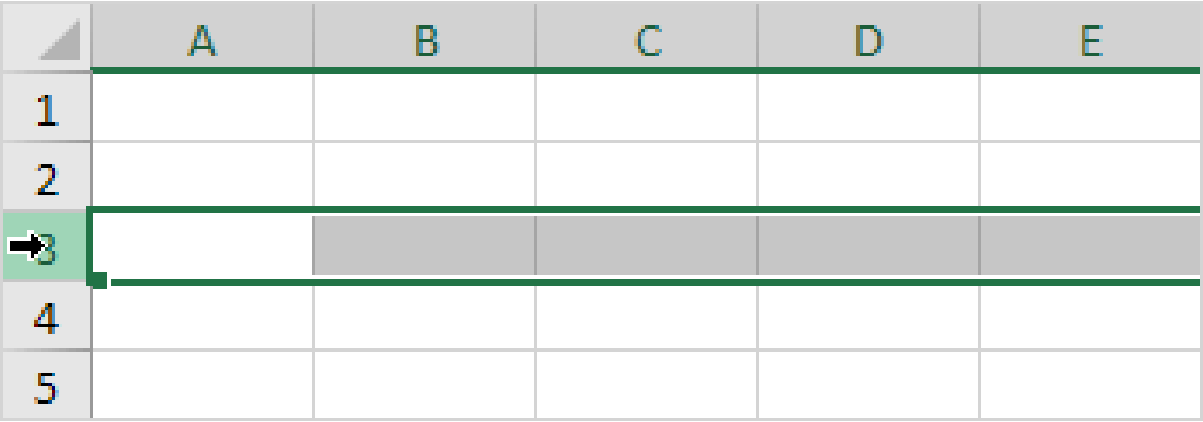
1. To select cell C3, click on the box at the intersection of column C and row 3.



2. To select column C, click on the column C header.



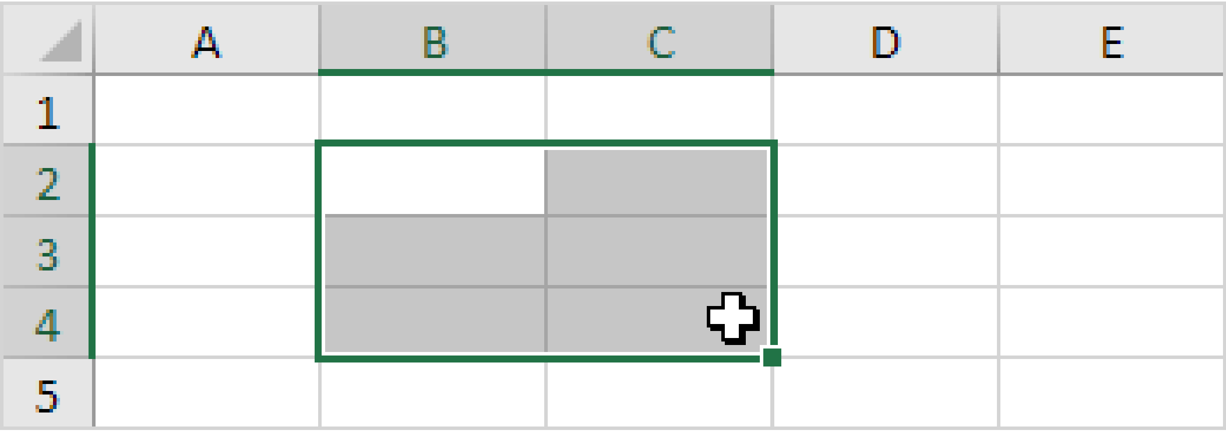
3. To select row 3, click on the row 3 header.



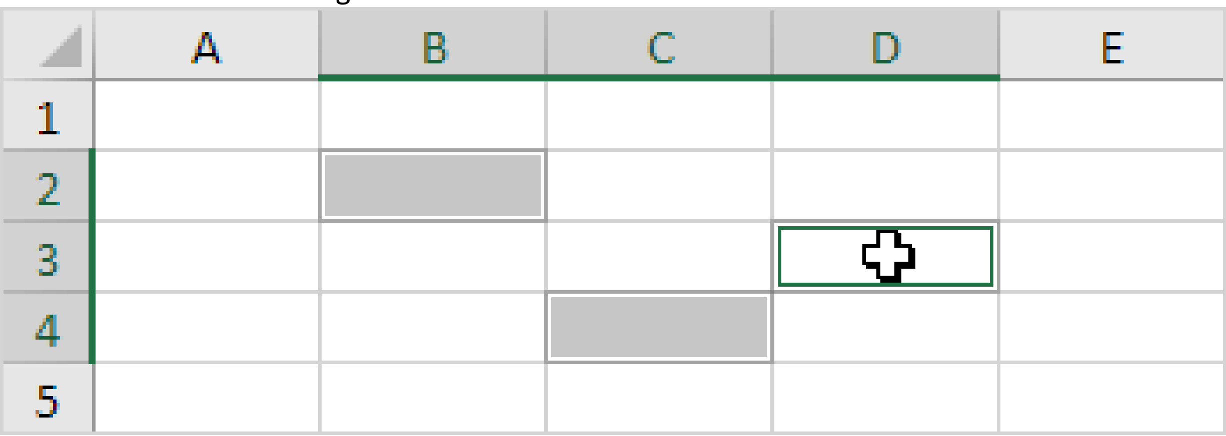

Range Examples

A range is a collection of two or more cells.

1. To select the range B2:C4, click on cell B2 and drag it to cell C4.



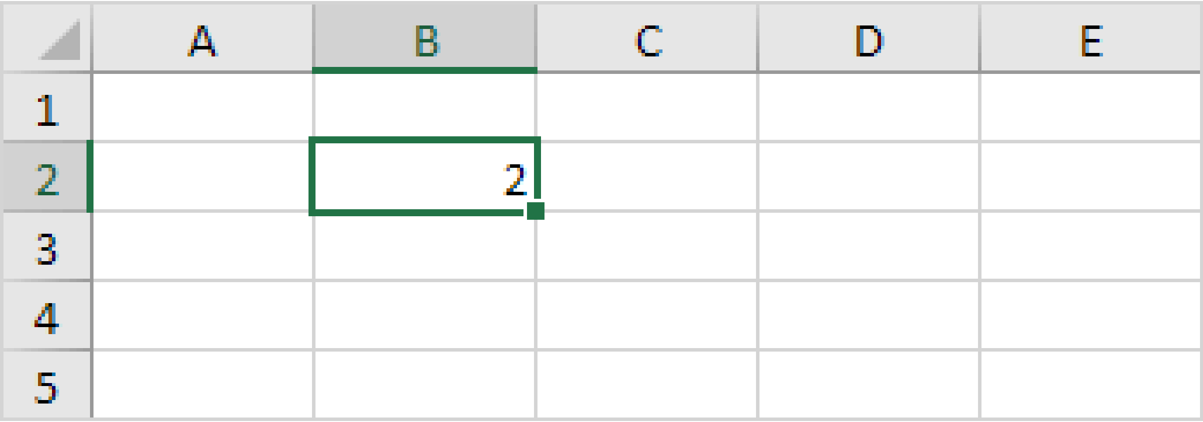

2. To select a range of individual cells, hold down CTRL and click on each cell that you want to include in the range.



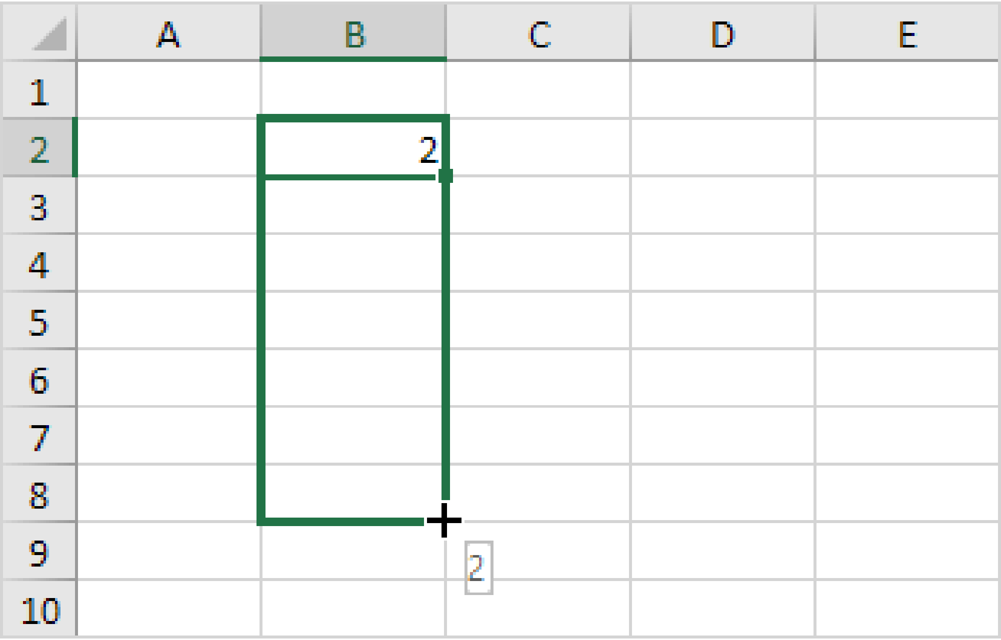

Fill a Range

To fill a range, execute the following steps.

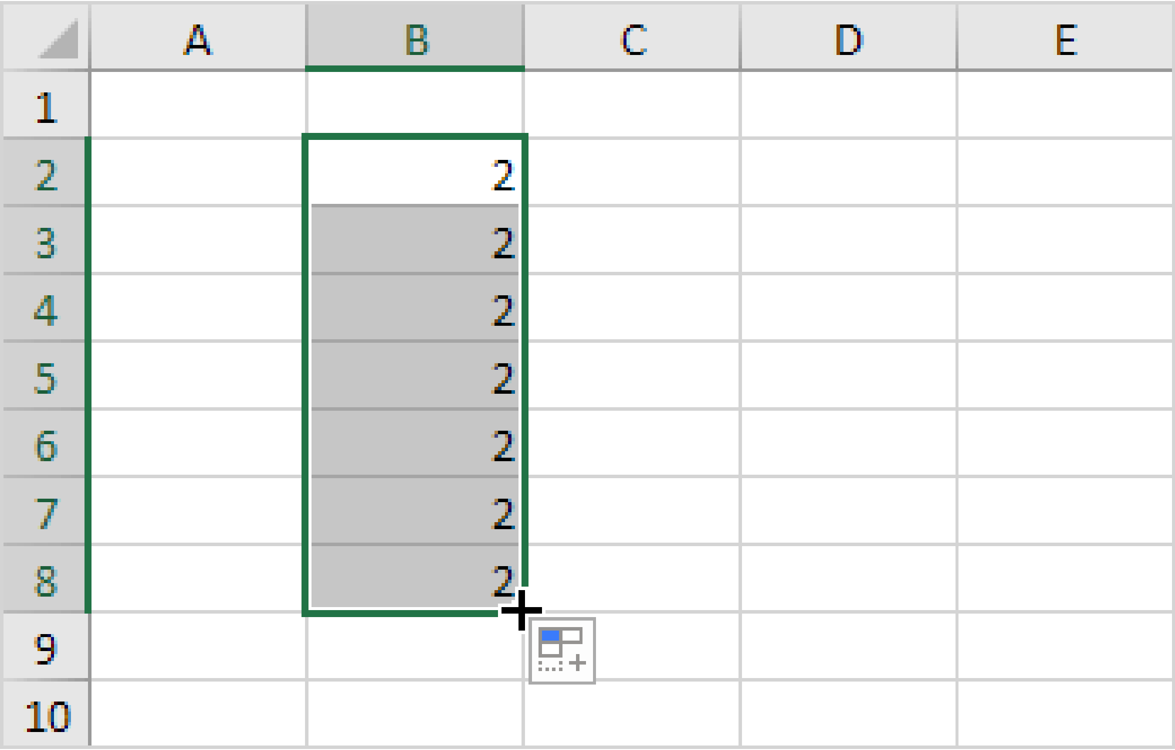
1a. Enter the value 2 into cell B2.




1b. Select cell B2, click on the lower right corner of cell B2 and drag it down to cell B8.

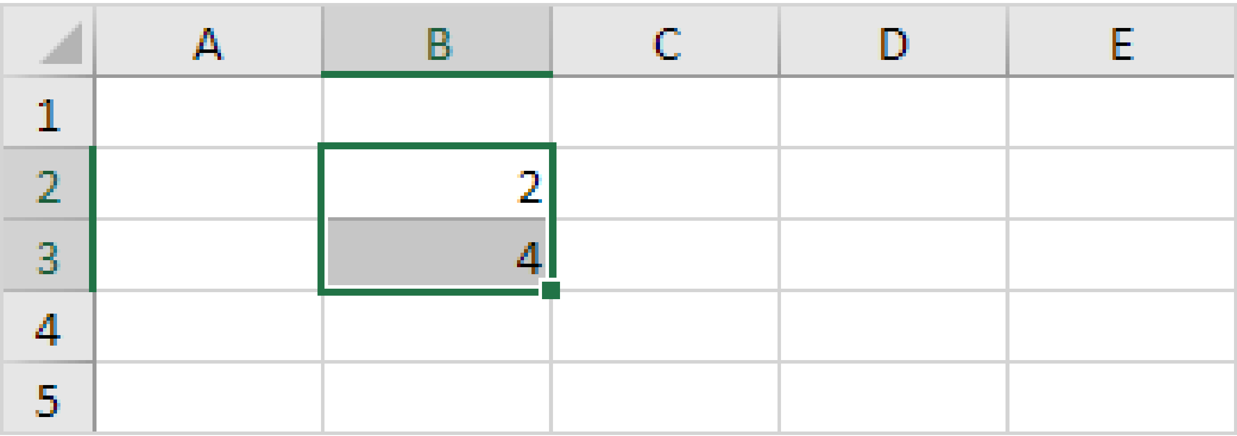



Result:

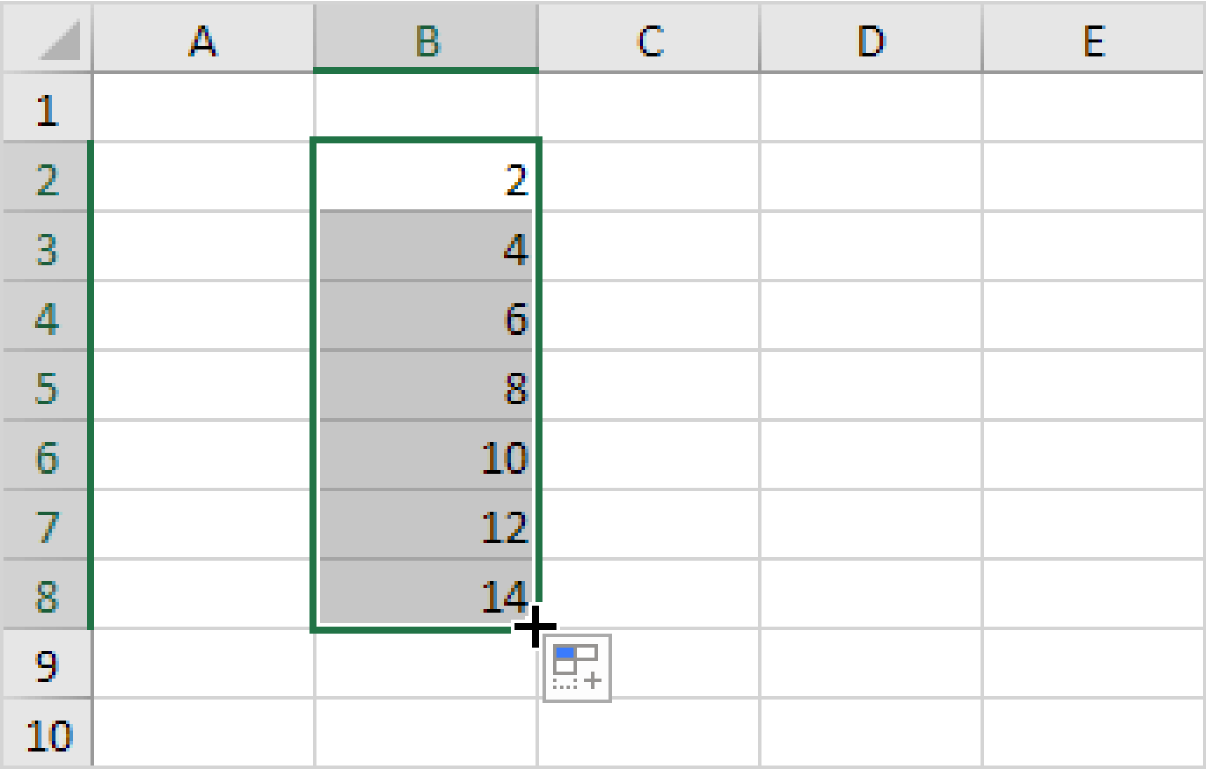



This dragging technique is very important and you will use it very often in Excel. Here's another example.

2a. Enter the value 2 into cell B2 and the value 4 into cell B3.

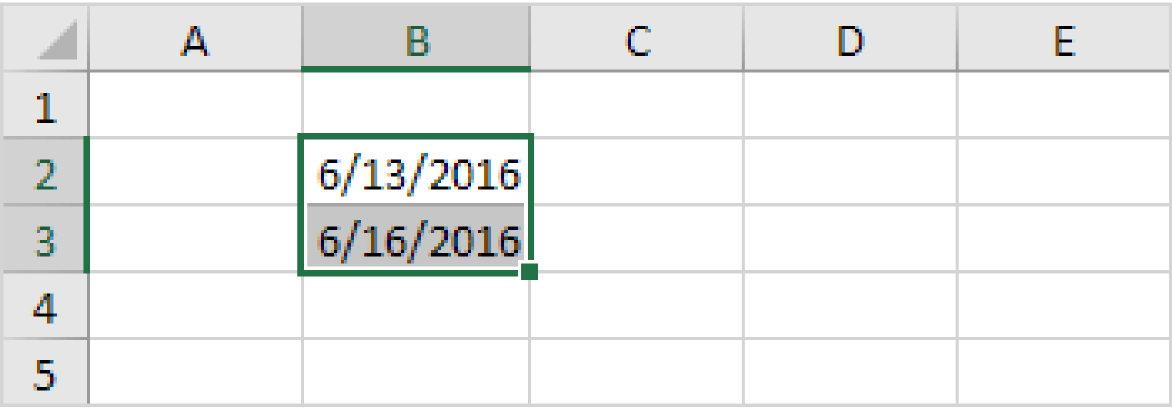



2b. Select cell B2 and cell B3, click on the lower right corner of this range and drag it down.

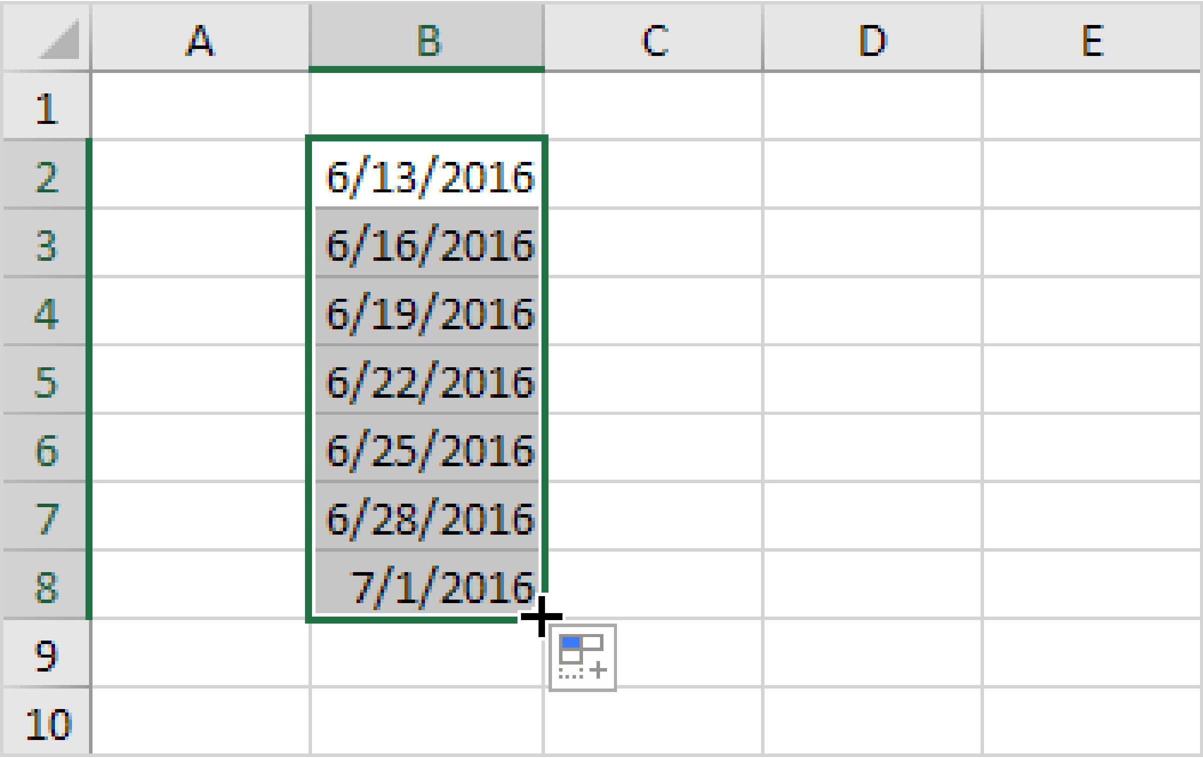



Excel automatically fills the range based on the pattern of the first two values. That's pretty cool huh!? Here's another example.

3a. Enter the date 6/13/2016 into cell B2 and the date 6/16/2016 into cell B3.




3b. Select cell B2 and cell B3, click on the lower right corner of this range and drag it down.

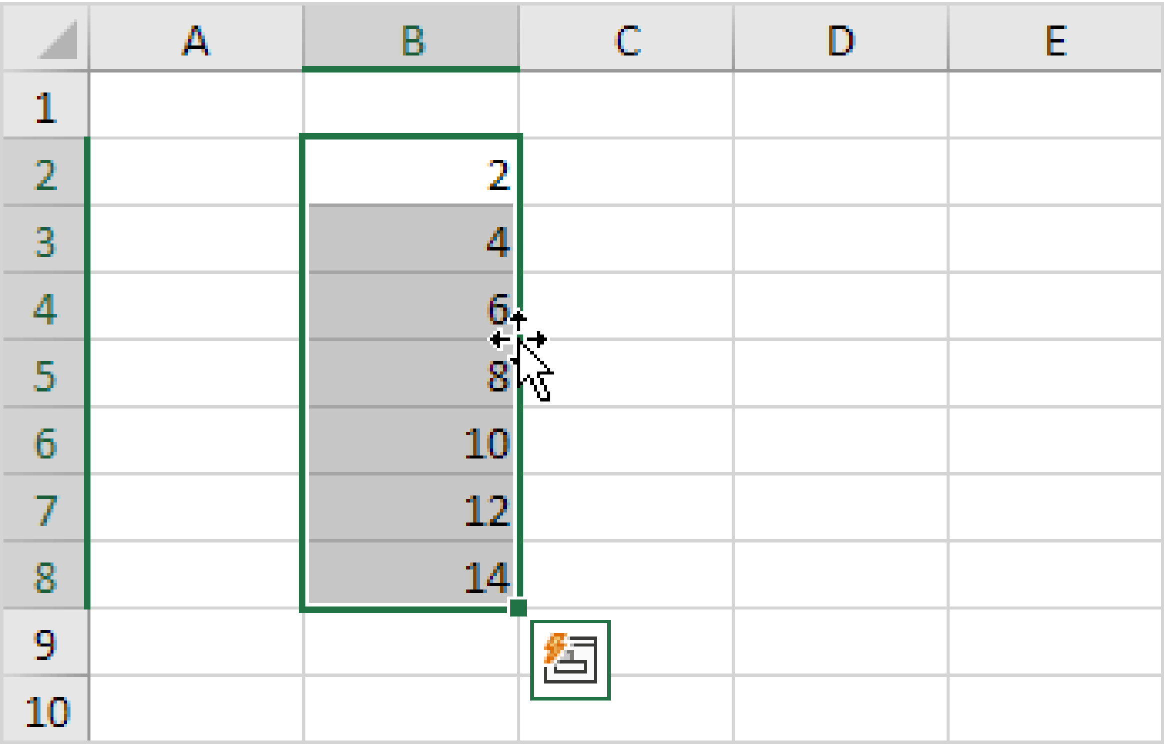



Note: visit our page about AutoFill for many more examples.

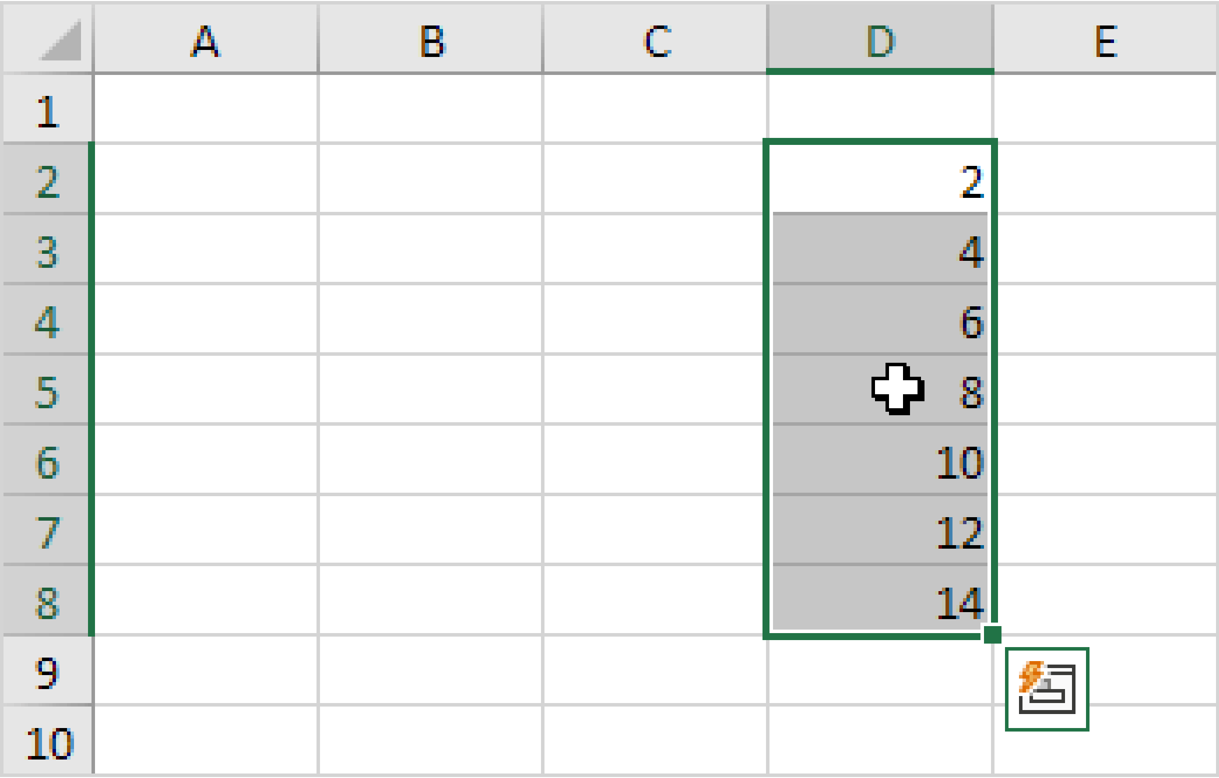
Move a Range

To move a range, execute the following steps.

1. Select a range and click on the border of the range.



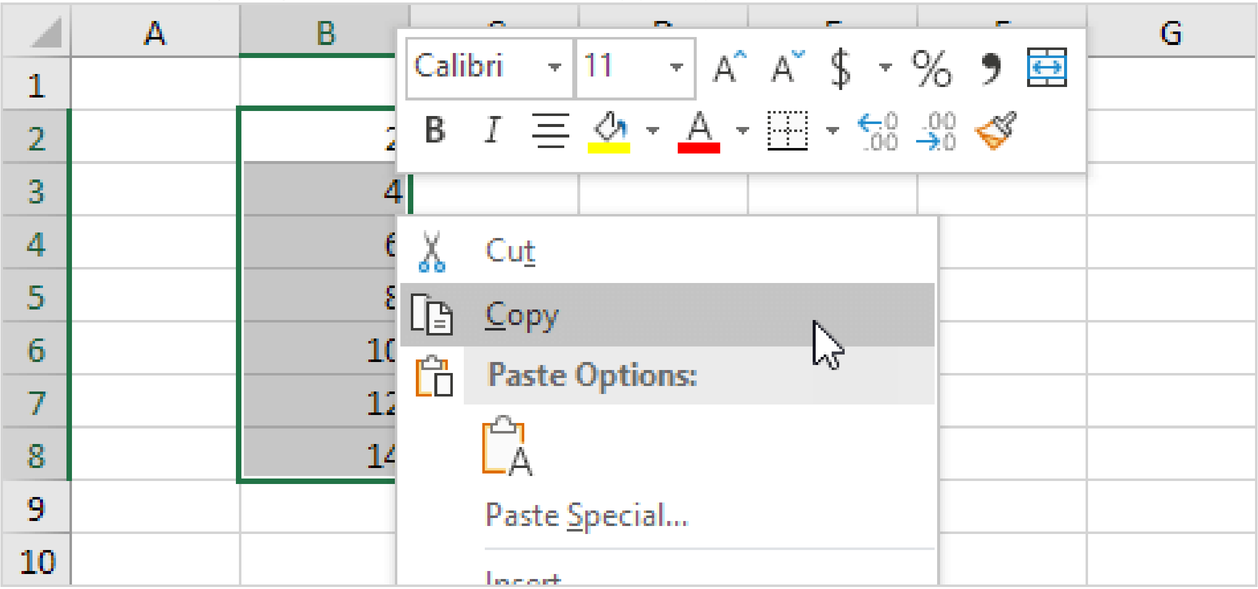

2. Drag the range to its new location.



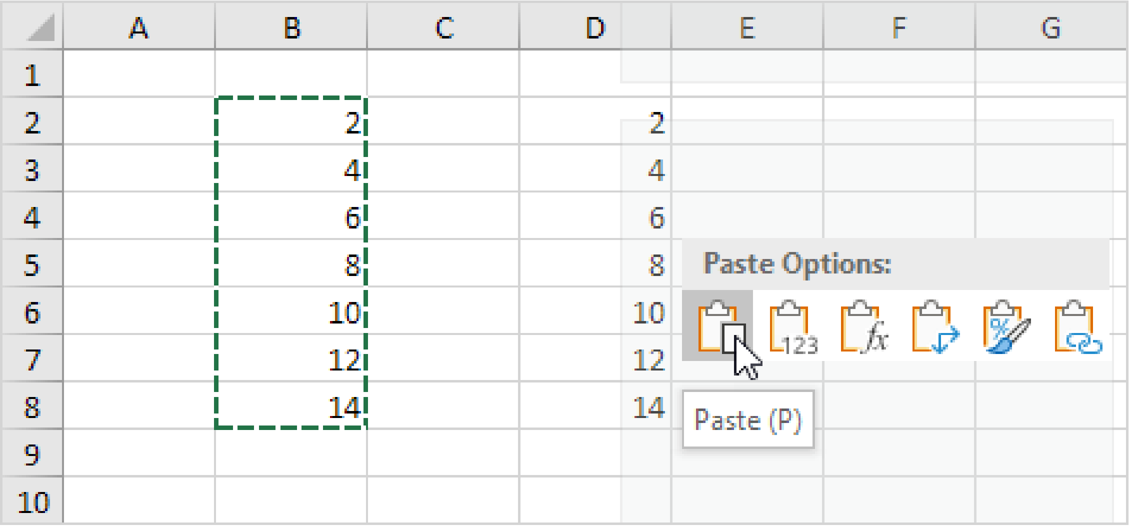
Copy/Paste a Range

To copy and paste a range, execute the following steps.

1. Select the range, right click, and then click Copy (or press CTRL + c).



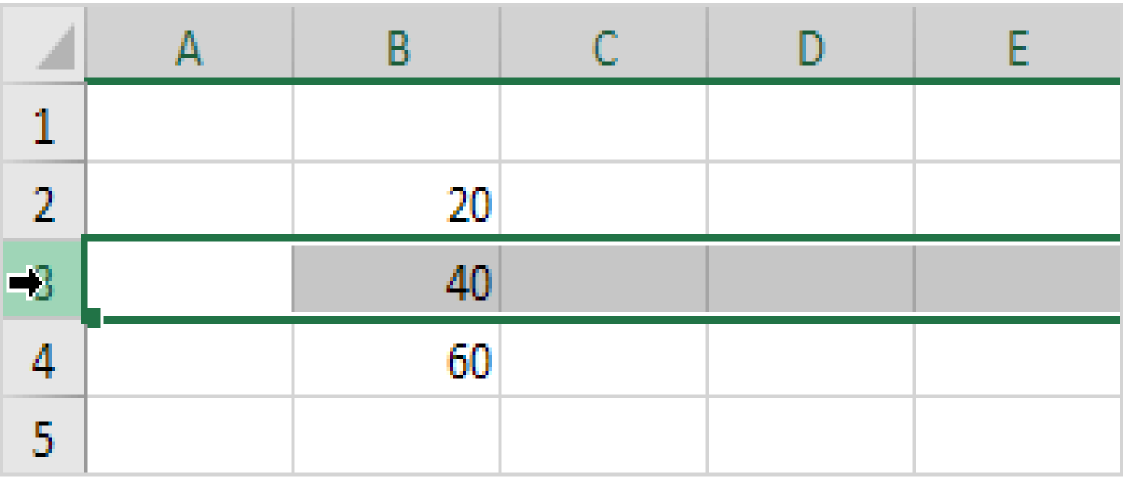
2. Select the cell where you want the first cell of the range to appear, right click, and then click Paste under 'Paste Options:' (or press CTRL + v).



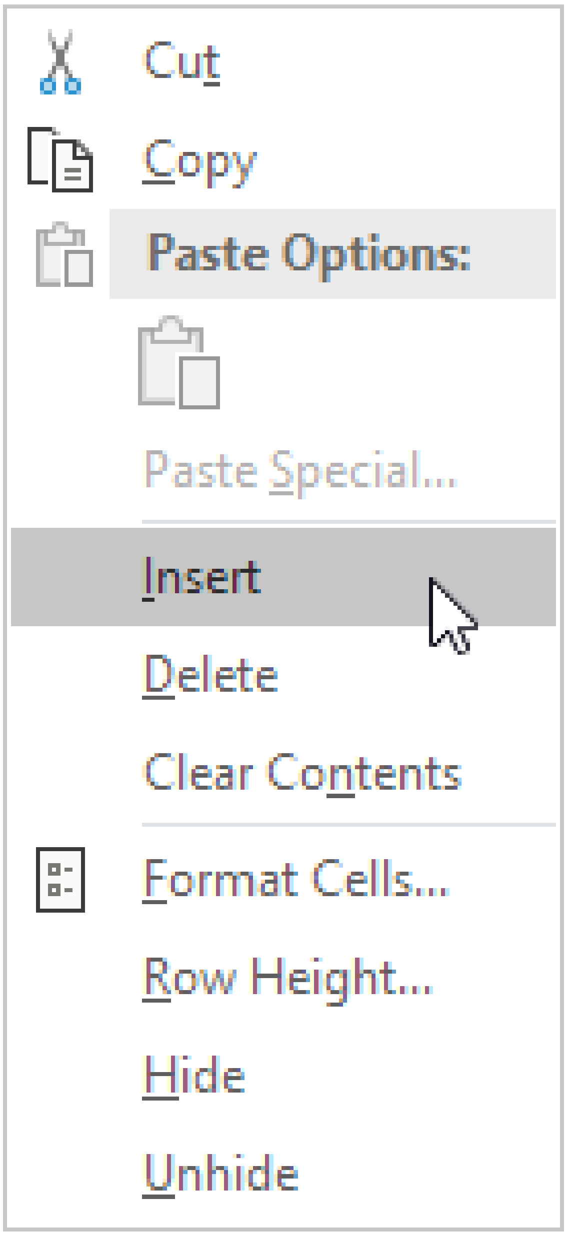

Insert Row, Column

To insert a row between the values 20 and 40 below, execute the following steps.

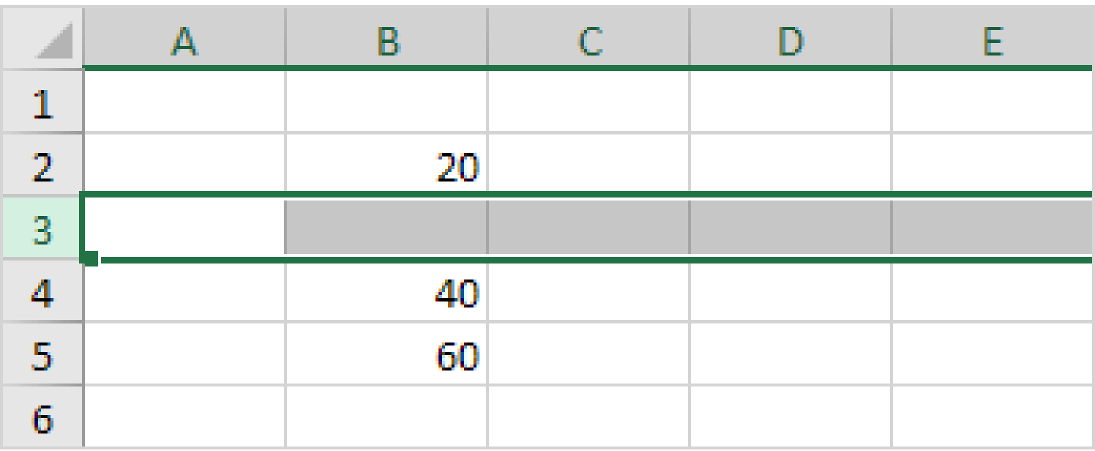
1. Select row 3.



2. Right click, and then click Insert.




Result.

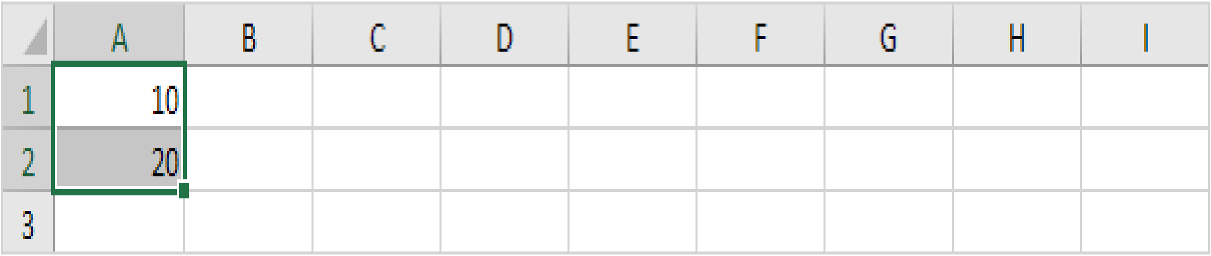



The rows below the new row are shifted down. In a similar way, you can insert a column.

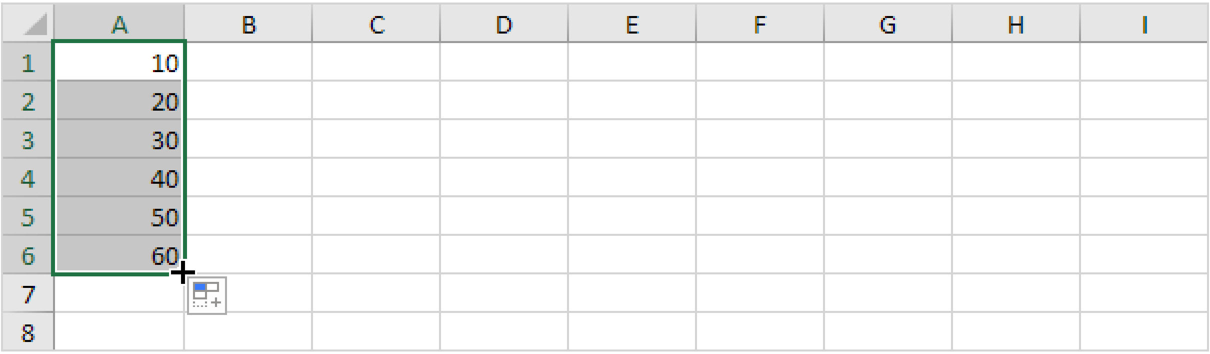
AutoFill

Use AutoFill in Excel to automatically fill a series of cells. This page contains many easy to follow AutoFill examples. The sky is the limit!

1. For example, enter the value 10 into cell A1 and the value 20 into cell A2.

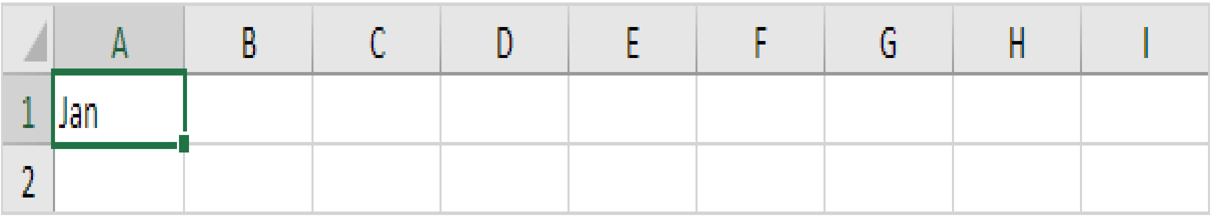



2. Select cell A1 and cell A2 and drag the fill handle down. The fill handle is the little green box at the lower right of a selected cell or selected range of cells.

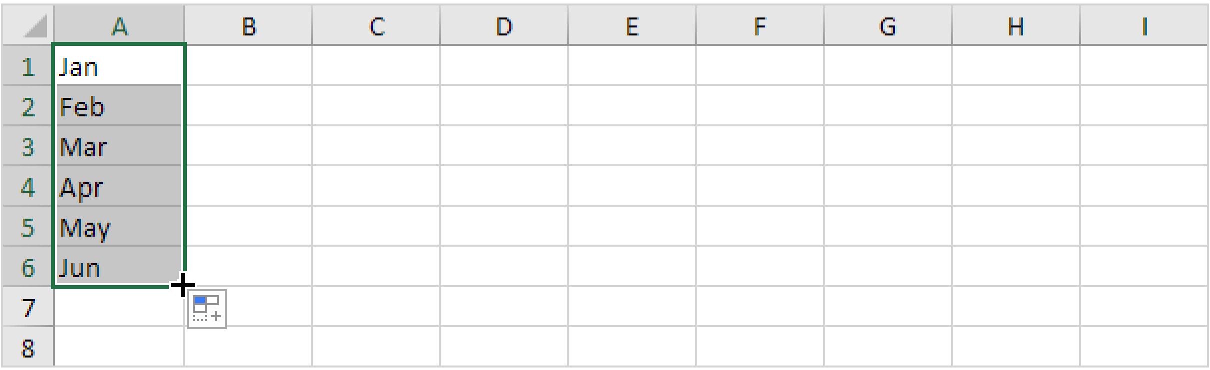



Note: AutoFill automatically fills in the numbers based on the pattern of the first two numbers.

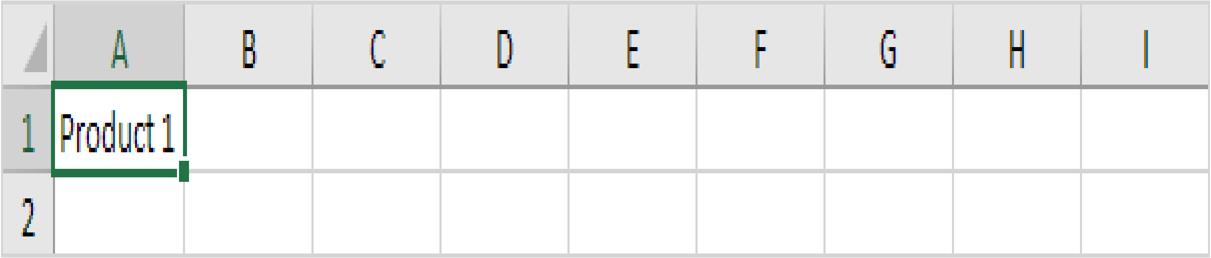
3. Enter Jan into cell A1.



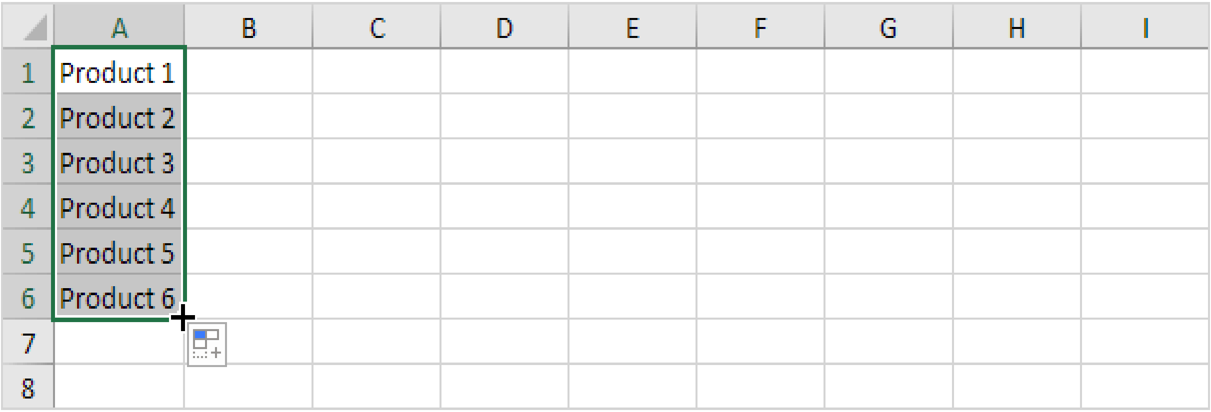

4. Select cell A1 and drag the fill handle down. AutoFill automatically fills in the month names.



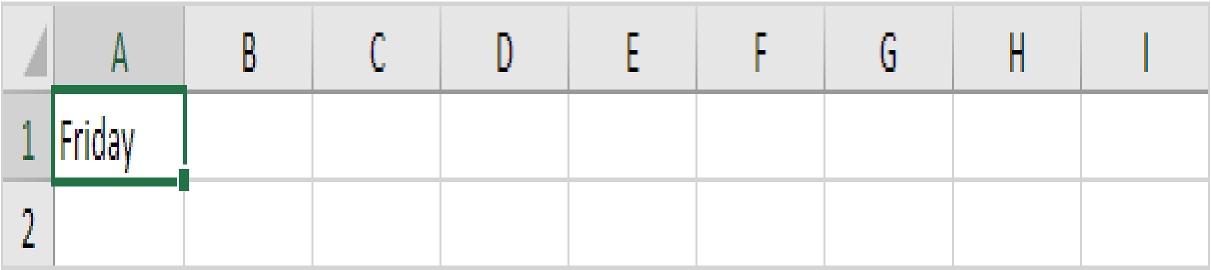

5. Enter Product 1 into cell A1.



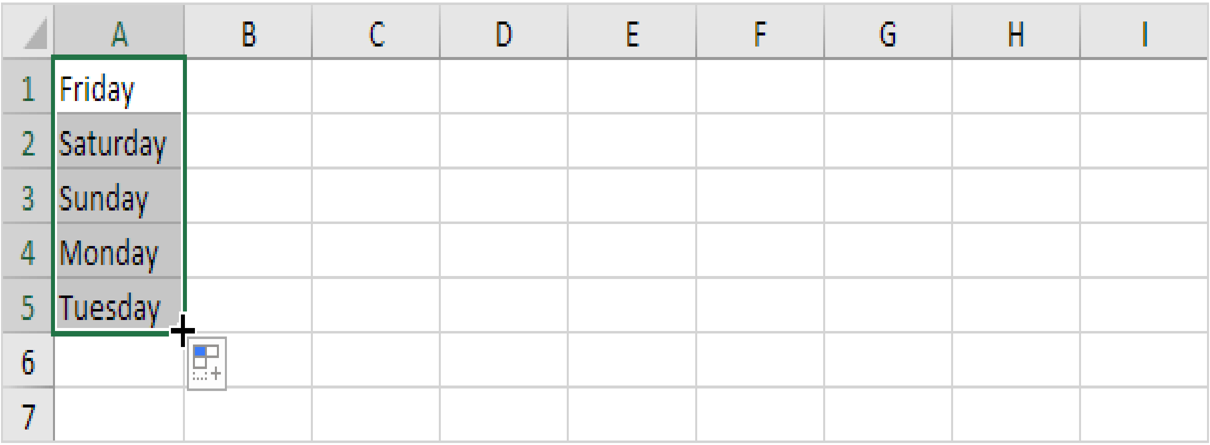

6. Select cell A1 and drag the fill handle down. AutoFill automatically fills in the product names.



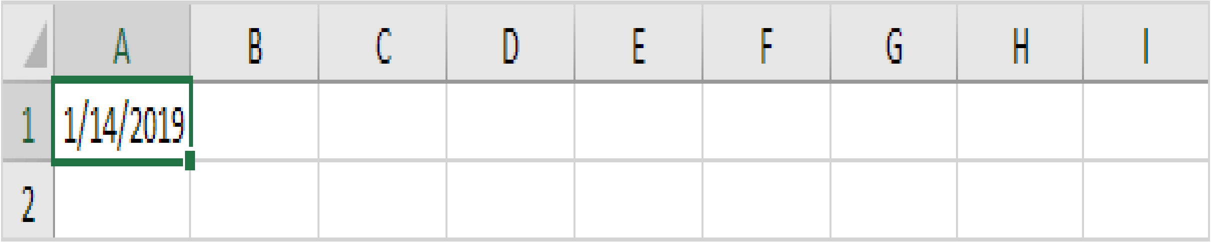

7. Enter Friday into cell A1.



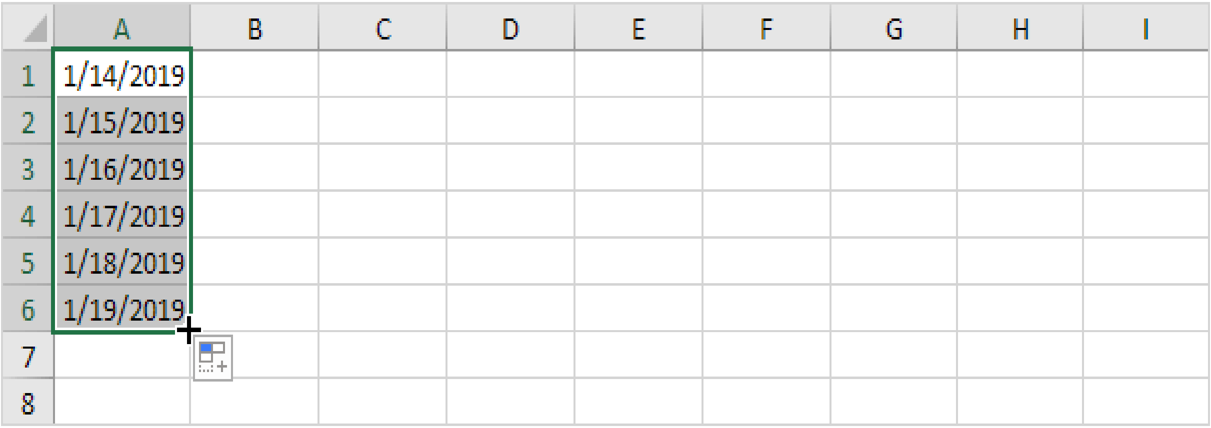

8. Select cell A1 and drag the fill handle down. AutoFill automatically fills in the day names.



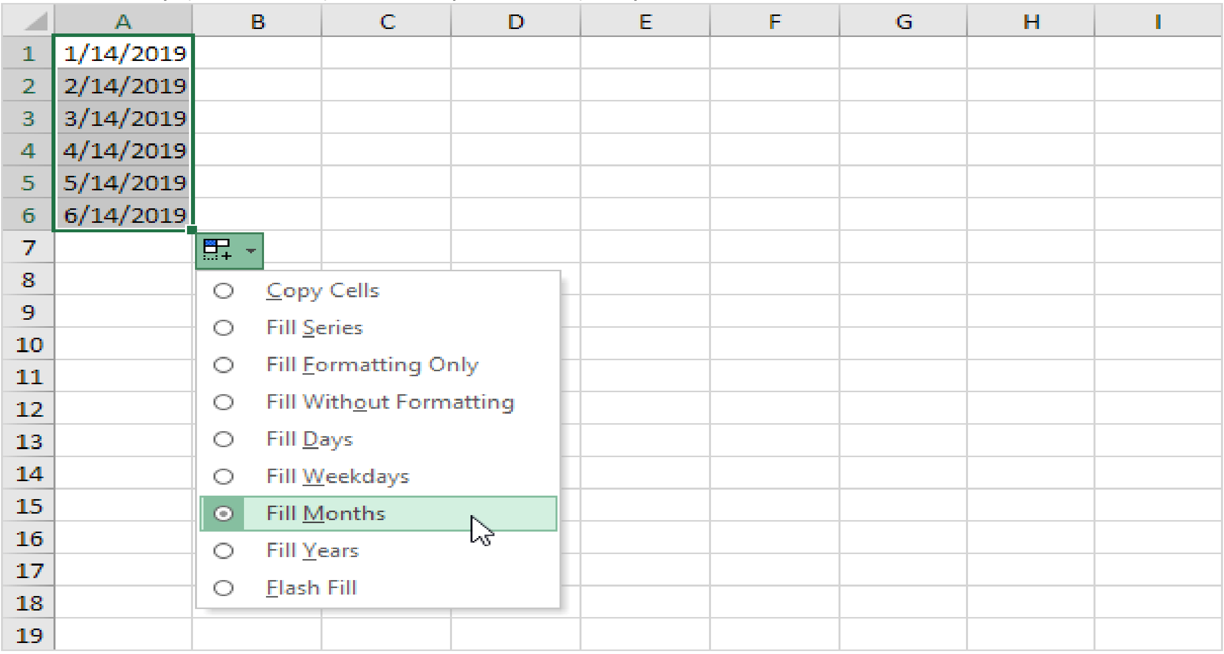

9. Enter the date 1/14/2019 into cell A1.




10. Select cell A1 and drag the fill handle down. AutoFill automatically fills in the days.

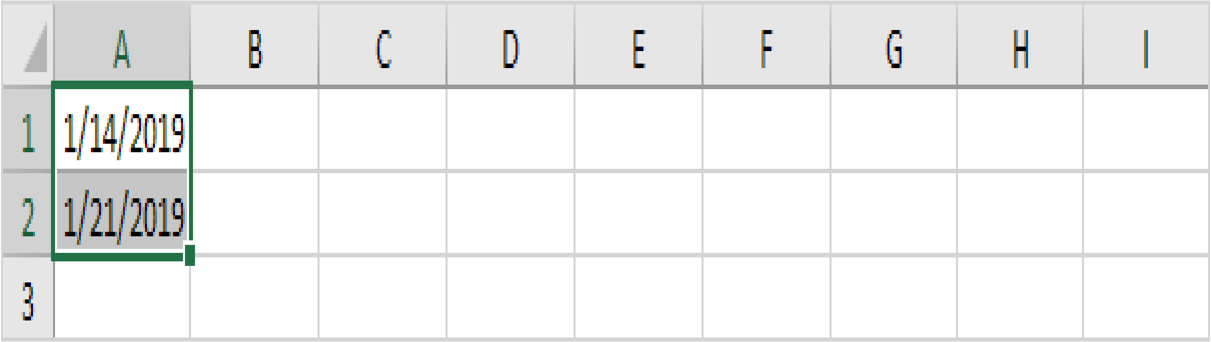



11. Instead of filling in days, use the AutoFill options to fill in weekdays (ignoring weekend days), months (see example below) or years.

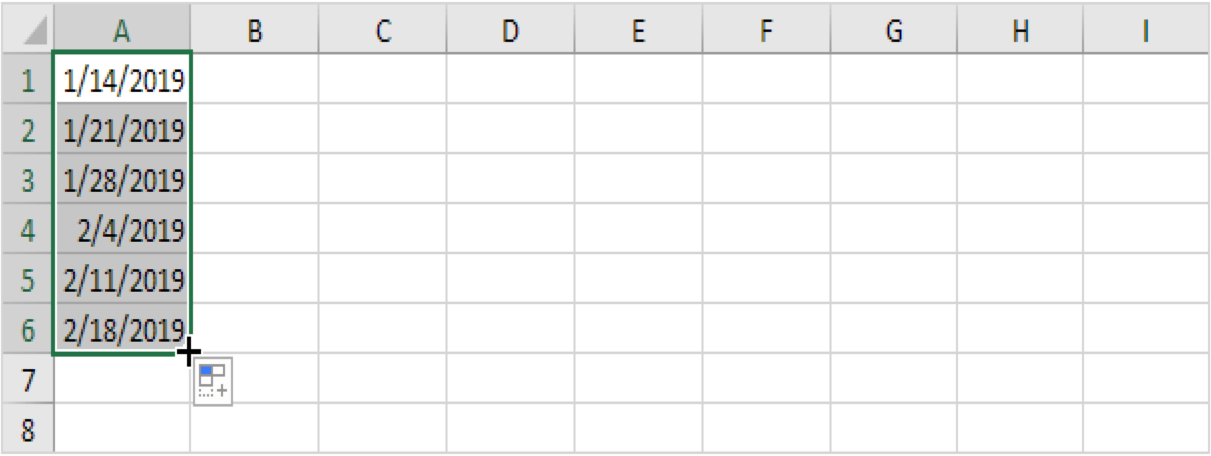



Note: also see the options to fill the formatting only and to fill a series without formatting.

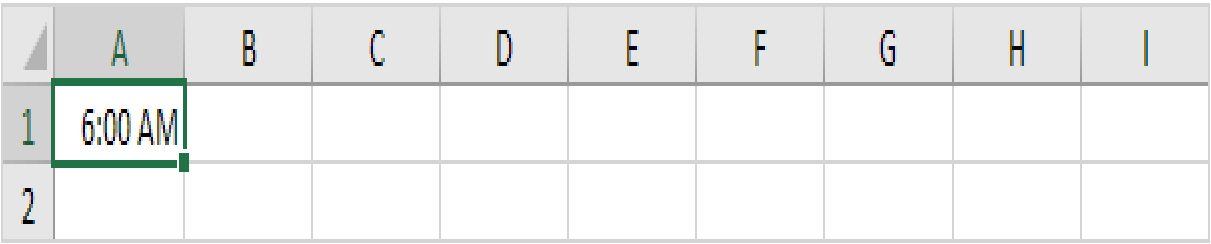
12. Enter the date 1/14/2019 into cell A1 and the date 1/21/2019 into cell A2.



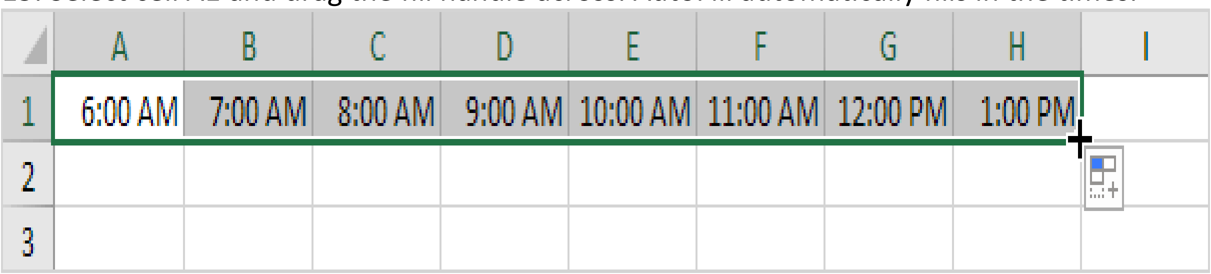

13. Select cell A1 and cell A2 and drag the fill handle down. AutoFill automatically fills in the dates based on the pattern of the first two dates.



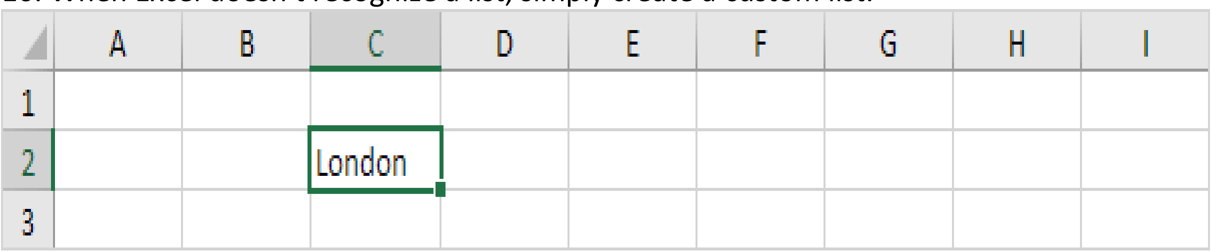

14. Enter the time 6:00 AM into cell A1.

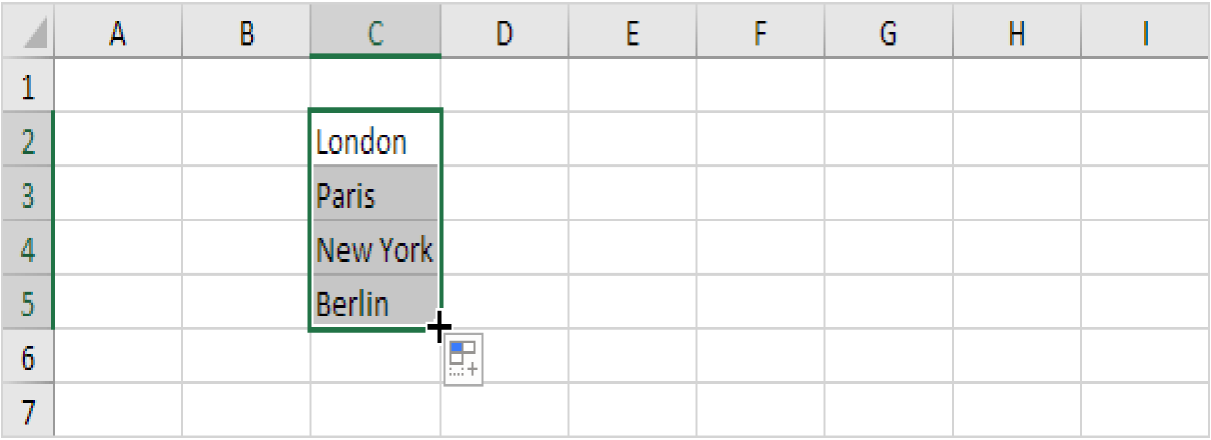



15. Select cell A1 and drag the fill handle across. AutoFill automatically fills in the times.



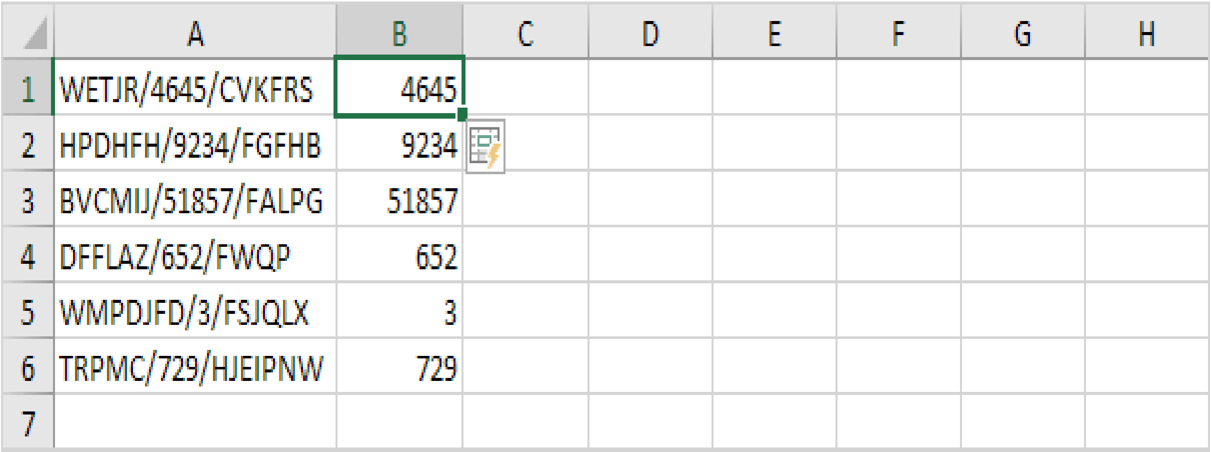

16. When Excel doesn't recognize a list, simply create a custom list.



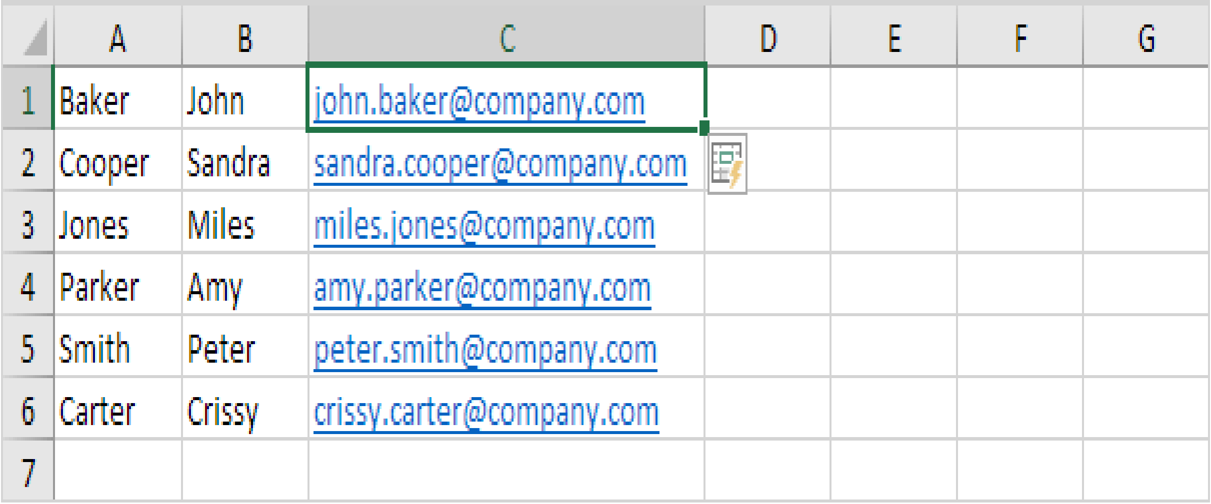


| | A | B | C | D | E | F | G | H | I |
|---|---|---|---|---|---|---|---|---|---|
| 1 | | | | | | | | | |
| 2 | | | London | | | | | | |
| 3 | | | Paris | | | | | | |
| 4 | | | New York | | | | | | |
| 5 | | | Berlin | | | | | | |
| 6 | | | | | | | | | |
| 7 | | | | | | | | | |

17. Use flash fill in Excel 2013 or later to automatically extract or to automatically combine data.



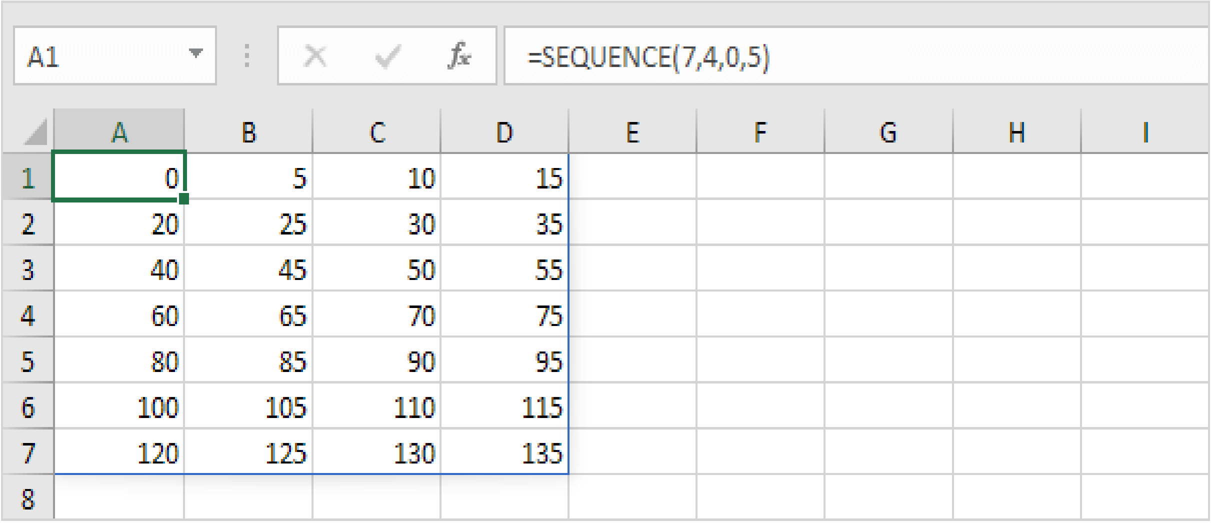
| | A | B | C | D | E | F | G | H |
|---|---|---|---|---|---|---|---|---|
| 1 | WETJR/4645/CVKFRS | 4645 | | | | | | |
| 2 | HPDHFH/9234/FGFHB | 9234 | | | | | | |
| 3 | BVCMIJ/51857/FALPG | 51857 | | | | | | |
| 4 | DFFLAZ/652/FWQP | 652 | | | | | | |
| 5 | WMPDJFD/3/FSJQLX | 3 | | | | | | |
| 6 | TRPMC/729/HJEIPNW | 729 | | | | | | |
| 7 | | | | | | | | |



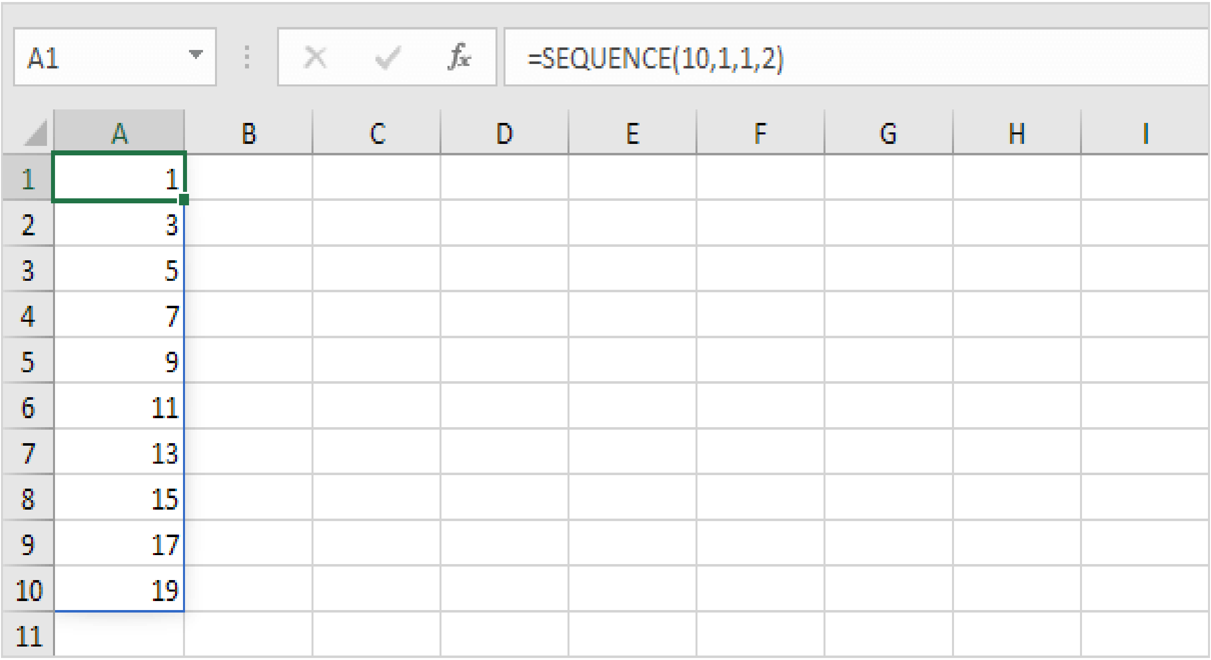
| | A | B | C | D | E | F | G |
|---|---|---|---|---|---|---|---|
| 1 | Baker | John | john.baker@company.com | | | | |
| 2 | Cooper | Sandra | sandra.cooper@company.com | | | | |
| 3 | Jones | Miles | miles.jones@company.com | | | | |
| 4 | Parker | Amy | amy.parker@company.com | | | | |
| 5 | Smith | Peter | peter.smith@company.com | | | | |
| 6 | Carter | Crissy | crissy.carter@company.com | | | | |
| 7 | | | | | | | |

If you have Excel 365 or Excel 2021, you can also use the SEQUENCE function to fill a series of cells. This function is pretty cool.

18. The SEQUENCE function below generates a two-dimensional array. Rows = 7, Columns = 4, Start = 0, Step = 5.




19. The SEQUENCE function below generates a list of odd numbers. Rows = 10, Columns = 1, Start = 1, Step = 2.




Note: the SEQUENCE function, entered into cell A1, fills multiple cells. Wow! This behavior in Excel 365/2021 is called spilling.

Flash Fill

Use flash fill in Excel 2013 or later to automatically extract or to automatically combine data. Flash Fill in Excel only works when it recognizes a pattern.

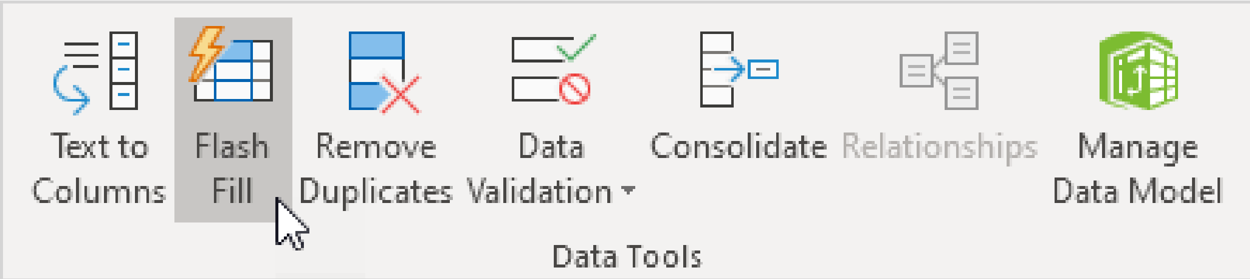
Flash Fill Example 1

For example, use flash fill in Excel to extract the numbers in column A below.

1. First, tell Excel what you want to do by entering the value 4645 into cell B1.

| | A | B | C | D | E | F | G | H |
|---|---|---|---|---|---|---|---|---|
| 1 | WETJR/4645/CVKFRS | 4645 | | | | | | |
| 2 | HPDHFH/9234/FGFHB | | | | | | | |
| 3 | BVCMIJ/51857/FALPG | | | | | | | |
| 4 | DFFLAZ/652/FWQP | | | | | | | |
| 5 | WMPDJFD/3/FSJQLX | | | | | | | |
| 6 | TRPMC/729/HJEIPNW | | | | | | | |
| 7 | | | | | | | | |

2. On the Data tab, in the Data Tools group, click Flash Fill (or press CTRL + E).




Result:

| | A | B | C | D | E | F | G | H |
|---|---|---|---|---|---|---|---|---|
| 1 | WETJR/4645/CVKFRS | 4645 | | | | | | |
| 2 | HPDHFH/9234/FGFHB | 9234 | | | | | | |
| 3 | BVCMIJ/51857/FALPG | 51857 | | | | | | |
| 4 | DFFLAZ/652/FWQP | 652 | | | | | | |
| 5 | WMPDJFD/3/FSJQLX | 3 | | | | | | |
| 6 | TRPMC/729/HJEIPNW | 729 | | | | | | |
| 7 | | | | | | | | |

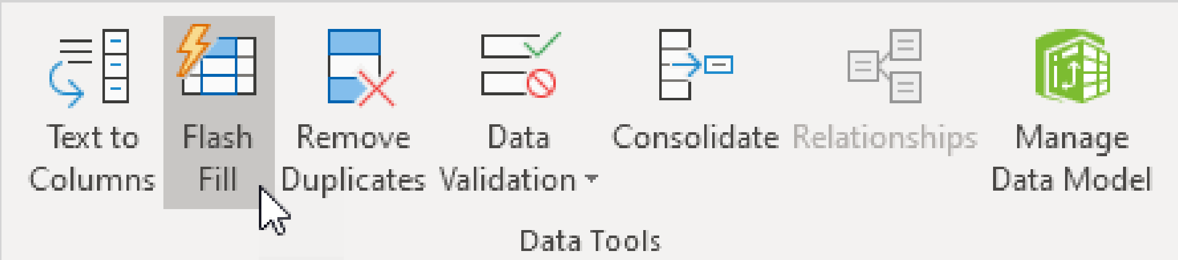
Flash Fill Example 2

For example, use flash fill in Excel to join the last names in column A below and the first names in column B below to create email addresses.

1. First, tell Excel what you want to do by entering a correct email address in cell C1.

| | A | B | C | D | E | F | G |
|---|---|---|---|---|---|---|---|
| 1 | Baker | John | john.baker@company.com | | | | |
| 2 | Cooper | Sandra | | | | | |
| 3 | Jones | Miles | | | | | |
| 4 | Parker | Amy | | | | | |
| 5 | Smith | Peter | | | | | |
| 6 | Carter | Crissy | | | | | |
| 7 | | | | | | | |

2. On the Data tab, in the Data Tools group, click Flash Fill (or press CTRL + E).




Result:

| | A | B | C | D | E | F | G |
|---|---|---|---|---|---|---|---|
| 1 | Baker | John | john.baker@company.com | | | | |
| 2 | Cooper | Sandra | sandra.cooper@company.com | | | | |
| 3 | Jones | Miles | miles.jones@company.com | | | | |
| 4 | Parker | Amy | amy.parker@company.com | | | | |
| 5 | Smith | Peter | peter.smith@company.com | | | | |
| 6 | Carter | Crissy | crissy.carter@company.com | | | | |
| 7 | | | | | | | |

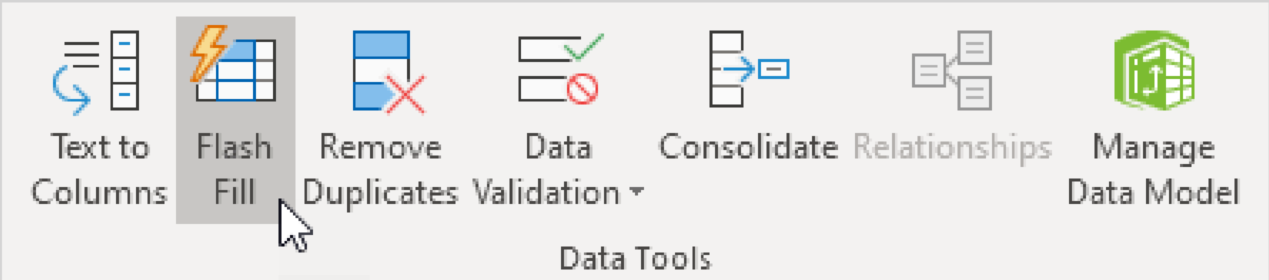
Flash Fill Example 3

For example, use flash fill in Excel to reformat the numbers in column A below.

1. First, tell Excel what you want to do by entering a correct social security number in cell B1.

| | A | B | C | D | E | F | G | H | I |
|---|---|---|---|---|---|---|---|---|---|
| 1 | 270369181 | 270-36-9181 | | | | | | | |
| 2 | 269302254 | | | | | | | | |
| 3 | 277128907 | | | | | | | | |
| 4 | 269225794 | | | | | | | | |
| 5 | 285012389 | | | | | | | | |
| 6 | 407240207 | | | | | | | | |
| 7 | | | | | | | | | |

2. On the Data tab, in the Data Tools group, click Flash Fill (or press CTRL + E).




Result:

| | A | B | C | D | E | F | G | H | I |
|---|---|---|---|---|---|---|---|---|---|
| 1 | 270369181 | 270-36-9181 | | | | | | | |
| 2 | 269302254 | 269-30-2254 | | | | | | | |
| 3 | 277128907 | 277-12-8907 | | | | | | | |
| 4 | 269225794 | 269-22-5794 | | | | | | | |
| 5 | 285012389 | 285-01-2389 | | | | | | | |
| 6 | 407240207 | 407-24-0207 | | | | | | | |
| 7 | | | | | | | | | |

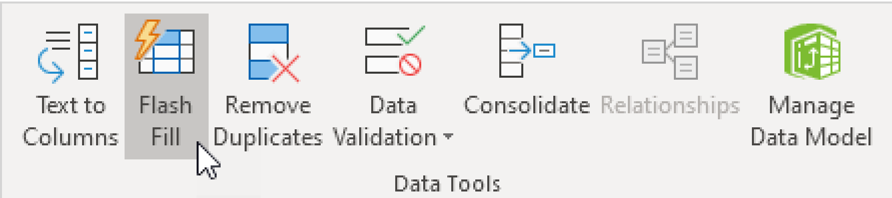
Flash Fill Limitations

Flash fill is a great Excel tool. However, it has a few limitations. For example, use flash fill in Excel to extract the numbers in column A below.

1. First, tell Excel what you want to do by entering the value 130 into cell B1.

| | A | B | C | D | E |
|---|---|---|---|---|---|
| 1 | Rose weighs 130 pounds | 130 | | | |
| 2 | The flag of the United States has 50 stars | | | | |
| 3 | A marathon is 26.2 miles | | | | |
| 4 | Christopher Columbus discovered America in 1492 | | | | |
| 5 | One inch is equal to 2.54 centimeters | | | | |
| 6 | The numeric value of π is approximately 3.14159 | | | | |
| 7 | | | | | |

2. On the Data tab, in the Data Tools group, click Flash Fill (or press CTRL + E).




Result:

| | A | B | C | D | E |
|---|---|---|---|---|---|
| 1 | Rose weighs 130 pounds | 130 | | | |
| 2 | The flag of the United States has 50 stars | 50 | | | |
| 3 | A marathon is 26.2 miles | 2 | | | |
| 4 | Christopher Columbus discovered America in 1492 | 1492 | | | |
| 5 | One inch is equal to 2.54 centimeters | 54 | | | |
| 6 | The numeric value of π is approximately 3.14159 | 14159 | | | |
| 7 | | | | | |

Note: flash fill did not correctly extract the decimal numbers (only the digits after the decimal point).

3. Flash fill needs a little help sometimes. Immediately after executing step 2, change the value in cell B3 to 26.2 and Excel will correctly extract all other decimal numbers for you.

| | A | B | C | D | E |
|---|---|---|---|---|---|
| 1 | Rose weighs 130 pounds | 130 | | | |
| 2 | The flag of the United States has 50 stars | 50 | | | |
| 3 | A marathon is 26.2 miles | 26.2 | | | |
| 4 | Christopher Columbus discovered America in 1492 | 1492 | | | |
| 5 | One inch is equal to 2.54 centimeters | 2.54 | | | |
| 6 | The numeric value of π is approximately 3.14159 | 3.14159 | | | |
| 7 | | | | | |

4. Flash fill in Excel does not automatically update your results when your source data changes. For example, if you change the number in cell A1 to 200, Excel will not update the number in cell B1.

| | A | B | C | D | E |
|---|---|---|---|---|---|
| 1 | Rose weighs 200 pounds | 130 | | | |
| 2 | The flag of the United States has 50 stars | 50 | | | |
| 3 | A marathon is 26.2 miles | 26.2 | | | |
| 4 | Christopher Columbus discovered America in 1492 | 1492 | | | |
| 5 | One inch is equal to 2.54 centimeters | 2.54 | | | |
| 6 | The numeric value of π is approximately 3.14159 | 3.14159 | | | |
| 7 | | | | | |

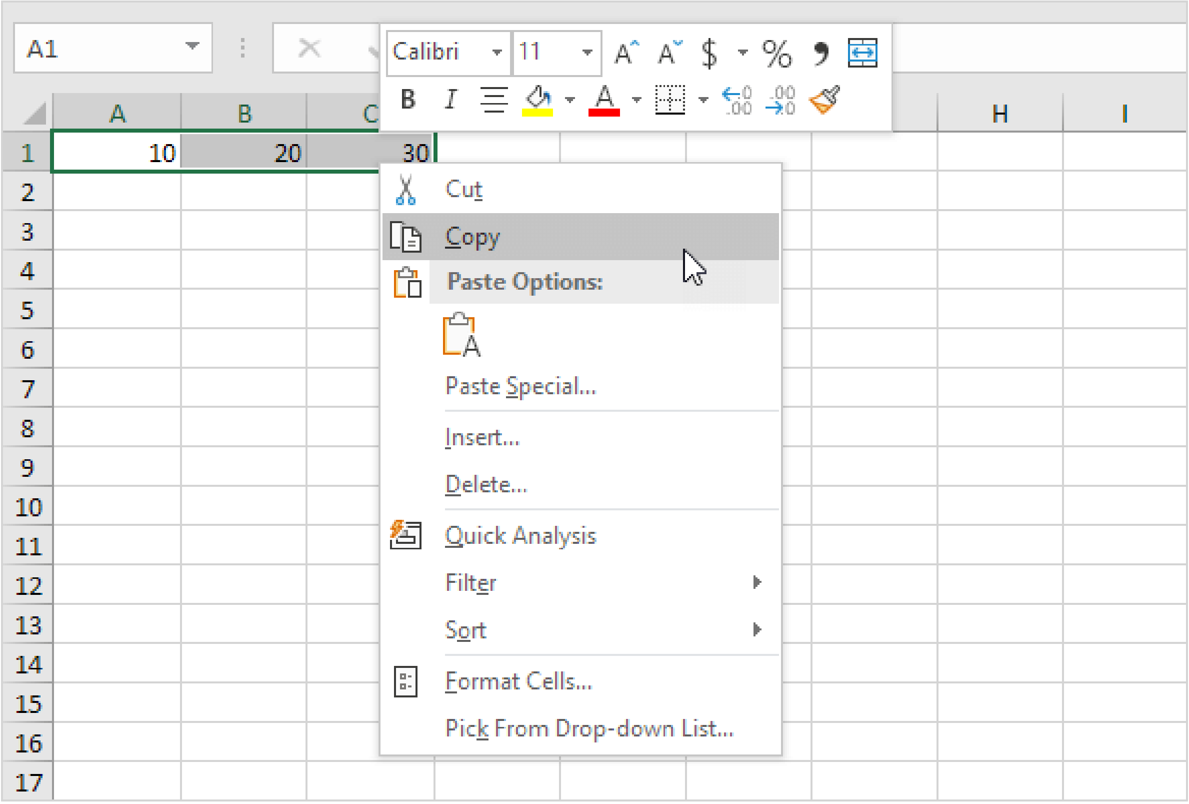
Transpose

Use the 'Paste Special Transpose' option to switch rows to columns or columns to rows in Excel. You can also use the TRANSPOSE function.

Paste Special Transpose

To transpose data, execute the following steps.

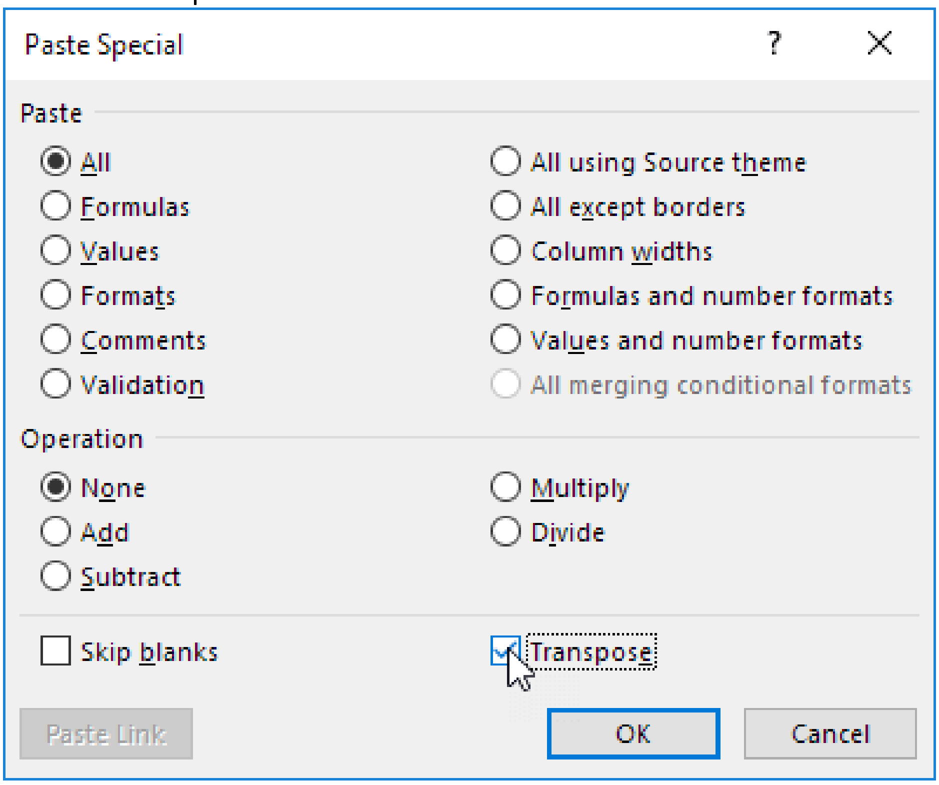
1. Select the range A1:C1.
2. Right click, and then click Copy.



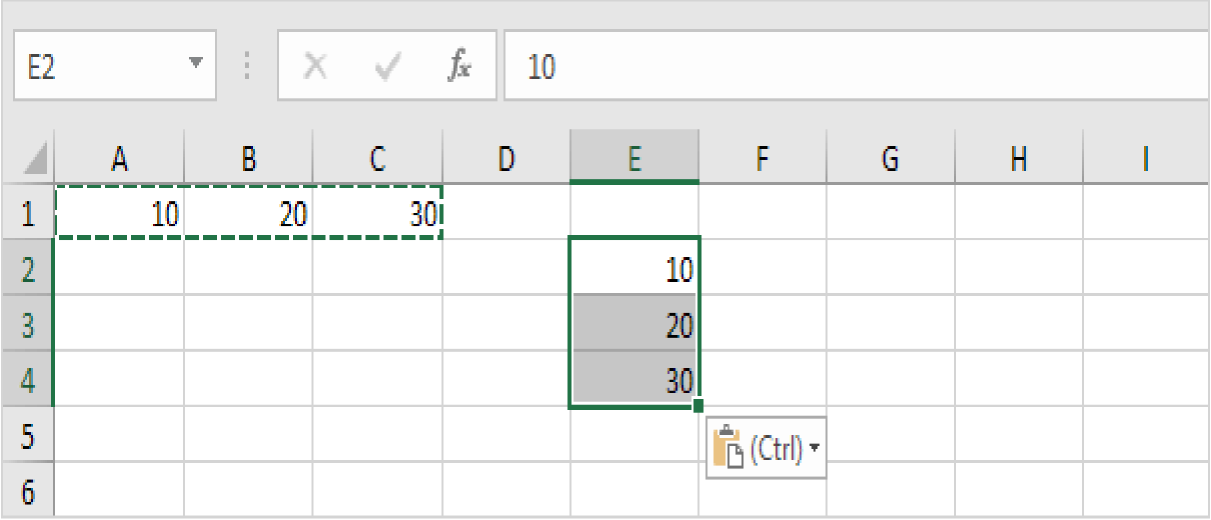

3. Select cell E2.

4. Right click, and then click Paste Special.

5. Check Transpose.



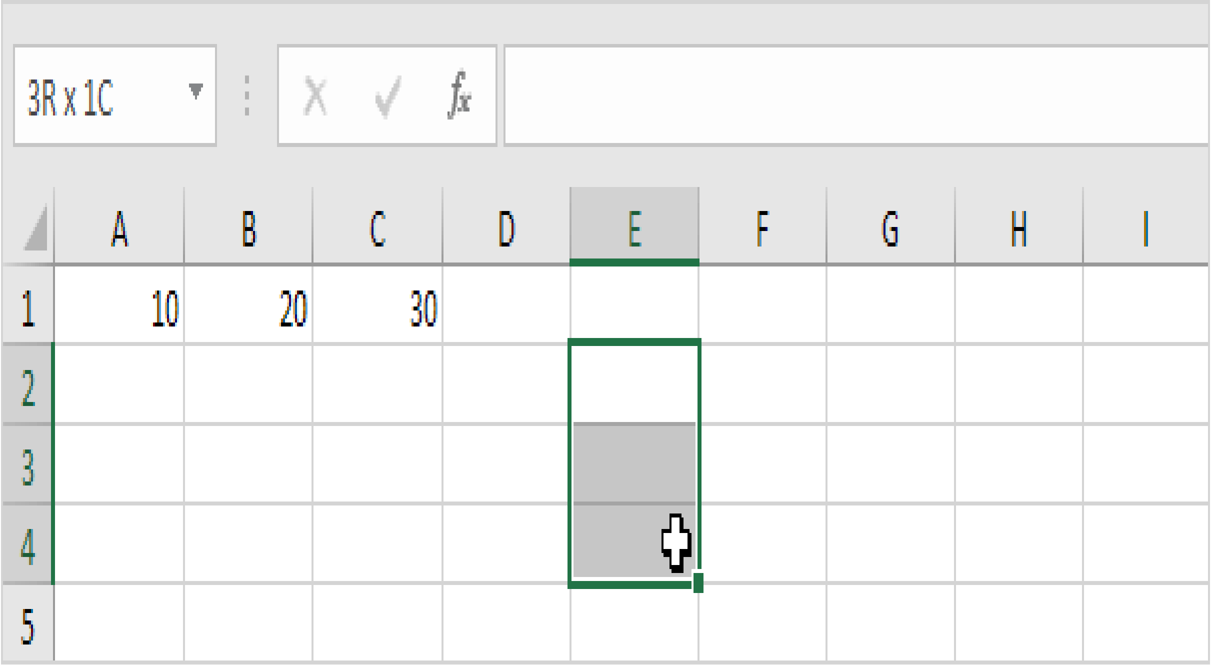

6. Click OK.



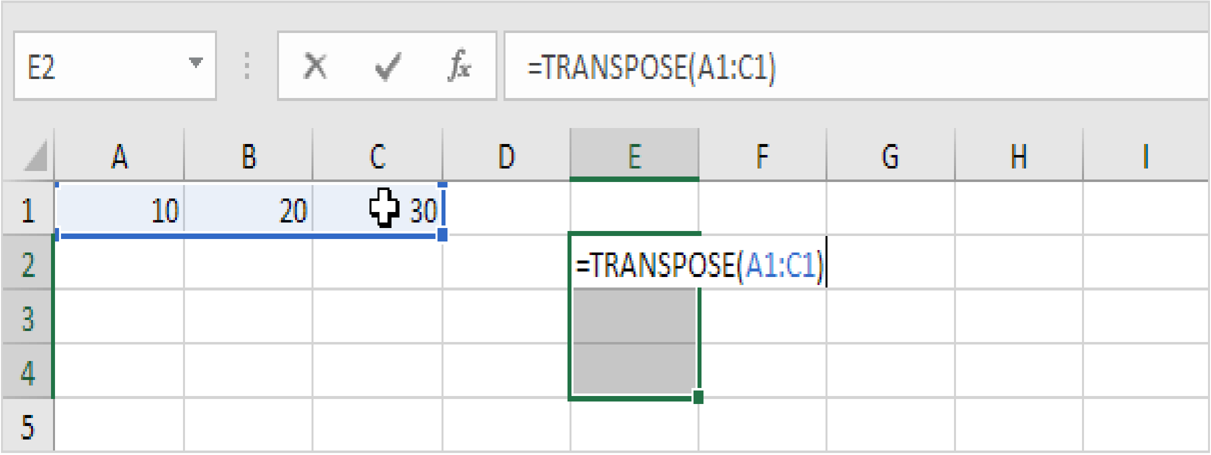

Transpose Function

To insert the TRANSPOSE function, execute the following steps.

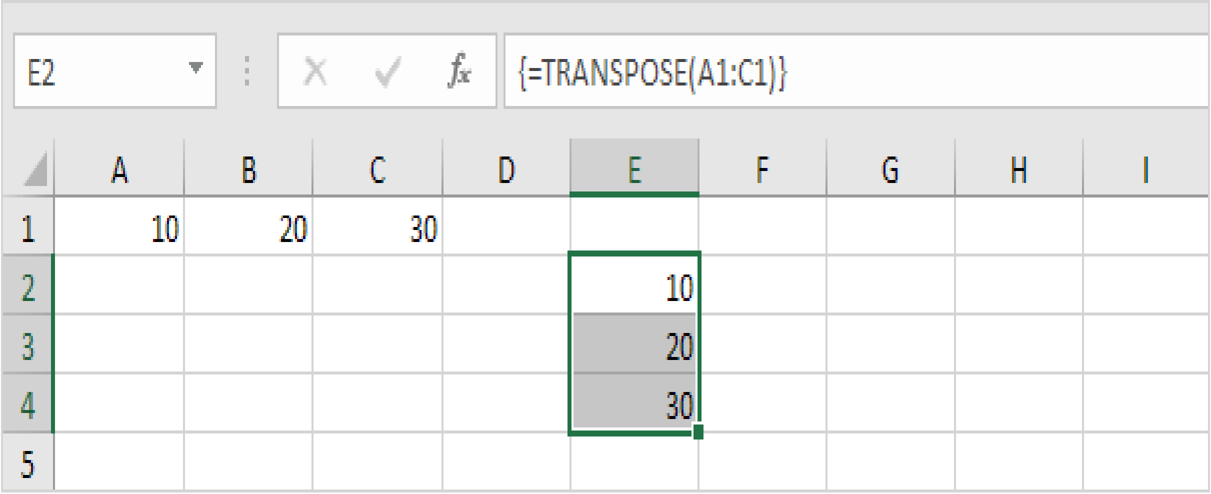
1. First, select the new range of cells.




2. Type in =TRANSPOSE(
3. Select the range A1:C1 and close with a parenthesis.

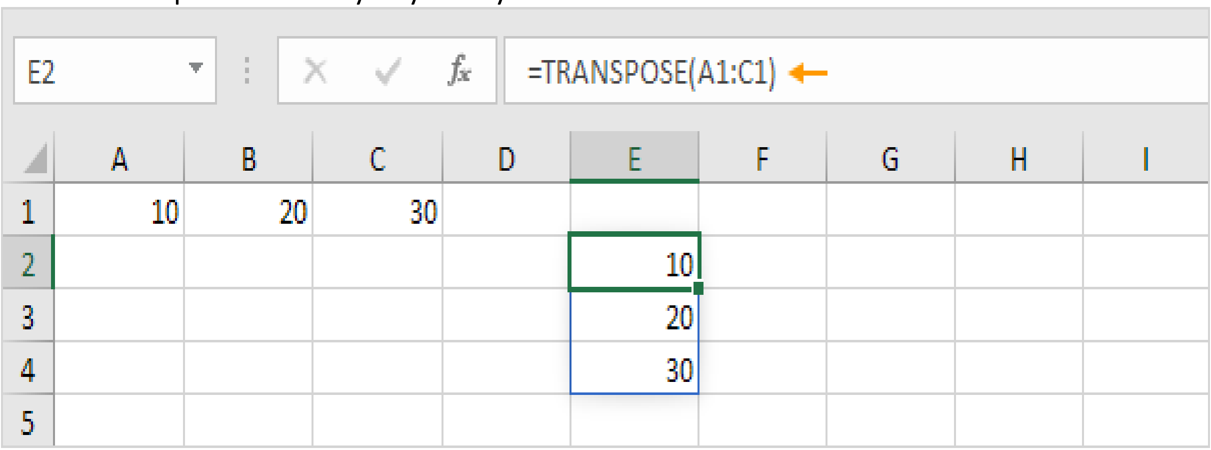



4. Finish by pressing CTRL + SHIFT + ENTER.




Note: the formula bar indicates that this is an array formula by enclosing it in curly braces {}. To delete this array formula, select the range E2:E4 and press Delete.

5. If you have Excel 365 or Excel 2021, simply select cell E2, enter the TRANSPOSE function and press Enter. Bye bye curly braces.

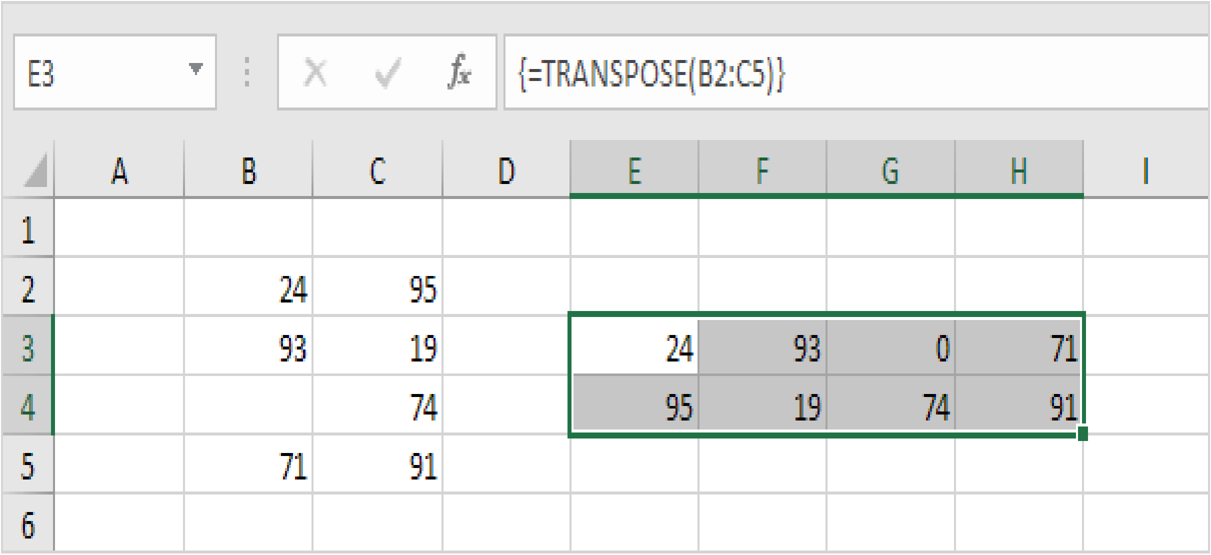



Note: the TRANSPOSE function, entered into cell E2, fills multiple cells. Wow! This behavior in Excel 365/2021 is called spilling.

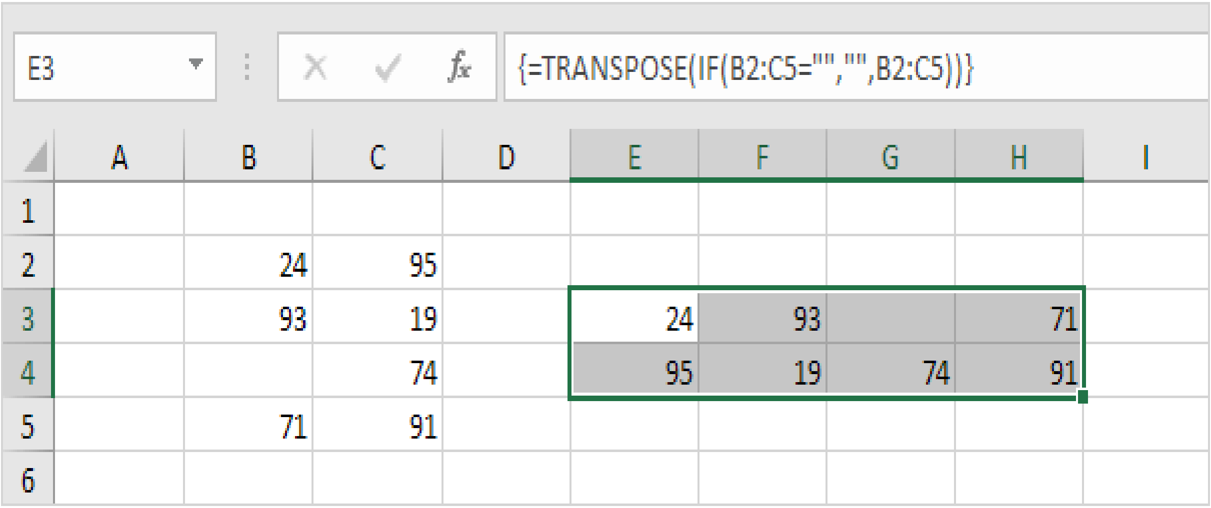
Transpose Table without Zeros

The TRANSPOSE function in Excel converts blank cells to zeros. Simply use the IF function to fix this problem.

1. For example, cell B4 below is blank. The TRANSPOSE function converts this blank cell to a zero (cell G3).




2. If blank, the IF function below returns an empty string (two double quotes with nothing in between) to transpose.

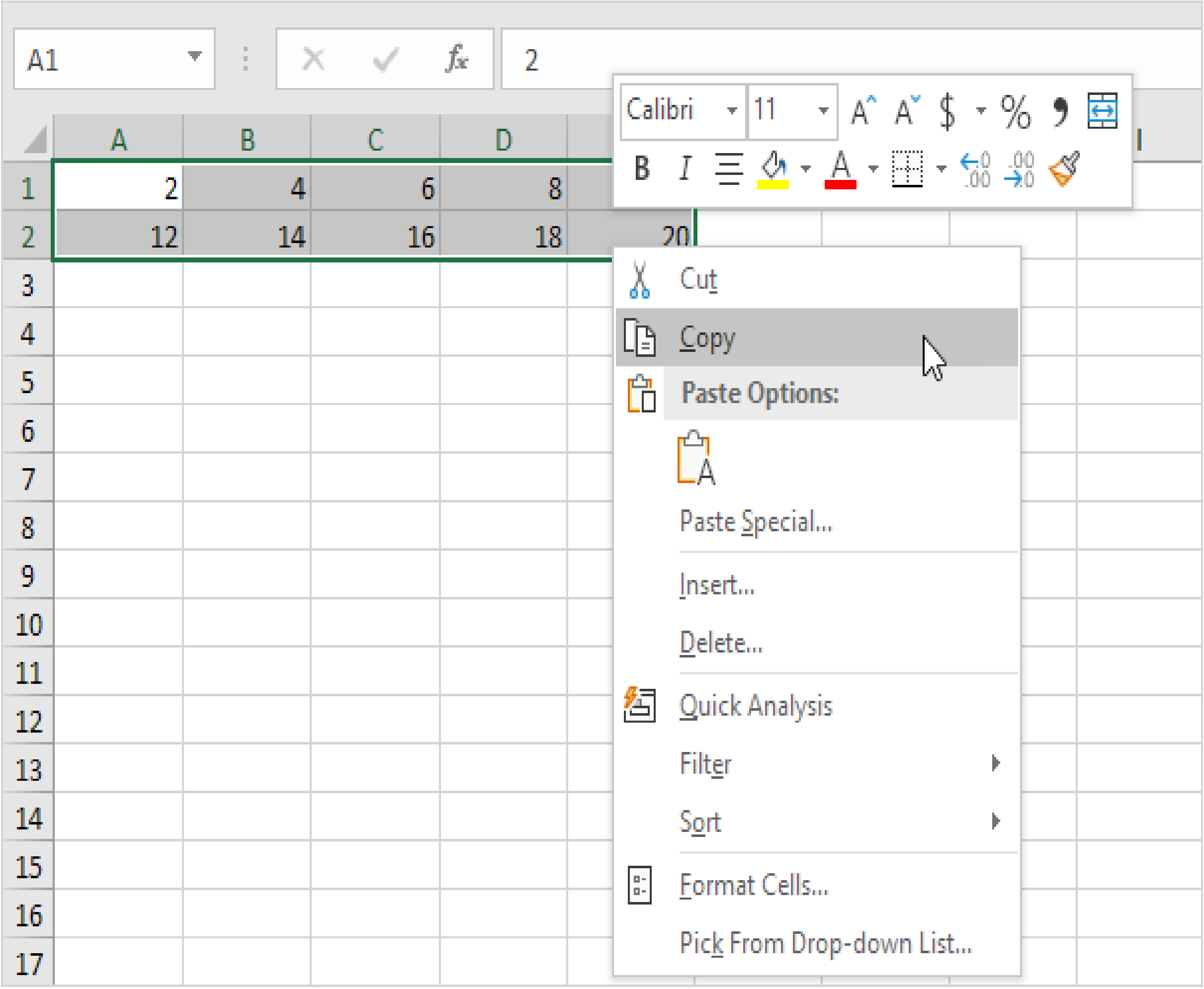



Transpose Magic

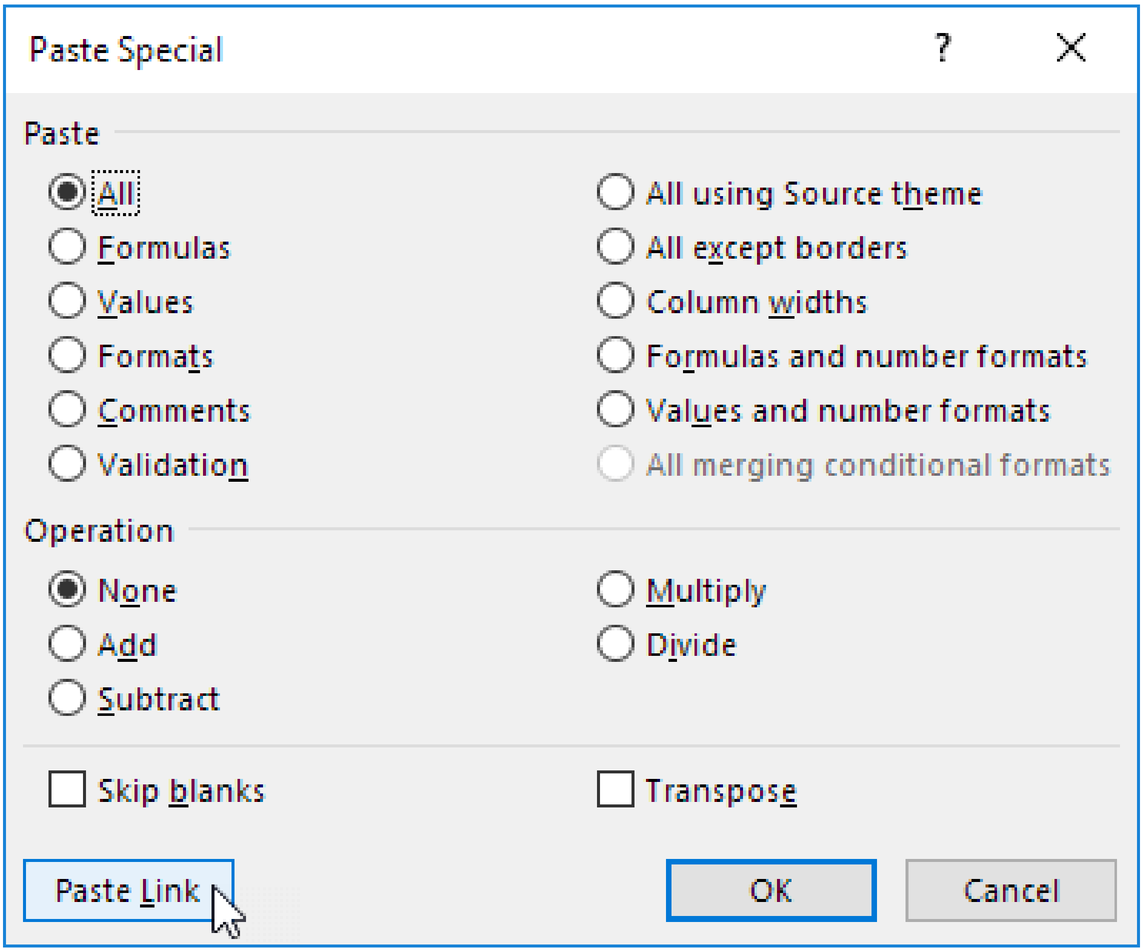
The 'Paste Special Transpose' option is a great way to transpose data but if you want to link the source cells to the target cells, you need a few magic tricks.

1. Select the range A1:E2.

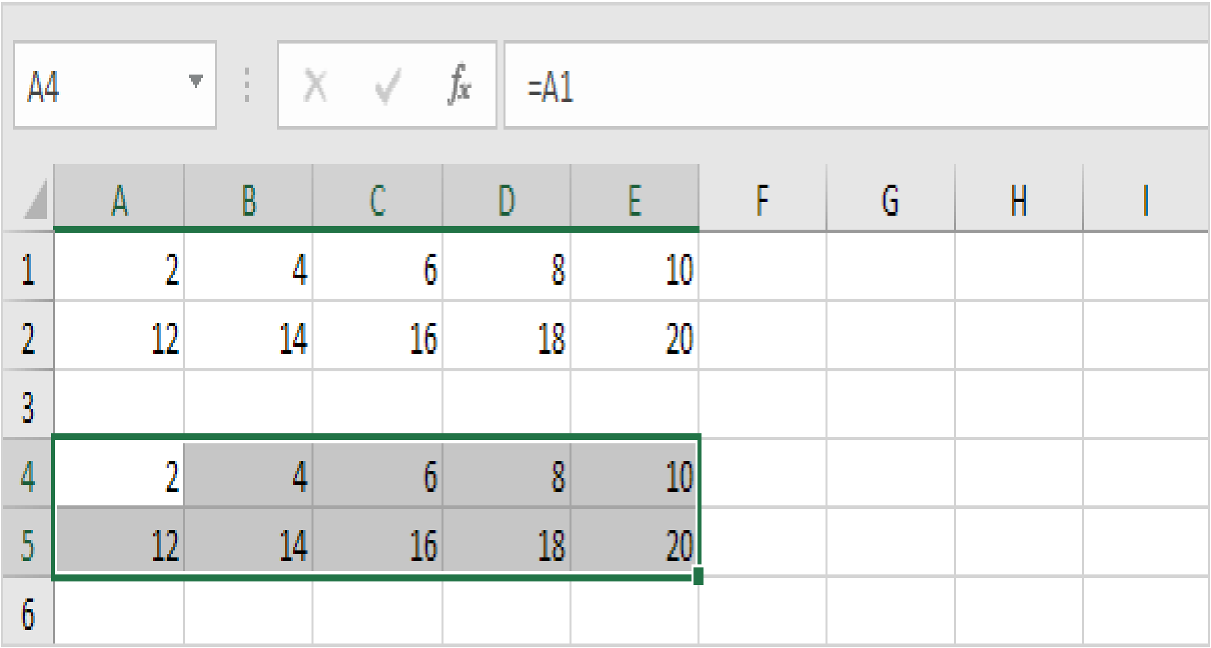
2. Right click, and then click Copy.



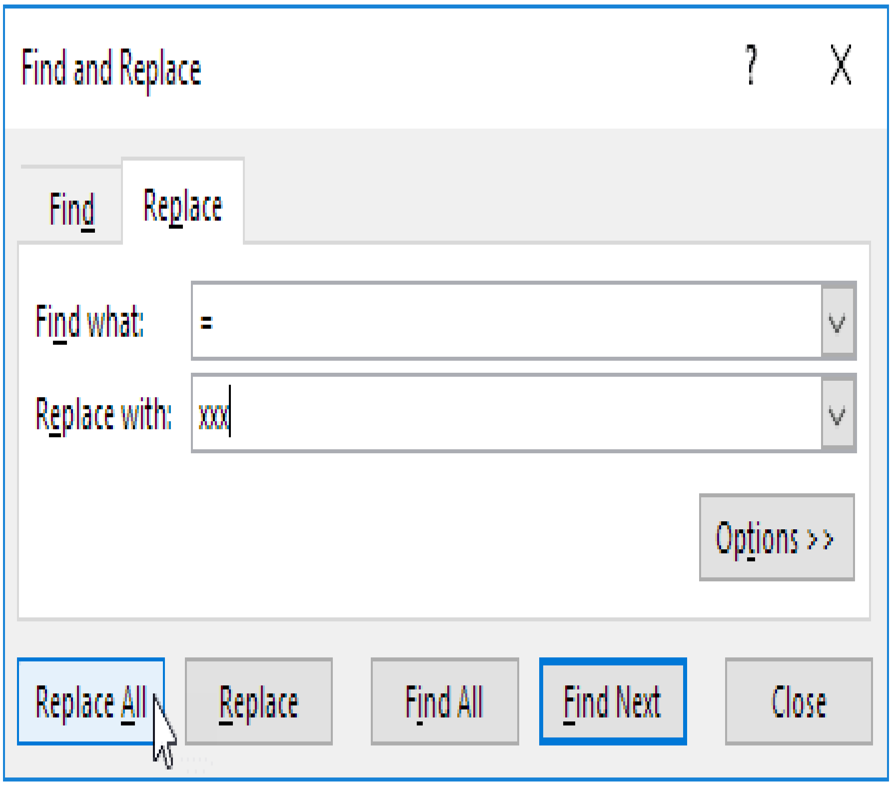

3. Select cell A4.
4. Right click, and then click Paste Special.
5. Click Paste Link.



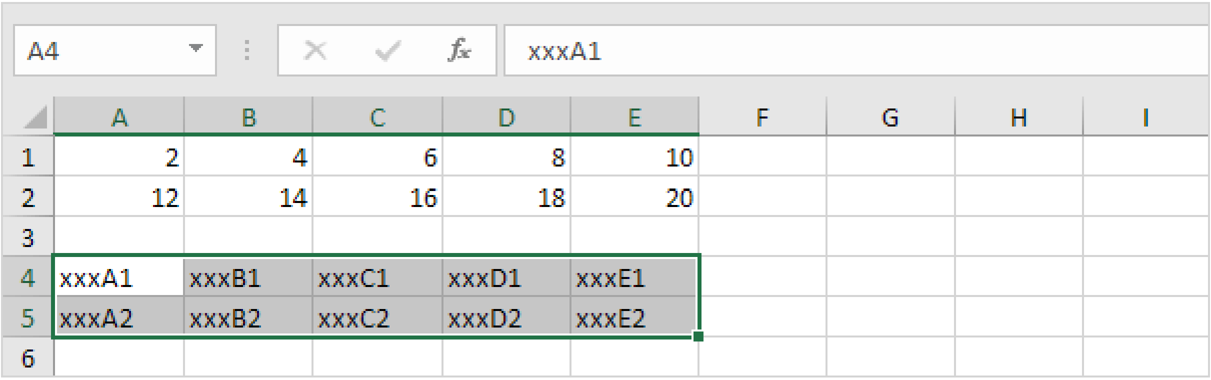

Result.




6. Select the range A4:E5 and replace all equal signs with xxx.

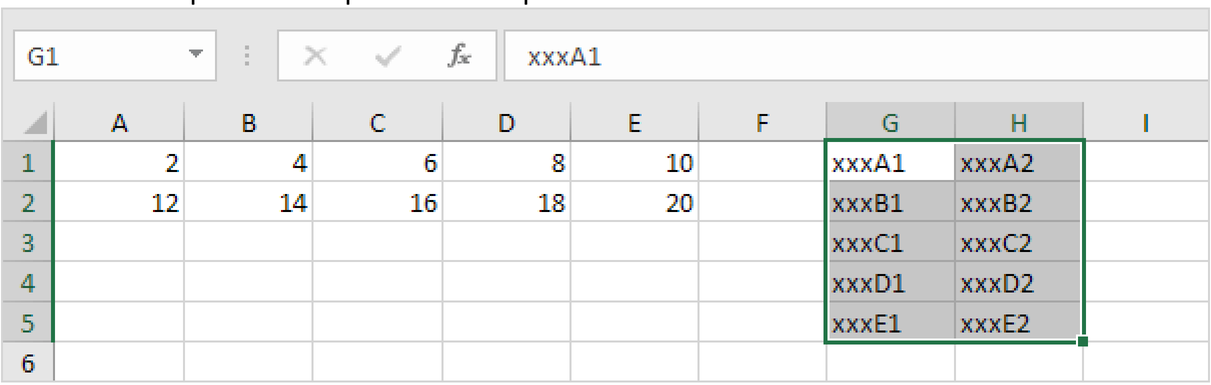



Result.



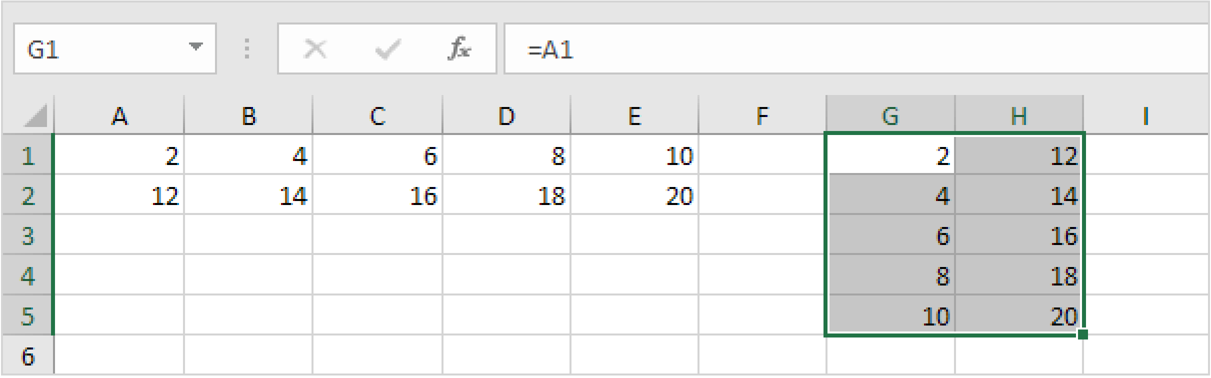

| | A | B | C | D | E | F | G | H | I |
|---|---|---|---|---|---|---|---|---|---|
| 1 | 2 | 4 | 6 | 8 | 10 | | | | |
| 2 | 12 | 14 | 16 | 18 | 20 | | | | |
| 3 | | | | | | | | | |
| 4 | xxxA1 | xxxB1 | xxxC1 | xxxD1 | xxxE1 | | | | |
| 5 | xxxA2 | xxxB2 | xxxC2 | xxxD2 | xxxE2 | | | | |
| 6 | | | | | | | | | |

7. Use 'Paste Special Transpose' to transpose this data.




| | A | B | C | D | E | F | G | H | I |
|---|---|---|---|---|---|---|---|---|---|
| 1 | 2 | 4 | 6 | 8 | 10 | | xxxA1 | xxxA2 | |
| 2 | 12 | 14 | 16 | 18 | 20 | | xxxB1 | xxxB2 | |
| 3 | | | | | | | xxxC1 | xxxC2 | |
| 4 | | | | | | | xxxD1 | xxxD2 | |
| 5 | | | | | | | xxxE1 | xxxE2 | |
| 6 | | | | | | | | | |

8. Select the range G1:H5 and replace all occurrences of 'xxx' with equal signs (the exact opposite of step 6).




Note: for example, change the value in cell C2 from 16 to 36. The value in cell H3 will also change from 16 to 36.

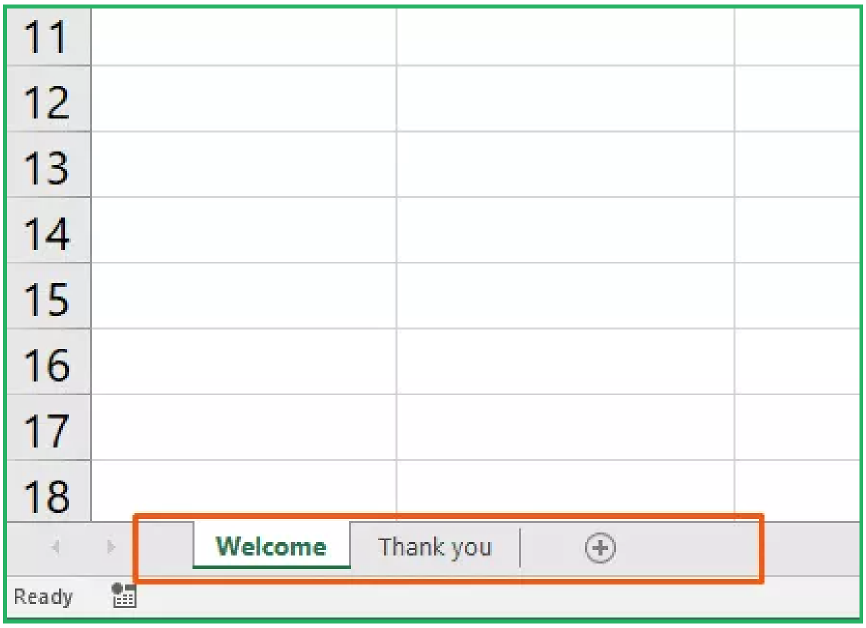
## Lesson 5 - Managing Worksheets

Managing your sheets

As we saw, workbooks can contain multiple sheets.

You can manage those sheets with the sheet tabs near the bottom of the screen. Click a tab to open that particular worksheet.

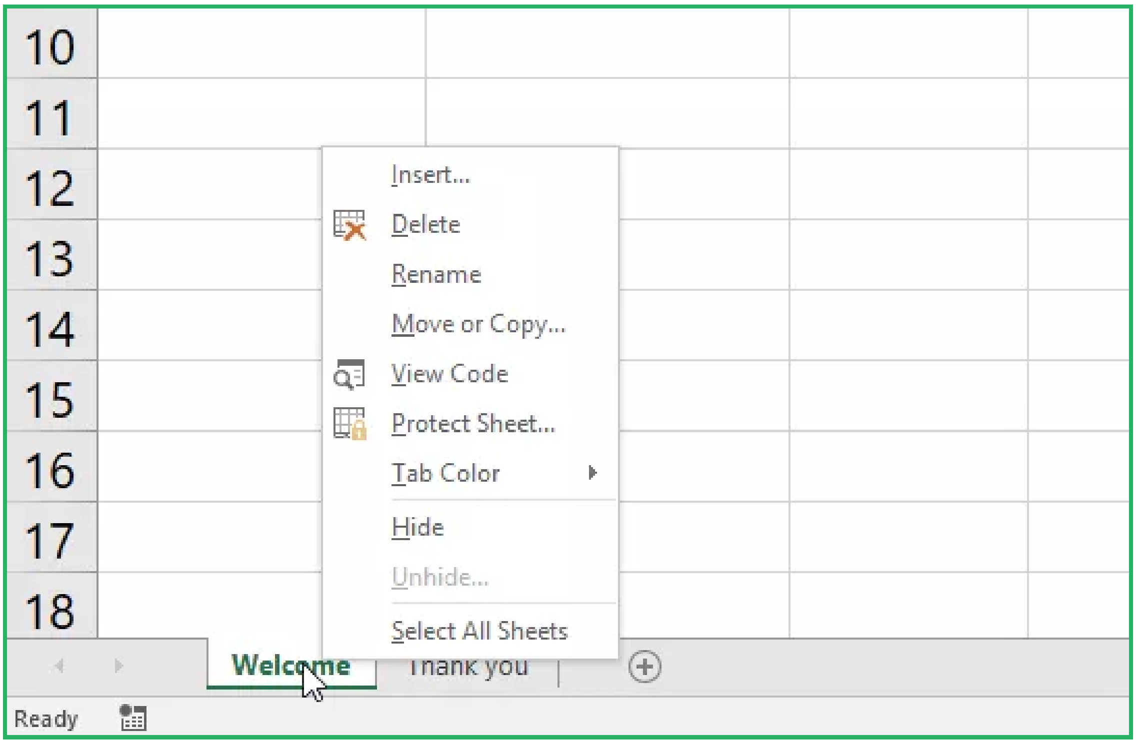
If you're using our example workbook, you'll see two sheets, called Welcome and Thank You:




To add a new worksheet, click the + (plus) button at the end of the list of sheets.

You can also reorder the sheets in your workbook by dragging them to a new location.

And if you right-click a worksheet tab, you'll get a number of options:

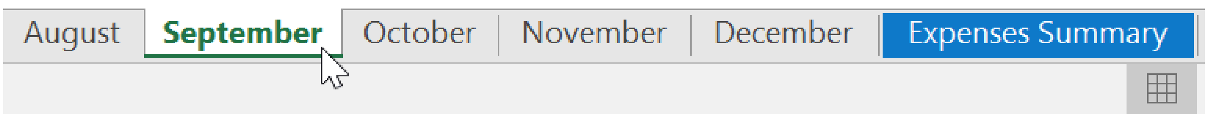



Grouping and ungrouping worksheets

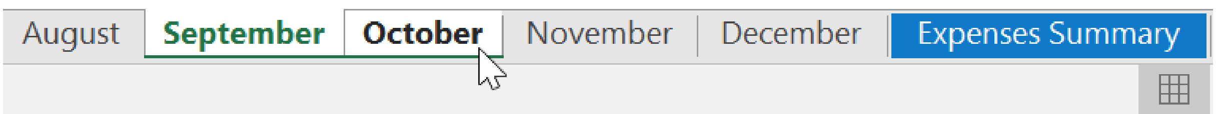
You can work with each worksheet **individually**, or you can work with multiple worksheets at the same time. Worksheets can be combined together into a **group**. Any changes made to one worksheet in a group will be made to **every worksheet** in the group.

To group worksheets:

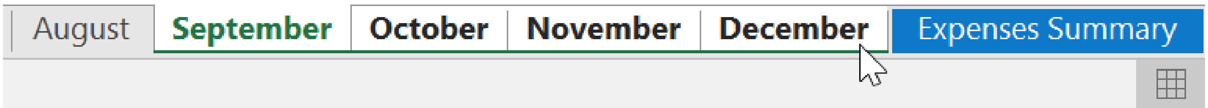
1. Select the **first worksheet** you want to include in the **worksheet group**.




2. Press and hold the **Ctrl** key on your keyboard. Select the **next worksheet** you want in the group.



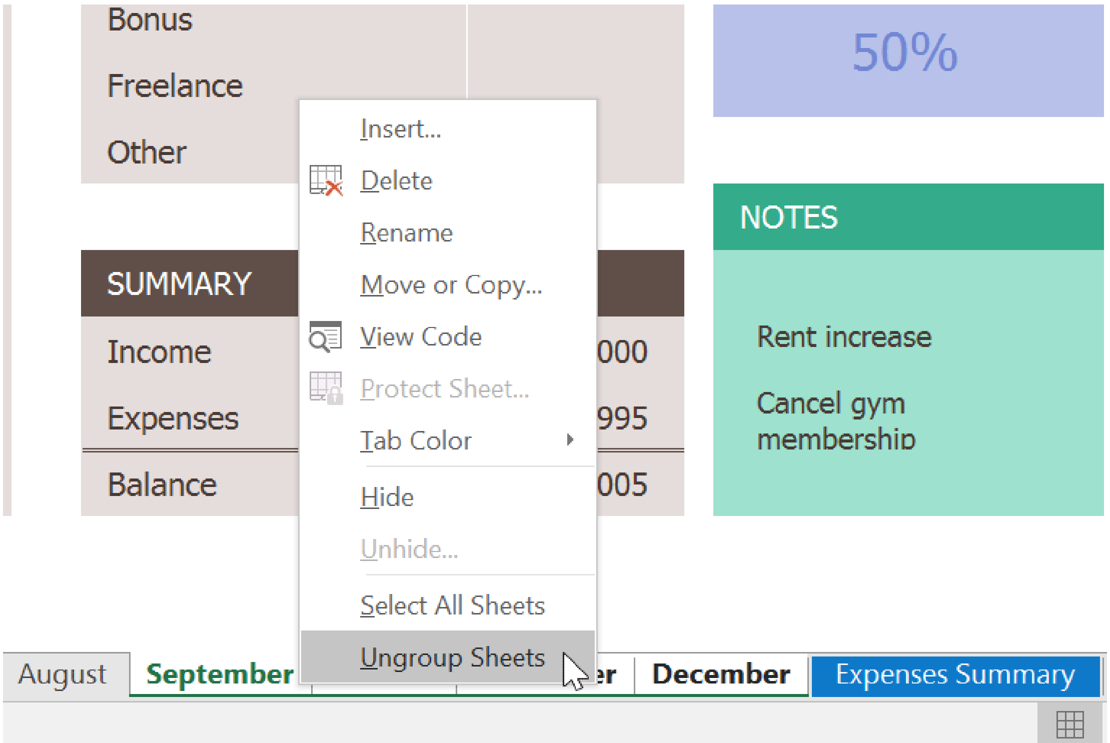

3. Continue to select worksheets until all of the worksheets you want to group are selected, then release the **Ctrl** key. The worksheets are now **grouped**.



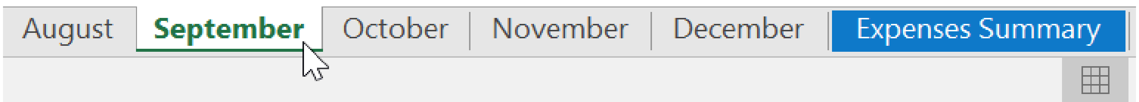

While worksheets are grouped, you can navigate to any worksheet within the group. Any **changes** made to one worksheet will appear on **every worksheet** in the group. However, if you select a worksheet that is not in the group, all of your worksheets will become **ungrouped**.

To ungroup worksheets:

1. Right-click a worksheet in the group, then select **Ungroup Sheets** from the worksheet menu.




2. The worksheets will be **ungrouped**. Alternatively, you can simply click any worksheet not included in the group to **ungroup all worksheets**.




EXCEL ESSENTIALS

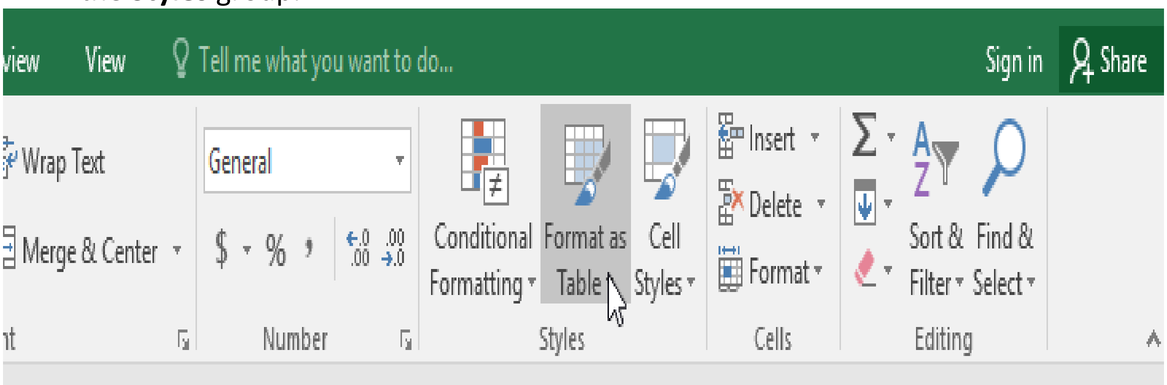
## Lesson 6 - Introduction to Excel Tables

Once you've entered information into your worksheet, you may want to format your data as a table. Just like regular formatting, tables can improve the look and feel of your workbook, and they'll also help you organize your content and make your data easier to use. Excel includes several tools and predefined table styles, allowing you to create tables quickly and easily.

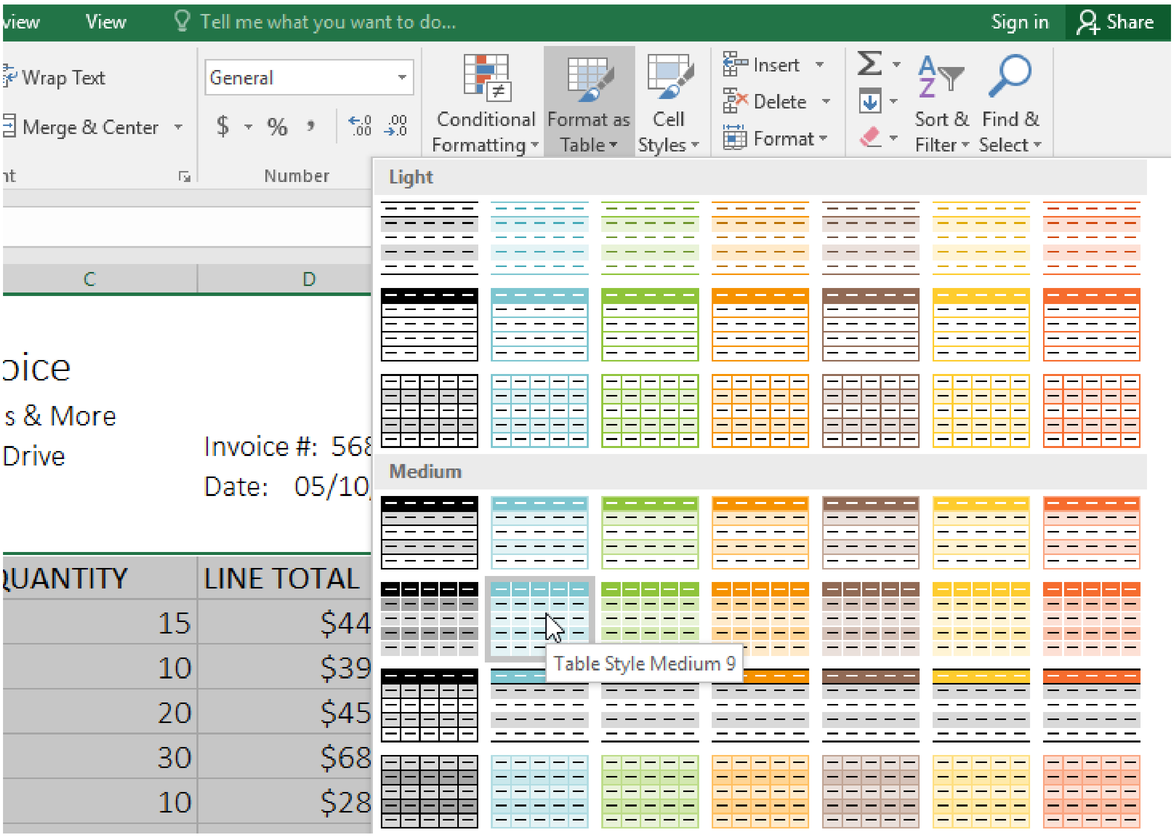
To format data as a table:

1. Select the **cells** you want to format as a table. In our example, we'll select the cell range **A2:D9**.

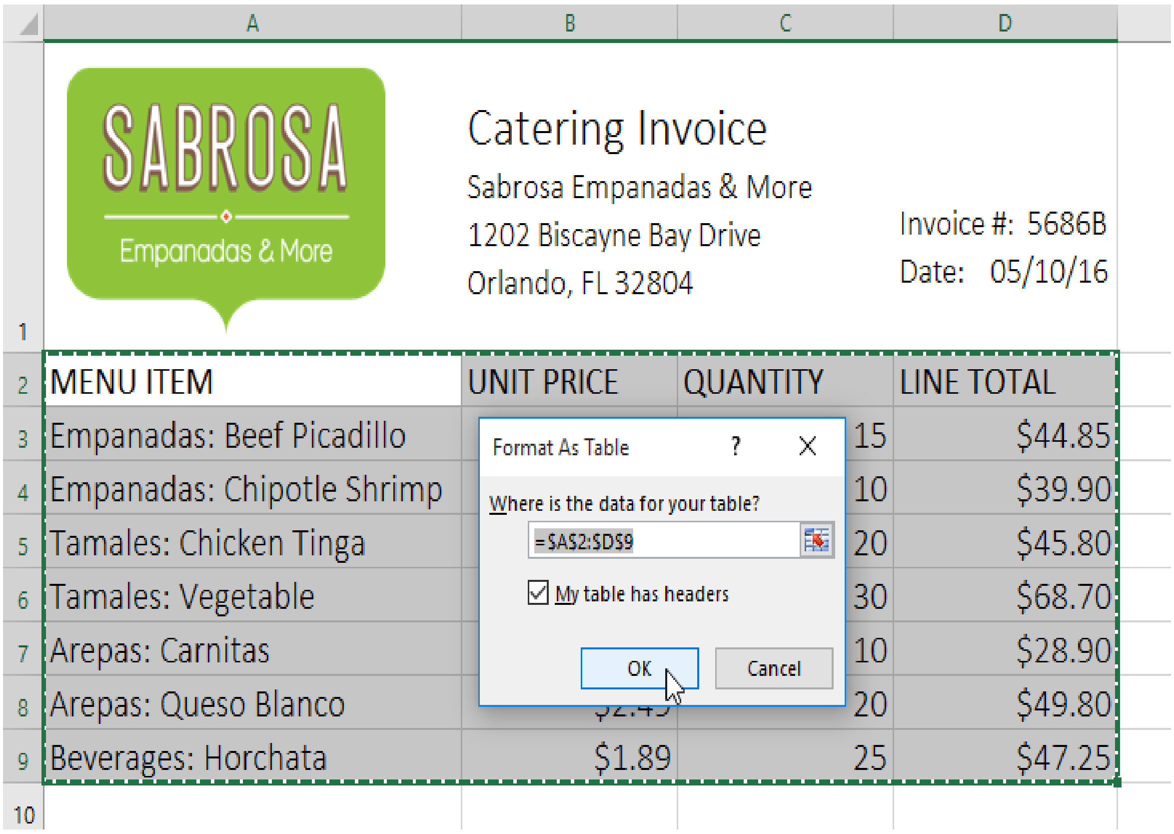

2. From the **Home** tab, click the **Format as Table** command in the **Styles** group.




3. Select a **table style** from the drop-down menu.




4. A dialog box will appear, confirming the selected **cell range** for the table.
5. If your table has **headers**, check the box next to **My table has headers**, then click **OK**.



6. The cell range will be formatted in the selected **table style**.

SABROSA
Empanadas & More

Catering Invoice
Sabrosa Empanadas & More
1202 Biscayne Bay Drive
Orlando, FL 32804

Invoice #: 5686B
Date: 05/10/16

| MENU ITEM | UNIT PRICE | QUANTITY | LINE TOTAL |
|---|---|---|---|
| Empanadas: Beef Picadillo | $2.99 | 15 | $44.85 |
| Empanadas: Chipotle Shrimp | $3.99 | 10 | $39.90 |
| Tamales: Chicken Tinga | $2.29 | 20 | $45.80 |
| Tamales: Vegetable | $2.29 | 30 | $68.70 |
| Arepas: Carnitas | $2.89 | 10 | $28.90 |
| Arepas: Queso Blanco | $2.49 | 20 | $49.80 |
| Beverages: Horchata | $1.89 | 25 | $47.25 |

Tables include **filtering** by default. You can filter your data at any time using the **drop-down arrows** in the header cells. To learn more, review our lesson on Filtering Data.

## Modifying tables

It's easy to modify the look and feel of any table after adding it to a worksheet. Excel includes many different options for customizing a table, including **adding rows or columns** and changing the **table style**.

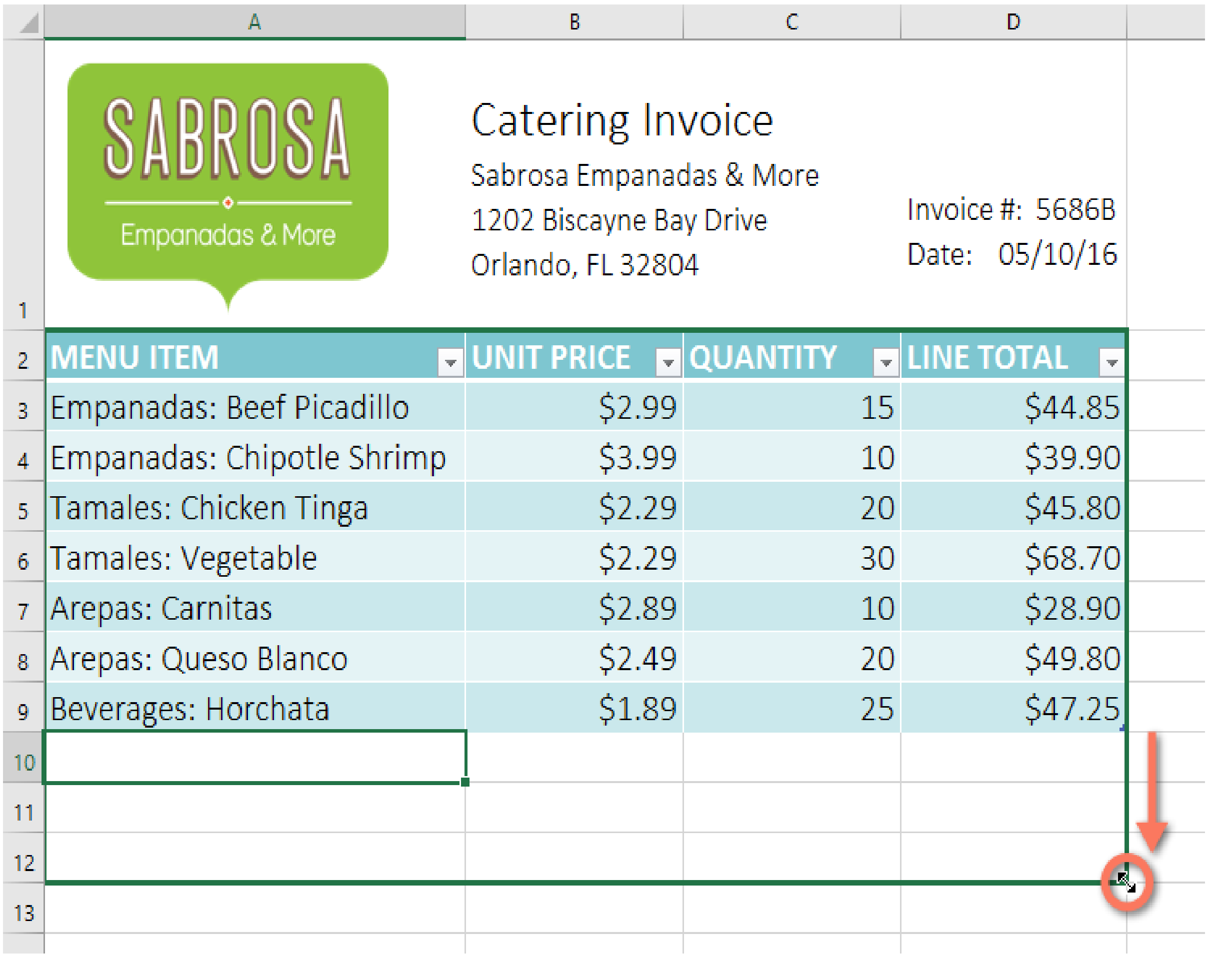
To add rows or columns to a table:

If you need to fit more content into your table, Excel allows you to modify the **table size** by including additional rows and columns. There are two simple ways to change the table size:

- Enter **new content** into any adjacent row or column. The row or column will be roped into the table automatically.

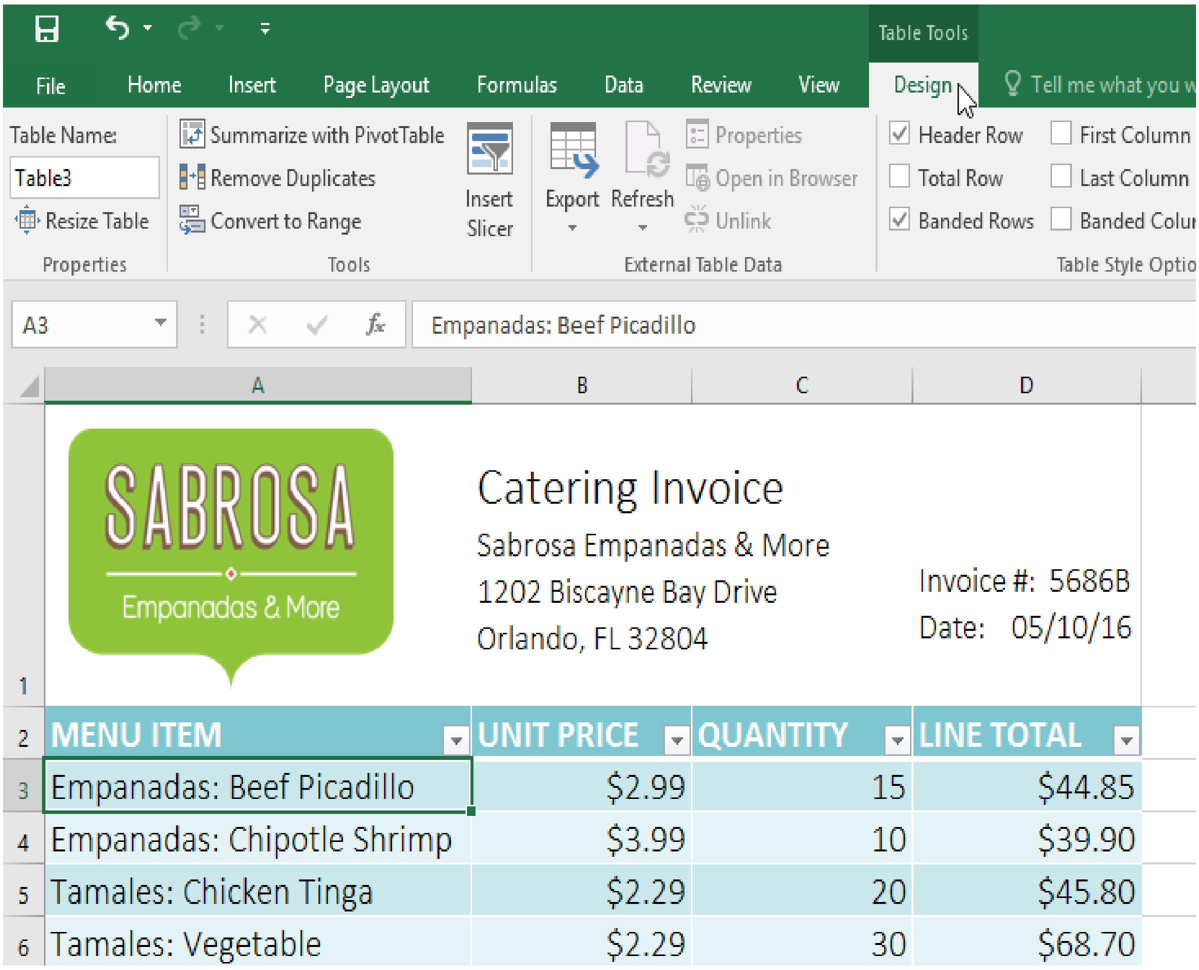

| MENU ITEM | UNIT PRICE | QUANTITY | LINE TOTAL |
|---|---|---|---|
| Empanadas: Beef Picadillo | $2.99 | 15 | $44.85 |
| Empanadas: Chipotle Shrimp | $3.99 | 10 | $39.90 |
| Tamales: Chicken Tinga | $2.29 | 20 | $45.80 |
| Tamales: Vegetable | $2.29 | 30 | $68.70 |
| Arepas: Carnitas | $2.89 | 10 | $28.90 |
| Arepas: Queso Blanco | $2.49 | 20 | $49.80 |
| Beverages: Horchata | $1.89 | 25 | $47.25 |
| Beverages: Lemonade | | | |

- Click and drag the **bottom-right corner** of the table to create additional rows or columns.

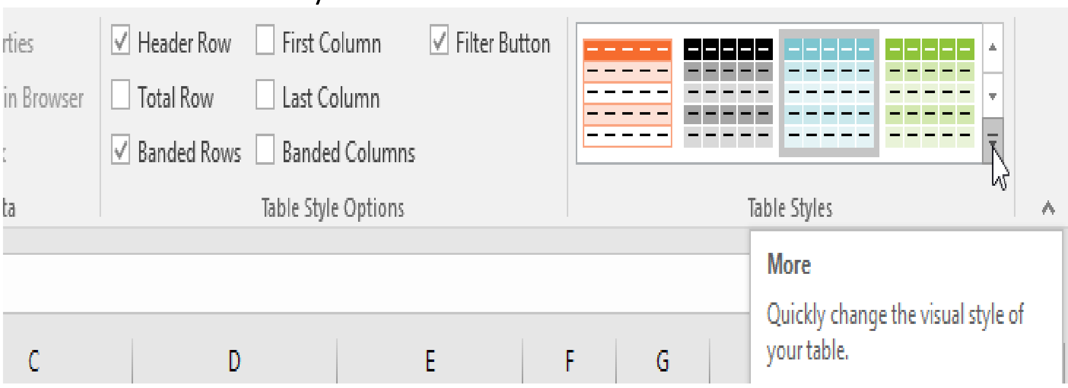



To change the table style:

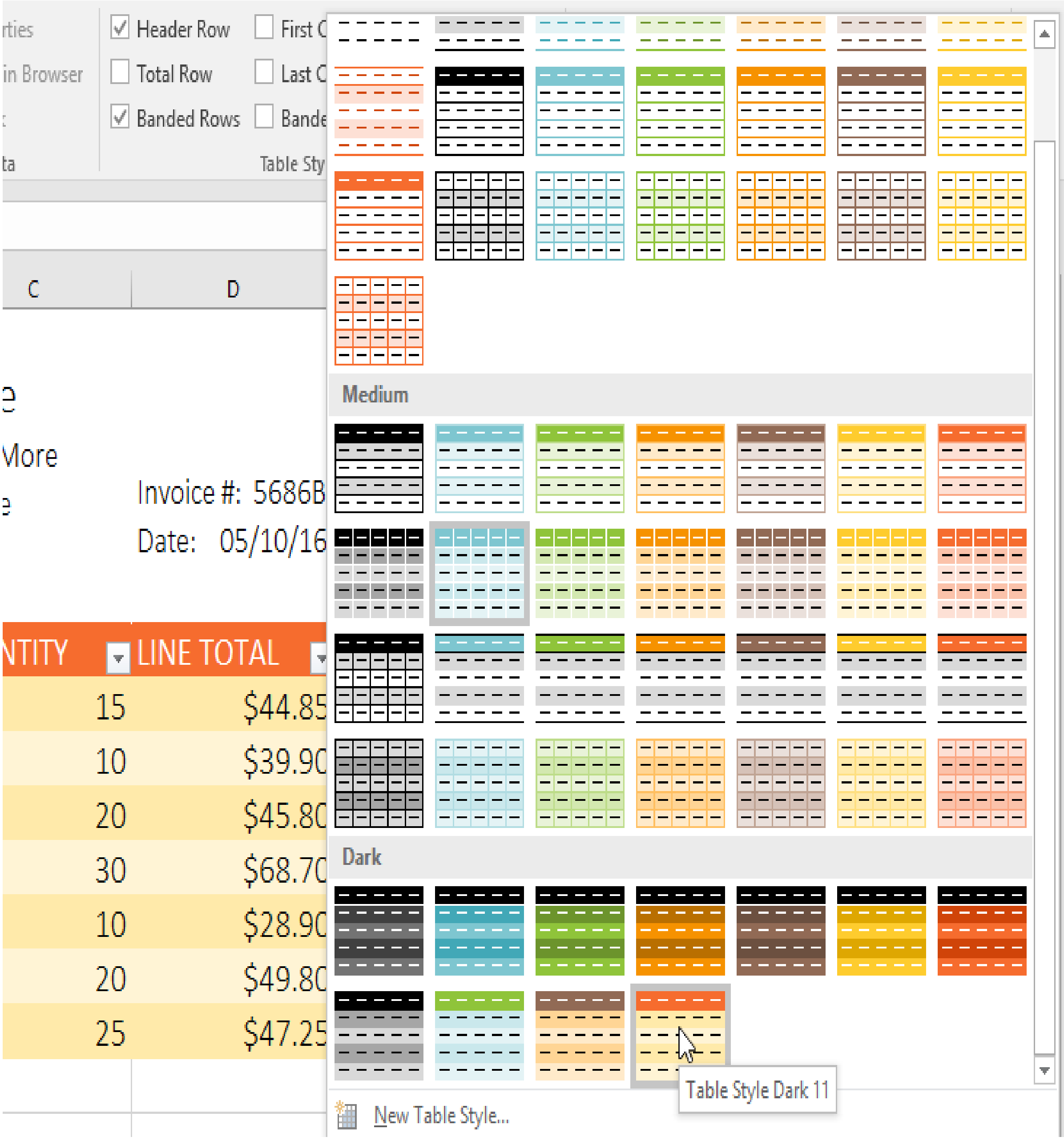
1. Select **any cell** in your table, then click the **Design** tab.



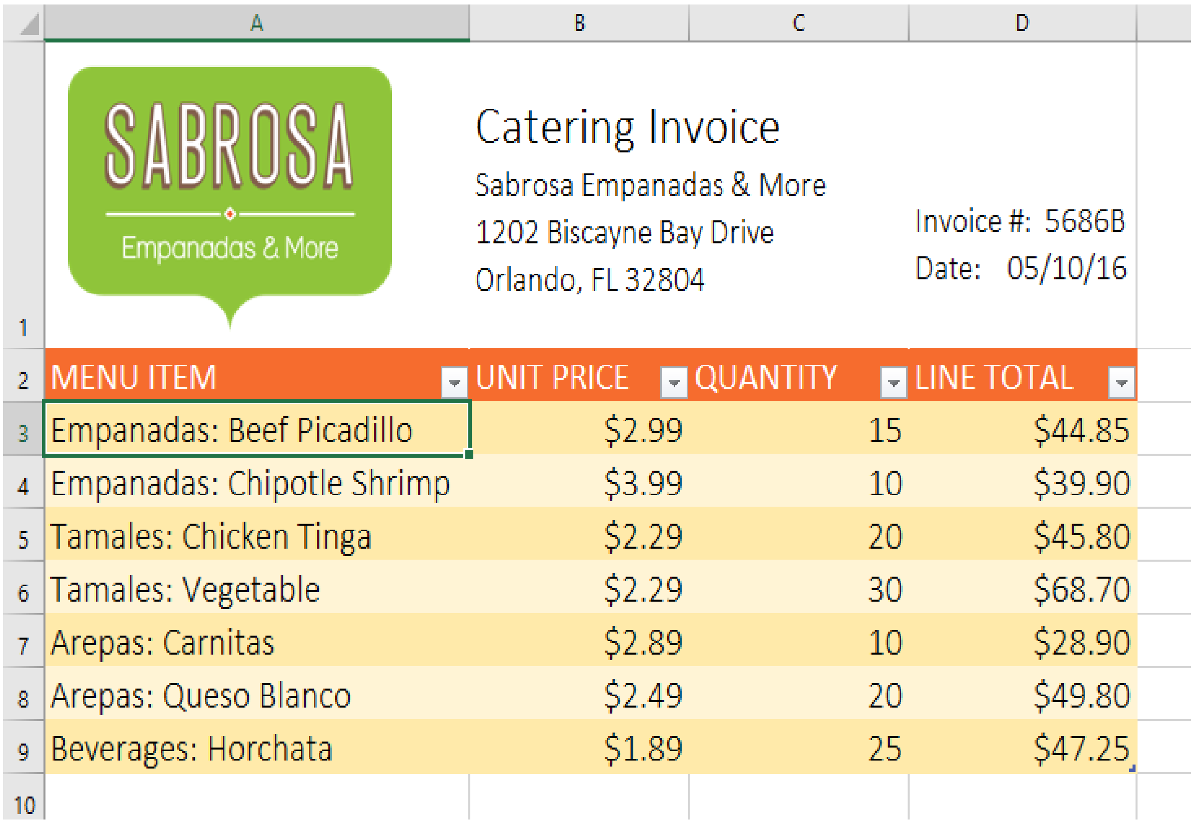

2. Locate the **Table Styles** group, then click the **More** drop-down arrow to see all available table styles.




3. Select the desired **table style**.




4. The **table style** will be applied.

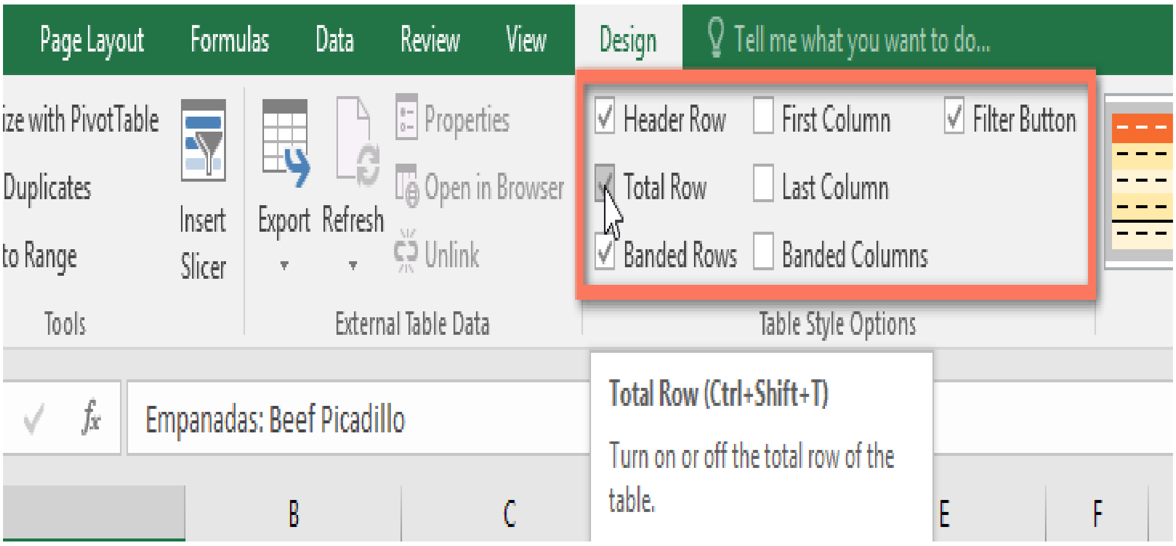



| MENU ITEM | UNIT PRICE | QUANTITY | LINE TOTAL |
|---|---|---|---|
| Empanadas: Beef Picadillo | $2.99 | 15 | $44.85 |
| Empanadas: Chipotle Shrimp | $3.99 | 10 | $39.90 |
| Tamales: Chicken Tinga | $2.29 | 20 | $45.80 |
| Tamales: Vegetable | $2.29 | 30 | $68.70 |
| Arepas: Carnitas | $2.89 | 10 | $28.90 |
| Arepas: Queso Blanco | $2.49 | 20 | $49.80 |
| Beverages: Horchata | $1.89 | 25 | $47.25 |

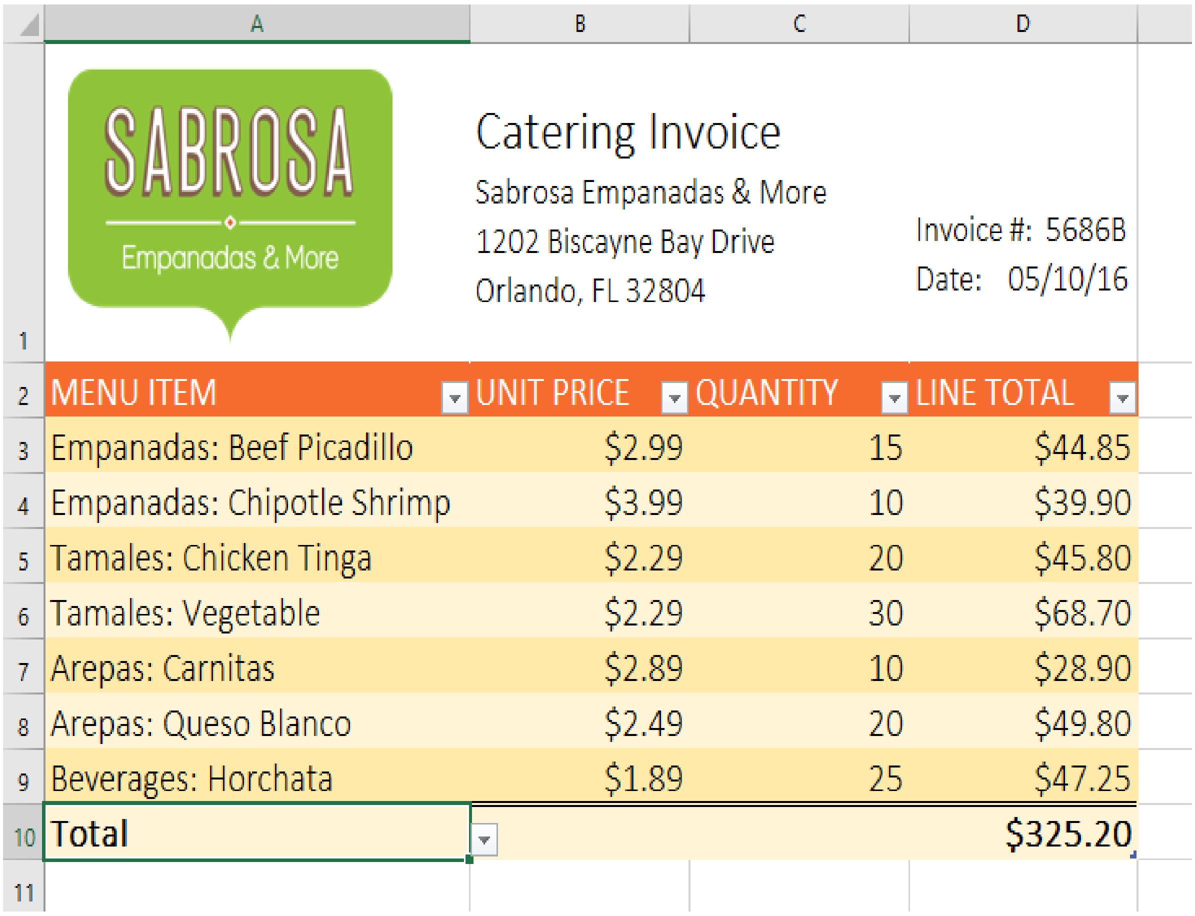
To modify table style options:

You can turn various options **on** or **off** to change the appearance of any table. There are several options: **Header Row**, **Total Row**, **Banded Rows**, **First Column**, **Last Column**, **Banded Columns**, and **Filter Button**. Select **any cell** in your table, then click the **Design** tab.

1. **Check** or **uncheck** the desired options in the **Table Style Options** group. In our example, we'll check **Total Row** to automatically include a **total** for our table.




2. The table style will be modified. In our example, a **new row** has been added to the table with a **formula** that automatically calculates the total value of the cells in column D.

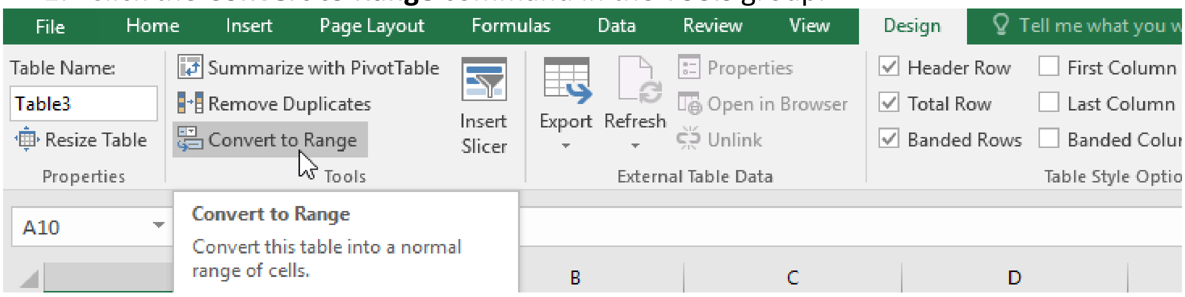



Depending on the type of **content** you have—and the **table style** you've chosen—these options can affect your table's appearance in various ways. You may need to experiment with a few different options to find the exact style you want.

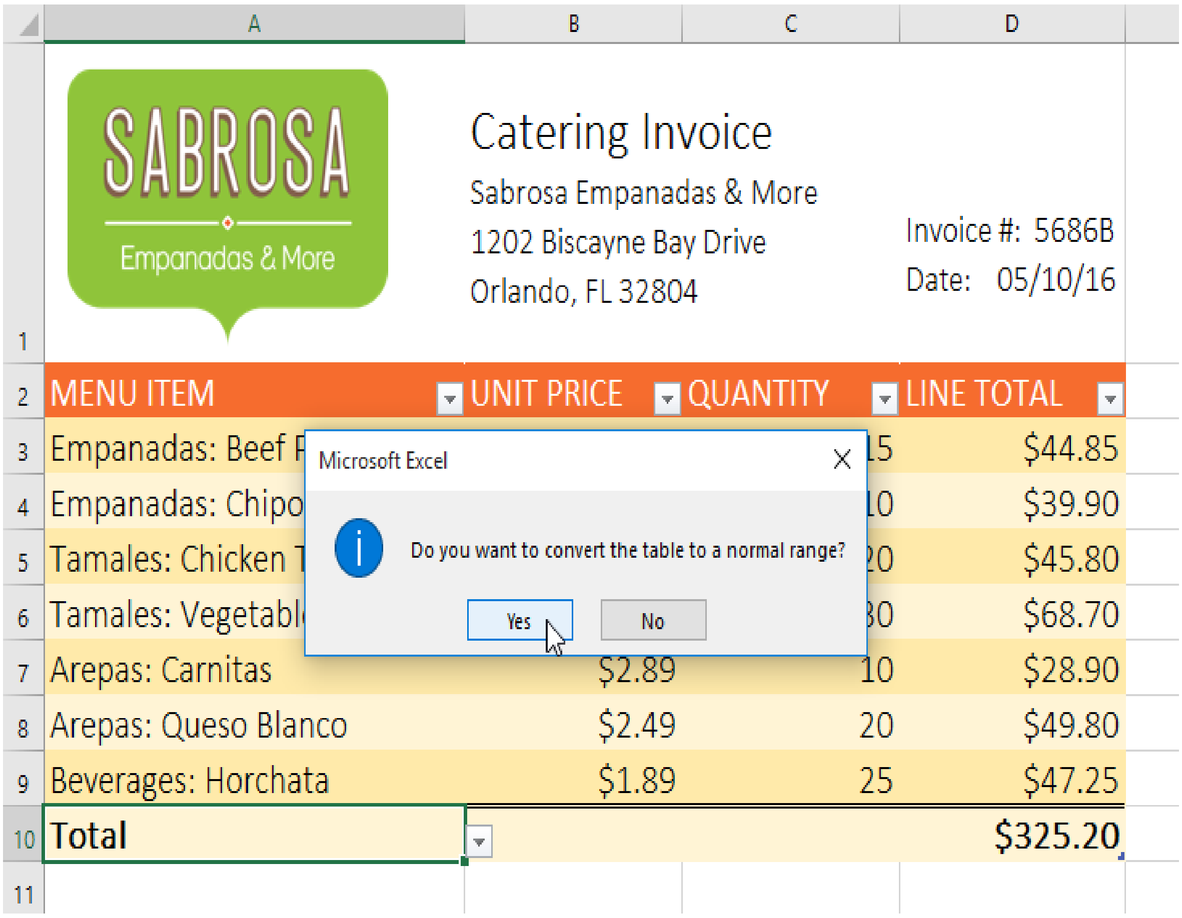
To remove a table:

It's possible to remove a table from your workbook without losing any of your data. However, this can cause issues with certain types of **formatting**, including colors, fonts, and banded rows. Before you use this option, make sure you're prepared to reformat your cells if necessary.

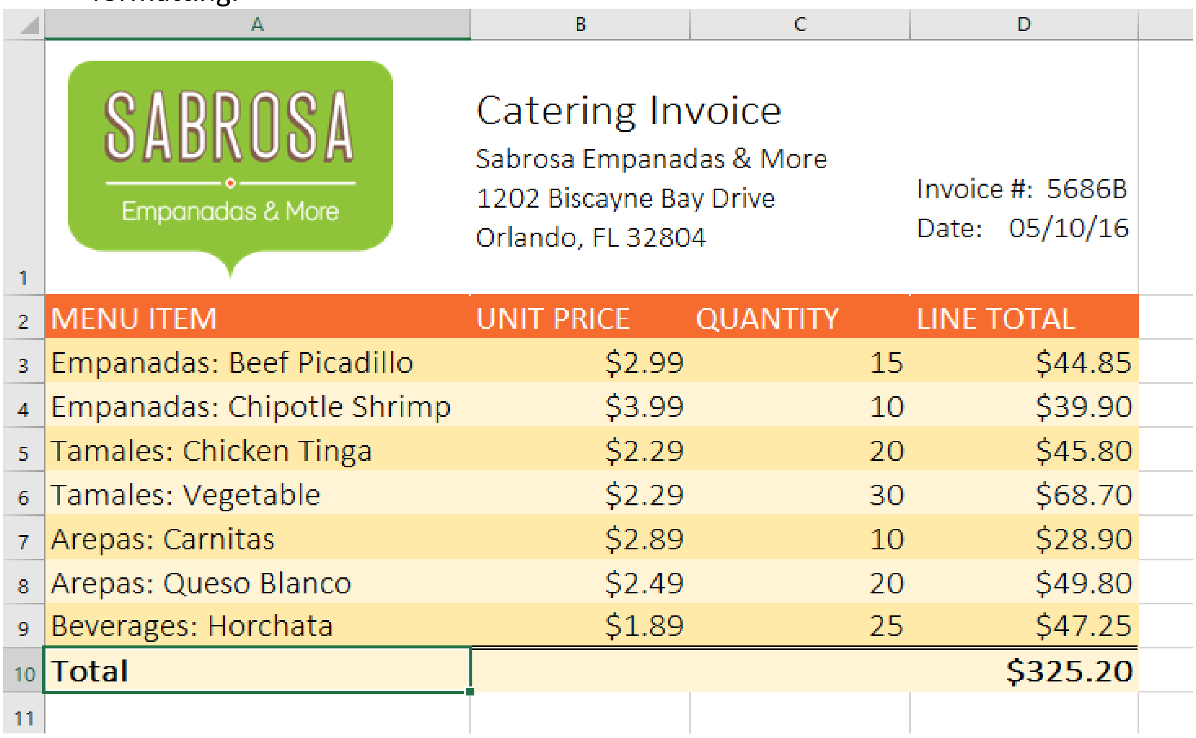
1. Select **any cell** in your table, then click the **Design** tab.
2. Click the **Convert to Range** command in the **Tools** group.



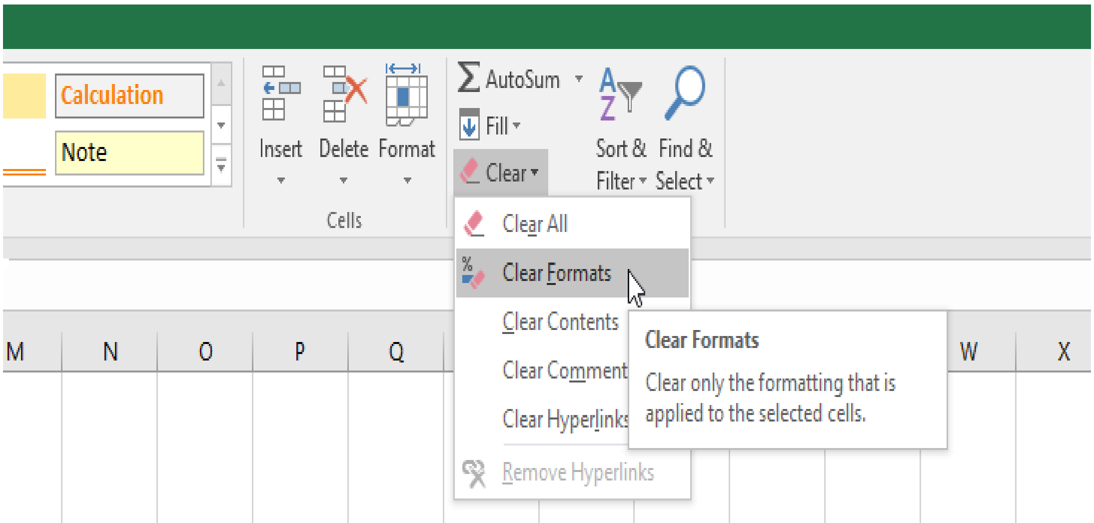

3. A dialog box will appear. Click **Yes**.




4. The range will no longer be a table, but the cells will retain their data and formatting.




To restart your formatting from scratch, click the **Clear** command on the **Home** tab. Next, choose **Clear Formats** from the menu.




## Lesson 7 - Auto-fill, Custom Lists, and Flash Fill, Data Validations

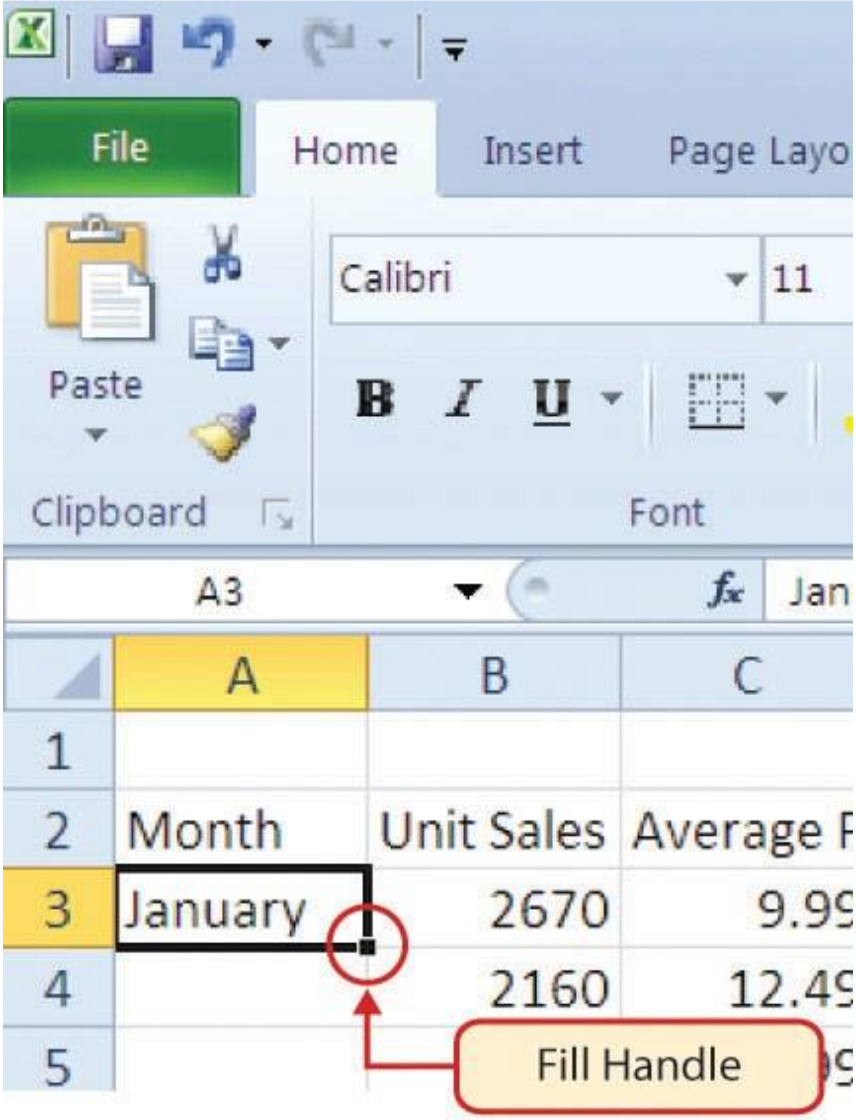
AUTO FILL

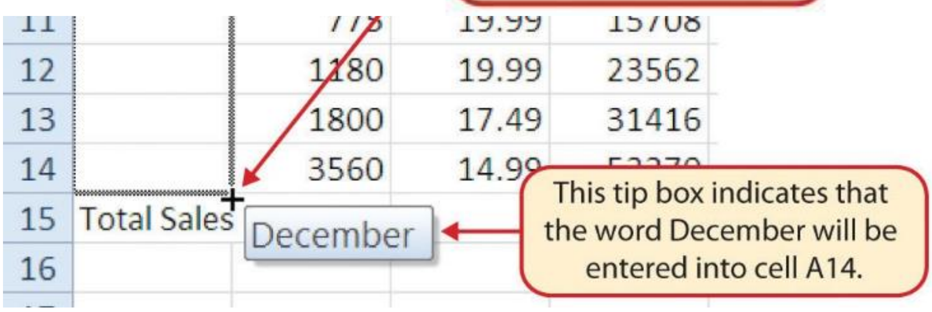
The Auto Fill feature is a valuable tool when manually entering data into a worksheet. This feature has many uses, but it is most beneficial when you are entering data in a defined sequence, such as the numbers 2, 4, 6, 8, and so on, or nonnumeric data such as the days of
the week or months of the year. The following steps demonstrate how Auto Fill can be used to enter the months of the year in Column A:

1. Click cell A3 in the Sheet1 worksheet.
2. Type the word **January** and press the ENTER key.
3. Activate cell A3 again.

4. Move the mouse pointer to the lower right corner of cell A3. You will see a small square in this corner of the cell; this is called the Fill Handle (See **Figure 1.18**) when the mouse pointer gets close to the Fill Handle, the white block plus sign will turn into a black plus sign.

Figure 1.18 Fill Handle




Left click and drag the Fill Handle to cell A14. Notice that the Auto Fill tip box indicates what month will be placed into each cell (see **Figure 1.19**). Release the left mouse button when the tip box reads “December.”

Figure 1.19 Using Auto Fill to Enter the Months of the Year

Once you release the left mouse button, all twelve months of the year should appear in the cell range A3:A14, as shown in **Figure 1.20**. You will also see the Auto Fill Options button. By clicking this button, you have several options for inserting data into a group of cells.

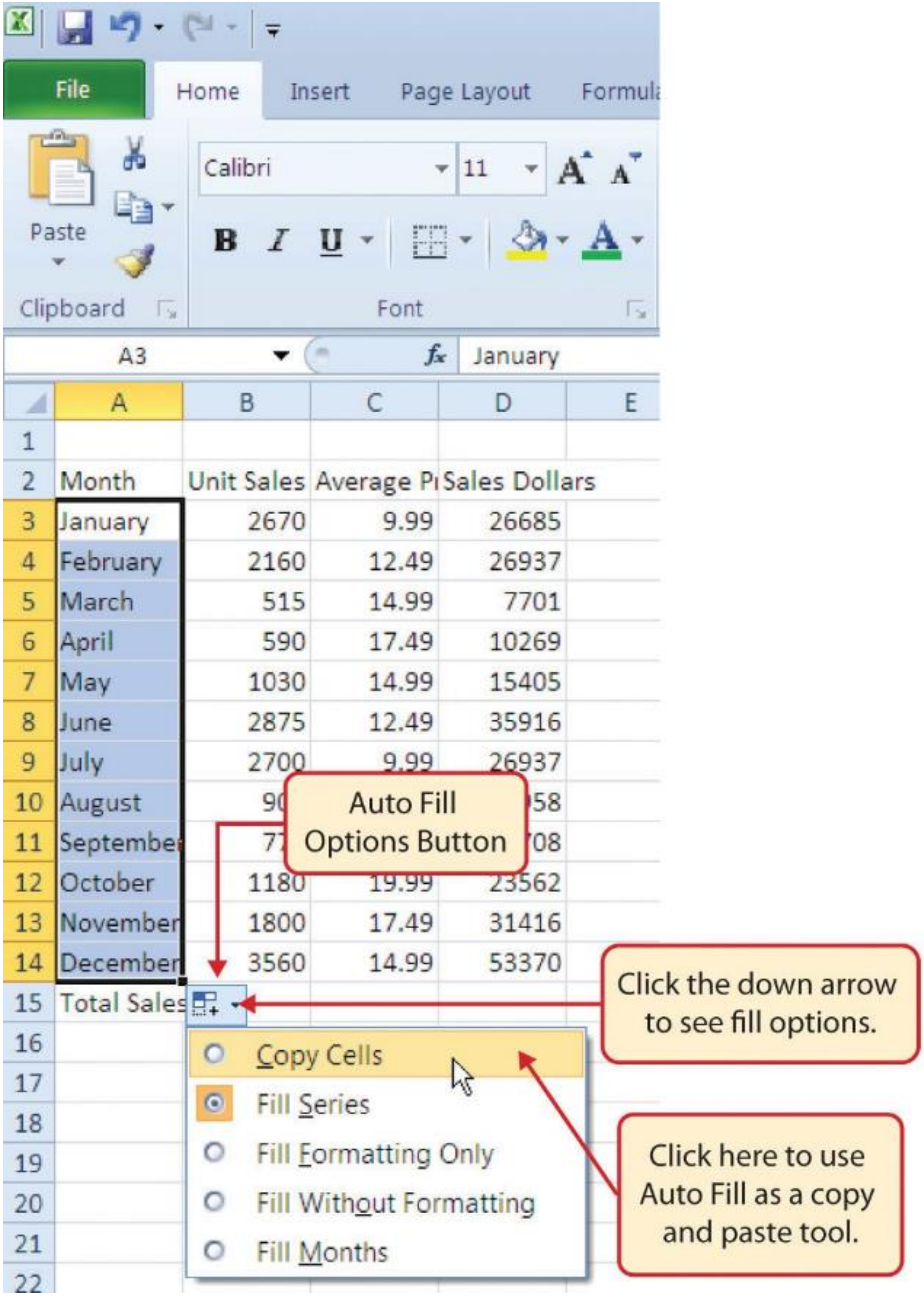



Figure 1.20 Auto Fill Options Button

1. Click the Auto Fill Options button.

2. Click the Copy Cells option. This will change the months in the range A4:A14 to January.
3. Click the Auto Fill Options button again.
4. Click the Fill Months option to return the months of the year to the cell range A4:A14. The Fill Series option will provide the same result.

## Lesson 8 - Number Formatting in Excel

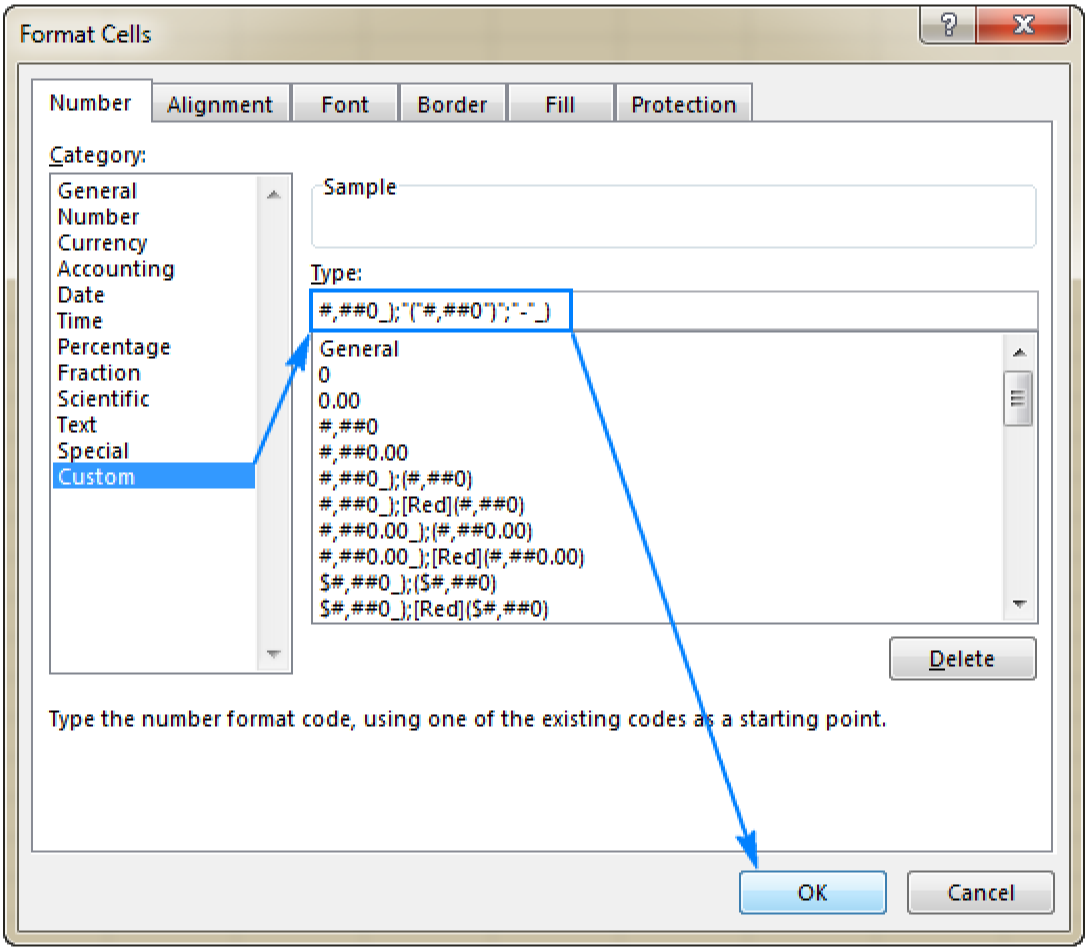
Microsoft Excel has a lot of built-in formats for number, currency, percentage, accounting, dates and times. But there are situations when you need something very specific. If none of the inbuilt Excel formats meets your needs, you can create your own number format.

Number formatting in Excel is a very powerful tool, and once you learn how to use it property, your options are almost unlimited. The aim of this tutorial is to explain the most essential aspects of Excel number format and set you on the right track to mastering custom number formatting.

### How to create a custom number format in Excel

To create a custom Excel format, open the workbook in which you want to apply and store your format, and follow these steps:

1. Select a cell for which you want to create custom formatting, and press Ctrl+1 to open the *Format Cells* dialog.
2. Under *Category*, select **Custom**.
3. Type the format code in the *Type* box.
4. Click OK to save the newly created format.




**Tip.** Instead of creating a custom number format from scratch, you choose a built-in Excel format close to your desired result, and customize it.

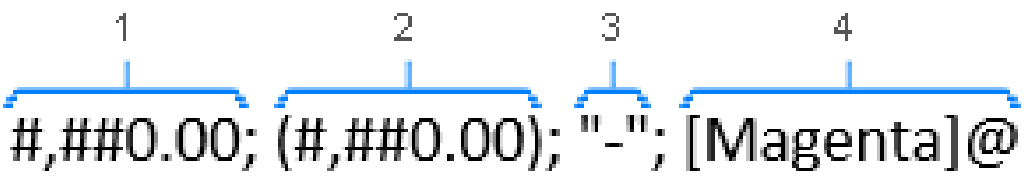
Understanding Excel number format

To be able to create a custom format in Excel, it is important that you understand how Microsoft Excel sees the number format.

An Excel number format consists of 4 sections of code, separated by semicolons, in this order:

POSITIVE; NEGATIVE; ZERO; TEXT

Here's an example of a custom Excel format code:




1. Format for positive numbers (display 2 decimal places and a thousands separator).
2. Format for negative numbers (the same as for positive numbers, but enclosed in parenthesis).
3. Format for zeros (display dashes instead of zeros).
4. Format for text values (display text in magenta font color).

## Excel formatting rules

When creating a custom number format in Excel, please remember these rules:

1. A custom Excel number format changes only the **visual representation**, i.e. how a value is displayed in a cell. The underlying value stored in a cell is not changed.
2. When you are **customizing** a built-in Excel format, a copy of that format is created. The original number format cannot be changed or deleted.
3. Excel custom number format does not have to include all four sections.
   If a custom format contains just **1 section**, that format will be applied to all number types - positive, negative and zeros.
   If a custom number format includes **2 sections**, the first section is used for positive numbers and zeros, and the second section - for negative numbers.
   A custom format is applied to **text values** only if it contains all four sections.
4. To apply the **default** Excel number format for any of the middle sections, type **General** instead of the corresponding format code.
   For example, to display zeros as dashes and show all other values with the default formatting, use this format code: **General; -General; "-"; General**
   **Note.** The General format included in the 2nd section of the format code does not display the minus sign, therefore we include it in the format code.
5. To **hide** a certain value type(s), skip the corresponding code section, and only type the ending semicolon.
   For example, to hide zeros and negative values, use the following format code: **General; ; ; General**. As the result, zeros and negative value will appear only in the formula bar, but will not be visible in cells.
6. To **delete** a custom number format, open the *Format Cells* dialog, select *Custom* in the *Category* list, find the format you want to delete in the *Type* list, and click the **Delete** button.

## Digit and text placeholders

For starters, let's explain 4 basic placeholders that you can use in your custom Excel format.

| Code | Description | Example |
|---|---|---|
| 0 | Digit placeholder that displays insignificant zeros. | #.00 - always displays 2 decimal places.<br>If you type 5.5 in a cell, it will display as 5.50. |
| # | Digit placeholder that represents optional digits and does not display extra zeros.<br>That is, if a number doesn't need a certain digit, it won't be displayed. | #.## - displays up to 2 decimal places.<br>If you type 5.5 in a cell, it will display as 5.5.<br>If you type 5.555, it will display as 5.56. |
| ? | Digit placeholder that leaves a space for insignificant zeros on either side of the decimal | #.??? - displays a maximum of 3 decimal places and |

| | | |
|---|---|---|
| | point but doesn't display them. It is often used to align numbers in a column by decimal point. | aligns numbers in a column by decimal point. |
| @ | Text placeholder | 0.00; -0.00; 0; [Red]@ - applies the red font color for text values. |

The following screenshot demonstrates a few number formats in action:

| General format | #.00 | #.## | #.??? |
|---|---|---|---|
| 0.5 | .50 | .5 | .5 |
| 5 | 5.00 | 5. | 5. |
| 5.5 | 5.50 | 5.5 | 5.5 |
| 5.55 | 5.55 | 5.55 | 5.55 |
| 50.555 | 50.56 | 50.56 | 50.555 |
| 50.5555 | 50.56 | 50.56 | 50.556 |

As you may have noticed in the above screenshot, the digit placeholders behave in the following way:

- If a number entered in a cell has more digits **to the right of the decimal point** than there are placeholders in the format, the number is "rounded" to as many decimal places as there are placeholders.
  For example, if you type 2.25 in a cell with **#.#** format, the number will display as 2.3.
- All digits **to the left of the decimal point** are displayed regardless of the number of placeholders.
  For example, if you type 202.25 in a cell with **#.#** format, the number will display as 202.3.

Below you will find a few more examples that will hopefully shed more light on number formatting in Excel.

| **Format** | **Description** | **Input values** | **Display as** |
|---|---|---|---|
| #.000 | Always display 3 decimal places. | 2<br>2.5<br>0.5556 | 2.000<br>2.500<br>.556 |
| #.0# | Display a minimum of 1 and a maximum of 2 decimal places. | 2<br>2.205<br>0.555 | 2.0<br>2.21<br>.56 |
| ???.??? | Display up to 3 decimal places with **aligned decimals**. | 22.55<br>2.5<br>2222.5555<br>0.55 | 22.55<br>2.5<br>2222.556<br>.55 |

### Excel formatting tips and guidelines

Theoretically, there are an infinite number of Excel custom number formats that you can make using a predefined set of formatting codes listed in the table below. And the following tips explain the most common and useful implementations of these format codes.

| **Format Code** | **Description** |
|---|---|
| General | General number format |
| # | Digit placeholder that represents optional digits and does not display extra zeros. |
| 0 | Digit placeholder that displays insignificant zeros. |
| ? | Digit placeholder that leaves a space for insignificant zeros but doesn't display them. |
| @ | Text placeholder |
| . (period) | Decimal point |
| , (comma) | Thousands separator. A comma that follows a digit placeholder scales the number by a thousand. |
| \ | Displays the character that follows it. |
| " " | Display any text enclosed in double quotes. |
| % | Multiplies the numbers entered in a cell by 100 and displays the percentage sign. |
| / | Represents decimal numbers as fractions. |
| E | Scientific notation format |
| _ (underscore) | Skips the width of the next character. It's commonly used in combination with parentheses to add left and right indents, **_(** and **_)** respectively. |
| * (asterisk) | Repeats the character that follows it until the width of the cell is filled. It's often used in combination with the space character to change alignment. |
| [] | Create conditional formats. |

### How to control the number of decimal places

The location of the **decimal point** in the number format code is represented by a **period** (.). The required number of **decimal places** is defined by **zeros** (0). For example:

- **0** or **#** - display the nearest integer with no decimal places.

- **0.0** or **#.0** - display 1 decimal place.
- **0.00** or **#.00** - display 2 decimal places, etc.

The difference between 0 and # in the integer part of the format code is as follows. If the format code has only pound signs (#) to the left of the decimal point, numbers less than 1 begin with a decimal point. For example, if you type 0.25 in a cell with **#.00** format, the number will display as .25. If you use **0.00** format, the number will display as 0.25.

| General format | 0 | 0.0 | #.0 | 0.00 | #.00 | #.000 |
|---|---|---|---|---|---|---|
| 0.5 | 1 | 0.5 | .5 | 0.50 | .50 | .500 |
| 5 | 5 | 5.0 | 5.0 | 5.00 | 5.00 | 5.000 |
| 5.5 | 6 | 5.5 | 5.5 | 5.50 | 5.50 | 5.500 |
| 5.55 | 6 | 5.6 | 5.6 | 5.55 | 5.55 | 5.550 |

**How to show a thousands separator**

To create an Excel custom number format with a thousands separator, include a **comma** (,) in the format code. For example:

- **#,###** - display a thousands separator and no decimal places.
- **#,##0.00** - display a thousands separator and 2 decimal places.

| General | #,### | #,##0.00 |
|---|---|---|
| 5000 | 5,000 | 5,000.00 |
| 50000 | 50,000 | 50,000.00 |
| 5000000 | 5,000,000 | 5,000,000.00 |
| 5000000000 | 5,000,000,000 | 5,000,000,000.00 |

Round numbers by thousand, million, etc.

As demonstrated in the previous tip, Microsoft Excel separates thousands by commas if a comma is enclosed by any digit placeholders - pound sign (#), question mark (?) or zero (0). If no digit placeholder follows a comma, it scales the number by thousand, two consecutive commas scale the number by million, and so on.

For example, if a cell format is **#.00,** and you type 5000 in that cell, the number 5.00 is displayed. For more examples, please see the screenshot below:

| General | #,#### | #, | #.00, | #.00,, |
|---|---|---|---|---|
| 50 | 50 | | .05 | .00 |
| 500 | 500 | 1 | .50 | .00 |
| 5000 | 5,000 | 5 | 5.00 | .01 |
| 55500 | 55,500 | 56 | 55.50 | .06 |
| 555500 | 555,500 | 556 | 555.50 | .56 |

**Text and spacing in custom Excel number format**

To display both text and numbers in a cell, do the following:

- To add a **single character**, precede that character with a backslash (\).
- To add a **text string**, enclose it in double quotation marks (" ").

For example, to indicate that numbers are rounded by thousands and millions, you can add *K* and *M* to the format codes, respectively:

- To display thousands: **#.00,\K**
- To display millions: **#.00,,\M**

**Tip.** To make the number format better readable, include a **space** between a comma and backward slash.

The following screenshot shows the above formats and a couple more variations:

| General | #.00, \K | #,###.0, \K | #.00,, \M | #,###.0000,, \M |
|---|---|---|---|---|
| 50 | .05 K | .1 K | .00 M | .0001 M |
| 500 | .50 K | .5 K | .00 M | .0005 M |
| 55500 | 55.50 K | 55.5 K | .06 M | .0555 M |
| 5555000 | 5555.00 K | 5,555.0 K | 5.56 M | 5.5550 M |
| 5555000000 | 5555000.00 K | 5,555,000.0 K | 5555.00 M | 5,555.0000 M |

And here is another example that demonstrates how to display text and numbers within a single cell. Supposing, you want to add the word "*Increase*" for positive numbers, and "*Decrease*" for negative numbers. All you have to do is include the text enclosed in double quotes in the appropriate section of your format code:

#.00" Increase"; -#.00" Decrease"; 0

**Tip.** To include a **space** between a number and text, type a space character after the opening or before the closing quote depending on whether the text precedes or follows the number, like in "*Increase* ".

| General | "Increase " #.00; "Decrease "-#.00; 0 |
|---|---|
| 20 | Increase 20.00 |
| -20.5 | Decrease -20.50 |
| 0 | 0 |
| 0.6 | Increase .60 |
| -12 | Decrease -12.00 |

In addition, the following characters can be included in Excel custom format codes without the use of backslash or quotation marks:

| Symbol | Description |
|---|---|
| + and - | Plus and minus signs |
| ( ) | Left and right parenthesis |
| : | Colon |
| ^ | Caret |
| ' | Apostrophe |

| Symbol | Description |
|---|---|
| { } | Curly brackets |
| < > | Less-than and greater than signs |
| = | Equal sign |
| / | Forward slash |
| ! | Exclamation point |
| & | Ampersand |
| ~ | Tilde |
|  | Space character |

A custom Excel number format can also accept other special symbols such as currency, copyright, trademark, etc. These characters can be entered by typing their four-digit ANSI codes while holding down the ALT key. Here are some of the most useful ones:

| Symbol | Code | Description |
|---|---|---|
| ™ | Alt+0153 | Trademark |
| © | Alt+0169 | Copyright symbol |
| ° | Alt+0176 | Degree symbol |
| ± | Alt+0177 | Plus-Minus sign |
| µ | Alt+0181 | Micro sign |

For example, to display temperatures, you can use the format code **#"°F"** or **#"°C"** and the result will look similar to this:

| Top 5 June 2016 temperatures | | |
|---|---|---|
| | #"°C" | #"°F" |
| Cancun | 28°C | 82°F |
| Paris | 16°C | 61°F |
| Orlando | 27°C | 81°F |
| Tenerife | 21°C | 70°F |
| Rome | 23°C | 73°F |

You can also create a custom Excel format that combines some specific text and the text typed in a cell. To do this, enter the additional text enclosed in double quotes in the 4th section of the format code before or after the text placeholder (@), or both.

For example, to proceed the text typed in the cell with some other text, say "*Shipped in*", use the following format code:

General; General; General; "Shipped in "@

| | General | General; General; General; "Shipped in "@ |
|---|---|---|
| Apples | 1 day | Shipped in 1 day |
| Oranges | a week | Shipped in a week |
| Grapes | 3 days | Shipped in 3 days |
| Lemons | 2 weeks | Shipped in 2 weeks |

Including currency symbols in a custom number format

To create a custom number format with the dollar sign ($), simply type it in the format code where appropriate. For example, the format **$#.00** will display 5 as $5.00.

Other currency symbols are not available on most of standard keyboards. But you can enter the popular currencies in this way:

- Turn NUM LOCK on, and
- Use the numeric keypad to type the ANSI code for the currency symbol you want to display.

| Symbol | Currency | Code |
|---|---|---|
| € | Euro | ALT+0128 |
| £ | British Pound | ALT+0163 |

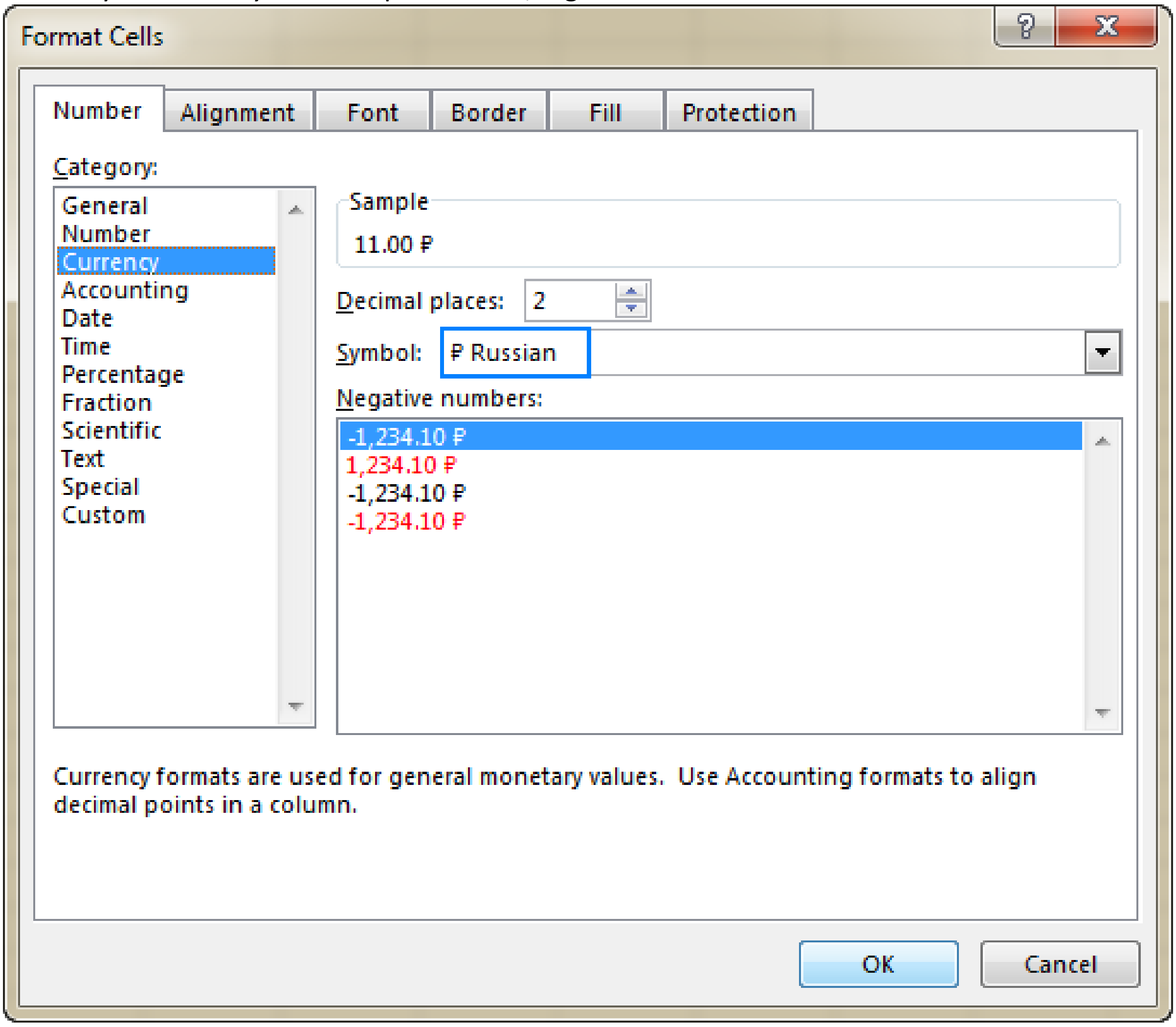
| | | |
|---|---|---|
| ¥ | Japanese Yen | ALT+0165 |
| ¢ | Cent Sign | ALT+0162 |

The resulting number formats may look something similar to this:

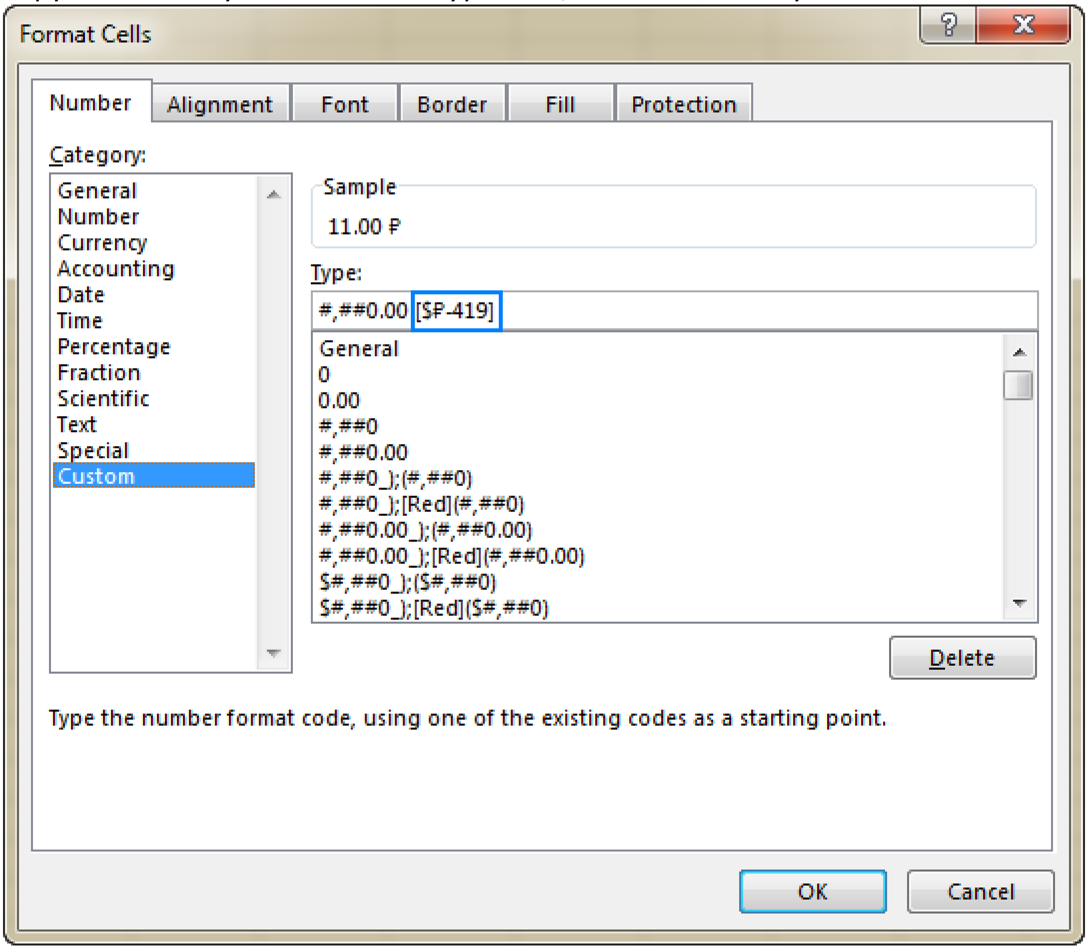
| General | $#.00 | €#,##.00 | £#.##.00 |
|---|---|---|---|
| 5 | $5.00 | €5.00 | £5.00 |
| 0.5 | $.50 | €.50 | £.50 |
| 5.1 | $5.10 | €5.10 | £5.10 |
| 5.119 | $5.12 | €5.12 | £5.12 |
| 50000 | $50000.00 | €50,000.00 | £50,000.00 |

If you want to create a custom Excel format with some other currency, follow these steps:

- Open the *Format Cells* dialog, select **Currency** under *Category*, and choose the desired currency from the *Symbol* drop-down list, e.g. Russian Ruble:



- Switch to **Custom** category, and modify the built-in Excel format the way you want. Or, copy the currency code from the *Type* field, and include it in your own number format:




How to display leading zeros with Excel custom format

If you try entering numbers 005 or 00025 in a cell with the default *General* format, you would notice that Microsoft Excel removes leading zeros because the number 005 is same as 5. But sometimes, we do want 005, not 5!

The simplest solution is to apply the Text format to such cells. Alternatively, you can type an apostrophe (') in front of the numbers. Either way, Excel will understand that you want any cell value to be treated as a text string. As the result, when you type 005, all leading zeros will be preserved, and the number will show up as 005.

If you want all numbers in a column to contain a certain number of digits, with leading zeros if needed, then create a custom format that includes only zeros.

As you remember, in Excel number format, 0 is the placeholder that displays insignificant zeros. So, if you need numbers consisting of 6 digits, use the following format code: **000000**

And now, if you type 5 in a cell, it will appear as 000005; 50 will appear as 000050, and so on:

| General | Format: 000000 |
|---|---|
| 5 | 000005 |
| 50 | 000050 |
| 501 | 000501 |
| 5010 | 005010 |
| 50110 | 050110 |

**Tip.** If you are entering phone numbers, zip codes, or social security numbers that contain leading zeros, the easiest way is to apply one of the predefined Special formats. Or, you can create the desired custom number format. For example, to properly display international seven-digit postal codes, use this format: **0000000**. For social security numbers with leading zeros, apply this format: **000-00-0000**.

Percentages in Excel custom number format

To display a number as a percentage of 100, include the **percent sign** (%) in your number format.

For example, to display percentages as integers, use this format: **#%**. As the result, the number 0.25 entered in a cell will appear as 25%.

To display percentages with 2 decimal places, use this format: **#.00%**

To display percentages with 2 decimal places and a thousands separator, use this one: **#,##.00%**

| General | #% | #.00% | #,##.00% |
|---|---|---|---|
| 0.05 | 5% | 5.00% | 5.00% |
| 0.5 | 50% | 50.00% | 50.00% |
| 5 | 500% | 500.00% | 500.00% |
| 50 | 5000% | 5000.00% | 5,000.00% |
| 500 | 50000% | 50000.00% | 50,000.00% |

Fractions in Excel number format

Fractions are special in terms that the same number can be displayed in a variety of ways. For example, 1.25 can be shown as 1 ¼ or 5/5. Exactly which way Excel displays the fraction is determined by the format codes that you use.

For decimal numbers to appear as fractions, include **forward slash** (/) in your format code, and separate an integer part with a space. For example:

- **# #/#** - displays a fraction remainder with up to 1 digit.

- **# ##/##** - displays a fraction remainder with up to 2 digits.
- **# ###/###** - displays a fraction remainder with up to 3 digits.
- **###/###** - displays an improper fraction (a fraction whose numerator is larger than or equal to the denominator) with up to 3 digits.

To round fractions to a specific denominator, supply it in your number format code after the slash. For example, to display decimal numbers as eighths, use the following **fixed base** fraction format: **# #/8**

The following screenshot demonstrated the above format codes in action:

| General | # #/# | # ##/## | ###/### | # #/8 |
|---|---|---|---|---|
| 0.2 | 1/5 | 1/5 | 1/5 | 2/8 |
| 1.25 | 1 1/4 | 1 1/4 | 5/4 | 1 2/8 |
| 0.5 | 1/2 | 1/2 | 1/2 | 4/8 |
| 0.24 | 1/4 | 6/25 | 6/25 | 2/8 |

As you probably know, the predefined Excel Fraction formats align numbers by the fraction bar (/) and display the whole number at some distance from the remainder. To implement this alignment in your custom format, use the question mark placeholders (?) instead of the pound signs (#) like shown in the following screenshot:

| General | # ?/? | # ??/?? | ???/??? | # ?/8 |
|---|---|---|---|---|
| 0.2 | 1/5 | 1/5 | 1/5 | 2/8 |
| 1.25 | 1 1/4 | 1  1/4 | 5/4 | 1 2/8 |
| 101.25 | 101 1/4 | 101  1/4 | 405/4 | 101 2/8 |

**Tip.** To enter a fraction in a cell formatted as *General*, preface the fraction with a zero and a space. For instance, to enter 4/8 in a cell, you type 0 4/8. If you type 4/8, Excel will assume you are entering a date, and change the cell format accordingly.

Create a custom Scientific Notation format

To display numbers in Scientific Notation format (Exponential format), include the capital letter **E** in your number format code. For example:

- **00E+00** - displays 1,500,500 as 1.50E+06.
- **#0.0E+0** - displays 1,500,500 as 1.5E+6
- **#E+#** - displays 1,500,500 as 2E+6

| General | 0.00E+00 | #0.0E+0 | #E+# |
|---|---|---|---|
| 15000 | 1.50E+04 | 1.5E+4 | 2E+4 |
| 1500500 | 1.50E+06 | 1.5E+6 | 2E+6 |
| 0.00005 | 5.00E-05 | 50.0E-6 | 5E-5 |

Show negative numbers in parenthesis

At the beginning of this tutorial, we discussed the 4 code sections that make up an Excel number format: **Positive; Negative; Zero; Text**

Most of the format codes we've discussed so far contained just 1 section, meaning that the custom format is applied to all number types - positive, negative and zeros.

To make a custom format for negative numbers, you'd need to include at least 2 code sections: the first will be used for positive numbers and zeros, and the second - for negative numbers.

To show negative values in parenthesis, simply include them in the second section of your format code, for example: **#.00; (#.00)**

**Tip.** To line up positive and negative numbers at the decimal point, add an indent to the positive values section, e.g. **0.00_); (0.00)**

| General | #.00; (#.00) | 0_); (0) | 0.0_);(0.0) | 0.00_); (0.00) |
|---|---|---|---|---|
| 0.5 | .50 | 1 | 0.5 | 0.50 |
| -0.5 | (.50) | (1) | (0.5) | (0.50) |
| 10 | 10.00 | 10 | 10.0 | 10.00 |
| -10.5 | (10.50) | (11) | (10.5) | (10.50) |

Display zeroes as dashes or blanks

The built-in Excel Accounting format shows zeros as dashes. This can also be done in your custom Excel number format.

As you remember, the zero layout is determined by the 3rd section of the format code. So, to force zeros to appear as **dashes**, type **"-"** in that section. For example: **0.00;(0.00);"-"**

The above format code instructs Excel to display 2 decimal places for positive and negative numbers, enclose negative numbers in parenthesis, and turn zeros into dashes.

If you don't want any special formatting for positive and negative numbers, type *General* in the 1st and 2nd sections: **General; -General; "-"**

To turn zeroes into **blanks**, skip the third section in the format code, and only type the ending semicolon: **General; -General; ; General**

| General | #.00; (#.00); 0 | 0.00; (0.00); ; | General; -General; "-" | General;-General; ;General |
|---|---|---|---|---|
| 0.5 | .50 | 0.50 | 0.5 | 0.5 |
| -0.5 | (.50) | (0.50) | -0.5 | -0.5 |
| 0 | 0 | | - | |

Add indents with custom Excel format

If you don't want the cell contents to ride up right against the cell border, you can indent information within a cell. To add an indent, use the **underscore** (_) to create a space equal to the width of the character that follows it.

The commonly used indent codes are as follows:

- To indent from the left border: **_(**
- To indent from the right border: **_)**

Most often, the right indent is included in a positive number format, so that Excel leaves space for the parenthesis enclosing negative numbers.
For example, to indent positive numbers and zeros from the right and text from the left, you can use the following format code:
**0.00_);(0.00); 0_);_(@**
Or, you can add indents on both sides of the cell:
**_(0.00_);_((0.00);_(0_);_(@_)**
The indent codes move the cell data by one character width. To move values from the cell edges by more than one character width, include 2 or more consecutive indent codes in your number format. The following screenshot demonstrates indenting cell contents by 1 and 2 characters:

| General | 0.00_);(0.00);0_);_(@ | 0.00_)_);(0.00)_);0_)_);_)_)@ |
|---|---|---|
| 0.5 | 0.50 | 0.50 |
| -0.5 | (0.50) | (0.50) |
| 0 | 0 | 0 |
| text | text | text |

**Change font color with custom number format**
Changing the font color for a certain value type is one of the simplest things you can do with a custom number format in Excel, which supports 8 main colors. To specify the color, just type one of the following color names in an appropriate section of your number format code.

| | |
|---|---|
| [Black]<br>[Green]<br>[White]<br>[Blue] | [Magenta]<br>[Yellow]<br>[Cyan]<br>[Red] |

**Note.** The color code must be the **first item** in the section.
For example, to leave the default General format for all value types, and change only the font color, use the format code similar to this:
**[Green]General;[Red]General;[Black]General;[Blue]General**
Or, combine color codes with the desired number formatting, e.g. display the currency symbol, 2 decimal places, a thousands separator, and show zeros as dashes:
**[Blue]$#,##0.00; [Red]-$#,##0.00; [Black]"-"; [Magenta]@**

| General | Custom format |
|---|---|
| 50.5 | $50.50 |
| -30.25 | -$30.25 |
| 0 | - |
| 500000.2 | $500,000.20 |
| N/A | N/A |

Repeat characters with custom format codes

To repeat a specific character in your custom Excel format so that it fills the column width, type an **asterisk** (*) before the character.

For example, to include enough equality signs after a number to fill the cell, use this number format: **#*=**

Or, you can include leading zeros by adding *0 before any number format, e.g. ***0#**

| General | #*= | *0# |
|---|---|---|
| 1 | 1============ | 0000000000001 |
| 20 | 20=========== | 0000000000020 |
| 300 | 300========== | 0000000000300 |

This formatting technique is commonly used to change cell alignment as demonstrated in the next formatting tip.

How to change alignment in Excel with custom number format

A usual way to change alignment in Excel is using the *Alignment* tab on the ribbon. However, you can "hardcode" cell alignment in a custom number format if needed.

For example, to align numbers left in a cell, type an **asterisk** and a **space** after the number code, for example: "**#,###*** " (double quotes are used only to show that an asterisk is followed by a space, you don't need them in a real format code).

Making a step further, you could have numbers aligned left and text entries aligned right using this custom format:

**#,###* ; -#,###* ; 0* ;* @**

| General | #,###* | #,###* ; -#,###* ; 0* ;* @ |
|---|---|---|
| 20000 | 20,000 | 20,000 |
| 0 | | 0 |
| -3000 | -3,000 | -3,000 |
| N/A | N/A | N/A |

This method is used in the built-in Excel Accounting format . If you apply the Accounting format to some cell, then open the *Format Cells* dialog, switch to the *Custom* category and look at the *Type* box, you will see this format code:

**_($* #,##0.00_);_($* (#,##0.00);_($* "-"??_);_(@_)**

The asterisk that follows the currency sign tells Excel to repeat the subsequent space character until the width of a cell is filled. This is why the Accounting number format aligns the currency symbol to the left, number to the right, and adds as many spaces as necessary in between.

Apply custom number formats based on conditions

To have your custom Excel format applied only if a number meets a certain condition, type the condition consisting of a comparison operator and a value, and enclose it in **square brackets** [].

For example, to displays numbers that are less than 10 in a red font color, and numbers that are greater than or equal to 10 in a green color, use this format code:

**[Red][<10];[Green][>=10]**

Additionally, you can specify the desired number format, e.g. show 2 decimal places:

**[Red][<10]0.00;[Green][>=10]0.00**

| General | [Red][<10];[Green][>=10] | [Red][<10]0.00;[Green][>=10]0.00 |
|---|---|---|
| 10 | 10 | 10.00 |
| 5 | 5 | 5.00 |
| 25 | 25 | 25.00 |

And here is another extremely useful, though rarely used formatting tip. If a cell displays both numbers and text, you can make a conditional format to show a noun in a singular or plural form depending on the number. For example:

**[=1]0" mile";0.##" miles"**

The above format code works as follows:

- If a cell value is equal to 1, it will display as "*1 mile*".
- If a cell value is greater than 1, the plural form "*miles*" will show up. Say, the number 3.5 will display as "*3.5 miles*".

Taking the example further, you can display fractions instead of decimals:

**[=1]?" mile";# ?/?" miles"**

In this case, the value 3.5 will appear as "*3 1/2 miles*".

| General | [=1]0" mile";0.##" miles" | [=1]?" mile";# ?/?" miles" |
|---|---|---|
| 0.5 | 0.5 miles | 1/2 miles |
| 1 | 1 mile | 1 mile |
| 3.5 | 3.5 miles | 3 1/2 miles |

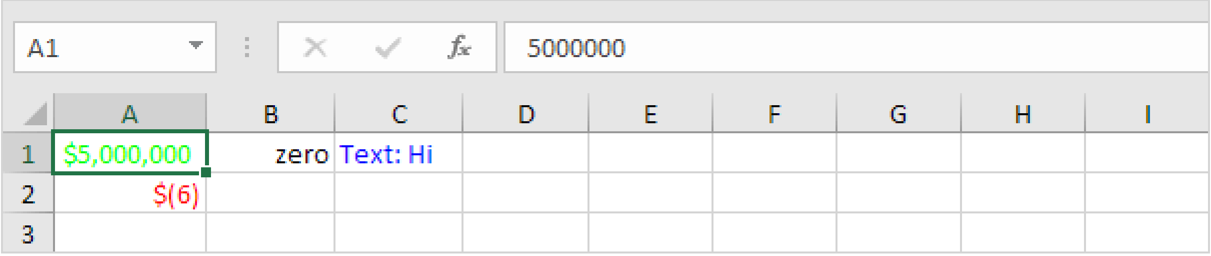
**Tip.** To apply more sophisticated conditions, use Excel's Conditional Formatting feature, which is specially designed to handle the task.

**Colors**

You can control positive numbers, negative numbers, zero values and text all at the same time! Each part is separated with a semicolon (;) in your number format code.

1. Enter the following values in cells A1, B1, C1 and A2: 5000000, 0, Hi and -5.89.

2. Use the following number format code: **[Green]$#,##0_);[Red]$(#,##0);"zero";[Blue]"Text:" @**

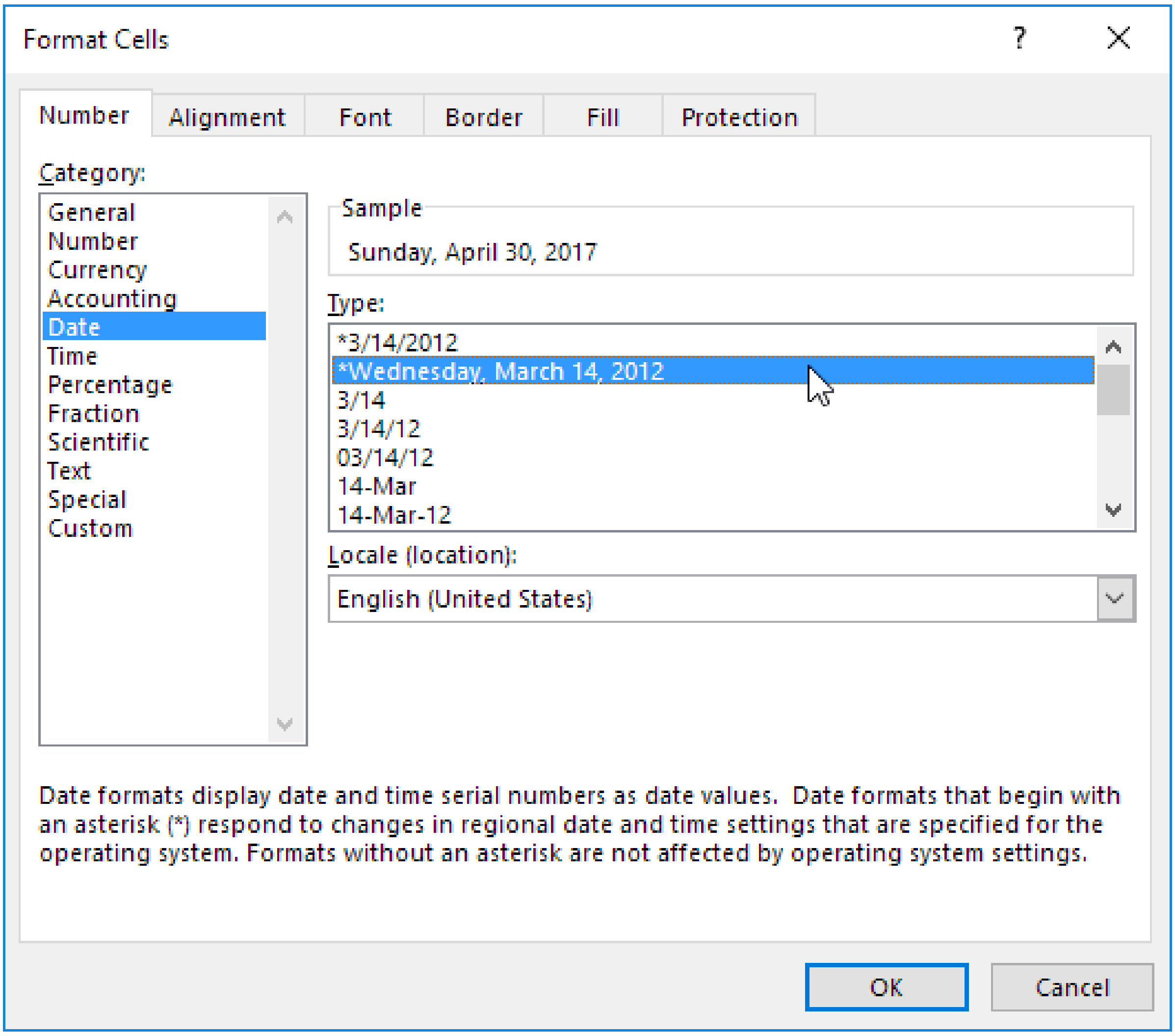



Note: #,## is used to add comma's to large numbers. To add a space, use the underscore "_" followed by a character. The length of the space will be the length of this character. In our example, we added a parentheses ")". As a result, the positive number lines up correctly with the negative number enclosed in parentheses. Use two parts separated with a semicolon (;) to control positive and negative numbers only. Use three parts separated with a semicolon (;) to control positive numbers, negative numbers and zero values only.

Dates and Times

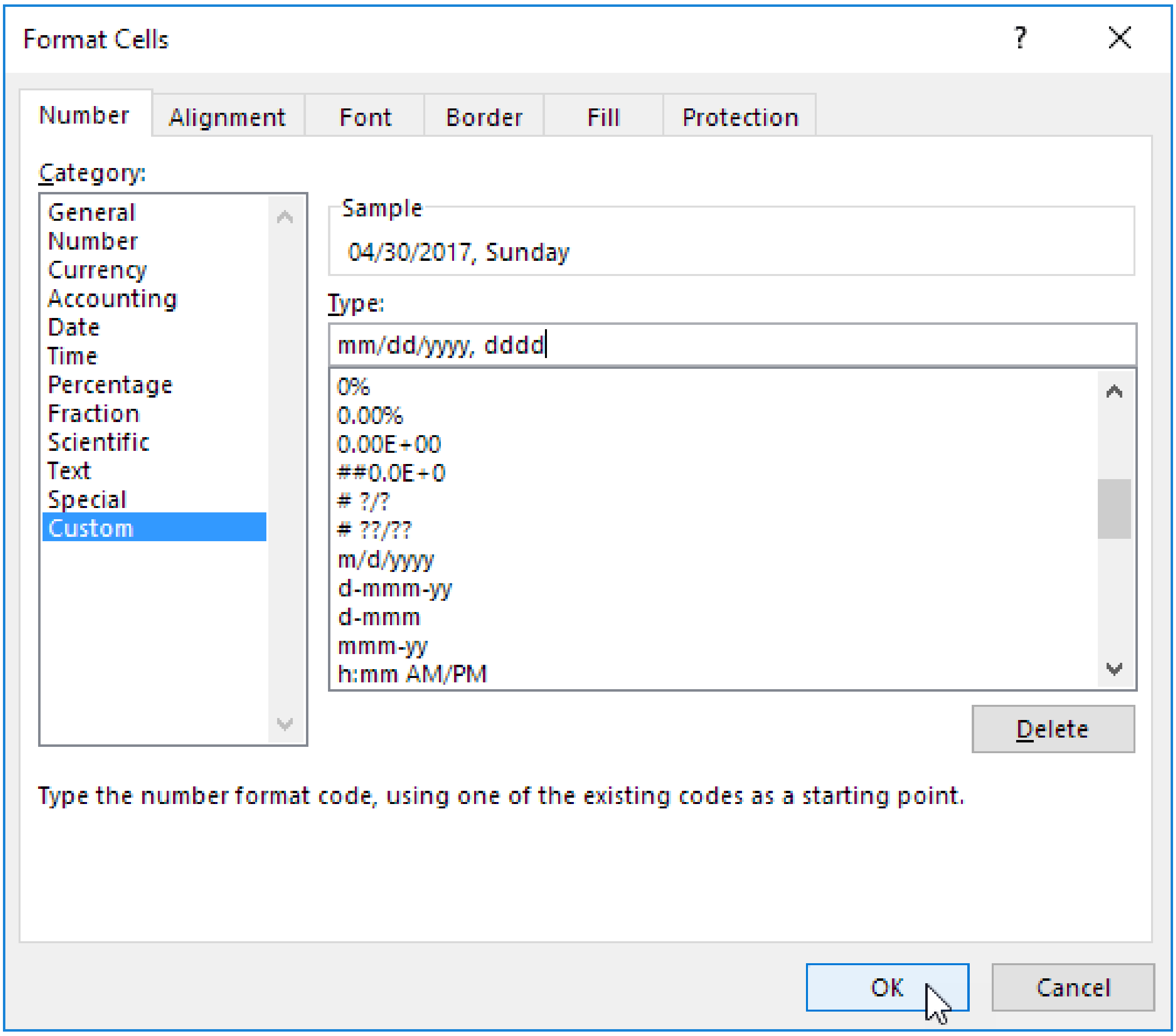
You can also control dates and times. Use one of the existing Date or Time formats as a starting point.

1. Enter the value 42855 into cell A1.
2. Select cell A1, right click, and then click Format Cells.
3. Select Date and select the Long Date.

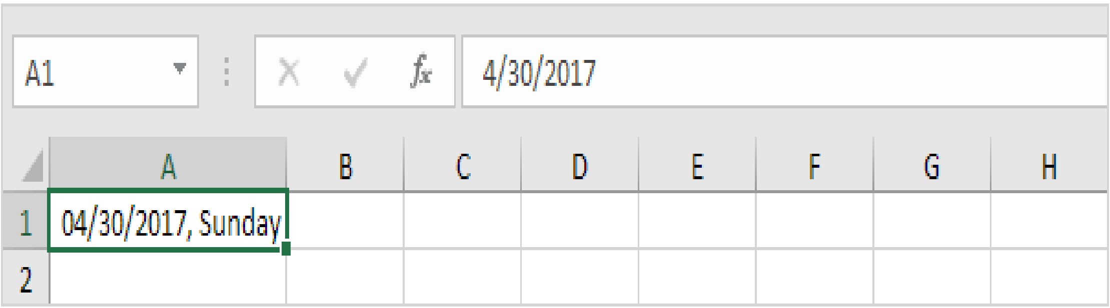



Note: Excel gives you a life preview of how the number will be formatted (under Sample).

4. Select Custom.
5. Slightly change the number format code to: **mm/dd/yyyy, dddd**
6. Click OK.



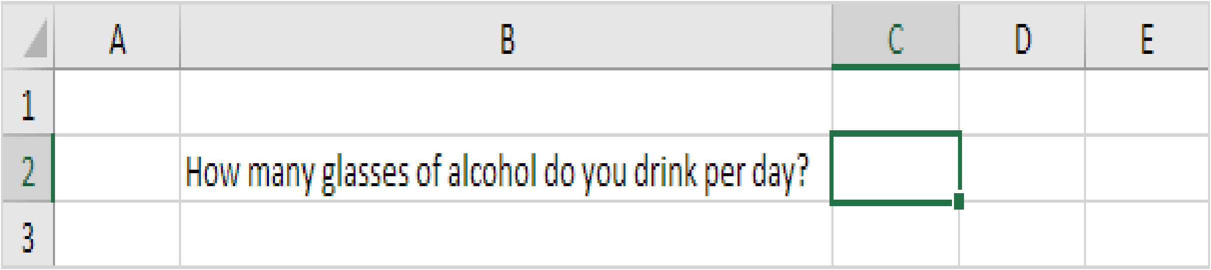

Result:




## Lesson 9 -Excel Data Validation, Drop-down List, Grouping

Data Validation

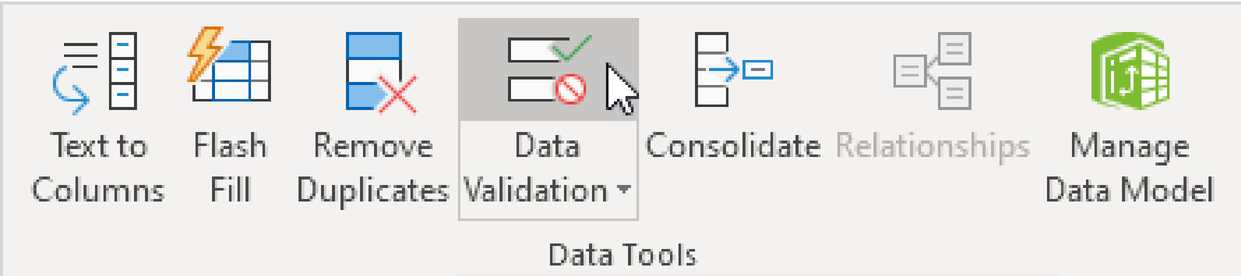
Use data validation in Excel to make sure that users enter certain values into a cell.
Data Validation Example
In this example, we restrict users to enter a whole number between 0 and 10.




Create Data Validation Rule

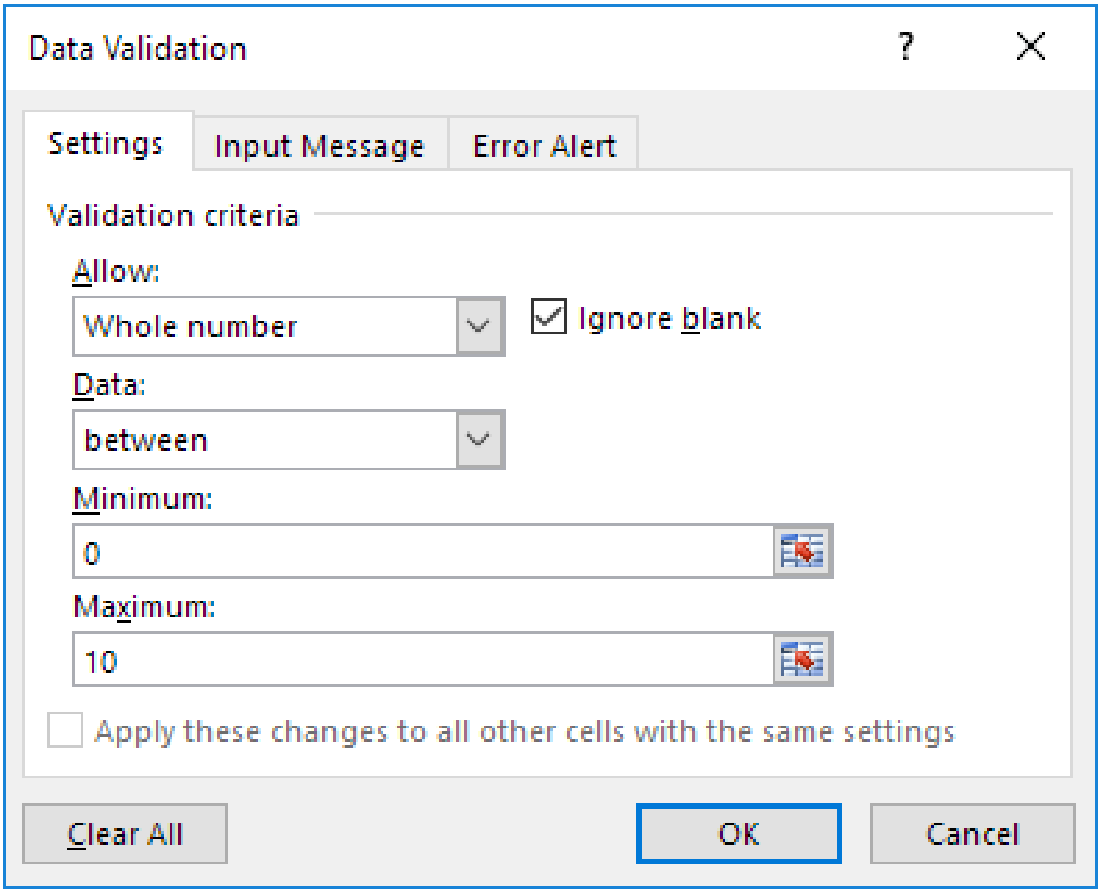
To create the data validation rule, execute the following steps.

1. Select cell C2.
2. On the Data tab, in the Data Tools group, click Data Validation.

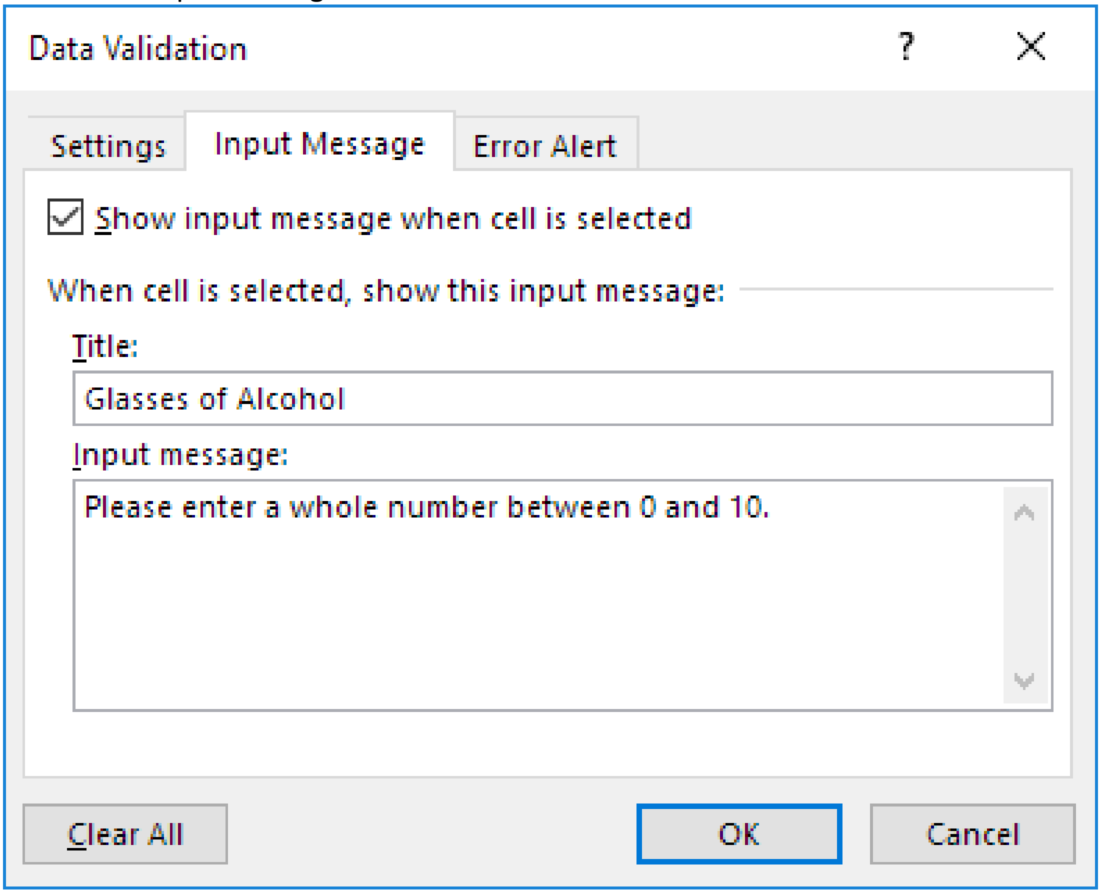



On the Settings tab:

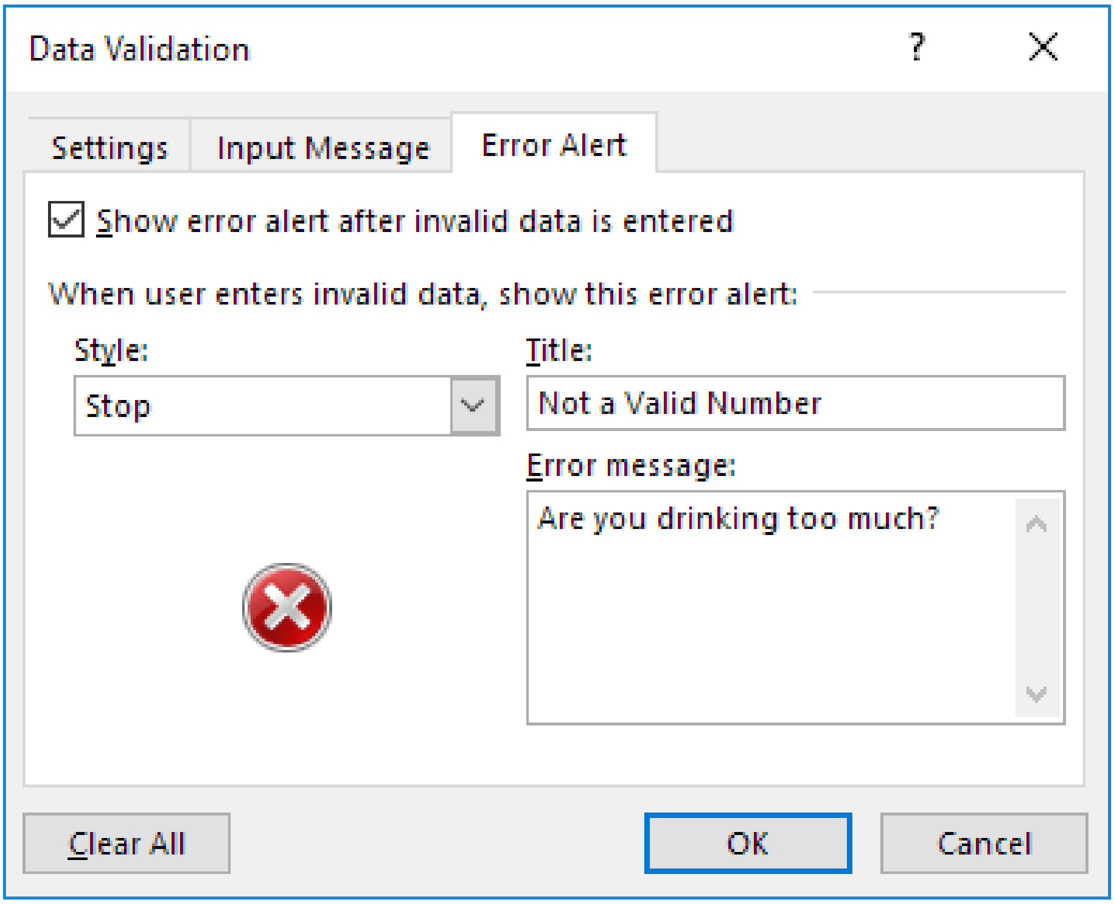
3. In the Allow list, click Whole number.
4. In the Data list, click between.
5. Enter the Minimum and Maximum values.



Input Message
Input messages appear when the user selects the cell and tell the user what to enter.
On the Input Message tab:
1. Check 'Show input message when cell is selected'.
2. Enter a title.
3. Enter an input message.



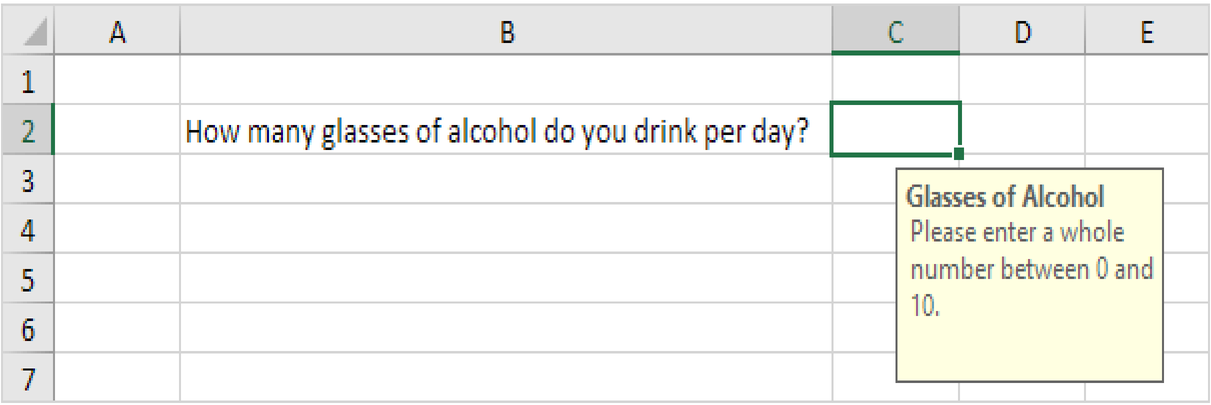

Error Alert
If users ignore the input message and enter a number that is not valid, you can show them an error alert.
On the Error Alert tab:
1. Check 'Show error alert after invalid data is entered'.
2. Enter a title.
3. Enter an error message.




4. Click OK.

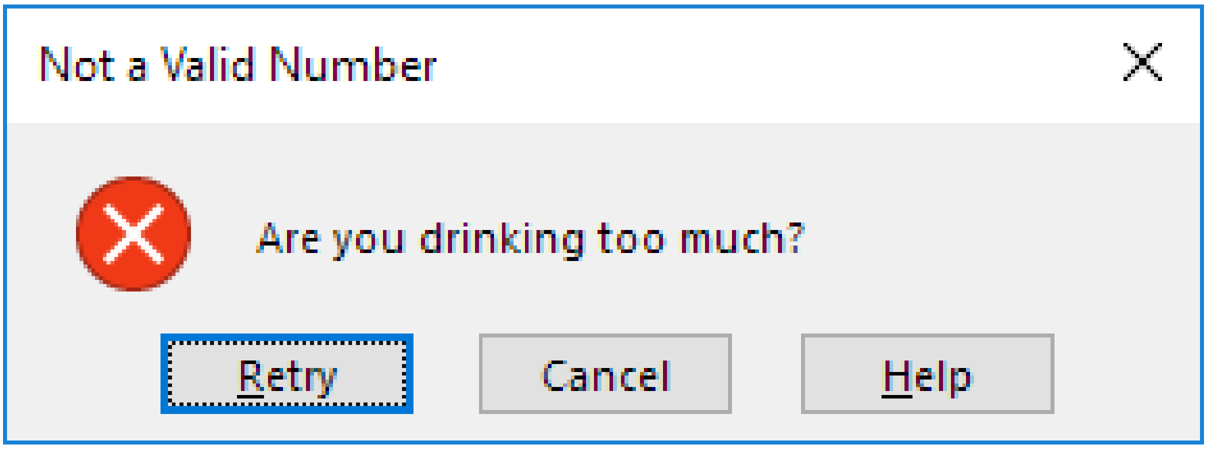
Data Validation Result

1. Select cell C2.




2. Try to enter a number higher than 10.

Result:



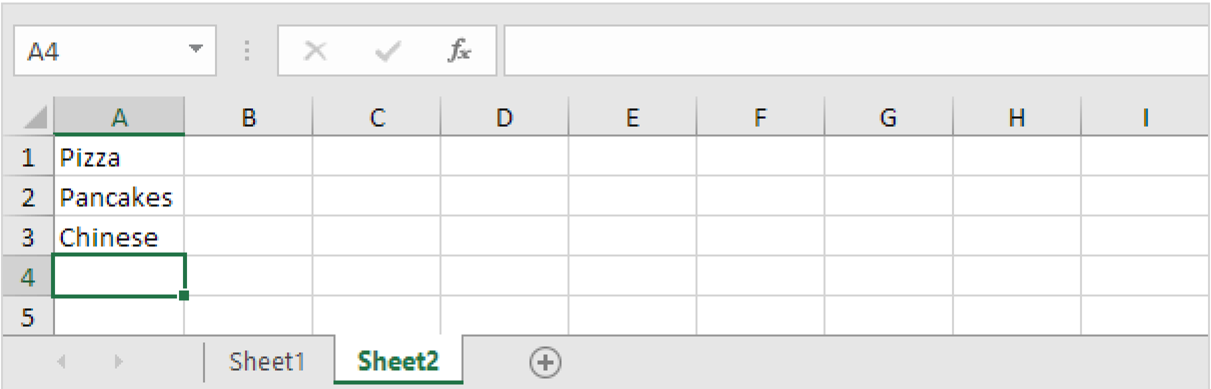

Note: to remove data validation from a cell, select the cell, on the Data tab, in the Data Tools group, click Data Validation, and then click Clear All. You can use Excel's Go To Special feature to quickly select all cells with data validation.

Drop-down List:
Drop-down lists in Excel are helpful if you want to be sure that users select an item from a list, instead of typing their own values.

**Create a Drop-down List**

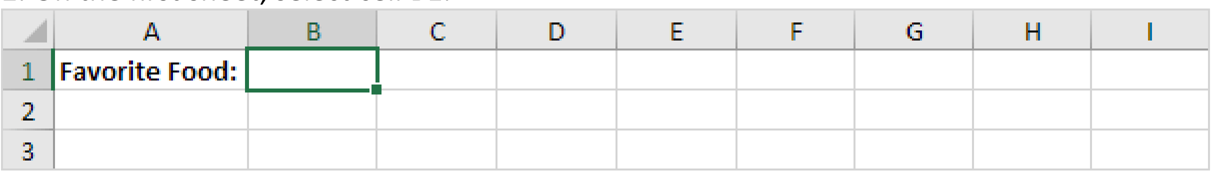
To create a drop-down list in Excel, execute the following steps.

1. On the second sheet, type the items you want to appear in the drop-down list.

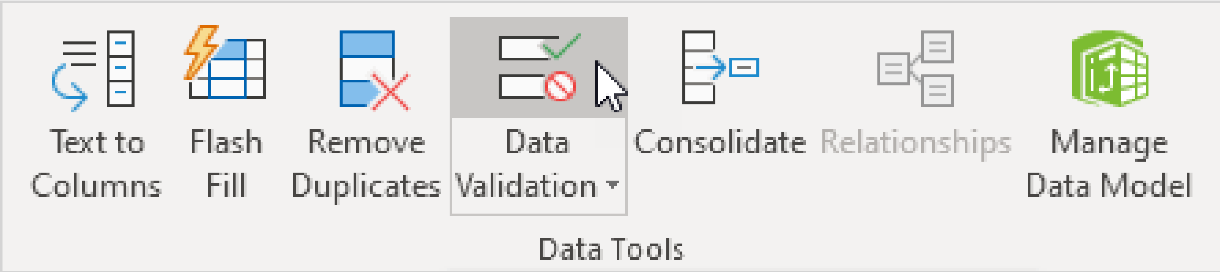



Note: if you don't want users to access the items on Sheet2, you can hide Sheet2. To achieve this, right click on the sheet tab of Sheet2 and click on Hide.

2. On the first sheet, select cell B1.



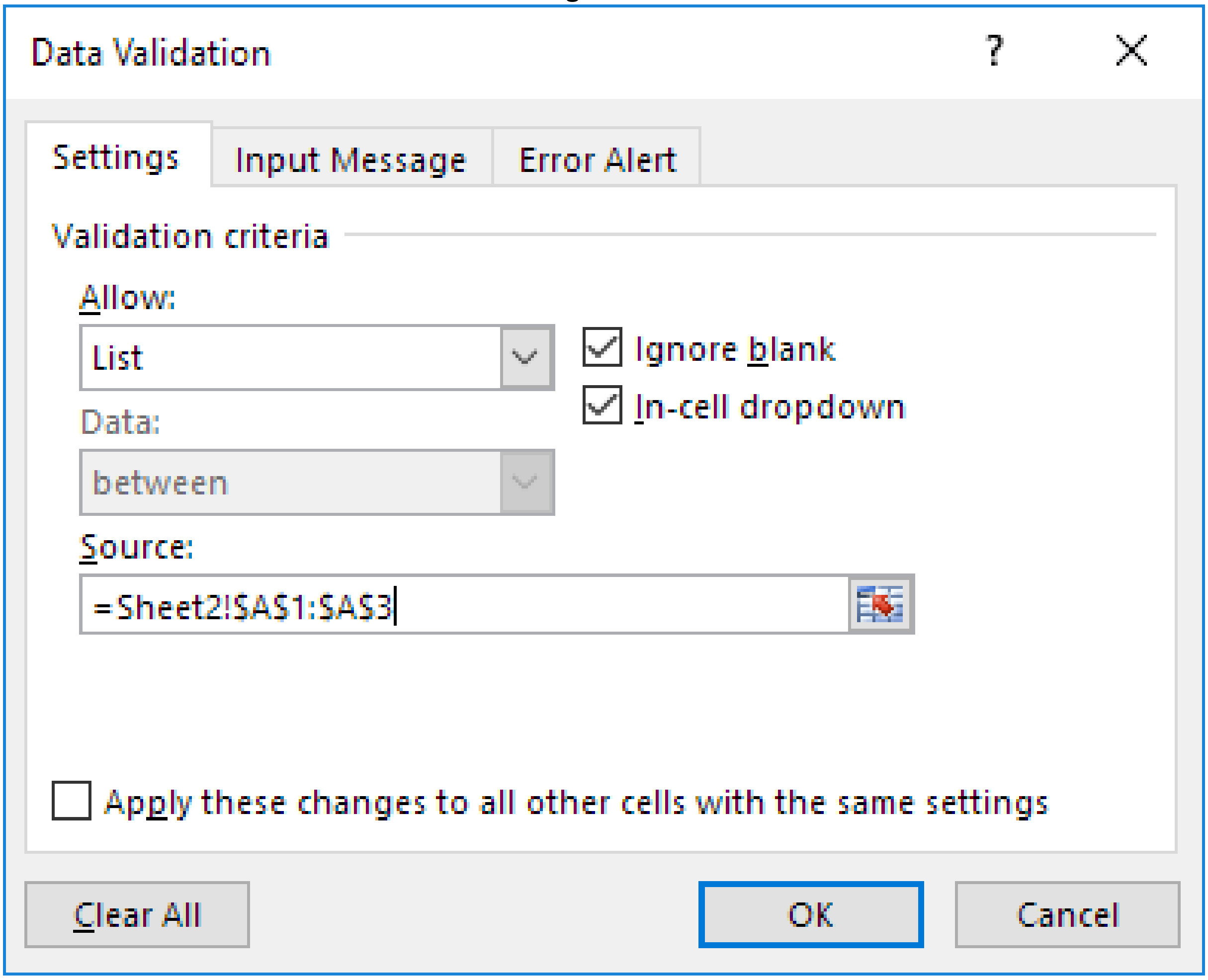

3. On the Data tab, in the Data Tools group, click Data Validation.




The 'Data Validation' dialog box appears.

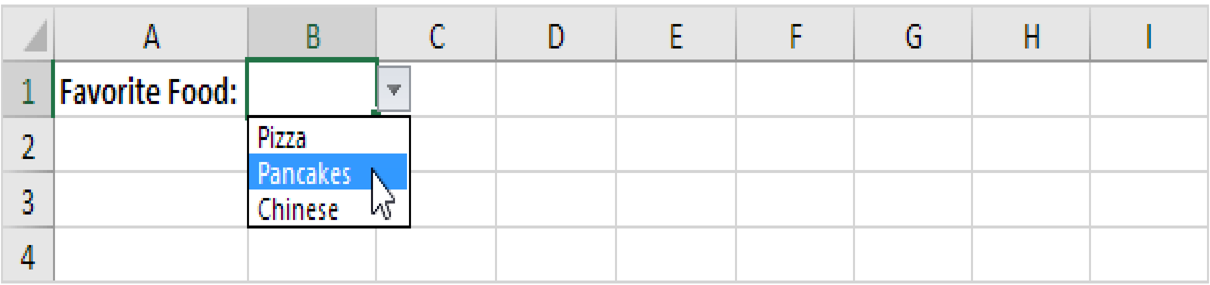
4. In the Allow box, click List.

5. Click in the Source box and select the range A1:A3 on Sheet2.



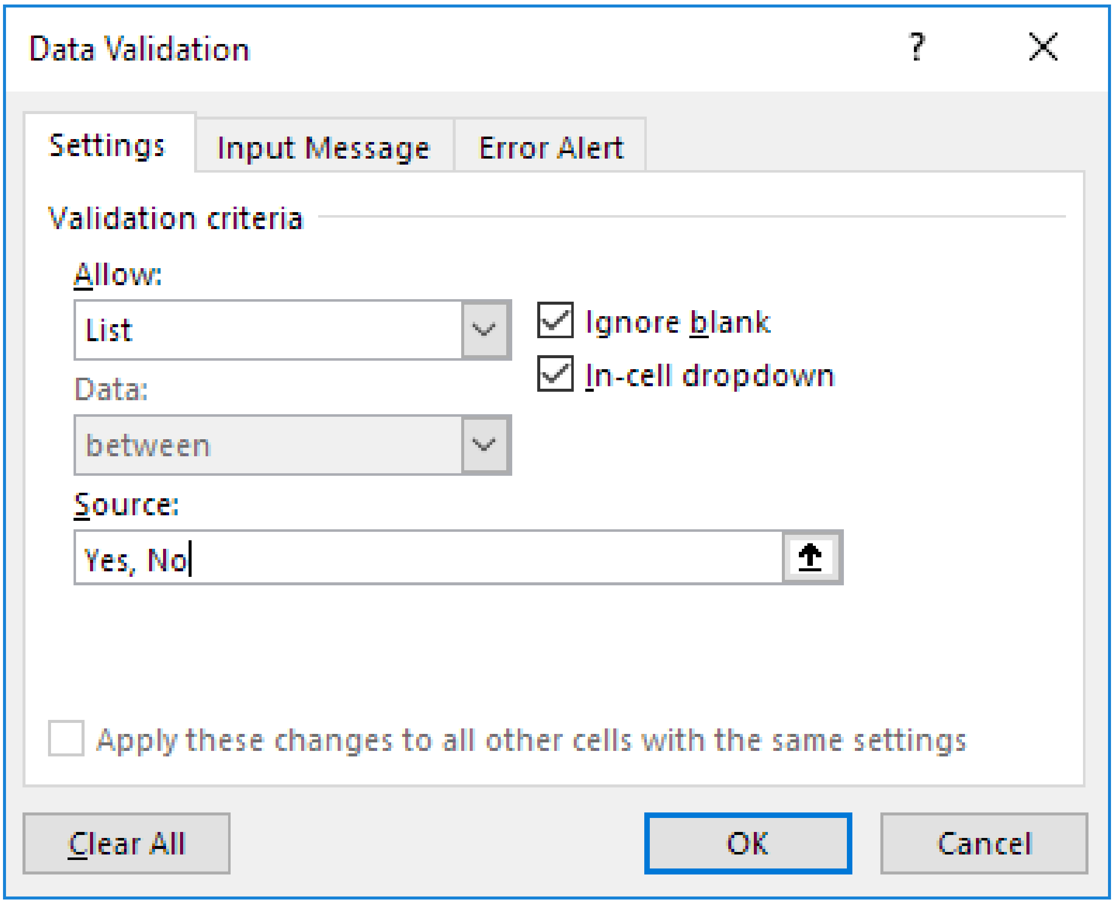

6. Click OK.

Result:




Note: to copy/paste a drop-down list, select the cell with the drop-down list and press CTRL + c, select another cell and press CTRL + v.

7. You can also type the items directly into the Source box, instead of using a range reference.

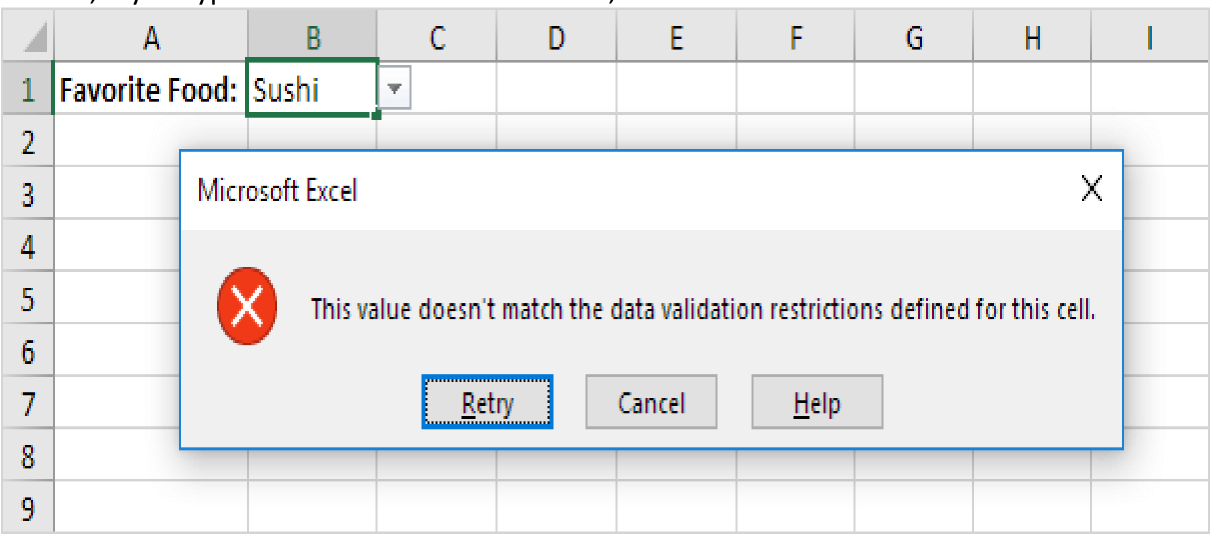



Note: this makes your drop-down list case sensitive. For example, if a user types yes, an error alert will be displayed.

Allow Other Entries

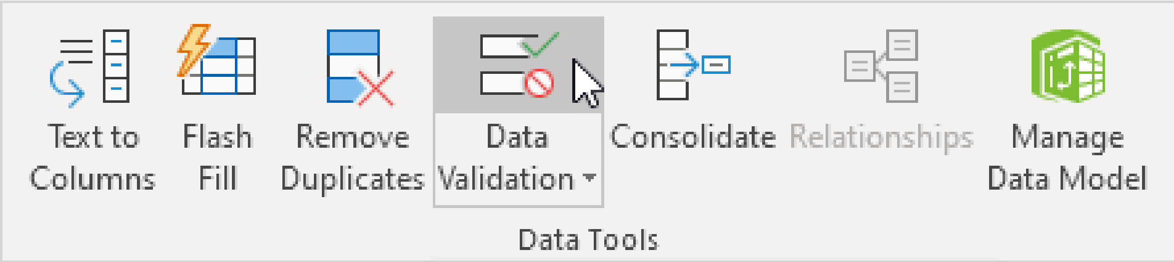
You can also create a drop-down list in Excel that allows other entries.

1. First, if you type a value that is not in the list, Excel shows an error alert.



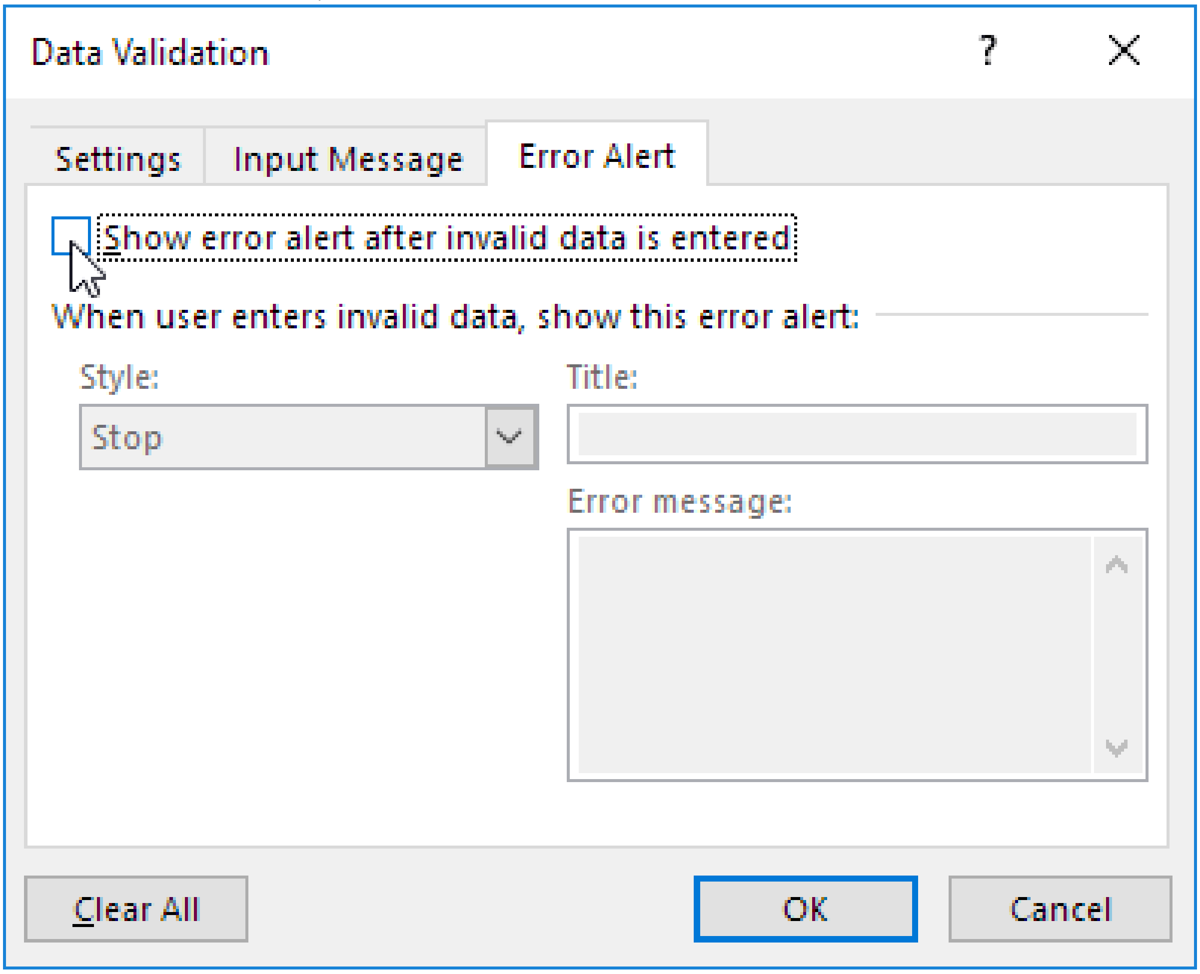

To allow other entries, execute the following steps.

2. On the Data tab, in the Data Tools group, click Data Validation.



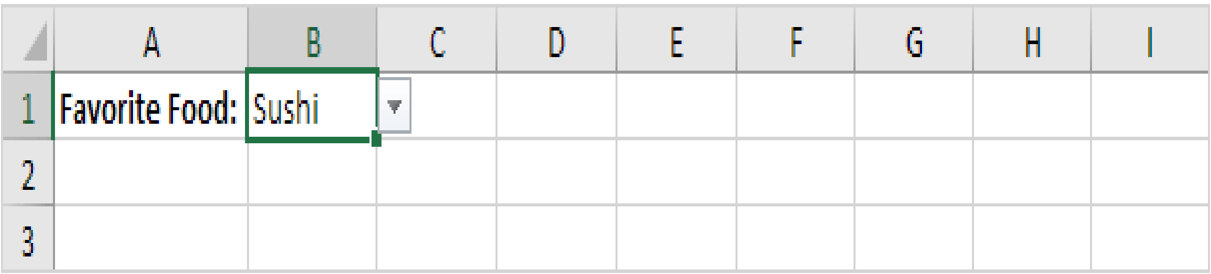

The 'Data Validation' dialog box appears.

3. On the Error Alert tab, uncheck 'Show error alert after invalid data is entered'.




4. Click OK.

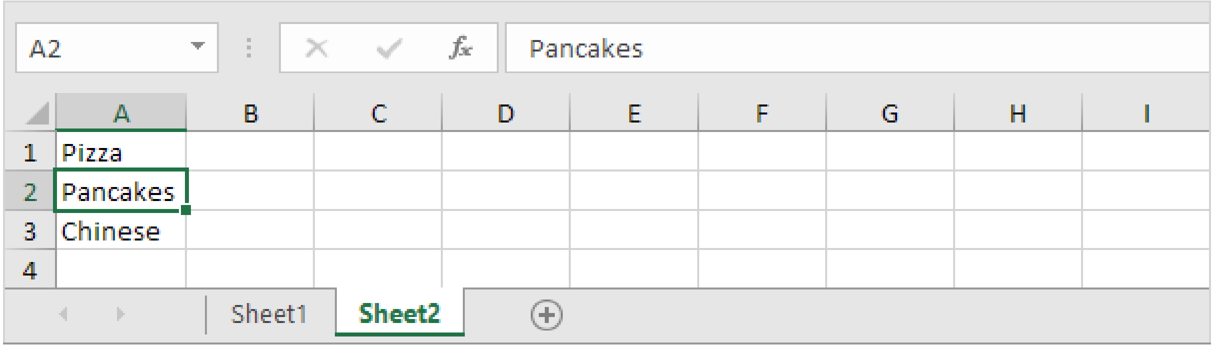
5. You can now enter a value that is not in the list.



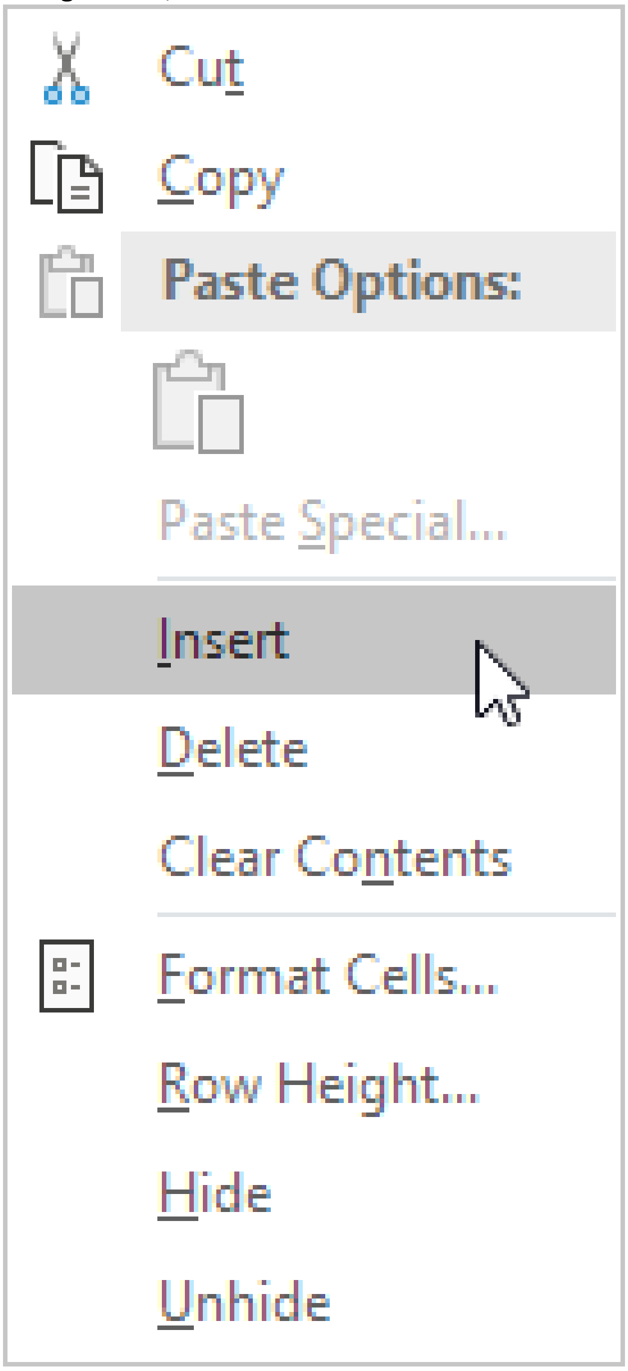

Add/Remove Items

You can add or remove items from a drop-down list in Excel without opening the 'Data Validation' dialog box and changing the range reference. This saves time.

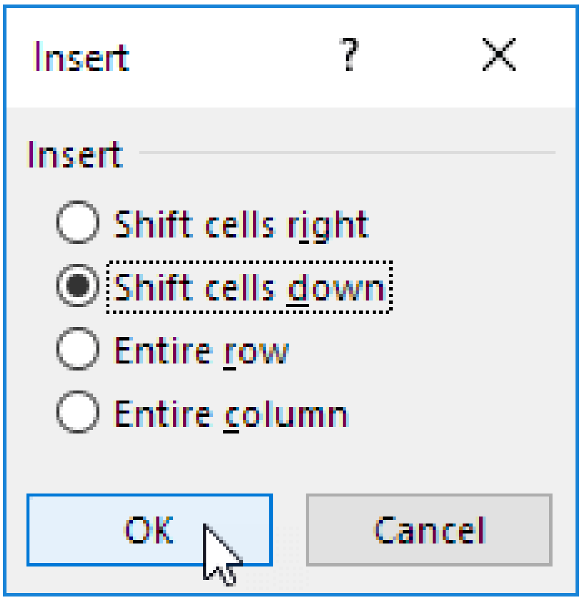
1. To add an item to a drop-down list, go to the items and select an item.



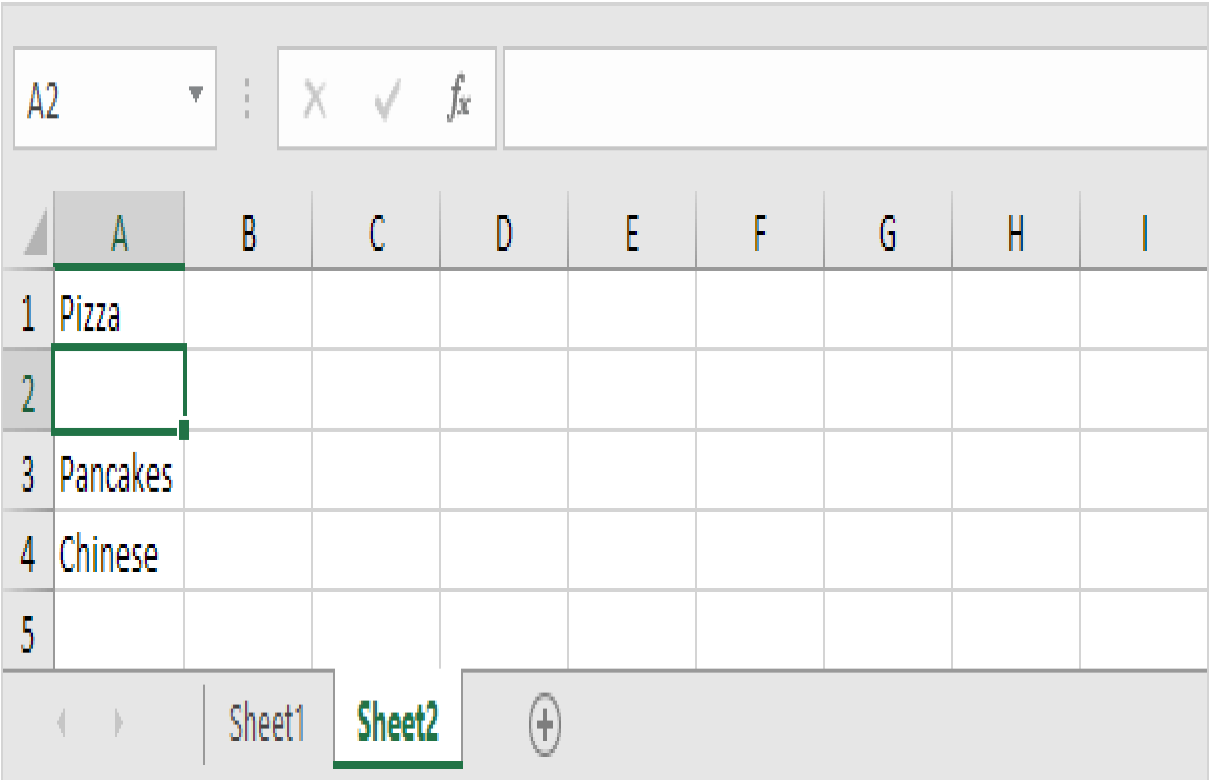

2. Right click, and then click Insert.



3. Select "Shift cells down" and click OK.

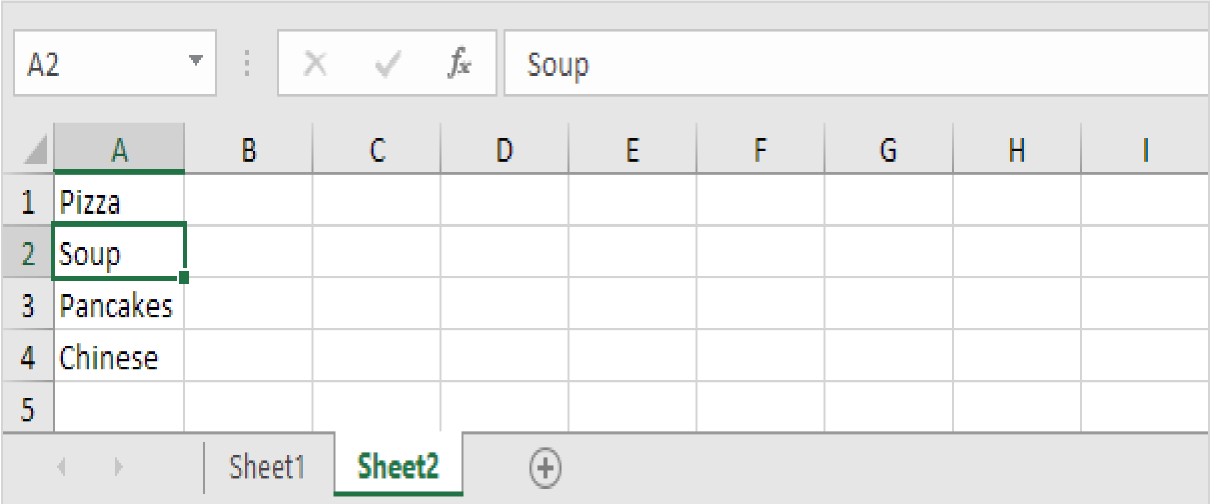



Result:

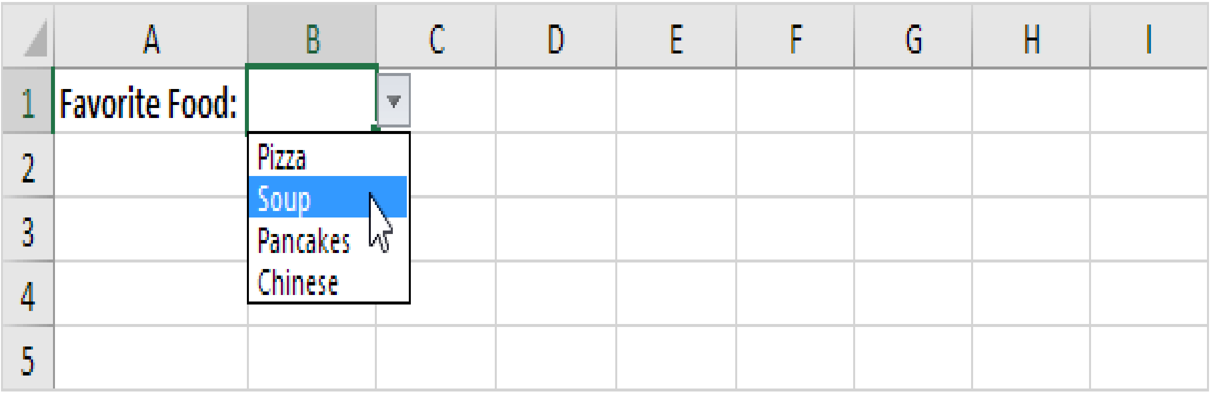



Note: Excel automatically changed the range reference from Sheet2!$A$1:$A$3 to Sheet2!$A$1:$A$4. You can check this by opening the 'Data Validation' dialog box.

4. Type a new item.




Result:

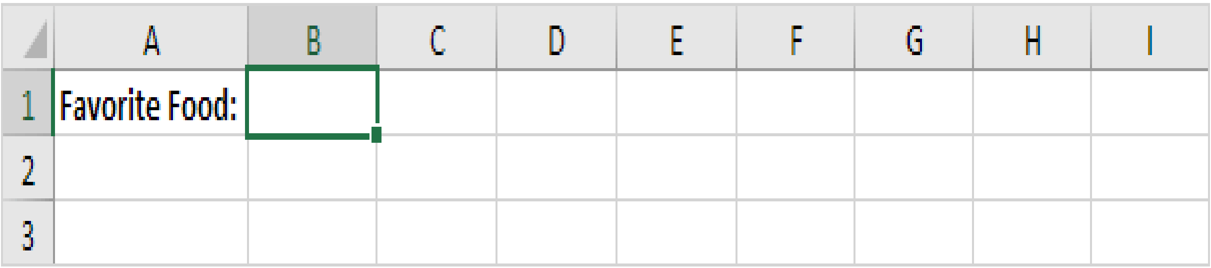



5. To remove an item from a drop-down list, at step 2, click Delete, select "Shift cells up" and click OK.

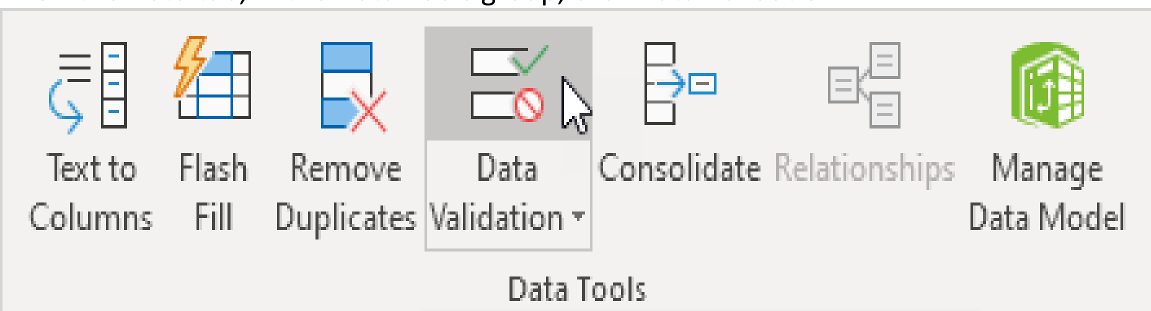
Dynamic Drop-down List

You can also use a formula that updates your drop-down list automatically when you add an item to the end of the list.

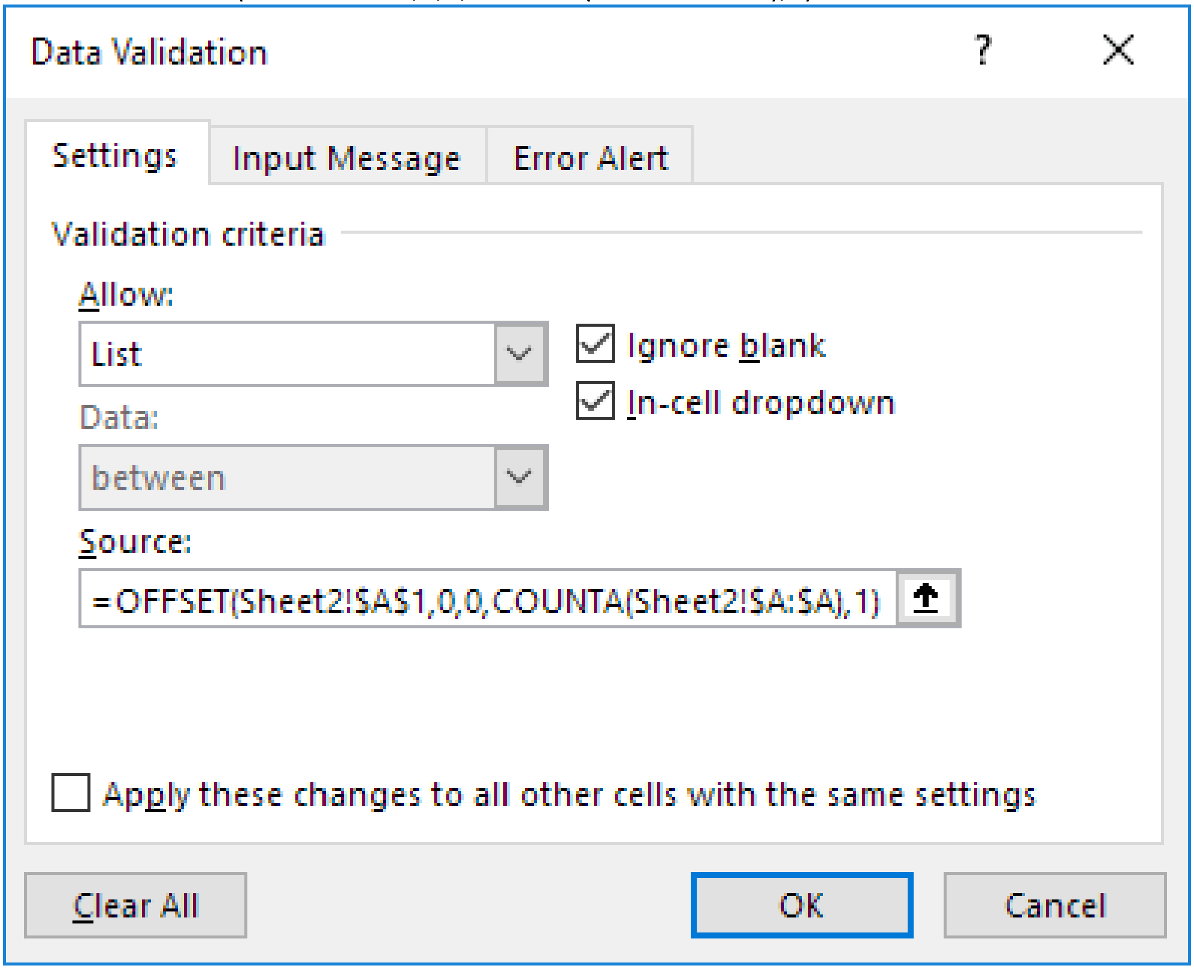
1. On the first sheet, select cell B1.



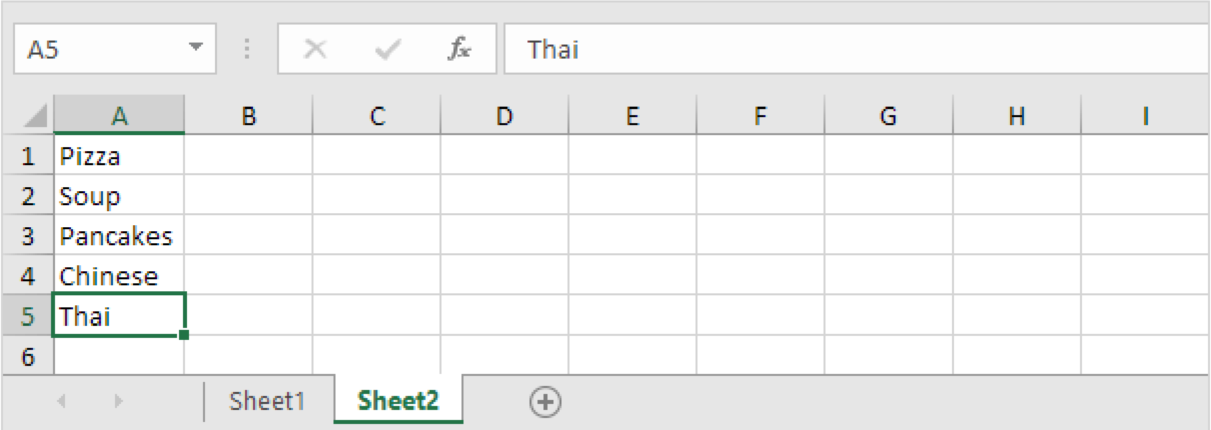

2. On the Data tab, in the Data Tools group, click Data Validation.



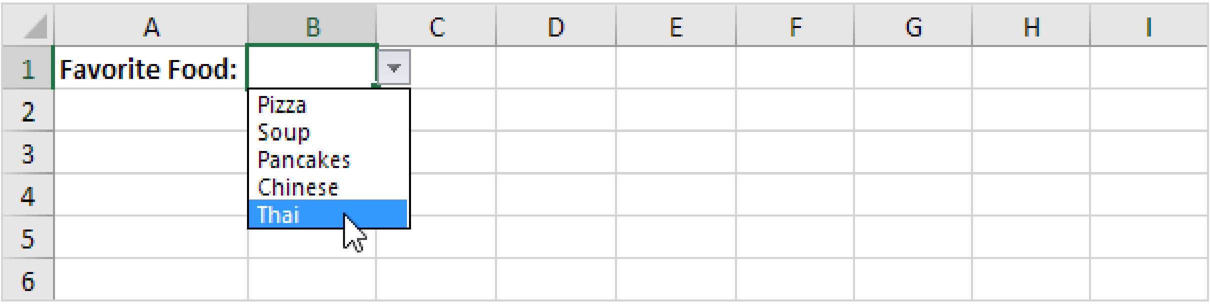
The 'Data Validation' dialog box appears.
3. In the Allow box, click List.
4. Click in the Source box and enter the formula: =OFFSET(Sheet2!$A$1,0,0,COUNTA(Sheet2!$A:$A),1)




Explanation: the OFFSET function takes 5 arguments. Reference: Sheet2!$A$1, rows to offset: 0, columns to offset: 0, height: COUNTA(Sheet2!$A:$A) and width: 1. COUNTA(Sheet2!$A:$A) counts the number of values in column A on Sheet2 that are not empty. When you add an item to the list on Sheet2, COUNTA(Sheet2!$A:$A) increases. As a result, the range returned by the OFFSET function expands and the drop-down list will be updated.
5. Click OK.
6. On the second sheet, simply add a new item to the end of the list.



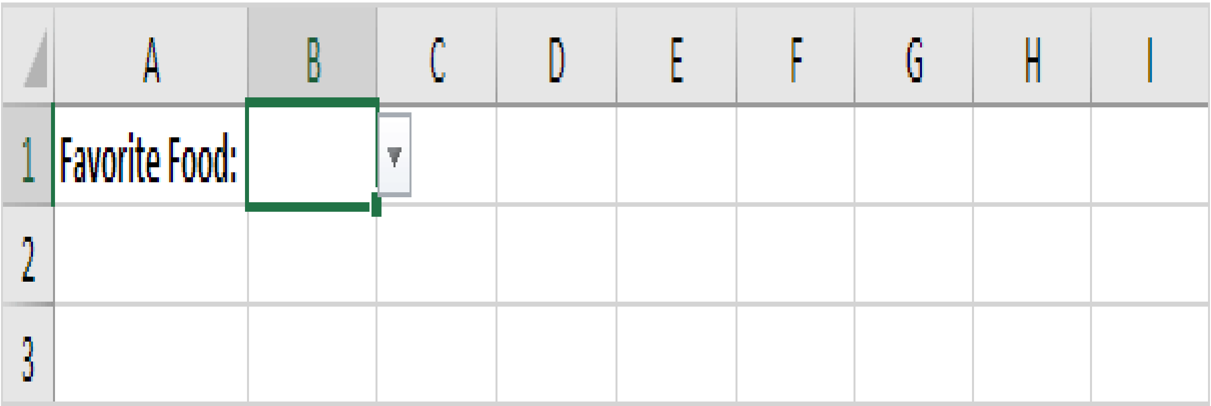

Result:



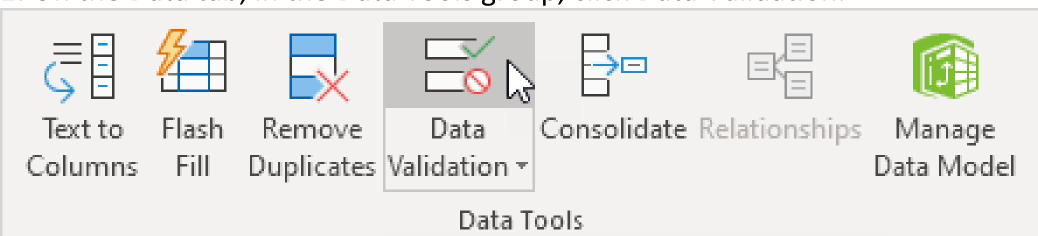

Remove a Drop-down List

To remove a drop-down list in Excel, execute the following steps.

1. Select the cell with the drop-down list.

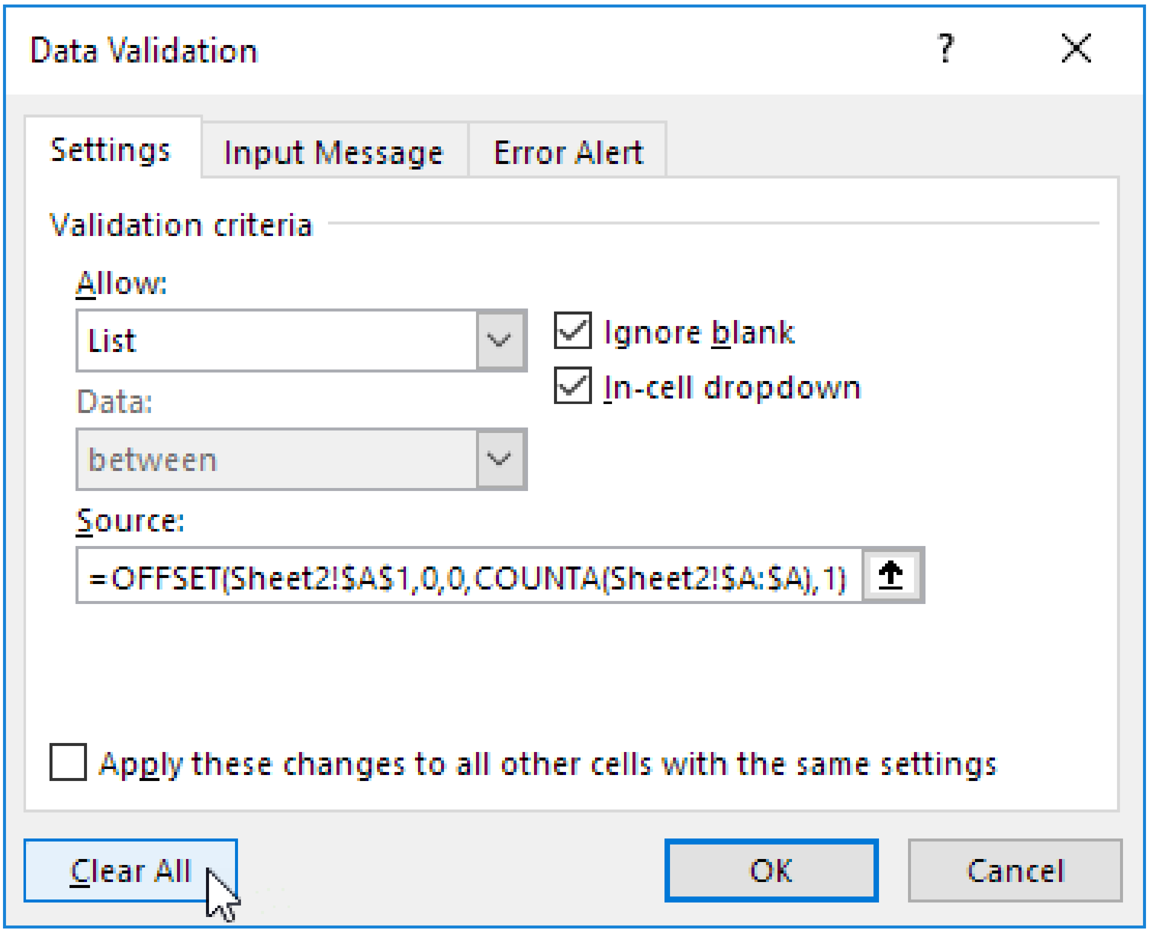



2. On the Data tab, in the Data Tools group, click Data Validation.




The 'Data Validation' dialog box appears.

3. Click Clear All.

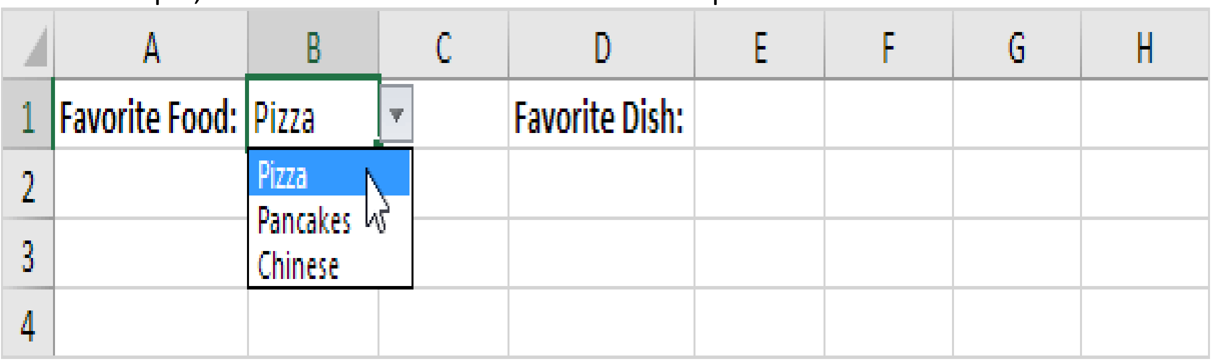



Note: to remove all other drop-down lists with the same settings, check "Apply these changes to all other cells with the same settings" before you click on Clear All.

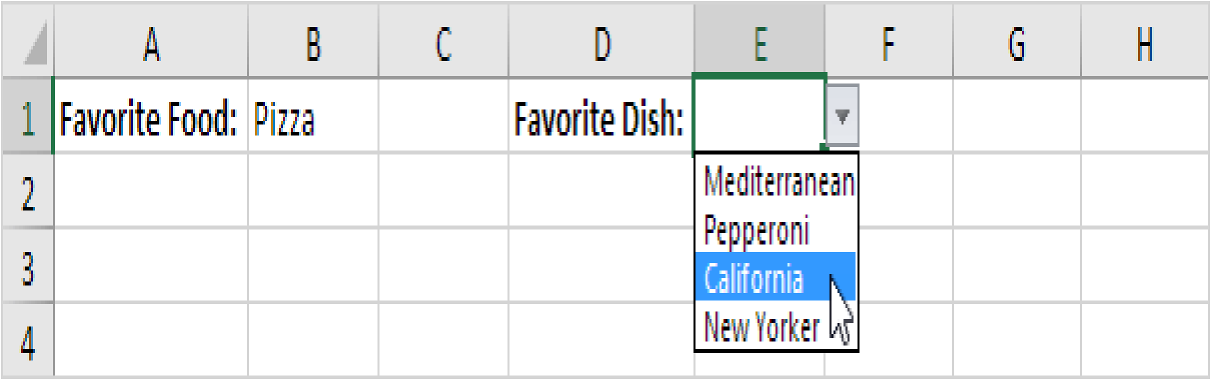
4. Click OK.

Dependent Drop-down Lists

1. For example, if the user selects Pizza from a first drop-down list.




2. A second drop-down list contains the Pizza items.




3. But if the user selects Chinese from the first drop-down list, the second drop-down list contains the Chinese dishes.

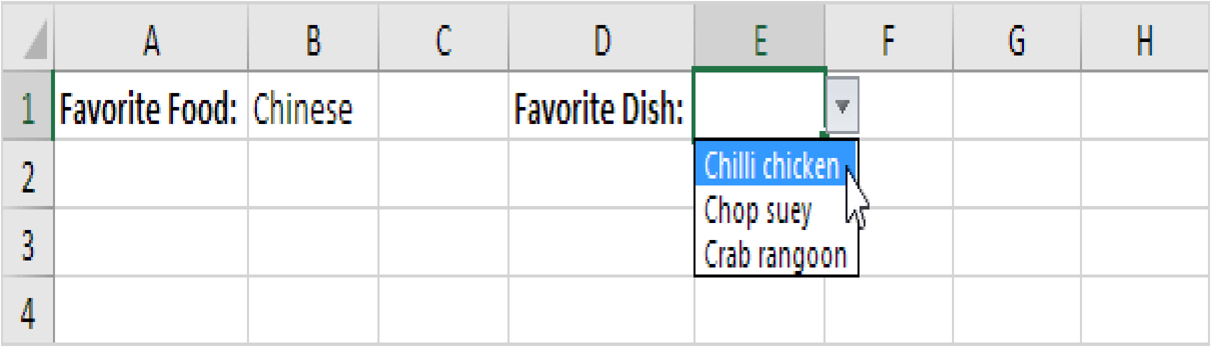
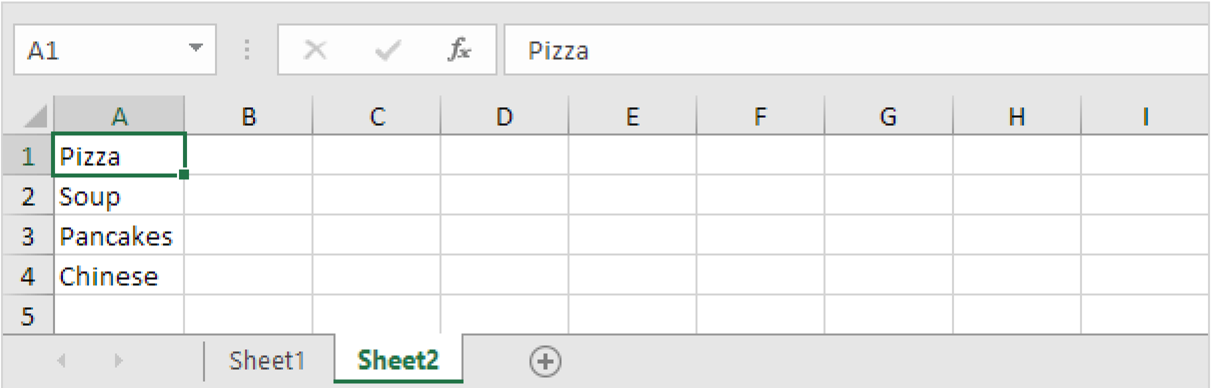


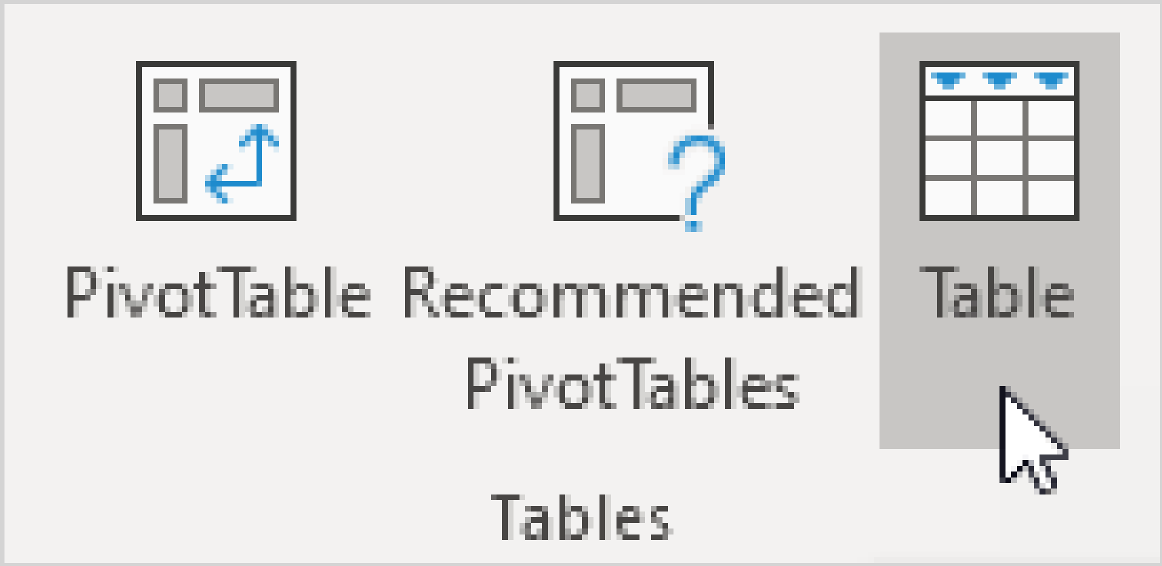

Table Magic

You can also store your items in an Excel table to create a dynamic drop-down list.

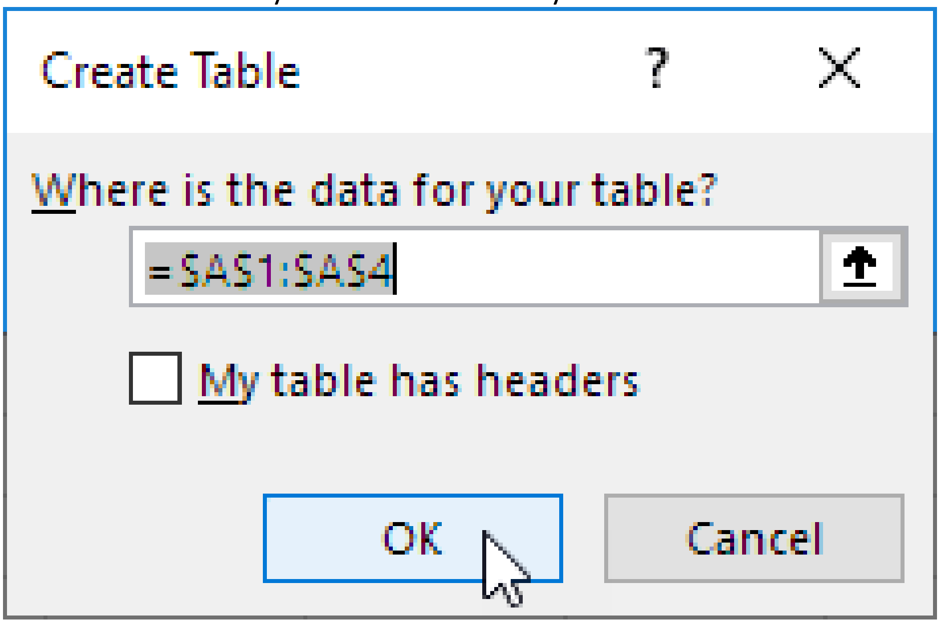
1. On the second sheet, select a list item.



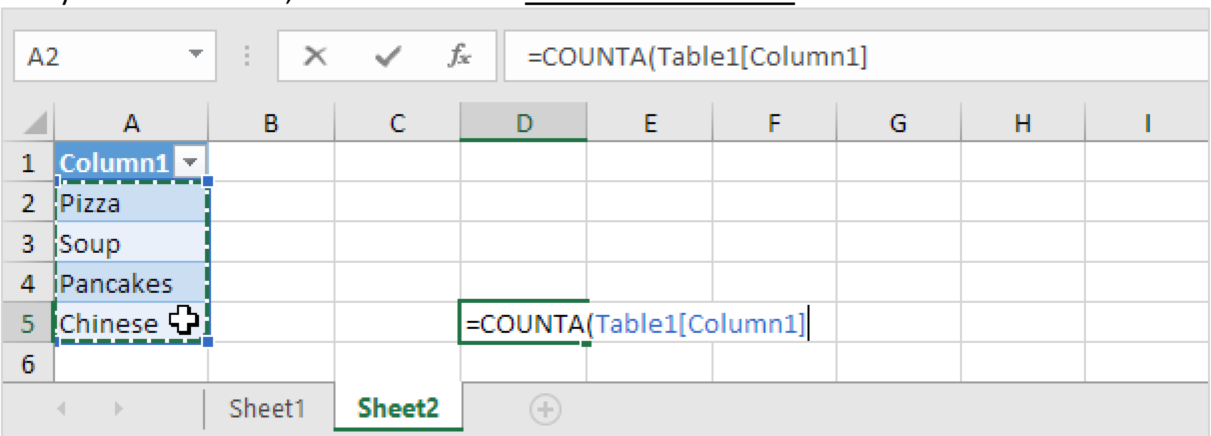

2. On the Insert tab, in the Tables group, click Table.



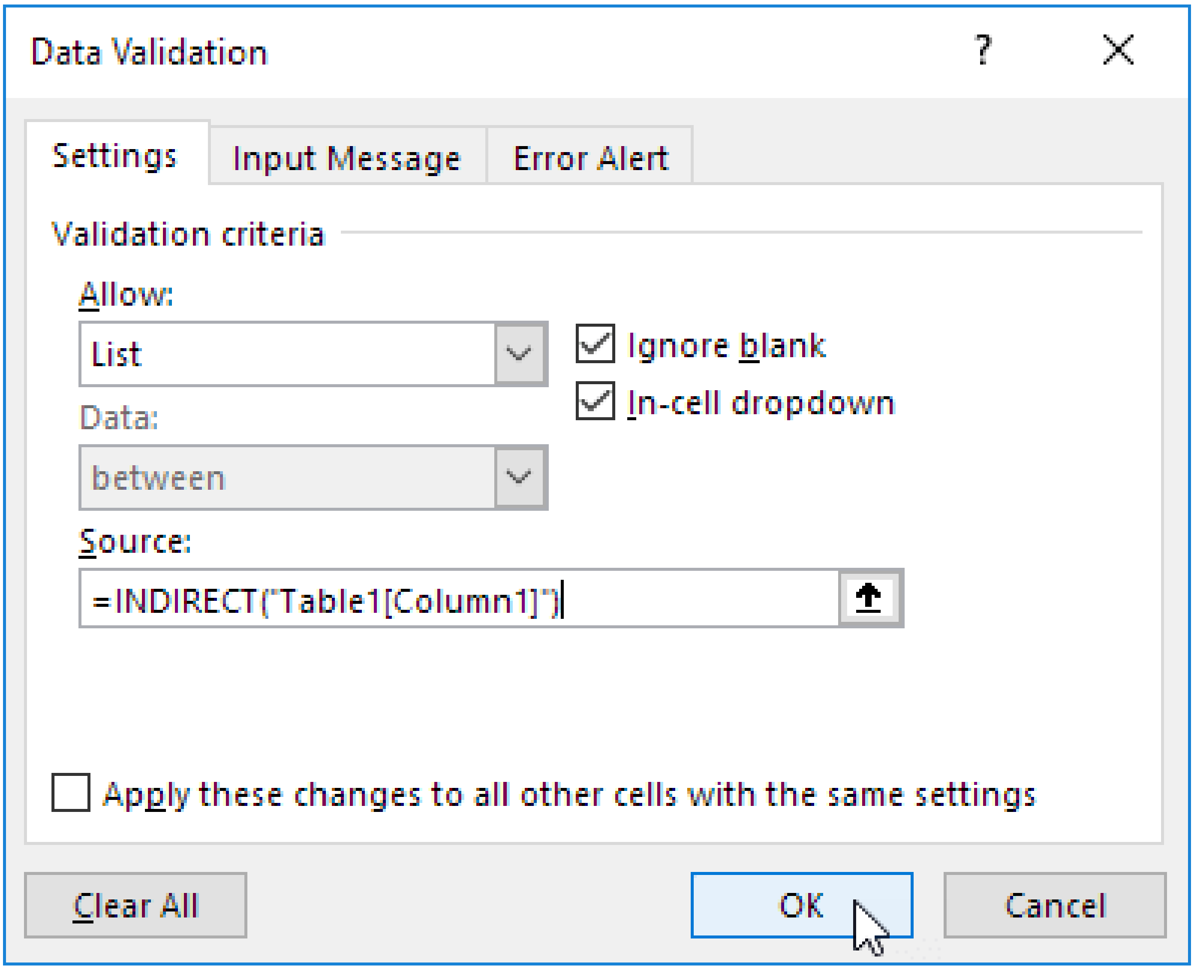

3. Excel automatically selects the data for you. Click OK.




4. If you select the list, Excel reveals the structured reference.

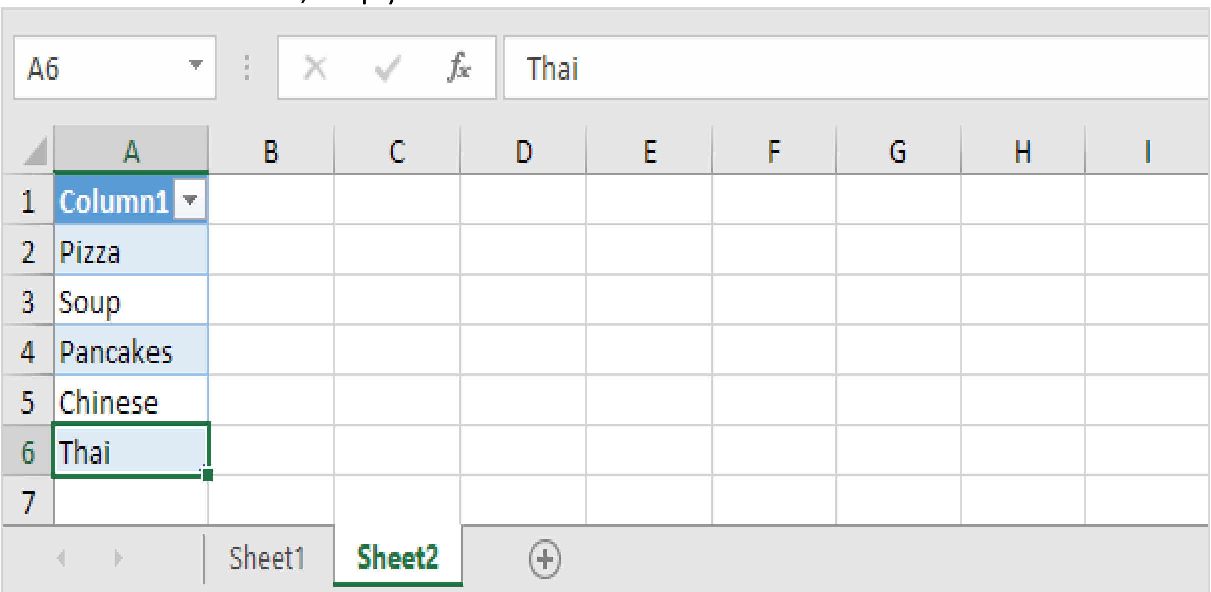



5. Use this structured reference to create a dynamic drop-down list.

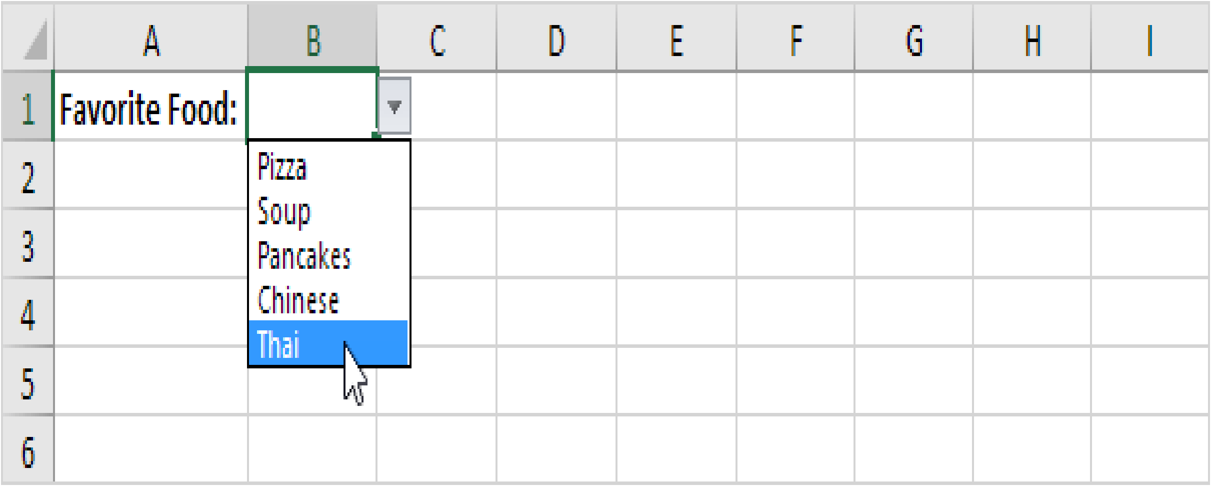



Explanation: the INDIRECT function in Excel converts a text string into a valid reference.

6. On the second sheet, simply add a new item to the end of the list.

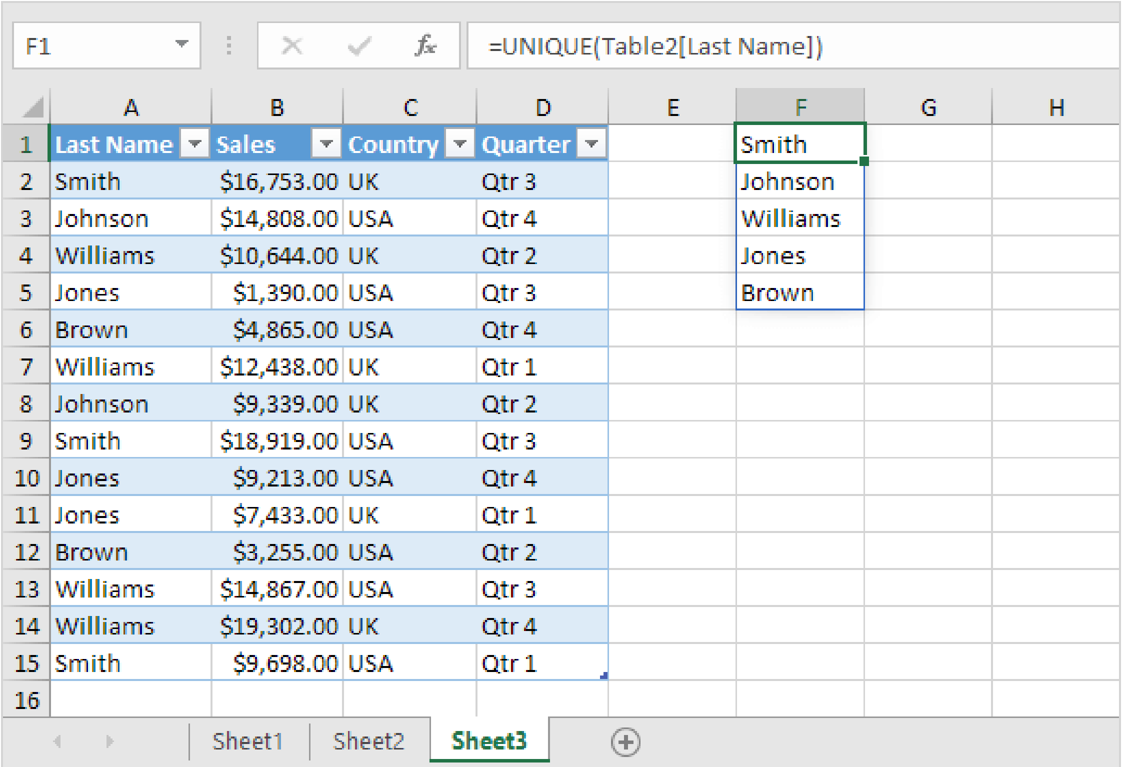



Result:




Note: try it yourself. Download the Excel file and create this drop-down list.

7. When using tables, use the UNIQUE function in Excel 365/2021 to extract unique list items.



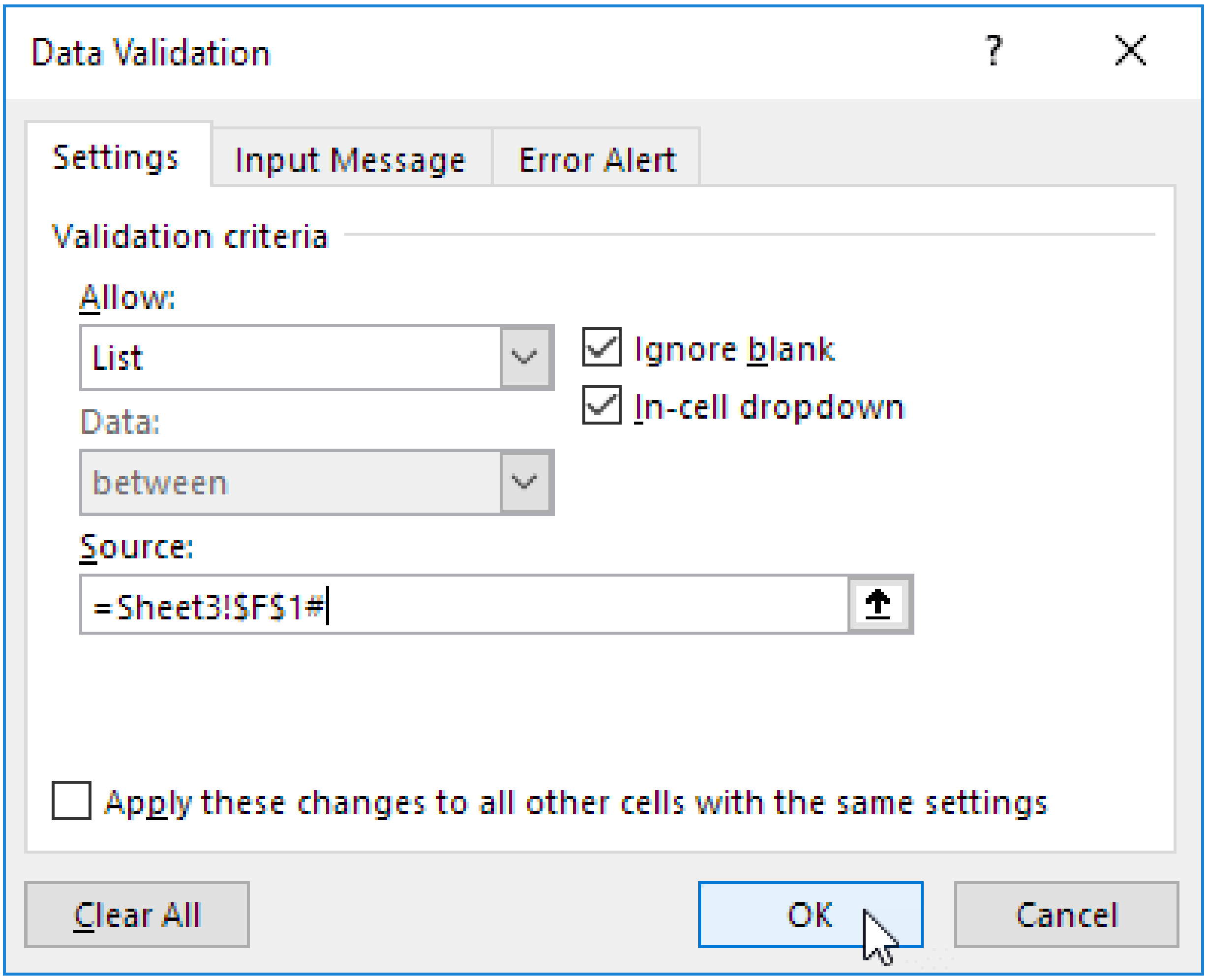
F1 =UNIQUE(Table2[Last Name])

| | A | B | C | D | E | F |
|---|---|---|---|---|---|---|
| 1 | Last Name | Sales | Country | Quarter | | Smith |
| 2 | Smith | $16,753.00 | UK | Qtr 3 | | Johnson |
| 3 | Johnson | $14,808.00 | USA | Qtr 4 | | Williams |
| 4 | Williams | $10,644.00 | UK | Qtr 2 | | Jones |
| 5 | Jones | $1,390.00 | USA | Qtr 3 | | Brown |
| 6 | Brown | $4,865.00 | USA | Qtr 4 | | |
| 7 | Williams | $12,438.00 | UK | Qtr 1 | | |
| 8 | Johnson | $9,339.00 | UK | Qtr 2 | | |
| 9 | Smith | $18,919.00 | USA | Qtr 3 | | |
| 10 | Jones | $9,213.00 | USA | Qtr 4 | | |
| 11 | Jones | $7,433.00 | UK | Qtr 1 | | |
| 12 | Brown | $3,255.00 | USA | Qtr 2 | | |
| 13 | Williams | $14,867.00 | USA | Qtr 3 | | |
| 14 | Williams | $19,302.00 | UK | Qtr 4 | | |
| 15 | Smith | $9,698.00 | USA | Qtr 1 | | |

Sheet1 Sheet2 Sheet3

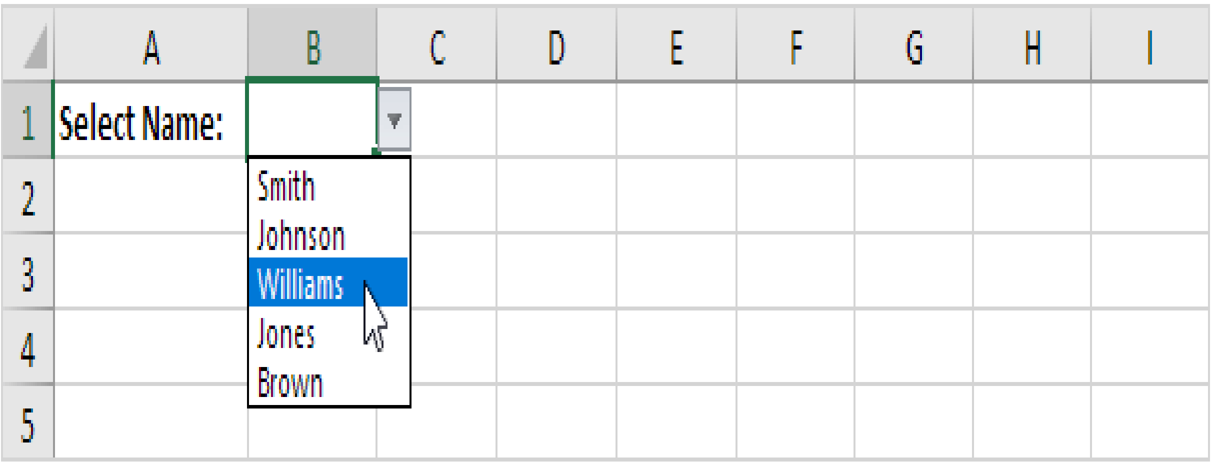
Note: this dynamic array function, entered into cell F1, fills multiple cells. Wow! This behavior in Excel 365/2021 is called spilling.

8. Use this spill range to create a magic drop-down list.




Explanation: always use the first cell (F1) and a hash character to refer to a spill range.

Result:

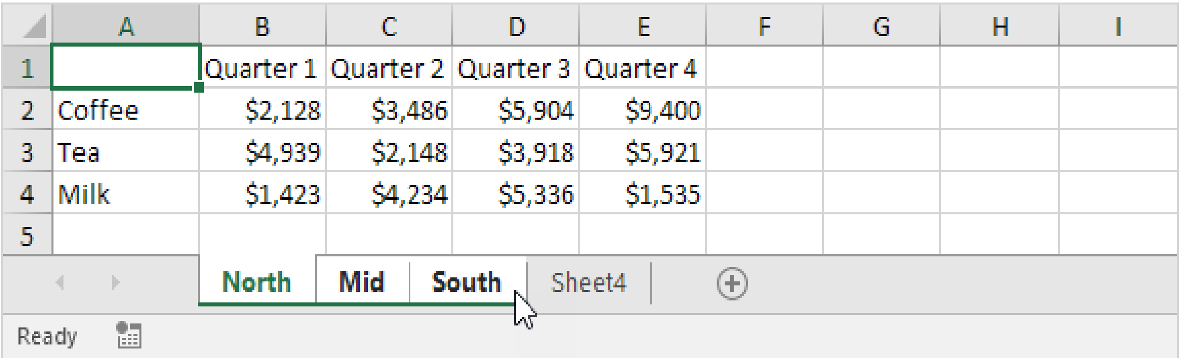



Note: when you add new records, the UNIQUE function automatically extracts new unique list items and Excel automatically updates the drop-down list.

Group Worksheets

You can group worksheets in Excel if you want to edit multiple worksheets at the same time. Our workbook contains 3 similar worksheets (North, Mid and South) and a blank fourth worksheet.

1. To group worksheets, hold down CTRL and click the sheet tabs of the sheets you want to group.



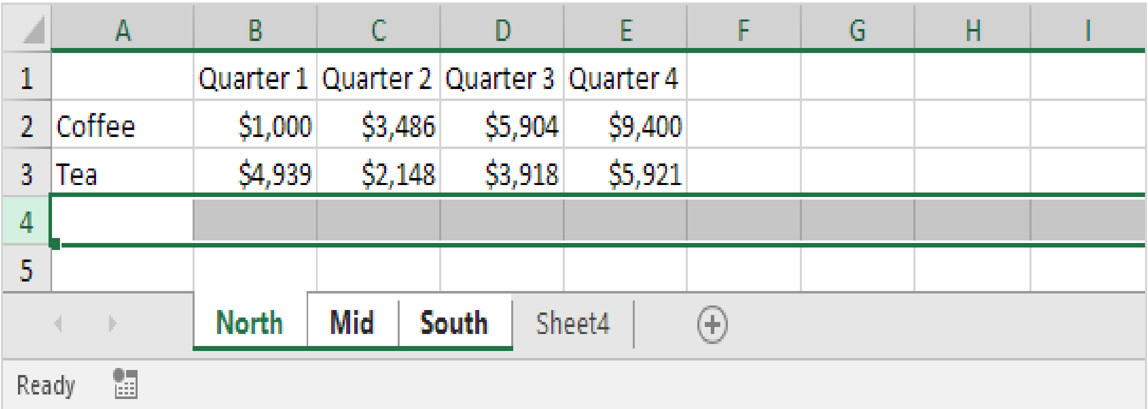
| | A | B | C | D | E | F | G | H | I |
|---|---|---|---|---|---|---|---|---|---|
| 1 | | Quarter 1 | Quarter 2 | Quarter 3 | Quarter 4 | | | | |
| 2 | Coffee | $2,128 | $3,486 | $5,904 | $9,400 | | | | |
| 3 | Tea | $4,939 | $2,148 | $3,918 | $5,921 | | | | |
| 4 | Milk | $1,423 | $4,234 | $5,336 | $1,535 | | | | |
| 5 | | | | | | | | | |



2. Release CTRL.

Now you can edit multiple worksheets at the same time.

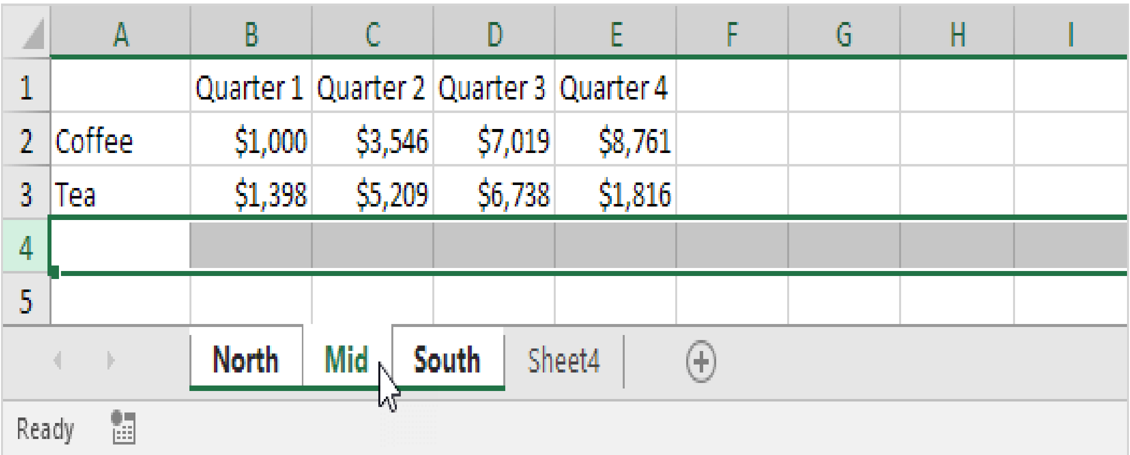
3. For example, on the North sheet, change the value of cell B2 to $1000 and delete row 4.



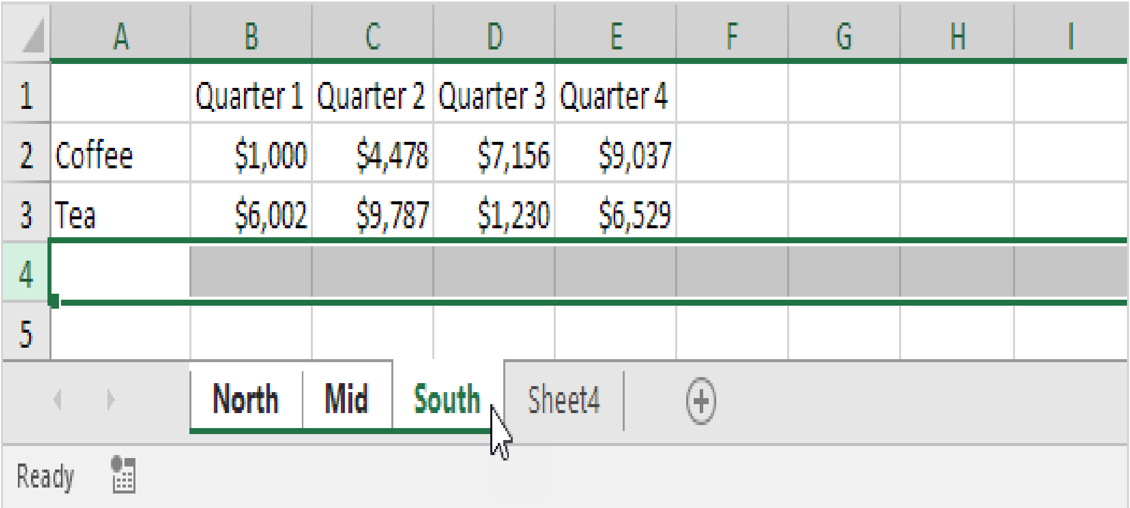
| | A | B | C | D | E | F | G | H | I |
|---|---|---|---|---|---|---|---|---|---|
| 1 | | Quarter 1 | Quarter 2 | Quarter 3 | Quarter 4 | | | | |
| 2 | Coffee | $1,000 | $3,486 | $5,904 | $9,400 | | | | |
| 3 | Tea | $4,939 | $2,148 | $3,918 | $5,921 | | | | |
| 4 | | | | | | | | | |
| 5 | | | | | | | | | |



4. Go to the other two worksheets and you'll see that these worksheets have been edited as well.



| | A | B | C | D | E | F | G | H | I |
|---|---|---|---|---|---|---|---|---|---|
| 1 | | Quarter 1 | Quarter 2 | Quarter 3 | Quarter 4 | | | | |
| 2 | Coffee | $1,000 | $3,546 | $7,019 | $8,761 | | | | |
| 3 | Tea | $1,398 | $5,209 | $6,738 | $1,816 | | | | |
| 4 | | | | | | | | | |
| 5 | | | | | | | | | |




5. To ungroup, right click one of the sheet tabs and click Ungroup Sheets or click any sheet tab outside the group. For example, the sheet tab of Sheet4.

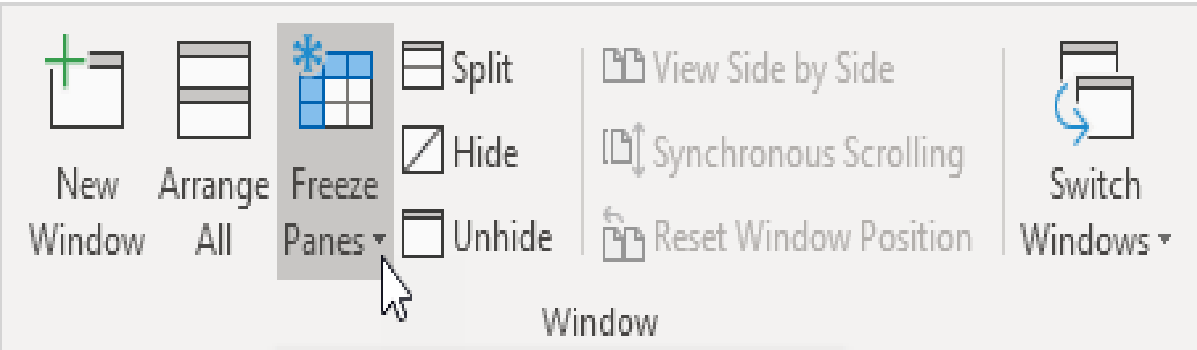
## Lesson 10 – Freeze Panes, Conditional Formatting

If you have a large table of data in Excel, it can be useful to freeze rows or columns. This way you can keep rows or columns visible while scrolling through the rest of the worksheet.

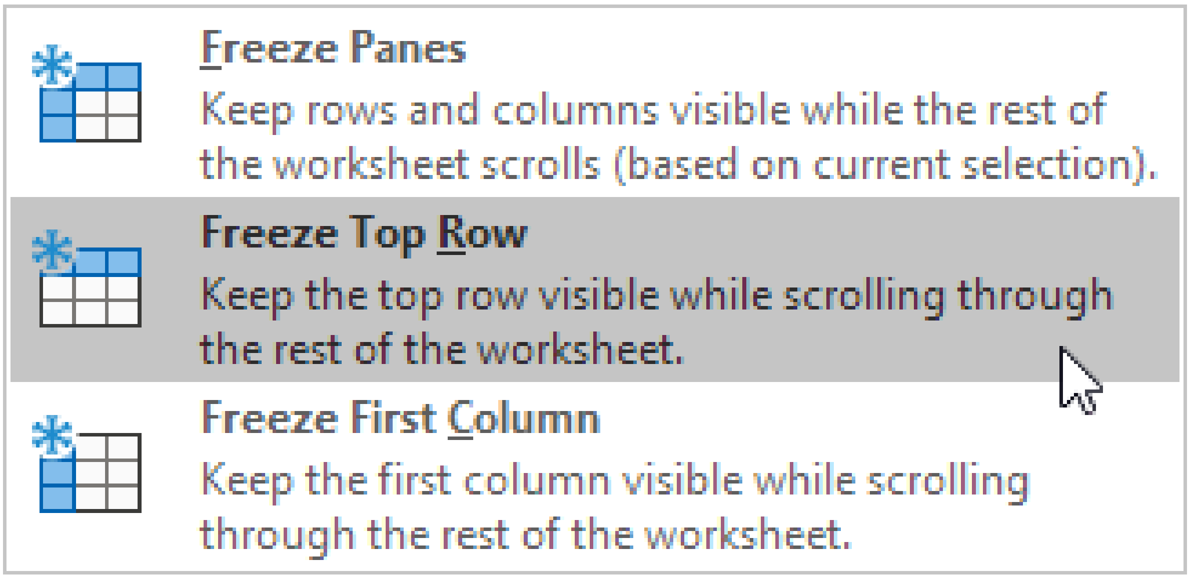
Freeze Top Row

To freeze the top row, execute the following steps.

1. On the View tab, in the Window group, click Freeze Panes.



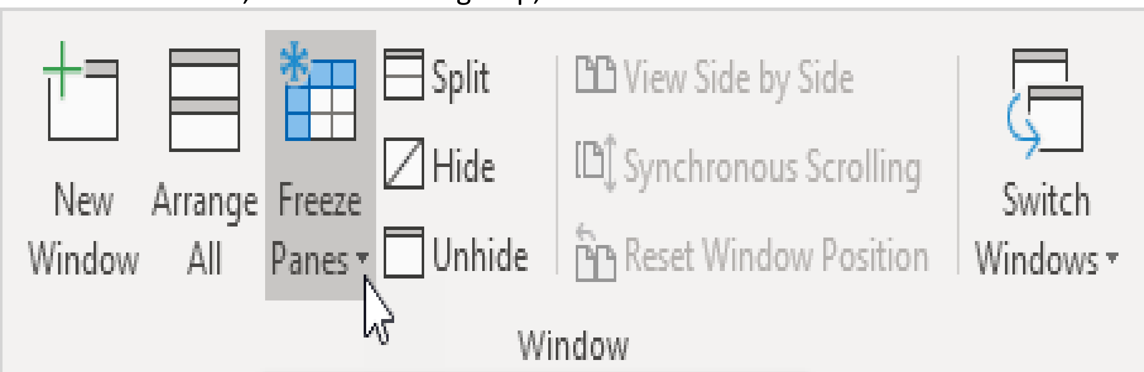

2. Click Freeze Top Row.



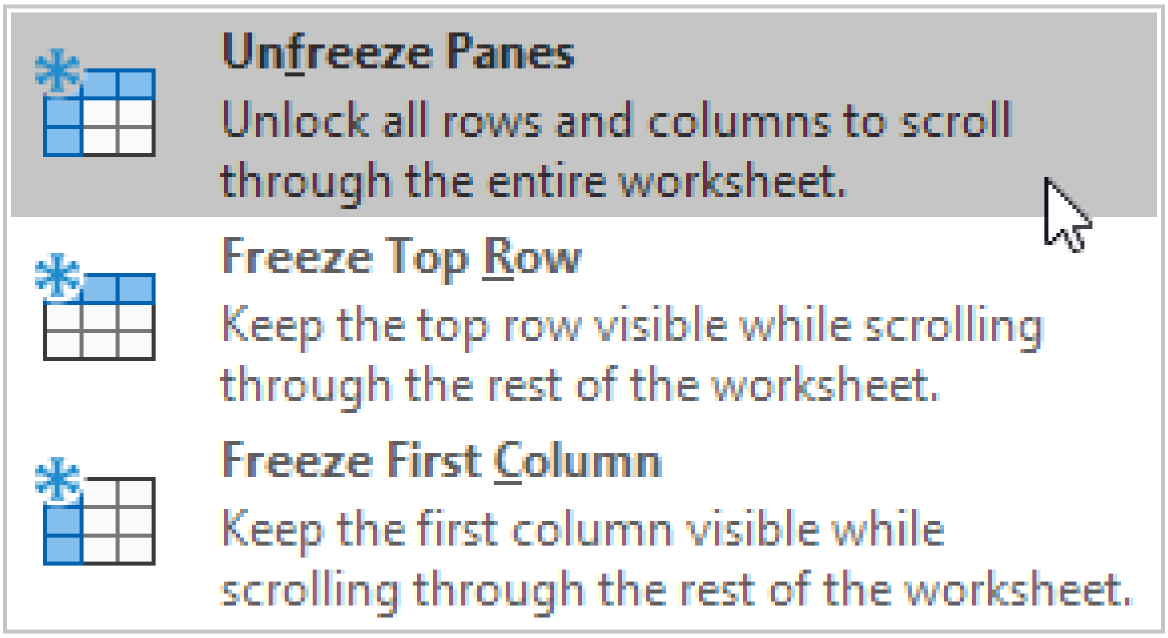

3. Scroll down to the rest of the worksheet.
Result. Excel automatically adds a dark grey horizontal line to indicate that the top row is frozen.

| | A | B | C | D | E | F | G | H | I | J |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | Age | Marital status | Address | Income | Car price | Education | Emply | Retired | Gender | Wireless |
| 20 | 32 | 0 | 0 | 28 | 14.2 | 1 | 2 | 0 | f | 0 |
| 21 | 42 | 0 | 9 | 109 | 54 | 3 | 20 | 0 | f | 1 |
| 22 | 40 | 1 | 12 | 117 | 59.8 | 2 | 19 | 0 | f | 1 |
| 23 | 36 | 0 | 6 | 39 | 19.2 | 2 | 0 | 0 | f | 0 |
| 24 | 42 | 1 | 13 | 53 | 25.9 | 2 | 6 | 0 | m | 0 |
| 25 | 65 | 1 | 17 | 42 | 21.3 | 2 | 24 | 0 | m | 0 |

Unfreeze Panes
To unlock all rows and columns, execute the following steps.
1. On the View tab, in the Window group, click Freeze Panes.



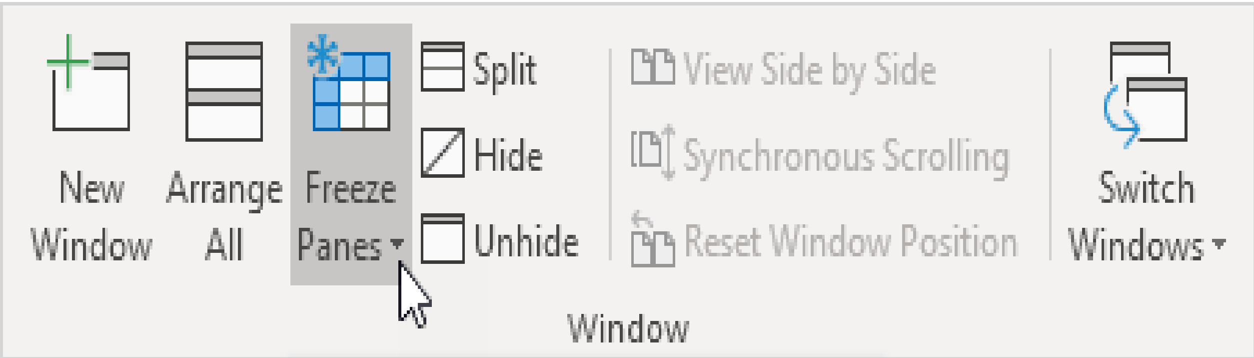

2. Click Unfreeze Panes.



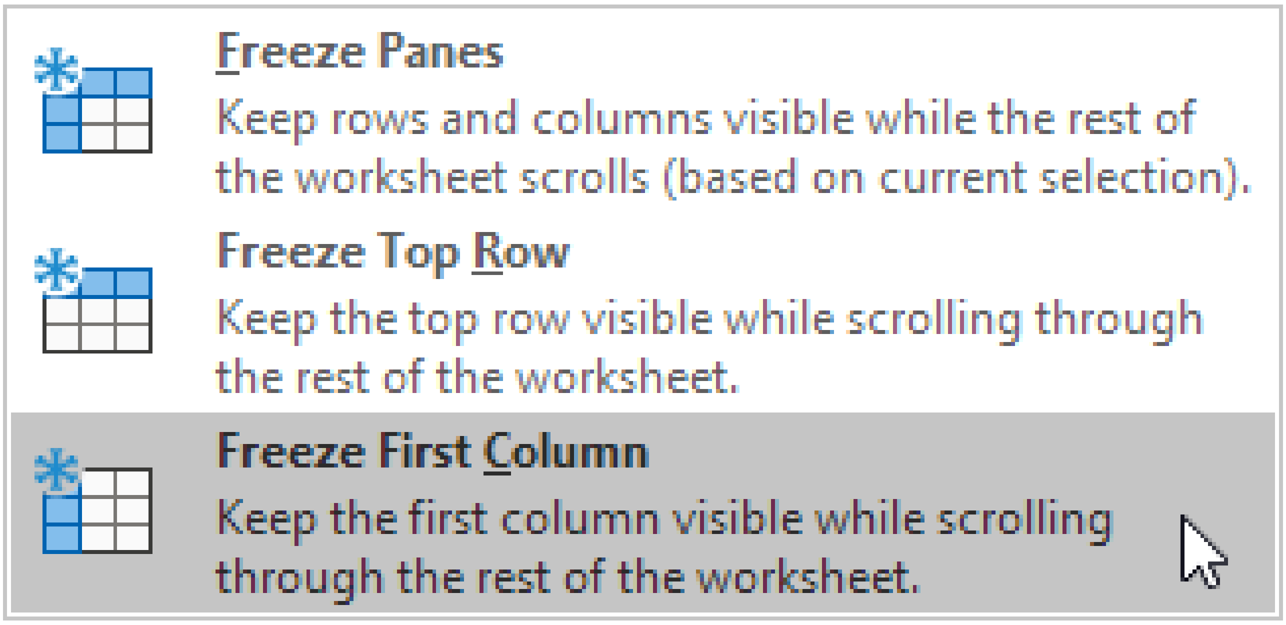

Freeze First Column

To freeze the first column, execute the following steps.

1. On the View tab, in the Window group, click Freeze Panes.




2. Click Freeze First Column.




3. Scroll to the right of the worksheet.

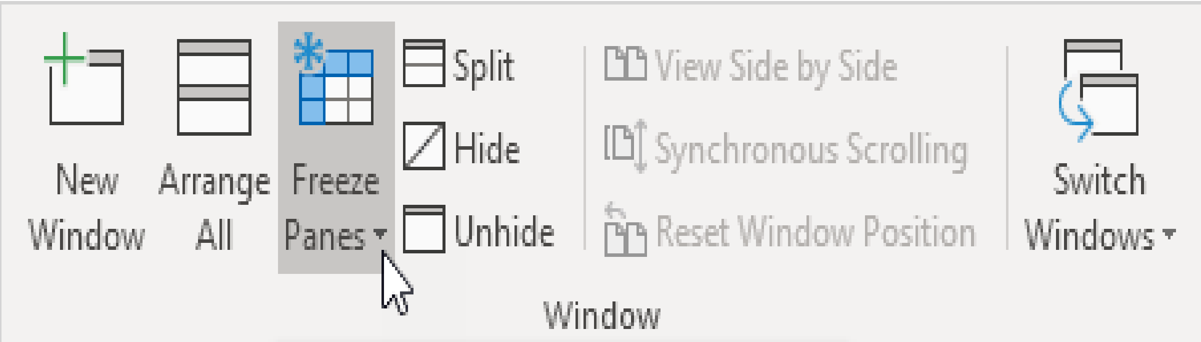
Result. Excel automatically adds a dark grey vertical line to indicate that the first column is frozen.

| | A | N | O | P | Q | R | S | T | U |
|---|---|---|---|---|---|---|---|---|---|
| 1 | Age | Internet | Caller ID | Call waiting | Own TV | Own VCR | Own PDA | Own computer | Gender |
| 2 | 55 | 0 | 1 | 0 | 1 | 1 | 0 | 0 | f |
| 3 | 56 | 0 | 1 | 1 | 1 | 1 | 0 | 0 | m |
| 4 | 28 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | f |
| 5 | 24 | 0 | 0 | 1 | 1 | 1 | 0 | 1 | m |
| 6 | 25 | 1 | 1 | 0 | 1 | 1 | 0 | 1 | m |
| 7 | 45 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | m |

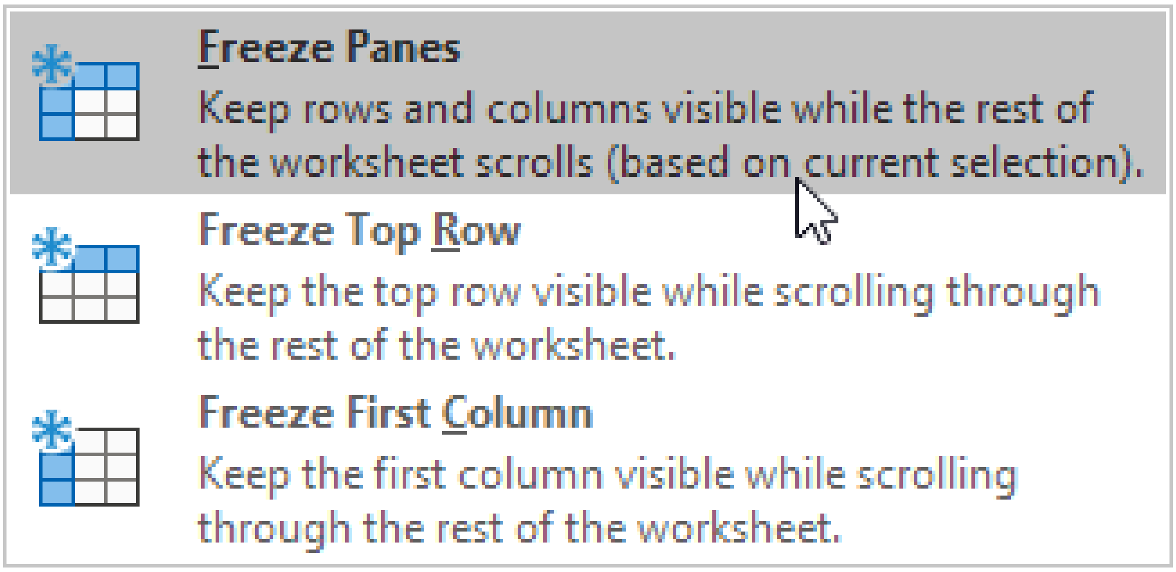
Freeze Rows

To freeze rows, execute the following steps.

1. For example, select row 4.
2. On the View tab, in the Window group, click Freeze Panes.




3. Click Freeze Panes.




4. Scroll down to the rest of the worksheet.

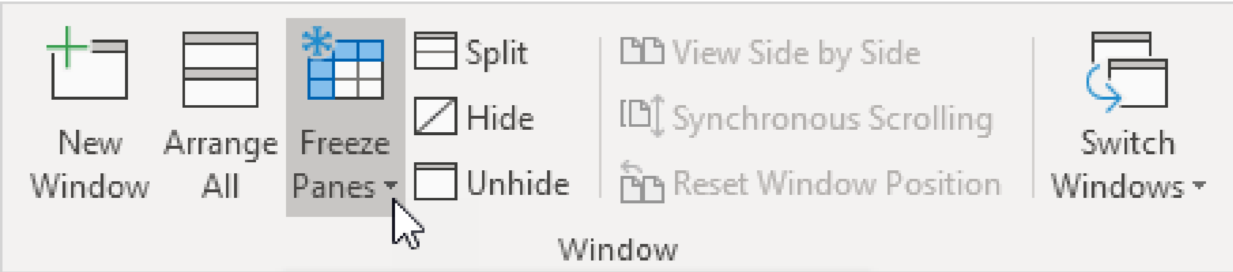
Result. All rows above row 4 are frozen. Excel automatically adds a dark grey horizontal line to indicate that the first three rows are frozen.

| | A | B | C | D | E | F | G | H | I | J |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | Age | Marital status | Address | Income | Car price | Education | Emply | Retired | Gender | Wireless |
| 2 | 55 | 1 | 12 | 72 | 37 | 1 | 23 | 0 | f | 0 |
| 3 | 56 | 0 | 29 | 153 | 76 | 1 | 35 | 0 | m | 1 |
| 24 | 42 | 1 | 13 | 53 | 25.9 | 2 | 6 | 0 | m | 0 |
| 25 | 65 | 1 | 17 | 42 | 21.3 | 2 | 24 | 0 | m | 0 |
| 26 | 52 | 1 | 5 | 83 | 40.9 | 1 | 24 | 0 | m | 0 |
| 27 | 51 | 1 | 17 | 148 | 73.7 | 4 | 10 | 0 | m | 1 |

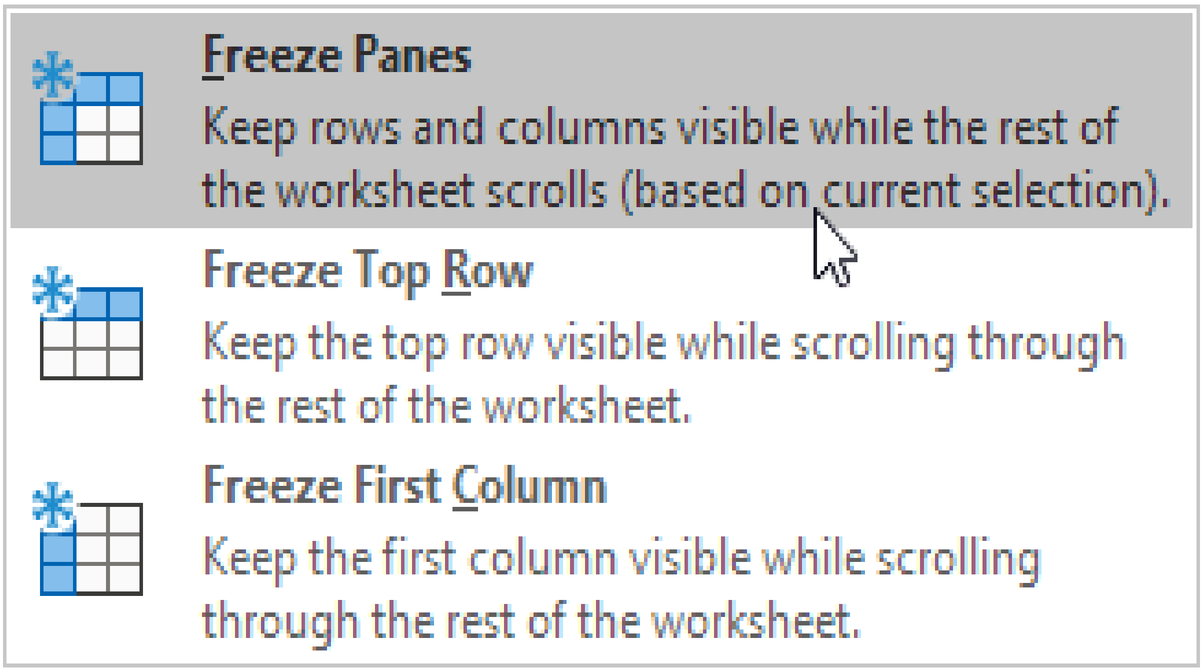
Freeze Columns

To freeze columns, execute the following steps.

1. For example, select column E.
2. On the View tab, in the Window group, click Freeze Panes.




3. Click Freeze Panes.




4. Scroll to the right of the worksheet.

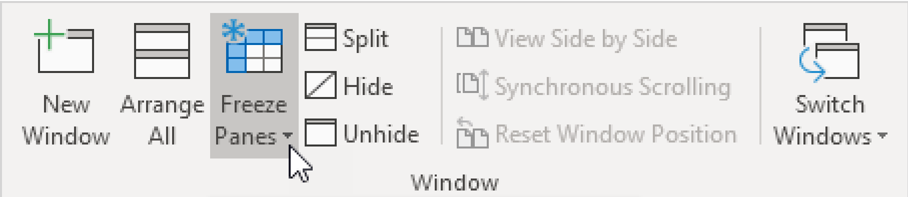
Result. All columns to the left of column E are frozen. Excel automatically adds a dark grey vertical line to indicate that the first four columns are frozen.

| | A | B | C | D | O | P | Q | R | S |
|---|---|---|---|---|---|---|---|---|---|
| 1 | Age | Marital status | Address | Income | Caller ID | Call waiting | Own TV | Own VCR | Own PDA |
| 2 | 55 | 1 | 12 | 72 | 1 | 0 | 1 | 1 | 0 |
| 3 | 56 | 0 | 29 | 153 | 1 | 1 | 1 | 1 | 0 |
| 4 | 28 | 1 | 9 | 28 | 0 | 0 | 1 | 1 | 0 |
| 5 | 24 | 1 | 4 | 26 | 0 | 1 | 1 | 1 | 0 |
| 6 | 25 | 1 | 2 | 23 | 1 | 0 | 1 | 1 | 0 |
| 7 | 45 | 0 | 9 | 76 | 1 | 1 | 1 | 1 | 0 |

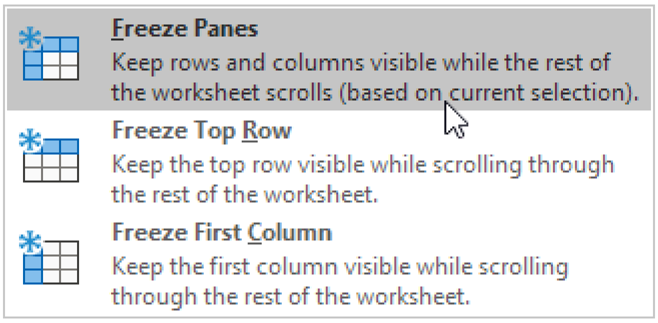
Freeze Cells

To freeze cells, execute the following steps.

1. For example, select cell C3.
2. On the View tab, in the Window group, click Freeze Panes.




3. Click Freeze Panes.




4. Scroll down and to the right.

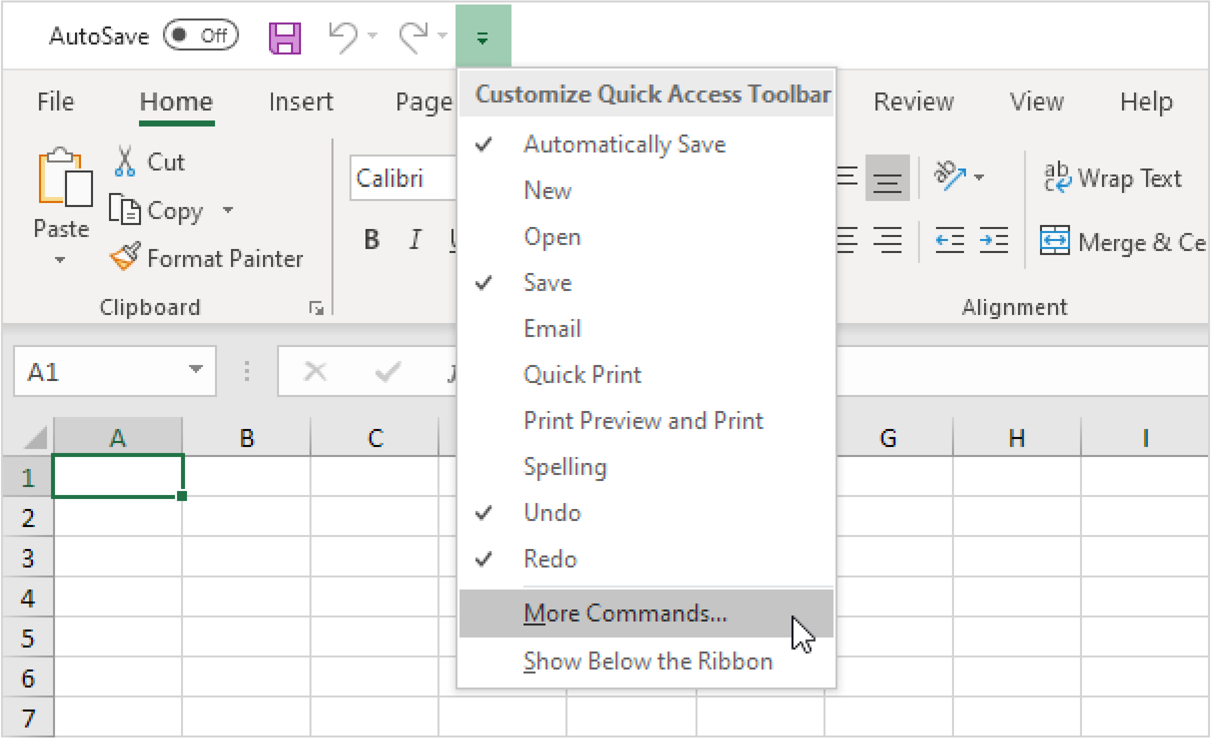
Result. The orange region above row 3 and to the left of column C is frozen.

| | A | B | K | L | M | N | O | P | Q |
|---|---|---|---|---|---|---|---|---|---|
| 1 | Age | Marital status | Multiple lines | Voice mail | Pager | Internet | Caller ID | Call waiting | Own TV |
| 2 | 55 | 1 | 1 | 1 | 1 | 0 | 1 | 0 | 1 |
| 27 | 51 | 1 | 1 | 1 | 1 | 0 | 1 | 1 | 1 |
| 28 | 44 | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 1 |
| 29 | 26 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 |
| 30 | 41 | 1 | 0 | 1 | 0 | 0 | 0 | 1 | 1 |
| 31 | 49 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |

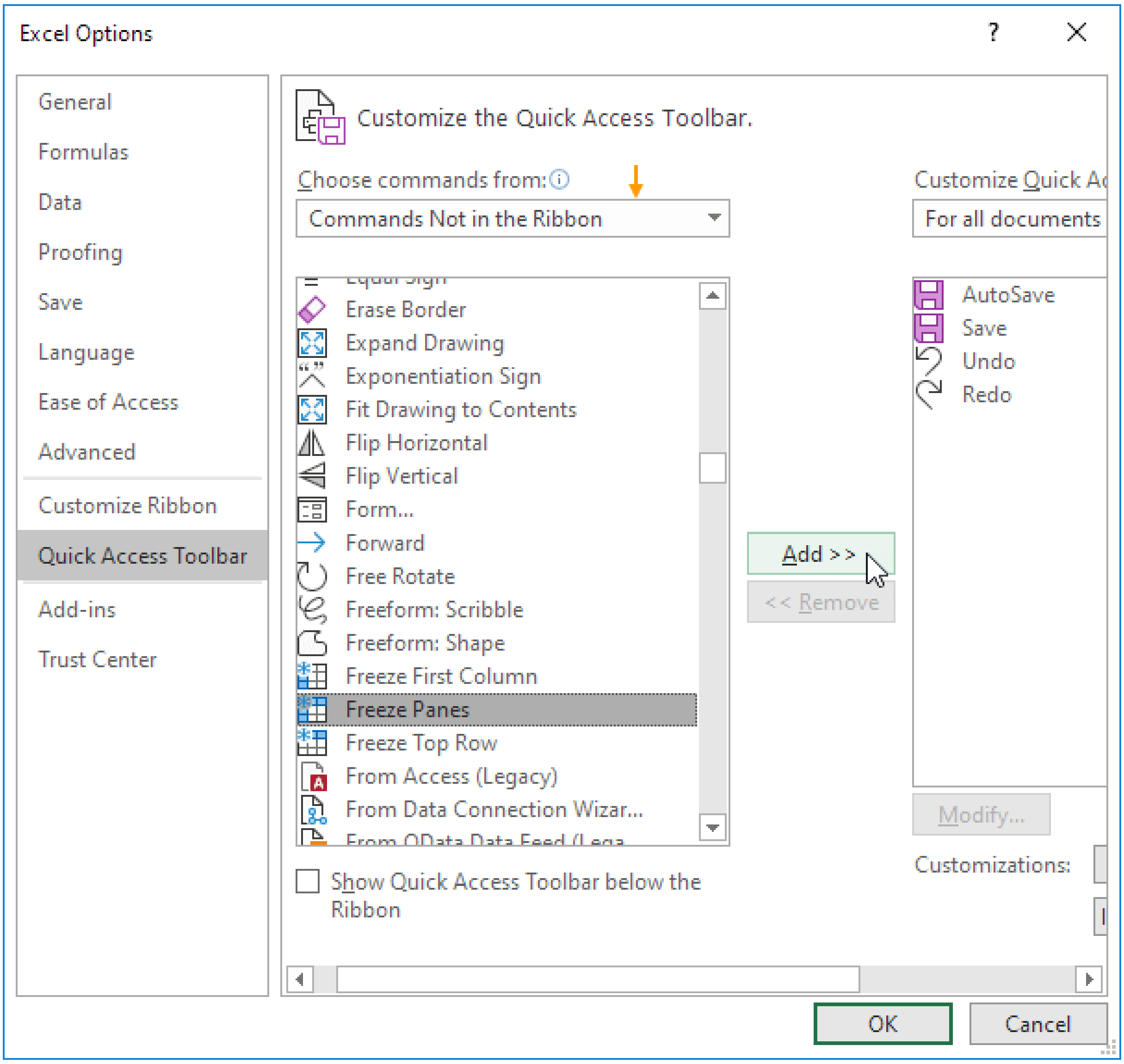
Magic Freeze Button

Add the magic Freeze button to the Quick Access Toolbar to freeze the top row, the first column, rows, columns or cells with a single click.

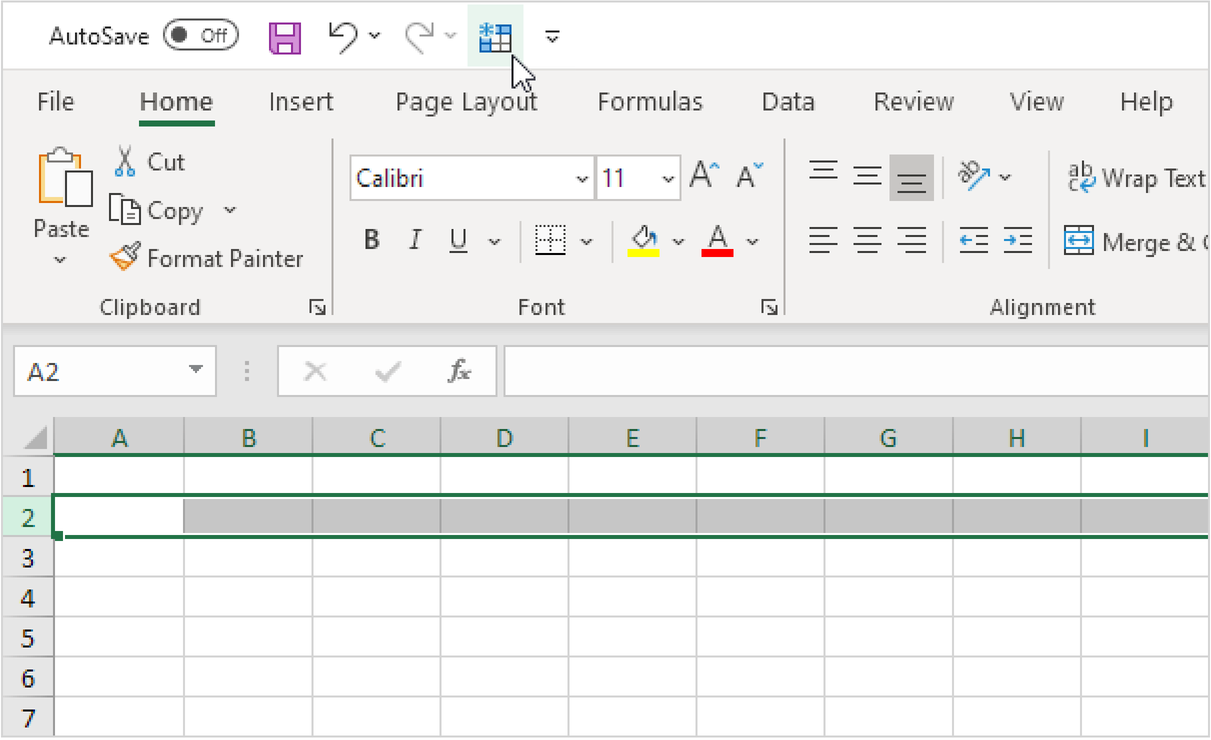
1. Click the down arrow.
2. Click More Commands.




3. Under Choose commands from, select Commands Not in the Ribbon.
4. Select Freeze Panes and click Add.

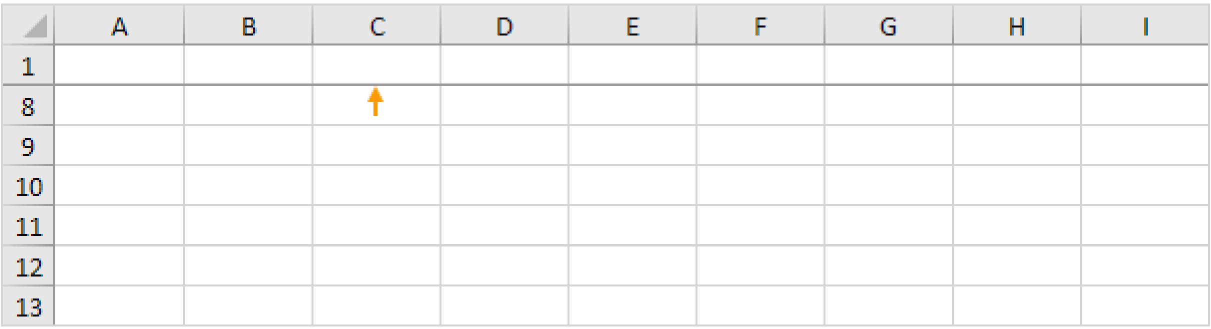



5. Click OK.
6. To freeze the top row, select row 2 and click the magic Freeze button.




7. Scroll down to the rest of the worksheet.

Result. Excel automatically adds a dark grey horizontal line to indicate that the top row is frozen.




Note: to unlock all rows and columns, click the Freeze button again. To freeze the first 4 columns, select column E (the fifth column) and click the magic Freeze button, etc.

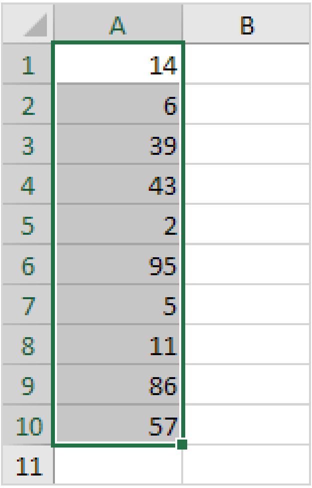
Conditional formatting

Conditional formatting in Excel enables you to highlight cells with a certain color, depending on the cell's value.

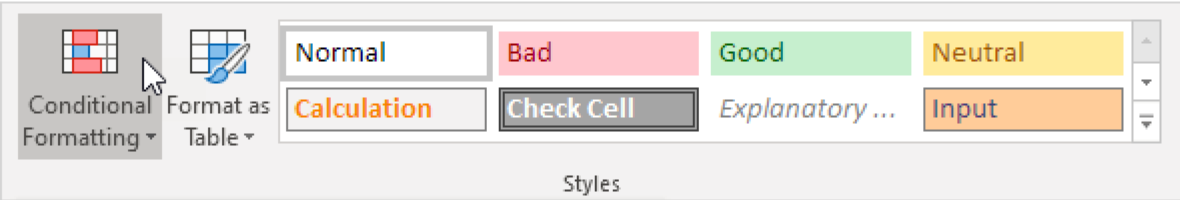
**Highlight Cells Rules**

To highlight cells that are greater than a value, execute the following steps.

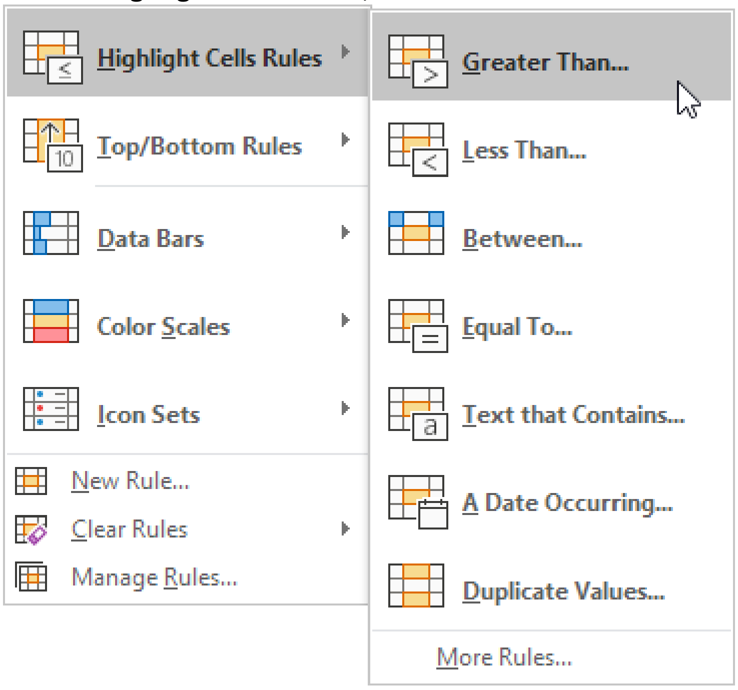
1. Select the range A1:A10.



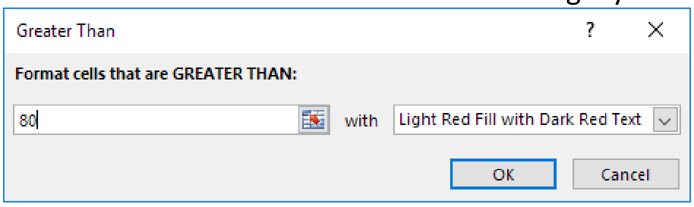

2. On the Home tab, in the Styles group, click Conditional Formatting.




3. Click Highlight Cells Rules, Greater Than.




4. Enter the value 80 and select a formatting style.




5. Click OK.

Result. Excel highlights the cells that are greater than 80.

| | A | B |
|---|---|---|
| 1 | 14 | |
| 2 | 6 | |
| 3 | 39 | |
| 4 | 43 | |
| 5 | 2 | |
| 6 | 95 | |
| 7 | 5 | |
| 8 | 11 | |
| 9 | 86 | |
| 10 | 57 | |
| 11 | | |

6. Change the value of cell A1 to 81.

Result. Excel changes the format of cell A1 automatically.

| | A | B |
|---|---|---|
| 1 | 81 | |
| 2 | 6 | |
| 3 | 39 | |
| 4 | 43 | |
| 5 | 2 | |
| 6 | 95 | |
| 7 | 5 | |
| 8 | 11 | |
| 9 | 86 | |
| 10 | 57 | |
| 11 | | |

Note: you can also use this category (see step 3) to highlight cells that are less than a value, between two values, equal to a value, cells that contain specific text, dates (today, last week, next month, etc.), duplicates or unique values.

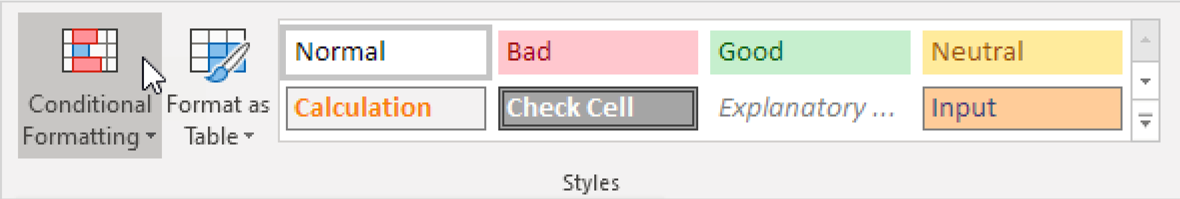
Clear Rules

To clear a conditional formatting rule, execute the following steps.

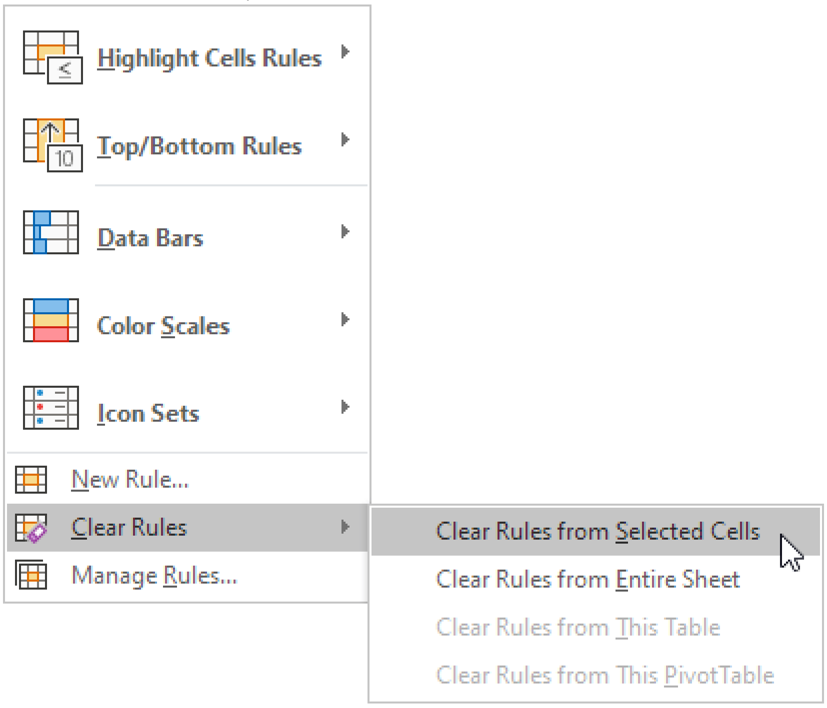
1. Select the range A1:A10.

| | A | B |
|---|---|---|
| 1 | 81 | |
| 2 | 6 | |
| 3 | 39 | |
| 4 | 43 | |
| 5 | 2 | |
| 6 | 95 | |
| 7 | 5 | |
| 8 | 11 | |
| 9 | 86 | |
| 10 | 57 | |
| 11 | | |

2. On the Home tab, in the Styles group, click Conditional Formatting.



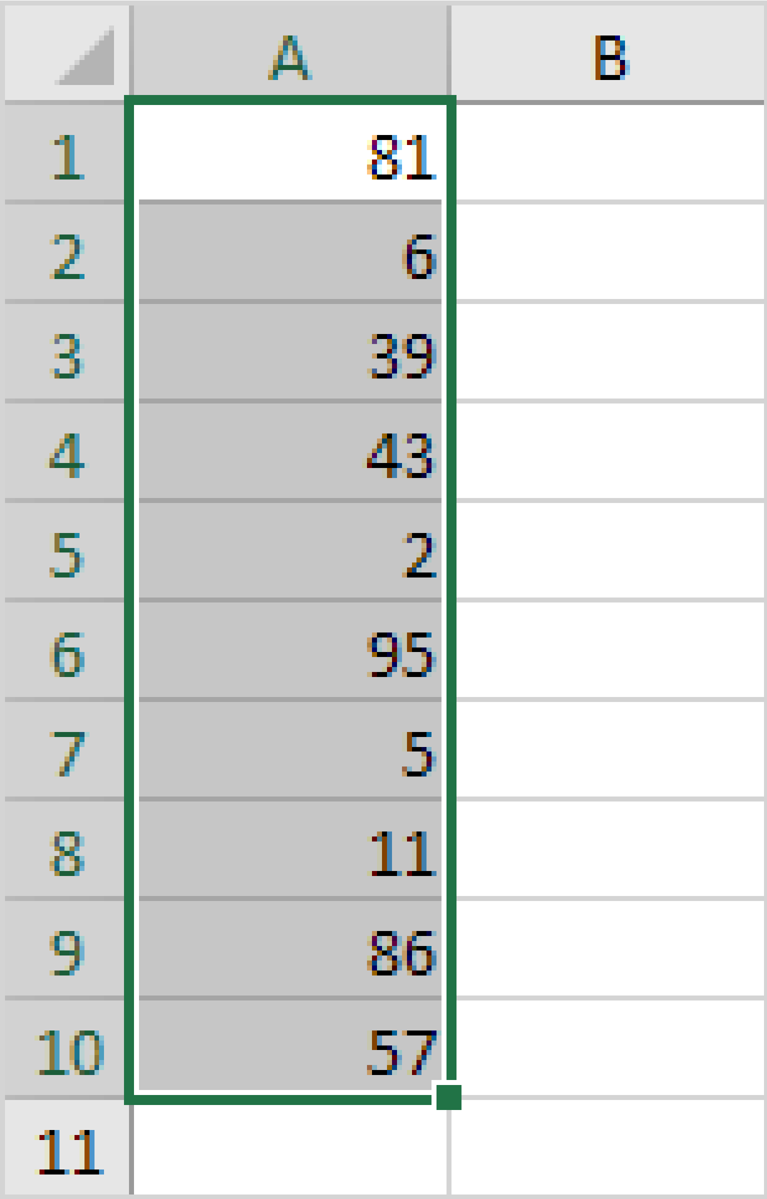

3. Click Clear Rules, Clear Rules from Selected Cells.



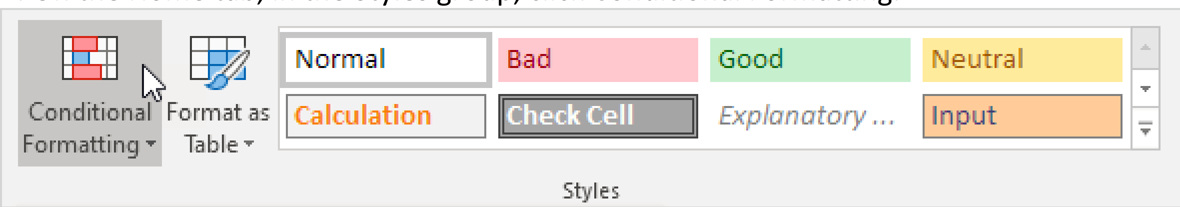

Top/Bottom Rules

To highlight cells that are above average, execute the following steps.

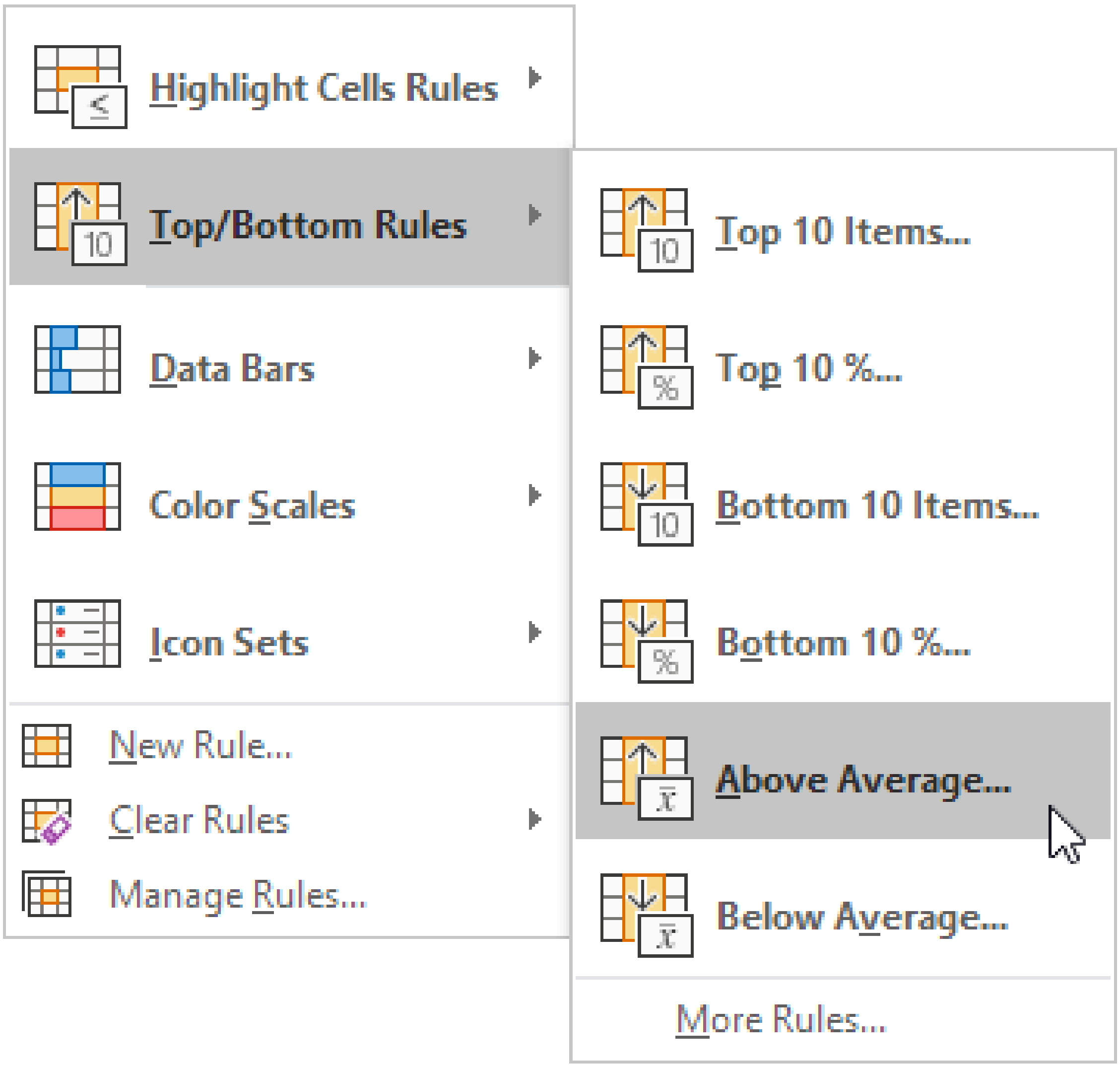
1. Select the range A1:A10.



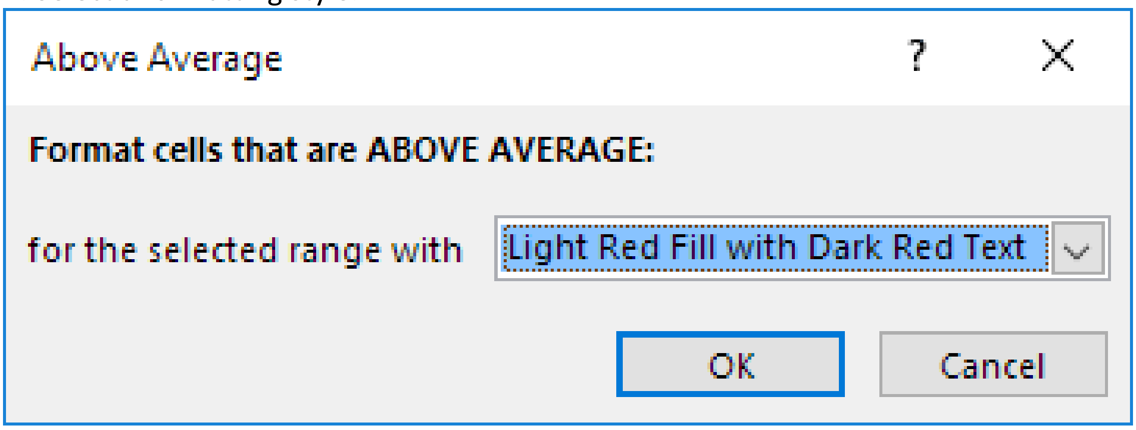

2. On the Home tab, in the Styles group, click Conditional Formatting.




3. Click Top/Bottom Rules, Above Average.




4. Select a formatting style.




5. Click OK.

Result. Excel calculates the average (42.5) and formats the cells that are above this average.

| | A | B |
|---|---|---|
| 1 | 81 | |
| 2 | 6 | |
| 3 | 39 | |
| 4 | 43 | |
| 5 | 2 | |
| 6 | 95 | |
| 7 | 5 | |
| 8 | 11 | |
| 9 | 86 | |
| 10 | 57 | |
| 11 | | |

Note: you can also use this category (see step 3) to highlight the top n items, the top n percent, the bottom n items, the bottom n percent or cells that are below average.

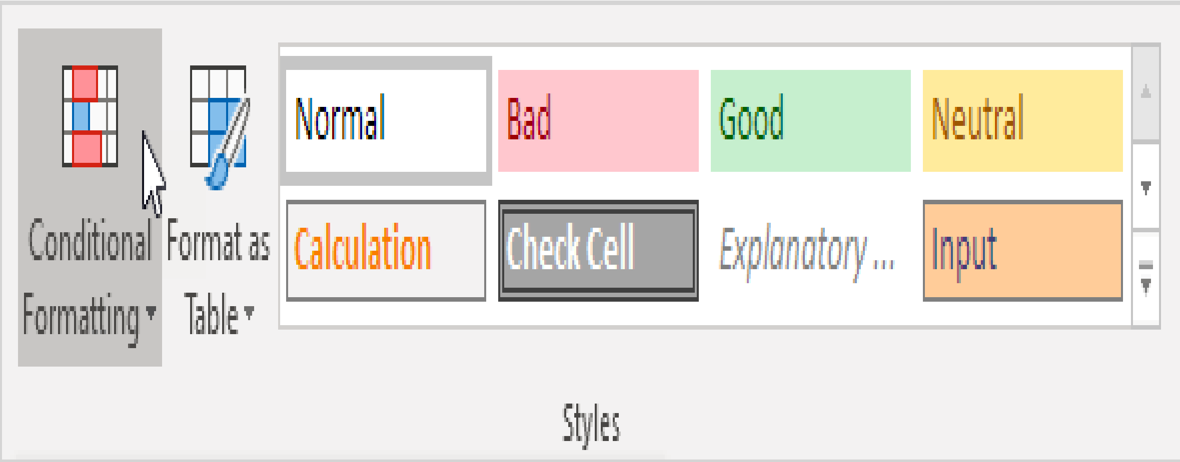
Conditional Formatting with Formulas

Take your Excel skills to the next level and use a formula to determine which cells to format. Formulas that apply conditional formatting must evaluate to TRUE or FALSE.

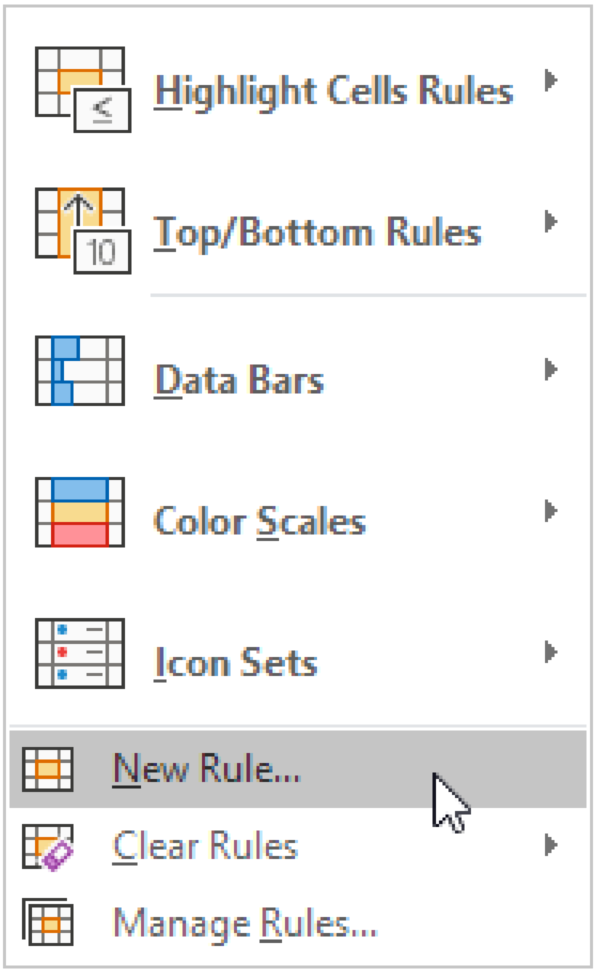
1. Select the range A1:E5.

| | A | B | C | D | E | F |
|---|---|---|---|---|---|---|
| 1 | 90 | 77 | 33 | 20 | 96 | |
| 2 | 59 | 66 | 20 | 61 | 44 | |
| 3 | 94 | 99 | 97 | 41 | 52 | |
| 4 | 36 | 43 | 70 | 13 | 54 | |
| 5 | 15 | 6 | 28 | 28 | 15 | |
| 6 | | | | | | |

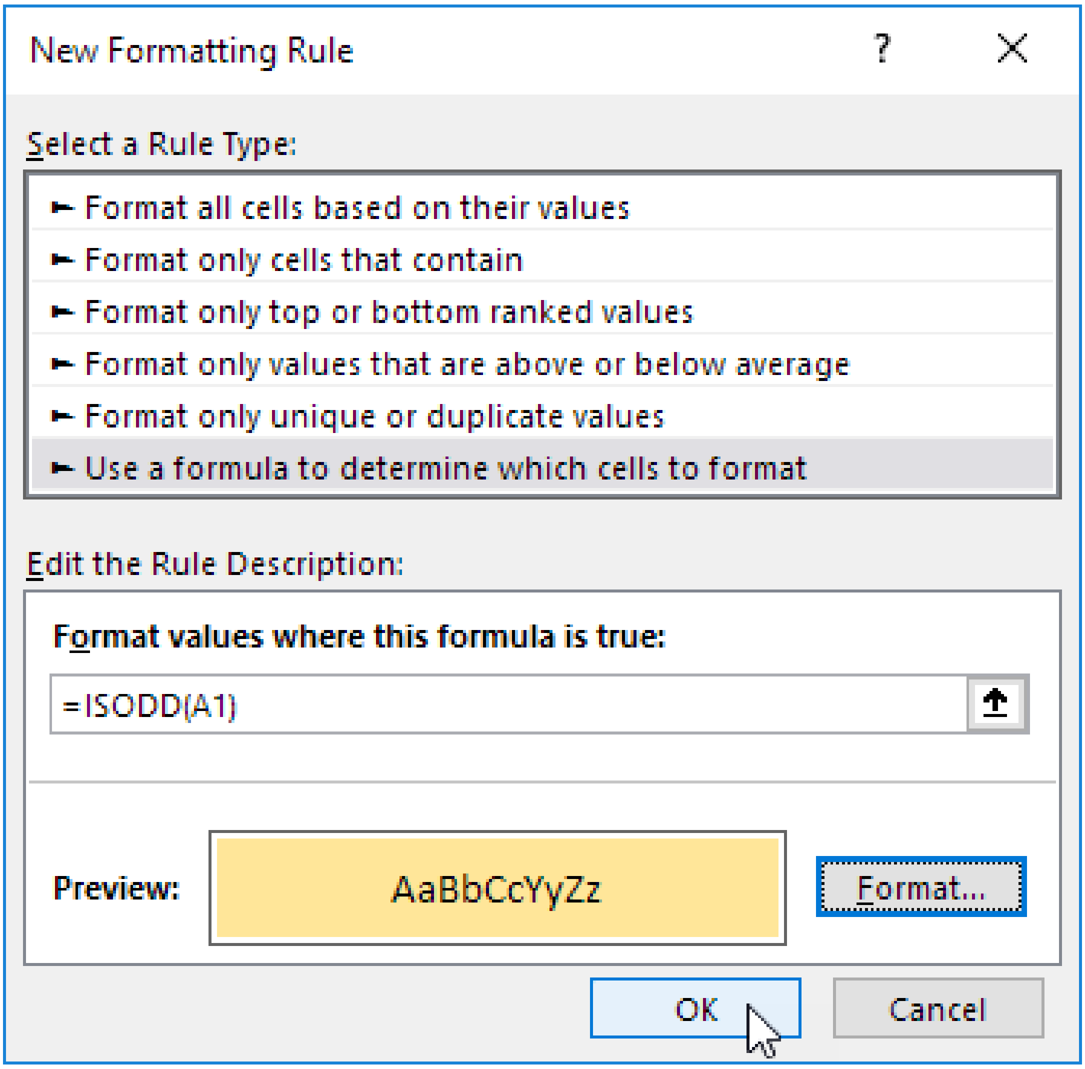
2. On the Home tab, in the Styles group, click Conditional Formatting.




3. Click New Rule.




4. Select 'Use a formula to determine which cells to format'.
5. Enter the formula =ISODD(A1)
6. Select a formatting style and click OK.




Result. Excel highlights all odd numbers.

| | A | B | C | D | E | F |
|---|---|---|---|---|---|---|
| 1 | 90 | 77 | 33 | 20 | 96 | |
| 2 | 59 | 66 | 20 | 61 | 44 | |
| 3 | 94 | 99 | 97 | 41 | 52 | |
| 4 | 36 | 43 | 70 | 13 | 54 | |
| 5 | 15 | 6 | 28 | 28 | 15 | |
| 6 | | | | | | |

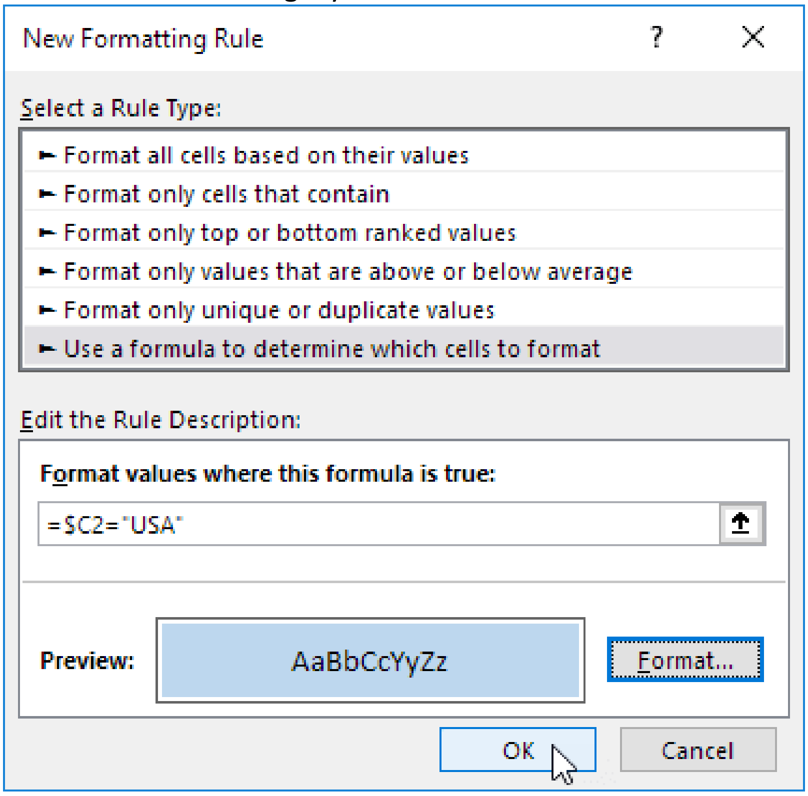
Explanation: always write the formula for the upper-left cell in the selected range. Excel automatically copies the formula to the other cells. Thus, cell A2 contains the formula =ISODD(A2), cell A3 contains the formula =ISODD(A3), etc.

Here's another example.

7. Select the range A2:D7.

| | A | B | C | D | E |
|---|---|---|---|---|---|
| 1 | Last Name | Sales | Country | Quarter | |
| 2 | Smith | $16,753.00 | UK | Qtr 3 | |
| 3 | Johnson | $14,808.00 | USA | Qtr 4 | |
| 4 | Williams | $10,644.00 | UK | Qtr 2 | |
| 5 | Jones | $1,390.00 | USA | Qtr 3 | |
| 6 | Brown | $4,865.00 | USA | Qtr 4 | |
| 7 | Williams | $12,438.00 | UK | Qtr 1 | |
| 8 | | | | | |

8. Repeat steps 2-4 above.
9. Enter the formula =$C2="USA"
10. Select a formatting style and click OK.




Result. Excel highlights all USA orders.

| | A | B | C | D | E |
|---|---|---|---|---|---|
| 1 | Last Name | Sales | Country | Quarter | |
| 2 | Smith | $16,753.00 | UK | Qtr 3 | |
| 3 | Johnson | $14,808.00 | USA | Qtr 4 | |
| 4 | Williams | $10,644.00 | UK | Qtr 2 | |
| 5 | Jones | $1,390.00 | USA | Qtr 3 | |
| 6 | Brown | $4,865.00 | USA | Qtr 4 | |
| 7 | Williams | $12,438.00 | UK | Qtr 1 | |
| 8 | | | | | |

Explanation: we fixed the reference to column C by placing a $ symbol in front of the column letter ($C2). As a result, cell B2, C2 and cell D2 also contain the formula =$C2="USA", cell A3, B3, C3 and D3 contain the formula =$C3="USA", etc.

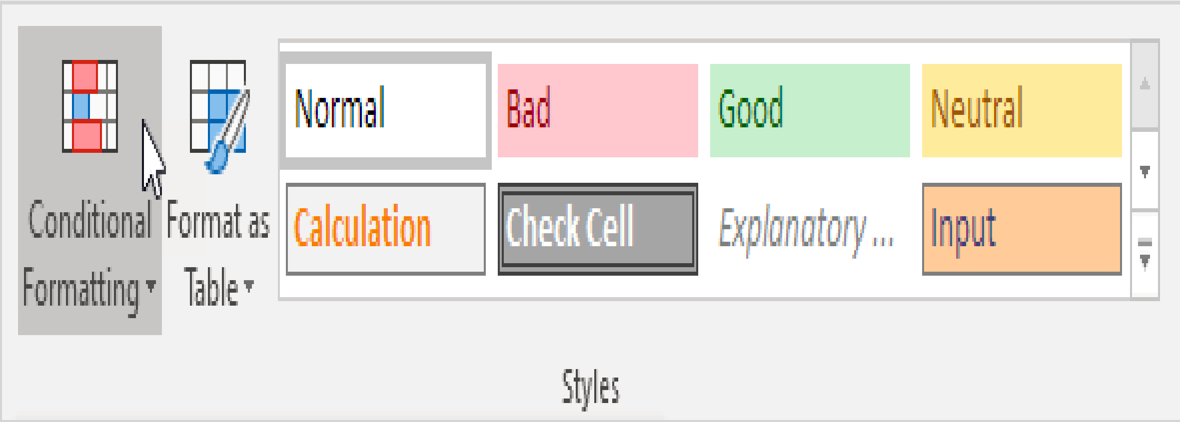
Manage Rules

To view all conditional formatting rules in a workbook, use the Conditional Formatting Rules Manager. You can also use this screen to create, edit and delete rules.

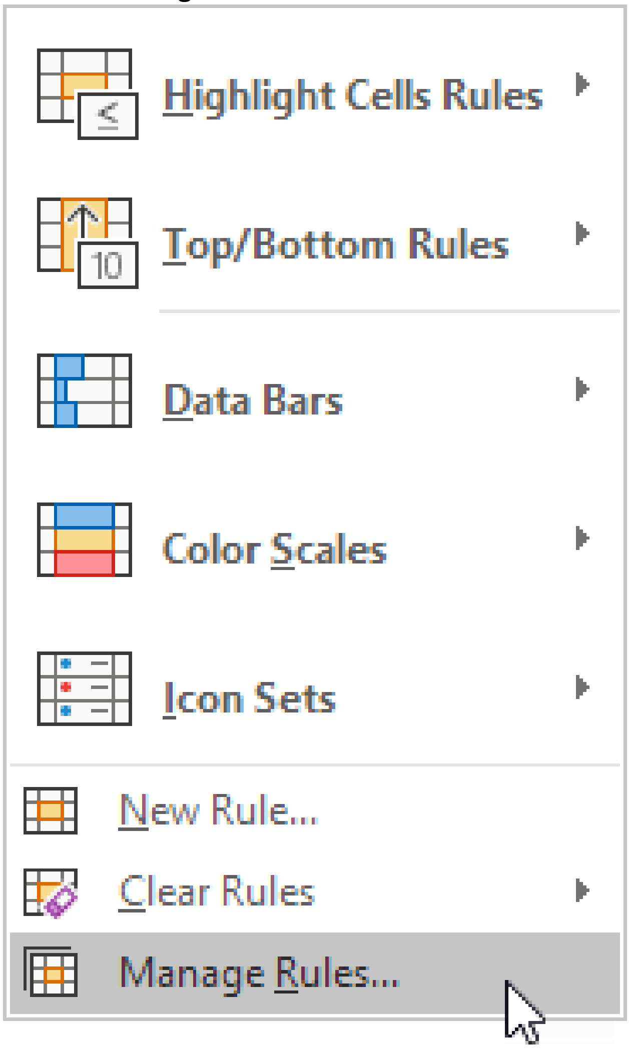
1. Select cell A1.

| | A | B |
|---|---|---|
| 1 | 81 | |
| 2 | 6 | |
| 3 | 39 | |
| 4 | 43 | |
| 5 | 2 | |
| 6 | 95 | |
| 7 | 5 | |
| 8 | 11 | |
| 9 | 86 | |
| 10 | 57 | |
| 11 | | |

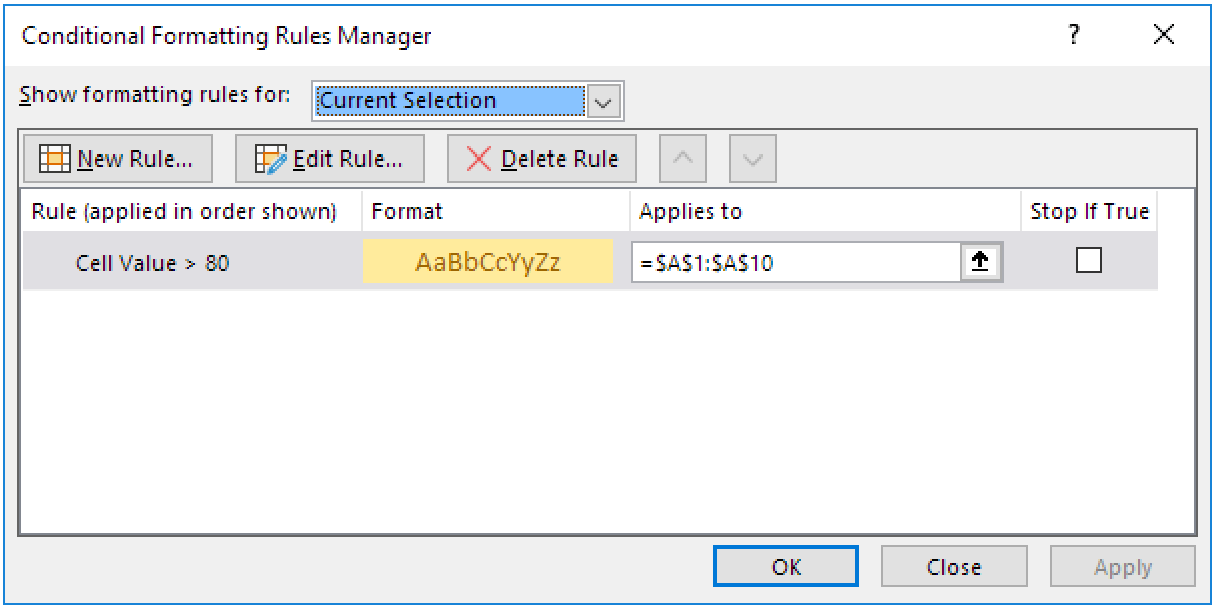
2. On the Home tab, in the Styles group, click Conditional Formatting.



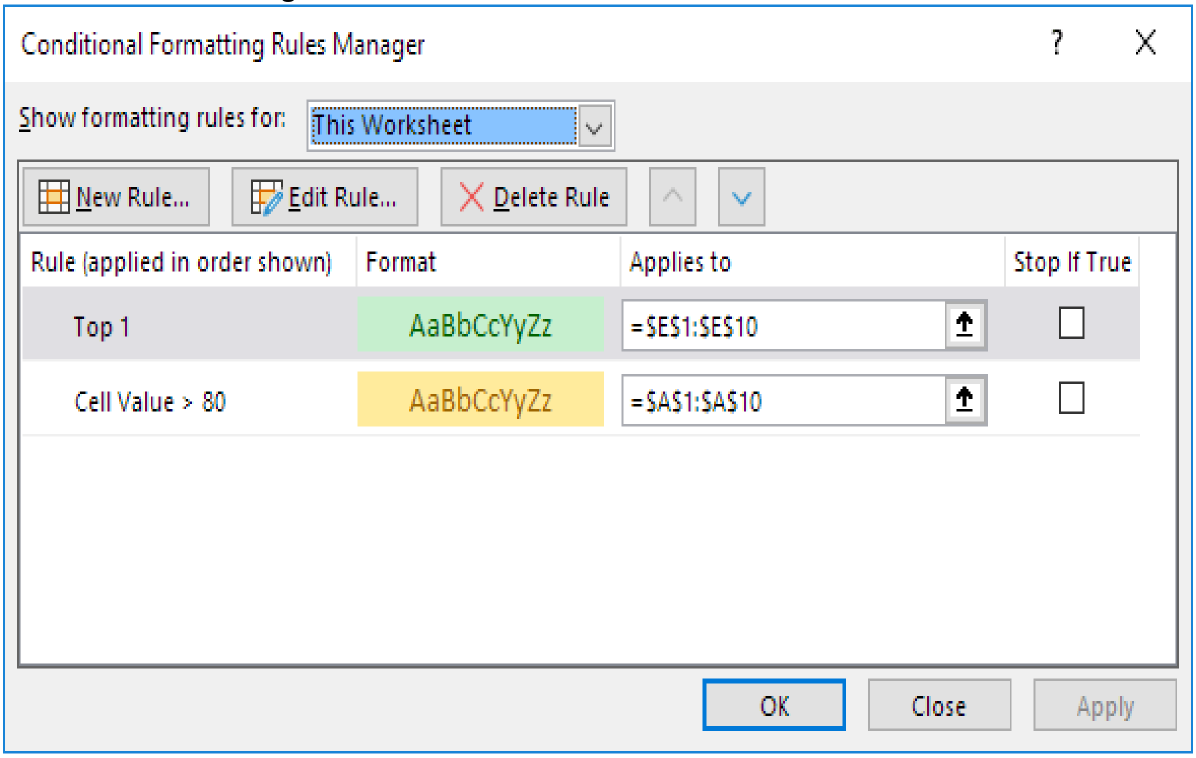

3. Click Manage Rules.




The Conditional Formatting Rules Manager appears.




Note: because we selected cell A1, Excel shows the rule applied to the range A1:A10.
4. From the drop-down list, change Current Selection to This Worksheet, to view all conditional formatting rules in this worksheet.

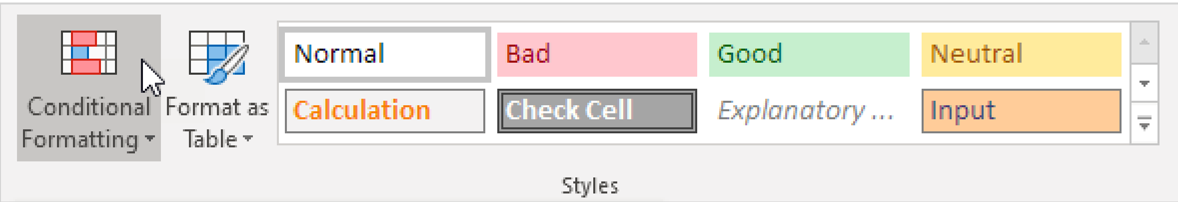



Note: click New Rule, Edit Rule and Delete Rule to create, edit and delete rules.
Find Duplicates

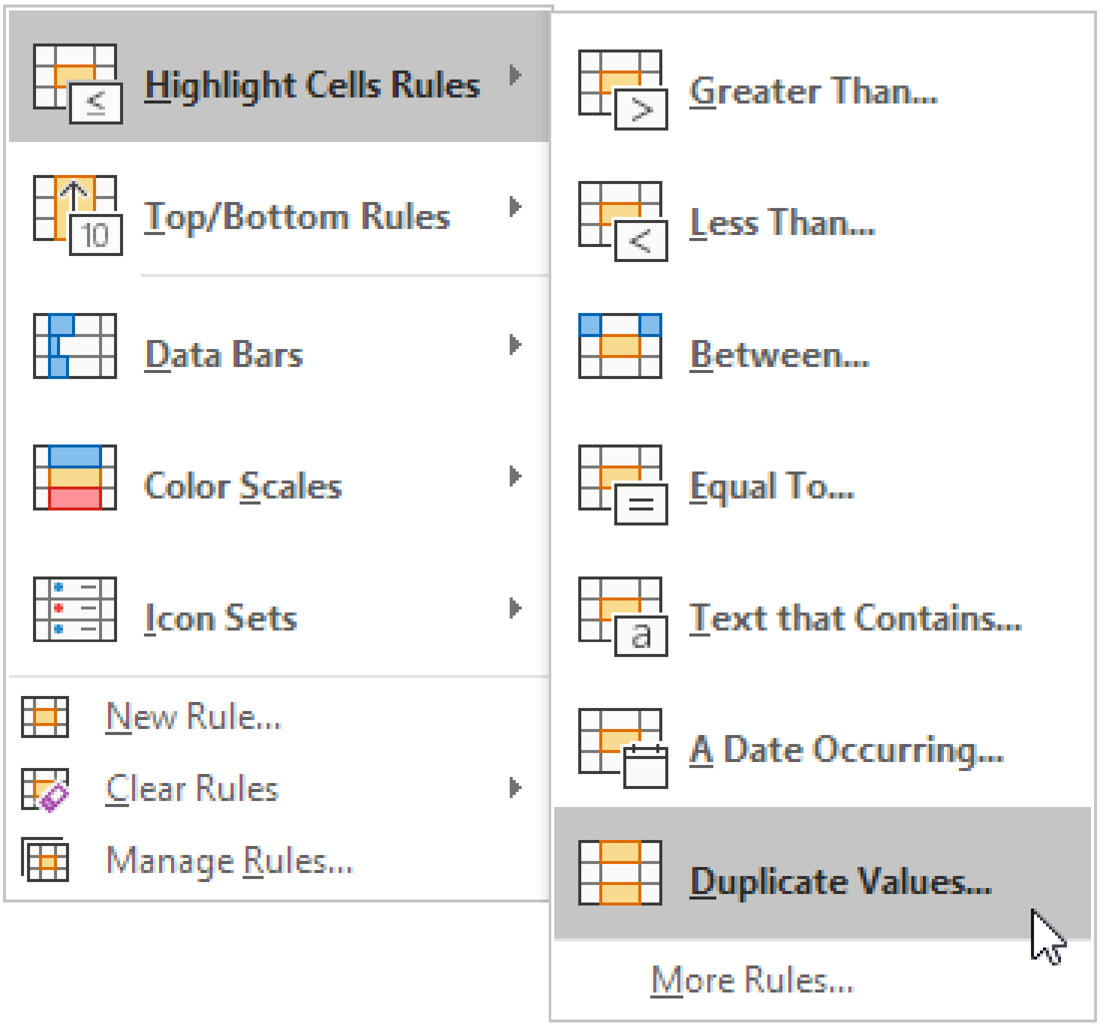
This example teaches you how to find duplicate values (or triplicates) and how to find duplicate rows in Excel.
Duplicate Values
To find and highlight duplicate values in Excel, execute the following steps.
1. Select the range A1:C10.

| | A | B | C | D |
|---|---|---|---|---|
| 1 | Sierra | Tango | Charlie | |
| 2 | Kilo | Bravo | Yankee | |
| 3 | Golf | Mike | Delta | |
| 4 | Juliet | Alpha | Foxtrot | |
| 5 | Papa | X-ray | November | |
| 6 | Zulu | Sierra | Whiskey | |
| 7 | Romeo | Echo | Quebec | |
| 8 | India | Oscar | Delta | |
| 9 | Sierra | Lima | Uniform | |
| 10 | Hotel | Juliet | Victor | |
| 11 | | | | |

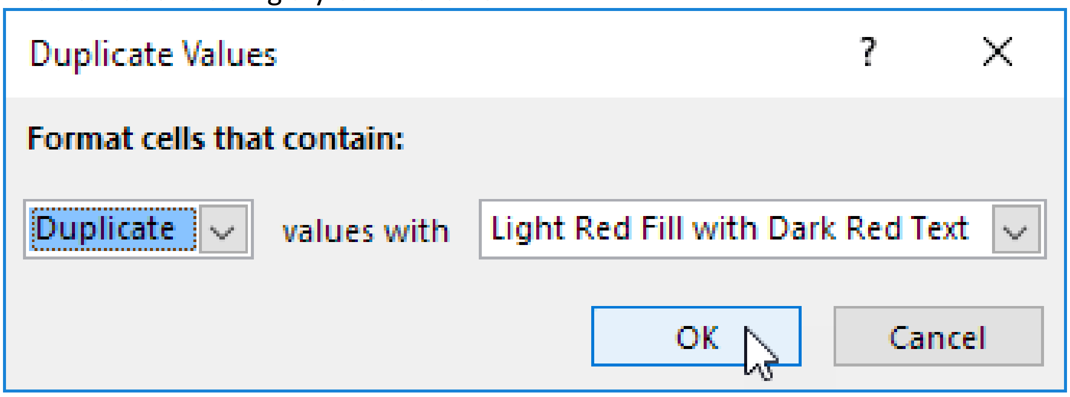
2. On the Home tab, in the Styles group, click Conditional Formatting.




3. Click Highlight Cells Rules, Duplicate Values.




4. Select a formatting style and click OK.




Result. Excel highlights the duplicate names.

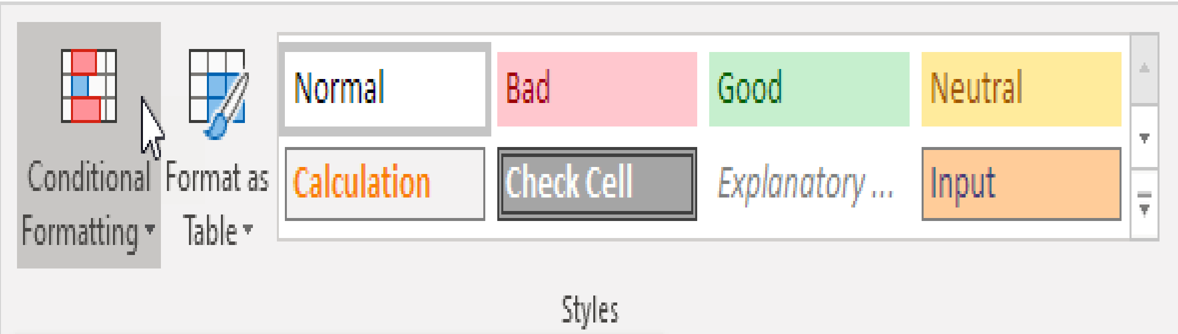
| | A | B | C | D |
|---|---|---|---|---|
| 1 | Sierra | Tango | Charlie | |
| 2 | Kilo | Bravo | Yankee | |
| 3 | Golf | Mike | Delta | |
| 4 | Juliet | Alpha | Foxtrot | |
| 5 | Papa | X-ray | November | |
| 6 | Zulu | Sierra | Whiskey | |
| 7 | Romeo | Echo | Quebec | |
| 8 | India | Oscar | Delta | |
| 9 | Sierra | Lima | Uniform | |
| 10 | Hotel | Juliet | Victor | |
| 11 | | | | |

Note: select Unique from the first drop-down list to highlight the unique names.

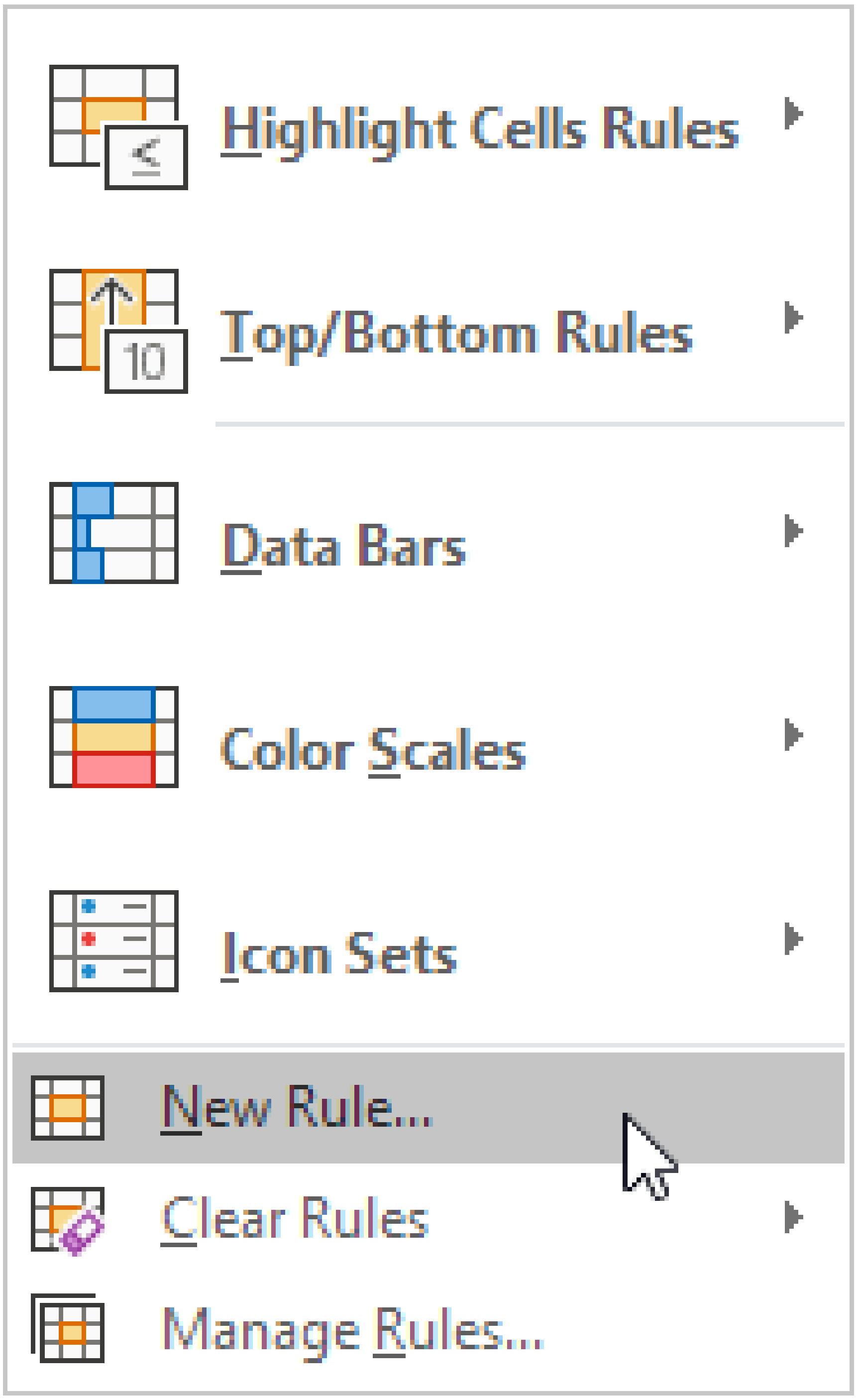
Triplicates

By default, Excel highlights duplicates (Juliet, Delta), triplicates (Sierra), etc. (see previous image). Execute the following steps to highlight triplicates only.

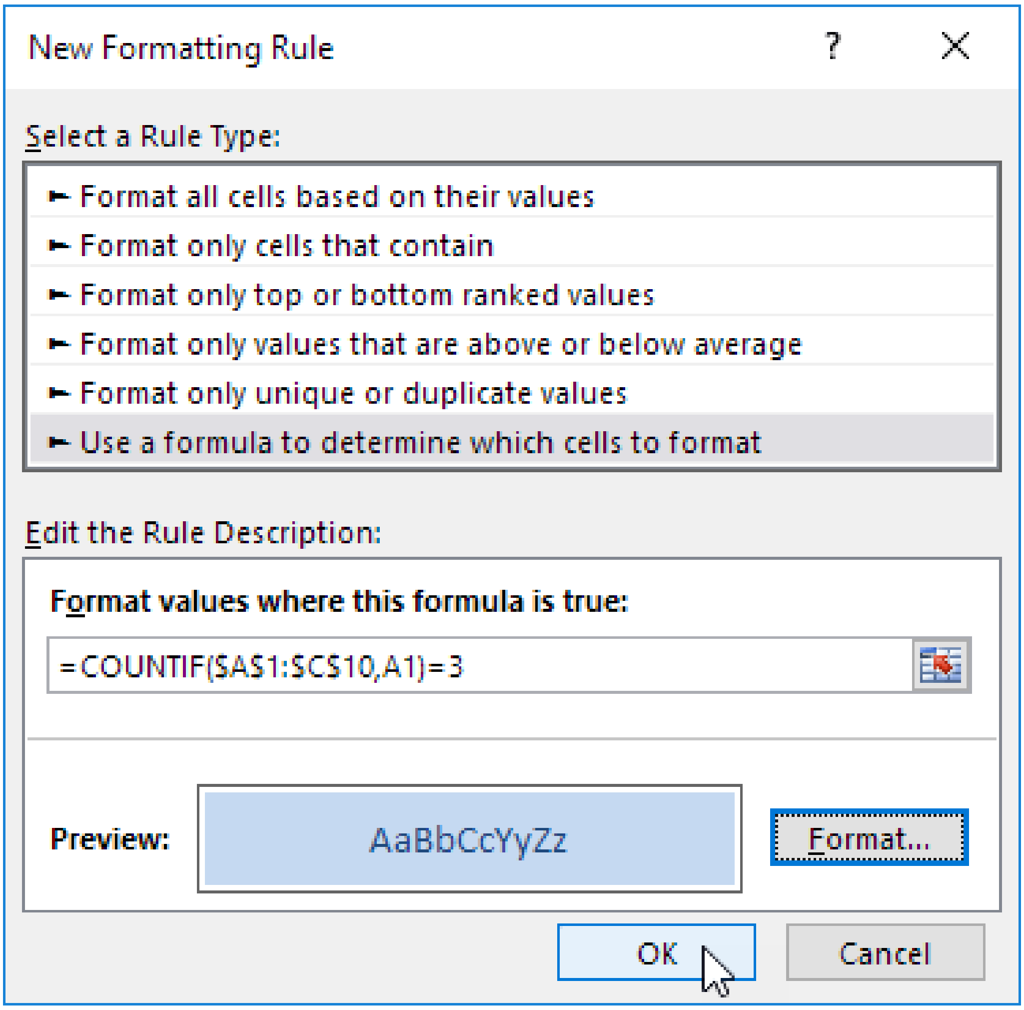
1. First, clear the previous conditional formatting rule.
2. Select the range A1:C10.
3. On the Home tab, in the Styles group, click Conditional Formatting.




4. Click New Rule.



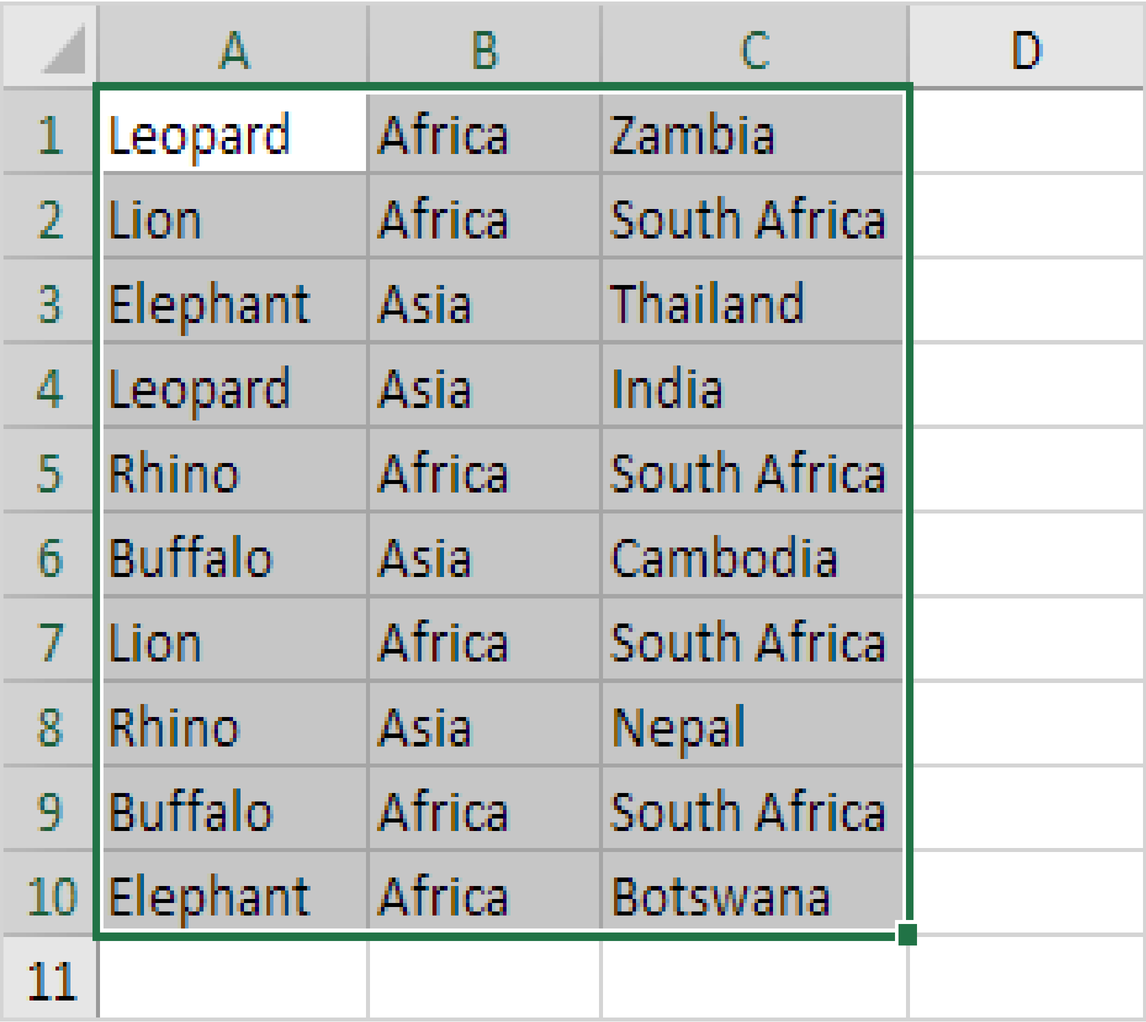

5. Select 'Use a formula to determine which cells to format'.
6. Enter the formula =COUNTIF($A$1:$C$10,A1)=3
7. Select a formatting style and click OK.




Result. Excel highlights the triplicate names.

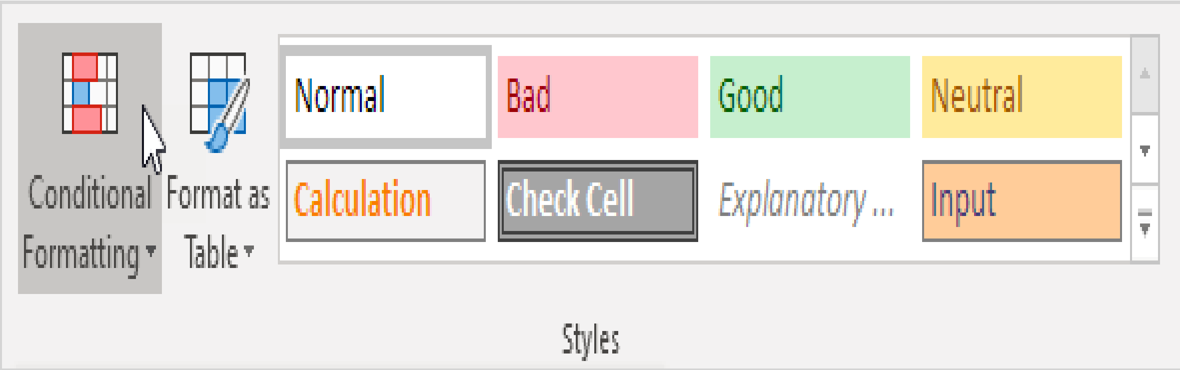
| | A | B | C | D |
|---|---|---|---|---|
| 1 | Sierra | Tango | Charlie | |
| 2 | Kilo | Bravo | Yankee | |
| 3 | Golf | Mike | Delta | |
| 4 | Juliet | Alpha | Foxtrot | |
| 5 | Papa | X-ray | November | |
| 6 | Zulu | Sierra | Whiskey | |
| 7 | Romeo | Echo | Quebec | |
| 8 | India | Oscar | Delta | |
| 9 | Sierra | Lima | Uniform | |
| 10 | Hotel | Juliet | Victor | |
| 11 | | | | |

Explanation: =COUNTIF($A$1:$C$10,A1) counts the number of names in the range A1:C10 that are equal to the name in cell A1. If COUNTIF($A$1:$C$10,A1) = 3, Excel formats cell A1. Always write the formula for the upper-left cell in the selected range (A1:C10). Excel automatically copies the formula to the other cells. Thus, cell A2 contains the formula =COUNTIF($A$1:$C$10,A2)=3, cell A3 =COUNTIF($A$1:$C$10,A3)=3, etc. Notice how we created an absolute reference ($A$1:$C$10) to fix this reference.
Note: you can use any formula you like. For example, use this formula =COUNTIF($A$1:$C$10,A1)>3 to highlight names that occur more than 3 times.
Duplicate Rows
To find and highlight duplicate rows in Excel, use COUNTIFS (with the letter S at the end) instead of COUNTIF.
1. Select the range A1:C10.

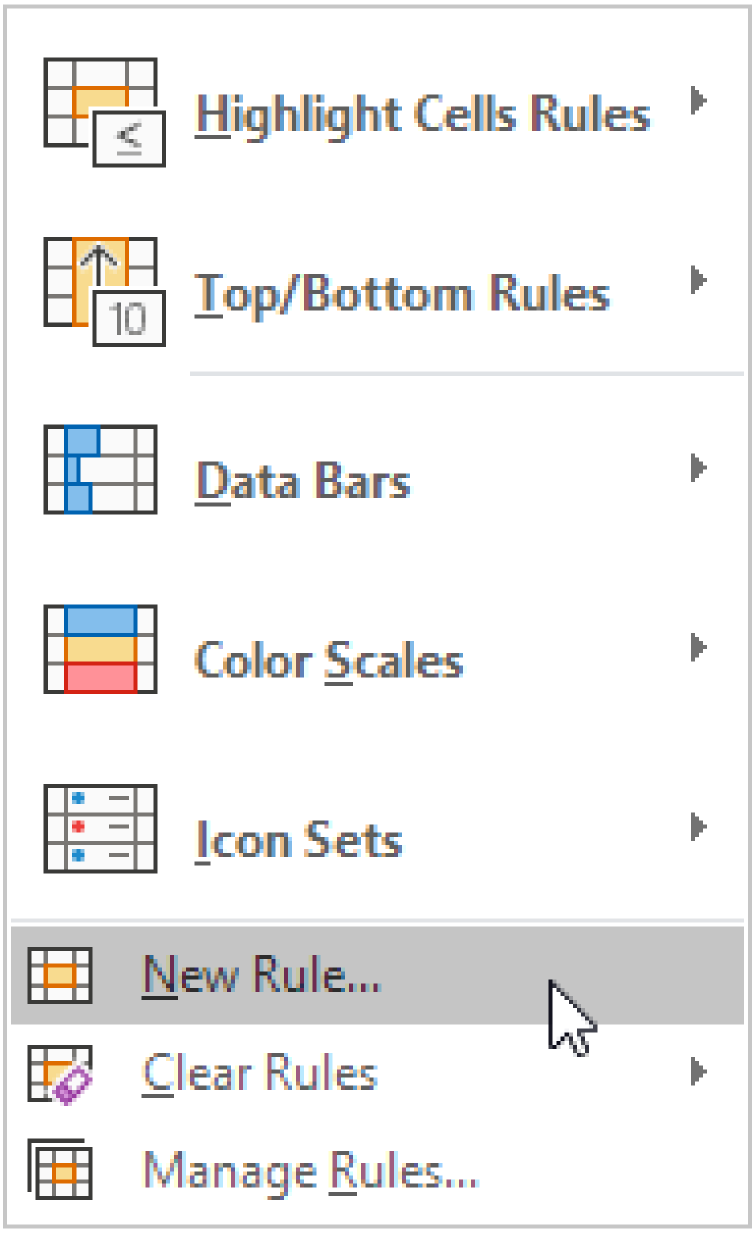


| | A | B | C | D |
|---|---|---|---|---|
| 1 | Leopard | Africa | Zambia | |
| 2 | Lion | Africa | South Africa | |
| 3 | Elephant | Asia | Thailand | |
| 4 | Leopard | Asia | India | |
| 5 | Rhino | Africa | South Africa | |
| 6 | Buffalo | Asia | Cambodia | |
| 7 | Lion | Africa | South Africa | |
| 8 | Rhino | Asia | Nepal | |
| 9 | Buffalo | Africa | South Africa | |
| 10 | Elephant | Africa | Botswana | |
| 11 | | | | |

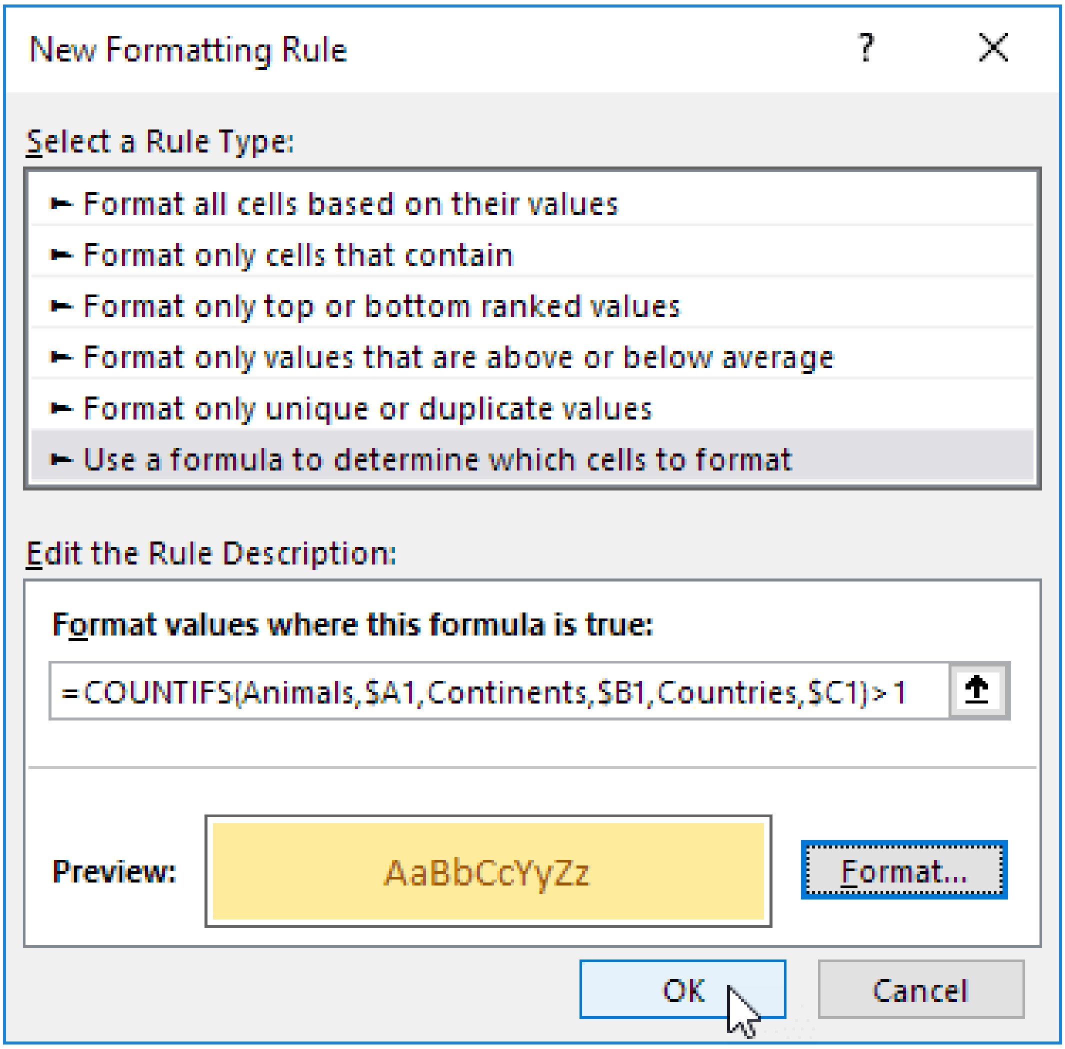
2. On the Home tab, in the Styles group, click Conditional Formatting.




3. Click New Rule.




4. Select 'Use a formula to determine which cells to format'.
5. Enter the formula =COUNTIFS(Animals,$A1,Continents,$B1,Countries,$C1)>1
6. Select a formatting style and click OK.



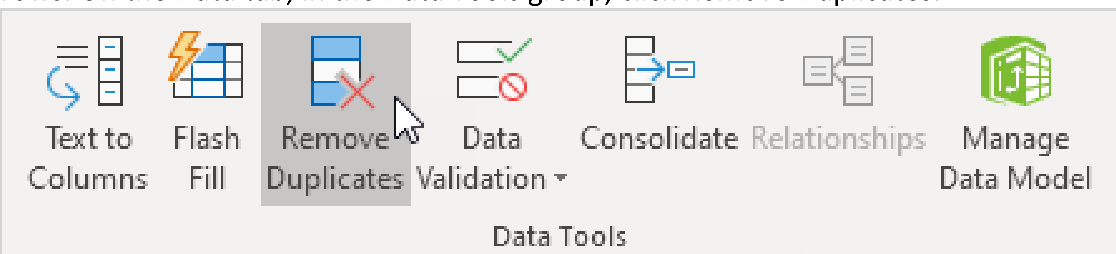

Note: the named range Animals refers to the range A1:A10, the named range Continents refers to the range B1:B10 and the named range Countries refers to the range C1:C10. =COUNTIFS(Animals,$A1,Continents,$B1,Countries,$C1) counts the number of rows based on multiple criteria (Leopard, Africa, Zambia).

Result. Excel highlights the duplicate rows.

| | A | B | C | D |
|---|---|---|---|---|
| 1 | Leopard | Africa | Zambia | |
| 2 | Lion | Africa | South Africa | |
| 3 | Elephant | Asia | Thailand | |
| 4 | Leopard | Asia | India | |
| 5 | Rhino | Africa | South Africa | |
| 6 | Buffalo | Asia | Cambodia | |
| 7 | Lion | Africa | South Africa | |
| 8 | Rhino | Asia | Nepal | |
| 9 | Buffalo | Africa | South Africa | |
| 10 | Elephant | Africa | Botswana | |
| 11 | | | | |

Explanation: if COUNTIFS(Animals,$A1,Continents,$B1,Countries,$C1) > 1, in other words, if there are multiple (Leopard, Africa, Zambia) rows, Excel formats cell A1. Always write the formula for the upper-left cell in the selected range (A1:C10). Excel automatically copies the formula to the other cells. We fixed the reference to each column by placing a $ symbol in front of the column letter ($A1, $B1 and $C1). As a result, cell A1, B1 and C1 contain the same formula, cell A2, B2 and C2 contain the formula =COUNTIFS(Animals,$A2,Continents,$B2,Countries,$C2)>1, etc.

7. Finally, you can use the Remove Duplicates tool in Excel to quickly remove duplicate rows. On the Data tab, in the Data Tools group, click Remove Duplicates.




In the example below, Excel removes all identical rows (blue) except for the first identical row found (yellow).

| | A | B | C | D |
|---|---|---|---|---|
| 1 | Last Name | Sales | Country | Quarter |
| 2 | Smith | $16,753.00 | UK | Qtr 3 |
| 3 | Johnson | $14,808.00 | USA | Qtr 4 |
| 4 | Williams | $10,644.00 | UK | Qtr 2 |
| 5 | Jones | $1,390.00 | USA | Qtr 3 |
| 6 | Brown | $4,865.00 | USA | Qtr 4 |
| 7 | Smith | $16,753.00 | UK | Qtr 3 |
| 8 | Williams | $12,438.00 | UK | Qtr 1 |
| 9 | Johnson | $9,339.00 | UK | Qtr 2 |
| 10 | Smith | $18,919.00 | USA | Qtr 3 |
| 11 | Jones | $9,213.00 | USA | Qtr 4 |
| 12 | Jones | $7,433.00 | UK | Qtr 1 |
| 13 | Smith | $16,753.00 | UK | Qtr 3 |
| 14 | Brown | $3,255.00 | USA | Qtr 2 |
| 15 | Williams | $14,867.00 | USA | Qtr 3 |
| 16 | Williams | $19,302.00 | UK | Qtr 4 |
| 17 | Smith | $9,698.00 | USA | Qtr 1 |
| 18 | | | | |

| | A | B | C | D |
|---|---|---|---|---|
| 1 | Last Name | Sales | Country | Quarter |
| 2 | Smith | $16,753.00 | UK | Qtr 3 |
| 3 | Johnson | $14,808.00 | USA | Qtr 4 |
| 4 | Williams | $10,644.00 | UK | Qtr 2 |
| 5 | Jones | $1,390.00 | USA | Qtr 3 |
| 6 | Brown | $4,865.00 | USA | Qtr 4 |
| 7 | Williams | $12,438.00 | UK | Qtr 1 |
| 8 | Johnson | $9,339.00 | UK | Qtr 2 |
| 9 | Smith | $18,919.00 | USA | Qtr 3 |
| 10 | Jones | $9,213.00 | USA | Qtr 4 |
| 11 | Jones | $7,433.00 | UK | Qtr 1 |
| 12 | Brown | $3,255.00 | USA | Qtr 2 |
| 13 | Williams | $14,867.00 | USA | Qtr 3 |
| 14 | Williams | $19,302.00 | UK | Qtr 4 |
| 15 | Smith | $9,698.00 | USA | Qtr 1 |
| 16 | | | | |
| 17 | | | | |
| 18 | | | | |

Note: visit our page about removing duplicates to learn more about this great Excel tool.

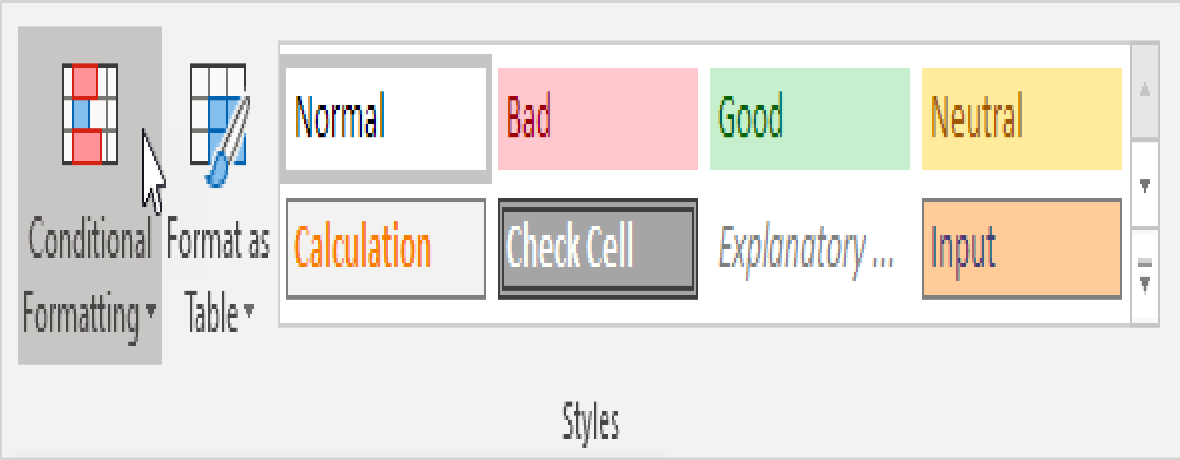
## Compare Two Lists

This example describes how to compare two lists using conditional formatting. For example, you may have two lists of NFL teams.

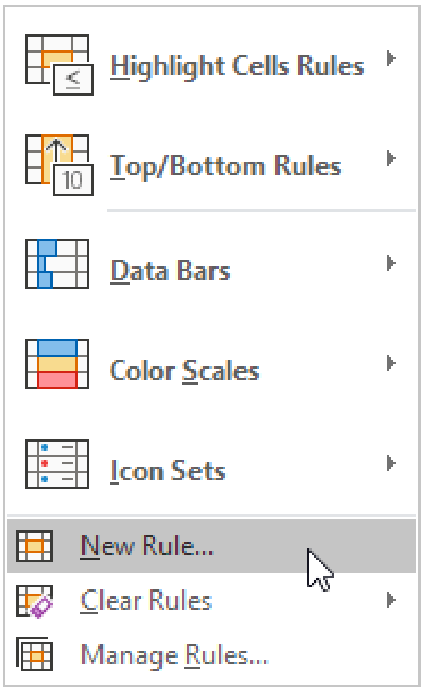
| | A | B | C |
|---|---|---|---|
| 1 | Miami Dolphins | Atlanta Falcons | |
| 2 | Cincinnati Bengals | New York Giants | |
| 3 | Detroit Lions | Denver Broncos | |
| 4 | San Francisco 49ers | Chicago Bears | |
| 5 | Indianapolis Colts | Tampa Bay Buccaneers | |
| 6 | New England Patriots | Washington Redskins | |
| 7 | Houston Texans | Indianapolis Colts | |
| 8 | Jacksonville Jaguars | San Diego Chargers | |
| 9 | Chicago Bears | New England Patriots | |
| 10 | San Diego Chargers | Cincinnati Bengals | |
| 11 | New York Giants | Arizona Cardinals | |
| 12 | New Orleans Saints | Minnesota Vikings | |
| 13 | Tampa Bay Buccaneers | Pittsburgh Steelers | |
| 14 | Seattle Seahawks | San Francisco 49ers | |
| 15 | Atlanta Falcons | New Orleans Saints | |
| 16 | Tennessee Titans | Houston Texans | |
| 17 | Washington Redskins | Seattle Seahawks | |
| 18 | Baltimore Ravens | Jacksonville Jaguars | |
| 19 | | Baltimore Ravens | |
| 20 | | Detroit Lions | |
| 21 | | | |

To highlight the teams in the first list that are not in the second list, execute the following steps.

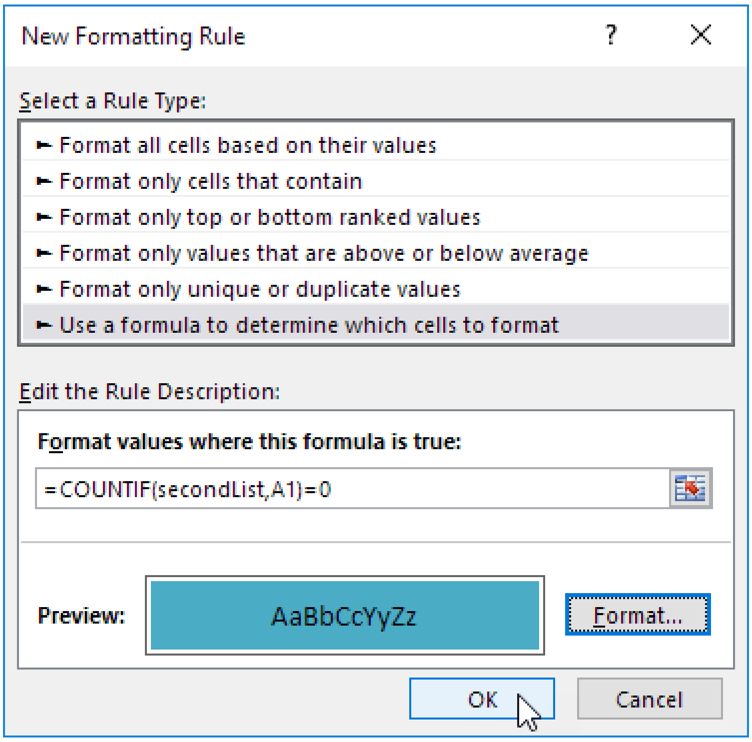
1. First, select the range A1:A18 and name it firstList, select the range B1:B20 and name it secondList.
2. Next, select the range A1:A18.
3. On the Home tab, in the Styles group, click Conditional Formatting.




4. Click New Rule.




5. Select 'Use a formula to determine which cells to format'.
6. Enter the formula =COUNTIF(secondList,A1)=0
7. Select a formatting style and click OK.




Result. Miami Dolphins and Tennessee Titans are not in the second list.

| | A | B | C |
|---|---|---|---|
| 1 | Miami Dolphins | Atlanta Falcons | |
| 2 | Cincinnati Bengals | New York Giants | |
| 3 | Detroit Lions | Denver Broncos | |
| 4 | San Francisco 49ers | Chicago Bears | |
| 5 | Indianapolis Colts | Tampa Bay Buccaneers | |
| 6 | New England Patriots | Washington Redskins | |
| 7 | Houston Texans | Indianapolis Colts | |
| 8 | Jacksonville Jaguars | San Diego Chargers | |
| 9 | Chicago Bears | New England Patriots | |
| 10 | San Diego Chargers | Cincinnati Bengals | |
| 11 | New York Giants | Arizona Cardinals | |
| 12 | New Orleans Saints | Minnesota Vikings | |
| 13 | Tampa Bay Buccaneers | Pittsburgh Steelers | |
| 14 | Seattle Seahawks | San Francisco 49ers | |
| 15 | Atlanta Falcons | New Orleans Saints | |
| 16 | Tennessee Titans | Houston Texans | |
| 17 | Washington Redskins | Seattle Seahawks | |
| 18 | Baltimore Ravens | Jacksonville Jaguars | |
| 19 | | Baltimore Ravens | |
| 20 | | Detroit Lions | |
| 21 | | | |

Explanation: =COUNTIF(secondList,A1) counts the number of teams in secondList that are equal to the team in cell A1. If COUNTIF(secondList,A1) = 0, the team in cell A1 is not in the second list. As a result, Excel fills the cell with a blue background color. Always write the formula for the upper-left cell in the selected range (A1:A18). Excel automatically copies the formula to the other cells. Thus, cell A2 contains the formula =COUNTIF(secondList,A2)=0, cell A3 =COUNTIF(secondList,A3)=0, etc.

8. To highlight the teams in the second list that are not in the first list, select the range B1:B20, create a new rule using the formula =COUNTIF(firstList,B1)=0, and set the format to orange fill.

Result. Denver Broncos, Arizona Cardinals, Minnesota Vikings and Pittsburgh Steelers are not in the first list.

| | A | B | C |
|---|---|---|---|
| 1 | Miami Dolphins | Atlanta Falcons | |
| 2 | Cincinnati Bengals | New York Giants | |
| 3 | Detroit Lions | Denver Broncos | |
| 4 | San Francisco 49ers | Chicago Bears | |
| 5 | Indianapolis Colts | Tampa Bay Buccaneers | |
| 6 | New England Patriots | Washington Redskins | |
| 7 | Houston Texans | Indianapolis Colts | |
| 8 | Jacksonville Jaguars | San Diego Chargers | |
| 9 | Chicago Bears | New England Patriots | |
| 10 | San Diego Chargers | Cincinnati Bengals | |
| 11 | New York Giants | Arizona Cardinals | |
| 12 | New Orleans Saints | Minnesota Vikings | |
| 13 | Tampa Bay Buccaneers | Pittsburgh Steelers | |
| 14 | Seattle Seahawks | San Francisco 49ers | |
| 15 | Atlanta Falcons | New Orleans Saints | |
| 16 | Tennessee Titans | Houston Texans | |
| 17 | Washington Redskins | Seattle Seahawks | |
| 18 | Baltimore Ravens | Jacksonville Jaguars | |
| 19 | | Baltimore Ravens | |
| 20 | | Detroit Lions | |
| 21 | | | |

EXCEL FORMULAS

## Lesson 11 - Excel Formula Basics

One of the most powerful features in Excel is the ability to calculate numerical information using formulas. Just like a calculator, Excel can add, subtract, multiply, and divide. In this lesson, we'll show you how to use cell references to create simple formulas.

Mathematical operators

Excel uses standard operators for formulas, such as a **plus sign** for addition (**+**), a **minus sign** for subtraction (**-**), an **asterisk** for multiplication (*****), a **forward slash** for division (**/**), and a **caret** (**^**) for exponents.

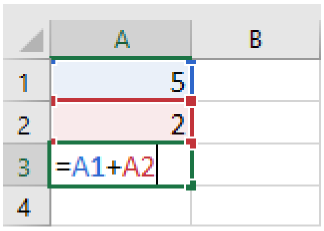
| | |
|---|---|
| Addition | + |
| Subtraction | - |
| Multiplication | * |
| Division | / |
| Exponents | ^ |

All formulas in Excel must begin with an **equals sign** (**=**). This is because the cell contains, or is equal to, the formula and the value it calculates.

Understanding cell references

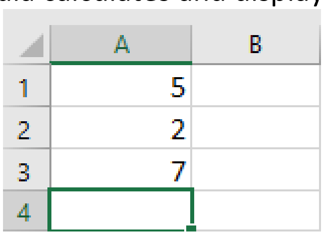
While you can create simple formulas in Excel using numbers (for example, **=2+2** or **=5*5**), most of the time you will use **cell addresses** to create a formula. This is known as making a **cell reference**. Using cell references will ensure that your formulas are always accurate because you can change the value of referenced cells without having to rewrite the formula.

In the formula below, cell A3 adds the values of cells A1 and A2 by making cell references:



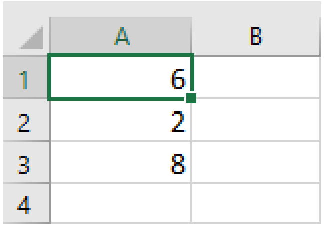
| | A | B |
|---|---|---|
| 1 | 5 | |
| 2 | 2 | |
| 3 | =A1+A2 | |
| 4 | | |

When you press Enter, the formula calculates and displays the answer in cell A3:



| | A | B |
|---|---|---|
| 1 | 5 | |
| 2 | 2 | |
| 3 | 7 | |
| 4 | | |

If the values in the referenced cells change, the formula automatically recalculates:




By combining a mathematical operator with cell references, you can create a variety of simple formulas in Excel. Formulas can also include a combination of cell references and numbers, as in the examples below:

| | |
|---|---|
| =A1+A2 | Adds cells A1 and A2 |
| =C4-3 | Subtracts 3 from cell C4 |
| =E7/J4 | Divides cell E7 by J4 |
| =N10*1.05 | Multiplies cell N10 by 1.05 |
| =R5^2 | Finds the square of cell R5 |

Basic calculations

Now that we've seen how to get some basic data into our spreadsheet, we're going to do some things with it.

Running basic calculations in Excel is easy. First, we'll look at how to add two numbers.

**Important: start calculations with = (equals)**

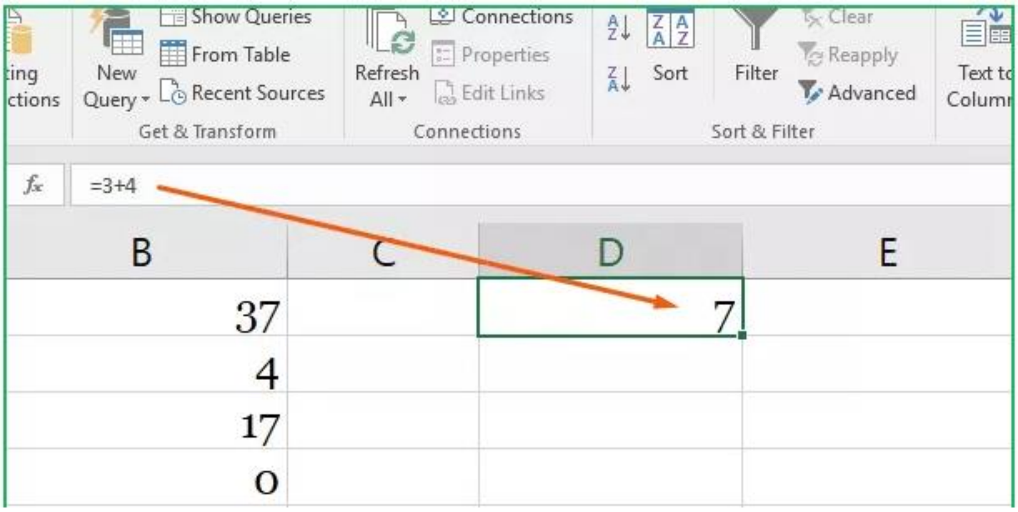
When you're running a calculation (or a formula, which we'll discuss next), the first thing you need to type is an equals sign. This tells Excel to get ready to run some sort of calculation.

So when you see something like **=MEDIAN (A2:A51)**, make sure you type it exactly as it is—including the equals sign.

Let's add 3 and 4. Type the following formula in a blank cell:

**=3+4**

Then hit **Enter**.



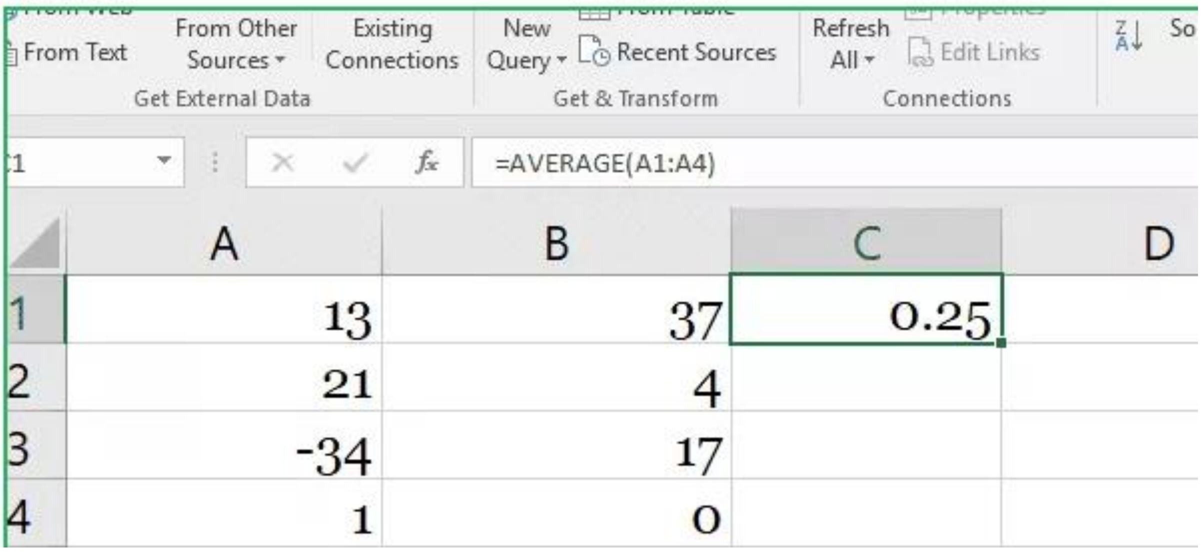

When you hit Enter, Excel evaluates your equation and displays the result, 7.
But if you look above at the formula bar, you'll still see the original formula.
That's a useful thing to keep in mind, in case you forget what you typed originally.
Performing subtraction, multiplication, and division is just as easy. Try these formulas:

- **=4-6**
- **=2*5**
- **=-10/3**

Now let's try something different. Open up the first sheet in the example workbook, click into cell C1, and type the following:
=A1+B1
Hit Enter.
You should get 82, the sum of the numbers in cells A1 and B1.
Now, change one of the numbers in A1 or B1 and watch what happens:
Because you're adding A1 and B1, Excel automatically updates the total when you change the values in one of those cells.
Try doing different types of arithmetic on the other numbers in columns A and B using this method.

### The power of functions

Excel's greatest power lies in functions. These let you run complex calculations with a few keypresses.
Many formulas take sets of numbers and give you information about them.
For example, the AVERAGE function gives you the average of a set of numbers. Let's try using it.
Click into an empty cell and type the following formula:
=AVERAGE(A1:A4)
Then hit Enter.




The resulting number, 0.25, is the average of the numbers in cells A1, A2, A3, and A4.

**Cell range notation**

In the formula above, we used “A1:A4” to tell Excel to look at all the cells between A1 and A4, including both of those cells. You can read it as “A1 through A4.”
You can also use this to include numbers in different columns. “A5:C7” includes A5, A6, A7, B5, B6, B7, C5, C6, and C7.

There are also functions that work on text.
Let’s try the CONCATENATE function!
Click into cell C5 and type this formula:
=CONCATENATE(A1, ” “, B1)
Then hit Enter.
You’ll see the message “1337” in the result cell.
How did this happen? CONCATENATE takes cells with text in them and puts them together.

## Lesson 12 - Logical Formulas in Excel

Learn how to use Excel's logical functions, such as IF, AND, OR and NOT.
Overview
Microsoft Excel provides 4 logical functions to work with the logical values. The functions are AND, OR, XOR and NOT. You use these functions when you want to carry out more than one comparison in your formula or test multiple conditions instead of just one. As well as logical operators, Excel logical functions return either TRUE or FALSE when their arguments are evaluated.
The following table provides a short summary of what each logical function does to help you choose the right formula for a specific task.

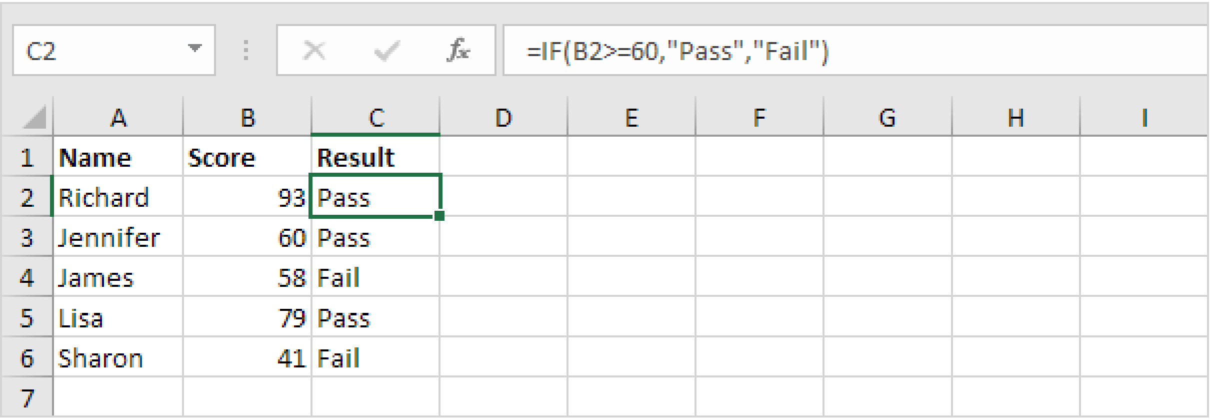
| **Function** | **Description** | **Formula Example** | **Formula Description** |
|---|---|---|---|

| | | | |
|---|---|---|---|
| AND | Returns TRUE if all of the arguments evaluate to TRUE. | **=AND(A2>=10, B2<5)** | The formula returns TRUE if a value in cell A2 is greater than or equal to 10, and a value in B2 is less than 5, FALSE otherwise. |
| OR | Returns TRUE if any argument evaluates to TRUE. | **=OR(A2>=10, B2<5)** | The formula returns TRUE if A2 is greater than or equal to 10 or B2 is less than 5, or both conditions are met. If neither of the conditions it met, the formula returns FALSE. |
| XOR | Returns a logical Exclusive Or of all arguments. | **=XOR(A2>=10, B2<5)** | The formula returns TRUE if either A2 is greater than or equal to 10 or B2 is less than 5. If neither of the conditions is met or both conditions are met, the formula returns FALSE. |
| NOT | Returns the reversed logical value of its argument. I.e. If the argument is FALSE, then TRUE is returned and vice versa. | **=NOT(A2>=10)** | The formula returns FALSE if a value in cell A1 is greater than or equal to 10; TRUE otherwise. |

IF

The IF function checks whether a condition is met, and returns one value if true and another value if false.

1. For example, take a look at the IF function in cell C2 below.


C2 =IF(B2>=60,"Pass","Fail")

| | A | B | C | D | E | F | G | H | I |
|---|---|---|---|---|---|---|---|---|---|
| 1 | Name | Score | Result | | | | | | |
| 2 | Richard | 93 | Pass | | | | | | |
| 3 | Jennifer | 60 | Pass | | | | | | |
| 4 | James | 58 | Fail | | | | | | |
| 5 | Lisa | 79 | Pass | | | | | | |
| 6 | Sharon | 41 | Fail | | | | | | |
| 7 | | | | | | | | | |

Explanation: if the score is greater than or equal to 60, the IF function returns Pass, else it returns Fail. Visit our page about the IF function for many more examples.

AND

The AND Function returns TRUE if all conditions are true and returns FALSE if any of the conditions are false.

1. For example, take a look at the AND function in cell D2 below.

D2 =AND(B2>=60,C2>=90)

| | A | B | C | D | E | F | G | H | I |
|---|---|---|---|---|---|---|---|---|---|
| 1 | **Name** | **Score 1** | **Score 2** | **Result** | | | | | |
| 2 | Richard | 93 | 80 | FALSE | | | | | |
| 3 | Jennifer | 60 | 91 | TRUE | | | | | |
| 4 | James | 58 | 75 | FALSE | | | | | |
| 5 | Lisa | 79 | 94 | TRUE | | | | | |
| 6 | Sharon | 41 | 33 | FALSE | | | | | |
| 7 | | | | | | | | | |

Explanation: the AND function returns TRUE if the first score is greater than or equal to 60 and the second score is greater than or equal to 90, else it returns FALSE.

OR

The OR function returns TRUE if any of the conditions are TRUE and returns FALSE if all conditions are false.

1. For example, take a look at the OR function in cell D2 below.

D2 =OR(B2>=60,C2>=60)

| | A | B | C | D | E | F | G | H | I |
|---|---|---|---|---|---|---|---|---|---|
| 1 | **Name** | **Score 1** | **Score 2** | **Result** | | | | | |
| 2 | Richard | 93 | 80 | TRUE | | | | | |
| 3 | Jennifer | 60 | 91 | TRUE | | | | | |
| 4 | James | 58 | 75 | TRUE | | | | | |
| 5 | Lisa | 79 | 94 | TRUE | | | | | |
| 6 | Sharon | 41 | 33 | FALSE | | | | | |
| 7 | | | | | | | | | |

Explanation: the OR function returns TRUE if at least one score is greater than or equal to 60, else it returns FALSE. Visit our page about the OR function for many more examples.

**NOT**

The NOT function changes TRUE to FALSE, and FALSE to TRUE.

1. For example, take a look at the NOT function in cell D2 below.

D2 | =NOT(OR(B2>=60,C2>=60))

| | A | B | C | D | E | F | G | H | I |
|---|---|---|---|---|---|---|---|---|---|
| 1 | **Name** | **Score 1** | **Score 2** | **Result** | | | | | |
| 2 | Richard | 93 | 80 | FALSE | | | | | |
| 3 | Jennifer | 60 | 91 | FALSE | | | | | |
| 4 | James | 58 | 75 | FALSE | | | | | |
| 5 | Lisa | 79 | 94 | FALSE | | | | | |
| 6 | Sharon | 41 | 33 | TRUE | | | | | |
| 7 | | | | | | | | | |

Explanation: in this example, the NOT function reverses the result of the OR function (see previous example).

Excel IFERROR Function

Types of Errors in Excel

Knowing the errors in Excel will better equip you to identify the possible reason and the best way to handle these.

Below are the types of errors you might find in Excel.

#N/A Error

This is called the 'Value Not Available' error.

You will see this when you use a lookup formula and it can't find the value (hence Not Available).

Below is an example where I use the VLOOKUP formula to find the price of an item, but it returns an error when it can't find that item in the table array.

E3 | =VLOOKUP(D3,$A$2:$B$6,2,0)

| | A | B | C | D | E |
|---|---|---|---|---|---|
| 1 | Product | Price | | | |
| 2 | Item A | 44 | | Lookup Value | Result |
| 3 | Item B | 55 | | Item F | #N/A |
| 4 | Item C | 56 | | | |
| 5 | Item D | 59 | | | |
| 6 | Item E | 71 | | | |

#DIV/0! Error

You're likely to see this error when a number is divided by 0.

This is called the division error. In the below example, it gives a #DIV/0! error as the quantity value (the divisor in the formula) is 0.

C4 =A4/B4

| | A | B | C |
|---|---|---|---|
| 1 | Total Cost | Quantity | Cost Per Quantity |
| 2 | 3320 | 50 | 66.4 |
| 3 | 1800 | 16 | 112.5 |
| 4 | 2250 | 0 | #DIV/0! |
| 5 | 4200 | 25 | 168.0 |
| 6 | 4800 | 21 | 228.6 |
| 7 | 3270 | 45 | 72.7 |
| 8 | 2700 | 54 | 50.0 |

#VALUE! Error

The value error occurs when you use an incorrect data type in a formula.

For example, in the below example, when I try to add cells that have numbers and character A, it gives the value error.

This happens as you can only add numeric values, but instead, I tried adding a number with a text character.

A5 =A1+A2+A3

| | A | B | C |
|---|---|---|---|
| 1 | 1 | | |
| 2 | 2 | | |
| 3 | A | | |
| 4 | | | |
| 5 | #VALUE! | | |

#REF! Error

This is called the reference error and you will see this when the reference in the formula is no longer valid. This could be the case when the formula refers to a cell reference and that cell reference does not exist (happens when you delete a row/column or worksheet that was referred to in the formula).

In the below example, while the original formula was =A2/B2, when I deleted Column B, all the references to it became #REF! and it also gave the #REF! error as the result of the formula.

B2 =A2/#REF!

| | A | B |
|---|---|---|
| 1 | **Total Cost** | **Cost Per Quantity** |
| 2 | 3120 | #REF! |
| 3 | 1800 | #REF! |
| 4 | 2250 | #REF! |
| 5 | 4200 | #REF! |
| 6 | 4800 | #REF! |
| 7 | 3270 | #REF! |
| 8 | 2700 | #REF! |

#NAME ERROR

This error is likely to a result of a misspelled function.

For example, if instead of VLOOKUP, you by mistake use VLOKUP, it will give a name error.

E3 =VLOKUP(D3,$A$2:$B$6,2,0)

| | A | B | C | D | E |
|---|---|---|---|---|---|
| 1 | Product | Price | | | |
| 2 | Item A | 44 | | Lookup Value | Result |
| 3 | Item B | 55 | | Item A | #NAME? |
| 4 | Item C | 56 | | | |
| 5 | Item D | 59 | | | |
| 6 | Item E | 71 | | | |

#NUM ERROR

Num error can occur if you try and calculate a very large value in Excel. For example, =187^549 will return a number error.

A1 =187^549

| | A | B | C |
|---|---|---|---|
| 1 | #NUM! | | |
| 2 | | | |

Another situation where you can get the NUM error is when you give a non-valid number argument to a formula. For example, if you're calculating the Square Root if a number and you give a negative number as the argument, it will return a number error.

For example, in the case of Square Root function, if you give a negative number as the argument, it will return a number error (as shown below).

While I have shown only a couple of examples here, there can be many other reasons that can lead to errors in Excel. When you get errors in Excel, you can't just leave it there. If the data is further used in calculations, you need to make sure the errors are handled the right way.

Excel IFERROR function is a great way to handle all types of errors in Excel.

Excel IFERROR Function – An Overview

Using the IFERROR function, you can specify what you want the formula to return instead of the error. If the formula does not return an error, then its own result is returned.

**IFERROR()**

*What it Does:*

If a formula evaluates to an error, it returns the specified value, else it returns the result of the formula

*Syntax:*

=IFERROR(value, value_if_error))

IFERROR Function Syntax

=IFERROR(value, value_if_error)

**Input Arguments**

- **value –** this is the argument that is checked for the error. In most cases, it is either a formula or a cell reference.
- **value_if_error** – this is the value that is returned if there is an error. The following error types evaluated: #N/A, #REF!, #DIV/0!, #VALUE!, #NUM!, #NAME?, and #NULL!.

Additional Notes:

- If you use "" as the value_if_error argument, the cell displays nothing in case of an error.
- If the value or value_if_error argument refers to an empty cell, it is treated as an empty string value by the Excel IFERROR function.
- If the value argument is an array formula, IFERROR will return an array of results for each item in the range specified in value.

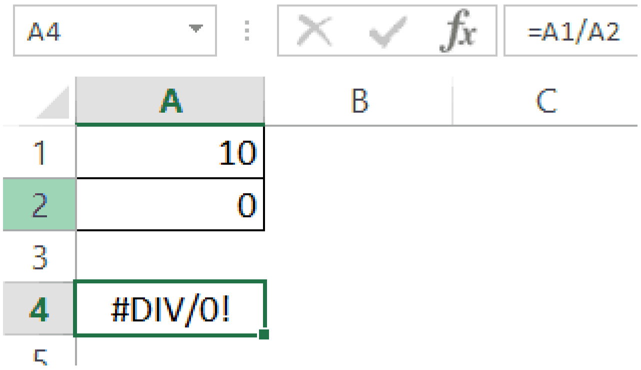
Excel IFERROR Function – Examples

Here are three examples of using IFERROR function in Excel.

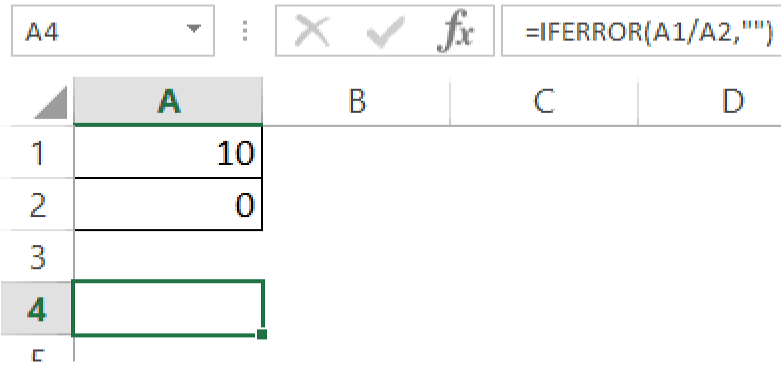
Example 1 – Return Blank Cell Instead of Error

If you have functions that may return an error, you can wrap it within the IFERROR function and specify blank as the value to return in case of an error.

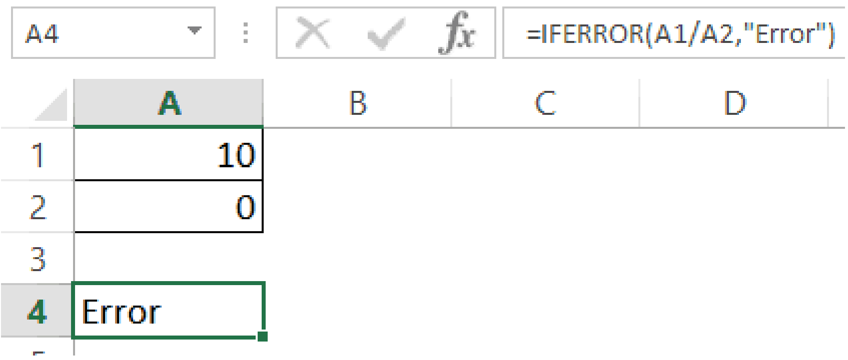
In the example shown below, the result in D4 is the #DIV/0! error as the divisor is 0.




In this case, you can use the following formula to return blank instead of the ugly DIV error.
=IFERROR(A1/A2,””)



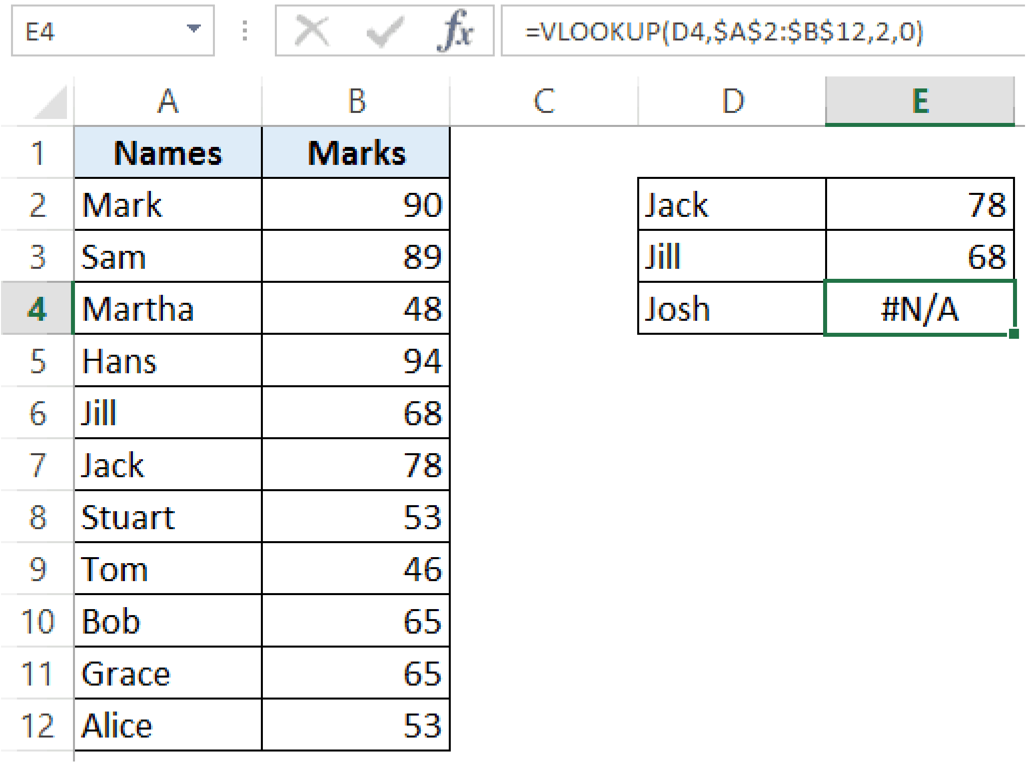

This IFERROR function would check whether the calculation leads to an error. If it does, it simply returns a blank as specified in the formula.
Here, you can also specify any other string or formula to display instead of the blank.
For example, the below formula would return the text “Error”, instead of the blank cell.
=IFERROR(A1/A2,”Error”)




Note: If you are using Excel 2003 or a prior version, you will not find the IFERROR function in it. In such cases, you need to use the combination of IF function and ISERROR function.

Example 2 – Return ‘Not Found’ when VLOOKUP Can’t Find a Value

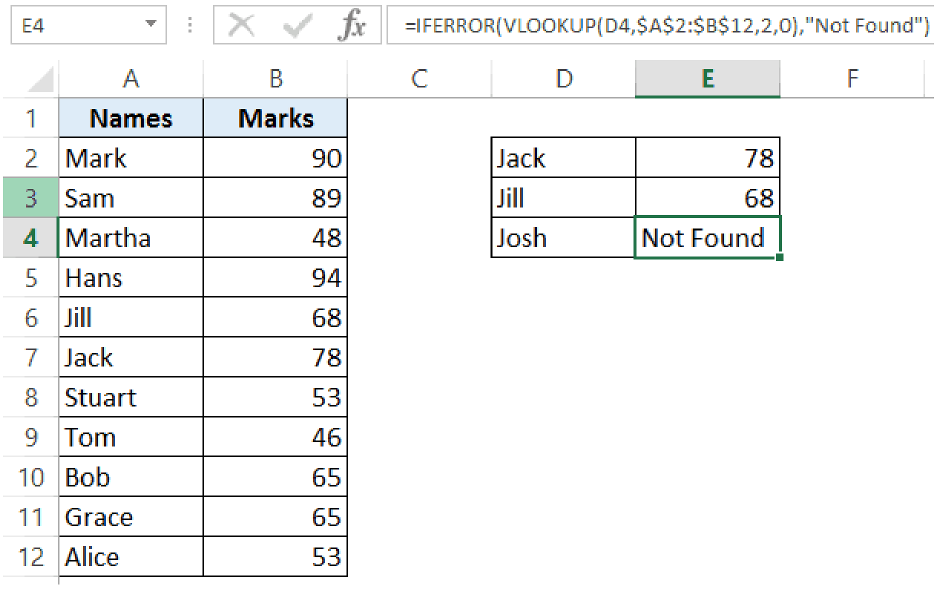
When you use the Excel VLOOKUP Function, and it can’t find the lookup value in the specified range, it would return the #N/A error.
For example, below is a data set of student names and their marks. I have used the VLOOKUP function to fetch the marks of three students (in D2, D3, and D4).



E4 =VLOOKUP(D4,$A$2:$B$12,2,0)

| | A | B | C | D | E |
|---|---|---|---|---|---|
| 1 | Names | Marks | | | |
| 2 | Mark | 90 | | Jack | 78 |
| 3 | Sam | 89 | | Jill | 68 |
| 4 | Martha | 48 | | Josh | #N/A |
| 5 | Hans | 94 | | | |
| 6 | Jill | 68 | | | |
| 7 | Jack | 78 | | | |
| 8 | Stuart | 53 | | | |
| 9 | Tom | 46 | | | |
| 10 | Bob | 65 | | | |
| 11 | Grace | 65 | | | |
| 12 | Alice | 53 | | | |

While the VLOOKUP formula in the above example finds the names of first two students, it can’t find Josh’s name on the list and hence it returns the #N/A error.
Here, we can use the IFERROR function to return a blank or some meaningful text instead of the error.
Below is the formula that will return ‘Not Found’ instead of the error.
=IFERROR(VLOOKUP(D2,$A$2:$B$12,2,0),”Not Found”)



E4 =IFERROR(VLOOKUP(D4,$A$2:$B$12,2,0),"Not Found")

| | A | B | C | D | E | F |
|---|---|---|---|---|---|---|
| 1 | Names | Marks | | | | |
| 2 | Mark | 90 | | Jack | 78 | |
| 3 | Sam | 89 | | Jill | 68 | |
| 4 | Martha | 48 | | Josh | Not Found | |
| 5 | Hans | 94 | | | | |
| 6 | Jill | 68 | | | | |
| 7 | Jack | 78 | | | | |
| 8 | Stuart | 53 | | | | |
| 9 | Tom | 46 | | | | |
| 10 | Bob | 65 | | | | |
| 11 | Grace | 65 | | | | |
| 12 | Alice | 53 | | | | |

Note that you can also use IFNA instead of IFERROR with VLOOKUP. While IFERROR would treat all kinds of error values, IFNA would only work on the #N/A errors and wouldn’t work with other errors.

Example 3 – Return 0 in case of an Error

If you don't specify the value to return by IFERROR in the case of an error, it would automatically return 0.

For example, if I divide 100 with 0 as shown below, it would return an error.

A4 | =A1/A2

| | A | B | C |
|---|---|---|---|
| 1 | 100 | | |
| 2 | 0 | | |
| 3 | | | |
| 4 | #DIV/0! | | |

However, if I use the below IFERROR function, it would return a 0 instead. Note that you still need to use a comma after the first argument.

A4 | =IFERROR(A1/A2,)

| | A | B | C | D |
|---|---|---|---|---|
| 1 | 100 | | | |
| 2 | 0 | | | |
| 3 | | | | |
| 4 | 0 | | | |

Example 4 – Using Nested IFERROR with VLOOKUP

Sometimes when using VLOOKUP, you may have to look through the fragmented table of arrays. For example, suppose you have the sales transaction records in 2 separate worksheets and you want to look-up an item number and see it's value.

Doing this requires using nested IFERROR with VLOOKUP.

Suppose you have a dataset as shown below:

| | A | B | C | D | E | F | G | H |
|---|---|---|---|---|---|---|---|---|
| 1 | **Name** | **Score** | | **Name** | **Score** | | | |
| 2 | Tom | 45 | | Martha | 50 | | | |
| 3 | Brad | 73 | | Sam | 90 | | Grace | |
| 4 | Jill | 76 | | Brent | 85 | | | |
| 5 | Phillip | 71 | | Grace | 81 | | | |

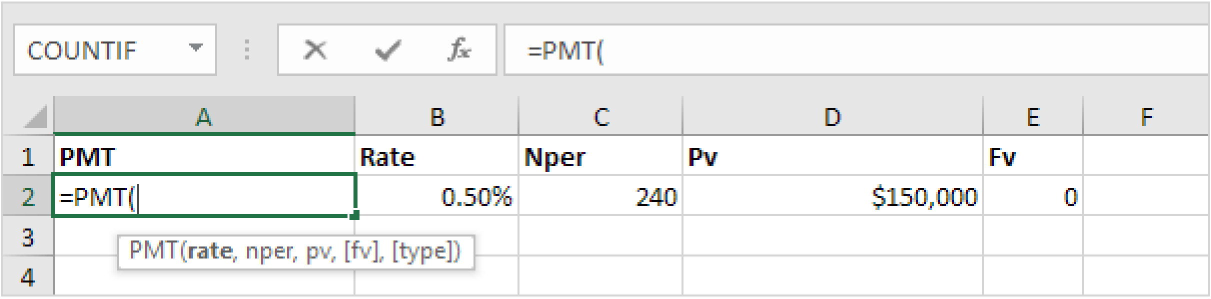
In this case, to find the score for Grace, you need to use the below nested IFERROR formula:

**=IFERROR(VLOOKUP(G3,$A$2:$B$5,2,0),IFERROR(VLOOKUP(G3,$D$2:$E$5,2,0),"Not Found"))**

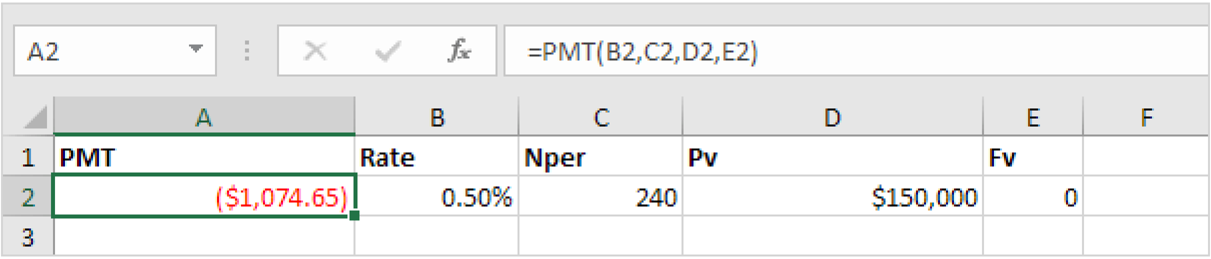
This kind of formula nesting ensure that you get the value from either of the table and any error returned is handled.
Note that in case the tables are on the same worksheet, however, in a real-life example, it likely to be on different worksheets.

## Lesson 13 - Financial Formulas in Excel

To illustrate Excel's most popular financial functions, we consider a loan with monthly payments, an annual interest rate of 6%, a 20-year duration, a present value of $150,000 (amount borrowed) and a future value of 0 (that's what you hope to achieve when you pay off a loan).
We make monthly payments, so we use 6%/12 = 0.5% for Rate and 20*12 = 240 for Nper (total number of periods). If we make annual payments on the same loan, we use 6% for Rate and 20 for Nper.
PMT
Select cell A2 and insert the PMT function.




Note: the last two arguments are optional. For loans, Fv can be omitted (the future value of a loan equals 0, however, it's included here for clarification). If Type is omitted, it is assumed that payments are due at the end of the period.
Result. The monthly payment equals $1,074.65.




Tip: when working with financial functions in Excel, always ask yourself the question, am I making a payment (negative) or am I receiving money (positive)? We pay off a loan of $150,000 (positive, we received that amount) and we make monthly payments of $1,074.65 (negative, we pay). Visit our page about the PMT function for many more examples.
RATE
If Rate is the only unknown variable, we can use the RATE function to calculate the interest rate.

B2 =RATE(C2,A2,D2,E2)

| | A | B | C | D | E | F |
|---|---|---|---|---|---|---|
| 1 | **Pmt** | **RATE** | **Nper** | **Pv** | **Fv** | |
| 2 | ($1,074.65) | 0.50% | 240 | $150,000 | 0 | |
| 3 | | | | | | |

NPER

Or the NPER function. If we make monthly payments of $1,074.65 on a 20-year loan, with an annual interest rate of 6%, it takes 240 months to pay off this loan.

C2 =NPER(B2,A2,D2,E2)

| | A | B | C | D | E | F |
|---|---|---|---|---|---|---|
| 1 | **Pmt** | **Rate** | **NPER** | **Pv** | **Fv** | |
| 2 | ($1,074.65) | 0.50% | 240 | $150,000 | 0 | |
| 3 | | | | | | |

We already knew this, but we can change the monthly payment now to see how this affects the total number of periods.

C2 =NPER(B2,A2,D2,E2)

| | A | B | C | D | E | F |
|---|---|---|---|---|---|---|
| 1 | **Pmt** | **Rate** | **NPER** | **Pv** | **Fv** | |
| 2 | ($2,074.65) | 0.50% | 89.95316057 | $150,000 | 0 | |
| 3 | | | | | | |

Conclusion: if we make monthly payments of $2,074.65, it takes less than 90 months to pay off this loan.

PV

Or the PV (Present Value) function. If we make monthly payments of $1,074.65 on a 20-year loan, with an annual interest rate of 6%, how much can we borrow? You already know the answer.

D2 =PV(B2,C2,A2,E2)

| | A | B | C | D | E | F |
|---|---|---|---|---|---|---|
| 1 | **Pmt** | **Rate** | **Nper** | **PV** | **Fv** | |
| 2 | ($1,074.65) | 0.50% | 240 | $150,000 | 0 | |
| 3 | | | | | | |

FV

And we finish this chapter with the FV (Future Value) function. If we make monthly payments of $1,074.65 on a 20-year loan, with an annual interest rate of 6%, do we pay off this loan? Yes.

E2 =FV(B2,C2,A2,D2)

| | A | B | C | D | E | F |
|---|---|---|---|---|---|---|
| 1 | Pmt | Rate | Nper | Pv | FV | |
| 2 | ($1,074.65) | 0.50% | 240 | $150,000 | 0 | |
| 3 | | | | | | |

But, if we make monthly payments of only $1,000.00, we still have debt after 20 years.

E2 =FV(B2,C2,A2,D2)

| | A | B | C | D | E | F |
|---|---|---|---|---|---|---|
| 1 | Pmt | Rate | Nper | Pv | FV | |
| 2 | ($1,000.00) | 0.50% | 240 | $150,000 | ($34,489.78) | |
| 3 | | | | | | |

## Lesson 14 - Lookup and Reference Formulas in Excel

Learn all about Excel's lookup & reference functions, such as VLOOKUP, HLOOKUP, MATCH, INDEX and CHOOSE.

Vlookup

The VLOOKUP (Vertical lookup) function looks for a value in the leftmost column of a table, and then returns a value in the same row from another column you specify.

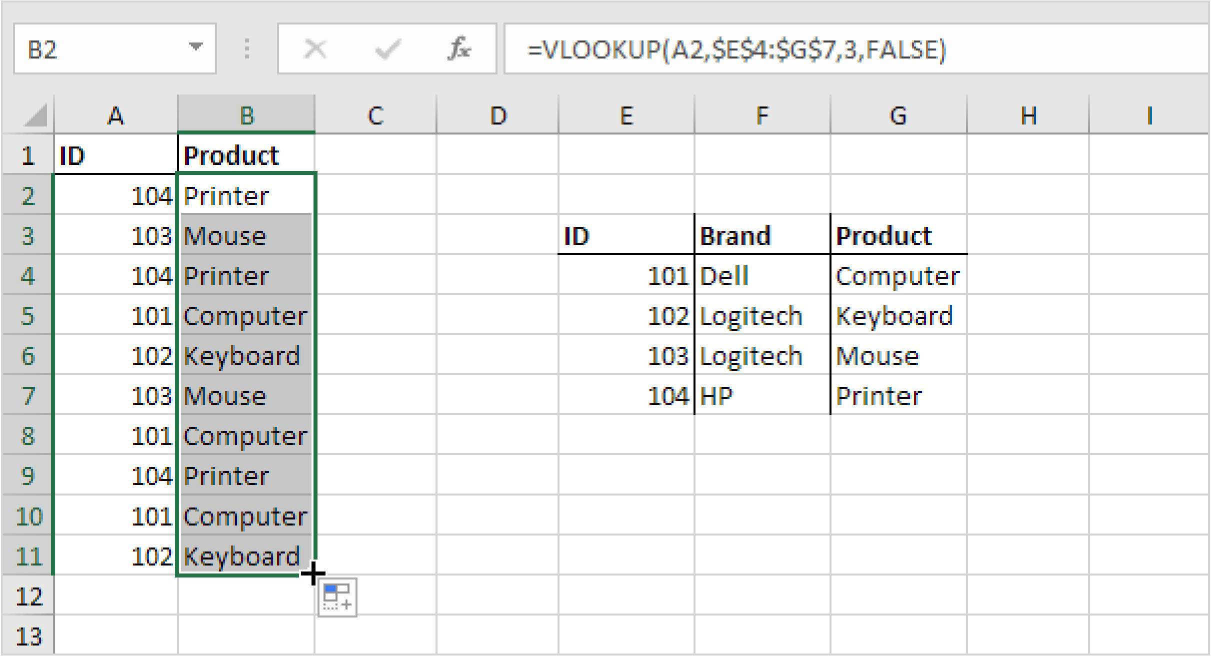
1. Insert the VLOOKUP function shown below.

B2 =VLOOKUP(A2,$E$4:$G$7,3,FALSE)

| | A | B | C | D | E | F | G | H | I |
|---|---|---|---|---|---|---|---|---|---|
| 1 | ID | Product | | | | | | | |
| 2 | 104 | Printer | | | | | | | |
| 3 | 103 | | | | ID | Brand | Product | | |
| 4 | 104 | | | | 101 | Dell | Computer | | |
| 5 | 101 | | | | 102 | Logitech | Keyboard | | |
| 6 | 102 | | | | 103 | Logitech | Mouse | | |
| 7 | 103 | | | | 104 | HP | Printer | | |
| 8 | 101 | | | | | | | | |
| 9 | 104 | | | | | | | | |
| 10 | 101 | | | | | | | | |
| 11 | 102 | | | | | | | | |
| 12 | | | | | | | | | |

Explanation: the VLOOKUP function looks for the ID (104) in the leftmost column of the range $E$4:$G$7 and returns the value in the same row from the third column (third argument is set to 3). The fourth argument is set to FALSE to return an exact match or a #N/A error if not found.

2. Drag the VLOOKUP function in cell B2 down to cell B11.



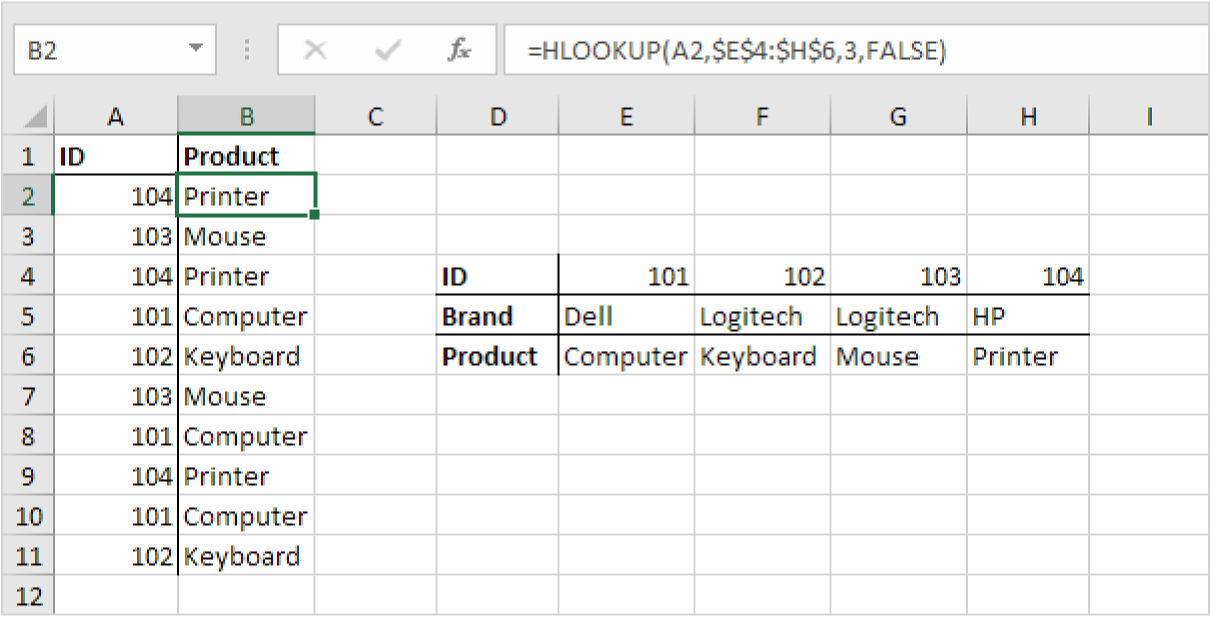
B2 =VLOOKUP(A2,$E$4:$G$7,3,FALSE)

| | A | B | C | D | E | F | G | H | I |
|---|---|---|---|---|---|---|---|---|---|
| 1 | ID | Product | | | | | | | |
| 2 | 104 | Printer | | | | | | | |
| 3 | 103 | Mouse | | | ID | Brand | Product | | |
| 4 | 104 | Printer | | | 101 | Dell | Computer | | |
| 5 | 101 | Computer | | | 102 | Logitech | Keyboard | | |
| 6 | 102 | Keyboard | | | 103 | Logitech | Mouse | | |
| 7 | 103 | Mouse | | | 104 | HP | Printer | | |
| 8 | 101 | Computer | | | | | | | |
| 9 | 104 | Printer | | | | | | | |
| 10 | 101 | Computer | | | | | | | |
| 11 | 102 | Keyboard | | | | | | | |
| 12 | | | | | | | | | |
| 13 | | | | | | | | | |

Note: when we drag the VLOOKUP function down, the absolute reference ($E$4:$G$7) stays the same, while the relative reference (A2) changes to A3, A4, A5, etc. Visit our page about the VLOOKUP function for much more information and many examples.

Hlookup

In a similar way, you can use the HLOOKUP (Horizontal lookup) function.



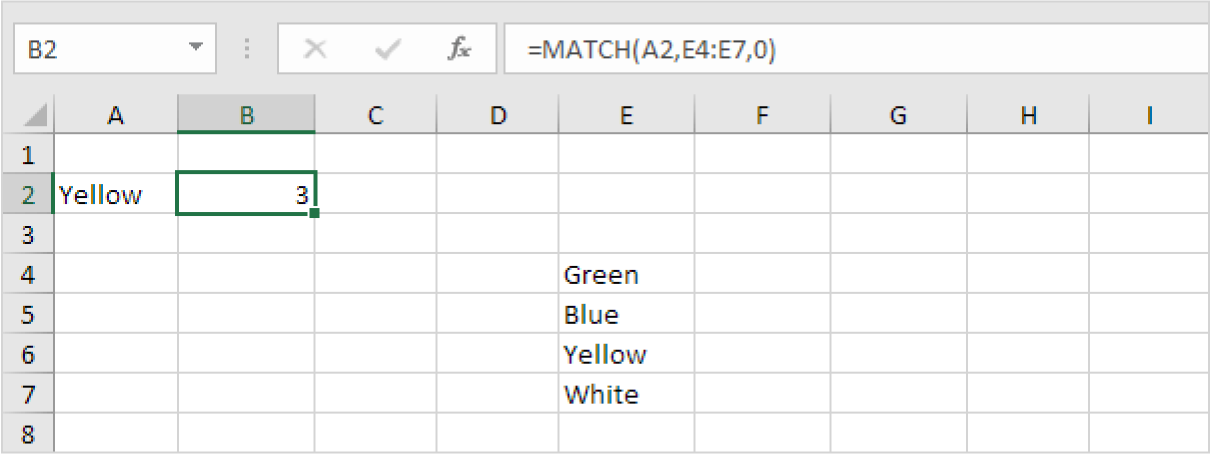
B2 =HLOOKUP(A2,$E$4:$H$6,3,FALSE)

| | A | B | C | D | E | F | G | H | I |
|---|---|---|---|---|---|---|---|---|---|
| 1 | ID | Product | | | | | | | |
| 2 | 104 | Printer | | | | | | | |
| 3 | 103 | Mouse | | | | | | | |
| 4 | 104 | Printer | | ID | 101 | 102 | 103 | 104 | |
| 5 | 101 | Computer | | Brand | Dell | Logitech | Logitech | HP | |
| 6 | 102 | Keyboard | | Product | Computer | Keyboard | Mouse | Printer | |
| 7 | 103 | Mouse | | | | | | | |
| 8 | 101 | Computer | | | | | | | |
| 9 | 104 | Printer | | | | | | | |
| 10 | 101 | Computer | | | | | | | |
| 11 | 102 | Keyboard | | | | | | | |
| 12 | | | | | | | | | |

Note: if you have Excel 365 or Excel 2021, use XLOOKUP instead of HLOOKUP to perform a horizontal lookup.

Match

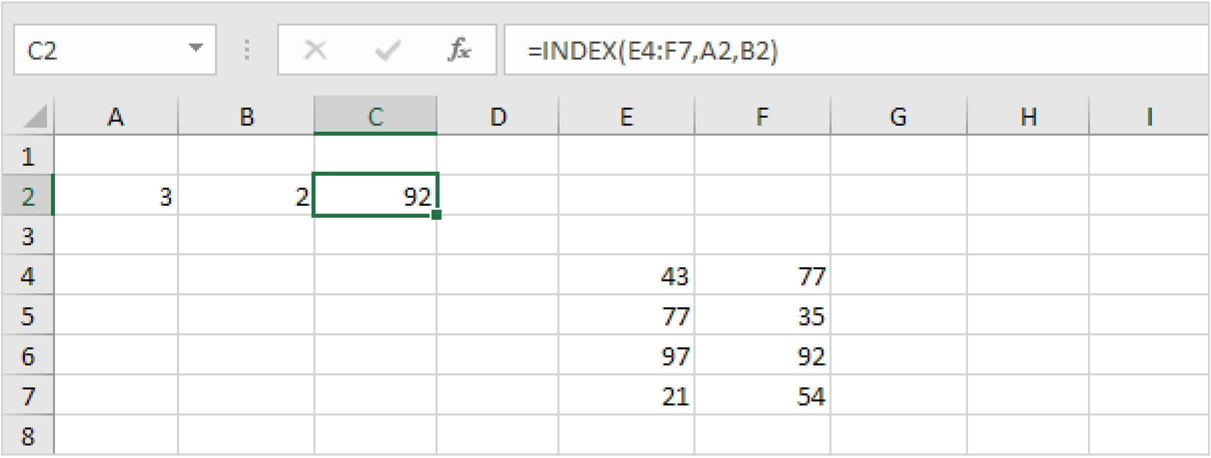
The MATCH function returns the position of a value in a given range.




<u>Explanation:</u> Yellow found at position 3 in the range E4:E7. The third argument is optional. Set this argument to 0 to return the position of the value that is exactly equal to lookup_value (A2) or a #N/A error if not found. Use INDEX and MATCH in Excel and impress your boss.

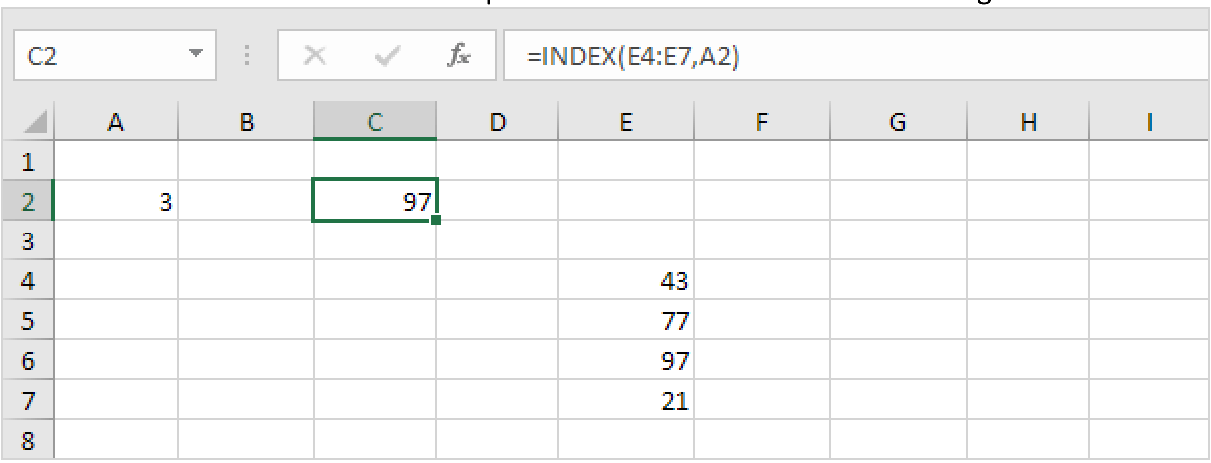
Index

The INDEX function below returns a specific value in a two-dimensional range.




<u>Explanation:</u> 92 found at the intersection of row 3 and column 2 in the range E4:F7.

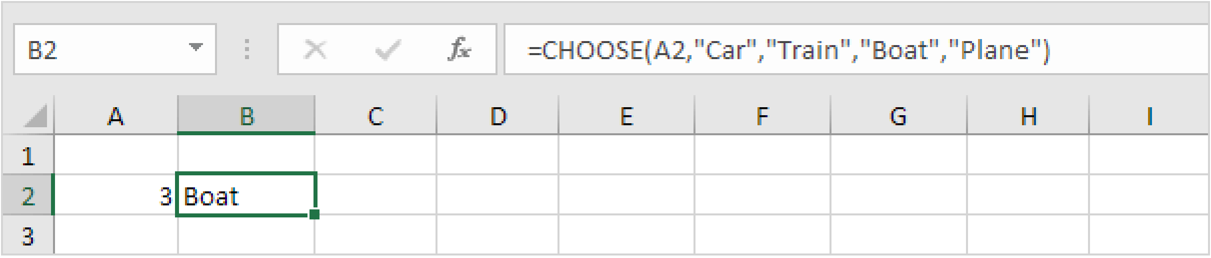
The INDEX function below returns a specific value in a one-dimensional range.




<u>Explanation:</u> 97 found at position 3 in the range E4:E7. Use INDEX and MATCH in Excel and impress your boss.

Choose

The CHOOSE function returns a value from a list of values, based on a position number.



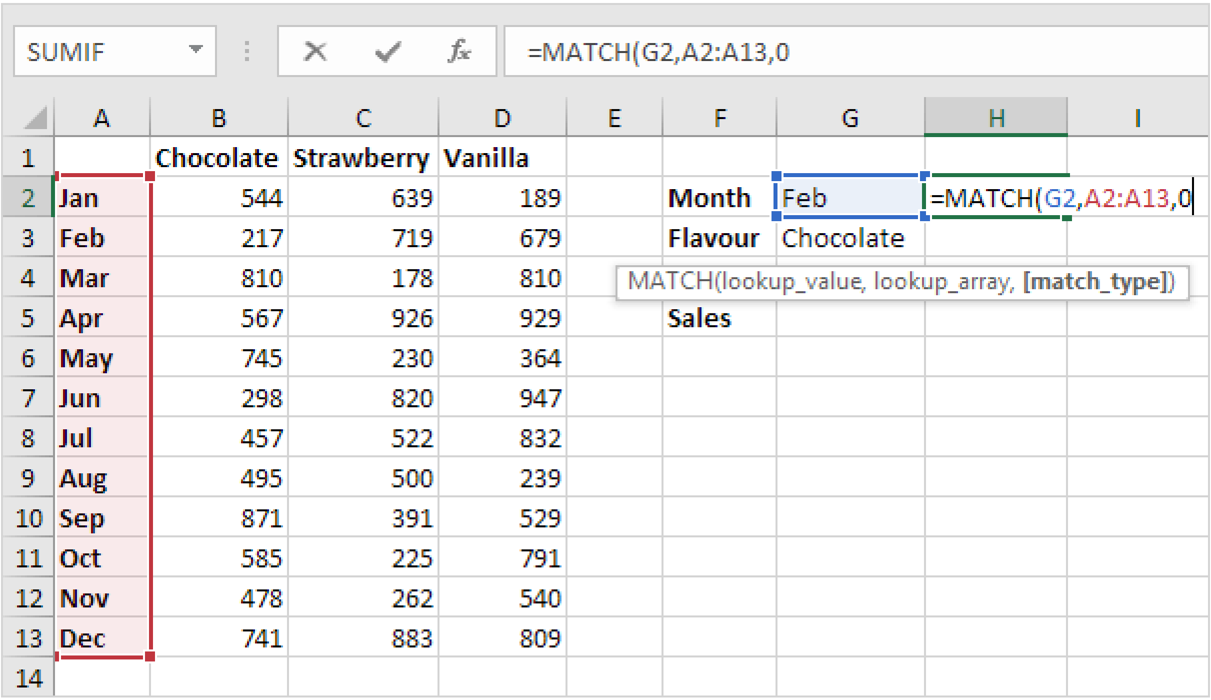
B2 =CHOOSE(A2,"Car","Train","Boat","Plane")

| | A | B | C | D | E | F | G | H | I |
|---|---|---|---|---|---|---|---|---|---|
| 1 | | | | | | | | | |
| 2 | 3 | Boat | | | | | | | |
| 3 | | | | | | | | | |

Explanation: Boat found at position 3.

To lookup a value in a two-dimensional range, use INDEX and MATCH in Excel. Below you can find the sales of different ice cream flavors in each month.

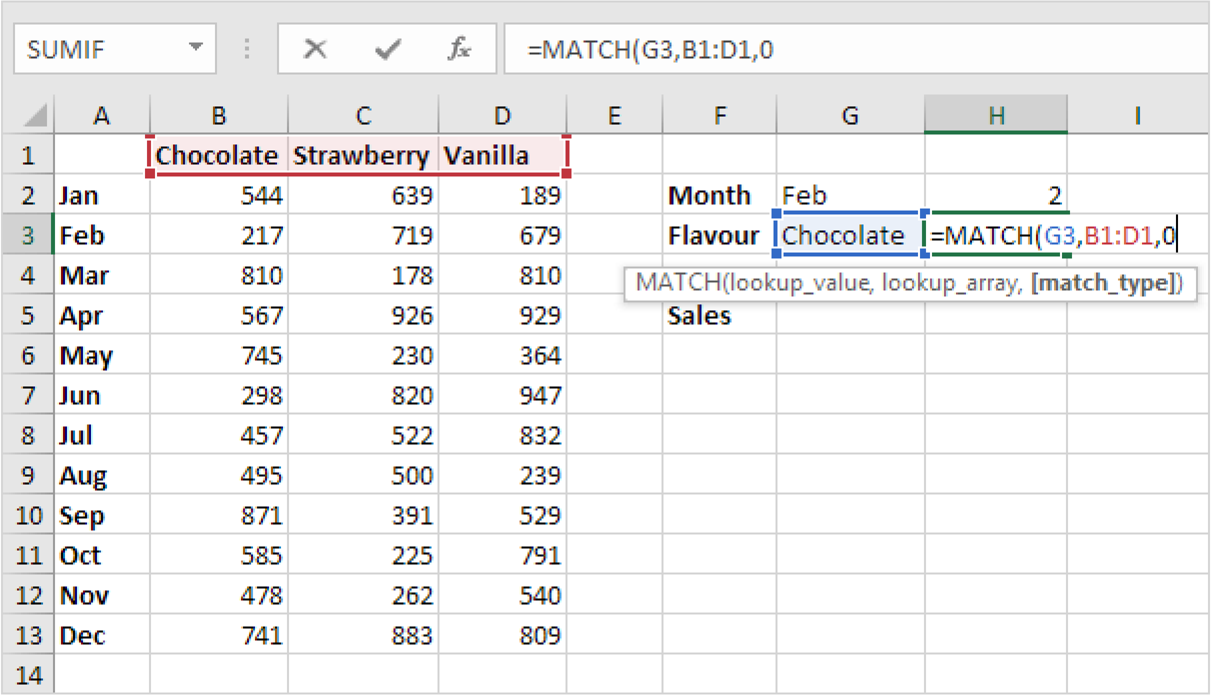
1. To find the position of Feb in the range A2:A13, use the MATCH function. The result is 2.



SUMIF =MATCH(G2,A2:A13,0

| | A | B | C | D | E | F | G | H | I |
|---|---|---|---|---|---|---|---|---|---|
| 1 | | Chocolate | Strawberry | Vanilla | | | | | |
| 2 | Jan | 544 | 639 | 189 | | Month | Feb | =MATCH(G2,A2:A13,0 | |
| 3 | Feb | 217 | 719 | 679 | | Flavour | Chocolate | | |
| 4 | Mar | 810 | 178 | 810 | | MATCH(lookup_value, lookup_array, [match_type]) | | | |
| 5 | Apr | 567 | 926 | 929 | | Sales | | | |
| 6 | May | 745 | 230 | 364 | | | | | |
| 7 | Jun | 298 | 820 | 947 | | | | | |
| 8 | Jul | 457 | 522 | 832 | | | | | |
| 9 | Aug | 495 | 500 | 239 | | | | | |
| 10 | Sep | 871 | 391 | 529 | | | | | |
| 11 | Oct | 585 | 225 | 791 | | | | | |
| 12 | Nov | 478 | 262 | 540 | | | | | |
| 13 | Dec | 741 | 883 | 809 | | | | | |
| 14 | | | | | | | | | |

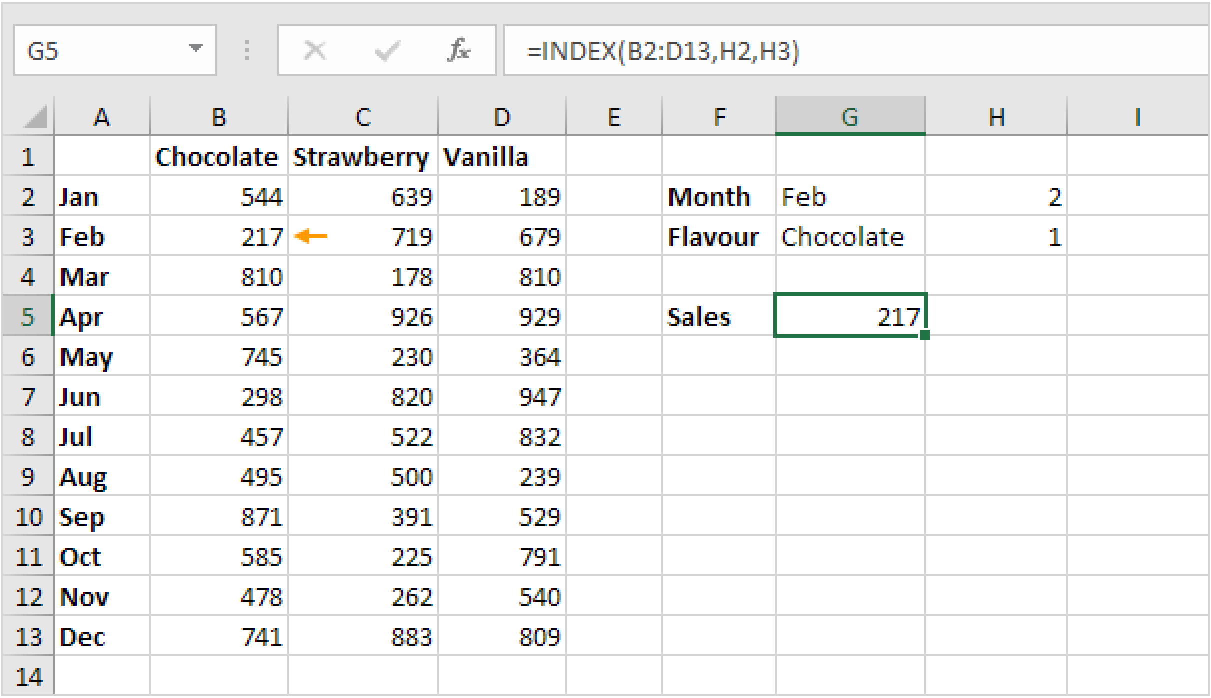
2. To find the position of Chocolate in the range B1:D1, use the MATCH function. The result is 1.



SUMIF | =MATCH(G3,B1:D1,0

| | A | B | C | D | E | F | G | H | I |
|---|---|---|---|---|---|---|---|---|---|
| 1 | | Chocolate | Strawberry | Vanilla | | | | | |
| 2 | Jan | 544 | 639 | 189 | | Month | Feb | 2 | |
| 3 | Feb | 217 | 719 | 679 | | Flavour | Chocolate | =MATCH(G3,B1:D1,0 | |
| 4 | Mar | 810 | 178 | 810 | | MATCH(lookup_value, lookup_array, [match_type]) | | | |
| 5 | Apr | 567 | 926 | 929 | | Sales | | | |
| 6 | May | 745 | 230 | 364 | | | | | |
| 7 | Jun | 298 | 820 | 947 | | | | | |
| 8 | Jul | 457 | 522 | 832 | | | | | |
| 9 | Aug | 495 | 500 | 239 | | | | | |
| 10 | Sep | 871 | 391 | 529 | | | | | |
| 11 | Oct | 585 | 225 | 791 | | | | | |
| 12 | Nov | 478 | 262 | 540 | | | | | |
| 13 | Dec | 741 | 883 | 809 | | | | | |
| 14 | | | | | | | | | |

3. Use these results and the INDEX function to find the sales of Chocolate in February.

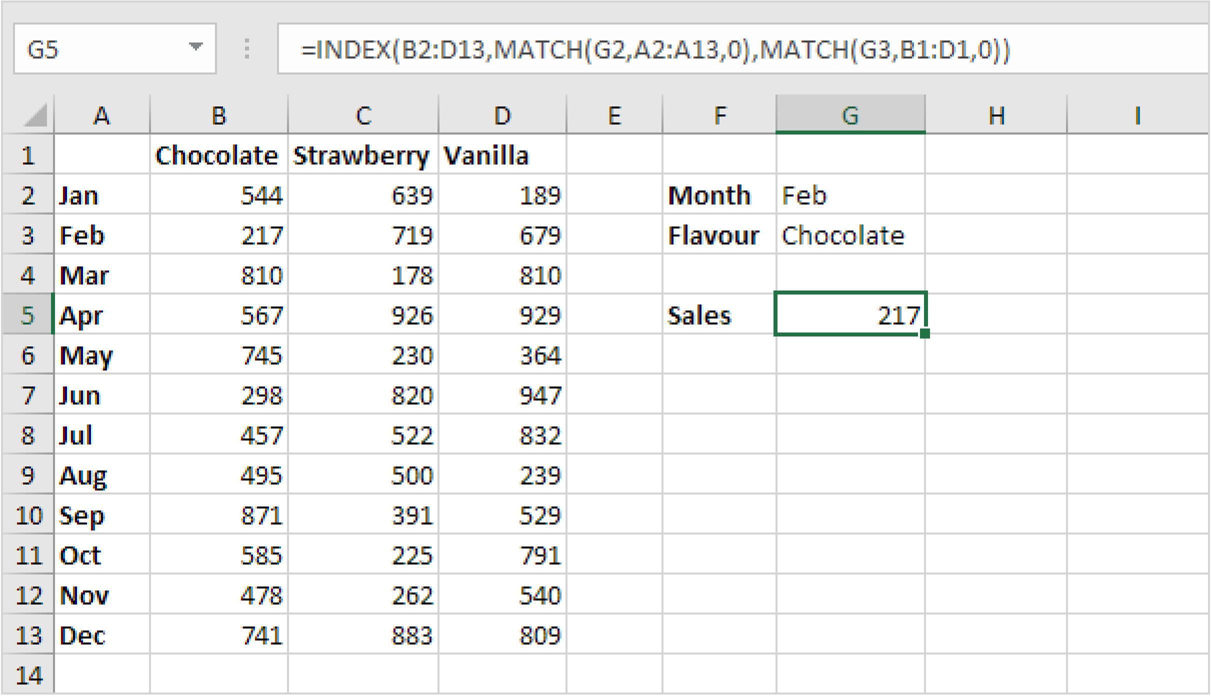


G5 | =INDEX(B2:D13,H2,H3)

| | A | B | C | D | E | F | G | H | I |
|---|---|---|---|---|---|---|---|---|---|
| 1 | | Chocolate | Strawberry | Vanilla | | | | | |
| 2 | Jan | 544 | 639 | 189 | | Month | Feb | 2 | |
| 3 | Feb | 217 | 719 | 679 | | Flavour | Chocolate | 1 | |
| 4 | Mar | 810 | 178 | 810 | | | | | |
| 5 | Apr | 567 | 926 | 929 | | Sales | 217 | | |
| 6 | May | 745 | 230 | 364 | | | | | |
| 7 | Jun | 298 | 820 | 947 | | | | | |
| 8 | Jul | 457 | 522 | 832 | | | | | |
| 9 | Aug | 495 | 500 | 239 | | | | | |
| 10 | Sep | 871 | 391 | 529 | | | | | |
| 11 | Oct | 585 | 225 | 791 | | | | | |
| 12 | Nov | 478 | 262 | 540 | | | | | |
| 13 | Dec | 741 | 883 | 809 | | | | | |
| 14 | | | | | | | | | |

Explanation: 217 found at the intersection of row 2 and column 1 in the range B2:D13.

4. Put it all together.

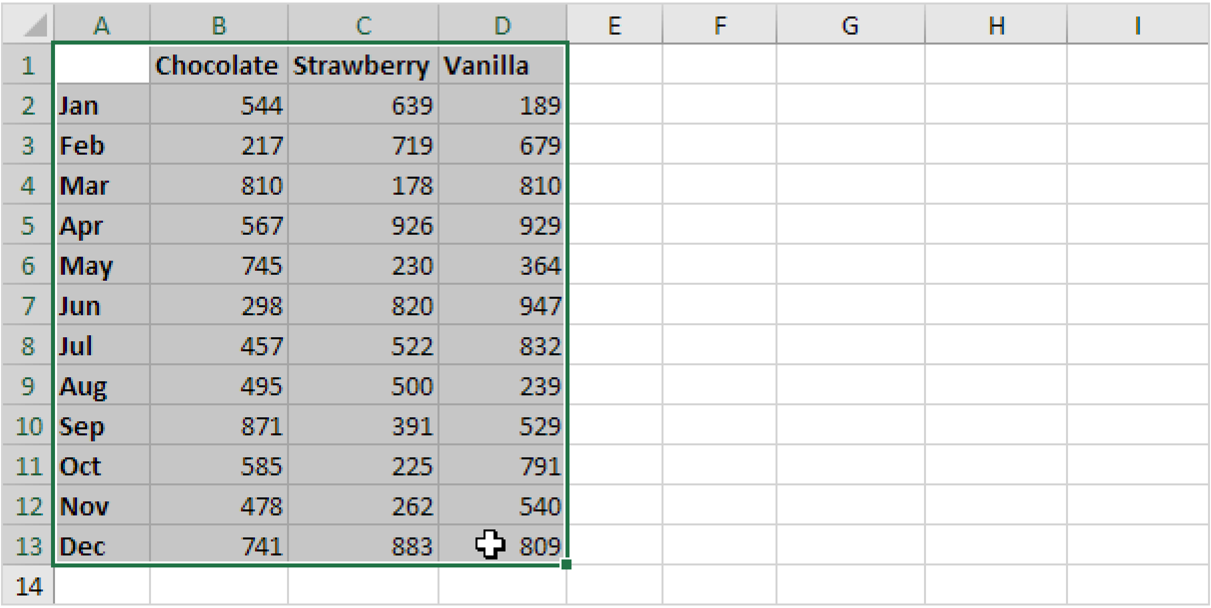


G5 =INDEX(B2:D13,MATCH(G2,A2:A13,0),MATCH(G3,B1:D1,0))

| | A | B | C | D | E | F | G | H | I |
|---|---|---|---|---|---|---|---|---|---|
| 1 | | Chocolate | Strawberry | Vanilla | | | | | |
| 2 | Jan | 544 | 639 | 189 | | Month | Feb | | |
| 3 | Feb | 217 | 719 | 679 | | Flavour | Chocolate | | |
| 4 | Mar | 810 | 178 | 810 | | | | | |
| 5 | Apr | 567 | 926 | 929 | | Sales | 217 | | |
| 6 | May | 745 | 230 | 364 | | | | | |
| 7 | Jun | 298 | 820 | 947 | | | | | |
| 8 | Jul | 457 | 522 | 832 | | | | | |
| 9 | Aug | 495 | 500 | 239 | | | | | |
| 10 | Sep | 871 | 391 | 529 | | | | | |
| 11 | Oct | 585 | 225 | 791 | | | | | |
| 12 | Nov | 478 | 262 | 540 | | | | | |
| 13 | Dec | 741 | 883 | 809 | | | | | |
| 14 | | | | | | | | | |

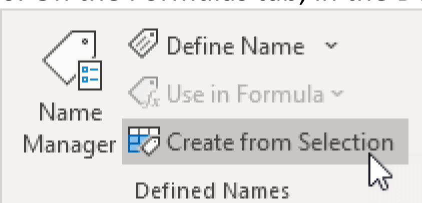
You can also lookup a value in a two-dimensional range without using INDEX and MATCH. The following trick is pretty awesome.

5. Select the range A1:D13.

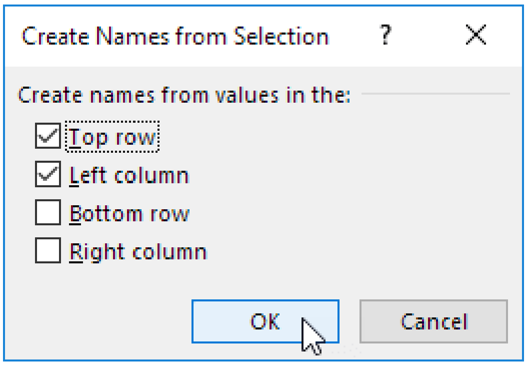


| | A | B | C | D | E | F | G | H | I |
|---|---|---|---|---|---|---|---|---|---|
| 1 | | Chocolate | Strawberry | Vanilla | | | | | |
| 2 | Jan | 544 | 639 | 189 | | | | | |
| 3 | Feb | 217 | 719 | 679 | | | | | |
| 4 | Mar | 810 | 178 | 810 | | | | | |
| 5 | Apr | 567 | 926 | 929 | | | | | |
| 6 | May | 745 | 230 | 364 | | | | | |
| 7 | Jun | 298 | 820 | 947 | | | | | |
| 8 | Jul | 457 | 522 | 832 | | | | | |
| 9 | Aug | 495 | 500 | 239 | | | | | |
| 10 | Sep | 871 | 391 | 529 | | | | | |
| 11 | Oct | 585 | 225 | 791 | | | | | |
| 12 | Nov | 478 | 262 | 540 | | | | | |
| 13 | Dec | 741 | 883 | 809 | | | | | |
| 14 | | | | | | | | | |

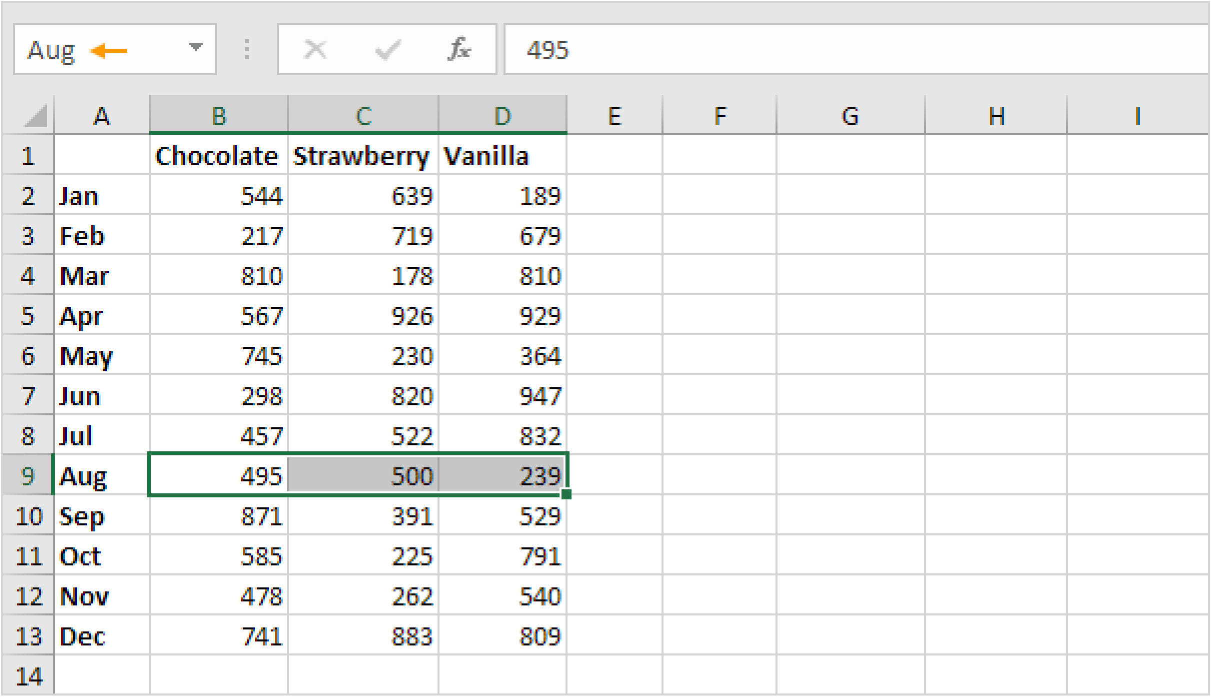
6. On the Formulas tab, in the Defined Names group, click Create from Selection.




7. Check Top row and Left column and click OK.




8. Excel created 12 + 3 = 15 named ranges! Simply select a range and look at the Name box.




| | A | B | C | D | E | F | G | H | I |
|---|---|---|---|---|---|---|---|---|---|
| 1 | | Chocolate | Strawberry | Vanilla | | | | | |
| 2 | Jan | 544 | 639 | 189 | | | | | |
| 3 | Feb | 217 | 719 | 679 | | | | | |
| 4 | Mar | 810 | 178 | 810 | | | | | |
| 5 | Apr | 567 | 926 | 929 | | | | | |
| 6 | May | 745 | 230 | 364 | | | | | |
| 7 | Jun | 298 | 820 | 947 | | | | | |
| 8 | Jul | 457 | 522 | 832 | | | | | |
| 9 | Aug | 495 | 500 | 239 | | | | | |
| 10 | Sep | 871 | 391 | 529 | | | | | |
| 11 | Oct | 585 | 225 | 791 | | | | | |
| 12 | Nov | 478 | 262 | 540 | | | | | |
| 13 | Dec | 741 | 883 | 809 | | | | | |
| 14 | | | | | | | | | |

9. Use the intersect operator (space) to return the intersection of two named ranges.

G5 =Feb Chocolate

| | A | B | C | D | E | F | G | H | I |
|---|---|---|---|---|---|---|---|---|---|
| 1 | | Chocolate | Strawberry | Vanilla | | | | | |
| 2 | Jan | 544 | 639 | 189 | | | | | |
| 3 | Feb | 217 | 719 | 679 | | | | | |
| 4 | Mar | 810 | 178 | 810 | | | | | |
| 5 | Apr | 567 | 926 | 929 | | Sales | 217 | | |
| 6 | May | 745 | 230 | 364 | | | | | |
| 7 | Jun | 298 | 820 | 947 | | | | | |
| 8 | Jul | 457 | 522 | 832 | | | | | |
| 9 | Aug | 495 | 500 | 239 | | | | | |
| 10 | Sep | 871 | 391 | 529 | | | | | |
| 11 | Oct | 585 | 225 | 791 | | | | | |
| 12 | Nov | 478 | 262 | 540 | | | | | |
| 13 | Dec | 741 | 883 | 809 | | | | | |
| 14 | | | | | | | | | |

10. Create a dynamic two-way lookup.

G5 =INDIRECT(G2) INDIRECT(G3)

| | A | B | C | D | E | F | G | H | I |
|---|---|---|---|---|---|---|---|---|---|
| 1 | | Chocolate | Strawberry | Vanilla | | | | | |
| 2 | Jan | 544 | 639 | 189 | | Month | Feb | | |
| 3 | Feb | 217 | 719 | 679 | | Flavour | Chocolate | | |
| 4 | Mar | 810 | 178 | 810 | | | | | |
| 5 | Apr | 567 | 926 | 929 | | Sales | 217 | | |
| 6 | May | 745 | 230 | 364 | | | | | |
| 7 | Jun | 298 | 820 | 947 | | | | | |
| 8 | Jul | 457 | 522 | 832 | | | | | |
| 9 | Aug | 495 | 500 | 239 | | | | | |
| 10 | Sep | 871 | 391 | 529 | | | | | |
| 11 | Oct | 585 | 225 | 791 | | | | | |
| 12 | Nov | 478 | 262 | 540 | | | | | |
| 13 | Dec | 741 | 883 | 809 | | | | | |
| 14 | | | | | | | | | |

Explanation: the INDIRECT functions convert the text strings ("Feb" in cell G2 and "Chocolate" in cell G3) into valid named ranges.

## Lesson 15 – Statistical Formulas in Excel

Statistical Functions

This chapter gives an overview of some very useful statistical functions in Excel.

**Average**

To calculate the average of a group of numbers, use the AVERAGE function.

A3 | =AVERAGE(A1:O1)

| | A | B | C | D | E | F | G | H | I | J | K | L | M | N | O | P |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 0 | 7 | 8 | 6 | 5 | 9 | 8 | 7 | 4 | 8 | 0 | 3 | 5 | 6 | 8 | |
| 2 | | | | | | | | | | | | | | | | |
| 3 | 5.6 | | | | | | | | | | | | | | | |
| 4 | | | | | | | | | | | | | | | | |

Note: visit our page about the AVERAGE function for many more examples.

Averageif

To average cells based on one criteria, use the AVERAGEIF function. For example, to calculate the average excluding zeros.

A3 | =AVERAGEIF(A1:O1,"<>0")

| | A | B | C | D | E | F | G | H | I | J | K | L | M | N | O | P |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 0 | 7 | 8 | 6 | 5 | 9 | 8 | 7 | 4 | 8 | 0 | 3 | 5 | 6 | 8 | |
| 2 | | | | | | | | | | | | | | | | |
| 3 | 6.46 | | | | | | | | | | | | | | | |
| 4 | | | | | | | | | | | | | | | | |

Note: visit our page about the AVERAGEIF function for many more examples.

Median

To find the median (or middle number), use the MEDIAN function.

A3 | =MEDIAN(A1:O1)

| | A | B | C | D | E | F | G | H | I | J | K | L | M | N | O | P |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 0 | 7 | 8 | 6 | 5 | 9 | 8 | 7 | 4 | 8 | 0 | 3 | 5 | 6 | 8 | |
| 2 | | | | | | | | | | | | | | | | |
| 3 | 6 | | | | | | | | | | | | | | | |
| 4 | | | | | | | | | | | | | | | | |

Check:

| | A | B | C | D | E | F | G | H | I | J | K | L | M | N | O | P |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 0 | 0 | 3 | 4 | 5 | 5 | 6 | 6 | 7 | 7 | 8 | 8 | 8 | 8 | 9 | |

Mode

To find the most frequently occurring number, use the MODE function.

A3 | =MODE(A1:O1)

| | A | B | C | D | E | F | G | H | I | J | K | L | M | N | O | P |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 0 | 7 | 8 | 6 | 5 | 9 | 8 | 7 | 4 | 8 | 0 | 3 | 5 | 6 | 8 | |
| 2 | | | | | | | | | | | | | | | | |
| 3 | 8 | | | | | | | | | | | | | | | |
| 4 | | | | | | | | | | | | | | | | |

Standard Deviation

To calculate the standard deviation, use the STEDV function.

A3 =STDEV(A1:O1)

| | A | B | C | D | E | F | G | H | I | J | K | L | M | N | O | P |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 0 | 7 | 8 | 6 | 5 | 9 | 8 | 7 | 4 | 8 | 0 | 3 | 5 | 6 | 8 | |
| 2 | | | | | | | | | | | | | | | | |
| 3 | 2.82 | | | | | | | | | | | | | | | |
| 4 | | | | | | | | | | | | | | | | |

Note: standard deviation is a number that tells you how far numbers are from their mean. Learn more about this topic on our page about standard deviation.

Min

To find the minimum value, use the MIN function.

A3 =MIN(A1:O1)

| | A | B | C | D | E | F | G | H | I | J | K | L | M | N | O | P |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 0 | 7 | 8 | 6 | 5 | 9 | 8 | 7 | 4 | 8 | 0 | 3 | 5 | 6 | 8 | |
| 2 | | | | | | | | | | | | | | | | |
| 3 | 0 | | | | | | | | | | | | | | | |
| 4 | | | | | | | | | | | | | | | | |

Max

To find the maximum value, use the MAX function.

A3 =MAX(A1:O1)

| | A | B | C | D | E | F | G | H | I | J | K | L | M | N | O | P |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 0 | 7 | 8 | 6 | 5 | 9 | 8 | 7 | 4 | 8 | 0 | 3 | 5 | 6 | 8 | |
| 2 | | | | | | | | | | | | | | | | |
| 3 | 9 | | | | | | | | | | | | | | | |
| 4 | | | | | | | | | | | | | | | | |

Large

To find the third largest number, use the following LARGE function.

A3 =LARGE(A1:O1,3)

| | A | B | C | D | E | F | G | H | I | J | K | L | M | N | O | P |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 0 | 7 | 8 | 6 | 5 | 9 | 8 | 7 | 4 | 8 | 0 | 3 | 5 | 6 | 8 | |
| 2 | | | | | | | | | | | | | | | | |
| 3 | 8 | | | | | | | | | | | | | | | |
| 4 | | | | | | | | | | | | | | | | |

Check:

| | A | B | C | D | E | F | G | H | I | J | K | L | M | N | O | P |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 0 | 0 | 3 | 4 | 5 | 5 | 6 | 6 | 7 | 7 | 8 | 8 | 8 | 8 | 9 | |

Small

To find the second smallest number, use the following SMALL function.

A3 =SMALL(A1:O1,2)

| | A | B | C | D | E | F | G | H | I | J | K | L | M | N | O | P |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 0 | 7 | 8 | 6 | 5 | 9 | 8 | 7 | 4 | 8 | 0 | 3 | 5 | 6 | 8 | |
| 2 | | | | | | | | | | | | | | | | |
| 3 | 0 | | | | | | | | | | | | | | | |
| 4 | | | | | | | | | | | | | | | | |

Check:

| | A | B | C | D | E | F | G | H | I | J | K | L | M | N | O | P |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 0 | 0 | 3 | 4 | 5 | 5 | 6 | 6 | 7 | 7 | 8 | 8 | 8 | 8 | 9 | |

Tip: Excel can generate most of these results with the click of a button. Our Descriptive Statistics example shows you how.

## Lesson 16 - Text Formulas in Excel

Excel has many functions to offer when it comes to manipulating text strings.

Join Strings

To join strings, use the & operator.

D1 =A1 & " " & B1

| | A | B | C | D | E | F | G | H | I |
|---|---|---|---|---|---|---|---|---|---|
| 1 | Hi | Tim | | Hi Tim | | | | | |
| 2 | | | | | | | | | |

Note: instead of using the & operator, use the CONCATENATE function in Excel.

Left

To extract the leftmost characters from a string, use the LEFT function.

D1 =LEFT(A1, 4)

| | A | B | C | D | E | F | G | H | I |
|---|---|---|---|---|---|---|---|---|---|
| 1 | example text | | | exam | | | | | |
| 2 | | | | | | | | | |

Right

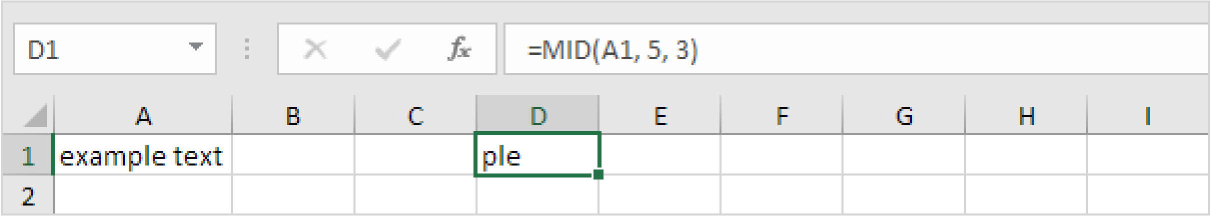
To extract the rightmost characters from a string, use the RIGHT function.

D1 =RIGHT(A1, 2)

| | A | B | C | D | E | F | G | H | I |
|---|---|---|---|---|---|---|---|---|---|
| 1 | example text | | | xt | | | | | |
| 2 | | | | | | | | | |

Mid

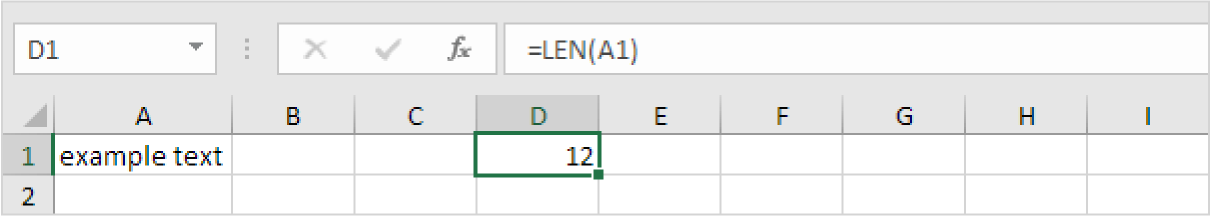
To extract a substring, starting in the middle of a string, use the MID function.




Note: started at position 5 (p) with length 3.

Len

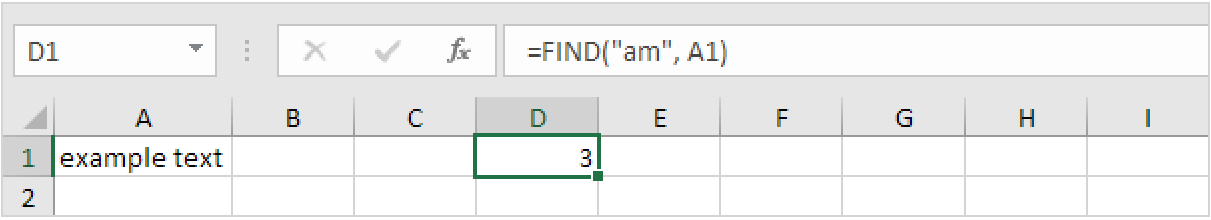
To get the length of a string, use the LEN function.




Note: space (position 8) included!

Find

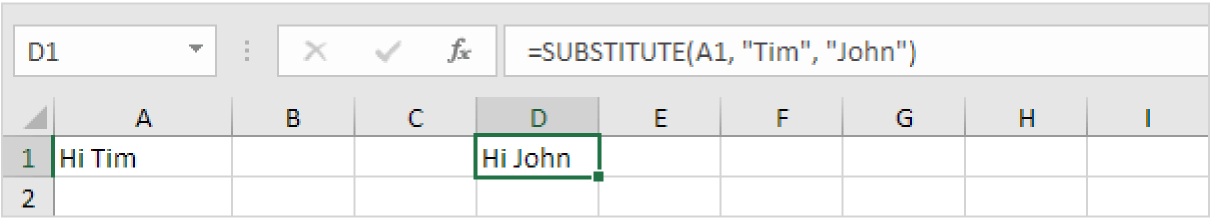
To find the position of a substring in a string, use the FIND function.




Note: string "am" found at position 3. Visit our page about the FIND function for more examples.

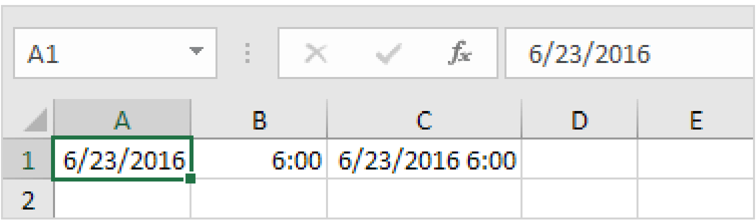
Substitute

To replace existing text with new text in a string, use the SUBSTITUTE function.




## Lesson 17 - Date and Time Formulas in Excel

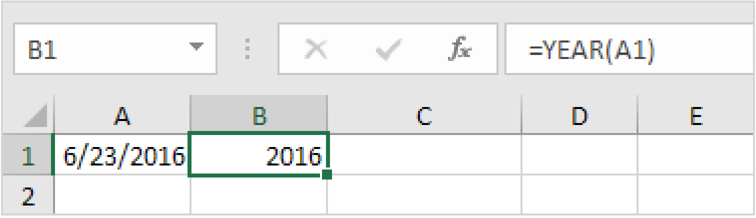
To enter a date in Excel, use the "/" or "-" characters. To enter a time, use the ":" (colon). You can also enter a date and a time in one cell.




Note: Dates are in US Format. Months first, Days second. This type of format depends on your windows regional settings. Learn more about Date and Time formats.

Year, Month, Day

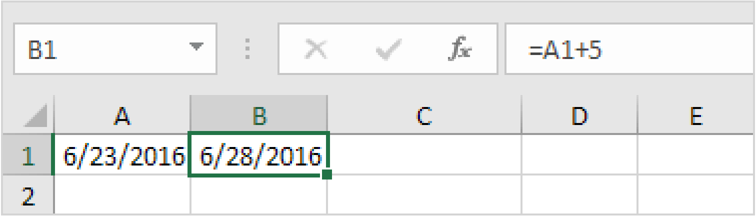
To get the year of a date, use the YEAR function.



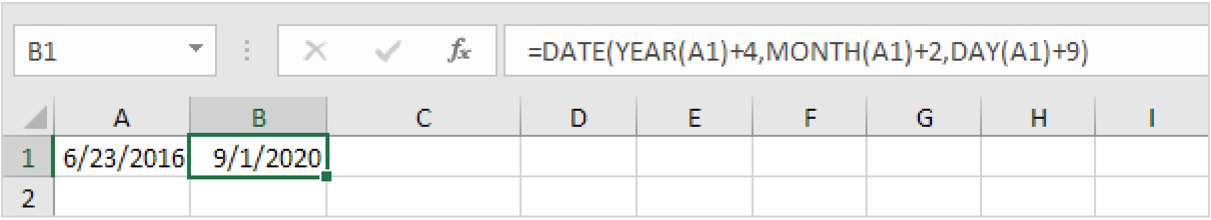

Note: use the MONTH and DAY function to get the month and day of a date.

Date Function

1. To add a number of days to a date, use the following simple formula.



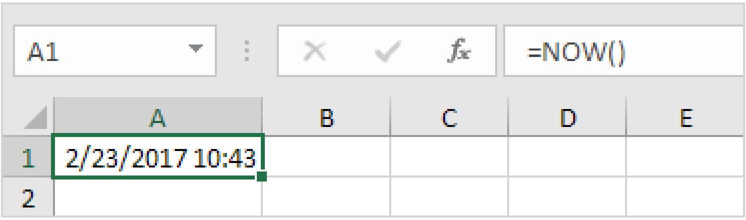

2. To add a number of years, months and/or days, use the DATE function.




Note: the DATE function accepts three arguments: year, month and day. Excel knows that 6 + 2 = 8 = August has 31 days and rolls over to the next month (23 August + 9 days = 1 September).

Current Date & Time

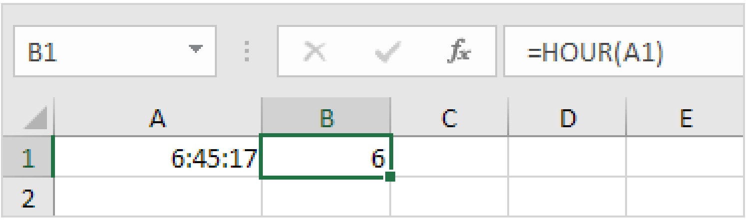
To get the current date and time, use the NOW function.




Note: use the TODAY function to enter today's date in Excel.

Hour, Minute, Second

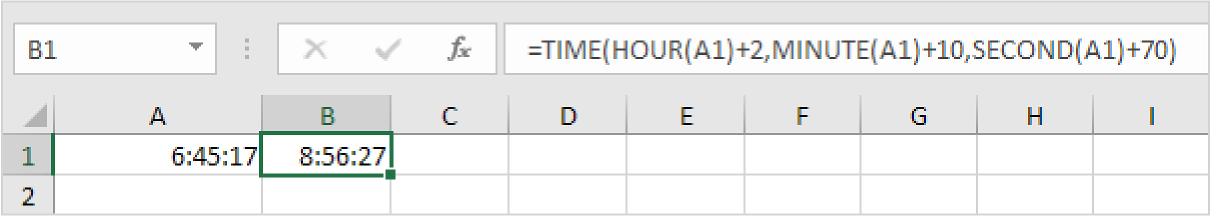
To return the hour, use the HOUR function.




Note: use the MINUTE and SECOND function to return the minute and second.

Time Function

To add a number of hours, minutes and/or seconds, use the TIME function.




Note: Excel adds 2 hours, 10 + 1 = 11 minutes and 70 - 60 = 10 seconds.

# INTRODUCTION TO EXCEL CHARTING

## Lesson 18 - Introduction to Excel Charting

### What Is An Excel Chart?

Charts are Excel's most basic way to visualise data. They offer a number of ways to represent your data graphically to make it easily understood.

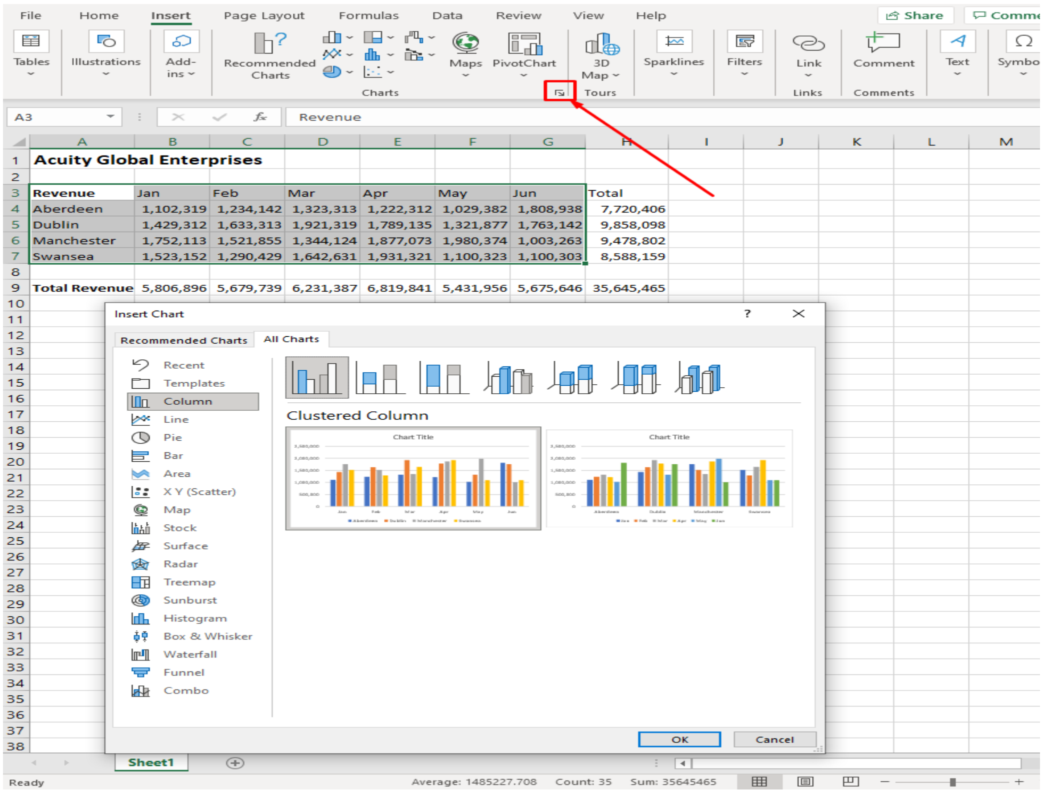
Excel also offers other ways to uncover data relationships in its more advanced functions and business intelligence suite. For more details on the different ways to visualise data see our Excel Course Offerings.

Excel Charts provide a visual way of seeing trends in the data in your worksheet.

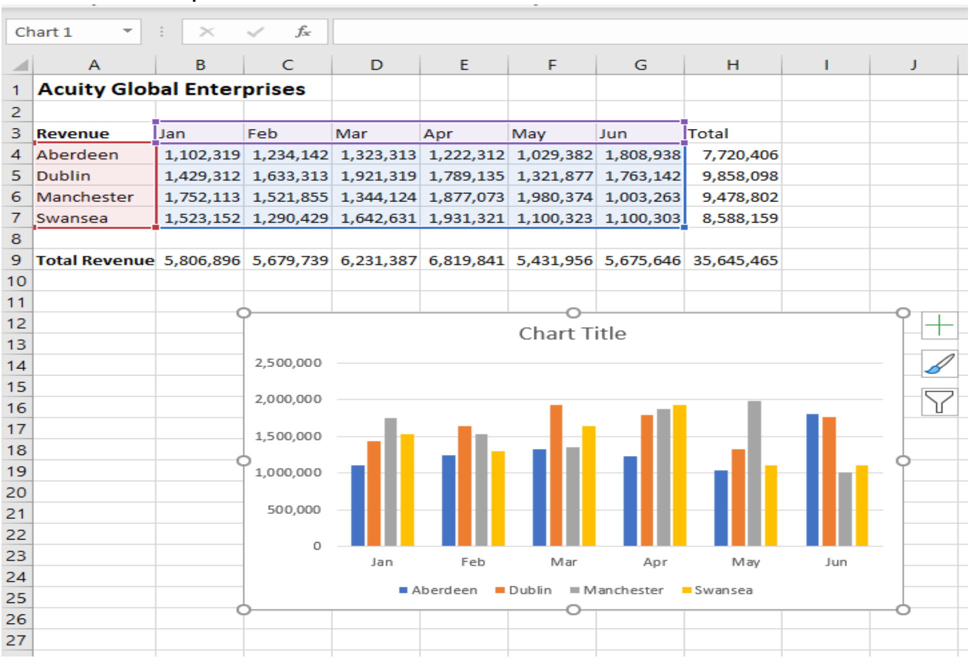
### How Can I Create A Chart In Excel?

The beauty of the ***charting process*** is that it is delightfully easy and simple – starting from the insert tab.

- Select the data that you wish to create a chart from
- Click on the '*Insert*' tab
- If you know the type of chart you would like, click on the corresponding button within the **Charts group** within the Insert tab. If you wish to see all the chart types available, click on the little arrow in the bottom right-hand corner of the charts section



I have chosen a simple column chart for this, your option may be different depending on data but the "**recommended charts**" feature is very helpful (more on this here).
As you can see there are many different options in the Charts group and even more in the menu we opened!

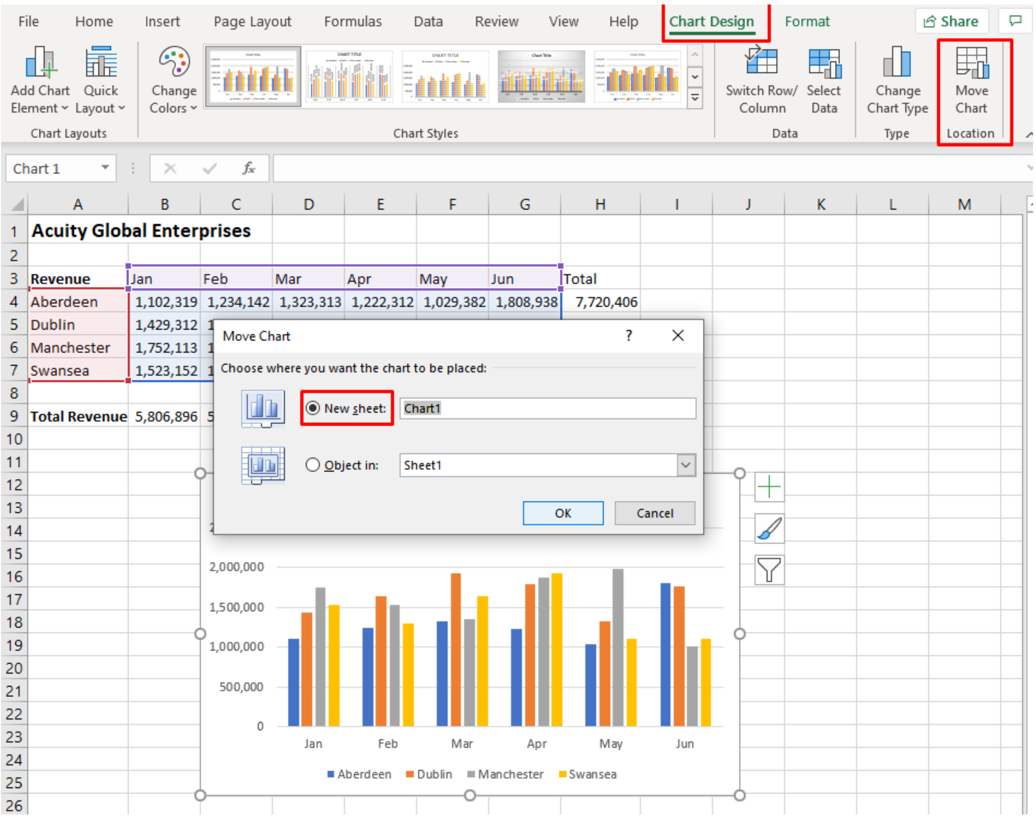


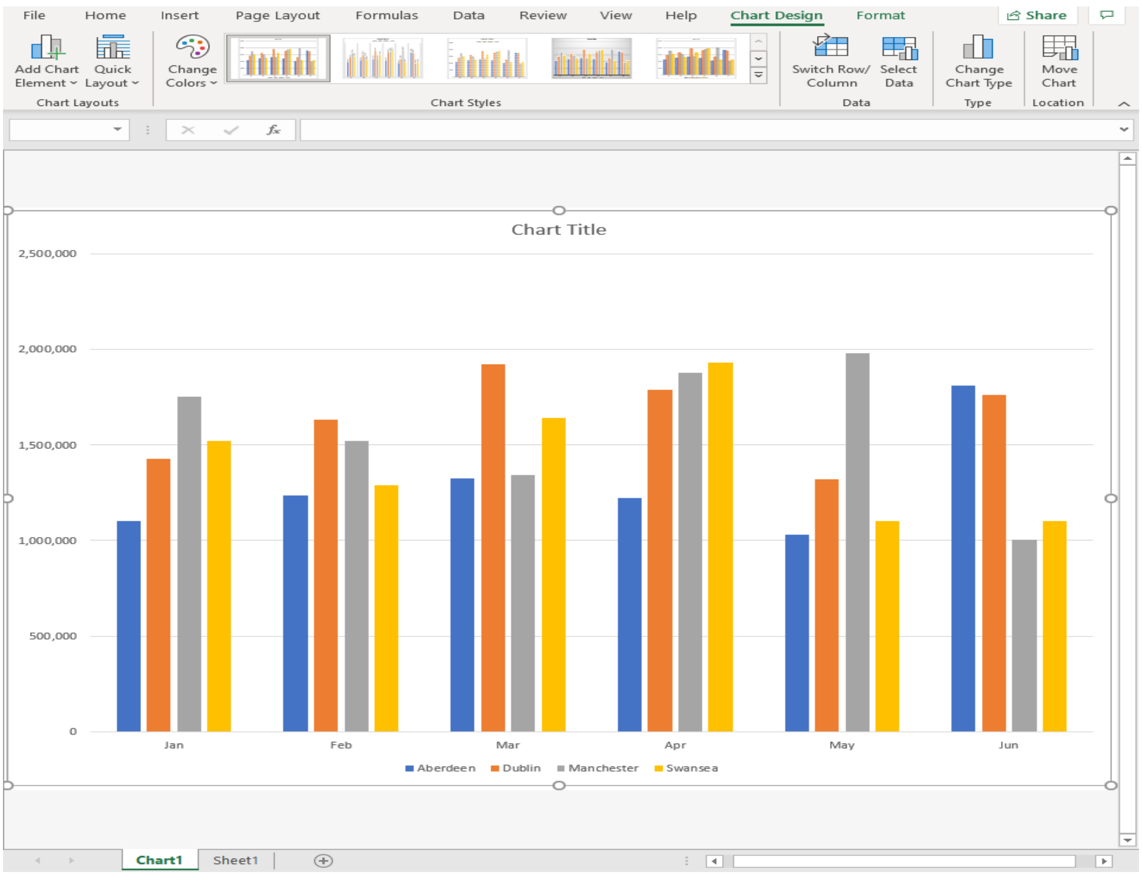

**This embeds the chart into your current worksheet**. When you click onto the chart you will see thick grey box around it and the data used for the chart will have different colour boxes around it.
When you are clicked onto the chart you are able to change its size by grabbing hold of the grey box at any of the circle points on the corners and in the centre of each side.
Charts can take up a lot of space, you can master control of your page layout using this guide.

Moving a Chart to Its Own Page

If you decide that you don't want your chart on the same sheet as your data you can move it onto its own sheet.

- Click on the chart
- Click on the '*Chart Design*' tab
- Click on '*Move Chart*' this opens a new box
- Check the '*New Sheet*' option
- Click ok
- This will move the chart into its own full sized sheet.



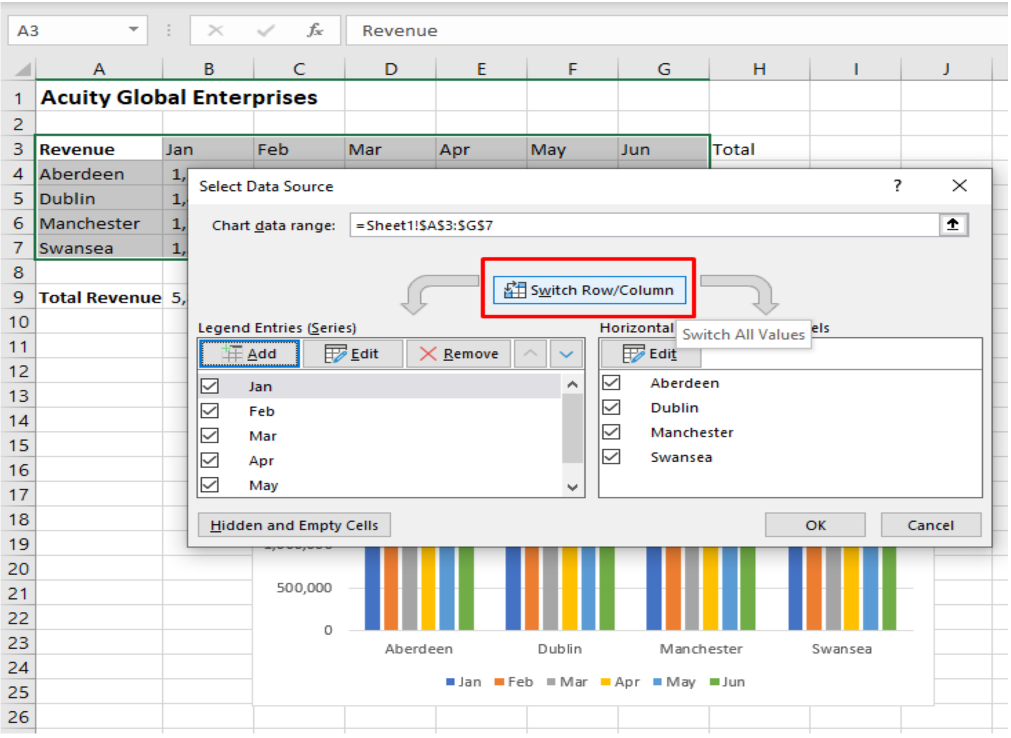

If you need to rename this charts page you can use the methods described in this post.

For this next section I have moved the chart back to an embedded chart on the same sheet as the data as this makes it easier to see what I am doing

## Switching Rows / Columns In Data

You may realise that the data would be better displayed the other way round. To change it

- right click on the chart and pick '*select data*', this opens up another box
- choose to '*Switch Row/Column*', click on this and it will immediately change the way the chart displays the information.
- to change it back, **just click on the same button again**.

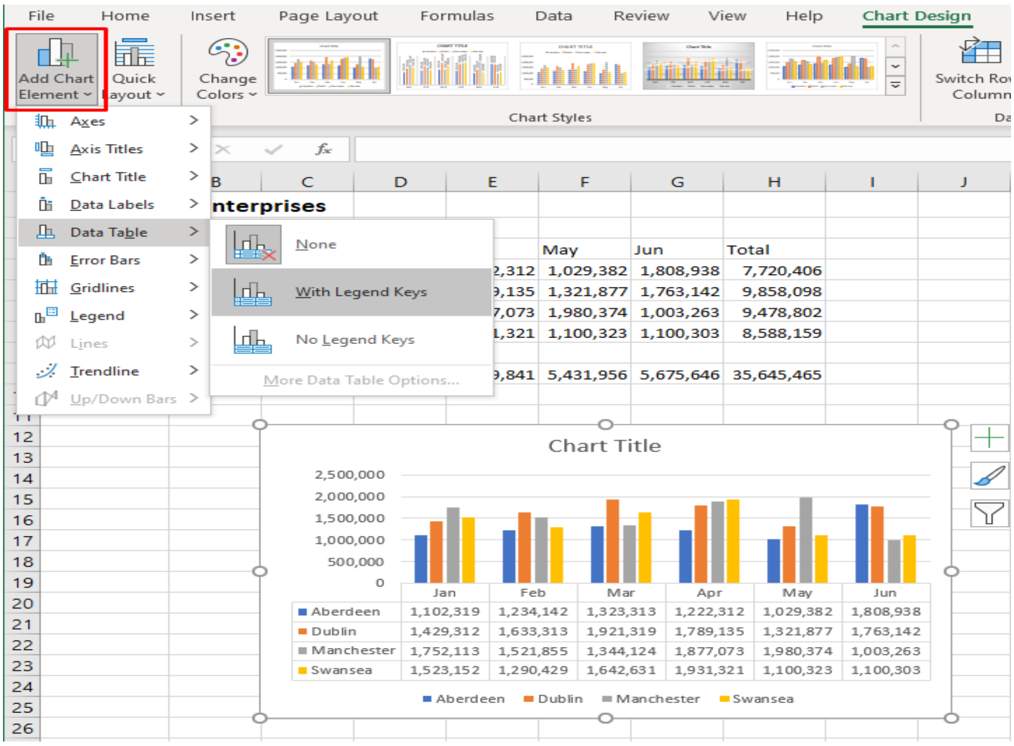



The **Switch Row/Column** tool is often the solution when the data you have made into a chart isn't being visualised how you may expect!

## Showing Data In A Chart

If you are going to use the chart in something else, like a PowerPoint presentation, you may want to show the data as well. To do this

- Click on the chart again and select the '*Chart Design*' tab
- Click on the button '*Add Chart Element*' then '*Data Table*' and pick whether or not you want legend keys.




## Different Types Of Excel Charts

Excel charts come in many different forms and layouts. The use of them is up to your discretion but here are a few example of how you could use the most common Excel charts. Remember the Charts group contains several options but the menu has even more!

**Bar Chart** – These Excel charts tend to be most useful when comparing different categories of data. As used in the previous example its effective when comparing salaries for different cities. You can quickly look at the chart and see the highest and lowest salaries even just at a glance. This will often be one of the recommended charts and is one of the most common types of charts.

**Pie Chart** – A Pie Chart, on the other hand, is great for expressing the relationship an individual piece of data has with the whole data set. For example, if you wanted to show how much profit your department contributed compared to a whole companies profit – a Pie Chart would be excellent.

**Line Chart** – Line Charts are excellent for showing growth over time. While a Bar Chart is great for showing the highest profit at one point, Line Charts are more appropriate for showing how that profit may change over a series of years. You can identify the highs and lows of your company's lifespan quickly and their relationship to other points on the line chart!

All three of these types of charts can be found in the Charts group as they are the most commonly used!

Each Chart Type has its own uses – experiment with what's best for your needs, and use the Recommended Charts feature too!

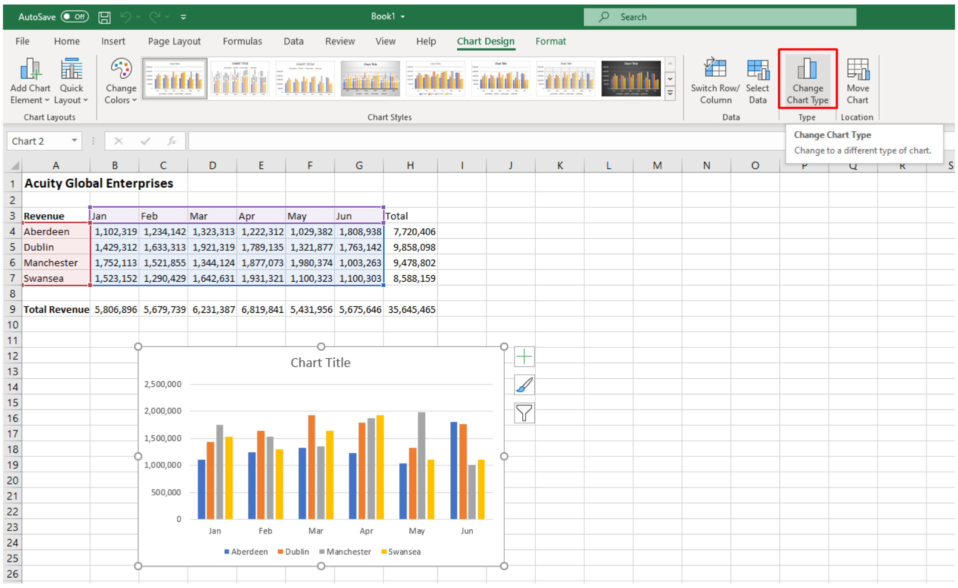
## Recommended Charts

Additionally – the Charts group contains a button for "recommended charts", which will automatically select a chart type for you! Simply go to the Insert Tab and go over to the Charts group as before.

Recommended charts are best used when you don't have any pre-existing plan for how the data should look. Excel collates countless data to figure out how to generate these recommended charts, so seeing what it has to offer couldn't hurt.

### Change Chart Type

To switch between different types of charts, click on the chart you have already created and navigate to the "Change Chart Type" button shown here within the Chart Design tab.




From here you can switch to any Chart type you want!

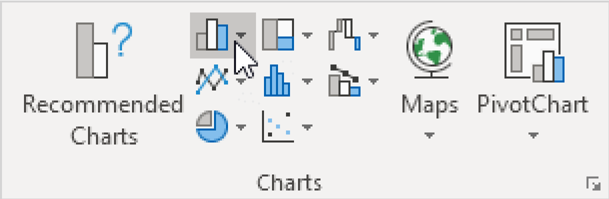
## Lesson 19 - Advanced Excel Charting Examples

### Column Chart

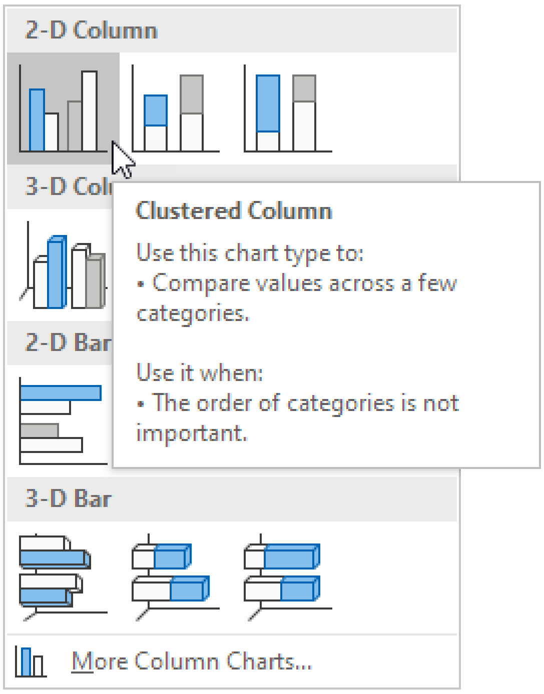
Column charts are used to compare values across categories by using vertical bars.
To create a column chart, execute the following steps.
1. Select the range A1:A7, hold down CTRL, and select the range C1:D7.

| | A | B | C | D | E |
|---|---|---|---|---|---|
| 1 | | Bears | Dolphins | Whales | |
| 2 | 2017 | 8 | 150 | 80 | |
| 3 | 2018 | 54 | 77 | 54 | |
| 4 | 2019 | 93 | 32 | 100 | |
| 5 | 2020 | 116 | 11 | 76 | |
| 6 | 2021 | 137 | 6 | 93 | |
| 7 | 2022 | 184 | 1 | 72 | |
| 8 | | | | | |

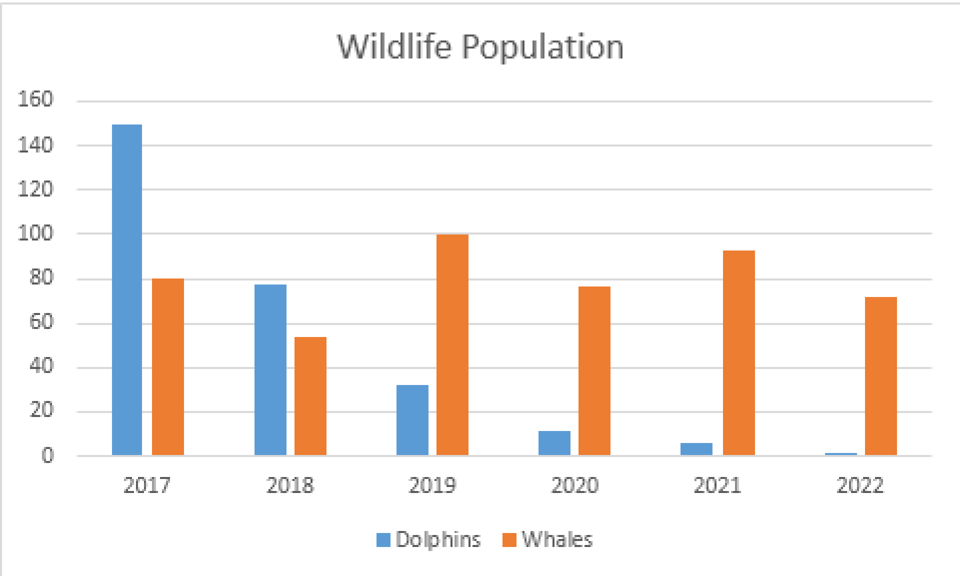
2. On the Insert tab, in the Charts group, click the Column symbol.




3. Click Clustered Column.




Result:




Note: only if you have numeric labels, empty cell A1 before you create the column chart. By doing this, Excel does not recognize the numbers in column A as a data series and automatically places these numbers on the horizontal (category) axis. After creating the chart, you can enter the text Year into cell A1 if you like.

## Line Chart

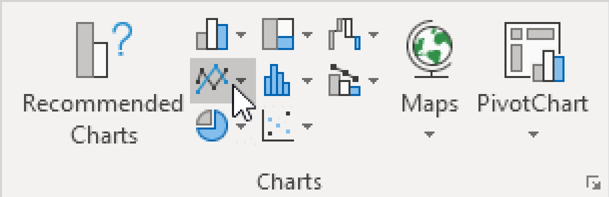
Line charts are used to display trends over time. Use a line chart if you have text labels, dates or a few numeric labels on the horizontal axis. Use a scatter plot (XY chart) to show scientific XY data.

To create a line chart, execute the following steps.

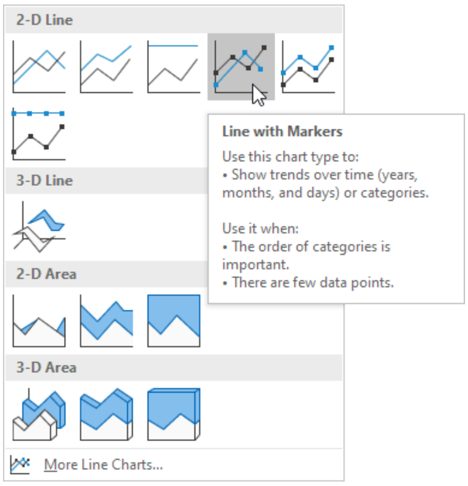
1. Select the range A1:D7.

| | A | B | C | D | E |
|---|---|---|---|---|---|
| 1 | | Bears | Dolphins | Whales | |
| 2 | 2017 | 8 | 150 | 80 | |
| 3 | 2018 | 54 | 77 | 54 | |
| 4 | 2019 | 93 | 32 | 100 | |
| 5 | 2020 | 116 | 11 | 76 | |
| 6 | 2021 | 137 | 6 | 93 | |
| 7 | 2022 | 184 | 1 | 72 | |
| 8 | | | | | |

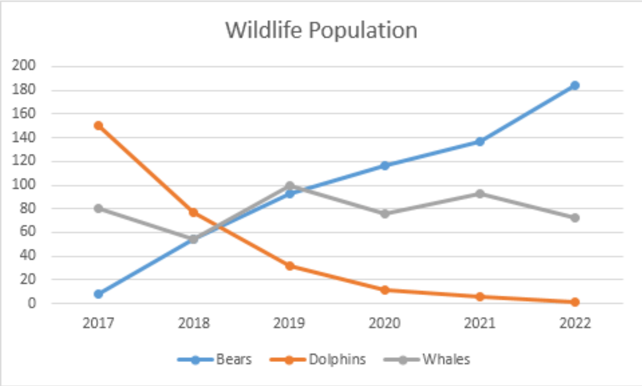
2. On the Insert tab, in the Charts group, click the Line symbol.




3. Click Line with Markers.




Result:



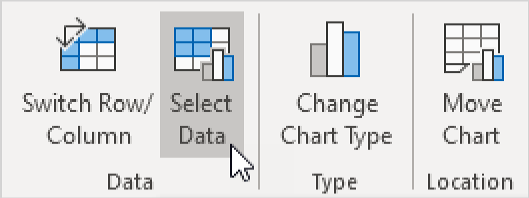

Note: only if you have numeric labels, empty cell A1 before you create the line chart. By doing this, Excel does not recognize the numbers in column A as a data series and automatically places these numbers on the horizontal (category) axis. After creating the chart, you can enter the text Year into cell A1 if you like.

Let's customize this line chart.

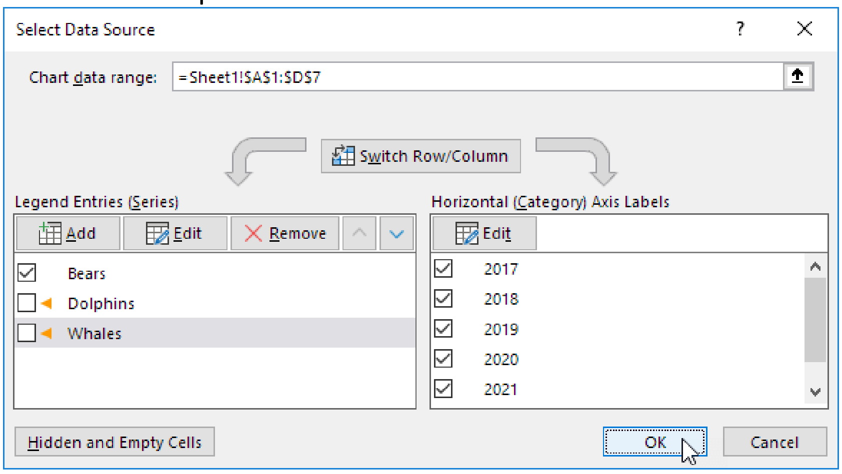
To change the data range included in the chart, execute the following steps.

4. Select the line chart.

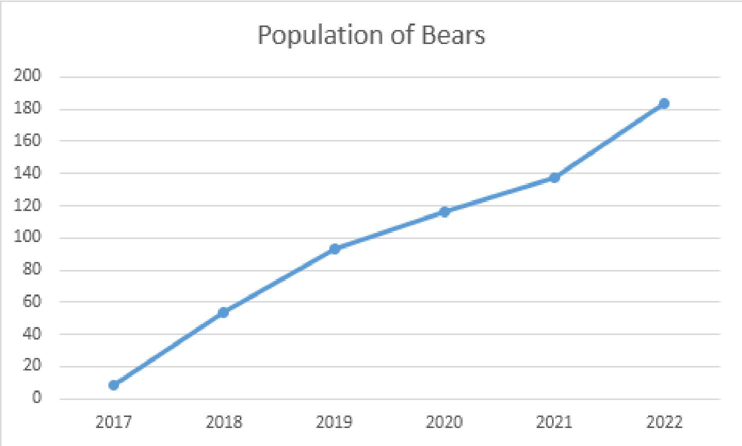
5. On the Design tab, in the Data group, click Select Data.




6. Uncheck Dolphins and Whales and click OK.

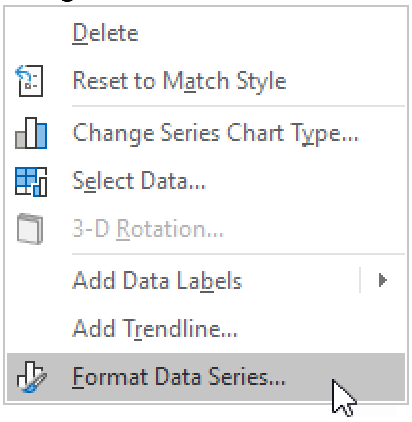



Result:



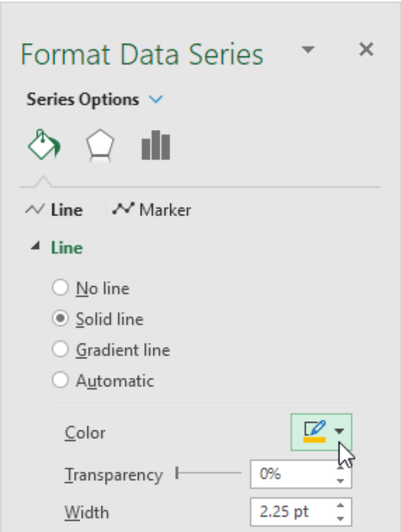

To change the color of the line and the markers, execute the following steps.

7. Right click the line and click Format Data Series.



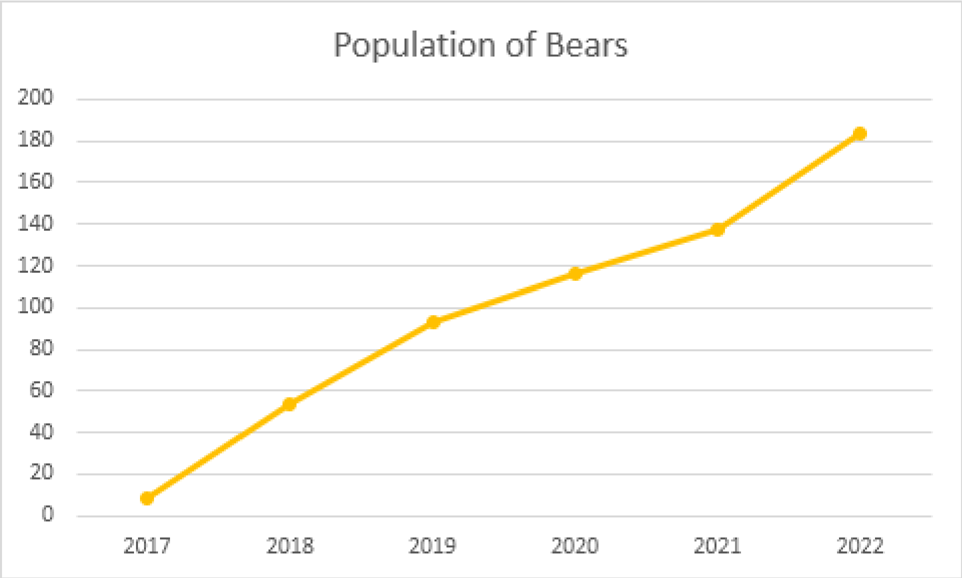

The Format Data Series pane appears.

8. Click the paint bucket icon and change the line color.




9. Click Marker and change the fill color and border color of the markers.

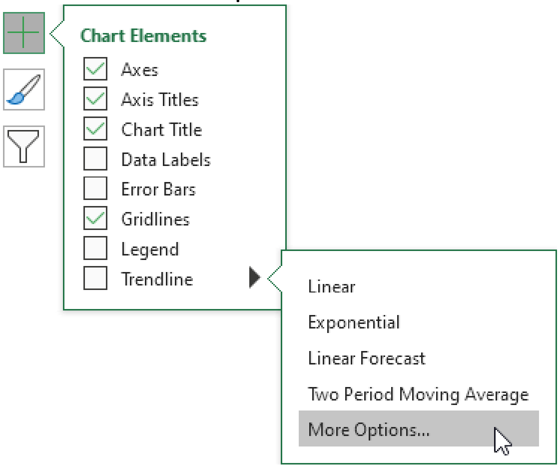
Result:




To add a trendline, execute the following steps.

10. Select the line chart.

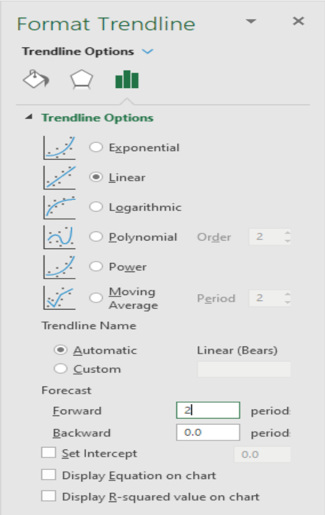
11. Click the + button on the right side of the chart, click the arrow next to Trendline and then click More Options.



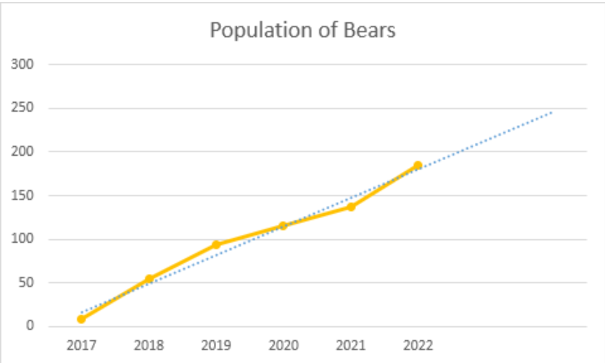

The Format Trendline pane appears.

12. Choose a Trend/Regression type. Click Linear.

13. Specify the number of periods to include in the forecast. Type 2 in the Forward box.

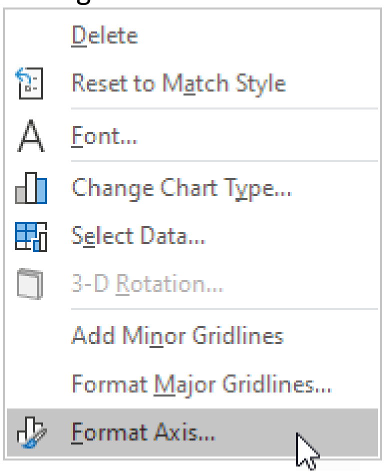



Result:



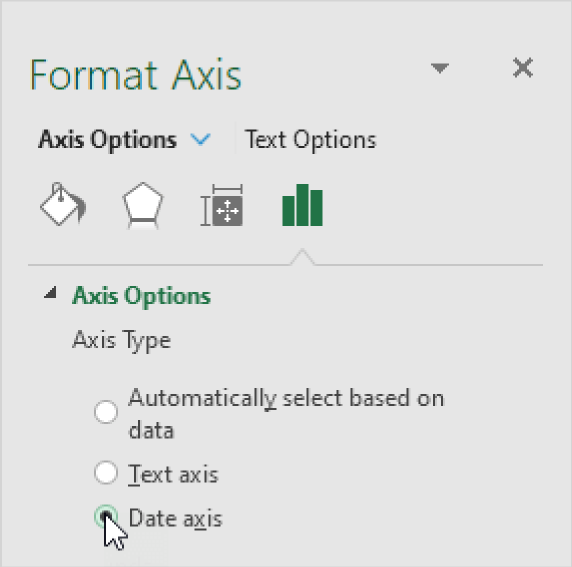

To change the axis type to Date axis, execute the following steps.

14. Right click the horizontal axis, and then click Format Axis.

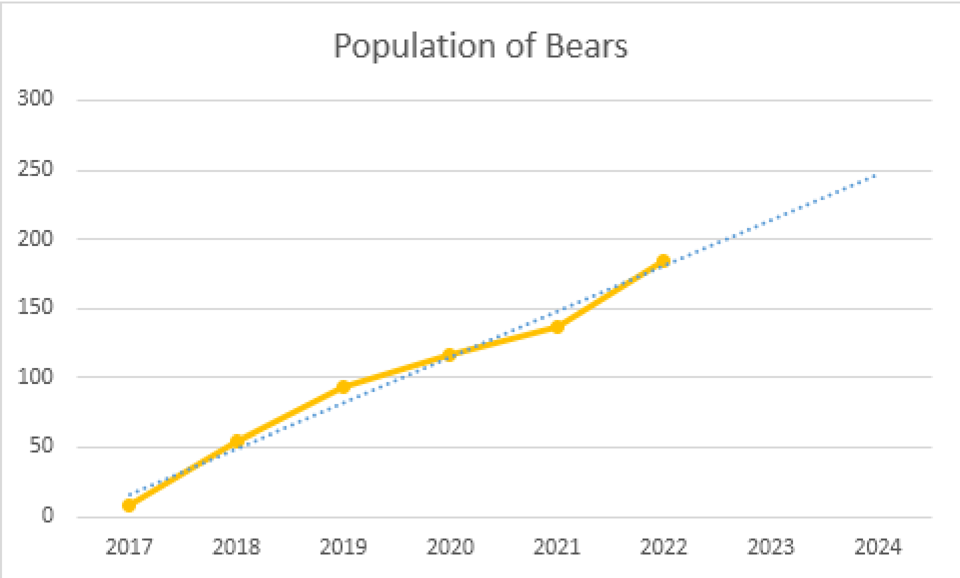



The Format Axis pane appears.

15. Click Date axis.




Result:




Conclusion: the trend line predicts a population of approximately 250 bears in 2024.

## Lesson 20 - Dynamic Charts in Excel

There are two ways to create a dynamic chart range in Excel:

- Using Excel Table
- Using Formulas

In most of the cases, using Excel Table is the best way to create dynamic ranges in Excel. Let's see how each of these methods work.

Using Excel Table

Using Excel Table is the best way to create dynamic ranges as it updates automatically when a new data point is added to it.

**Pro Tip:** To convert a range of cells to an Excel Table, select the cells and use the keyboard shortcut – Control + T (hold the Control key and press the T key).

In the example below, you can see that as soon as add new data, the Excel Table expands to include this data as a part of the table (note that the border and formatting expand to include it in the table).

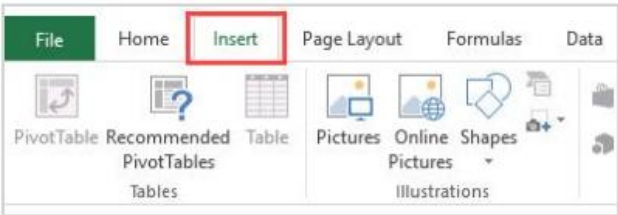
| | A | B |
|---|---|---|
| 1 | Months | Value |
| 2 | Jan | 28 |
| 3 | Feb | 19 |
| 4 | Mar | 22 |
| 5 | Apr | 26 |
| 6 | May | 25 |
| 7 | June | 18 |
| 8 | | |

Now, we need to use this Excel table while creating the charts.
Here are the exact steps to create a dynamic line chart using the Excel table:

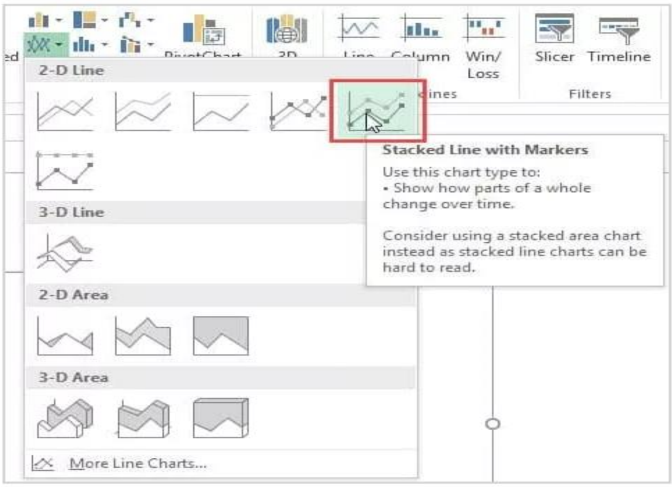
- Select the entire Excel table.

| | A | B |
|---|---|---|
| 1 | Months | Value |
| 2 | Jan | 28 |
| 3 | Feb | 19 |
| 4 | Mar | 22 |
| 5 | Apr | 26 |

- Go to the Insert tab.

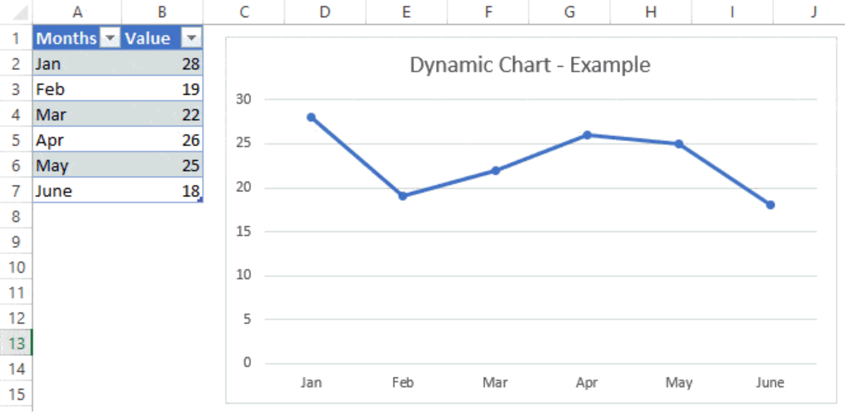



- In the Charts Group, select 'Line with Markers' chart.




That's it!
The above steps would insert a line chart which would automatically update when you add more data to the Excel table.

Note that while adding new data automatically updates the chart, deleting data would not completely remove the data points. For example, if you remove 2 data points, the chart will show some empty space on the right. To correct this, drag the blue mark at the bottom right of the Excel table to remove the deleted data points from the table (as shown below).




While the example of a line chart, you can also create other chart types such as column/bar charts using this technique.

Using Excel Formulas

As mentioned, using Excel table is the best way to create dynamic chart ranges. However, if you can’t use Excel table for some reason (possibly if you are using Excel 2003), there is another (slightly complicated) way to create dynamic chart ranges using Excel formulas and named ranges.

Suppose you have the data set as shown below:

| | A | B |
|---|---|---|
| 1 | **Months** | **Value** |
| 2 | Jan | 28 |
| 3 | Feb | 19 |
| 4 | Mar | 22 |
| 5 | Apr | 26 |
| 6 | May | 25 |
| 7 | June | 18 |

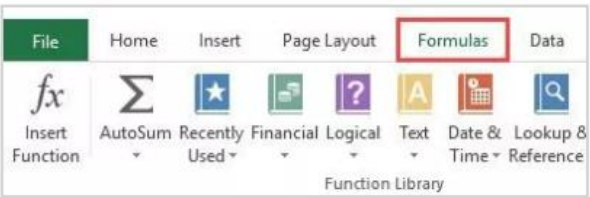
To create a dynamic chart range from this data, we need to:

1. Create two dynamic named ranges using the OFFSET formula (one each for ‘Values’ and ‘Months’ column). Adding/deleting a data point would automatically update these named ranges.
2. Insert a chart that uses the named ranges as a data source.

Step 1 – Creating Dynamic Named Ranges

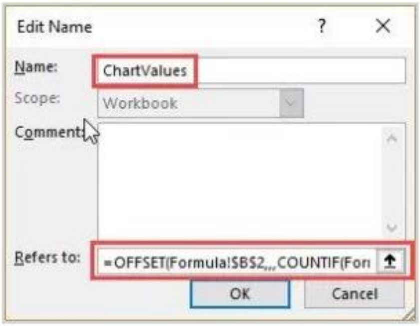
Below are the steps to create dynamic named ranges:

- Go to the ‘Formulas’ Tab.

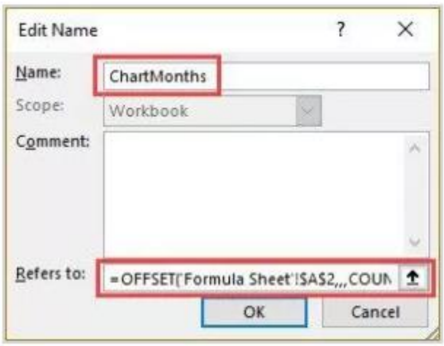


- Click on 'Name Manager'.


- In the Name Manager dialog box, specify the name as **ChartValues** and enter the following formula in Refers to part: =OFFSET(Formula!$B$2,,,COUNTIF(Formula!$B$2:$B$100,"<>"))




- Click OK.
- In the Name Manager dialog box, click on New.
- In the Name Manager dialog box, specify the name as **ChartMonths** and enter the following formula in Refers to part: =OFFSET(Formula!$A$2,,,COUNTIF(Formula!$A$2:$A$100,"<>"))




- Click Ok.
- Click Close.

The above steps have created two named ranges in the Workbook – ChartValue and ChartMonth (these refer to the values and months range in the data set respectively).
If you go and update the value column by adding one more data point, the ChartValue named range would now automatically update to show the additional data point in it.
The magic is done by the OFFSET function here.
In the 'ChartValue' named range formula, we have specified B2 as the reference point. OFFSET formula starts there and extends to cover all the filled cells in the column.

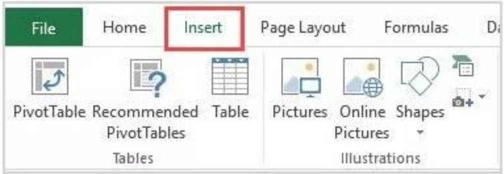
The Same logic works in the ChartMonth named range formula as well.

Step 2 – Create a Chart Using these Named Ranges

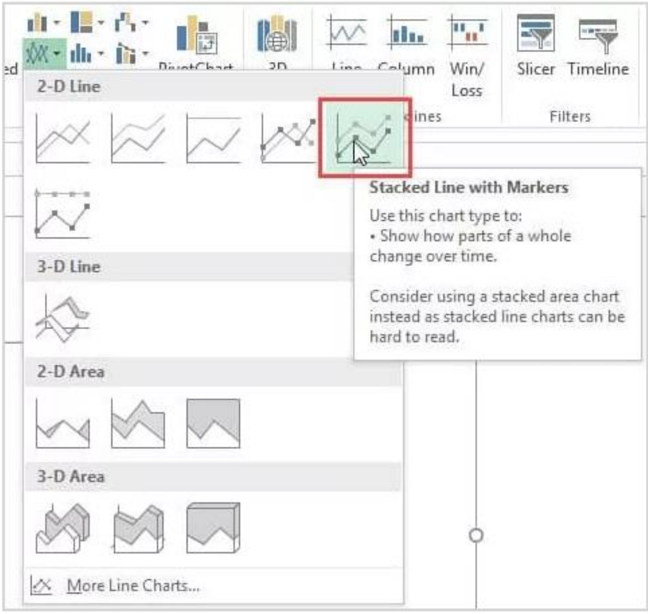
Now all you need to do is insert a chart that will use the named ranges as the data source.

Here are the steps to insert a chart and use dynamic chart ranges:

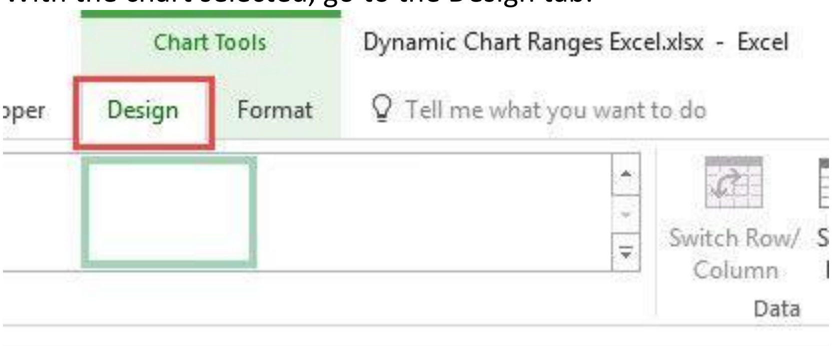
- Go to the Insert tab.



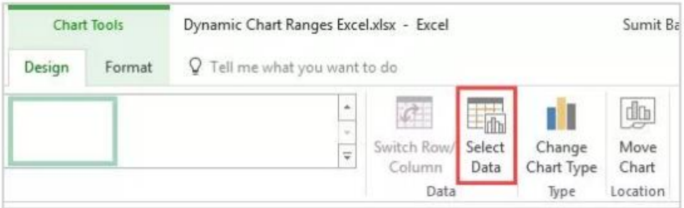

- Click on 'Insert Line or Area Chart' and insert the 'Line with markers' chart. This will insert the chart in the worksheet.



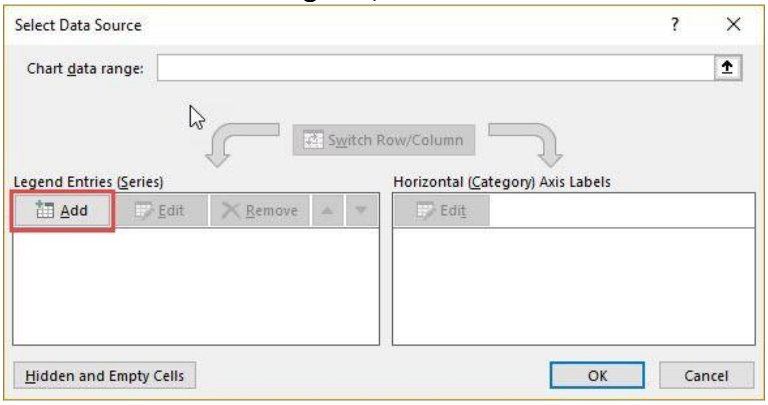

- With the chart selected, go to the Design tab.




- Click on Select Data.

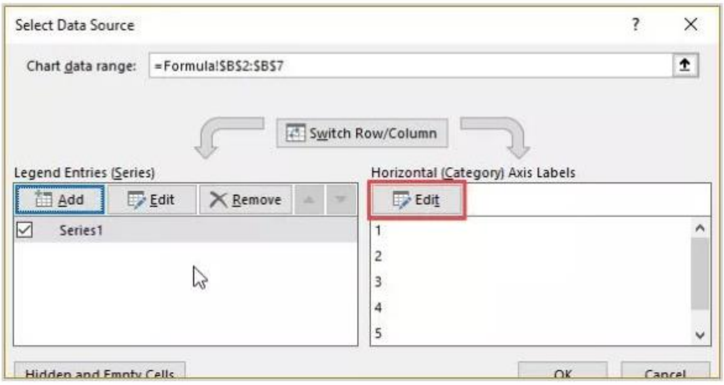



- In the 'Select Data Source' dialog box, click on the Add button in 'Legend Entries




(Series)'.
- In the Series value field, enter =Formula!ChartValues (note that you need to

  specify the worksheet name before the named range for this to work).
- Click OK.
- Click on the Edit button in the 'Horizontal (Category) Axis Labels'.




- In the 'Axis Labels' dialog box, enter =Formula!ChartMonths


- Click Ok.

That's it! Now your chart is using a dynamic range and will update when you add/delete data points in the chart.

A few important things to know when using named ranges with charts:

- There should not be any blank cells in the chart data. If there is a blank, named range would not refer to the correct dataset (as the total count would lead to it referring to less number of cells).
- You need to follow the naming convention when using the sheet name in chart source. For example, if the sheet name is a single word, such as Formula, then you can use =Formula!ChartValue. But if there is more than one word, such as Formula Chart, then you need to use ='Formula Chart'!ChartValue.

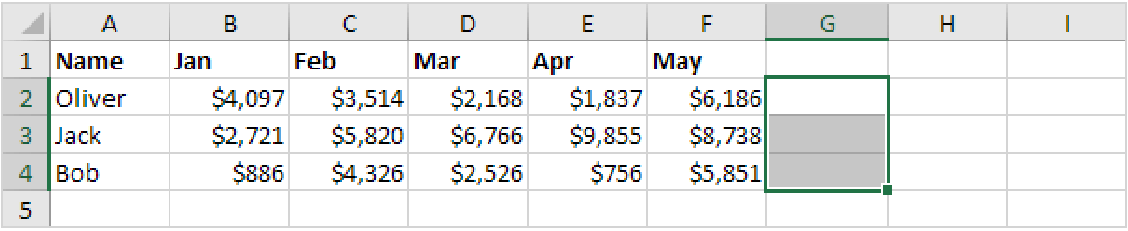
## Lesson 21 - Sparklines in Excel

Sparklines in Excel are graphs that fit in one cell. Sparklines are great for displaying trends.

Insert Sparklines

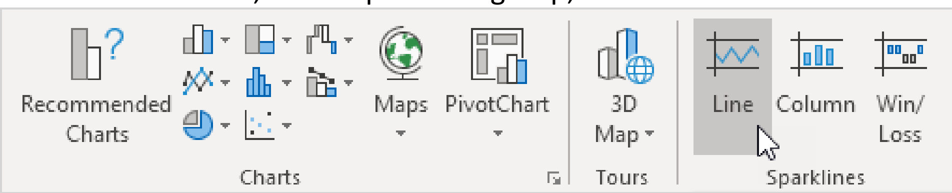
To insert sparklines, execute the following steps.

1. Select the cells where you want the sparklines to appear. In this example, we select the range G2:G4.

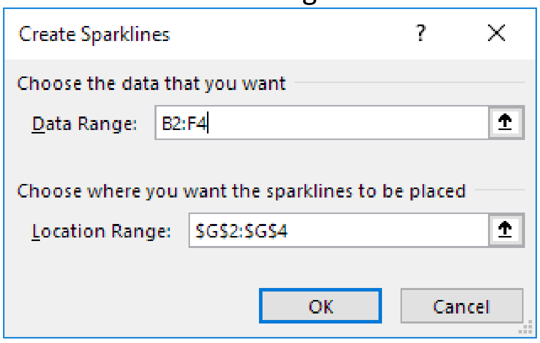


| | A | B | C | D | E | F | G | H | I |
|---|---|---|---|---|---|---|---|---|---|
| 1 | Name | Jan | Feb | Mar | Apr | May | | | |
| 2 | Oliver | $4,097 | $3,514 | $2,168 | $1,837 | $6,186 | | | |
| 3 | Jack | $2,721 | $5,820 | $6,766 | $9,855 | $8,738 | | | |
| 4 | Bob | $886 | $4,326 | $2,526 | $756 | $5,851 | | | |
| 5 | | | | | | | | | |

2. On the Insert tab, in the Sparklines group, click Line.

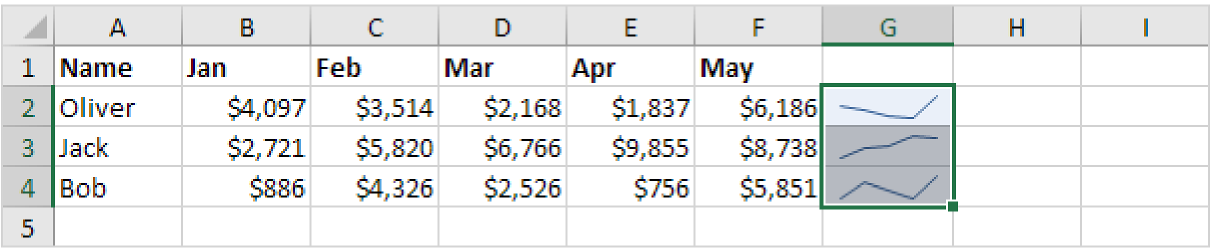



3. Click in the Data Range box and select the range B2:F4.




4. Click OK.

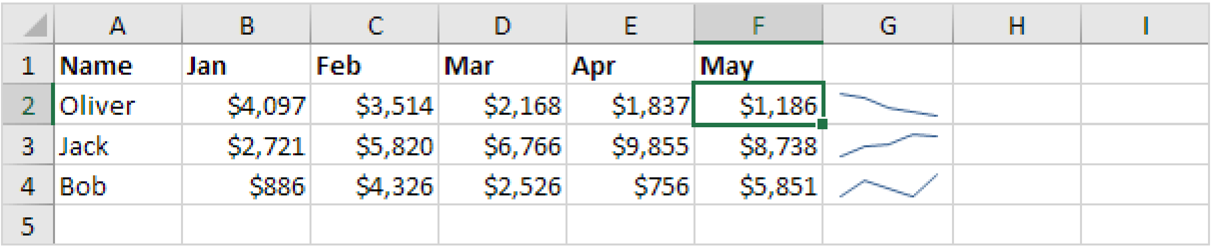
Result:



| | A | B | C | D | E | F | G | H | I |
|---|---|---|---|---|---|---|---|---|---|
| 1 | Name | Jan | Feb | Mar | Apr | May | | | |
| 2 | Oliver | $4,097 | $3,514 | $2,168 | $1,837 | $6,186 | | | |
| 3 | Jack | $2,721 | $5,820 | $6,766 | $9,855 | $8,738 | | | |
| 4 | Bob | $886 | $4,326 | $2,526 | $756 | $5,851 | | | |
| 5 | | | | | | | | | |

5. Change the value in cell F2 to 1186.

Result. Excel automatically updates the sparkline.

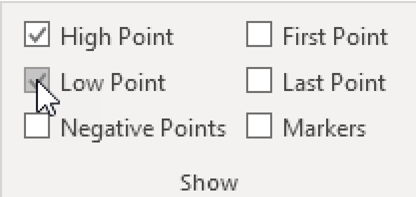


| | A | B | C | D | E | F | G | H | I |
|---|---|---|---|---|---|---|---|---|---|
| 1 | Name | Jan | Feb | Mar | Apr | May | | | |
| 2 | Oliver | $4,097 | $3,514 | $2,168 | $1,837 | $1,186 | | | |
| 3 | Jack | $2,721 | $5,820 | $6,766 | $9,855 | $8,738 | | | |
| 4 | Bob | $886 | $4,326 | $2,526 | $756 | $5,851 | | | |
| 5 | | | | | | | | | |

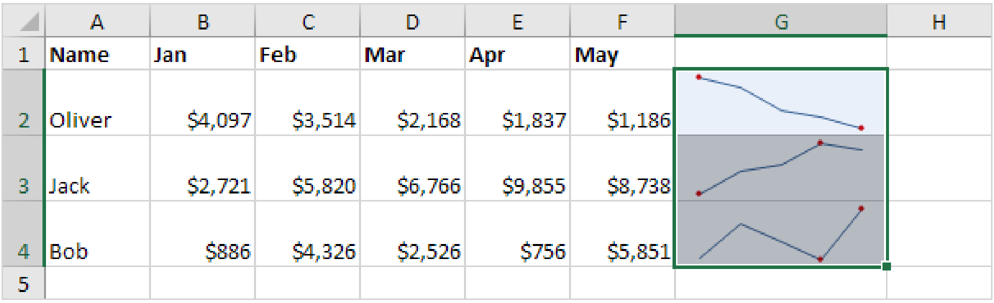
Customize Sparklines

To customize sparklines, execute the following steps.

1. Select the sparklines.
2. On the Design tab, in the Show group, check High Point and Low point.



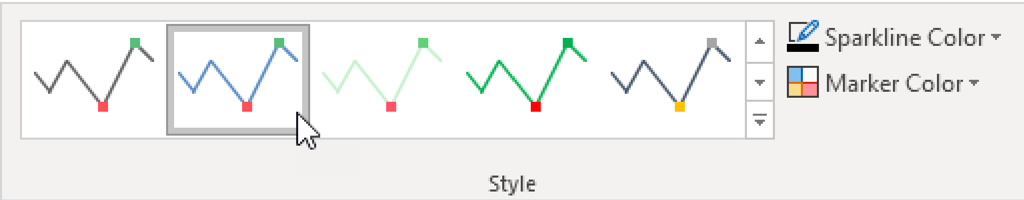

Result:



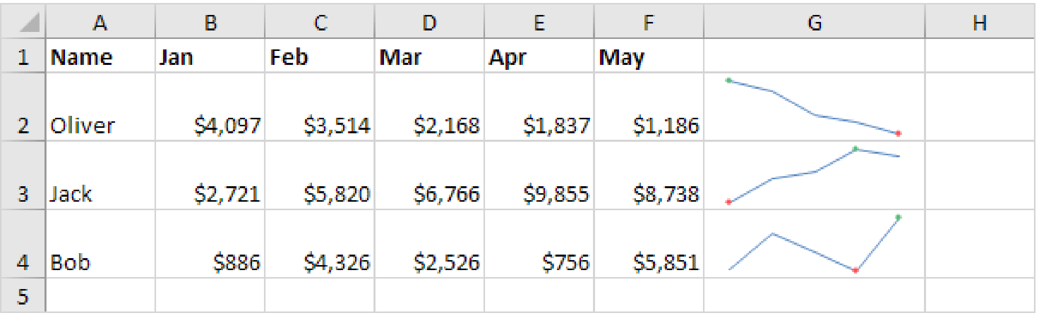
| | A | B | C | D | E | F | G | H |
|---|---|---|---|---|---|---|---|---|
| 1 | Name | Jan | Feb | Mar | Apr | May | | |
| 2 | Oliver | $4,097 | $3,514 | $2,168 | $1,837 | $1,186 | | |
| 3 | Jack | $2,721 | $5,820 | $6,766 | $9,855 | $8,738 | | |
| 4 | Bob | $886 | $4,326 | $2,526 | $756 | $5,851 | | |
| 5 | | | | | | | | |

Note: to make the sparklines larger, simply change the row height and column width of the sparkline cells.

3. On the Design tab, in the Style group, choose a nice visual style.




Result:



| | A | B | C | D | E | F | G | H |
|---|---|---|---|---|---|---|---|---|
| 1 | Name | Jan | Feb | Mar | Apr | May | | |
| 2 | Oliver | $4,097 | $3,514 | $2,168 | $1,837 | $1,186 | | |
| 3 | Jack | $2,721 | $5,820 | $6,766 | $9,855 | $8,738 | | |
| 4 | Bob | $886 | $4,326 | $2,526 | $756 | $5,851 | | |
| 5 | | | | | | | | |

Note: the high points are colored green now and the low points are colored red.

To delete a sparkline, execute the following steps.

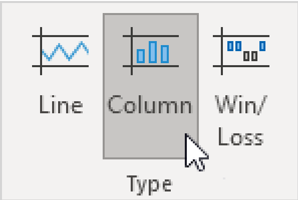
4. Select 1 or more sparklines.
5. On the Design tab, in the Group group, click Clear.


Compare Sparklines

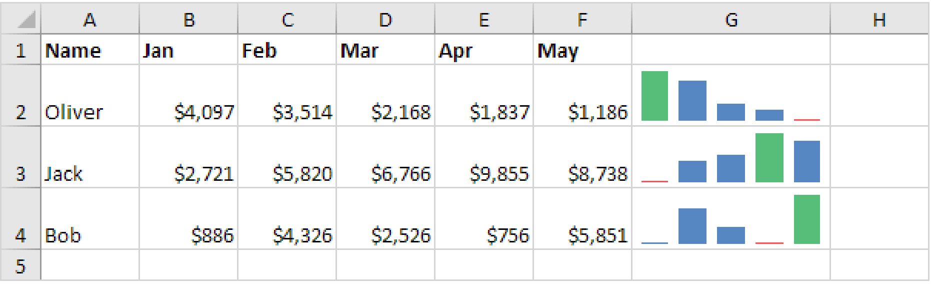
By default, each sparkline has its own vertical scale. The maximum value is plotted at the top of the cell. The minimum value is plotted at the bottom of the cell.

To compare sparklines, execute the following steps.

1. Select the sparklines.
2. On the Design tab, in the Type group, click Column.



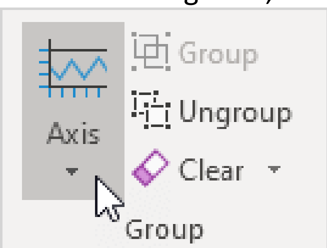

Result:



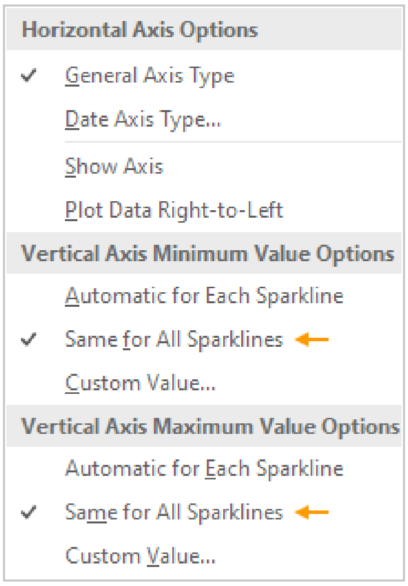
| | A | B | C | D | E | F | G | H |
|---|---|---|---|---|---|---|---|---|
| 1 | Name | Jan | Feb | Mar | Apr | May | | |
| 2 | Oliver | $4,097 | $3,514 | $2,168 | $1,837 | $1,186 | | |
| 3 | Jack | $2,721 | $5,820 | $6,766 | $9,855 | $8,738 | | |
| 4 | Bob | $886 | $4,326 | $2,526 | $756 | $5,851 | | |
| 5 | | | | | | | | |

Note: all green bars have the same height, but the maximum values (B2, E3 and F4) are different!

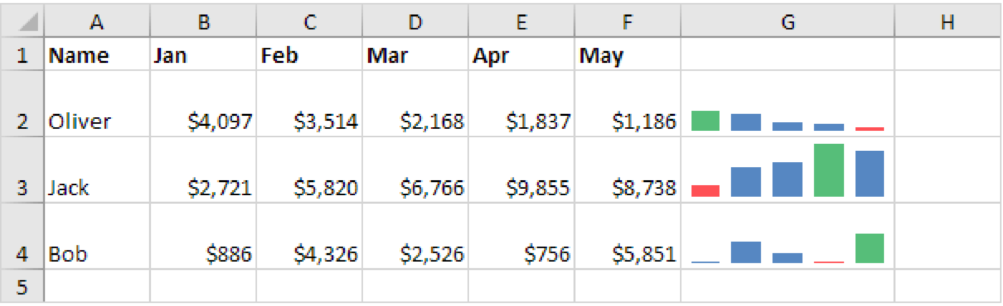
3. Select the sparklines.
4. On the Design tab, in the Group group, click Axis.




5. Under Vertical Axis Minimum Value Options and Vertical Axis Maximum Value Options, select Same for All Sparklines.




Result:

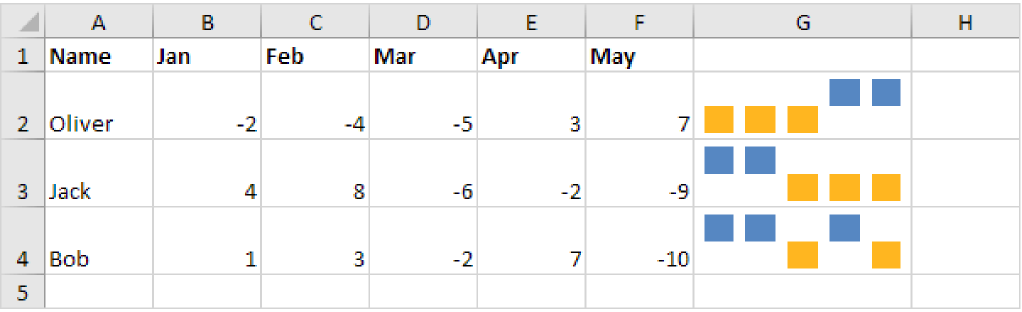


| | A | B | C | D | E | F | G | H |
|---|---|---|---|---|---|---|---|---|
| 1 | Name | Jan | Feb | Mar | Apr | May | | |
| 2 | Oliver | $4,097 | $3,514 | $2,168 | $1,837 | $1,186 | | |
| 3 | Jack | $2,721 | $5,820 | $6,766 | $9,855 | $8,738 | | |
| 4 | Bob | $886 | $4,326 | $2,526 | $756 | $5,851 | | |
| 5 | | | | | | | | |

Note: now you can clearly see that the earnings of Jack are much higher.

Win/Loss Sparklines

A win/loss sparkline only shows whether each value is positive (win) or negative (loss). Sometimes this can be useful.



| | A | B | C | D | E | F | G | H |
|---|---|---|---|---|---|---|---|---|
| 1 | Name | Jan | Feb | Mar | Apr | May | | |
| 2 | Oliver | -2 | -4 | -5 | 3 | 7 | | |
| 3 | Jack | 4 | 8 | -6 | -2 | -9 | | |
| 4 | Bob | 1 | 3 | -2 | 7 | -10 | | |
| 5 | | | | | | | | |

Note: try it yourself. Download the Excel file and select the sparklines. Next, on the Design tab, click Column (instead of Win/Loss) to clearly see how high and low the values are.

## PIVOT TABLE

### Lesson 22 - Overview of Excel Pivot Table

You can use a PivotTable to summarize, analyze, explore, and present summary data. PivotCharts complement PivotTables by adding visualizations to the summary data in a PivotTable, and allow you to easily see comparisons, patterns, and trends. Both PivotTables and PivotCharts enable you to make informed decisions about critical data in your enterprise. You can also connect to external data sources such as SQL Server tables, SQL Server Analysis Services cubes, Azure Marketplace, Office Data Connection (.odc) files, XML files, Access databases, and text files to create PivotTables, or use existing PivotTables to create new tables.

About PivotTables

- A PivotTable is an interactive way to quickly summarize large amounts of data. You can use a PivotTable to analyze numerical data in detail, and answer unanticipated questions about your data. A PivotTable is especially designed for:
- Querying large amounts of data in many user-friendly ways.
- Subtotaling and aggregating numeric data, summarizing data by categories and subcategories, and creating custom calculations and formulas.
- Expanding and collapsing levels of data to focus your results, and drilling down to details from the summary data for areas of interest to you.
- Moving rows to columns or columns to rows (or "pivoting") to see different summaries of the source data.
- Filtering, sorting, grouping, and conditionally formatting the most useful and interesting subset of data enabling you to focus on just the information you want.
- Presenting concise, attractive, and annotated online or printed reports.

Pivot Table

Pivot tables are one of Excel's most powerful features. A pivot table allows you to extract the significance from a large, detailed data set.

Our data set consists of 213 records and 6 fields. Order ID, Product, Category, Amount, Date and Country.

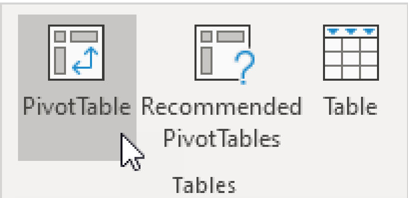
| | A | B | C | D | E | F | G | H |
|---|---|---|---|---|---|---|---|---|
| 1 | Order ID | Product | Category | Amount | Date | Country | | |
| 2 | 1 | Carrots | Vegetables | $4,270 | 1/6/2016 | United States | | |
| 3 | 2 | Broccoli | Vegetables | $8,239 | 1/7/2016 | United Kingdom | | |
| 4 | 3 | Banana | Fruit | $617 | 1/8/2016 | United States | | |
| 5 | 4 | Banana | Fruit | $8,384 | 1/10/2016 | Canada | | |
| 6 | 5 | Beans | Vegetables | $2,626 | 1/10/2016 | Germany | | |
| 7 | 6 | Orange | Fruit | $3,610 | 1/11/2016 | United States | | |
| 8 | 7 | Broccoli | Vegetables | $9,062 | 1/11/2016 | Australia | | |
| 9 | 8 | Banana | Fruit | $6,906 | 1/16/2016 | New Zealand | | |
| 10 | 9 | Apple | Fruit | $2,417 | 1/16/2016 | France | | |
| 11 | 10 | Apple | Fruit | $7,431 | 1/16/2016 | Canada | | |

Insert a Pivot Table

To insert a pivot table, execute the following steps.

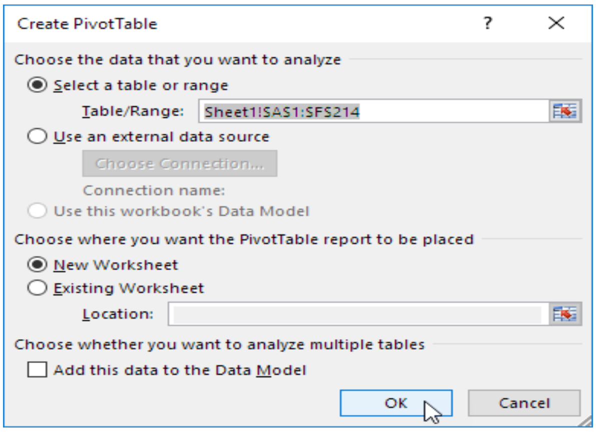
1. Click any single cell inside the data set.

2. On the Insert tab, in the Tables group, click PivotTable.




The following dialog box appears. Excel automatically selects the data for you. The default location for a new pivot table is New Worksheet.

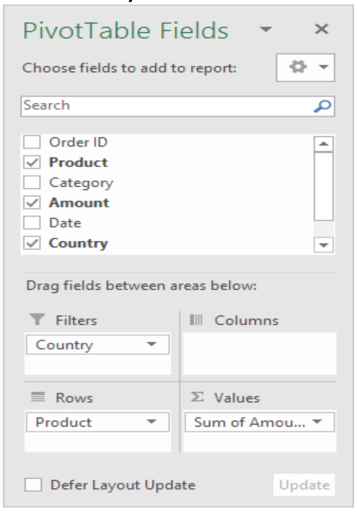
3. Click OK.




Drag fields

The PivotTable Fields pane appears. To get the total amount exported of each product, drag the following fields to the different areas.

1. Product field to the Rows area.
2. Amount field to the Values area.
3. Country field to the Filters area.



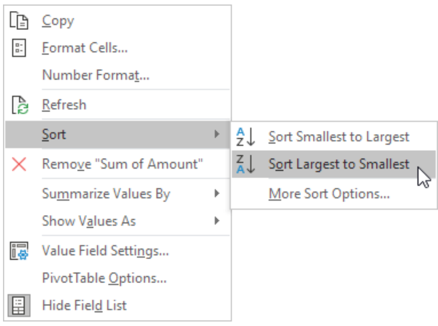

Below you can find the pivot table. Bananas are our main export product. That's how easy pivot tables can be!

| | A | B | C |
|---|---|---|---|
| 1 | Country | (All) | |
| 2 | | | |
| 3 | **Row Labels** | **Sum of Amount** | |
| 4 | Apple | 191257 | |
| 5 | Banana | 340295 | |
| 6 | Beans | 57281 | |
| 7 | Broccoli | 142439 | |
| 8 | Carrots | 136945 | |
| 9 | Mango | 57079 | |
| 10 | Orange | 104438 | |
| 11 | **Grand Total** | **1029734** | |
| 12 | | | |

Sort

To get Banana at the top of the list, sort the pivot table.

1. Click any cell inside the Sum of Amount column.
2. Right click and click on Sort, Sort Largest to Smallest.




Result.

| | A | B | C |
|---|---|---|---|
| 1 | Country | (All) | |
| 2 | | | |
| 3 | **Row Labels** | **Sum of Amount** | |
| 4 | Banana | 340295 | |
| 5 | Apple | 191257 | |
| 6 | Broccoli | 142439 | |
| 7 | Carrots | 136945 | |
| 8 | Orange | 104438 | |
| 9 | Beans | 57281 | |
| 10 | Mango | 57079 | |
| 11 | **Grand Total** | **1029734** | |
| 12 | | | |

Filter

Because we added the Country field to the Filters area, we can filter this pivot table by Country. For example, which products do we export the most to France?

1. Click the filter drop-down and select France.

Result. Apples are our main export product to France.

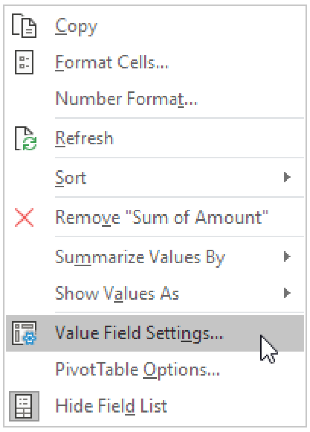
| | A | B | C |
|---|---|---|---|
| 1 | Country | France | |
| 2 | | | |
| 3 | **Row Labels** | **Sum of Amount** | |
| 4 | Apple | 80193 | |
| 5 | Banana | 36094 | |
| 6 | Carrots | 9104 | |
| 7 | Mango | 7388 | |
| 8 | Broccoli | 5341 | |
| 9 | Orange | 2256 | |
| 10 | Beans | 680 | |
| 11 | **Grand Total** | **141056** | |
| 12 | | | |

Note: you can use the standard filter (triangle next to Row Labels) to only show the amounts of specific products.

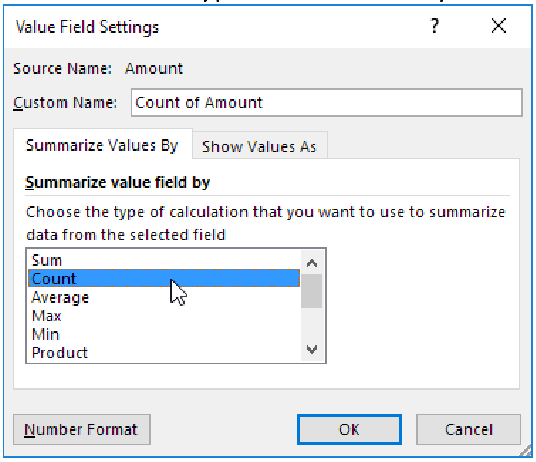
Change Summary Calculation

By default, Excel summarizes your data by either summing or counting the items. To change the type of calculation that you want to use, execute the following steps.

1. Click any cell inside the Sum of Amount column.
2. Right click and click on Value Field Settings.

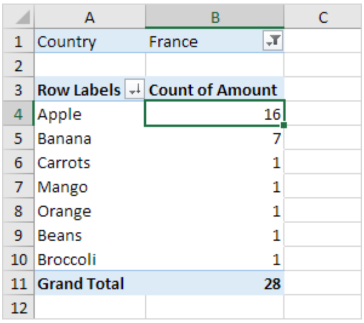



3. Choose the type of calculation you want to use. For example, click Count.




4. Click OK.

Result. 16 out of the 28 orders to France were 'Apple' orders.

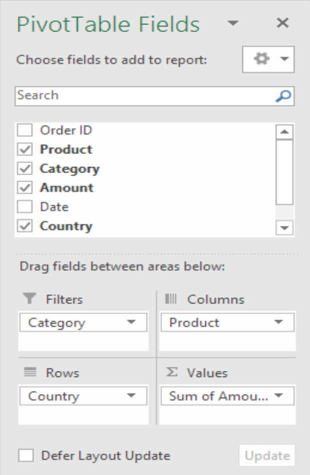


| | A | B | C |
|---|---|---|---|
| 1 | Country | France | |
| 2 | | | |
| 3 | Row Labels | Count of Amount | |
| 4 | Apple | 16 | |
| 5 | Banana | 7 | |
| 6 | Carrots | 1 | |
| 7 | Mango | 1 | |
| 8 | Orange | 1 | |
| 9 | Beans | 1 | |
| 10 | Broccoli | 1 | |
| 11 | Grand Total | 28 | |
| 12 | | | |

## Two-dimensional Pivot Table

If you drag a field to the Rows area and Columns area, you can create a two-dimensional pivot table. First, insert a pivot table. Next, to get the total amount exported to each country, of each product, drag the following fields to the different areas.

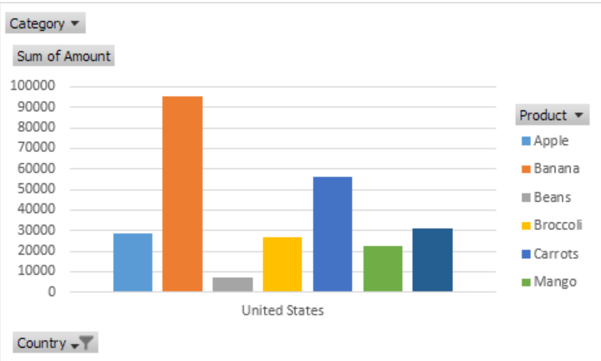
1. Country field to the Rows area.
2. Product field to the Columns area.
3. Amount field to the Values area.
4. Category field to the Filters area.




Below you can find the two-dimensional pivot table.

| | A | B | C | D | E | F | G | H | I |
|---|---|---|---|---|---|---|---|---|---|
| 1 | Category | (All) | | | | | | | |
| 2 | | | | | | | | | |
| 3 | Sum of Amount | Column | | | | | | | |
| 4 | Row Labels | Apple | Banana | Beans | Broccoli | Carrots | Mango | Orange | Grand Total |
| 5 | Australia | 20634 | 52721 | 14433 | 17953 | 8106 | 9186 | 8680 | 131713 |
| 6 | Canada | 24867 | 33775 | | 12407 | | 3767 | 19929 | 94745 |
| 7 | France | 80193 | 36094 | 680 | 5341 | 9104 | 7388 | 2256 | 141056 |
| 8 | Germany | 9082 | 39686 | 29905 | 37197 | 21636 | 8775 | 8887 | 155168 |
| 9 | New Zealand | 10332 | 40050 | | 4390 | | | 12010 | 66782 |
| 10 | United Kingdom | 17534 | 42908 | 5100 | 38436 | 41815 | 5600 | 21744 | 173137 |
| 11 | United States | 28615 | 95061 | 7163 | 26715 | 56284 | 22363 | 30932 | 267133 |
| 12 | Grand Total | 191257 | 340295 | 57281 | 142439 | 136945 | 57079 | 104438 | 1029734 |
| 13 | | | | | | | | | |

To easily compare these numbers, create a pivot chart and apply a filter. Maybe this is one step too far for you at this stage, but it shows you one of the many other powerful pivot table features Excel has to offer.



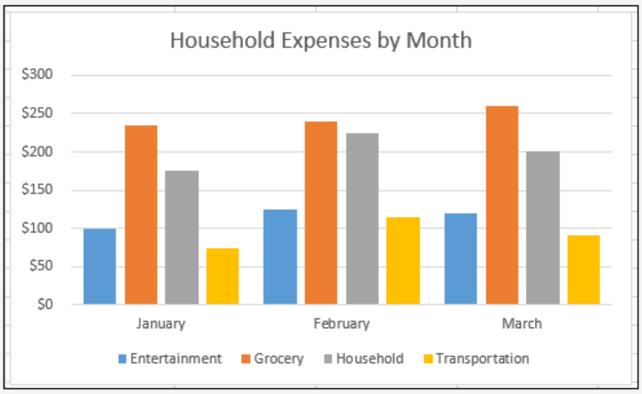

## Lesson 23- Pivot Chart

### Create a PivotChart

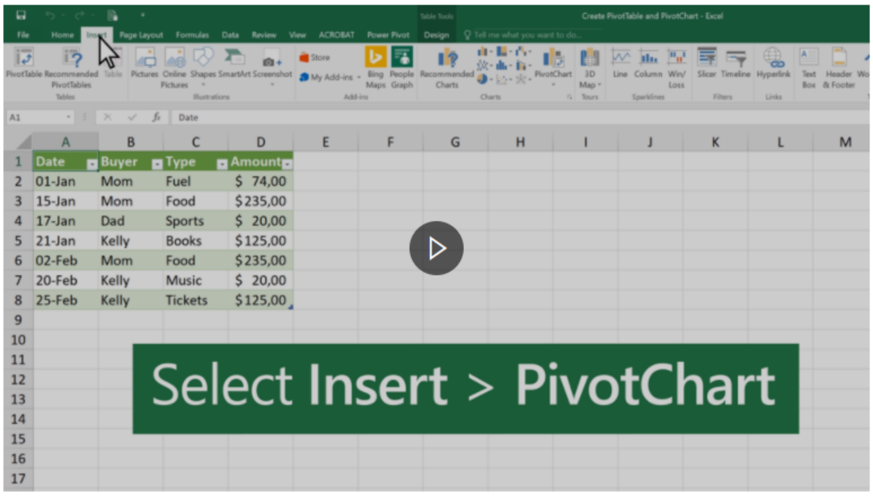
Sometimes it's hard to see the big picture when your raw data hasn’t been summarized. Your first instinct may be to create a PivotTable, but not everyone can look at numbers in a table and quickly see what's going on. Pivot Charts are a great way to add data visualizations to your data.

**Household expense data** **Corresponding PivotChart**

| | A | B | C |
|---|---|---|---|
| 1 | MONTH | CATEGORY | AMOUNT |
| 2 | January | Transportation | $74.00 |
| 3 | January | Grocery | $235.00 |
| 4 | January | Household | $175.00 |
| 5 | January | Entertainment | $100.00 |
| 6 | February | Transportation | $115.00 |
| 7 | February | Grocery | $240.00 |
| 8 | February | Household | $225.00 |
| 9 | February | Entertainment | $125.00 |
| 10 | March | Transportation | $90.00 |
| 11 | March | Grocery | $260.00 |
| 12 | March | Household | $200.00 |
| 13 | March | Entertainment | $120.00 |




Create a PivotChart




1. Select a cell in your table.
2. Select **Insert > PivotChart** .


3. Select **OK**.

Create a chart from a PivotTable

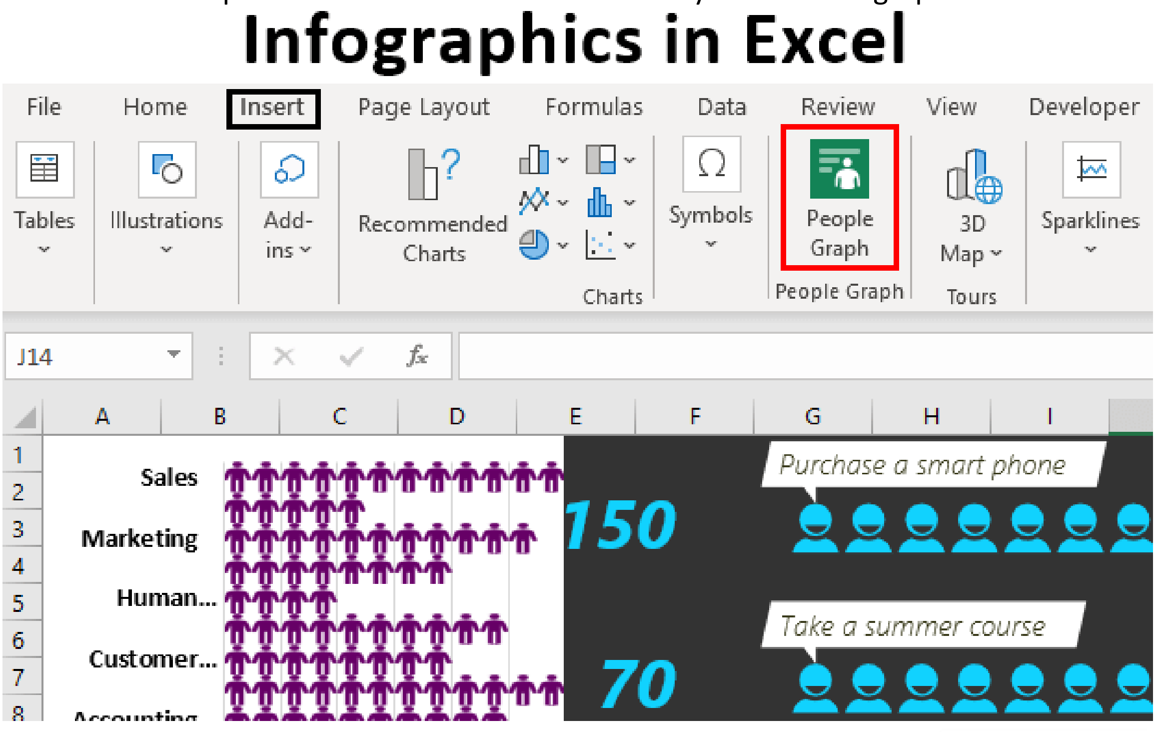
1. Select a cell in your table.


2. Select **PivotTable Tools > Analyze > PivotChart** .
3. Select a chart.
4. Select **OK**.

# INFOGRAPHICS IN EXCEL

## Lesson 24 –Info graphics with Excel

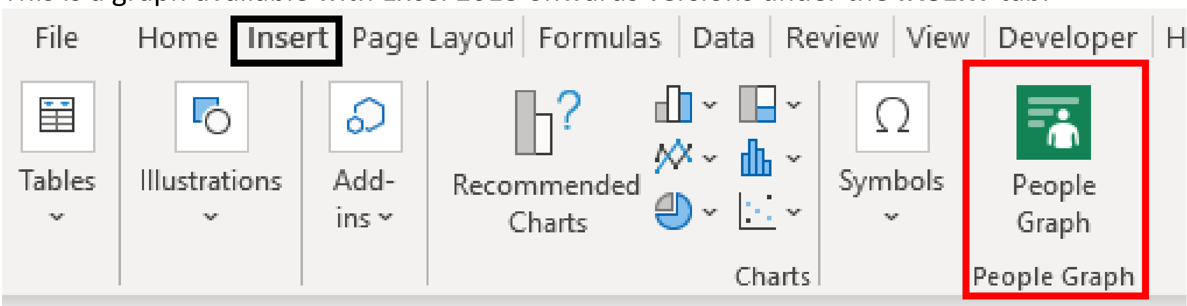
Infographics in excel is the way of showing the information or summary report through attractive charts, graphs, and images. In other words infographics are the art of visualizing the data using external elements or images. They are different from dashboards and require the architectural mind to build your own infographics in excel.




How to Create People Graph Infographics in Excel?

Now we will see some of the examples of creating infographics in excel.

People Graph is the new additional feature available from Excel 2013 versions onwards. This is a graph available with Excel 2013 onwards versions under the **INSERT** tab.

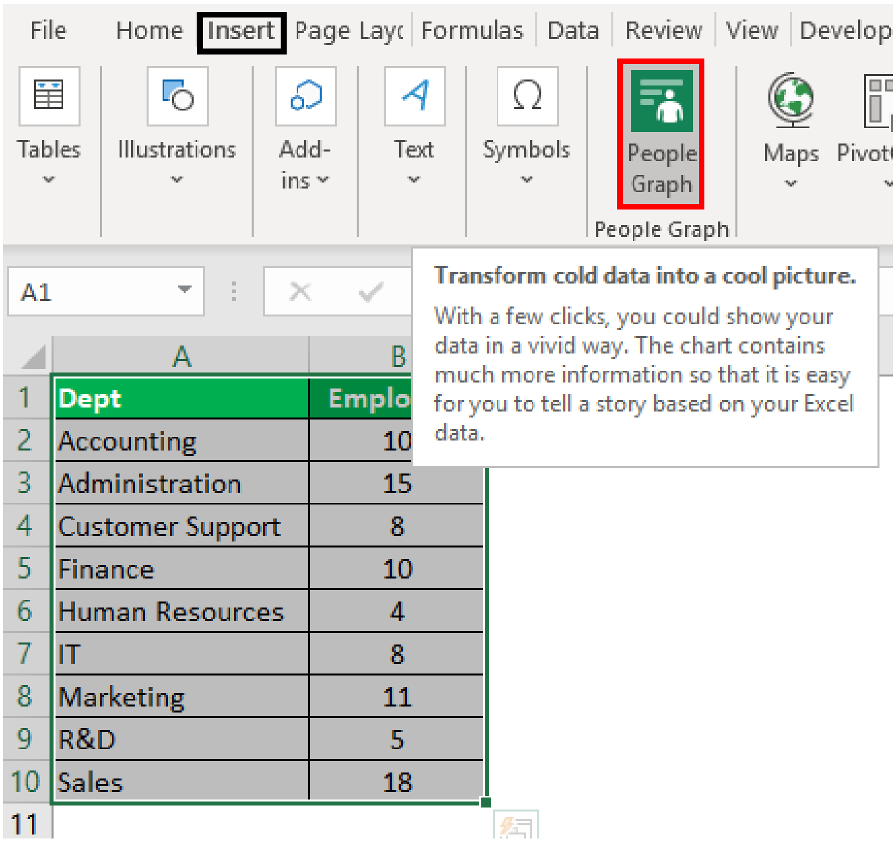



For example, below is an organization’s departmental manpower, and for this data, we will show you how to create people graph infographics in excel.

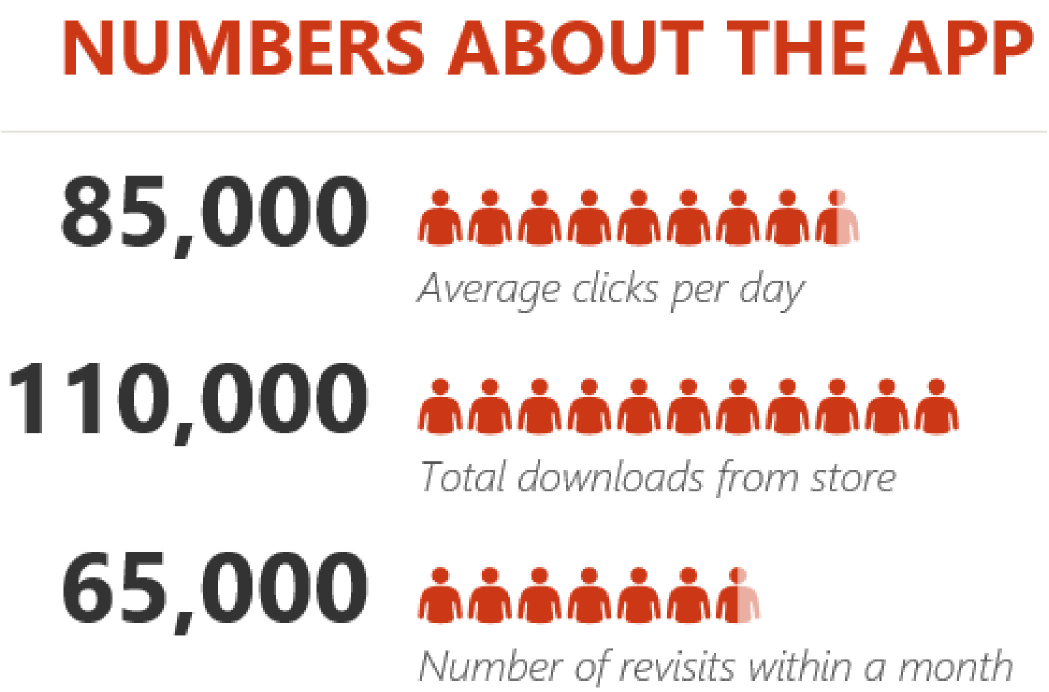
| | A | B | C |
|---|---|---|---|
| 1 | Dept | Employees | |
| 2 | Accounting | 10 | |
| 3 | Administration | 15 | |
| 4 | Customer Support | 8 | |
| 5 | Finance | 10 | |
| 6 | Human Resources | 4 | |
| 7 | IT | 8 | |
| 8 | Marketing | 11 | |
| 9 | R&D | 5 | |
| 10 | Sales | 18 | |
| 11 | | | |

Steps to create an infographics in excel are as follows.

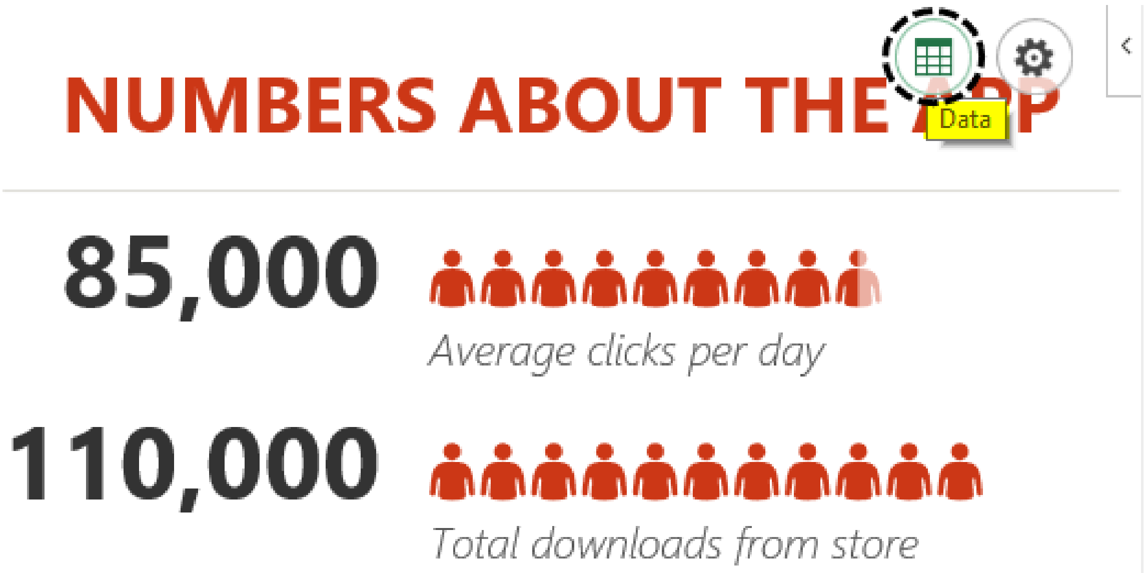
1. **Copy the data to the excel worksheet, select the data to go to the INSERT tab, and click on "People Graph."**



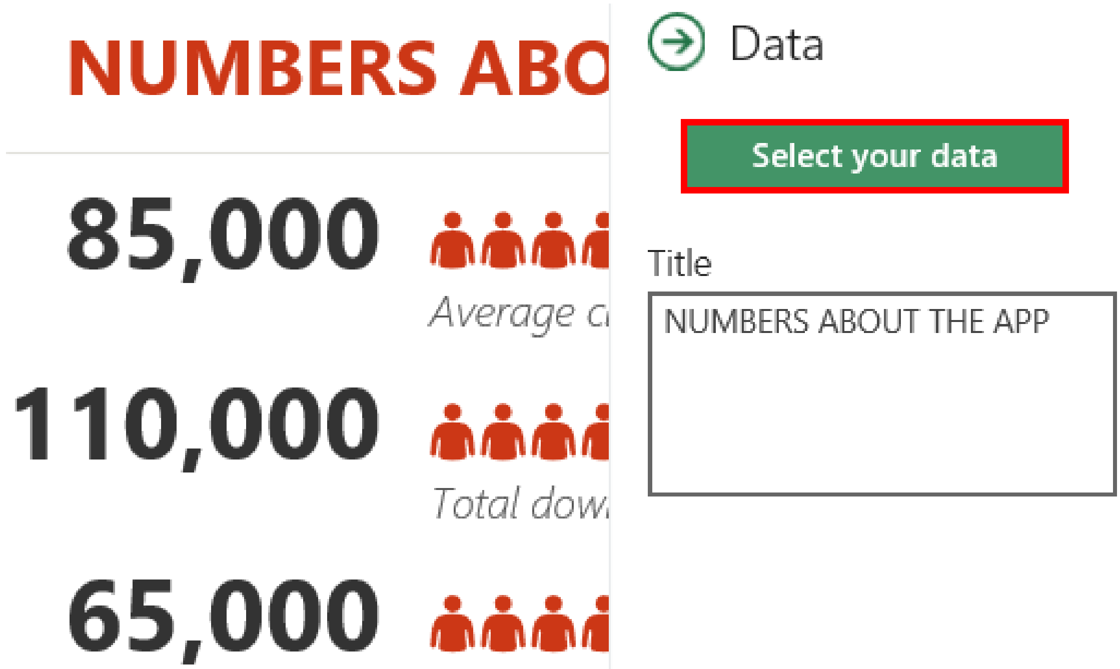

2. **First, it will show about numbers of this particular app.**



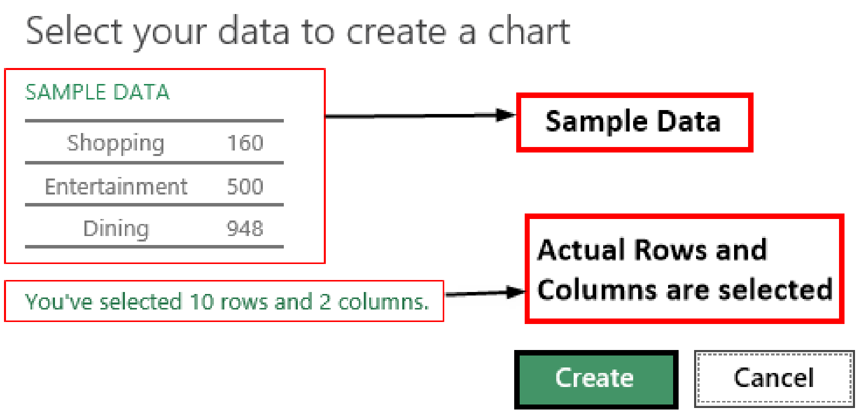

3. **Click on the “Data” icon at the top.**



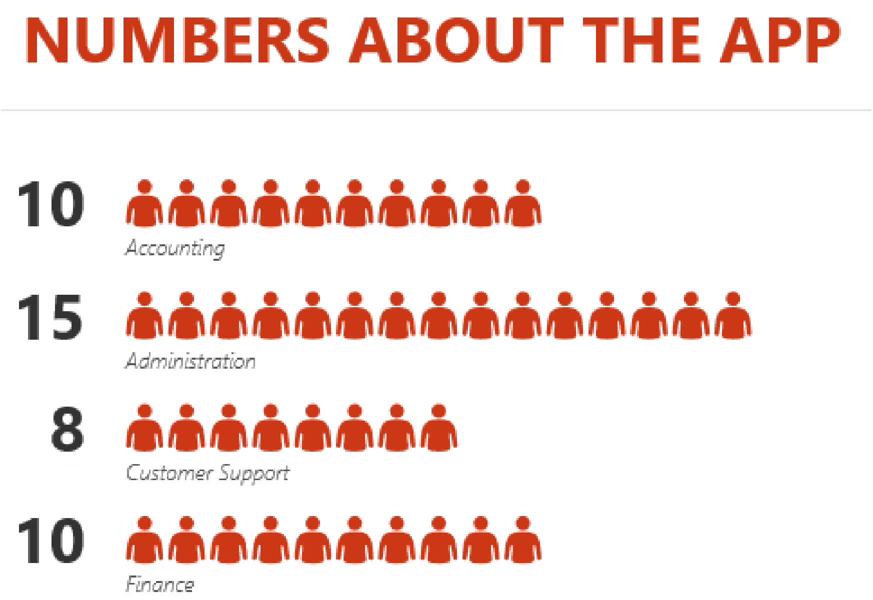

4. **Choose “Select Data”.**




5. **Now, it will show sample data preview, but at the bottom, it shows how many rows and columns in excel are selected. Now click on "Create" to get your first People Graph.**

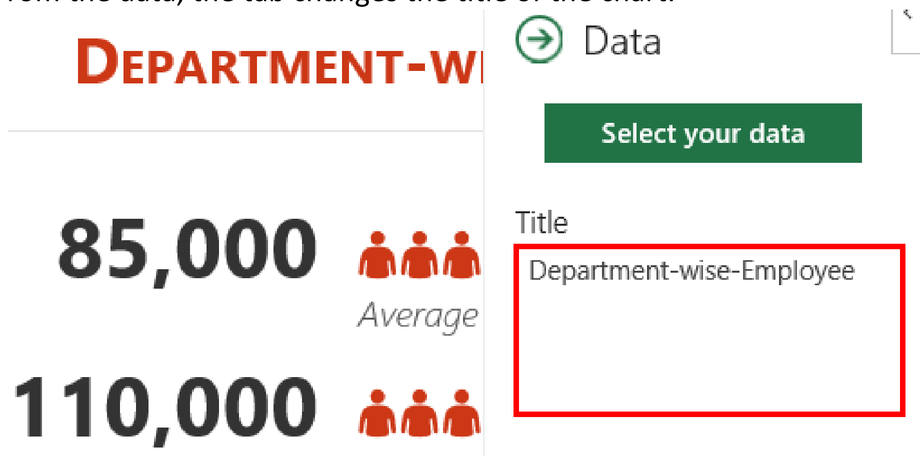



We get the following People Graph.



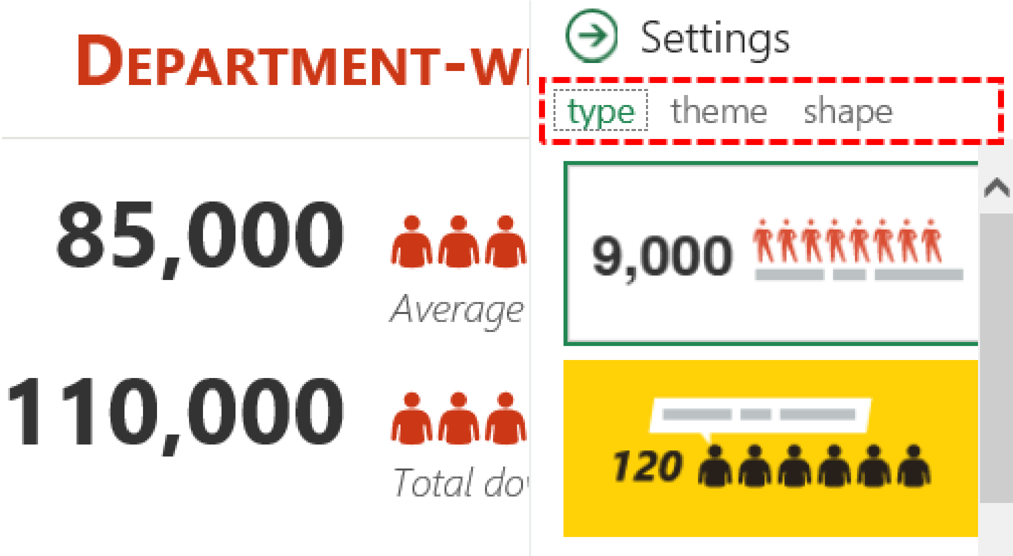

Not all the departments are showing here; we need to expand the chart to see all the department data.

From the data, the tab changes the title of the chart.

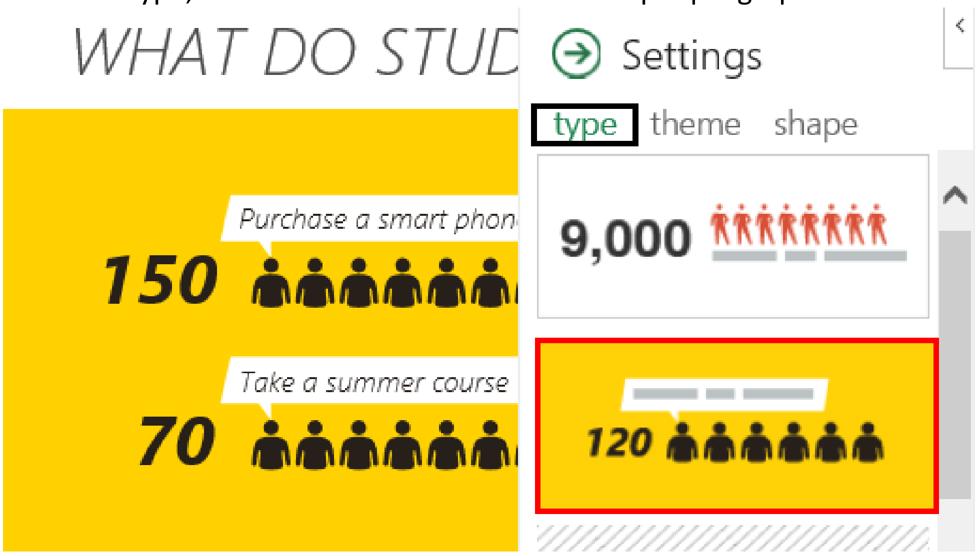



Click on "**Settings**" options to format the chart.


In this "Settings," we have three options, i.e., "**Type**," "**theme**," and "**Shape**."

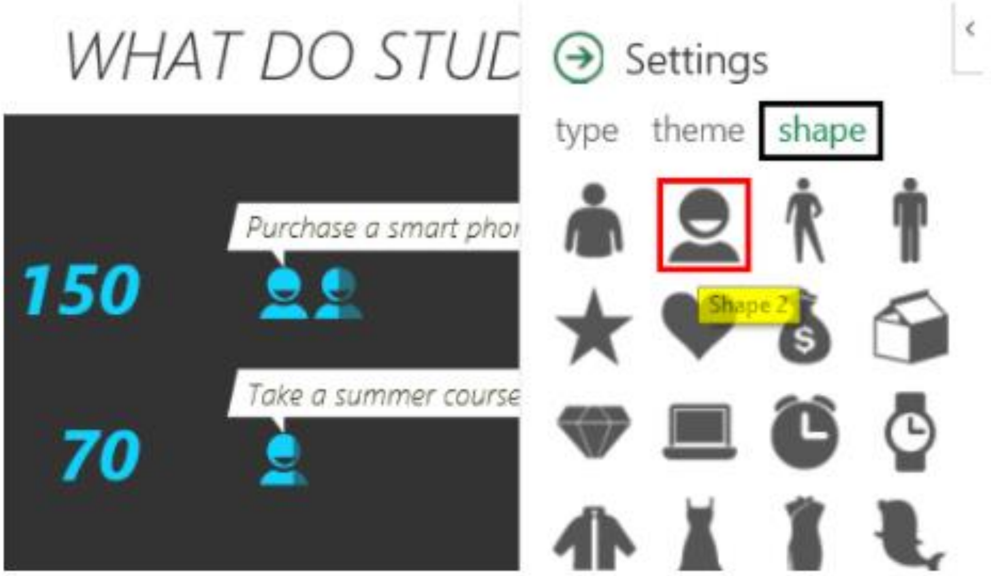



From the type, we can choose a different kind of people graph.




Under "Theme," we can change the color background of the chart.


Under "Shape," we can change icons of the chart.

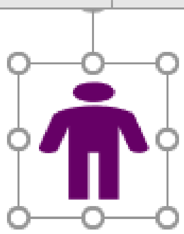



**How to Use External Images to Create Infographics?**

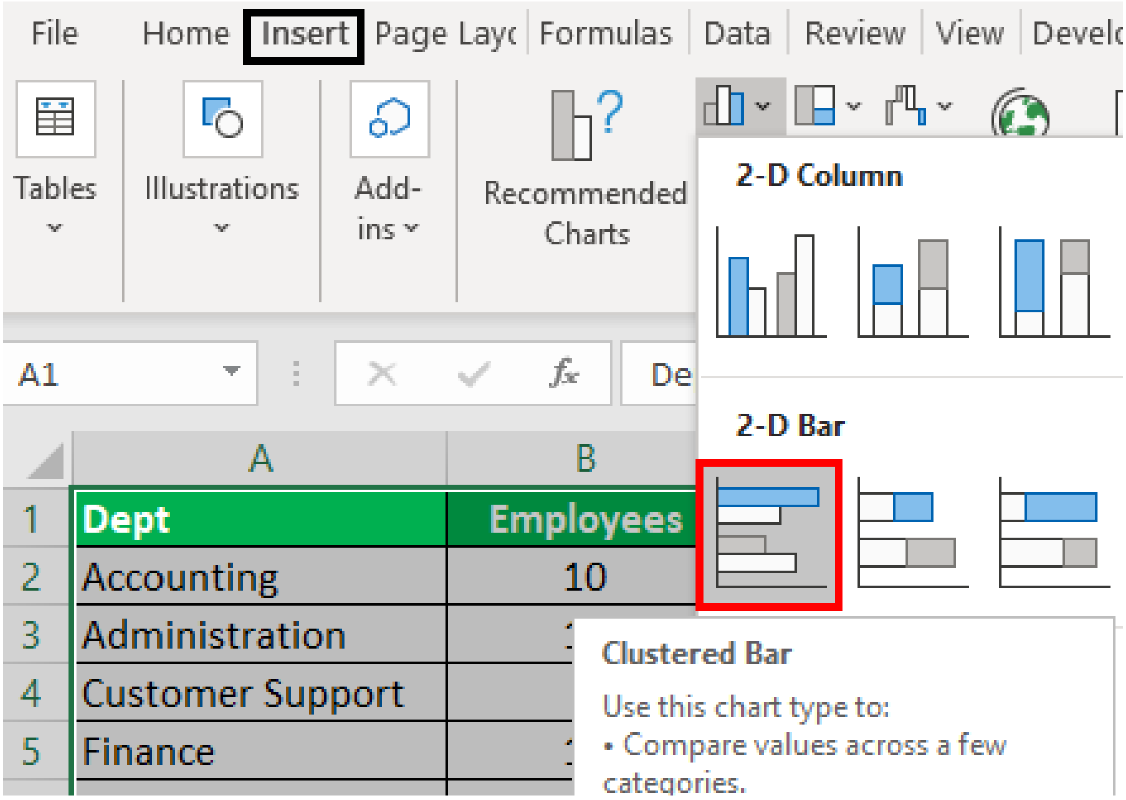
We have seen people graph infographics in excel; we can build infographics by using external images as well. For the same data, we will use a human image from outside excel.

I have downloaded the below human image from the internet into excel worksheet.

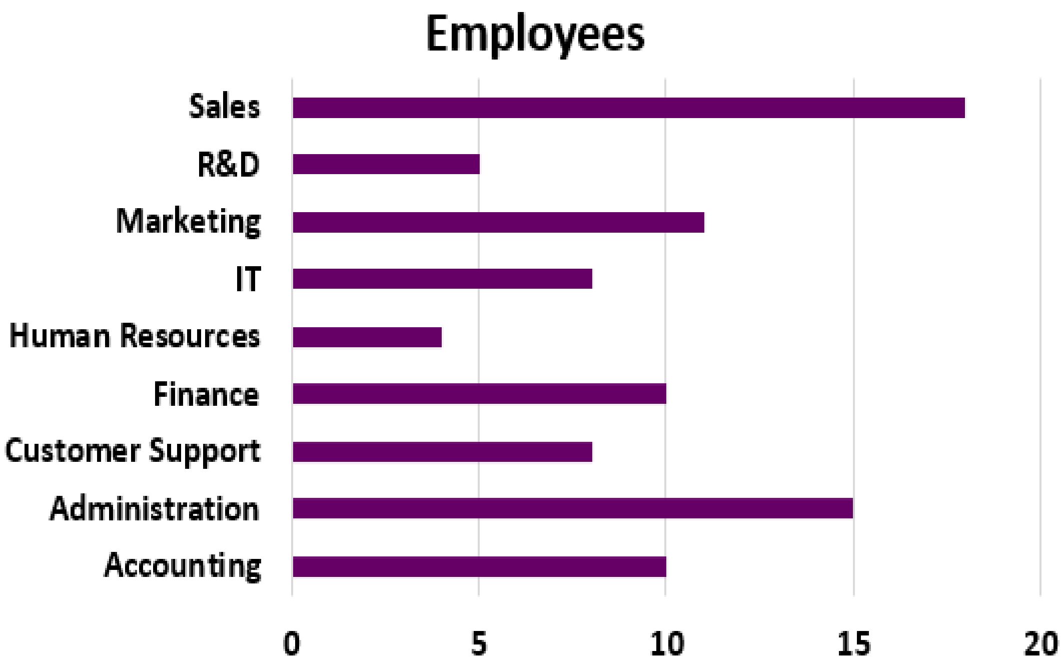
| | A | B |
|---|---|---|
| 1 | Dept | Employees |
| 2 | Accounting | 10 |
| 3 | Administration | 15 |
| 4 | Customer Support | 8 |
| 5 | Finance | 10 |
| 6 | Human Resources | 4 |
| 7 | IT | 8 |
| 8 | Marketing | 11 |
| 9 | R&D | 5 |
| 10 | Sales | 18 |
| 11 | | |



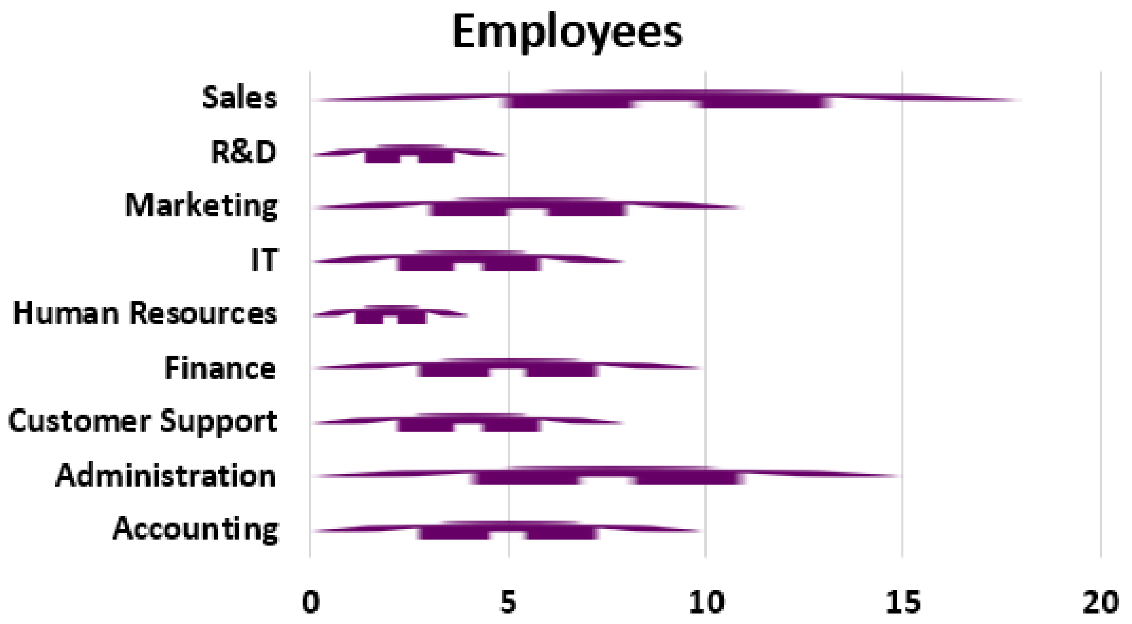
First, insert a bar chart in excel for the data.



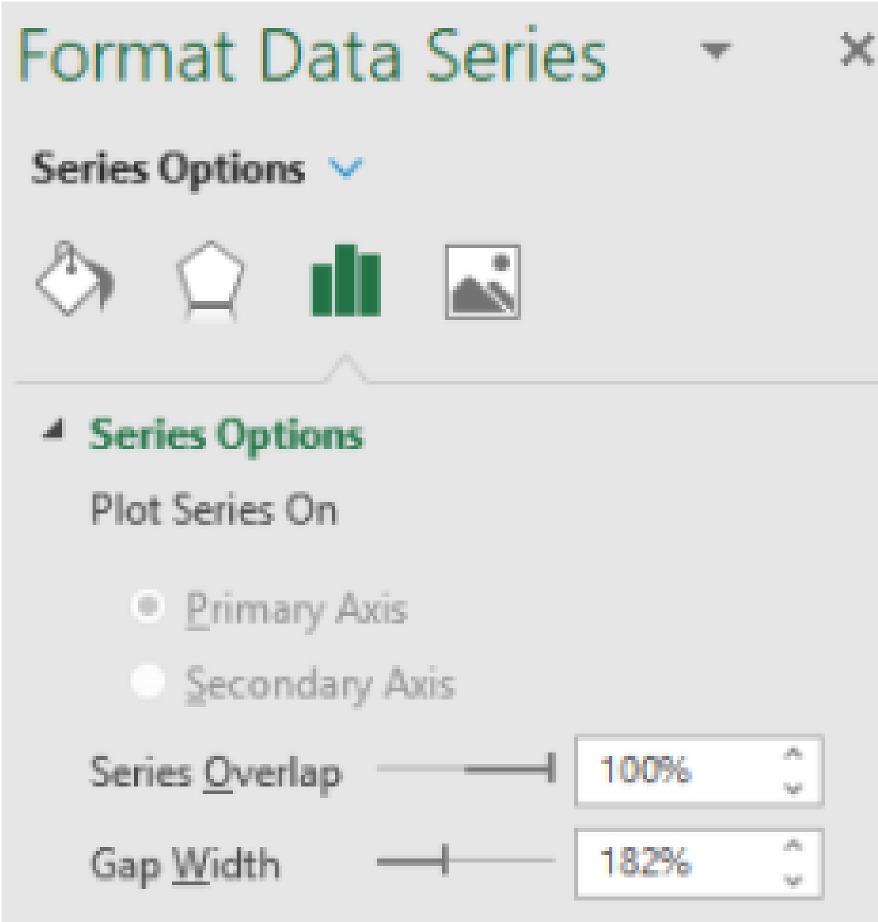

Now we have a chart like this.



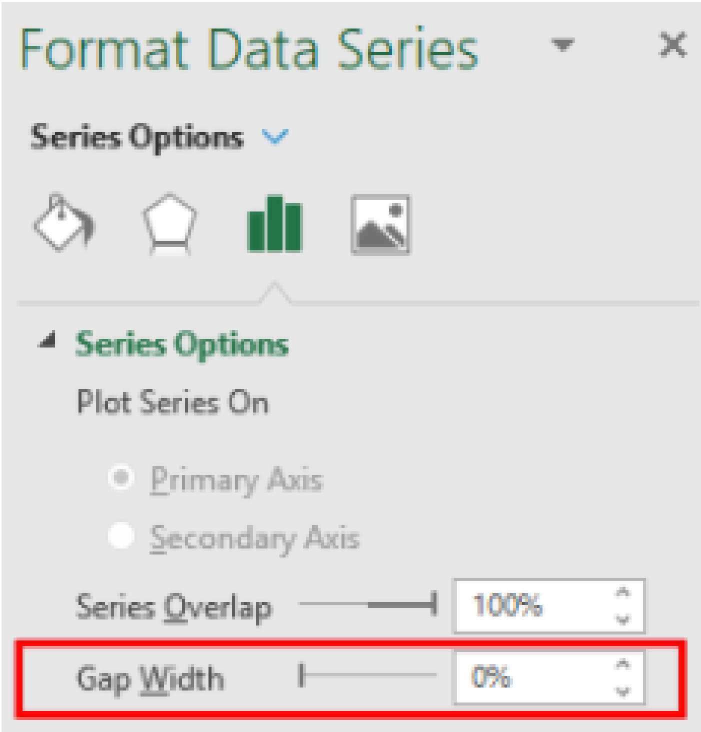

What you have to do is copy the human image >>> select the bar and paste it.



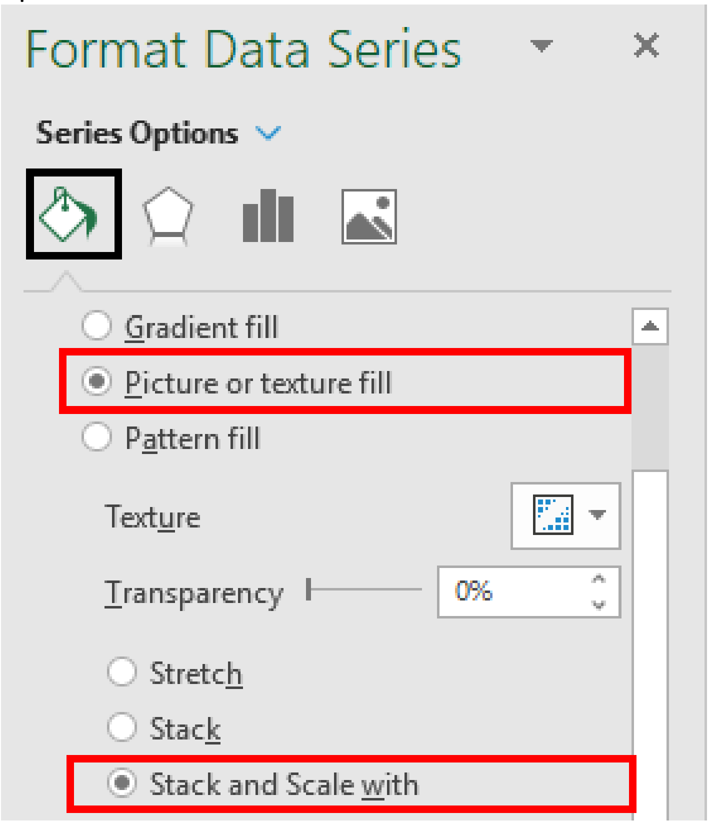

We need to format the chart to make it more beautiful. Select the bar and press Ctrl + 1 to open the formatting tab to the right side.




Make the "Gap Width" as 0%.




Now go to “Fill” and click on “Fill.”Make the fill as “Picture or Texture Fill” and check the option of “Stack and Scale Width.”

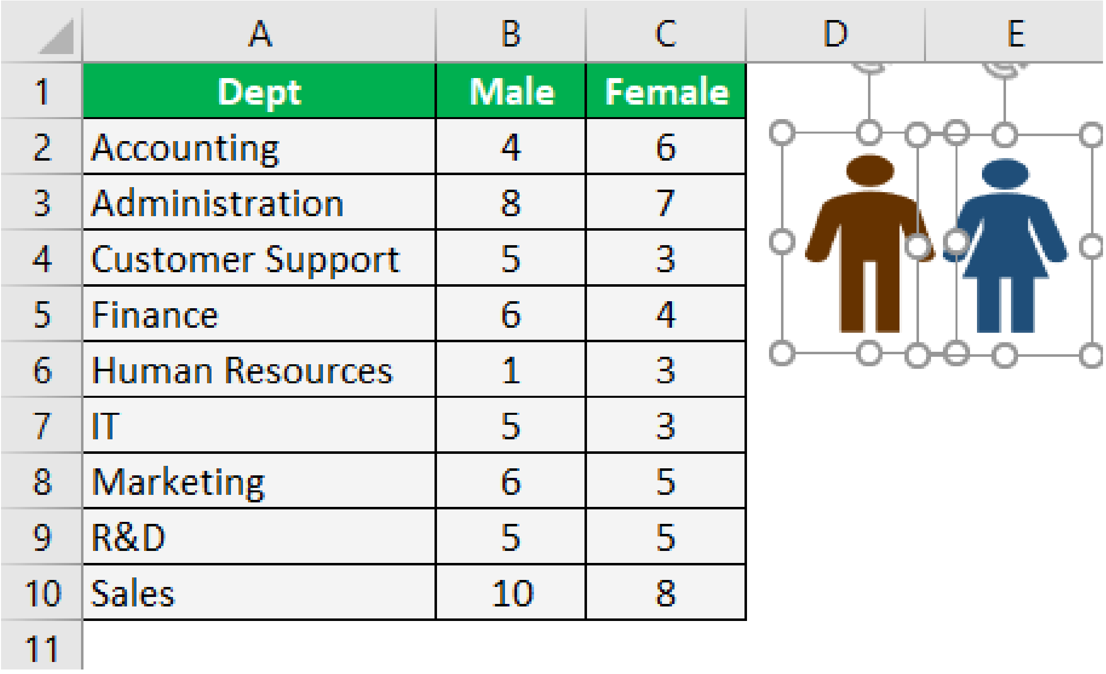



Now our chart looks like this.


Now assume we have a segregation of “Male” and “Female” employees.

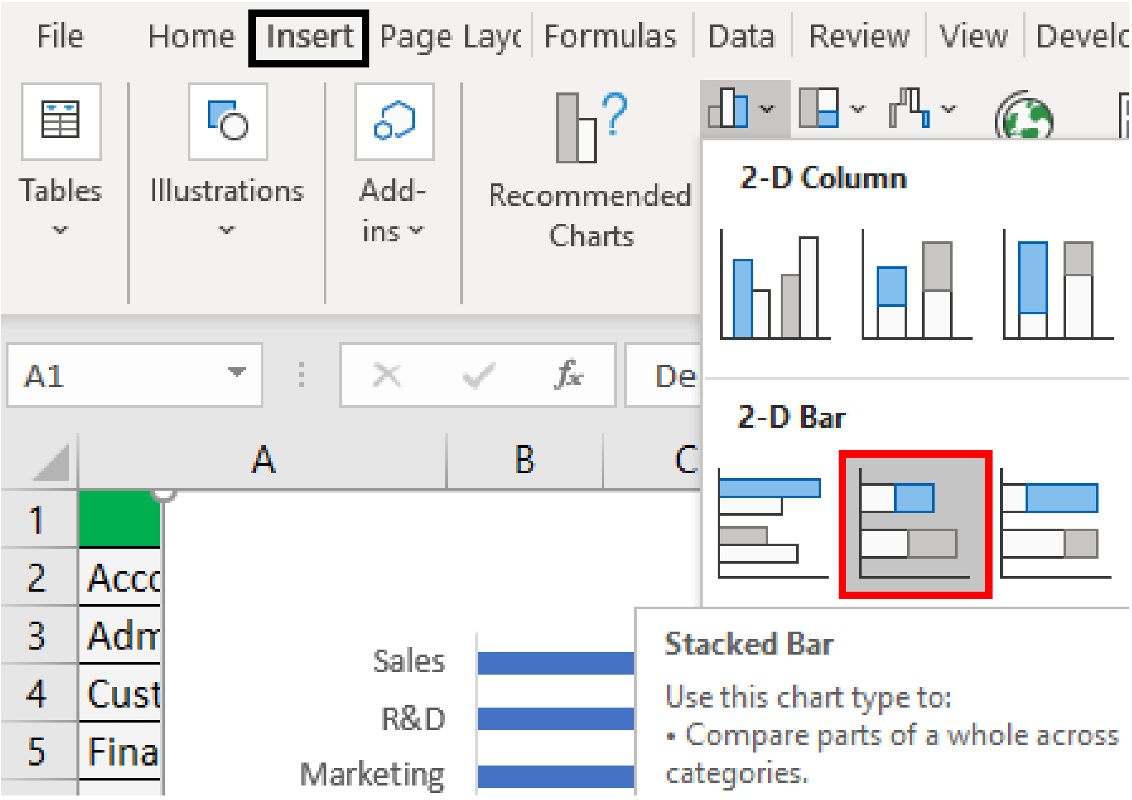
| Dept | Male | Female |
|---|---|---|
| Accounting | 4 | 6 |
| Administration | 8 | 7 |
| Customer Support | 5 | 3 |
| Finance | 6 | 4 |
| Human Resources | 1 | 3 |
| IT | 5 | 3 |
| Marketing | 6 | 5 |
| R&D | 5 | 5 |
| Sales | 10 | 8 |

In the infographic chart, we need to show male and female human images.

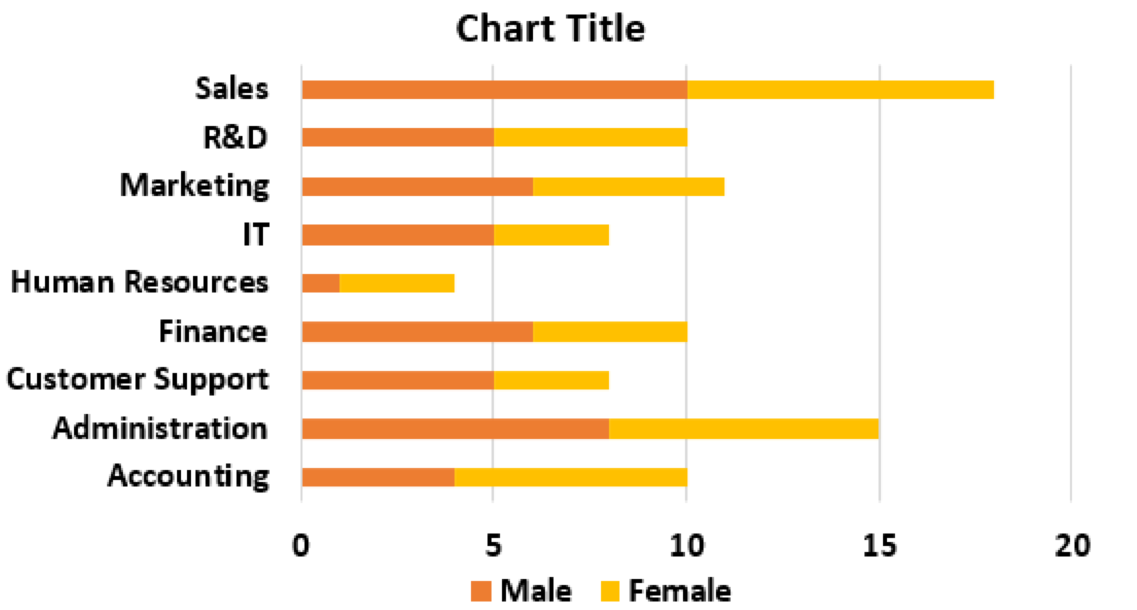


| | A | B | C |
|---|---|---|---|
| 1 | Dept | Male | Female |
| 2 | Accounting | 4 | 6 |
| 3 | Administration | 8 | 7 |
| 4 | Customer Support | 5 | 3 |
| 5 | Finance | 6 | 4 |
| 6 | Human Resources | 1 | 3 |
| 7 | IT | 5 | 3 |
| 8 | Marketing | 6 | 5 |
| 9 | R&D | 5 | 5 |
| 10 | Sales | 10 | 8 |

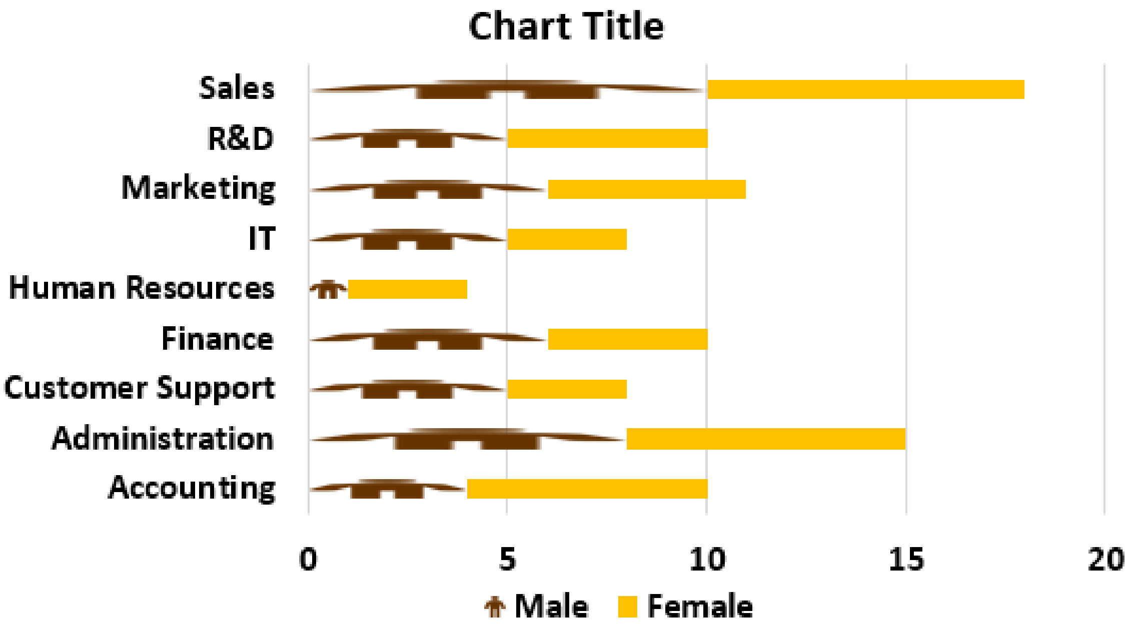
Select the data and insert the "Stacked Bar" chart.



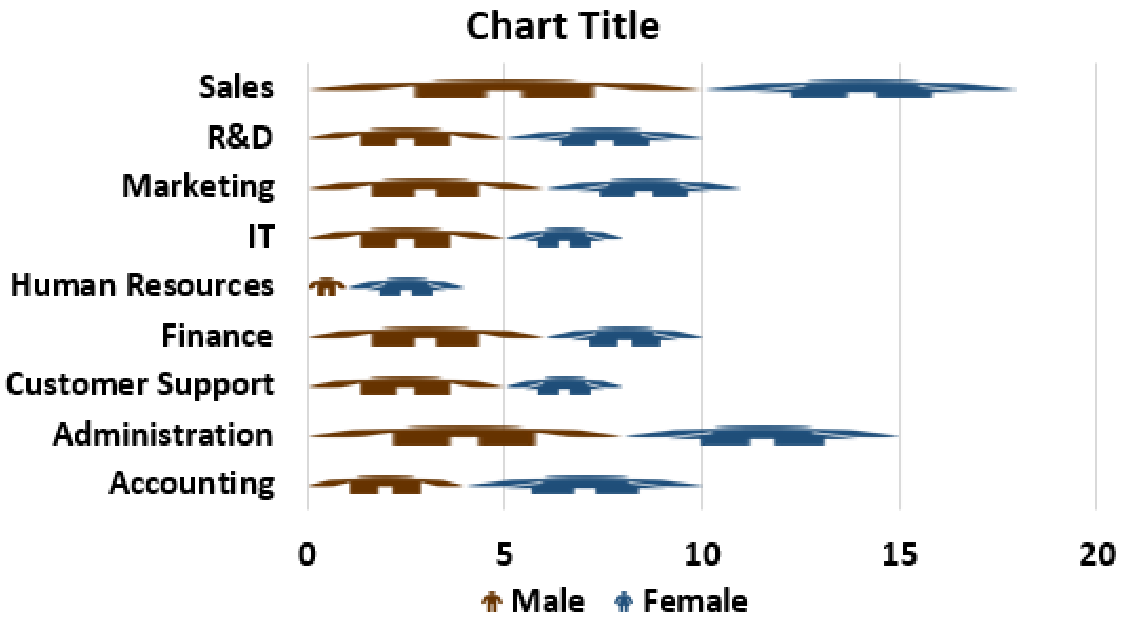

Now we have a chart like this.




Copy the “Male” image and paste it on an orange-colored bar.




Copy the “Female” image and paste it on a yellow-colored bar.




Select the male bar and format the data series as we did in the previous example. Do the same thing for the "Female" chart as well, and we have a segregation of "Male" and "Female" separately now.


We do one more thing to show male and female employees differently. Arrange the data in the below manner.

| | A | B | C | D |
|---|---|---|---|---|
| 1 | Dept | Male | Female | |
| 2 | Accounting | -4 | 6 | |
| 3 | Administration | -8 | 7 | |
| 4 | Customer Support | -5 | 3 | |
| 5 | Finance | -6 | 4 | |
| 6 | Human Resources | -1 | 3 | |
| 7 | IT | -5 | 3 | |
| 8 | Marketing | -6 | 5 | |
| 9 | R&D | -5 | 5 | |
| 10 | Sales | -10 | 8 | |
| 11 | | | | |

I have converted male employee’s numbers to, now, we can see male employees to the left and female employees to the right.

# ADVANCED DATA ANALYSIS

## Lesson 25 - Advanced sorting & filtering

You can sort your Excel data on one column or multiple columns. You can sort in ascending or descending order.

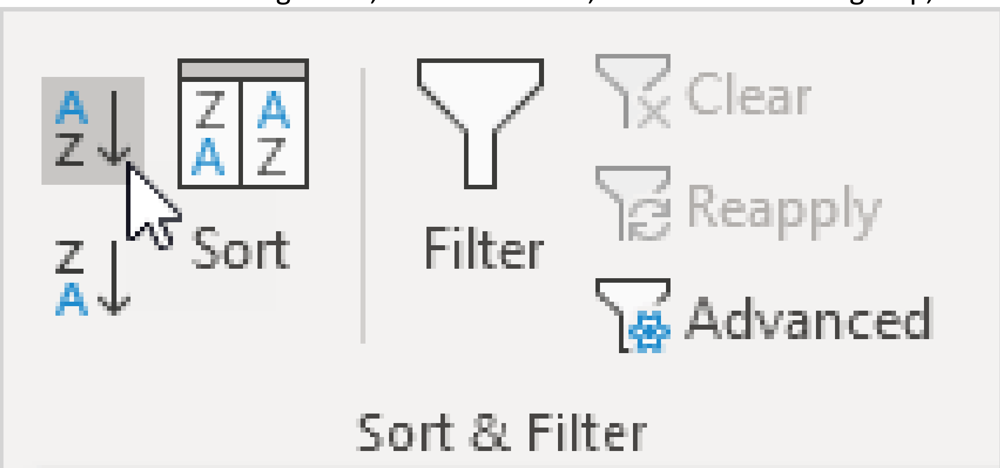
One Column

To sort on one column, execute the following steps.

1. Click any cell in the column you want to sort.

| | A | B | C | D | E |
|---|---|---|---|---|---|
| 1 | **Last Name** | **Sales** | **Country** | **Quarter** | |
| 2 | Smith | $16,753.00 | UK | Qtr 3 | |
| 3 | Johnson | $14,808.00 | USA | Qtr 4 | |
| 4 | Williams | $10,644.00 | UK | Qtr 2 | |
| 5 | Jones | $1,390.00 | USA | Qtr 3 | |
| 6 | Brown | $4,865.00 | USA | Qtr 4 | |
| 7 | Williams | $12,438.00 | UK | Qtr 1 | |
| 8 | Johnson | $9,339.00 | UK | Qtr 2 | |
| 9 | Smith | $18,919.00 | USA | Qtr 3 | |
| 10 | Jones | $9,213.00 | USA | Qtr 4 | |
| 11 | Jones | $7,433.00 | UK | Qtr 1 | |
| 12 | Brown | $3,255.00 | USA | Qtr 2 | |
| 13 | Williams | $14,867.00 | USA | Qtr 3 | |
| 14 | Williams | $19,302.00 | UK | Qtr 4 | |
| 15 | Smith | $9,698.00 | USA | Qtr 1 | |
| 16 | | | | | |

2. To sort in ascending order, on the Data tab, in the Sort & Filter group, click AZ.




Result:

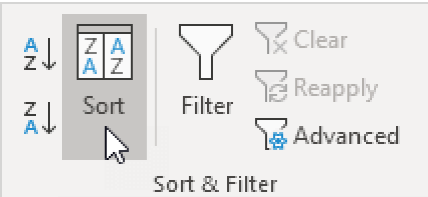
| | A | B | C | D | E |
|---|---|---|---|---|---|
| 1 | **Last Name** | **Sales** | **Country** | **Quarter** | |
| 2 | Brown | $4,865.00 | USA | Qtr 4 | |
| 3 | Brown | $3,255.00 | USA | Qtr 2 | |
| 4 | Johnson | $14,808.00 | USA | Qtr 4 | |
| 5 | Johnson | $9,339.00 | UK | Qtr 2 | |
| 6 | Jones | $1,390.00 | USA | Qtr 3 | |
| 7 | Jones | $9,213.00 | USA | Qtr 4 | |
| 8 | Jones | $7,433.00 | UK | Qtr 1 | |
| 9 | Smith | $16,753.00 | UK | Qtr 3 | |
| 10 | Smith | $18,919.00 | USA | Qtr 3 | |
| 11 | Smith | $9,698.00 | USA | Qtr 1 | |
| 12 | Williams | $10,644.00 | UK | Qtr 2 | |
| 13 | Williams | $12,438.00 | UK | Qtr 1 | |
| 14 | Williams | $14,867.00 | USA | Qtr 3 | |
| 15 | Williams | $19,302.00 | UK | Qtr 4 | |
| 16 | | | | | |

Note: to sort in descending order, click ZA.

Multiple Columns

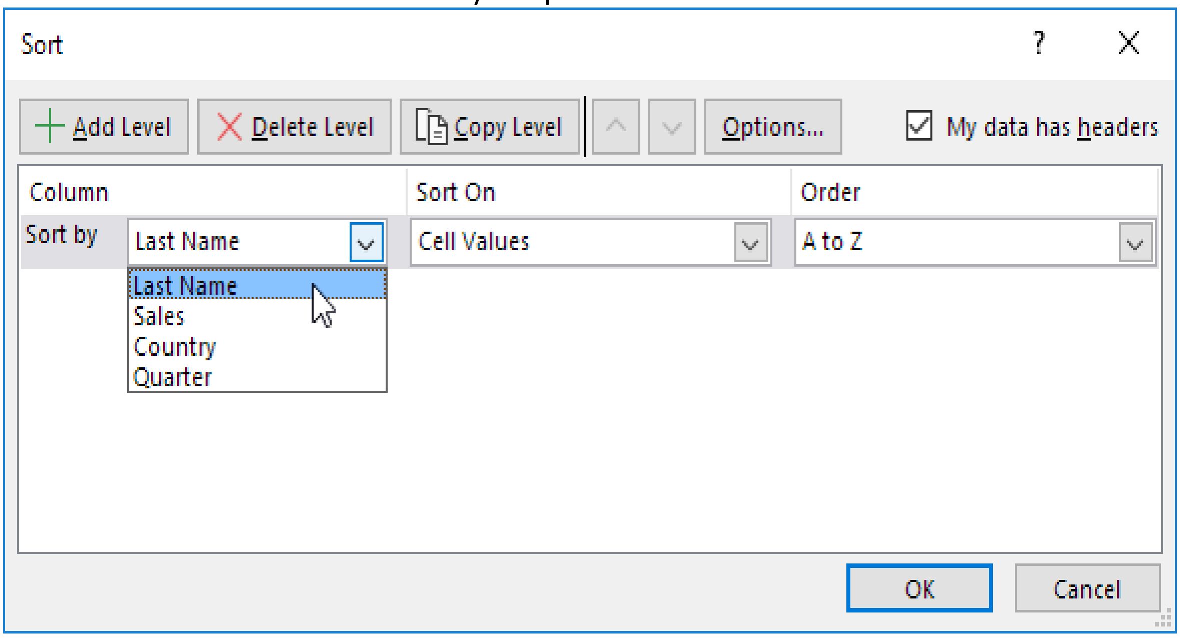
To sort on multiple columns, execute the following steps.

1. On the Data tab, in the Sort & Filter group, click Sort.



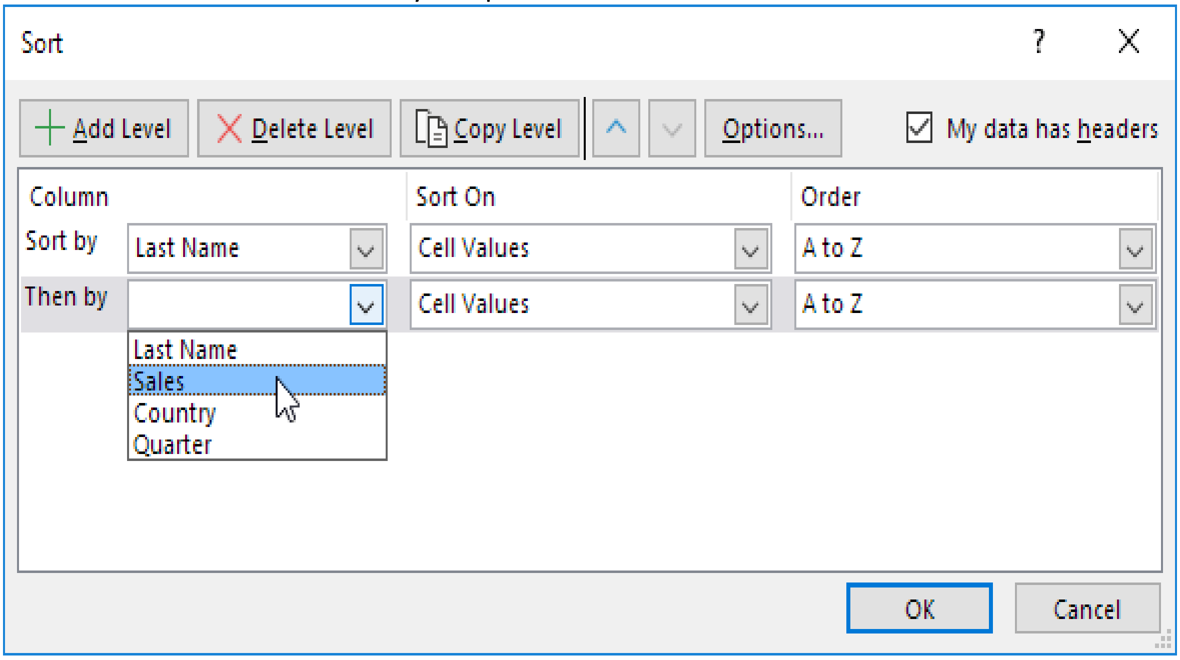

The Sort dialog box appears.

2. Select Last Name from the 'Sort by' drop-down list.




3. Click on Add Level.

4. Select Sales from the 'Then by' drop-down list.




5. Click OK.

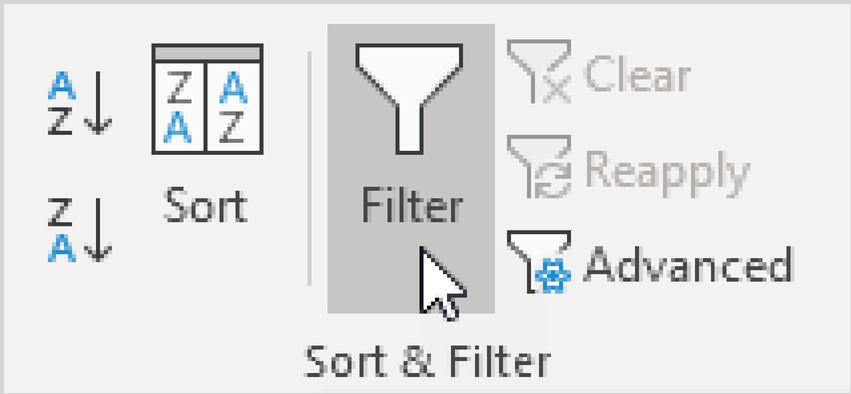
Result. Records are sorted by Last Name first and Sales second.

| | A | B | C | D | E |
|---|---|---|---|---|---|
| 1 | **Last Name** | **Sales** | **Country** | **Quarter** | |
| 2 | Brown | $3,255.00 | USA | Qtr 2 | |
| 3 | Brown | $4,865.00 | USA | Qtr 4 | |
| 4 | Johnson | $9,339.00 | UK | Qtr 2 | |
| 5 | Johnson | $14,808.00 | USA | Qtr 4 | |
| 6 | Jones | $1,390.00 | USA | Qtr 3 | |
| 7 | Jones | $7,433.00 | UK | Qtr 1 | |
| 8 | Jones | $9,213.00 | USA | Qtr 4 | |
| 9 | Smith | $9,698.00 | USA | Qtr 1 | |
| 10 | Smith | $16,753.00 | UK | Qtr 3 | |
| 11 | Smith | $18,919.00 | USA | Qtr 3 | |
| 12 | Williams | $10,644.00 | UK | Qtr 2 | |
| 13 | Williams | $12,438.00 | UK | Qtr 1 | |
| 14 | Williams | $14,867.00 | USA | Qtr 3 | |
| 15 | Williams | $19,302.00 | UK | Qtr 4 | |
| 16 | | | | | |

Filter

Filter your Excel data if you only want to display records that meet certain criteria.

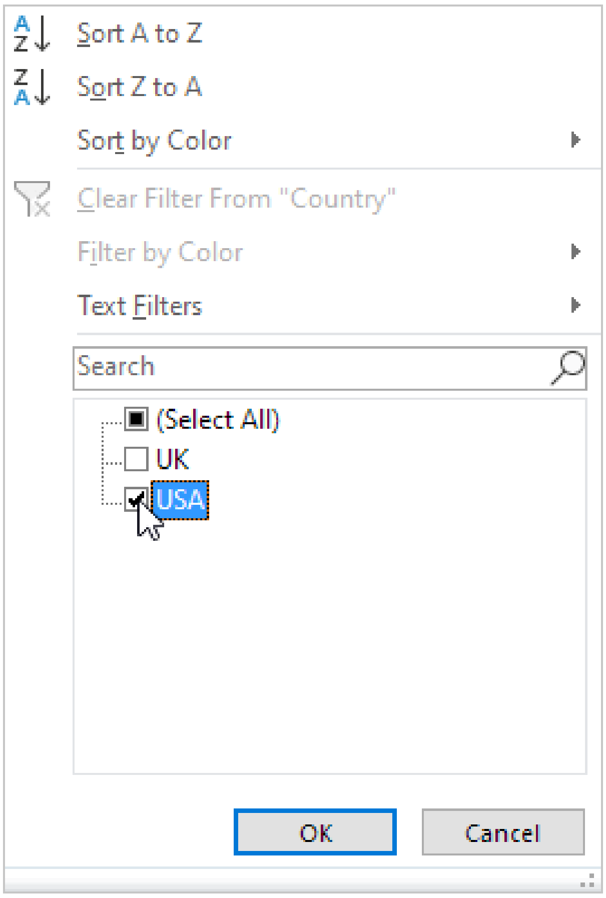
1. Click any single cell inside a data set.
2. On the Data tab, in the Sort & Filter group, click Filter.




Arrows in the column headers appear.

| | A | B | C | D | E |
|---|---|---|---|---|---|
| 1 | Last Nan | Sales | Count | Quart | |
| 2 | Smith | $16,753.00 | UK | Qtr 3 | |
| 3 | Johnson | $14,808.00 | USA | Qtr 4 | |
| 4 | Williams | $10,644.00 | UK | Qtr 2 | |
| 5 | Jones | $1,390.00 | USA | Qtr 3 | |
| 6 | Brown | $4,865.00 | USA | Qtr 4 | |
| 7 | Williams | $12,438.00 | UK | Qtr 1 | |
| 8 | Johnson | $9,339.00 | UK | Qtr 2 | |
| 9 | Smith | $18,919.00 | USA | Qtr 3 | |
| 10 | Jones | $9,213.00 | USA | Qtr 4 | |
| 11 | Jones | $7,433.00 | UK | Qtr 1 | |
| 12 | Brown | $3,255.00 | USA | Qtr 2 | |
| 13 | Williams | $14,867.00 | USA | Qtr 3 | |
| 14 | Williams | $19,302.00 | UK | Qtr 4 | |
| 15 | Smith | $9,698.00 | USA | Qtr 1 | |
| 16 | | | | | |

3. Click the arrow next to Country.
4. Click on Select All to clear all the check boxes, and click the check box next to USA.



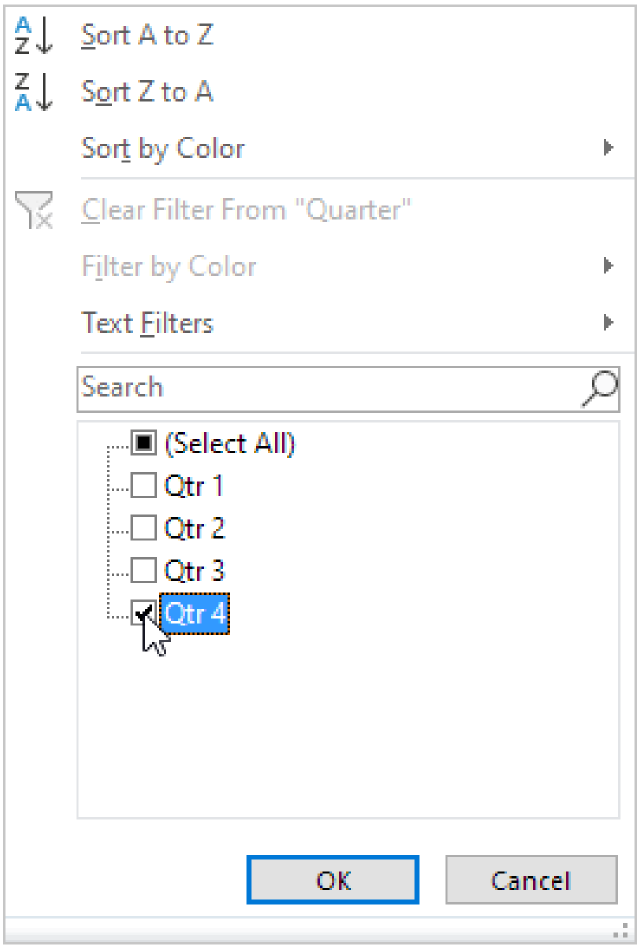

5. Click OK.

Result. Excel only displays the sales in the USA.

| | A | B | C | D | E |
|---|---|---|---|---|---|
| 1 | Last Nan | Sales | Count | Quart | |
| 3 | Johnson | $14,808.00 | USA | Qtr 4 | |
| 5 | Jones | $1,390.00 | USA | Qtr 3 | |
| 6 | Brown | $4,865.00 | USA | Qtr 4 | |
| 9 | Smith | $18,919.00 | USA | Qtr 3 | |
| 10 | Jones | $9,213.00 | USA | Qtr 4 | |
| 12 | Brown | $3,255.00 | USA | Qtr 2 | |
| 13 | Williams | $14,867.00 | USA | Qtr 3 | |
| 15 | Smith | $9,698.00 | USA | Qtr 1 | |
| 16 | | | | | |

6. Click the arrow next to Quarter.

7. Click on Select All to clear all the check boxes, and click the check box next to Qtr 4.

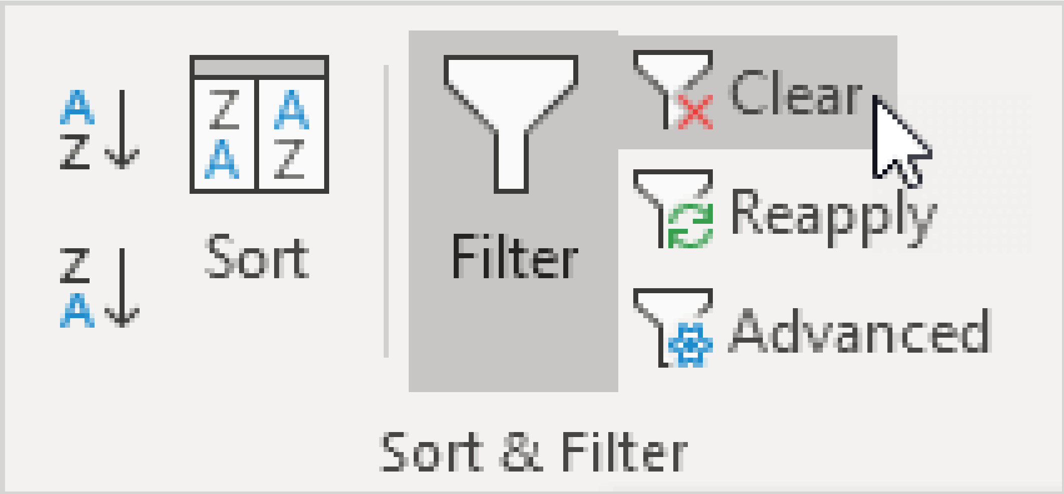



8. Click OK.

Result. Excel only displays the sales in the USA in Qtr 4.

| | A | B | C | D | E |
|---|---|---|---|---|---|
| 1 | Last Nan | Sales | Count | Quart | |
| 3 | Johnson | $14,808.00 | USA | Qtr 4 | |
| 6 | Brown | $4,865.00 | USA | Qtr 4 | |
| 10 | Jones | $9,213.00 | USA | Qtr 4 | |
| 16 | | | | | |

9. To remove the filter, on the Data tab, in the Sort & Filter group, click Clear. To remove the filter and the arrows, click Filter.

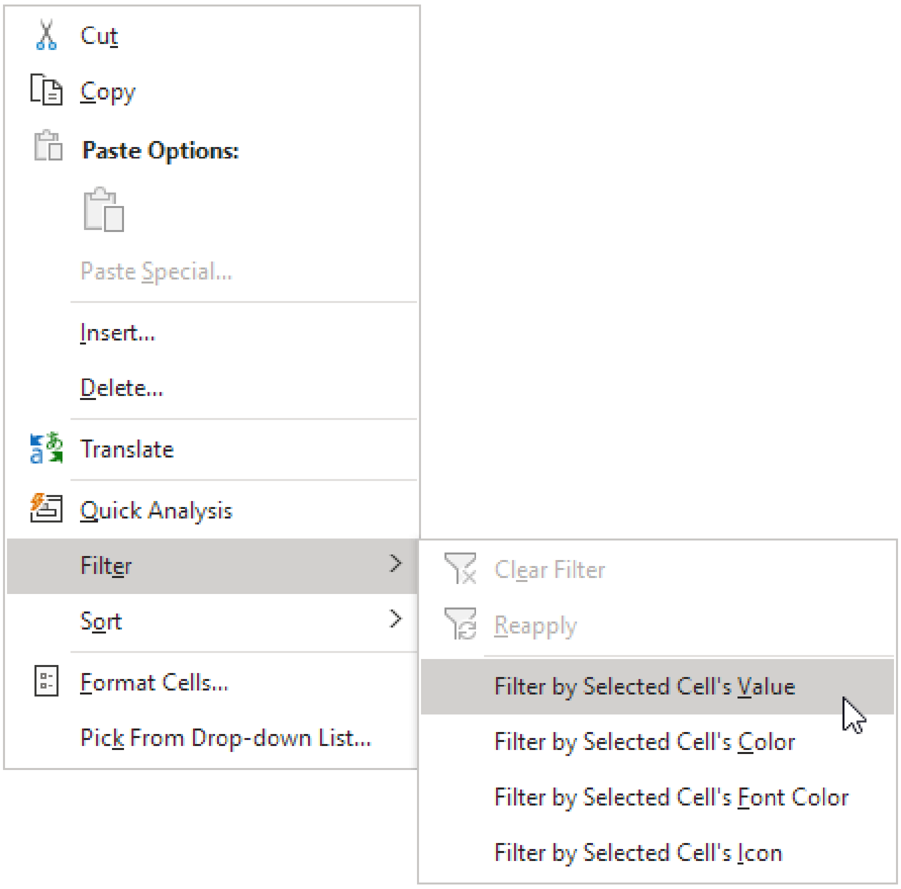



There's a quicker way to filter Excel data.

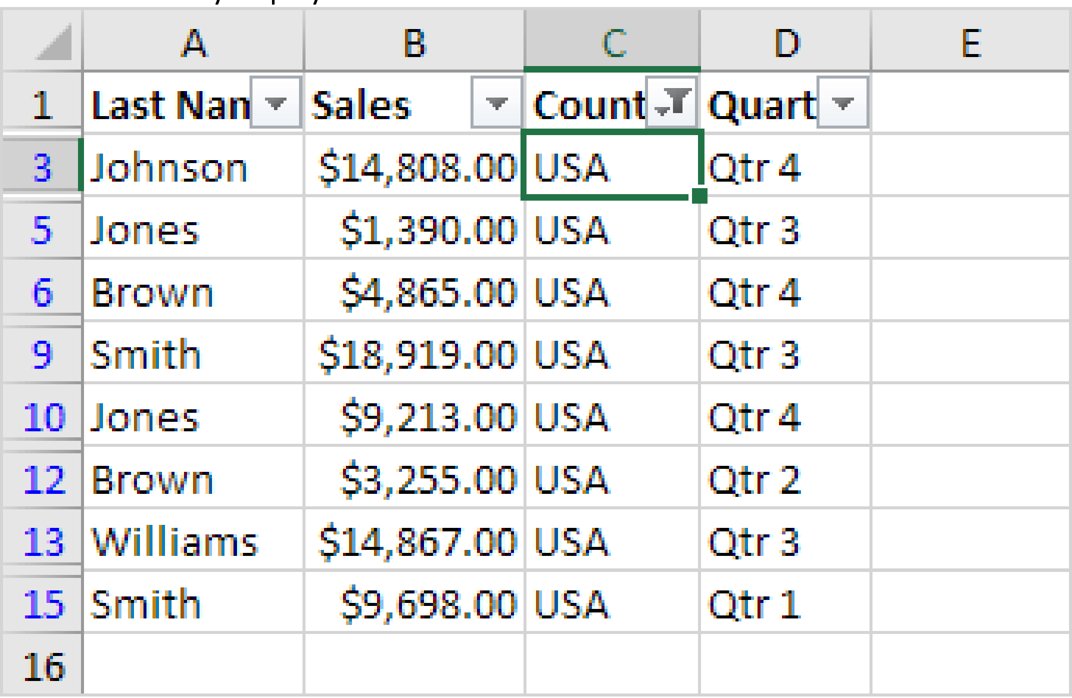
10. Select a cell.

| | A | B | C | D | E |
|---|---|---|---|---|---|
| 1 | **Last Name** | **Sales** | **Country** | **Quarter** | |
| 2 | Smith | $16,753.00 | UK | Qtr 3 | |
| 3 | Johnson | $14,808.00 | USA | Qtr 4 | |
| 4 | Williams | $10,644.00 | UK | Qtr 2 | |
| 5 | Jones | $1,390.00 | USA | Qtr 3 | |
| 6 | Brown | $4,865.00 | USA | Qtr 4 | |
| 7 | Williams | $12,438.00 | UK | Qtr 1 | |
| 8 | Johnson | $9,339.00 | UK | Qtr 2 | |
| 9 | Smith | $18,919.00 | USA | Qtr 3 | |
| 10 | Jones | $9,213.00 | USA | Qtr 4 | |
| 11 | Jones | $7,433.00 | UK | Qtr 1 | |
| 12 | Brown | $3,255.00 | USA | Qtr 2 | |
| 13 | Williams | $14,867.00 | USA | Qtr 3 | |
| 14 | Williams | $19,302.00 | UK | Qtr 4 | |
| 15 | Smith | $9,698.00 | USA | Qtr 1 | |
| 16 | | | | | |

11. Right click, and then click Filter, Filter by Selected Cell's Value.




Result. Excel only displays the sales in the USA.



| | A | B | C | D | E |
|---|---|---|---|---|---|
| 1 | Last Nan | Sales | Count | Quart | |
| 3 | Johnson | $14,808.00 | USA | Qtr 4 | |
| 5 | Jones | $1,390.00 | USA | Qtr 3 | |
| 6 | Brown | $4,865.00 | USA | Qtr 4 | |
| 9 | Smith | $18,919.00 | USA | Qtr 3 | |
| 10 | Jones | $9,213.00 | USA | Qtr 4 | |
| 12 | Brown | $3,255.00 | USA | Qtr 2 | |
| 13 | Williams | $14,867.00 | USA | Qtr 3 | |
| 15 | Smith | $9,698.00 | USA | Qtr 1 | |
| 16 | | | | | |

Note: simply select another cell in another column to further filter this data set.

## Advanced Filter

This example teaches you how to apply an advanced filter in Excel to only display records that meet complex criteria.

When you use the Advanced Filter, you need to enter the criteria on the worksheet. Create a Criteria range (blue border below for illustration only) above your data set. Use the same column headers. Be sure there's at least one blank row between your Criteria range and data set.

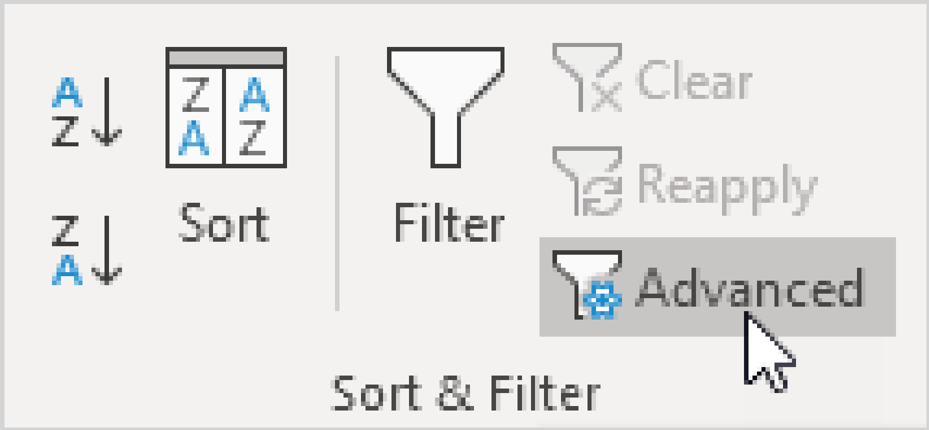
### And Criteria

To display the sales in the USA and in Qtr 4, execute the following steps.

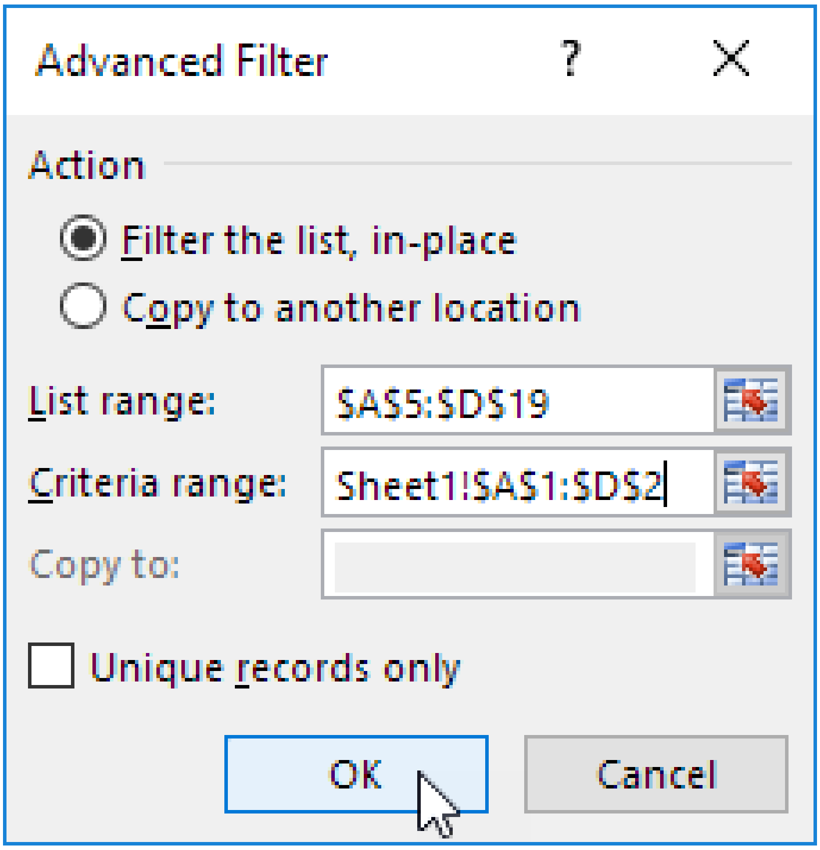
1. Enter the criteria shown below on the worksheet.

| | A | B | C | D | E |
|---|---|---|---|---|---|
| 1 | Last Name | Sales | Country | Quarter | |
| 2 | | | USA | Qtr 4 | |
| 3 | | | | | |
| 4 | | | | | |
| 5 | Last Name | Sales | Country | Quarter | |
| 6 | Smith | $16,753.00 | UK | Qtr 3 | |
| 7 | Johnson | $14,808.00 | USA | Qtr 4 | |
| 8 | Williams | $10,644.00 | UK | Qtr 2 | |
| 9 | Jones | $1,390.00 | USA | Qtr 3 | |
| 10 | Brown | $4,865.00 | USA | Qtr 4 | |
| 11 | Williams | $12,438.00 | UK | Qtr 1 | |
| 12 | Johnson | $9,339.00 | UK | Qtr 2 | |
| 13 | Smith | $18,919.00 | USA | Qtr 3 | |
| 14 | Jones | $9,213.00 | USA | Qtr 4 | |
| 15 | Jones | $7,433.00 | UK | Qtr 1 | |
| 16 | Brown | $3,255.00 | USA | Qtr 2 | |
| 17 | Williams | $14,867.00 | USA | Qtr 3 | |
| 18 | Williams | $19,302.00 | UK | Qtr 4 | |
| 19 | Smith | $9,698.00 | USA | Qtr 1 | |
| 20 | | | | | |

2. Click any single cell inside the data set.
3. On the Data tab, in the Sort & Filter group, click Advanced.




4. Click in the Criteria range box and select the range A1:D2 (blue).
5. Click OK.




Notice the options to copy your filtered data set to another location and display unique records only (if your data set contains duplicates).
Result.

| | A | B | C | D | E |
|---|---|---|---|---|---|
| 1 | **Last Name** | **Sales** | **Country** | **Quarter** | |
| 2 | | | USA | Qtr 4 | |
| 3 | | | | | |
| 4 | | | | | |
| 5 | **Last Name** | **Sales** | **Country** | **Quarter** | |
| 7 | Johnson | $14,808.00 | USA | Qtr 4 | |
| 10 | Brown | $4,865.00 | USA | Qtr 4 | |
| 14 | Jones | $9,213.00 | USA | Qtr 4 | |
| 20 | | | | | |

No rocket science so far. We can achieve the same result with the normal filter. We need the Advanced Filter for Or criteria.

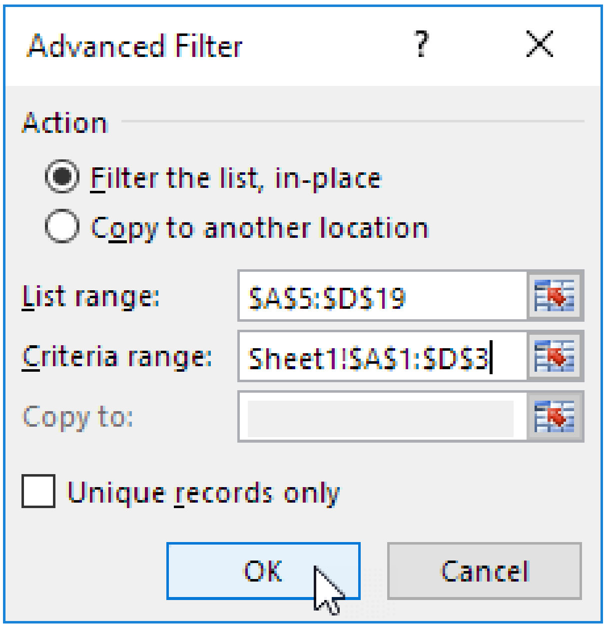
Or Criteria

To display the sales in the USA in Qtr 4 or in the UK in Qtr 1, execute the following steps.

6. Enter the criteria shown below on the worksheet.

7. On the Data tab, in the Sort & Filter group, click Advanced, and adjust the Criteria range to range A1:D3 (blue).

8. Click OK.




Result.

| | A | B | C | D | E |
|---|---|---|---|---|---|
| 1 | Last Name | Sales | Country | Quarter | |
| 2 | | | USA | Qtr 4 | |
| 3 | | | UK | Qtr 1 | |
| 4 | | | | | |
| 5 | Last Name | Sales | Country | Quarter | |
| 7 | Johnson | $14,808.00 | USA | Qtr 4 | |
| 10 | Brown | $4,865.00 | USA | Qtr 4 | |
| 11 | Williams | $12,438.00 | UK | Qtr 1 | |
| 14 | Jones | $9,213.00 | USA | Qtr 4 | |
| 15 | Jones | $7,433.00 | UK | Qtr 1 | |
| 20 | | | | | |

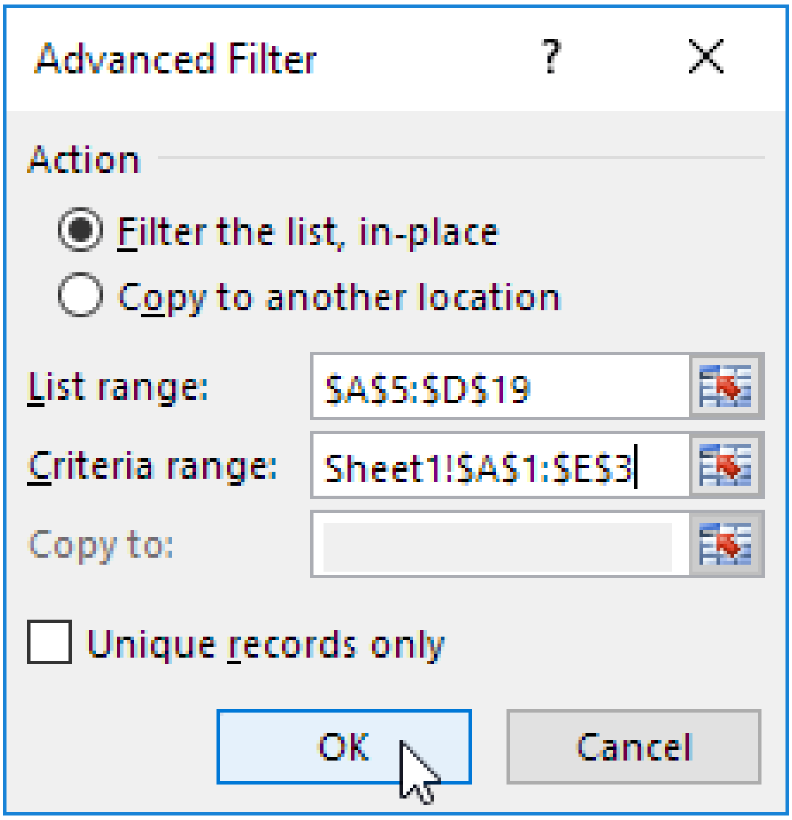
Formula as Criteria

To display the sales in the USA in Qtr 4 greater than $10.000 <u>or</u> in the UK in Qtr 1, execute the following steps.

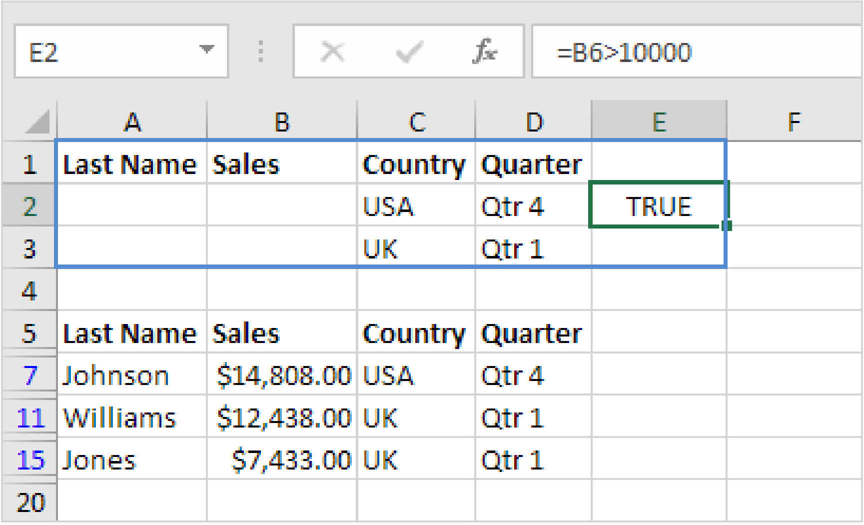
9. Enter the criteria (+formula) shown below on the worksheet.

10. On the Data tab, in the Sort & Filter group, click Advanced, and adjust the Criteria range to range A1:E3 (blue).

11. Click OK.



Result.



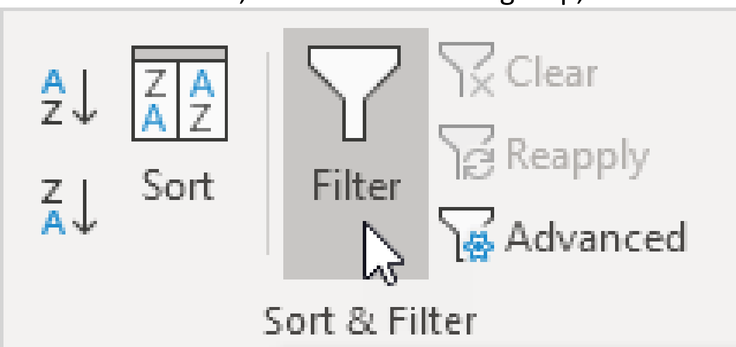

| | A | B | C | D | E | F |
|---|---|---|---|---|---|---|
| 1 | Last Name | Sales | Country | Quarter | | |
| 2 | | | USA | Qtr 4 | TRUE | |
| 3 | | | UK | Qtr 1 | | |
| 4 | | | | | | |
| 5 | Last Name | Sales | Country | Quarter | | |
| 7 | Johnson | $14,808.00 | USA | Qtr 4 | | |
| 11 | Williams | $12,438.00 | UK | Qtr 1 | | |
| 15 | Jones | $7,433.00 | UK | Qtr 1 | | |
| 20 | | | | | | |

Note: always place a formula in a new column. Do not use a column label or use a column label that is not in your data set. Create a relative reference to the first cell in the column (B6). The formula must evaluate to TRUE or FALSE.

Date Filters

This example teaches you how to apply a date filter to only display records that meet certain criteria.

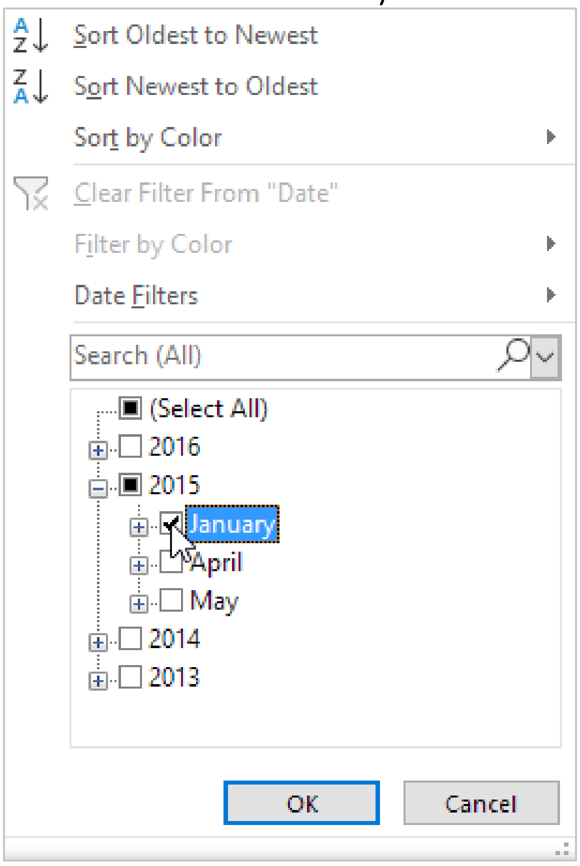
1. Click any single cell inside a data set.
2. On the Data tab, in the Sort & Filter group, click Filter.




Arrows in the column headers appear.

| | A | B | C | D | E |
|---|---|---|---|---|---|
| 1 | Last Nan | Sales | Count | Date | |
| 2 | Smith | $16,753.00 | UK | 4/25/2013 | |
| 3 | Johnson | $14,808.00 | USA | 1/5/2016 | |
| 4 | Williams | $10,644.00 | UK | 4/13/2015 | |
| 5 | Jones | $1,390.00 | USA | 9/5/2016 | |
| 6 | Brown | $4,865.00 | USA | 1/21/2013 | |
| 7 | Williams | $12,438.00 | UK | 4/6/2013 | |
| 8 | Johnson | $9,339.00 | UK | 11/14/2016 | |
| 9 | Smith | $18,919.00 | USA | 7/16/2014 | |
| 10 | Jones | $9,213.00 | USA | 1/26/2015 | |
| 11 | Jones | $7,433.00 | UK | 11/1/2013 | |
| 12 | Brown | $3,255.00 | USA | 5/18/2015 | |
| 13 | Williams | $14,867.00 | USA | 1/5/2015 | |
| 14 | Williams | $19,302.00 | UK | 8/23/2016 | |
| 15 | Smith | $9,698.00 | USA | 1/17/2016 | |
| 16 | | | | | |

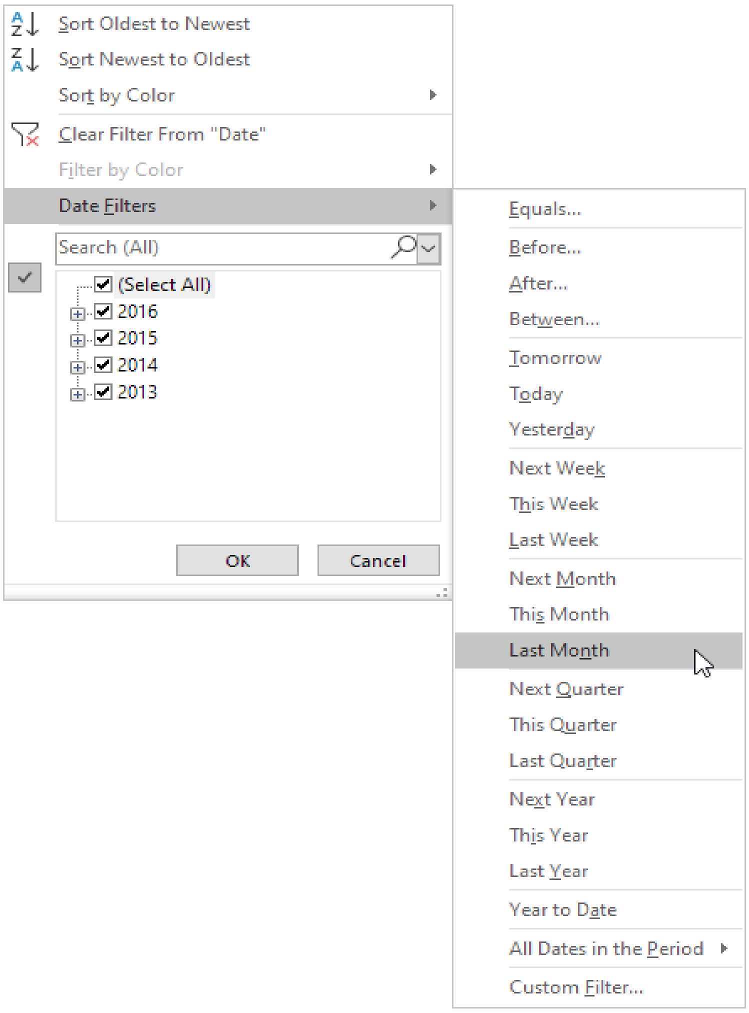
3. Click the arrow next to Date.
4. Click on Select All to clear all the check boxes, click the + sign next to 2015, and click the check box next to January.




5. Click OK.
Result. Excel only displays the sales in 2015, in January.

| | A | B | C | D | E |
|---|---|---|---|---|---|
| 1 | Last Nan | Sales | Count | Date | |
| 10 | Jones | $9,213.00 | USA | 1/26/2015 | |
| 13 | Williams | $14,867.00 | USA | 1/5/2015 | |
| 16 | | | | | |

6. Click the arrow next to Date.
7. Click on Select All to select all the check boxes.
8. Click Date Filters (this option is available because the Date column contains dates) and select Last Month from the list.




Result. Excel only displays the sales of last month.

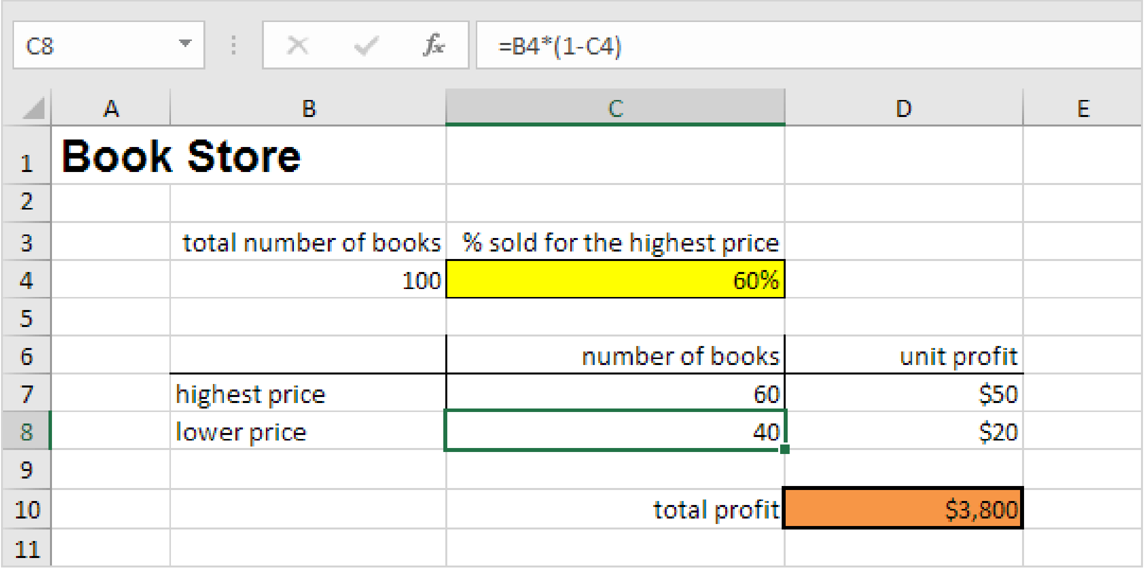
| | A | B | C | D | E |
|---|---|---|---|---|---|
| 1 | Last Nan | Sales | Count | Date | |
| 8 | Johnson | $9,339.00 | UK | 11/14/2016 | |
| 16 | | | | | |

Note: this date filter and many other date filters depend on today's date.

## Lesson 26 - What if analysis

What-If Analysis in Excel allows you to try out different values (scenarios) for formulas. The following example helps you master what-if analysis quickly and easily.

Assume you own a book store and have 100 books in storage. You sell a certain % for the highest price of $50 and a certain % for the lower price of $20.



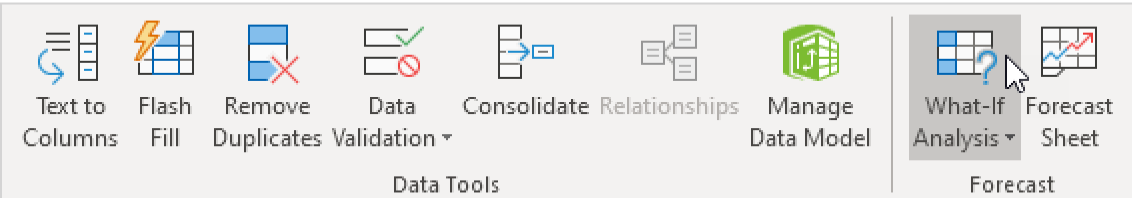

If you sell 60% for the highest price, cell D10 calculates a total profit of 60 * $50 + 40 * $20 = $3800.

### Create Different Scenarios

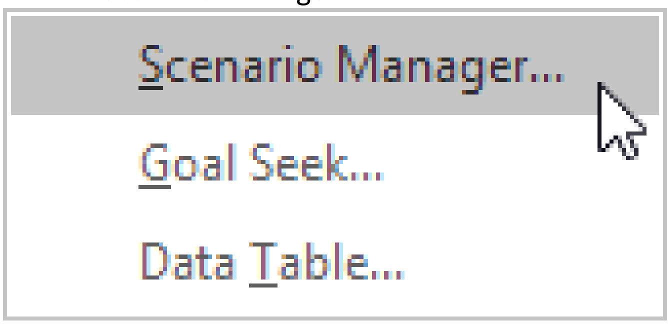
But what if you sell 70% for the highest price? And what if you sell 80% for the highest price? Or 90%, or even 100%? Each different percentage is a different scenario. You can use the Scenario Manager to create these scenarios.

Note: You can simply type in a different percentage into cell C4 to see the corresponding result of a scenario in cell D10. However, what-if analysis enables you to easily compare the results of different scenarios. Read on.

1. On the Data tab, in the Forecast group, click What-If Analysis.

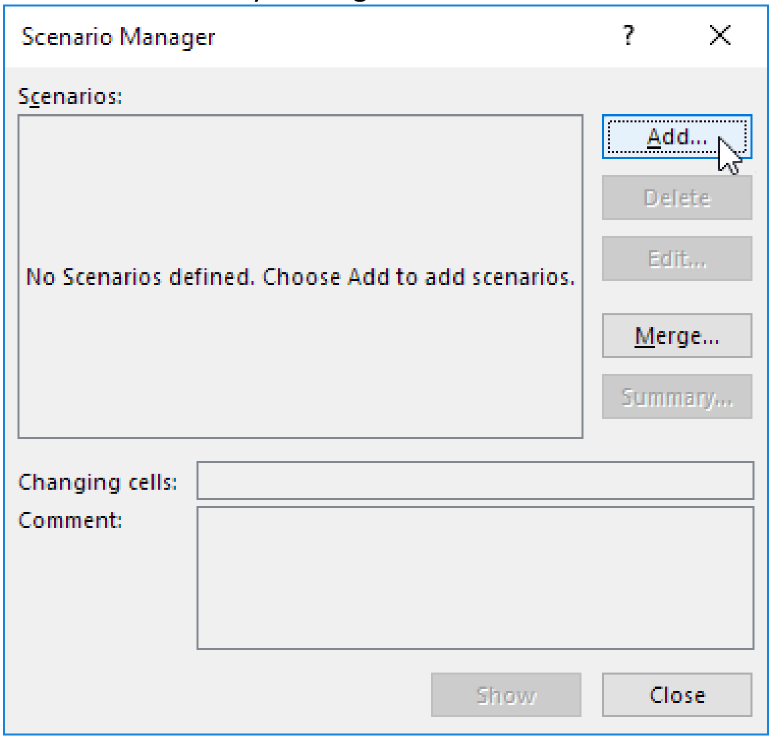



2. Click Scenario Manager.

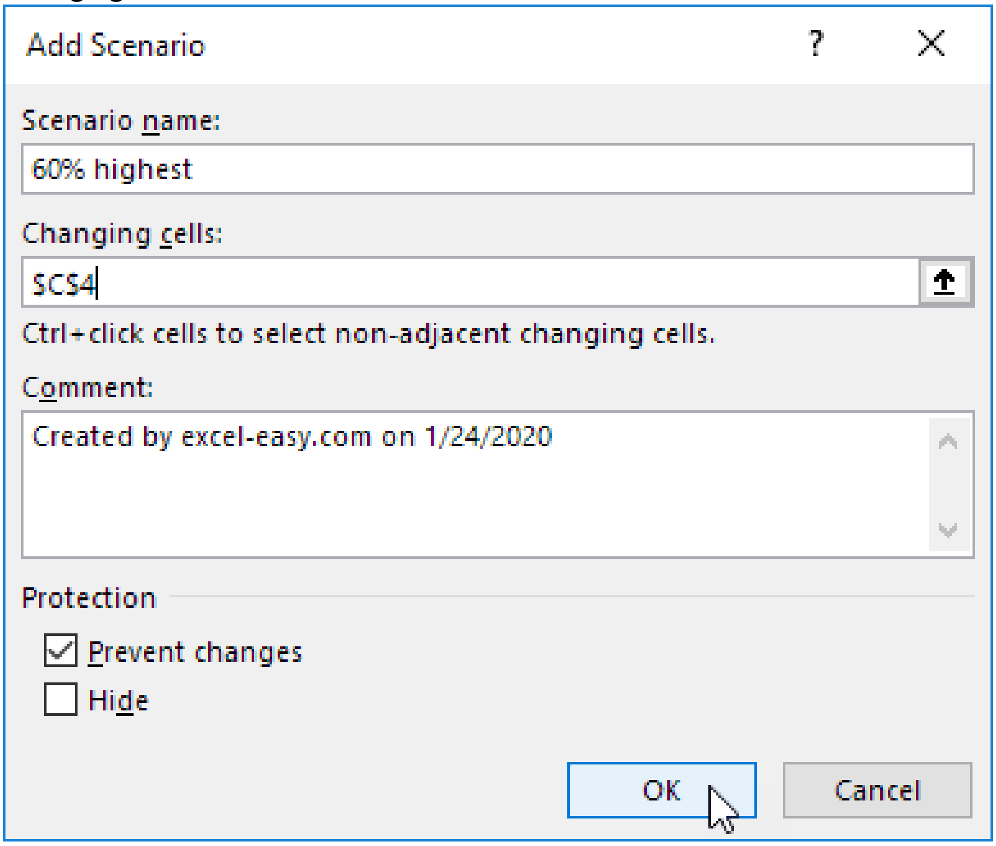



The Scenario Manager dialog box appears.

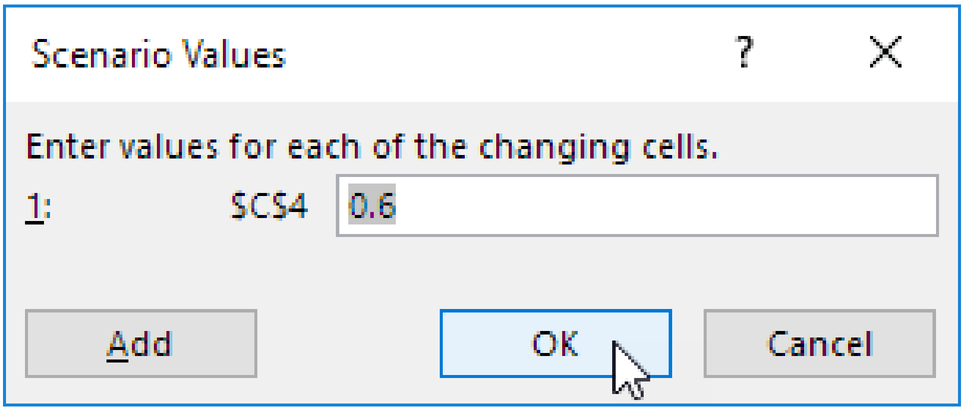
3. Add a scenario by clicking on Add.




4. Type a name (60% highest), select cell C4 (% sold for the highest price) for the Changing cells and click on OK.

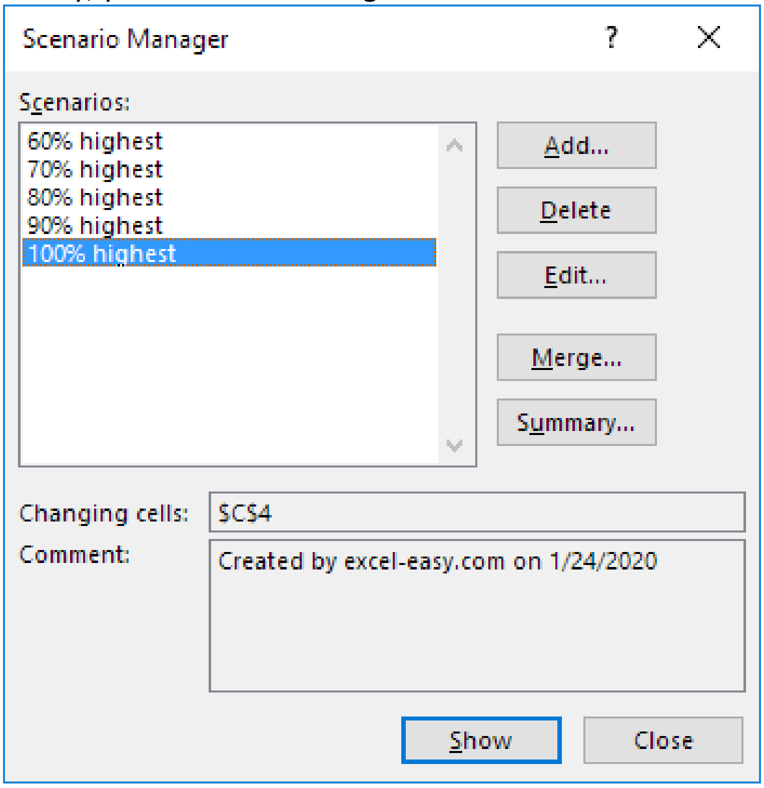



5. Enter the corresponding value 0.6 and click on OK again.




6. Next, add 4 other scenarios (70%, 80%, 90% and 100%).

Finally, your Scenario Manager should be consistent with the picture below:

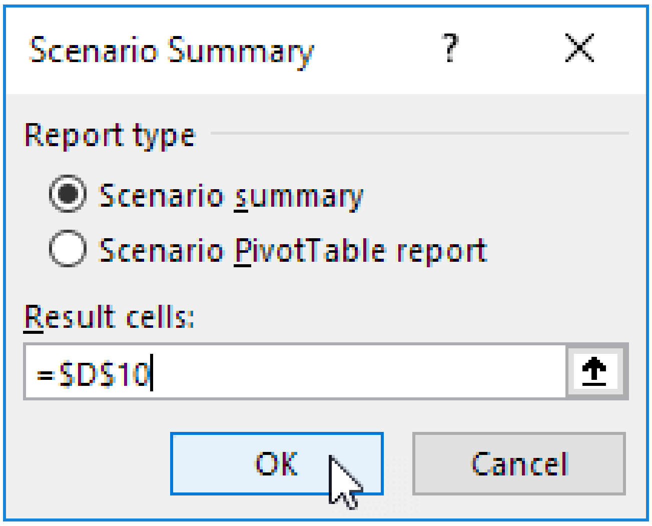



Note: to see the result of a scenario, select the scenario and click on the Show button. Excel will change the value of cell C4 accordingly for you to see the corresponding result on the sheet.

Scenario Summary

To easily compare the results of these scenarios, execute the following steps.

1. Click the Summary button in the Scenario Manager.
2. Next, select cell D10 (total profit) for the result cell and click on OK.




Result:

| Scenario Summary | | | | | | |
|---|---|---|---|---|---|---|
| | Current Values: | 60% highest | 70% highest | 80% highest | 90% highest | 100% highest |
| Changing Cells: | | | | | | |
| $C$4 | 60% | 60% | 70% | 80% | 90% | 100% |
| Result Cells: | | | | | | |
| $D$10 | $3,800 | $3,800 | $4,100 | $4,400 | $4,700 | $5,000 |

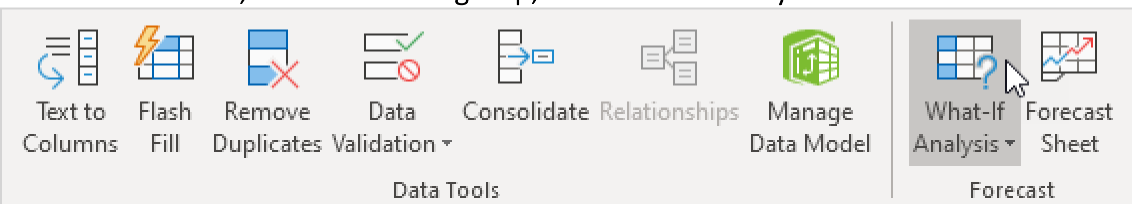
Notes: Current Values column represents values of changing cells at time Scenario Summary Report was created. Changing cells for each scenario are highlighted in gray.

Conclusion: if you sell 70% for the highest price, you obtain a total profit of $4100, if you sell 80% for the highest price, you obtain a total profit of $4400, etc. That's how easy what-if analysis in Excel can be.

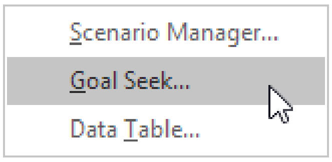
Goal Seek

What if you want to know how many books you need to sell for the highest price, to obtain a total profit of exactly $4700? You can use Excel's Goal Seek feature to find the answer.

1. On the Data tab, in the Forecast group, click What-If Analysis.




2. Click Goal Seek.



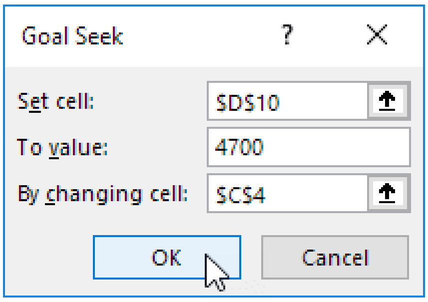

The Goal Seek dialog box appears.

3. Select cell D10.

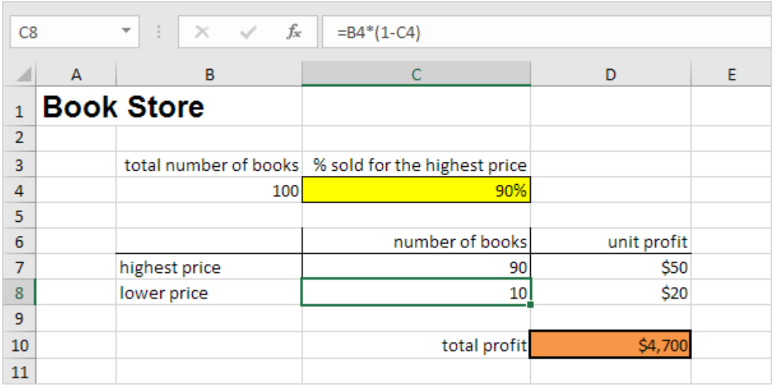
4. Click in the 'To value' box and type 4700.

5. Click in the 'By changing cell' box and select cell C4.

6. Click OK.




Result. You need to sell 90% of the books for the highest price to obtain a total profit of exactly $4700.



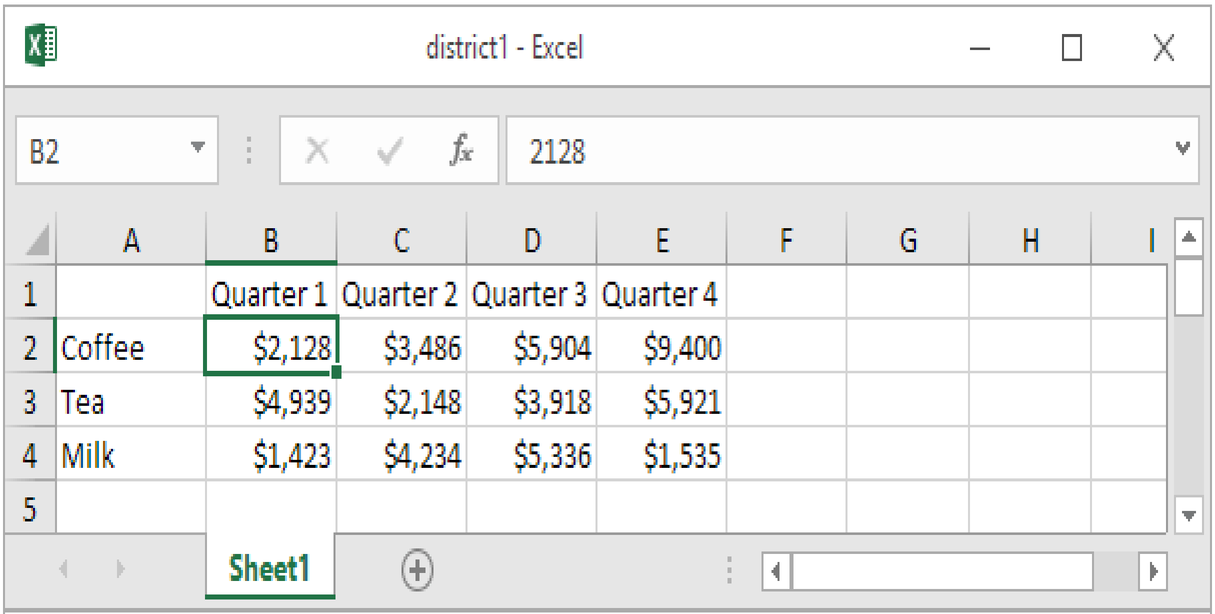

| | A | B | C | D | E |
|---|---|---|---|---|---|
| 1 | Book Store | | | | |
| 2 | | | | | |
| 3 | | total number of books | % sold for the highest price | | |
| 4 | | 100 | 90% | | |
| 5 | | | | | |
| 6 | | | number of books | unit profit | |
| 7 | | highest price | 90 | $50 | |
| 8 | | lower price | 10 | $20 | |
| 9 | | | | | |
| 10 | | | total profit | $4,700 | |
| 11 | | | | | |

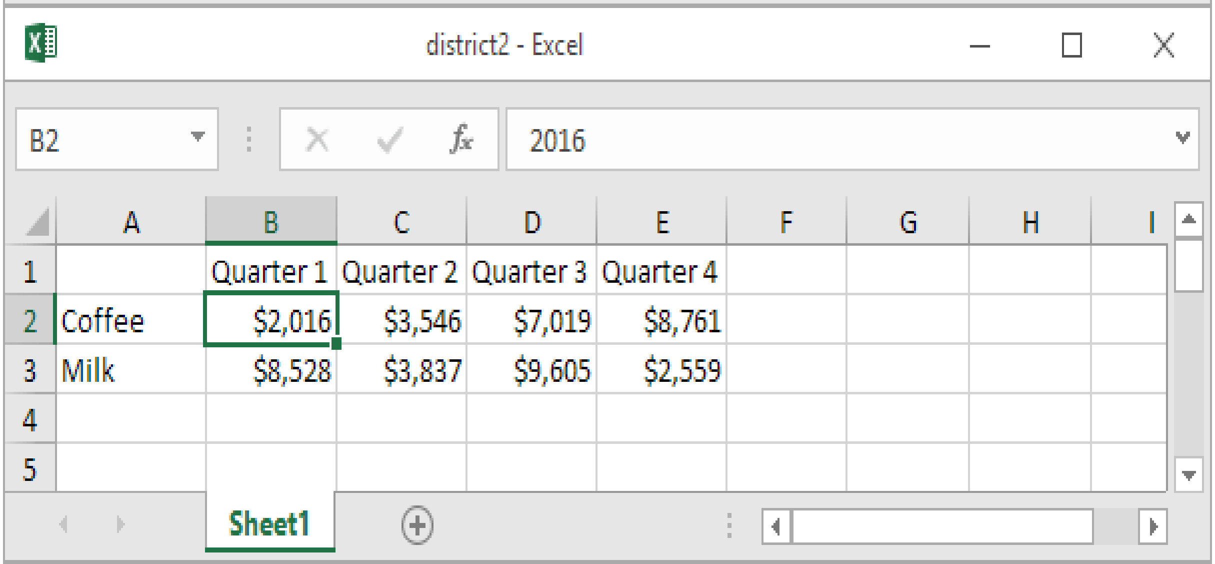
## Lesson 27 – Consolidation

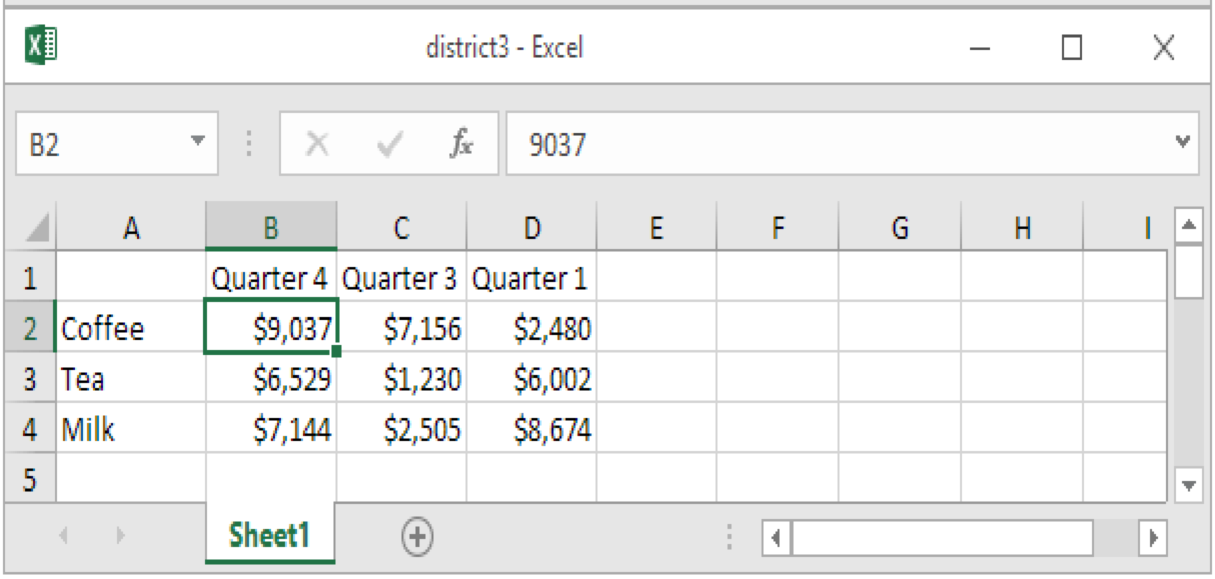
The consolidate function in Excel allows an analyst to combine information from multiple workbooks into one place. The Excel consolidate function lets you select data from its various locations and creates a table to summarize the information for you.

You can use Excel's Consolidate feature to consolidate your worksheets (located in one workbook or multiple workbooks) into one worksheet. Below you can find the workbooks of three districts.

Before you start: if your worksheets are identical, it's probably easier to create 3D-references (if you have one workbook) or External References (if you have multiple workbooks) to consolidate your data.

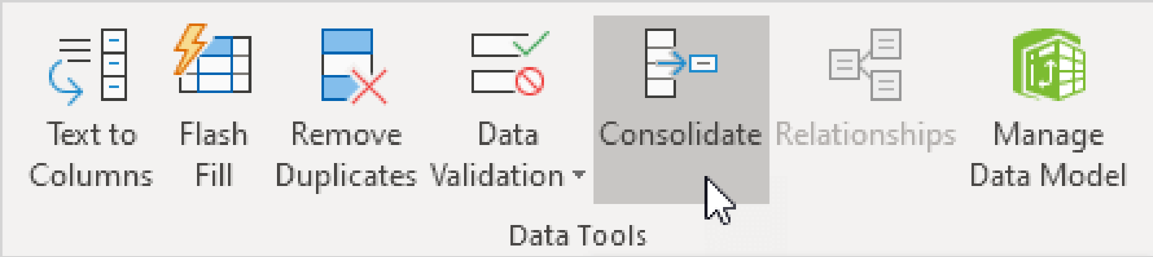

district1 - Excel
B2
2128
Quarter 1 Quarter 2 Quarter 3 Quarter 4
Coffee $2,128 $3,486 $5,904 $9,400
Tea $4,939 $2,148 $3,918 $5,921
Milk $1,423 $4,234 $5,336 $1,535
Sheet1


district2 - Excel
B2
2016
Quarter 1 Quarter 2 Quarter 3 Quarter 4
Coffee $2,016 $3,546 $7,019 $8,761
Milk $8,528 $3,837 $9,605 $2,559
Sheet1

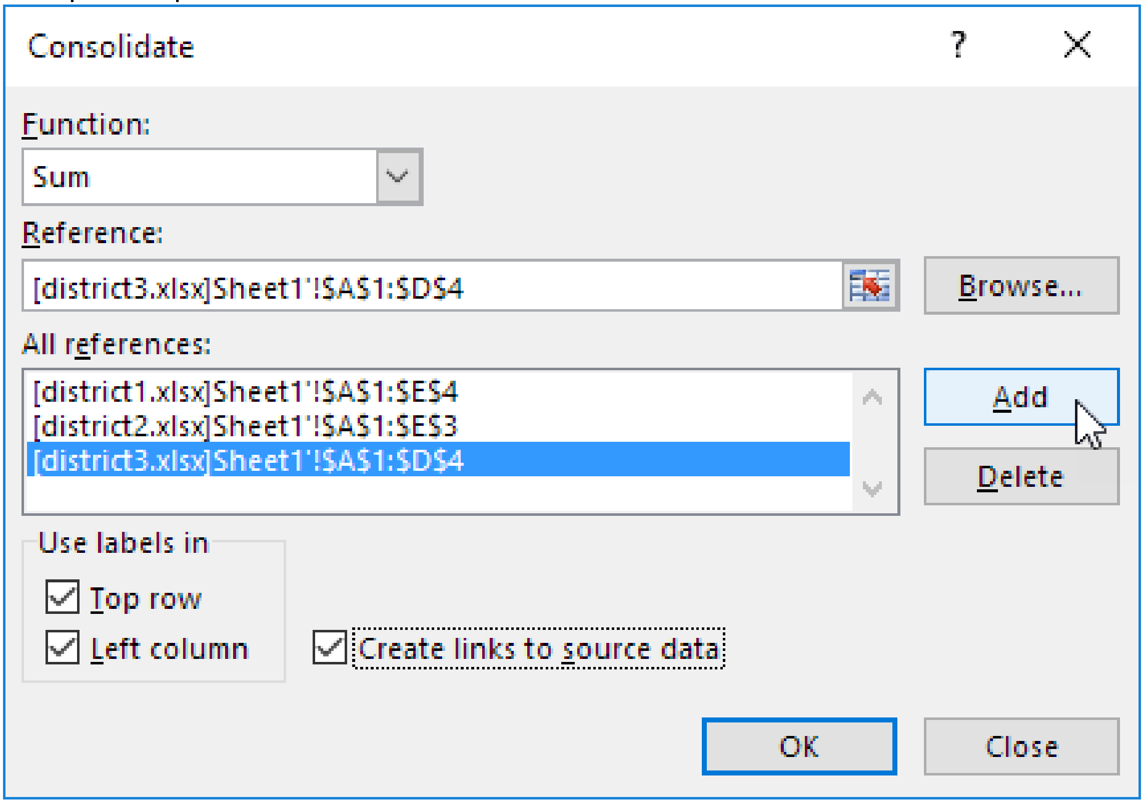

district3 - Excel
B2
9037
Quarter 4 Quarter 3 Quarter 1
Coffee $9,037 $7,156 $2,480
Tea $6,529 $1,230 $6,002
Milk $7,144 $2,505 $8,674
Sheet1

As you can see, the worksheets are not identical. However, the beauty of the Consolidate feature is that it can easily sum, count, average, etc this data by looking at the labels. This is a lot easier than creating formulas.

1. Open all three workbooks.
2. Open a blank workbook. On the Data tab, in the Data Tools group, click Consolidate.




3. Choose the Sum function to sum the data.
4. Click in the Reference box, select the range A1:E4 in the district1 workbook, and click Add.
5. Repeat step 4 for the district2 and district3 workbook.

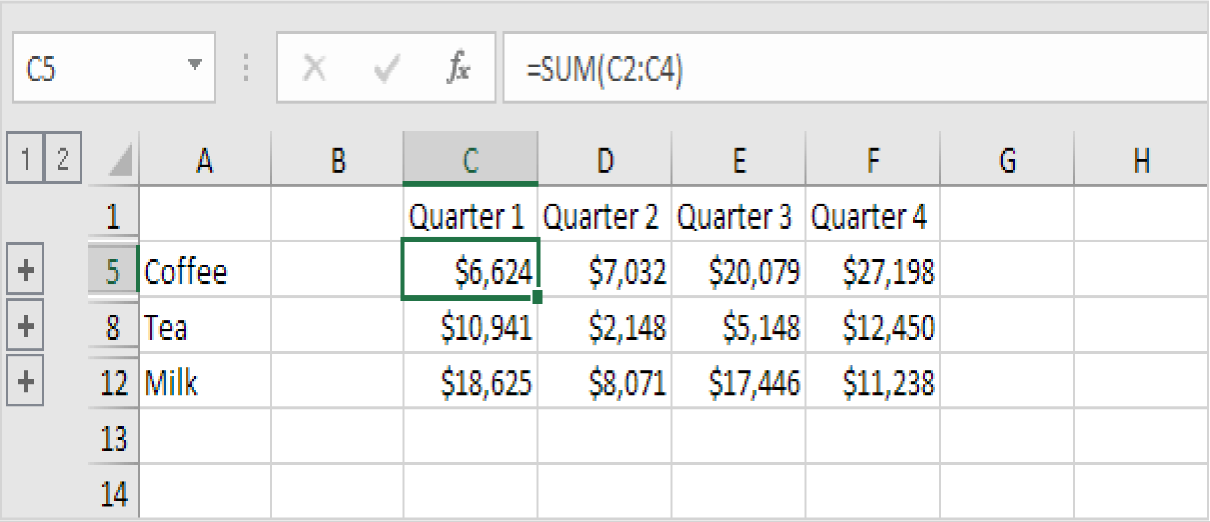



6. Check Top row, Left column and Create links to source data.

Note: if you don't check Top row and Left column, Excel sums all cells that have the same position. For example, cell B2 (in district1.xlsx) + cell B2 (in district2.xlsx) + cell B2 (in district3.xlsx). Because our worksheets are not identical, we want Excel to sum cells that have the same labels. If you check Create links to source data, Excel creates a link to your source data (your consolidated data will be updated if your source data changes) and creates an outline.

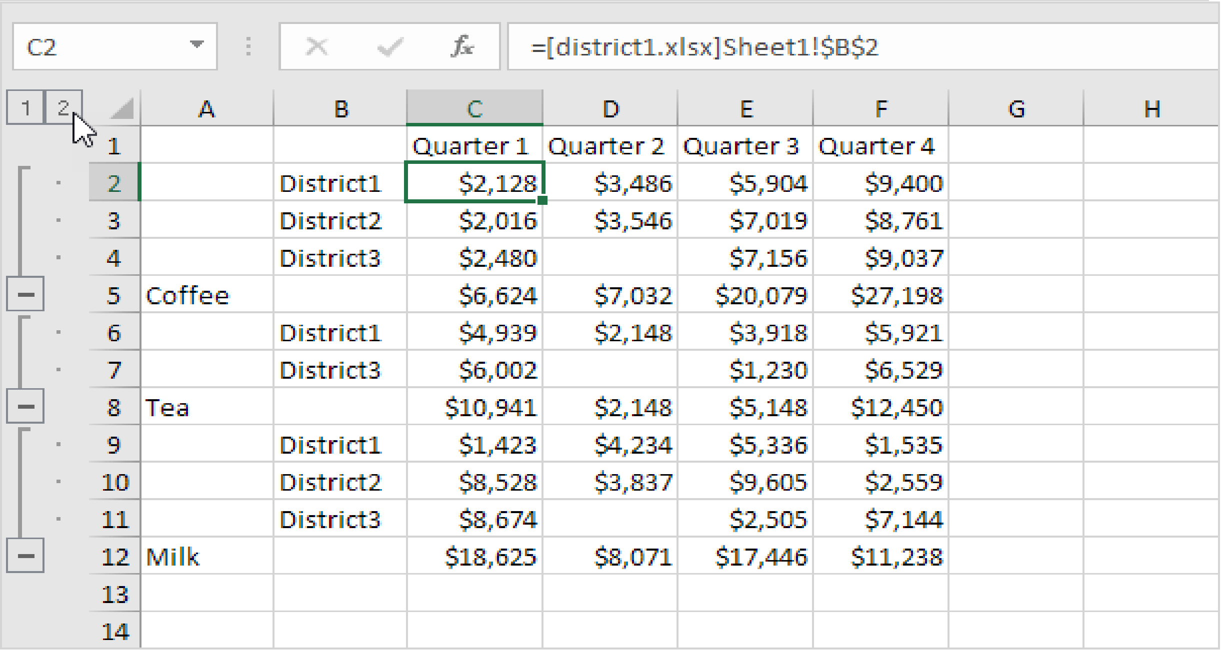
7. Click OK.

Result.



C5 =SUM(C2:C4)

| | A | B | C | D | E | F | G | H |
|---|---|---|---|---|---|---|---|---|
| 1 | | | Quarter 1 | Quarter 2 | Quarter 3 | Quarter 4 | | |
| 5 | Coffee | | $6,624 | $7,032 | $20,079 | $27,198 | | |
| 8 | Tea | | $10,941 | $2,148 | $5,148 | $12,450 | | |
| 12 | Milk | | $18,625 | $8,071 | $17,446 | $11,238 | | |
| 13 | | | | | | | | |
| 14 | | | | | | | | |



C2 =[district1.xlsx]Sheet1!$B$2

| | A | B | C | D | E | F | G | H |
|---|---|---|---|---|---|---|---|---|
| 1 | | | Quarter 1 | Quarter 2 | Quarter 3 | Quarter 4 | | |
| 2 | | District1 | $2,128 | $3,486 | $5,904 | $9,400 | | |
| 3 | | District2 | $2,016 | $3,546 | $7,019 | $8,761 | | |
| 4 | | District3 | $2,480 | | $7,156 | $9,037 | | |
| 5 | Coffee | | $6,624 | $7,032 | $20,079 | $27,198 | | |
| 6 | | District1 | $4,939 | $2,148 | $3,918 | $5,921 | | |
| 7 | | District3 | $6,002 | | $1,230 | $6,529 | | |
| 8 | Tea | | $10,941 | $2,148 | $5,148 | $12,450 | | |
| 9 | | District1 | $1,423 | $4,234 | $5,336 | $1,535 | | |
| 10 | | District2 | $8,528 | $3,837 | $9,605 | $2,559 | | |
| 11 | | District3 | $8,674 | | $2,505 | $7,144 | | |
| 12 | Milk | | $18,625 | $8,071 | $17,446 | $11,238 | | |
| 13 | | | | | | | | |
| 14 | | | | | | | | |

## Lesson 28 - Power Query introduction, Power query Installation

What is Excel Power Query?

Power Query is an Excel add-in that you can use for ETL. That means, you can **extract data** from different sources, **transform** it, and **then load it** to the worksheet. You can say POWER QUERY is a data cleansing machine as it has all the options to transform the data. It is real-time and records all the steps that you perform.

Why Should You Use Power Query (Benefits)?

If you have this question in your mind, here's my answer for you:

- **Different Data Sources**: You can load data into power query editor from different data sources, like, CSV, TXT, JSON, etc.
- **Transform Data Easily**: Normally you use formulas and pivot tables for data transformations but with POWER QUERY you can do a lot thing just with clicks.
- **It's Real-Time**: Write a query for once and you can refresh it every time there is a change in data, and it will transform the new data which you have updated.

An example:
Imagine you have 100 Excel files that have data from 100 cities and now your boss wants you to create a report with all the data from those 100 files. OKAY, if you decide to open each file manually and copy and paste data from those files and you need at least one hour for this. But with the power query, you can do it in minutes.

The Concept of Power Query

To learn power query, you need to understand its concept that works in 3 steps:

1. Get Data

Power query allows you to get data from different sources like web, CSV, text files, multiple workbooks from a folder, and a lot of other sources where we can store data.

2. Transform Data

After getting data in the power query you have a whole bunch of options that you can use to transform it and clean it. It creates queries for all the steps you perform (in a sequence one step after another).

3. Load Data

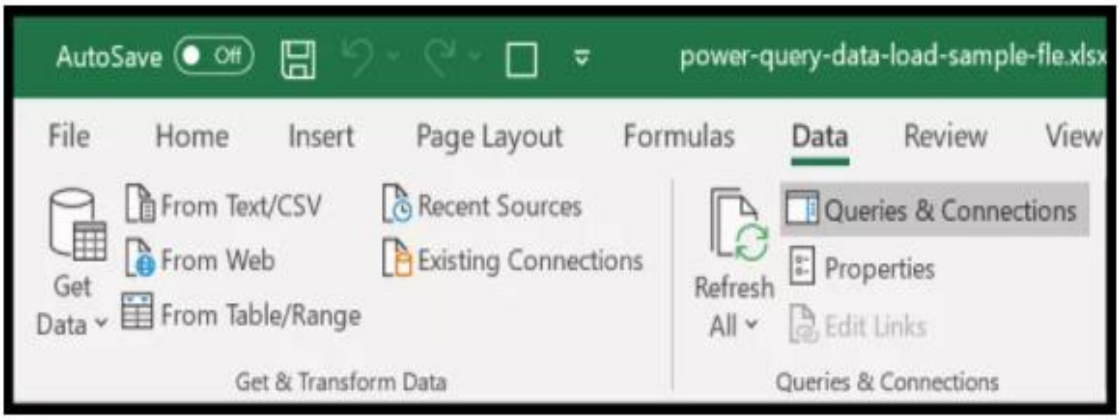
From the power query editor, you can load the transformed data to the worksheet, or you can directly create a pivot table or a pivot chart or create a data connection only.

Where is Power Query (How to install it)?

Below you can see how to install access to the power query in the different versions of Microsoft Excel.

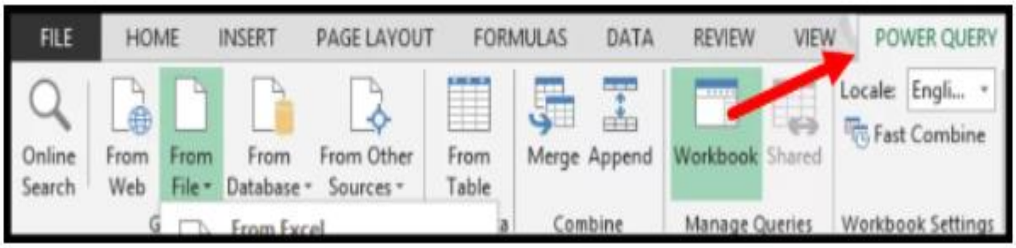
Excel 2016, 2019, Office 365

If you are using Excel 2016, Excel 2019, or you have OFFICE 365 subscription, **it's already there on the Data tab**, as a group named "GET & TRANSFORM".




Excel 2010 and Excel 2013

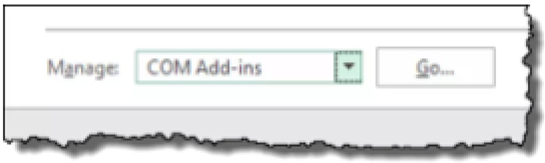
For 2010 and 2013, **you need to install an add-in** separately which you can download from **this link** and once you install it, you'll get a new tab in the Excel ribbon, like below:




- First, download the add-in from here (Microsoft's Official Website).
- Once you have downloaded the file, open it and follow the instructions.
- After that, you'll automatically get the "Power Query" tab on your Excel ribbon.

If somehow that "POWER QUERY" tab doesn't appear, there is no need to worry about it. You can add it using the COM Add-ins option.

- Go to File Tab ➜ Options ➜ Add-ins.

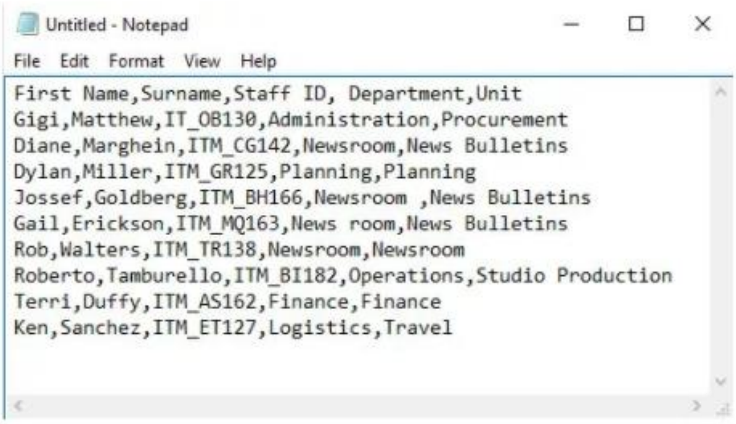



- In "Add-In" options, select "COM Add-ins" and click GO.
- After that, tick mark "Microsoft Power Query for Excel".


- In the end, click OK.

Example – Import Data from Text File

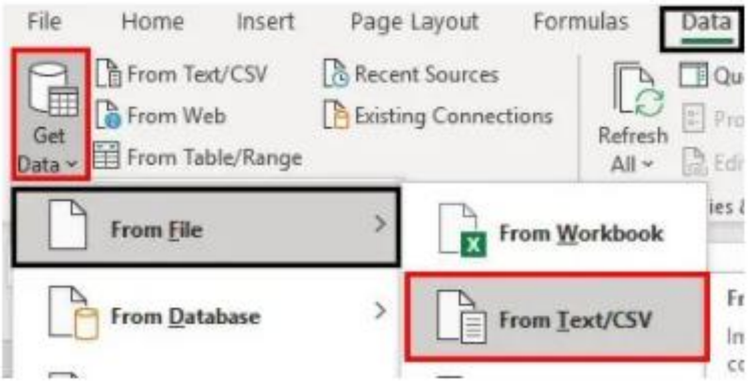
Getting the data from a text file is common, and each column is separated by delimiter value. For example, look at the below data table.




```
First Name,Surname,Staff ID, Department,Unit
Gigi,Matthew,IT_OB130,Administration,Procurement
Diane,Marghein,ITM_CG142,Newsroom,News Bulletins
Dylan,Miller,ITM_GR125,Planning,Planning
Jossef,Goldberg,ITM_BH166,Newsroom ,News Bulletins
Gail,Erickson,ITM_MQ163,News room,News Bulletins
Rob,Walters,ITM_TR138,Newsroom,Newsroom
Roberto,Tamburello,ITM_BI182,Operations,Studio Production
Terri,Duffy,ITM_AS162,Finance,Finance
Ken,Sanchez,ITM_ET127,Logistics,Travel
```

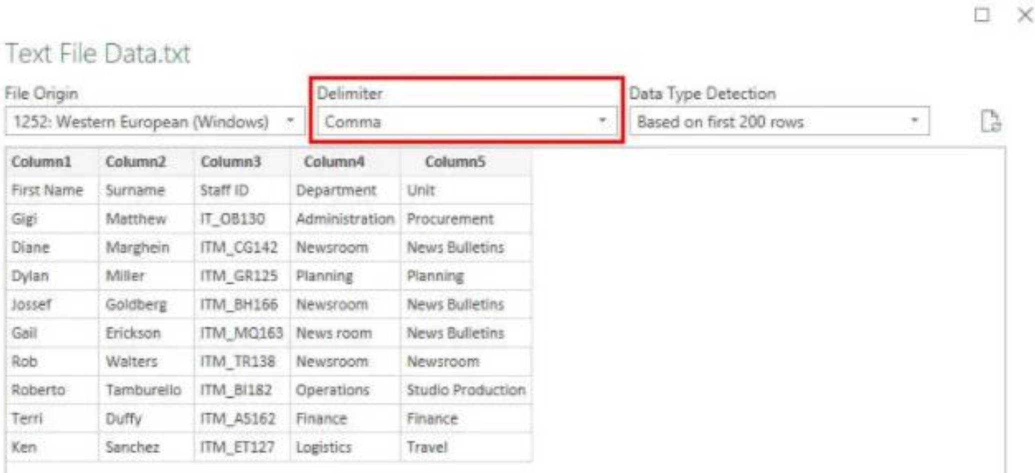
We will use power query to import this data and transform it the format which excel loves working with.

1. **Go to Data tab and under get data click on From File and under this click on "From Text / CSV".**




2. **Now it will ask you to choose the file that you would like to import, so choose the file and click on "Ok".**

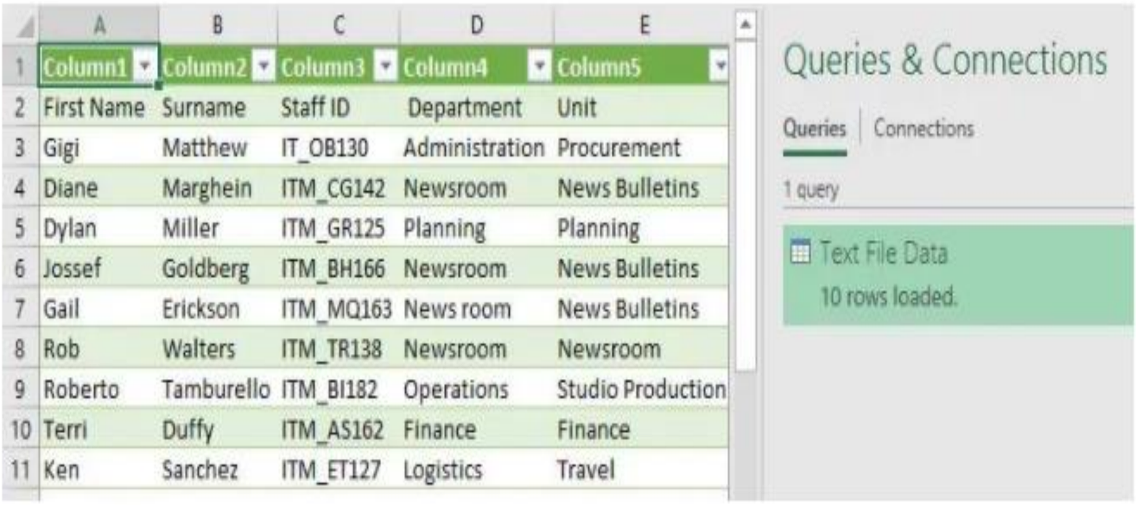

3. **This will display the preview of the data before it loads to power query model, and it looks like this.**




| Column1 | Column2 | Column3 | Column4 | Column5 |
|---|---|---|---|---|
| First Name | Surname | Staff ID | Department | Unit |
| Gigi | Matthew | IT_OB130 | Administration | Procurement |
| Diane | Marghein | ITM_CG142 | Newsroom | News Bulletins |
| Dylan | Miller | ITM_GR125 | Planning | Planning |
| Jossef | Goldberg | ITM_BH166 | Newsroom | News Bulletins |
| Gail | Erickson | ITM_MQ163 | News room | News Bulletins |
| Rob | Walters | ITM_TR138 | Newsroom | Newsroom |
| Roberto | Tamburello | ITM_BI182 | Operations | Studio Production |
| Terri | Duffy | ITM_AS162 | Finance | Finance |
| Ken | Sanchez | ITM_ET127 | Logistics | Travel |

As you can see above, it has automatically detected the delimiter as “comma” and segregated the data into multiple columns.

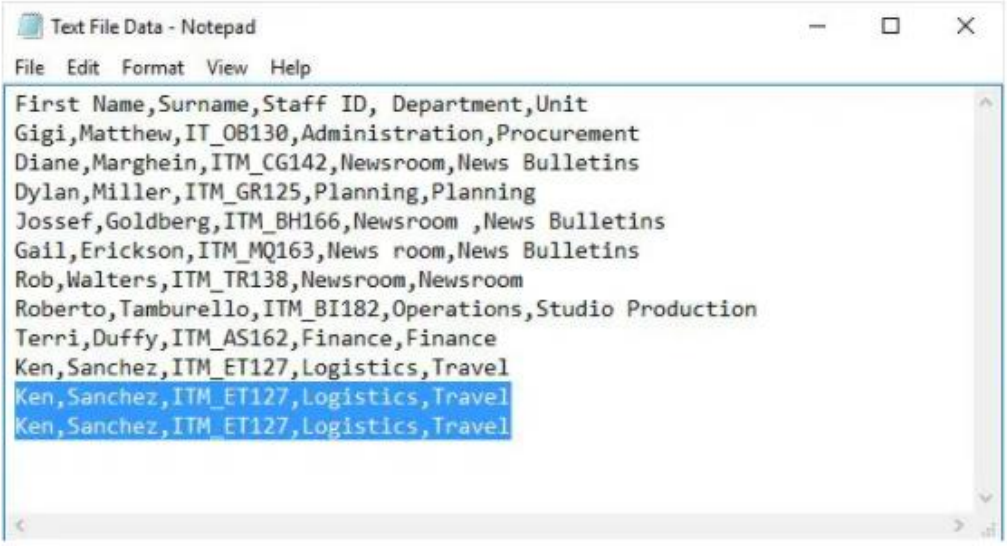
4. **Click on “Load” at the bottom and data will be loaded to excel file in excel table format.**




| | A | B | C | D | E |
|---|---|---|---|---|---|
| 1 | Column1 | Column2 | Column3 | Column4 | Column5 |
| 2 | First Name | Surname | Staff ID | Department | Unit |
| 3 | Gigi | Matthew | IT_OB130 | Administration | Procurement |
| 4 | Diane | Marghein | ITM_CG142 | Newsroom | News Bulletins |
| 5 | Dylan | Miller | ITM_GR125 | Planning | Planning |
| 6 | Jossef | Goldberg | ITM_BH166 | Newsroom | News Bulletins |
| 7 | Gail | Erickson | ITM_MQ163 | News room | News Bulletins |
| 8 | Rob | Walters | ITM_TR138 | Newsroom | Newsroom |
| 9 | Roberto | Tamburello | ITM_BI182 | Operations | Studio Production |
| 10 | Terri | Duffy | ITM_AS162 | Finance | Finance |
| 11 | Ken | Sanchez | ITM_ET127 | Logistics | Travel |

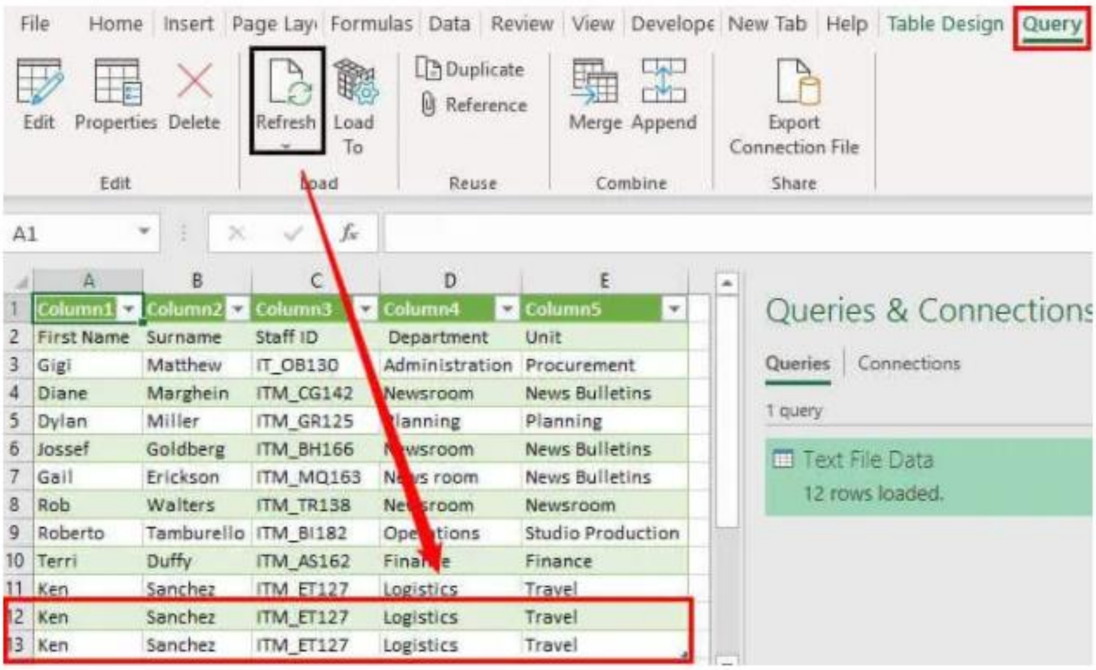
As you can see to the right side, we have a window called “Queries & Connections”, so this suggests that data is imported through power query.

5. **Once the data is loaded to excel the connected text file should be intact with excel, so go to the text file and add two extra lines of data.**

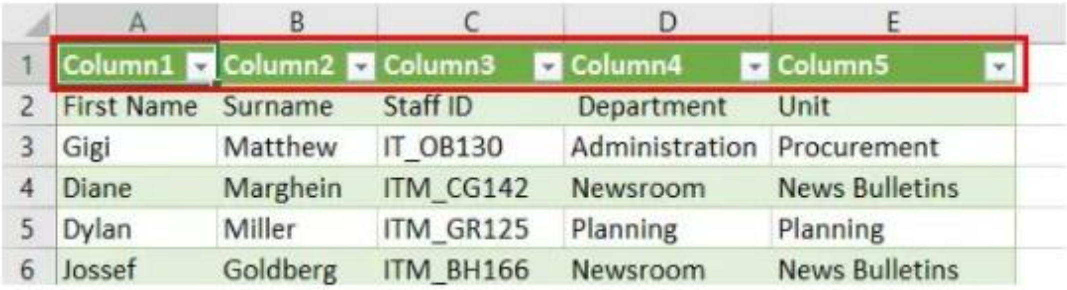



6. **Now come to excel and select the table, and it will show two more tabs as "Query & Table Design".**


7. **Under "Query" click on "Refresh" button and data will be refreshed with updated two new rows.**

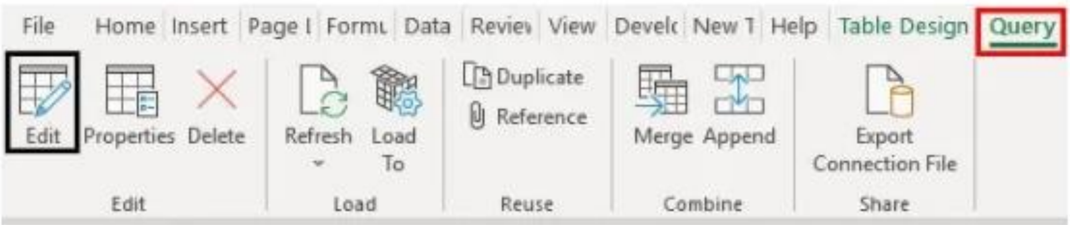



8. **There is another problem here, i.e. first row is not captured as a column header.**

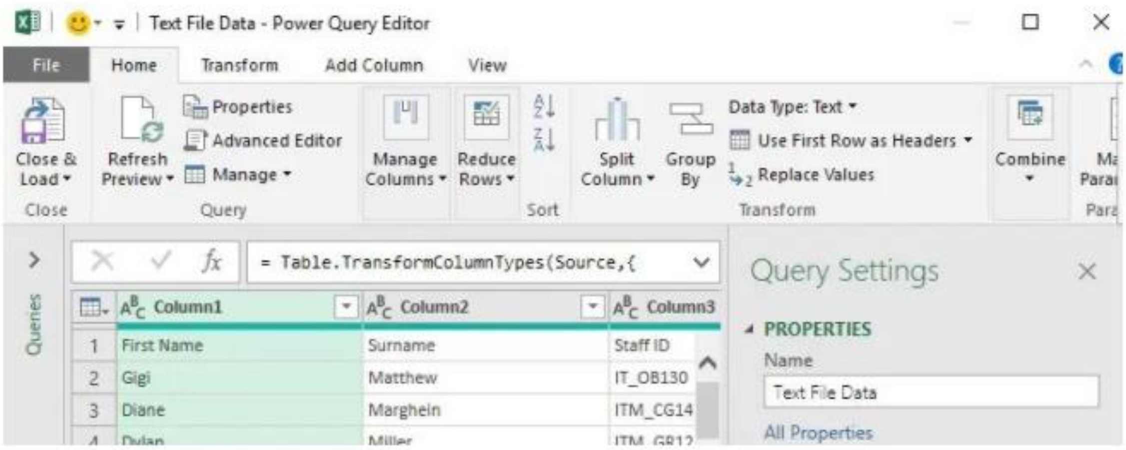


| | A | B | C | D | E |
|---|---|---|---|---|---|
| 1 | Column1 | Column2 | Column3 | Column4 | Column5 |
| 2 | First Name | Surname | Staff ID | Department | Unit |
| 3 | Gigi | Matthew | IT_OB130 | Administration | Procurement |
| 4 | Diane | Marghein | ITM_CG142 | Newsroom | News Bulletins |
| 5 | Dylan | Miller | ITM_GR125 | Planning | Planning |
| 6 | Jossef | Goldberg | ITM_BH166 | Newsroom | News Bulletins |

9. **To apply these changes, click on “Edit Query” under “Query” tab.**

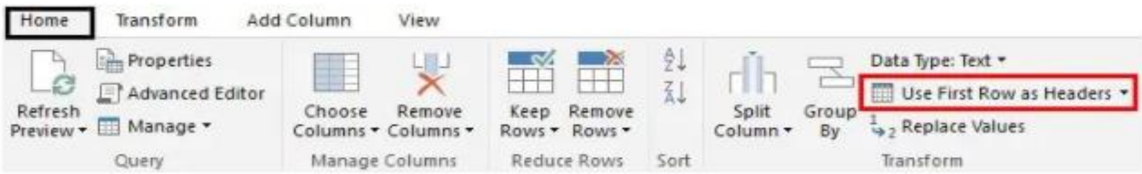



10. **This will open the power query editor tab.**

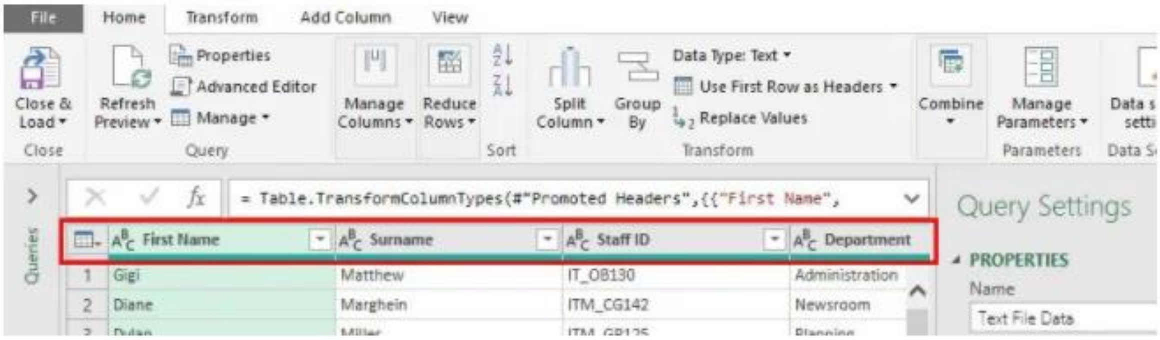



This is where we need power query.

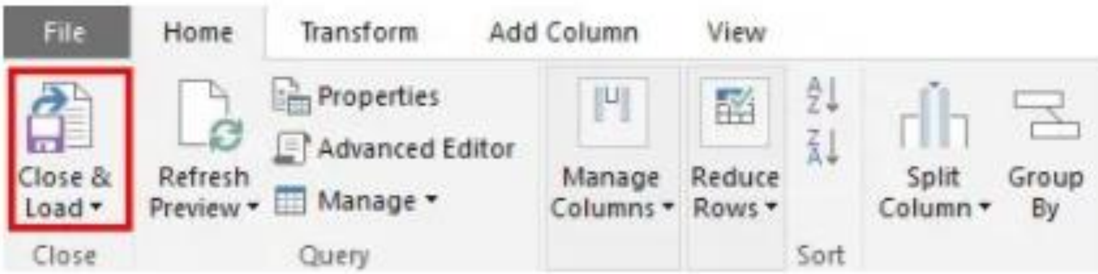
11. **To make the first row as header under HOME tab, click on “Use First Row as Header”.**




12. **So this will make the first row as a column header, and we can see this below.**




13. **Click on "Close & Load" under the HOME tab, and data will be back to excel with modified changes.**




14. **Now in excel, we have data like this.**

| | A | B | C | D | E |
|---|---|---|---|---|---|
| 1 | First Name | Surname | Staff ID | Department | Unit |
| 2 | Gigi | Matthew | IT_OB130 | Administration | Procurement |
| 3 | Diane | Marghein | ITM_CG142 | Newsroom | News Bulletins |
| 4 | Dylan | Miller | ITM_GR125 | Planning | Planning |
| 5 | Jossef | Goldberg | ITM_BH166 | Newsroom | News Bulletins |
| 6 | Gail | Erickson | ITM_MQ163 | News room | News Bulletins |
| 7 | Rob | Walters | ITM_TR138 | Newsroom | Newsroom |
| 8 | Roberto | Tamburello | ITM_BI182 | Operations | Studio Production |
| 9 | Terri | Duffy | ITM_AS162 | Finance | Finance |
| 10 | Ken | Sanchez | ITM_ET127 | Logistics | Travel |
| 11 | Ken | Sanchez | ITM_ET127 | Logistics | Travel |
| 12 | Ken | Sanchez | ITM_ET127 | Logistics | Travel |

Without changing the actual position of the data, power query modified the data.

## Lesson 29 - Power query – Append Query, Merge Query

### Merge queries (Power Query)

When you merge, you typically join two queries that are either within Excel or from an external data source. In addition, the Merge feature has an intuitive user interface to help you easily join two related tables. For an example of merging total sales from an order details query into a products table, see the Learn to combine multiple data sources tutorial.

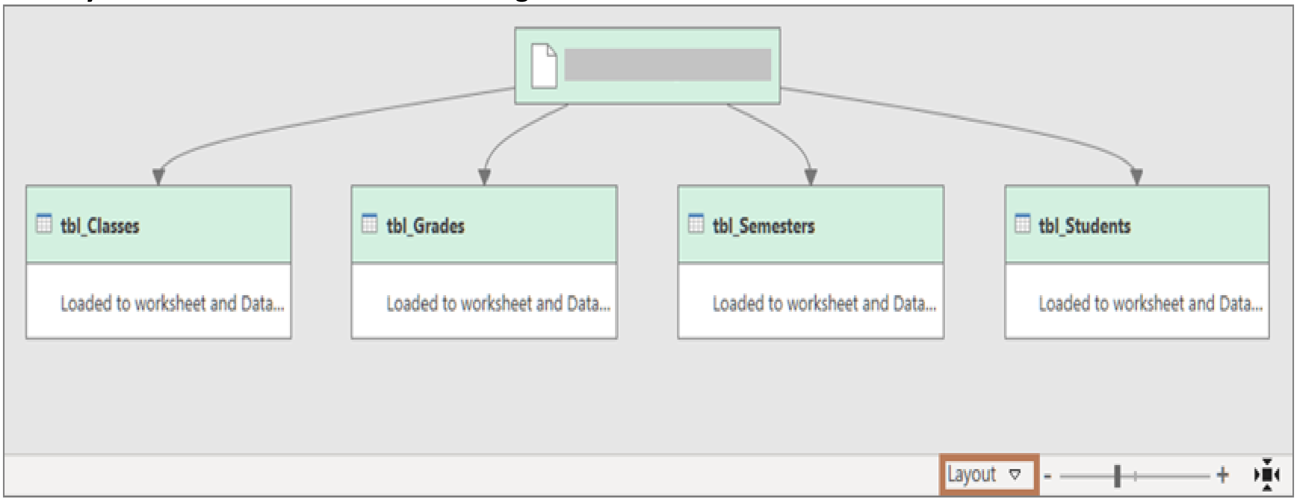
### About Merging queries

A merge query creates a new query from two existing queries. One query result contains all columns from a primary table, with one column serving as a single column containing a relationship to a secondary table. The related table contains all rows that match each row from a primary table based on a common column value. An Expand operation adds columns from a related table into a primary table.

There are two types of merge operations:

- **Inline Merge** You merge data into your existing query until you reach a final result. The result is a new step at the end of the current query.
- **Intermediate Merge** You create a new query for each merge operation.

To see a visual representation of the relationships in the **Query Dependencies** dialog box, select **View** > **Query Dependencies**. At the bottom of the dialog box, select the **Layout** command to control the diagram orientation.




### Perform a Merge operation

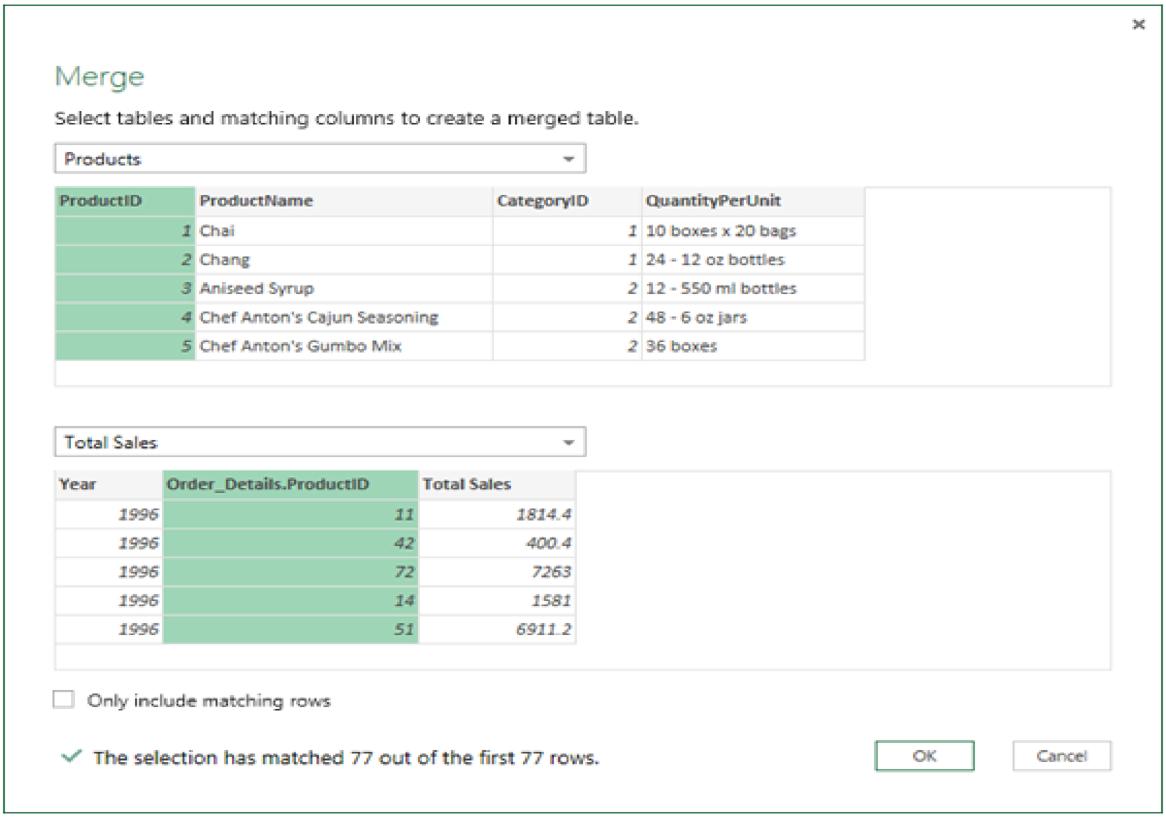
You need at least two queries that can be merged and that have at least one or more columns to match in a join operation. They can come from different types of external data sources. The following example uses Products and Total Sales.

1. To open a query, locate one previously loaded from the Power Query Editor, select a cell in the data, and then select **Query** > **Edit**. For more information see Create, load, or edit a query in Excel.
2. Select **Home** > **Merge Queries**. The default action is to do an inline merge. To do an intermediate merge, select the arrow next to the command, and then select **Merge Queries as New**.

   The **Merge** dialog box appears.

3. Select the primary table from the first drop-down list, and then select a join column by selecting the column header.
4. Select the related table from the next drop-down list, and then select a matching column by selecting the column header.

   Ensure that you select the same number of columns to match in the preview of the primary and related or secondary tables. Column comparison is based on the order of selection in each table. Matching columns must be the same data type, such as **Text** or **Number**. You can also select multiple columns to merge.




5. After you select columns from a primary table and related table, Power Query displays the number of matches from a top set of rows. This action validates whether the **Merge** operation was correct or whether you need to make changes to get the results you want. You can either select different tables or columns.
6. The default join operation is an inner join, but from the **Join Kind** drop down list, you can select the following types of join operations:

   **Inner join** Brings in only matching rows from both the primary and related tables.

   **Left outer join** Keeps all the rows from the primary table and brings in any matching rows from the related table.

   **Right outer join** Keeps all the rows from the related table and brings in any matching rows from the primary table.

   **Full outer** Brings in all the rows from both the primary and related tables.

**Left anti join** Brings in only rows from the primary table that don't have any matching rows from the related table.

**Right anti join** Brings in only rows from the related table that don't have any matching rows from the primary table.

**Cross join** Returns the Cartesian product of rows from both tables by combining each row from the primary table with each row from the related table.

7. If you want to do a fuzzy match, select **Use fuzzy matching to perform the merge** and select from the **Fuzzy Matching options**. For more information, see Create a fuzzy match.
8. To include only those rows from the primary table that match the related table, select **Only include matching rows**. Otherwise, all rows from the primary table are included in the resulting query.
9. Select **OK**.

**Result**

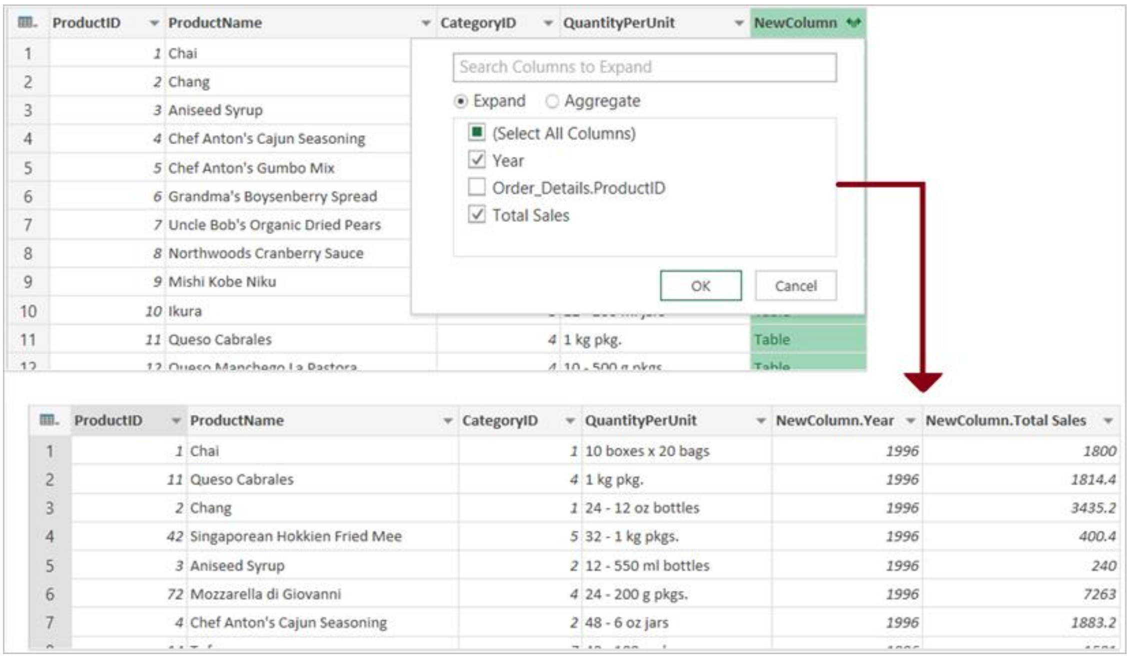
fx = Table.NestedJoin(Products,{"ProductID"},#"Total Sales",{"Order_Details.ProductID"},"NewColumn")

| ProductID | ProductName | CategoryID | QuantityPerUnit | NewColumn |
|---|---|---|---|---|
| 1 | Chai | 1 | 10 boxes x 20 bags | Table |
| 2 | Chang | 1 | 24 - 12 oz bottles | Table |
| 3 | Aniseed Syrup | 2 | 12 - 550 ml bottles | Table |
| 4 | Chef Anton's Cajun Seasoning | 2 | 48 - 6 oz jars | Table |
| 5 | Chef Anton's Gumbo Mix | 2 | 36 boxes | Table |
| 6 | Grandma's Boysenberry Spread | 2 | 12 - 8 oz jars | Table |

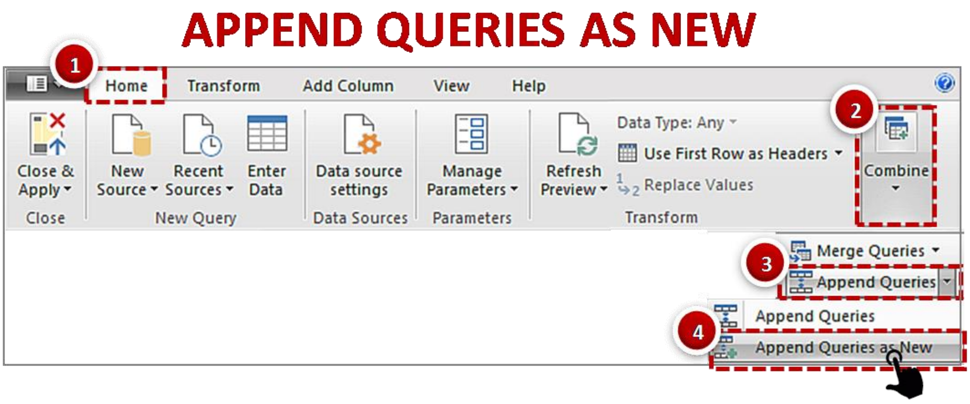
Expand the Table column

After a **Merge** operation, you can expand the **Table** structured column to add columns from the related table into the primary table. Once a column is expanded into the primary table, you can apply filters and other transform operations. For more information, see Work with a List, Record, or Table structured column.

1. In the Data Preview, select the **Expand** icon next to the **NewColumn** column header.
2. In the **Expand** drop-down box, select or clear the columns to display the results you want. To aggregate the column values, select **Aggregate.**



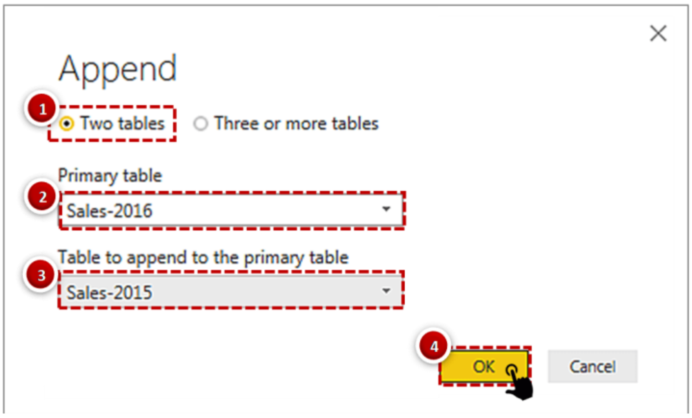

3. You may want to rename the new columns. For more information, see Rename a column.
   Append Queries
   To combine the above data tables, you need to use the Append Queries feature. To use this feature click on-
   **Home > Combine > Append Queries > Append Queries as New**




**Step 2: Choose Tables for Appending**

When you click on **Append Queries as New** option, an Append window gets open that allows you to choose the data tables from Power Query. First, you need to specify how many tables you want to append. Then choose the tables and click OK as shown in the below picture.

## CHOOSE TABLES FOR APPENDING



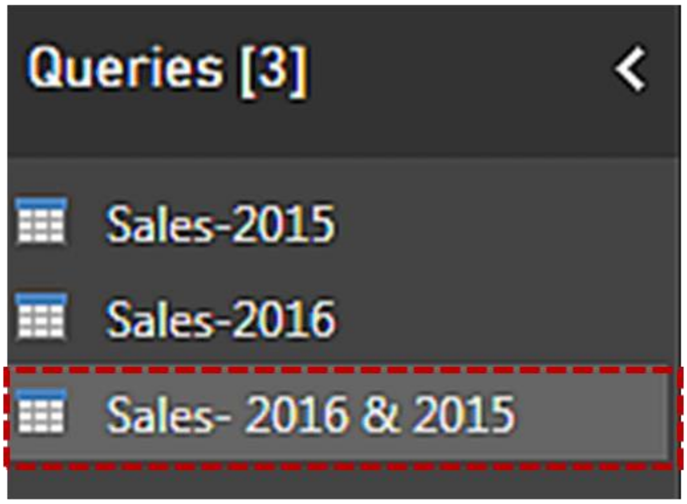

**Step 3: Close & Apply**

After you get the desired output as shown in the below picture, you can click on the Close & Apply button.

## DATA TABLE AFTER APPENDING QUERIES

| OrderDate | OrderNum | ProductKey | CustomerKey | TerritoryKey |
|---|---|---|---|---|
| 1/1/2016 | SO48797 | 385 | 14335 | 1 |
| 1/1/2016 | SO48802 | 383 | 24923 | 9 |
| 1/1/2016 | SO48801 | 326 | 15493 | 1 |
| 1/1/2016 | SO48799 | 352 | 26708 | 4 |
| 1/1/2016 | SO48798 | 369 | 23332 | 9 |
| 1/1/2016 | SO48800 | 342 | 15491 | 5 |
| 1/1/2015 | SO45080 | 332 | 14657 | 1 |
| 1/2/2015 | SO45079 | 312 | 29255 | 4 |
| 1/3/2015 | SO45082 | 350 | 11455 | 9 |
| 1/4/2015 | SO45081 | 338 | 26782 | 6 |
| 1/5/2015 | SO45083 | 312 | 14947 | 10 |
| 1/6/2015 | SO45084 | 310 | 29143 | 4 |

# APPENDED QUERIES



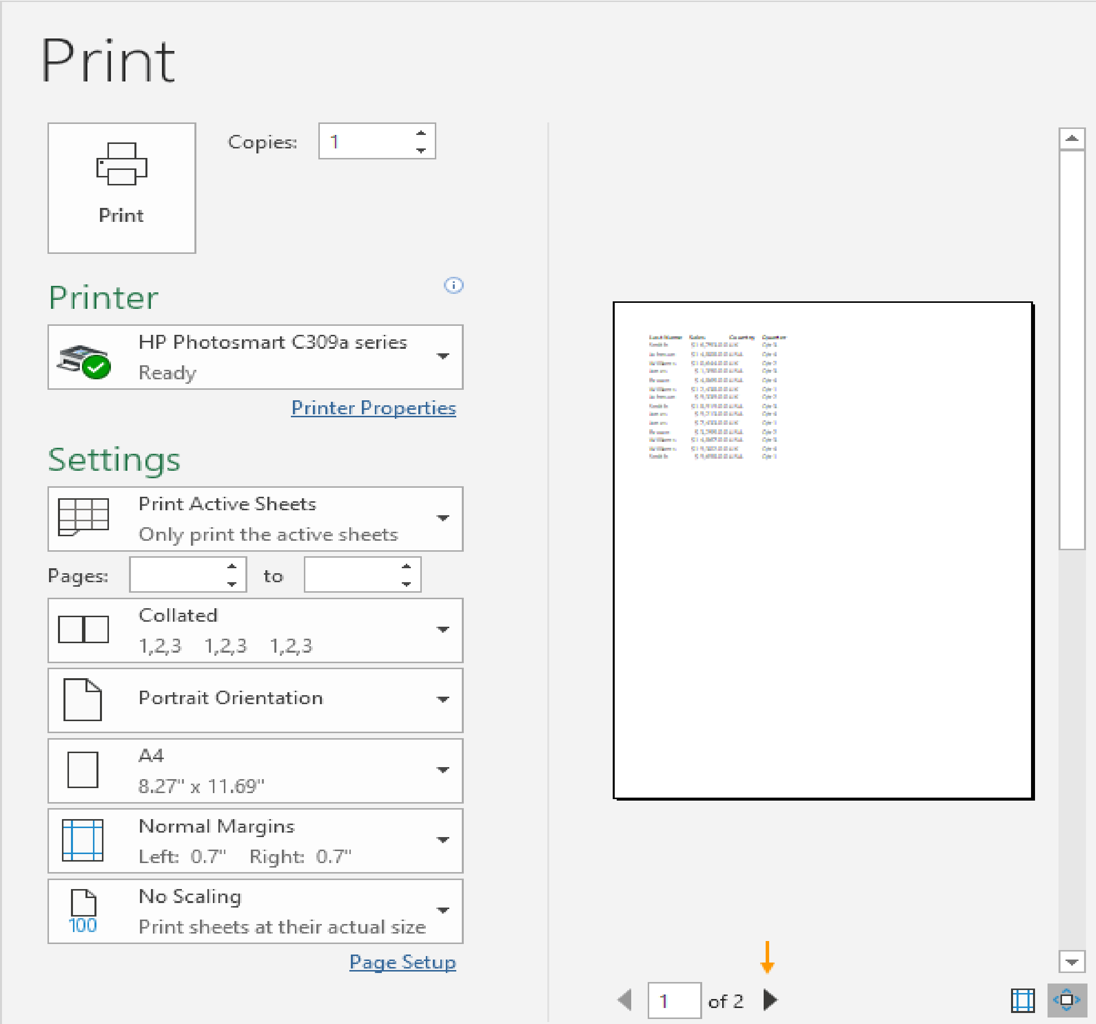

**EXCEL PRINTING**

## Lesson 30 – Print settings for worksheet, workbooks, Header & footer

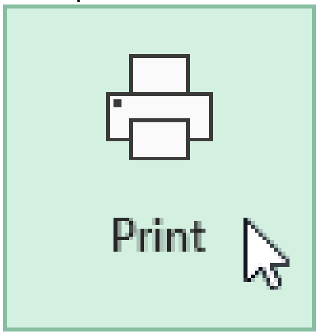
Print a Worksheet

To print a worksheet in Excel, execute the following steps.

1. On the File tab, click Print.
2. To preview the other pages that will be printed, click 'Next Page' or 'Previous Page' at the bottom of the window.




3. To print the worksheet, click the big Print button.

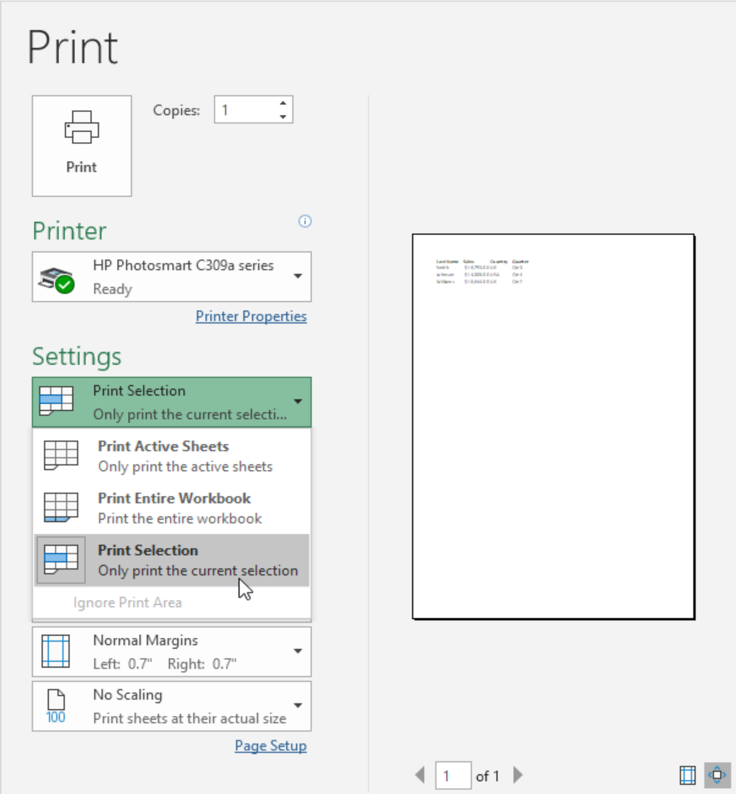



What to Print

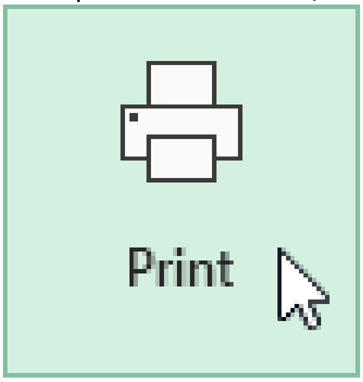
Instead of printing the entire worksheet, you can also print the current selection.

1. First, select the range of cells you want to print.

2. Next, under Settings, select Print Selection.




3. To print the selection, click the big Print button.



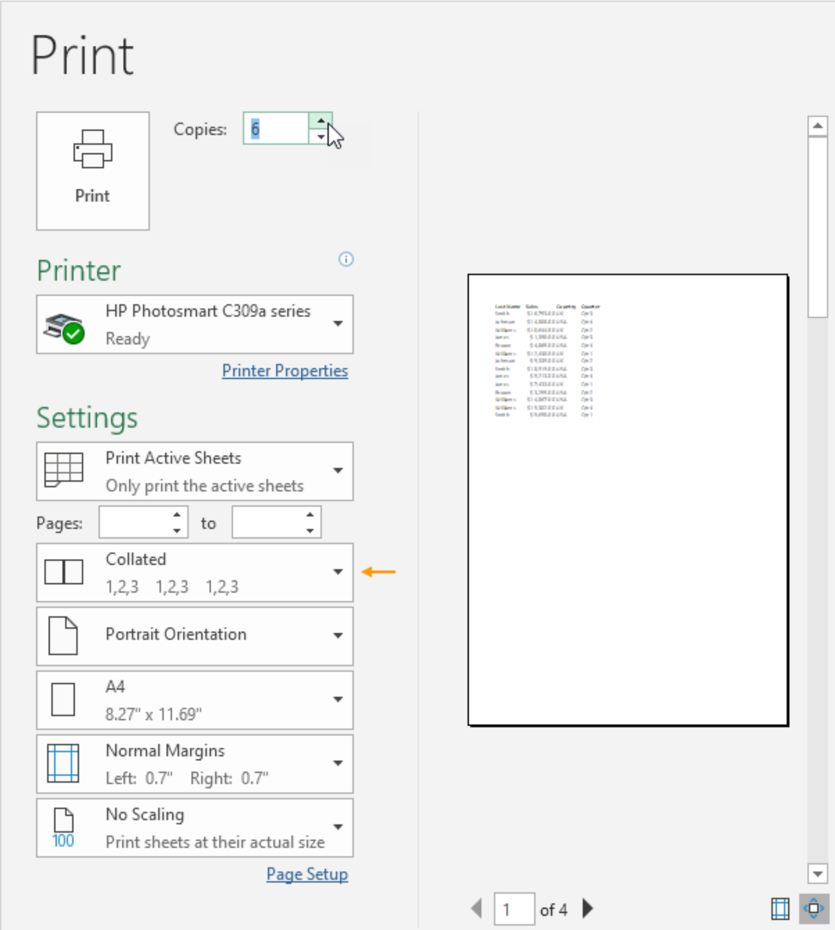

Note: you can also print the active sheets (first select the sheets by holding down CTRL and clicking the sheet tabs) or print the entire workbook. Use the boxes next to Pages (see first screenshot) to only print a few pages of your document. For example, 2 to 2 only prints the second page.

Multiple Copies

To print multiple copies, execute the following steps.

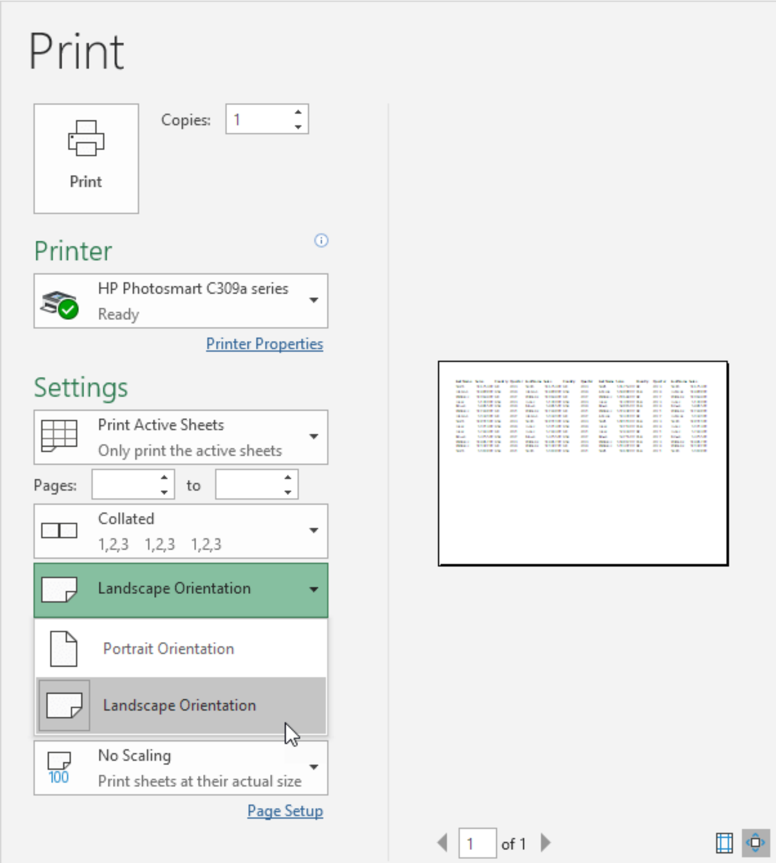
1. Use the arrows next to the Copies box.

2. If one copy contains multiple pages, you can switch between Collated and Uncollated. For example, if you print 6 copies, Collated prints the entire first copy, then the entire second copy, etc. Uncollated prints 6 copies of page 1, 6 copies of page 2, etc.




Orientation

You can switch between Portrait Orientation (more rows but fewer columns) and Landscape Orientation (more columns but fewer rows).

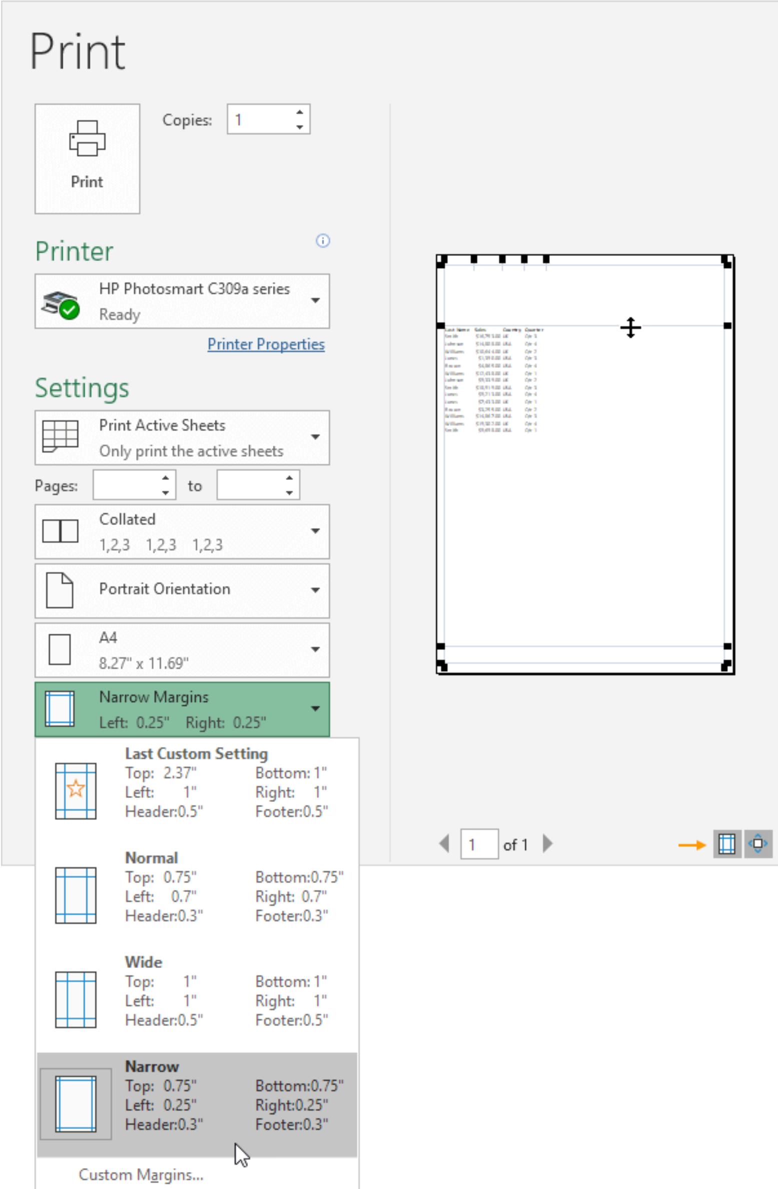



Page Margins

To adjust the page margins, execute the following steps.

1. Select one of the predefined margins (Normal, Wide or Narrow) from the Margins drop-down list.

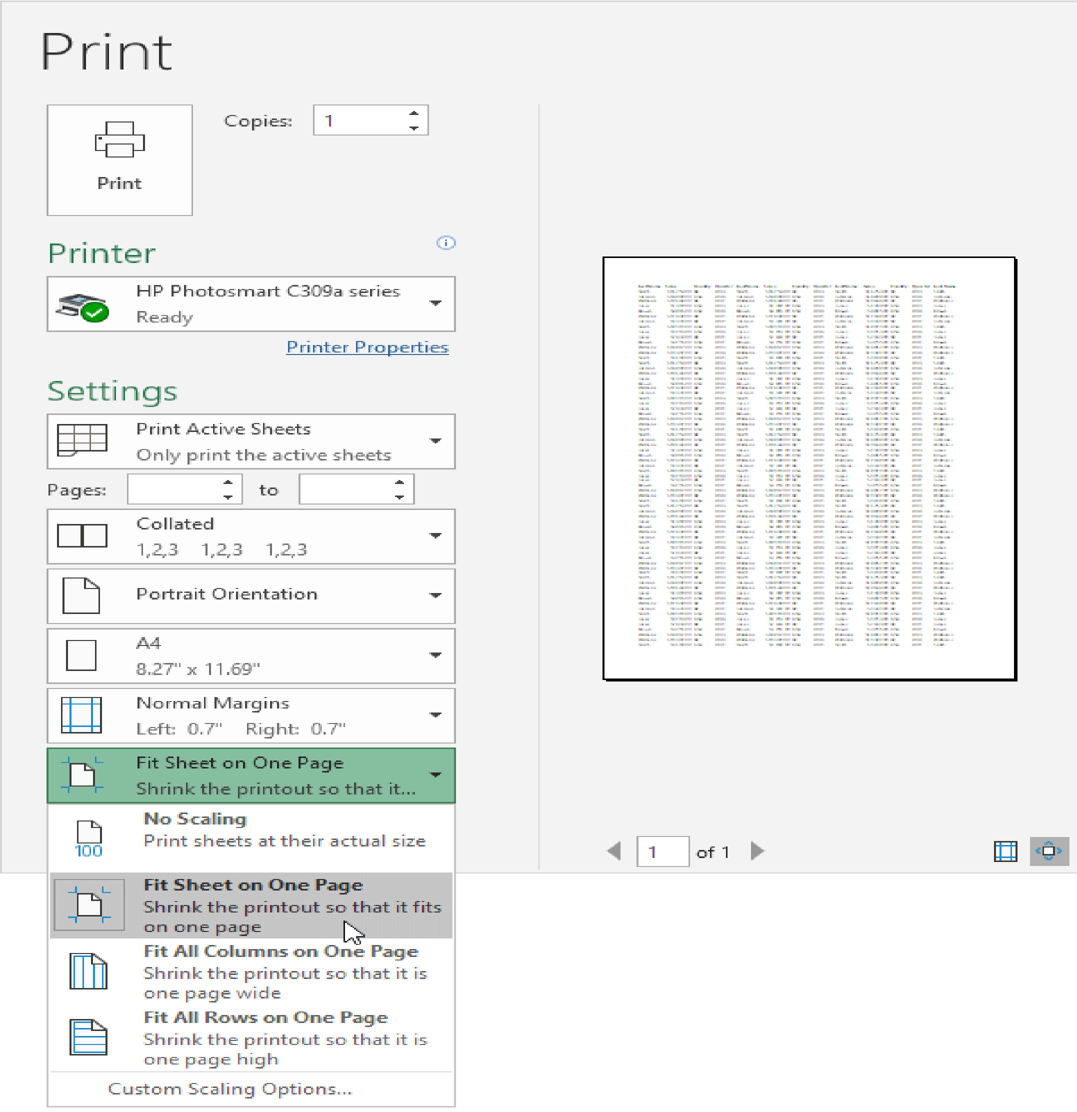
2. Or click the 'Show Margins' icon at the bottom right of the window. Now you can drag the lines to manually change the page margins.




## Scaling

If you want to fit more data on one page, you can fit the sheet on one page. To achieve this, execute the following steps.

1. Select 'Fit Sheet on One Page' from the Scaling drop-down list.



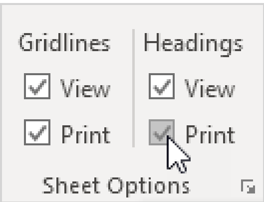

Note: you can also shrink the printout to one page wide or one page high. Click Custom Scaling Options to manually enter a scaling percentage or to fit the printout to a specific number of pages wide and tall. Be careful, Excel doesn't warn you when your printout becomes unreadable.

Print with Grid lines & Headings

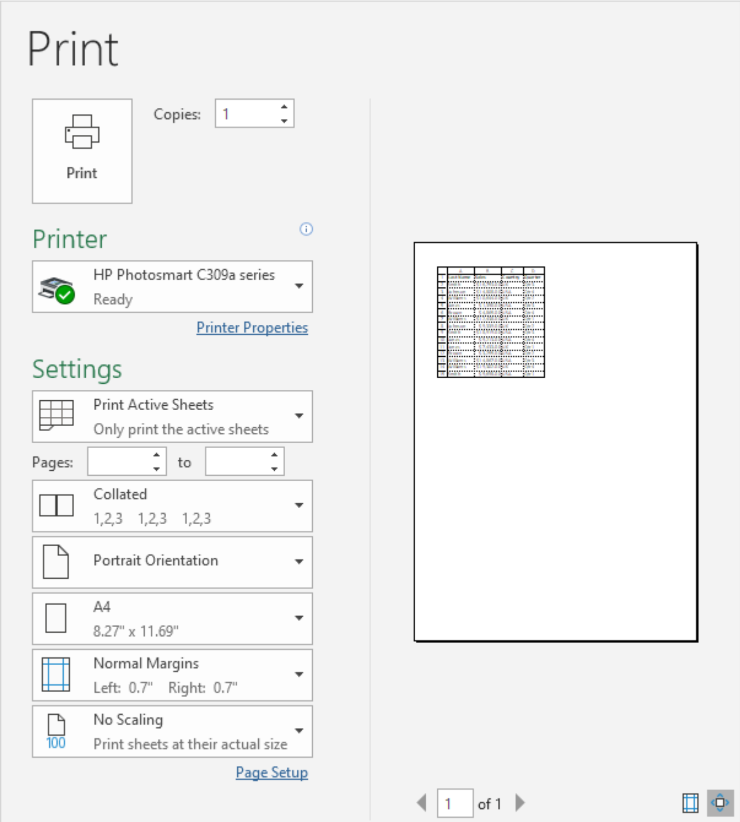
Print gridlines (the horizontal and vertical lines on your worksheet) and row/column headers (1, 2, 3 etc. and A, B, C etc.) to make your printed copy easier to read.

To print gridlines and headings in Excel, execute the following steps.

1. On the Page Layout tab, in the Sheet Options group, check Print under Gridlines and check Print under Headings.




2. On the File tab, click Print for a print preview.




Print Area

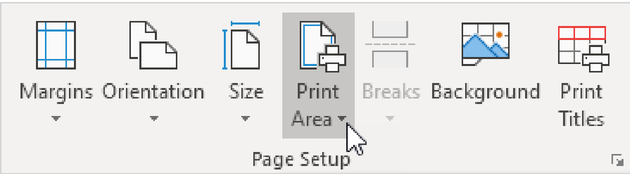
If you set a print area in Excel, only that area will be printed. The print area is saved when you save the workbook.

To set a print area, execute the following steps.

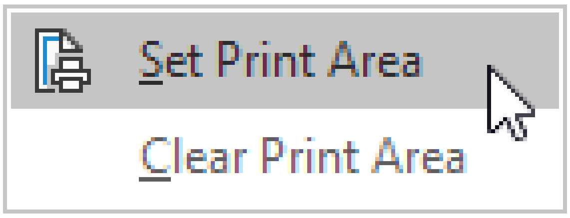
1. Select a range of cells.

| | A | B | C | D | E |
|---|---|---|---|---|---|
| 1 | Last Name | Sales | Country | Quarter | |
| 2 | Smith | $16,753.00 | UK | Qtr 3 | |
| 3 | Johnson | $14,808.00 | USA | Qtr 4 | |
| 4 | Williams | $10,644.00 | UK | Qtr 2 | |
| 5 | Jones | $1,390.00 | USA | Qtr 3 | |
| 6 | Brown | $4,865.00 | USA | Qtr 4 | |
| 7 | Williams | $12,438.00 | UK | Qtr 1 | |
| 8 | Johnson | $9,339.00 | UK | Qtr 2 | |
| 9 | Smith | $18,919.00 | USA | Qtr 3 | |
| 10 | Jones | $9,213.00 | USA | Qtr 4 | |
| 11 | Jones | $7,433.00 | UK | Qtr 1 | |
| 12 | Brown | $3,255.00 | USA | Qtr 2 | |
| 13 | Williams | $14,867.00 | USA | Qtr 3 | |
| 14 | Williams | $19,302.00 | UK | Qtr 4 | |
| 15 | Smith | $9,698.00 | USA | Qtr 1 | |
| 16 | | | | | |

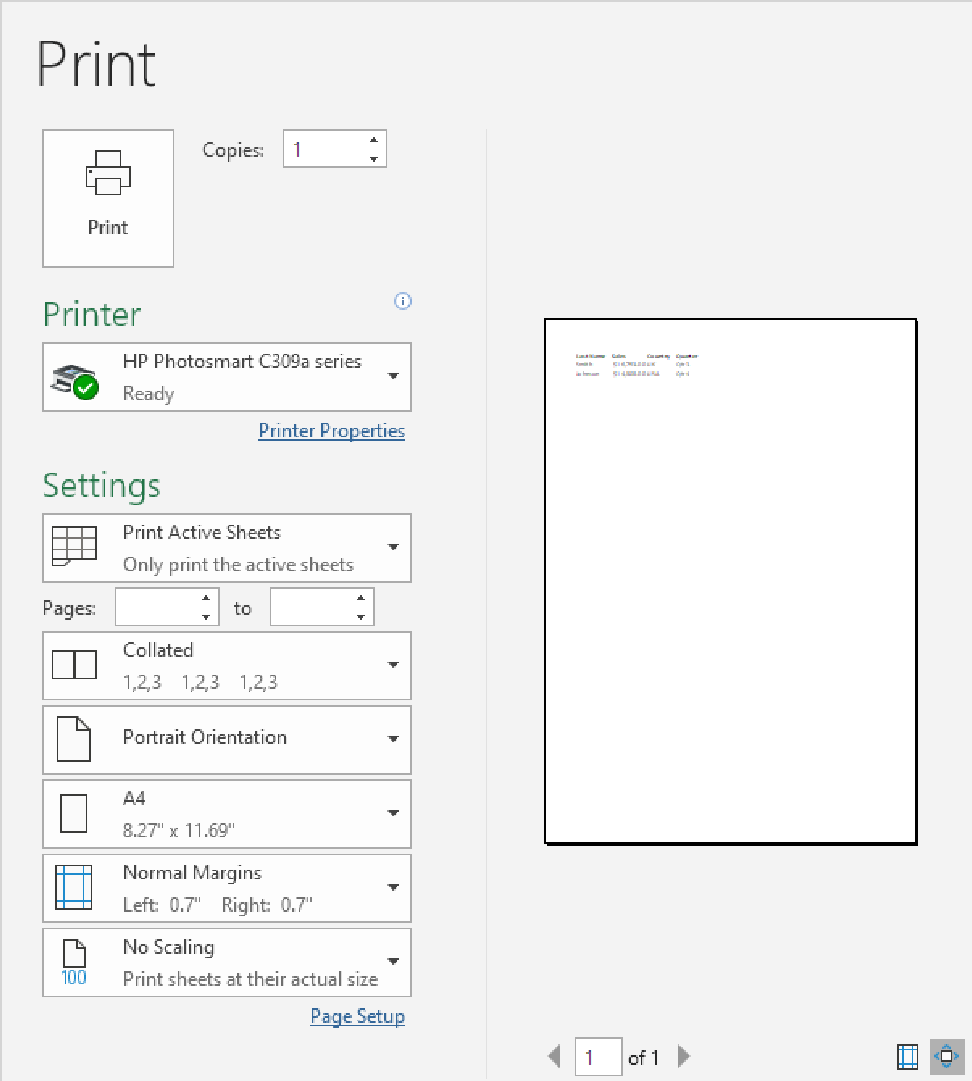
2. On the Page Layout tab, in the Page Setup group, click Print Area.




3. Click Set Print Area.




4. Save, close and reopen the Excel file.
5. On the File tab, click Print.
Result. See the print preview below. Only the print area will be printed.

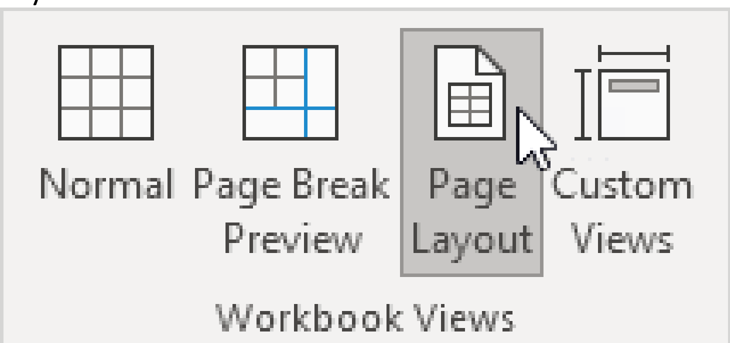



Note: use the Name Manager to edit and delete print areas. On the Formulas tab, in the Defined Names group, click Name Manager.

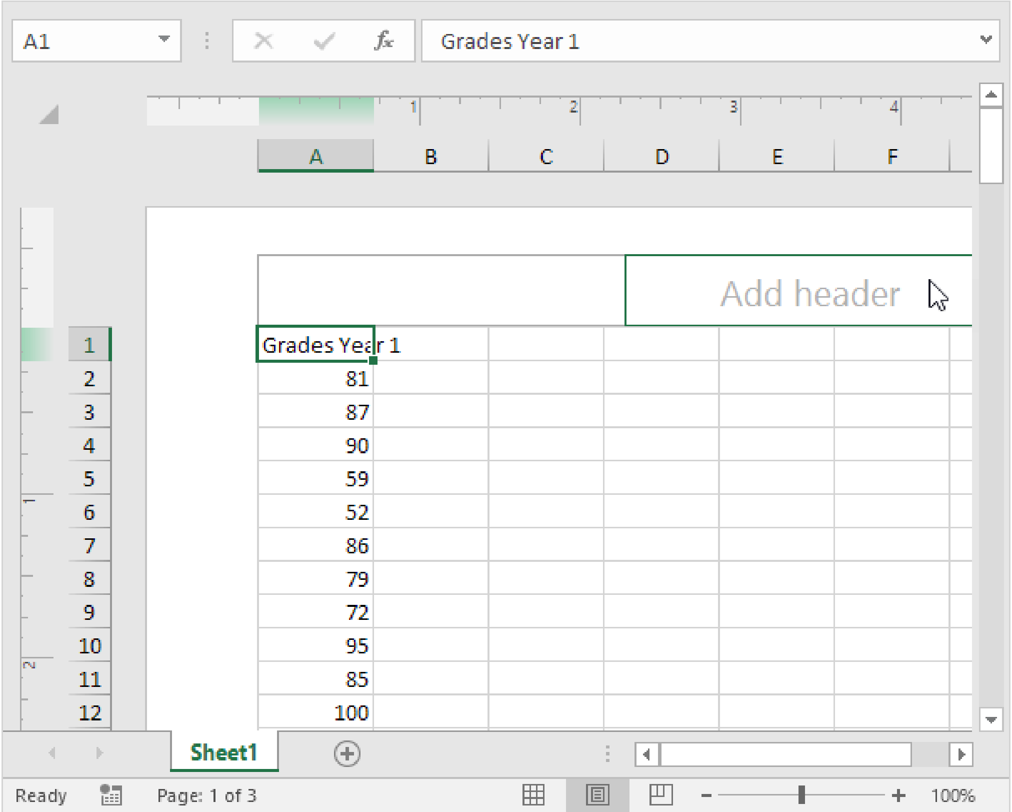
Headers and Footers

This example teaches you how to add information to the header (top of each printed page) or footer (bottom of each printed page) in Excel.

1. On the View tab, in the Workbook Views group, click Page Layout, to switch to Page Layout view.

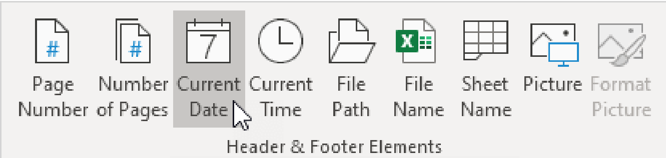



2. Click Add header.

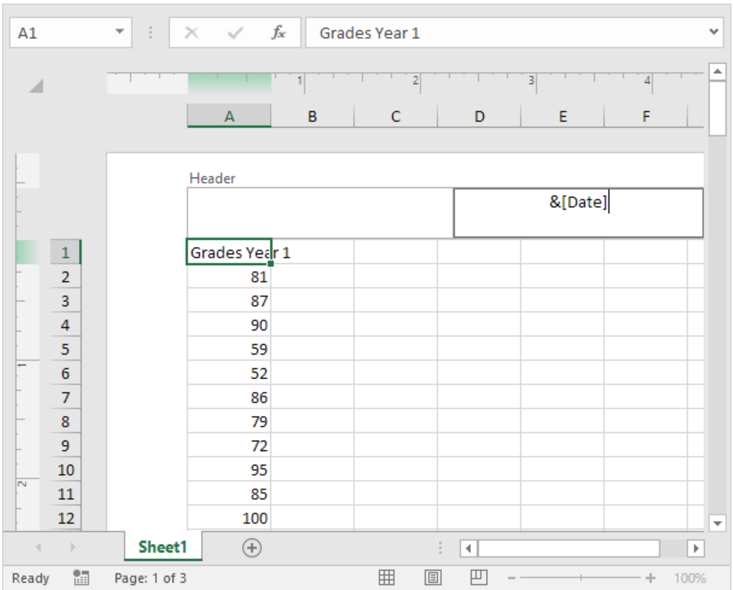


The Header & Footer Tools contextual tab activates.

3. On the Design tab, in the Header & Footer Elements group, click Current Date to add the current date (or add the current time, file name, sheet name, etc).



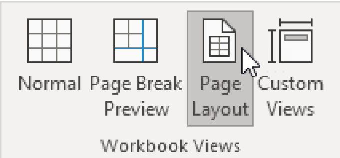

Result:



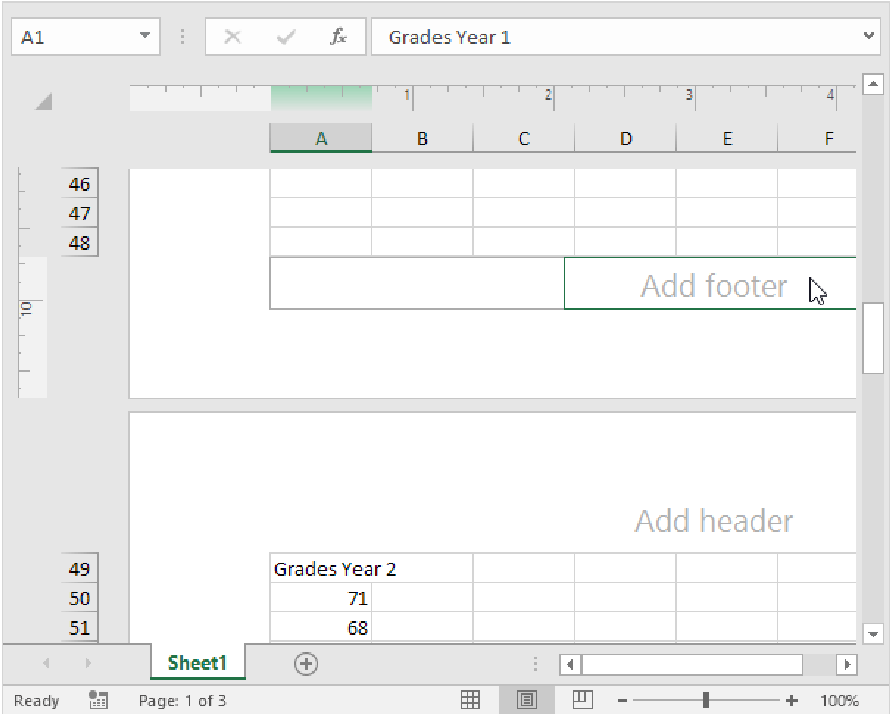
Note: Excel uses codes in order to automatically update the header or footer as you change the workbook.

4. You can also add information to the left and right part of the header. For example, click the left part to add the name of your company.
5. Click somewhere else on the sheet to see the header.
Page Numbers

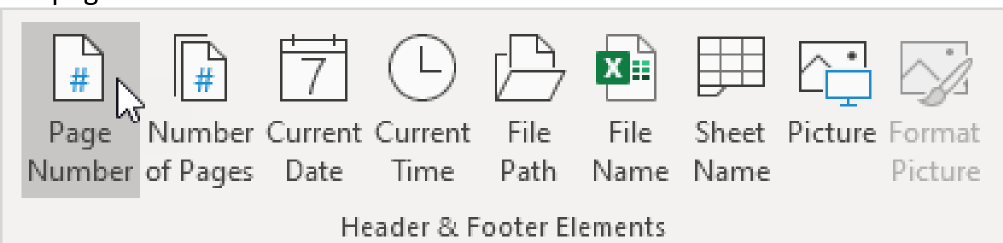
This example teaches you how to insert page numbers in Excel.
1. On the View tab, in the Workbook Views group, click Page Layout, to switch to Page Layout view.



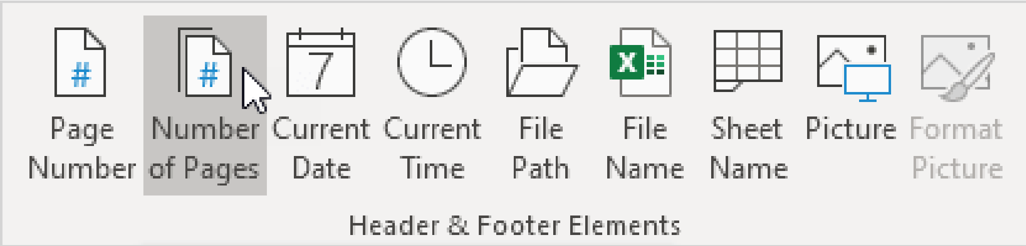

2. Click Add footer.



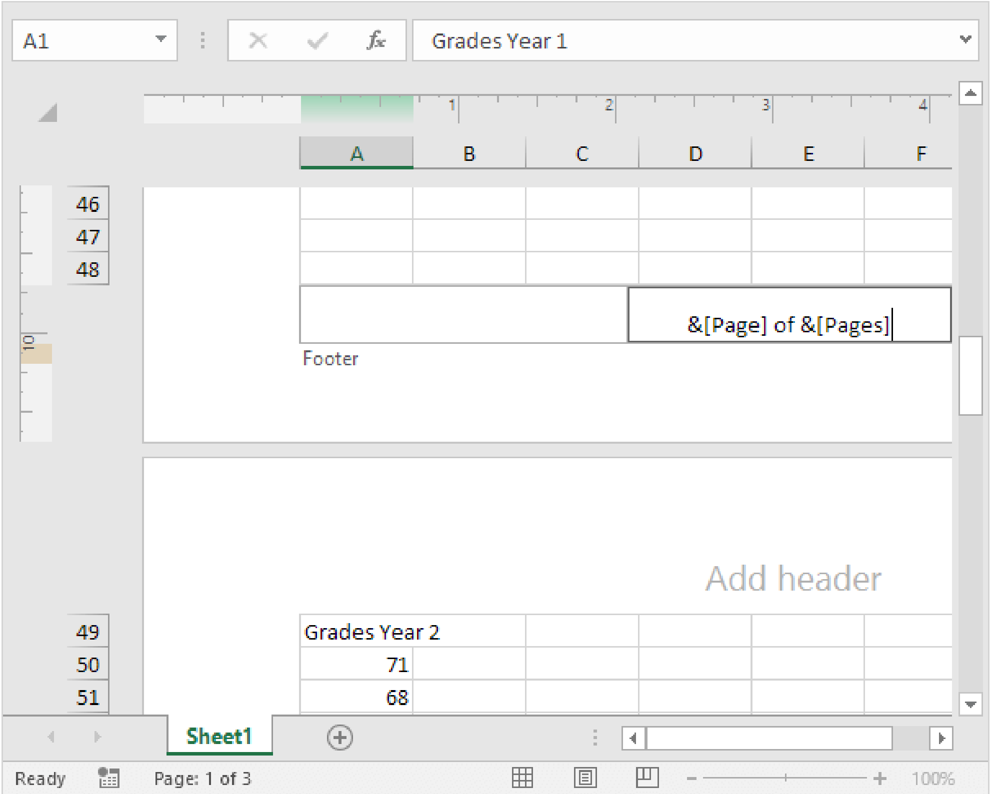

The Header & Footer Tools contextual tab activates.
3. On the Design tab, in the Header & Footer Elements group, click Page Number to add the page number.




4. Type " of "
5. On the Design tab, in the Header & Footer Elements group, click Number of Pages to add the number of pages.

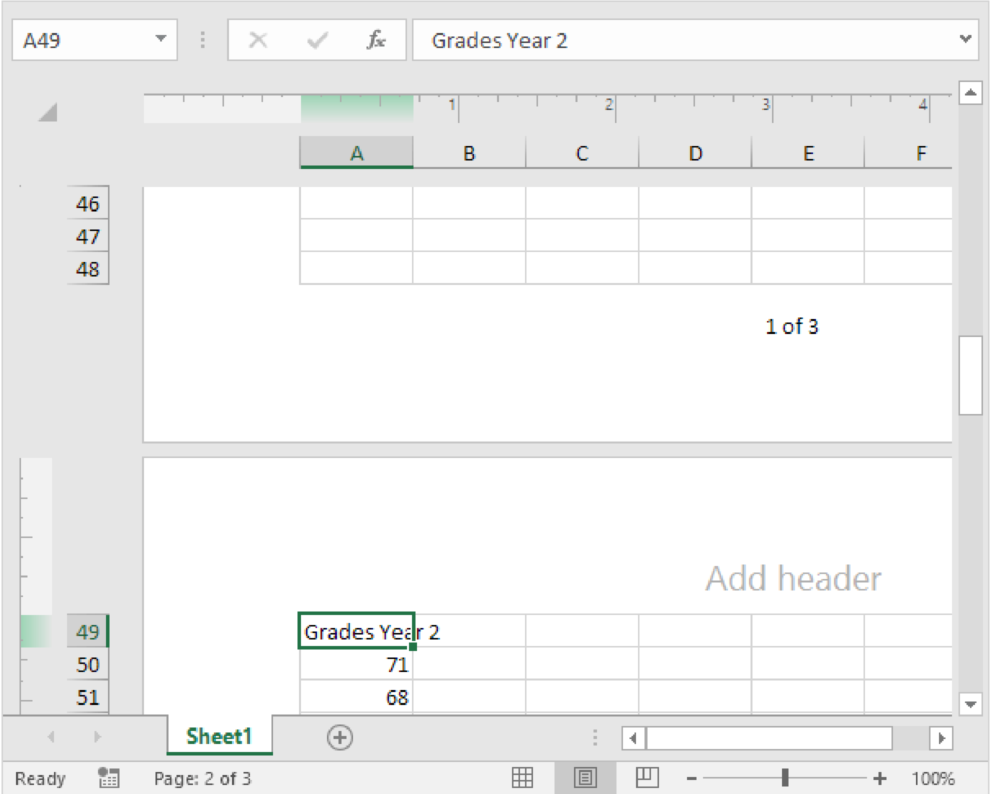



Result:

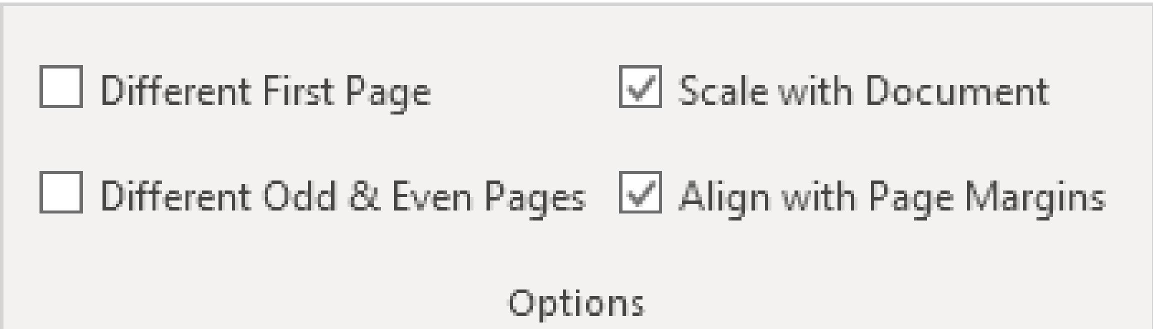



Note: Excel uses codes in order to automatically update the header or footer as you change the workbook.

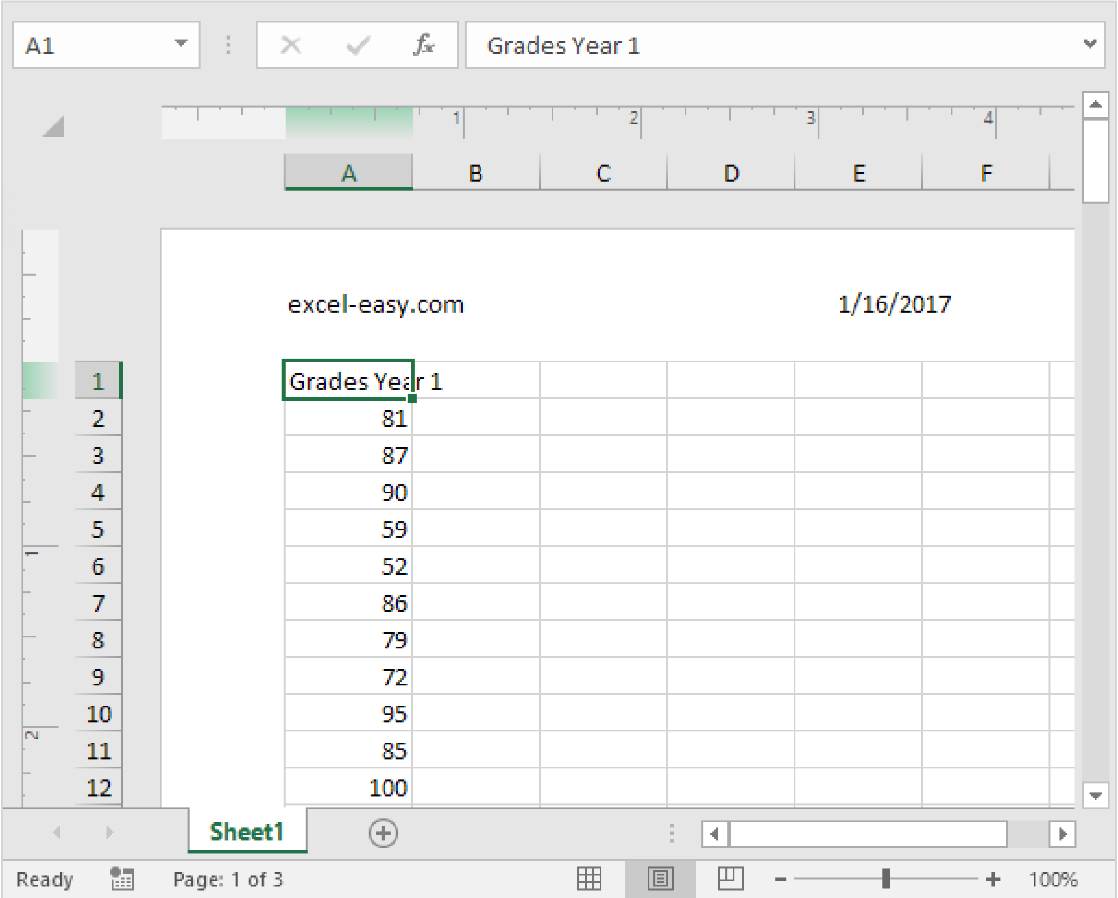
6. Click somewhere else on the sheet to see the footer.



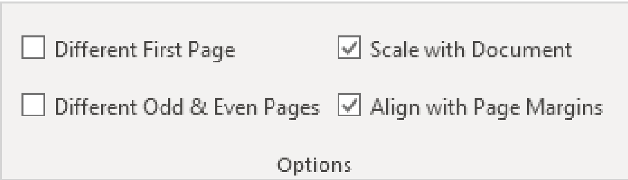

7. On the Design tab, in the Options group, you can add a different first page header/footer and a different header/footer for odd and even pages.




8. On the View tab, in the Workbook Views group, click Normal, to switch back to Normal view.




6. On the Design tab, in the Options group, you can add a different first page header/footer and a different header/footer for odd and even pages.



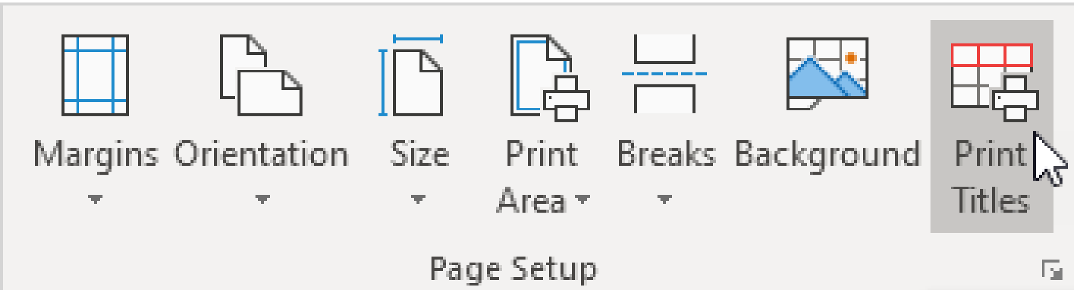

7. On the View tab, in the Workbook Views group, click Normal, to switch back to Normal view.

Print Titles

You can specify rows and columns in Excel that will be printed on each printed page. This can make your printed copy easier to read.

To print titles, execute the following steps.

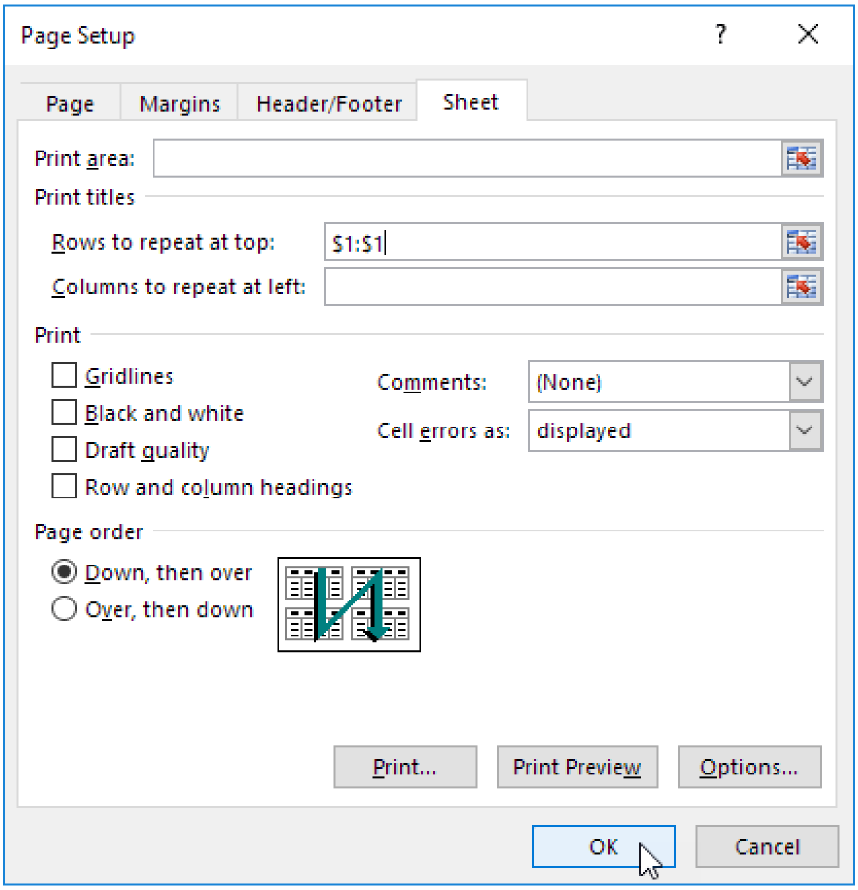
1. On the Page Layout tab, in the Page Setup group, click Print Titles.



The Page Setup dialog box appears.

2. To repeat row 1 at the top of each printed page, click in the corresponding box and select row 1.

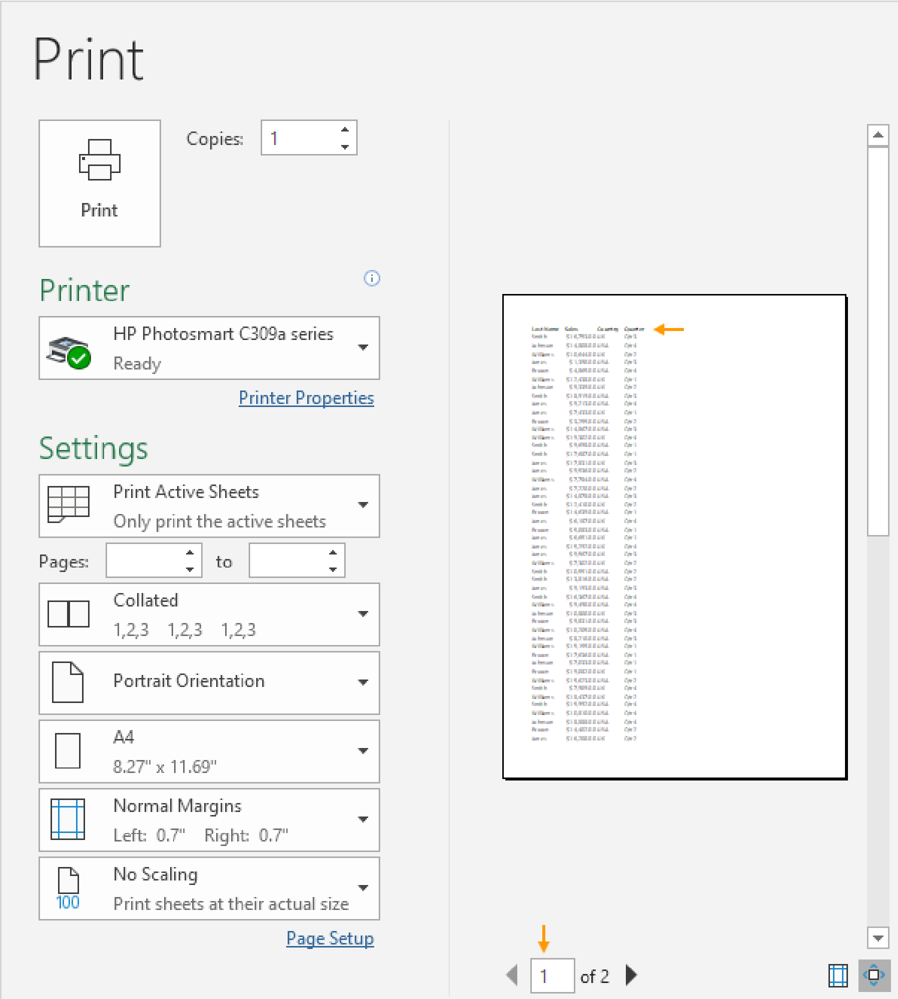
3. Click OK.

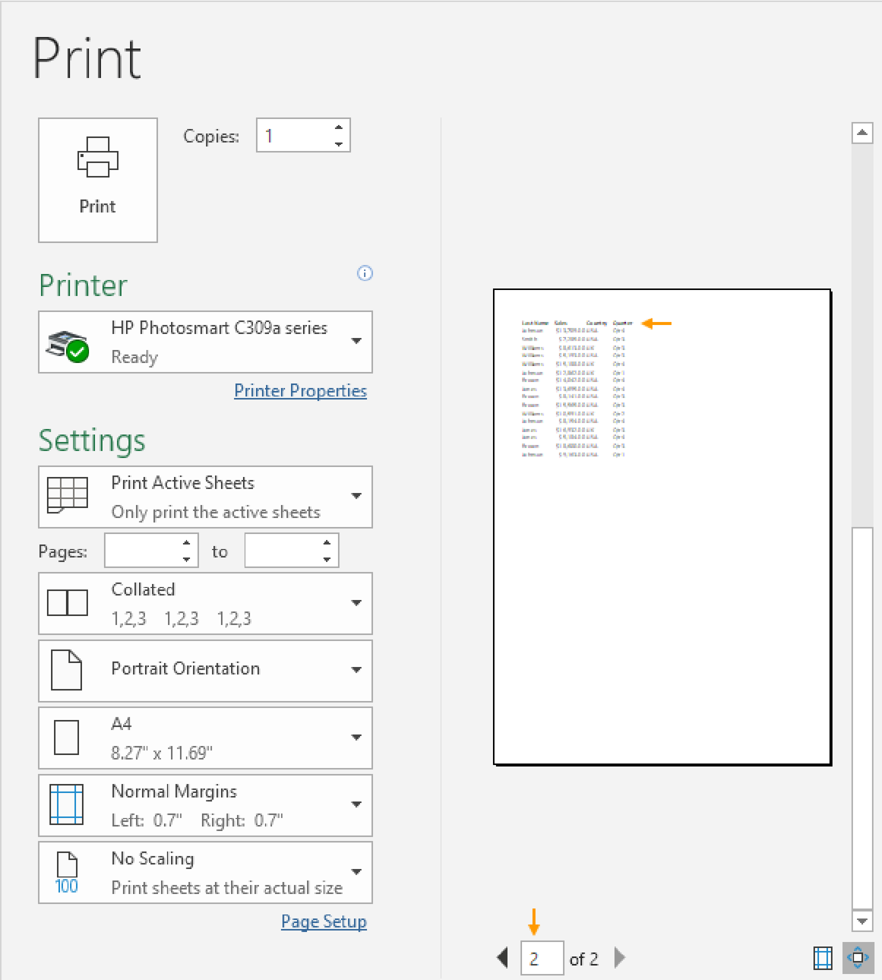



Note: in a similar way, you can repeat columns at the left of each printed page.

4. On the File tab, click Print for a print preview.

The labels (LastName, Sales, Country and Quarter) appear on page 1 and page 2.

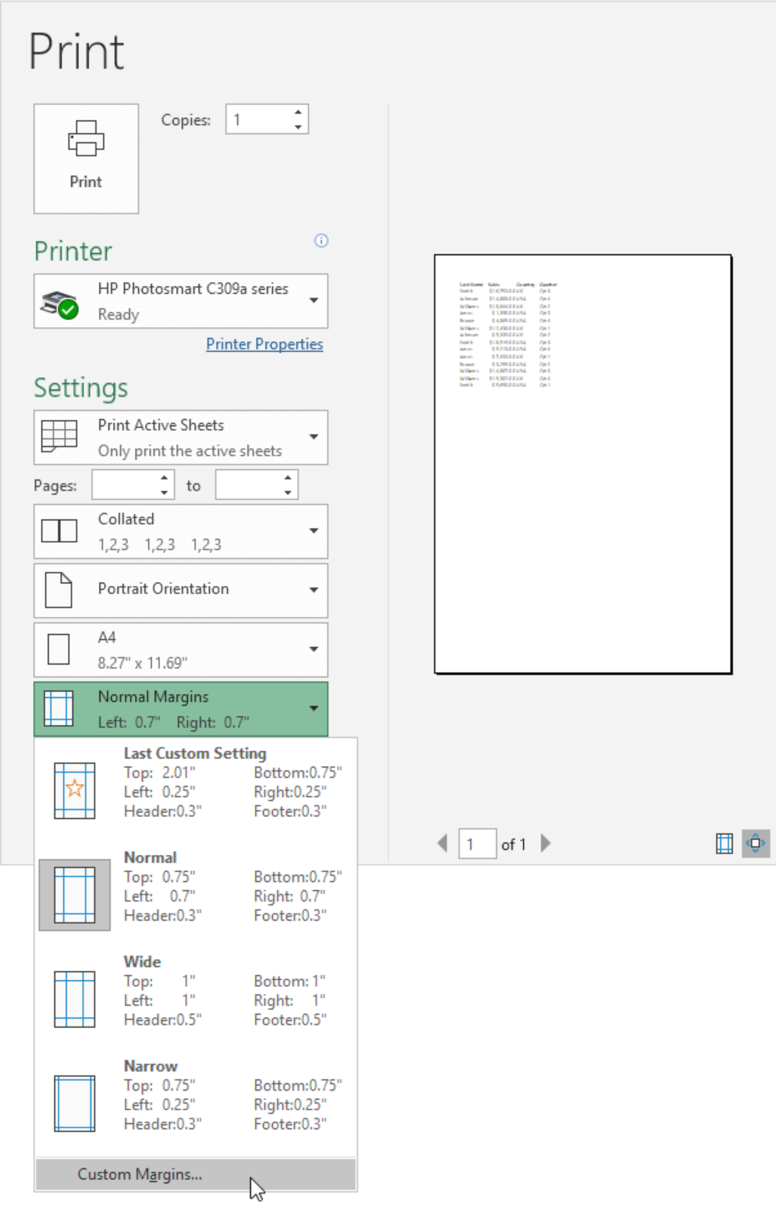

Print
Copies: 1
Print
Printer
HP Photosmart C309a series
Ready
Printer Properties
Settings
Print Active Sheets
Only print the active sheets
Pages: to
Collated
1,2,3 1,2,3 1,2,3
Portrait Orientation
A4
8.27" x 11.69"
Normal Margins
Left: 0.7" Right: 0.7"
No Scaling
Print sheets at their actual size
100
Page Setup
1 of 2



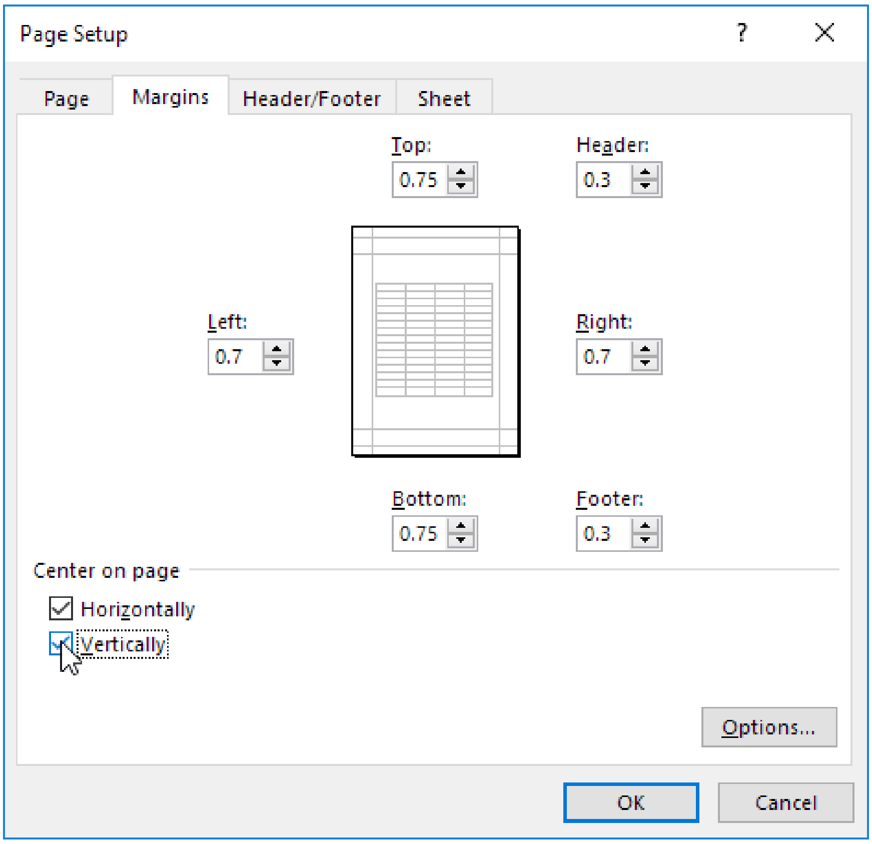

## Center on Page

To center a range of cells on a printed page in Excel automatically, execute the following steps.

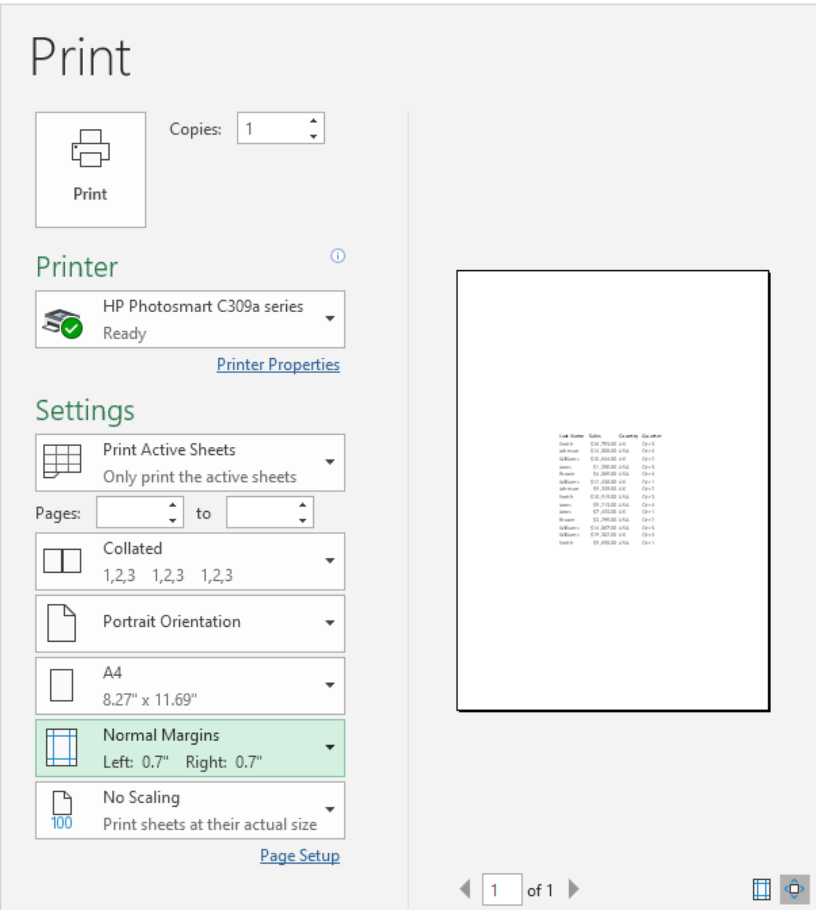
1. On the File tab, click Print.
2. Click 'Custom Margins' from the Margins drop-down list.




3. Next, check horizontally and vertically.


Page Setup
Page
Margins
Header/Footer
Sheet
Top:
0.75
Header:
0.3
Left:
0.7
Right:
0.7
Bottom:
0.75
Footer:
0.3
Center on page
Horizontally
Vertically
Options...
OK
Cancel

4. Click OK.


Print
Copies: 1
Print
Printer
HP Photosmart C309a series
Ready
Printer Properties
Settings
Print Active Sheets
Only print the active sheets
Pages: to
Collated
1,2,3 1,2,3 1,2,3
Portrait Orientation
A4
8.27" x 11.69"
Normal Margins
Left: 0.7" Right: 0.7"
No Scaling
Print sheets at their actual size
Page Setup
1 of 1

# Module 4: Power Point Presentation (Advance)

## Lesson 1: PowerPoint Basics

Getting Started with PowerPoint

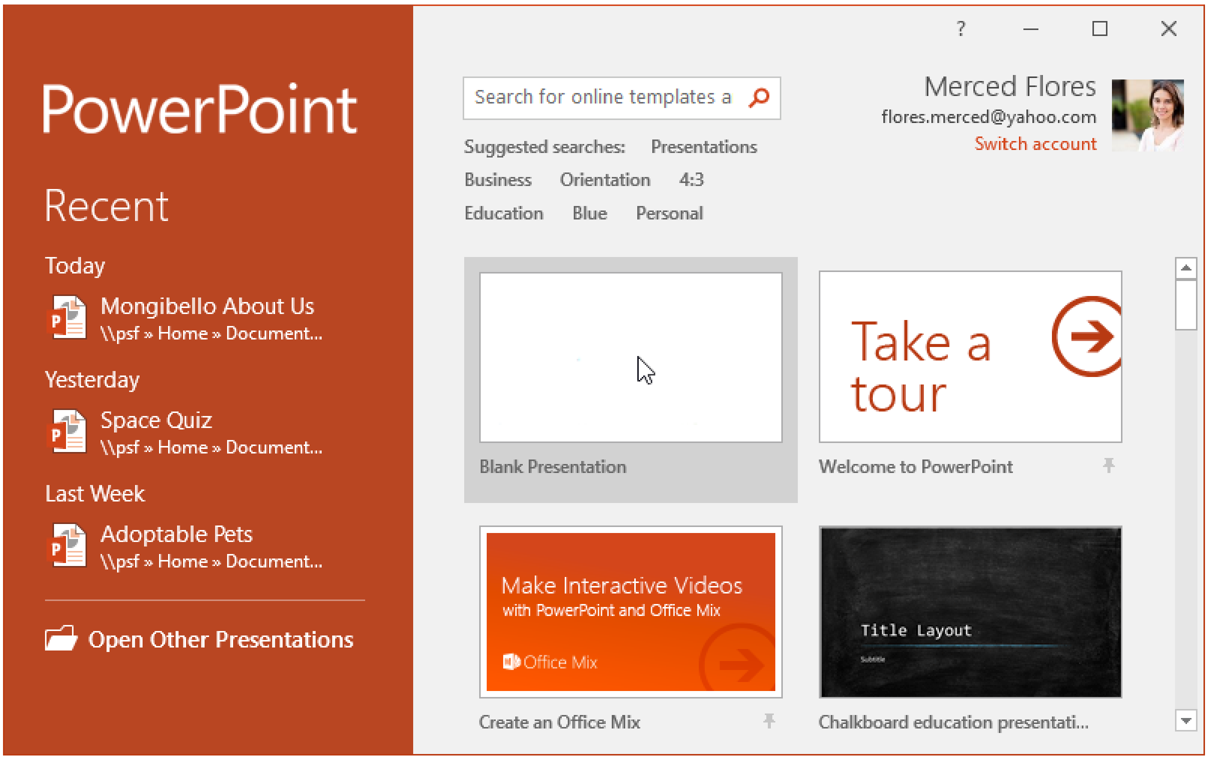
PowerPoint is a presentation program that allows you to create dynamic slide presentations. These presentations can include animation, narration, images, videos, and much more. In this lesson, you'll learn your way around the PowerPoint environment, including the Ribbon, Quick Access Toolbar, and Backstage view.

Getting to know PowerPoint

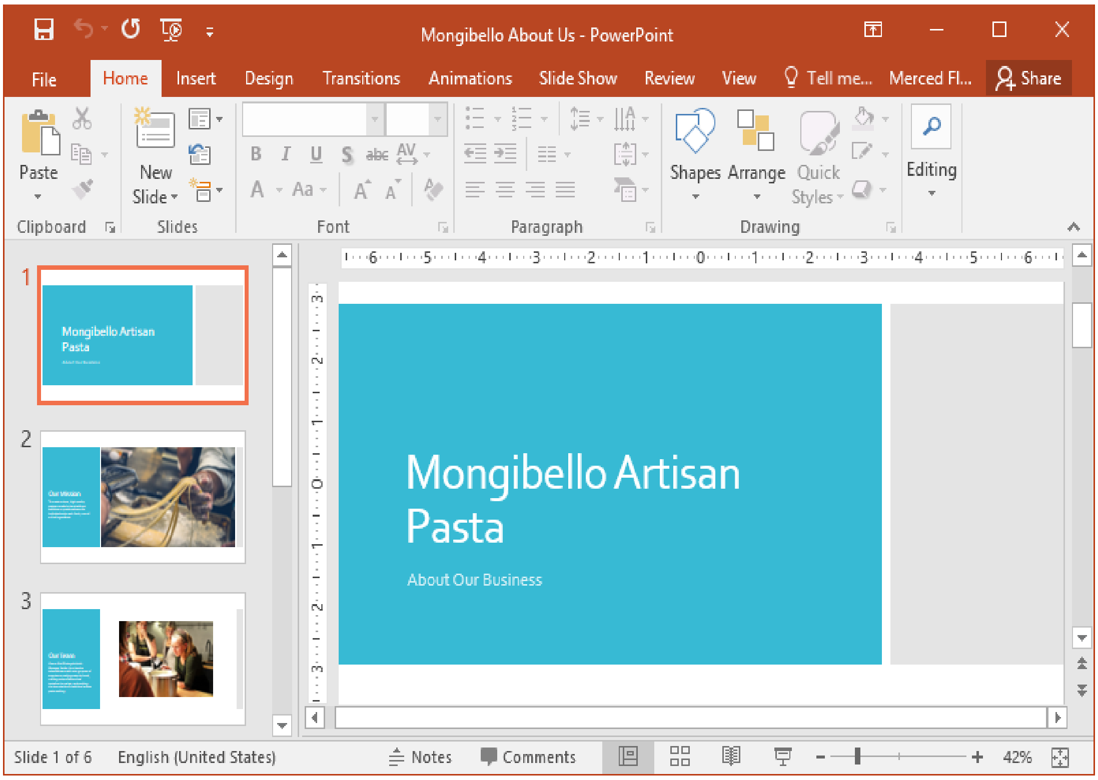
PowerPoint 2016 is similar to PowerPoint 2013 and PowerPoint 2010. If you've previously used these versions, PowerPoint 2016 should feel familiar. But if you are new to PowerPoint or have more experience with older versions, you should first take some time to become familiar with the PowerPoint 2016 interface.

The PowerPoint interface

When you open PowerPoint for the first time, the Start Screen will appear. From here, you'll be able to create a new presentation, choose a template, and access your recently edited presentations. From the Start Screen, locate and select Blank Presentation to access the PowerPoint interface.




Click the buttons in the interactive below to become familiar with the PowerPoint interface.

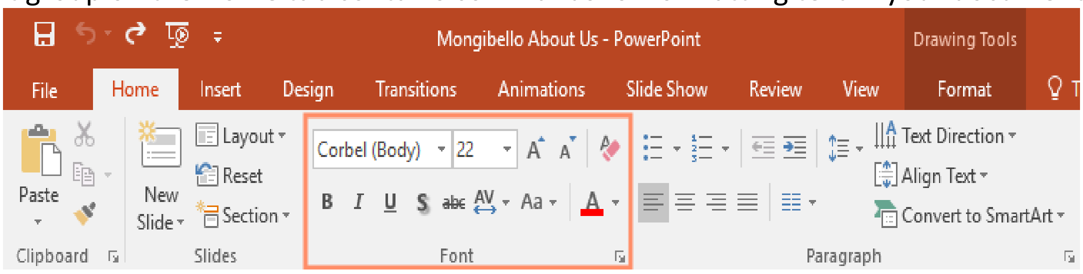



Working with the PowerPoint environment

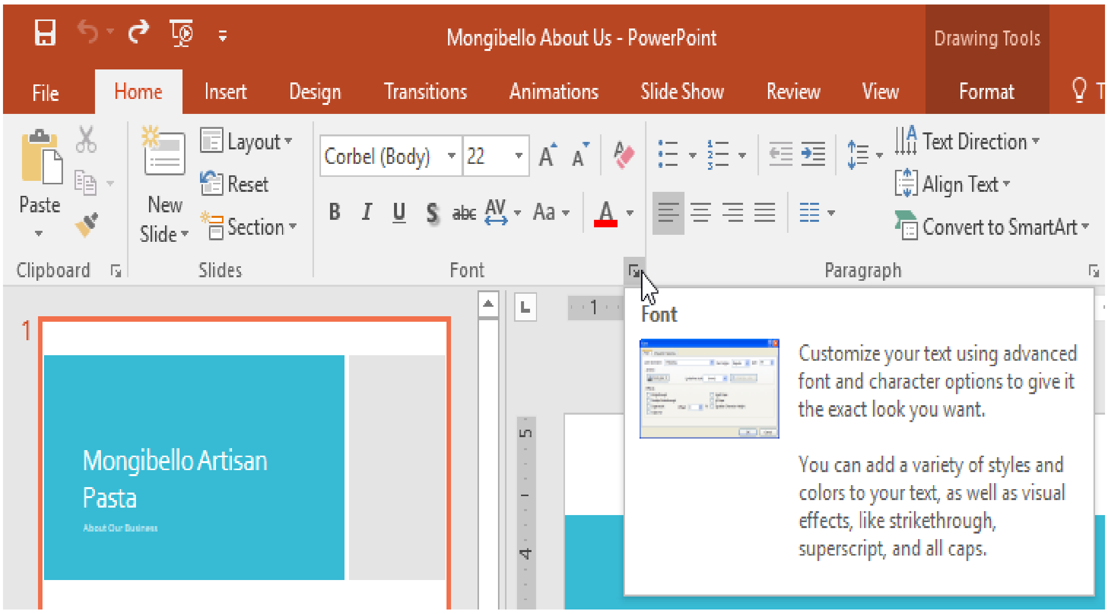
The **Ribbon** and **Quick Access Toolbar** are where you will find the commands to perform common tasks in PowerPoint. **Backstage view** gives you various options for saving, opening a file, printing, and sharing your document.

The Ribbon

PowerPoint uses a **tabbed Ribbon system** instead of traditional menus. **The Ribbon** contains **multiple tabs**, each with several **groups of commands**. For example, the Font group on the Home tab contains commands for formatting text in your document.

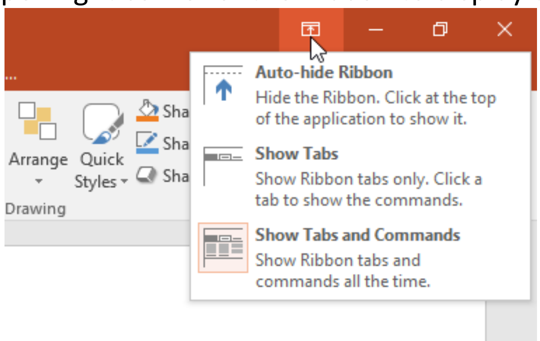



Some groups also have a **small arrow** in the bottom-right corner that you can click for even more options.




Showing and hiding the Ribbon

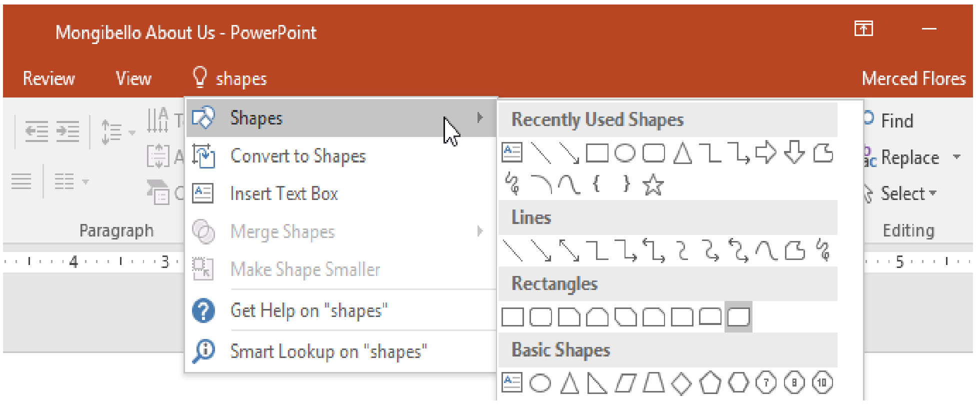
The Ribbon is designed to respond to your current task, but you can choose to **minimize** it if you find that it takes up too much screen space. Click the **Ribbon Display Options** arrow in the upper-right corner of the Ribbon to display the drop-down menu.




- **Auto-hide Ribbon:** Auto-hide displays your workbook in full-screen mode and completely hides the Ribbon. To **show the Ribbon**, click the **Expand Ribbon** command at the top of screen.
- **Show Tabs:** This option hides all command groups when they're not in use, but **tabs** will remain visible. To **show the Ribbon**, simply click a tab.
- **Show Tabs and Commands:** This option maximizes the Ribbon. All of the tabs and commands will be visible. This option is selected by default when you open PowerPoint for the first time.

Using the Tell me feature

If you're having trouble finding command you want, the **Tell Me** feature can help. It works just like a regular search bar: Type what you're looking for, and a list of options will appear. You can then use the command directly from the menu without having to find it on the Ribbon.

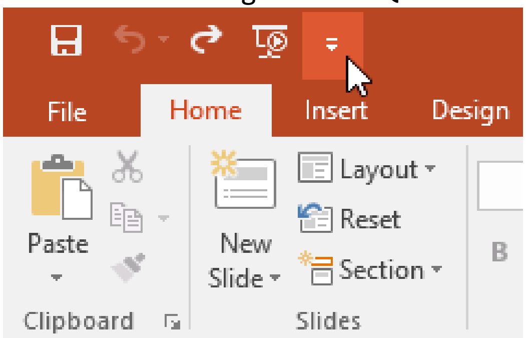



The Quick Access Toolbar

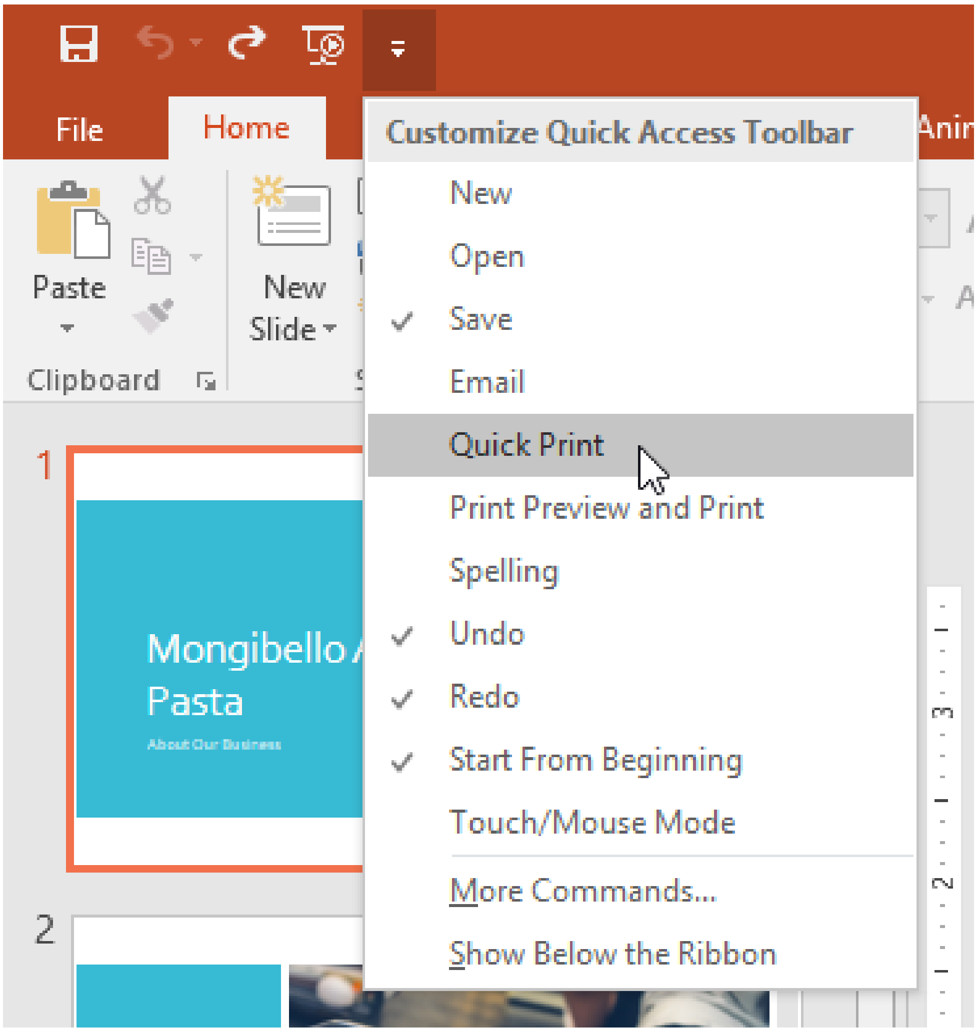
Located just above the Ribbon, the **Quick Access Toolbar** lets you access common commands no matter which tab is selected. By default, it includes the **Save**, **Undo**, **Redo**, and **Start From Beginning** commands. You can add other commands depending on your preference.

To add commands to the Quick Access Toolbar:

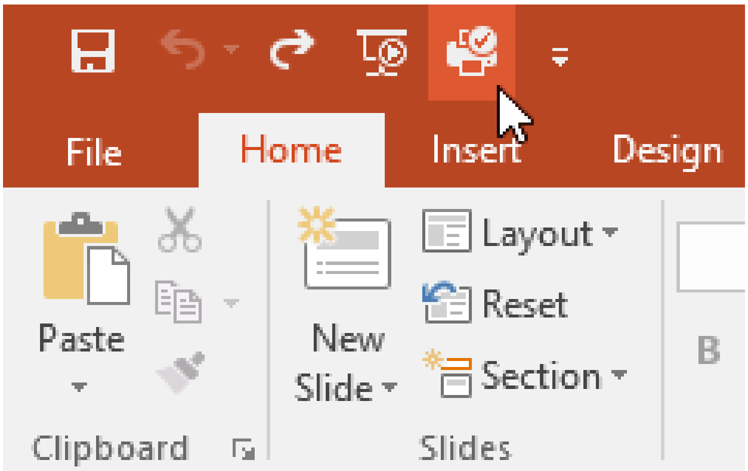
1. Click the **drop-down arrow** to the right of the **Quick Access Toolbar**.




2. Select the **command** you want to add from the drop-down menu. To choose from more commands, select **More Commands**.

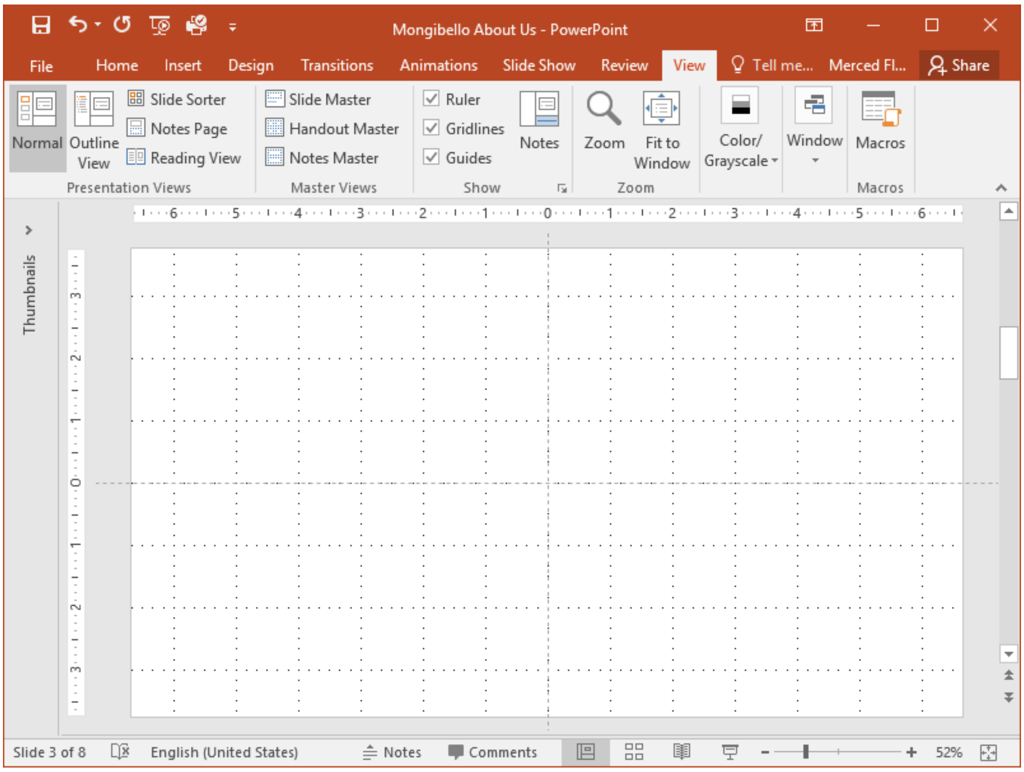



3. The command will be added to the Quick Access Toolbar.




The Ruler, guides, and gridlines

PowerPoint includes several tools to help organize and arrange content on your slides, including the **Ruler**, **guides**, and **gridlines**. These tools make it easier to **align objects** on your slides. Simply click the **check boxes** in the **Show** group on the **View** tab to show and hide these tools.

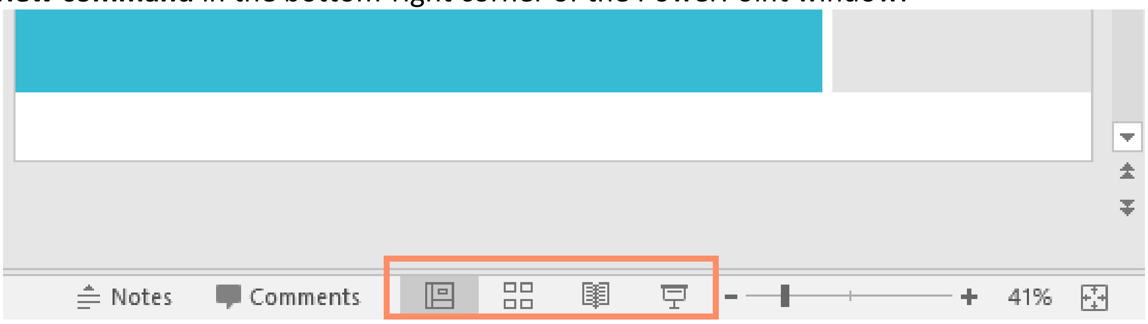



## Zoom and other view options

PowerPoint has a variety of viewing options that change how your presentation is displayed. You can choose to view your presentation in **Normal** view, **Slide Sorter** view, **Reading** view, or **Slide Show** view. You can also **zoom in and out** to make your presentation easier to read.

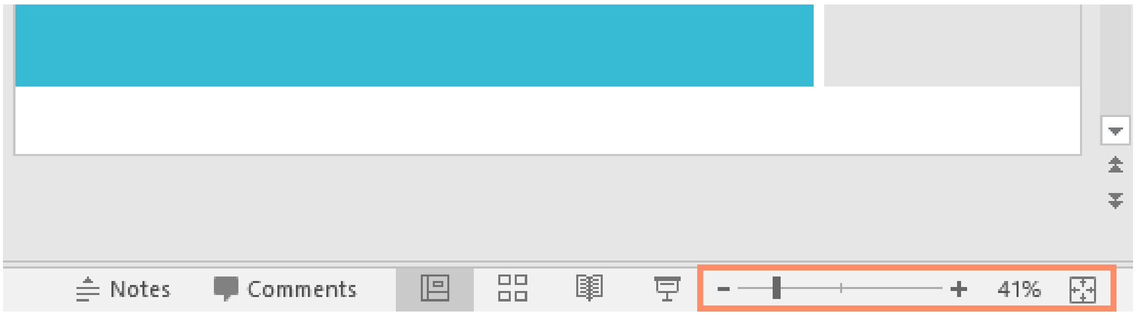
## Switching slide views

Switching between different slide views is easy. Just locate and select the desired **slide view command** in the bottom-right corner of the PowerPoint window.



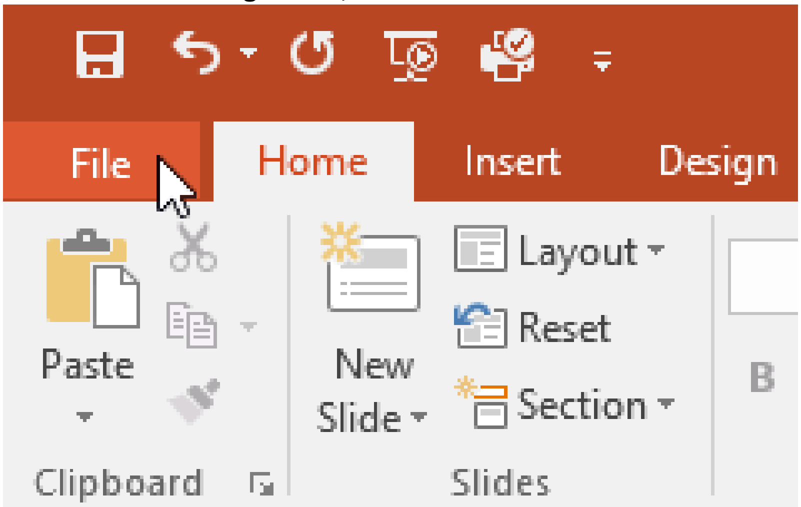

Zooming in and out

To zoom in or out, click and drag the **zoom control slider** in the bottom-right corner of the PowerPoint window. You can also select the **+** or **-** **commands** to zoom in or out by smaller increments. The number next to the slider displays the current **zoom percentage**, also called the **zoom level**.

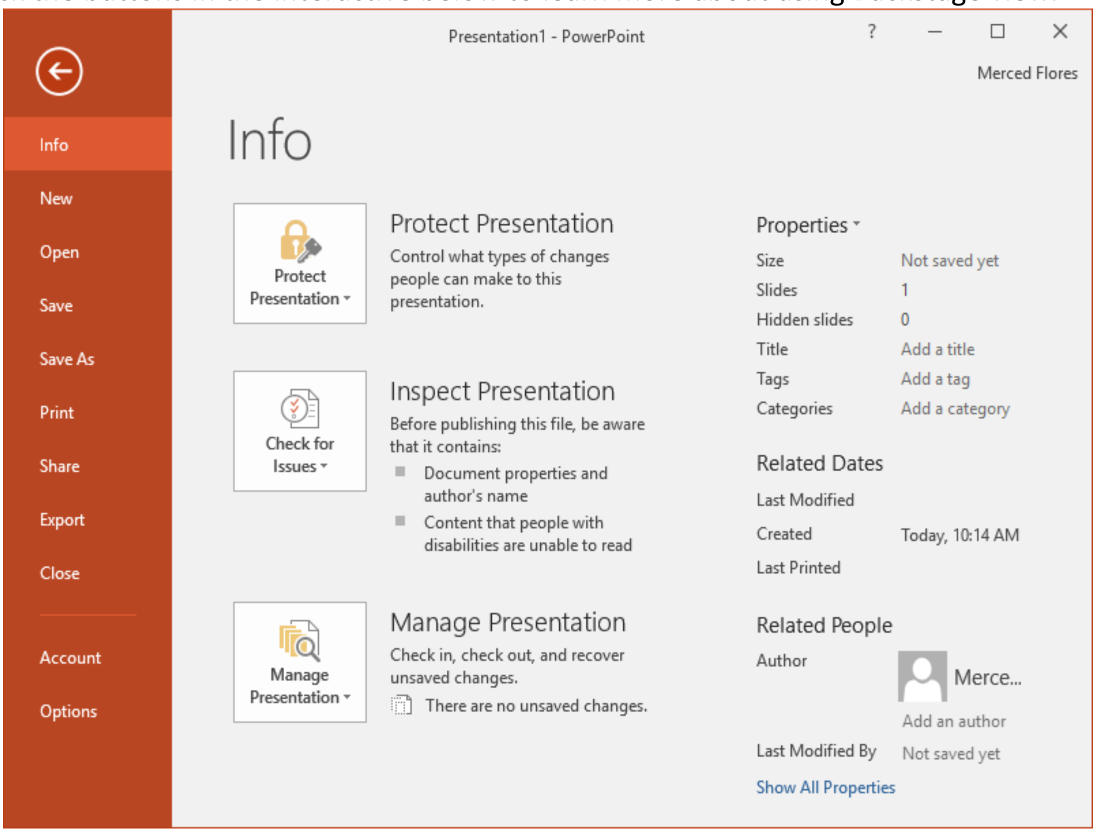



Backstage view

**Backstage view** gives you various options for saving, opening, printing, and sharing your presentations. To access Backstage view, click the **File** tab on the **Ribbon**.




Click the buttons in the interactive below to learn more about using Backstage view.



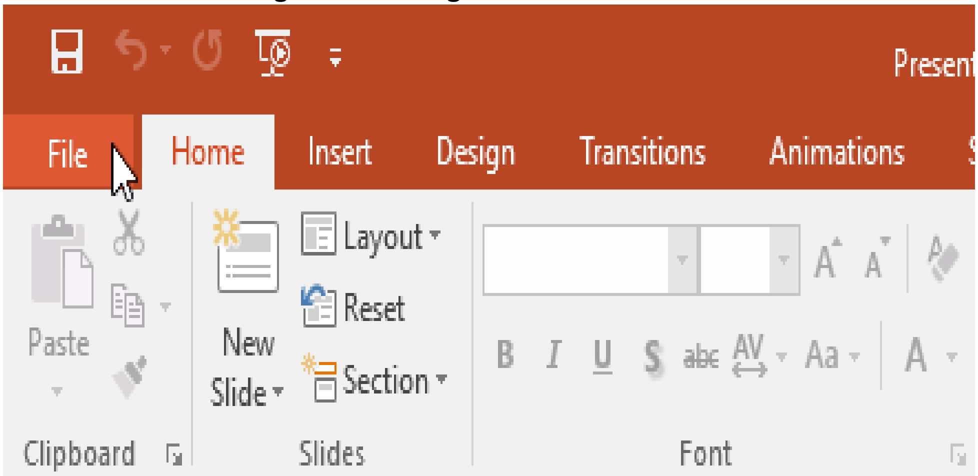
## 1.2 Creating and Opening Presentations

PowerPoint files are called presentations. Whenever you start a new project in PowerPoint, you'll need to create a new presentation, which can either be blank or from a template. You'll also need to know how to open an existing presentation.

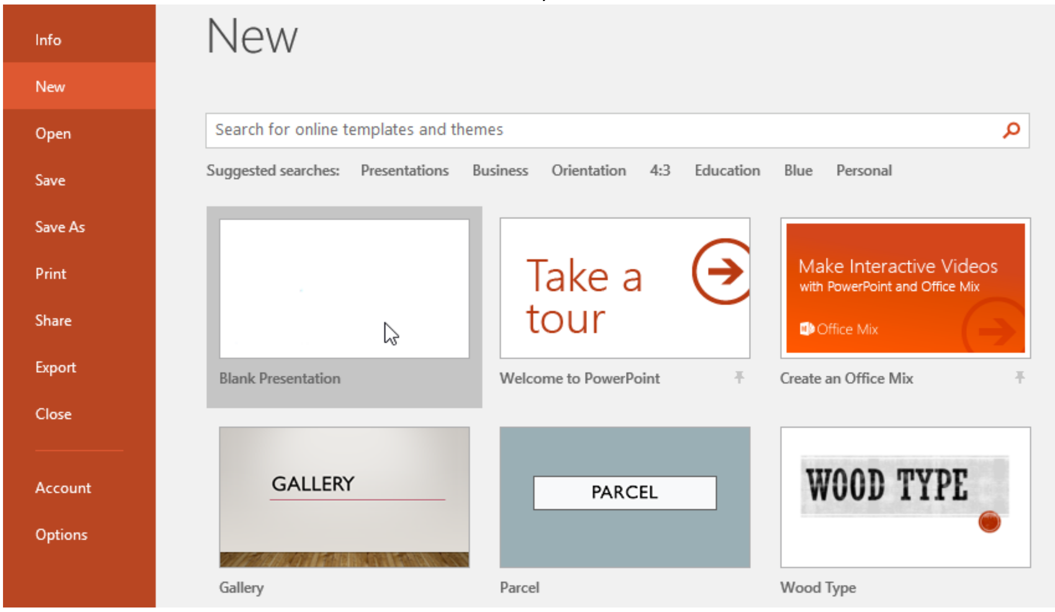
To create a new presentation:

When beginning a new project in PowerPoint, you'll often want to start with a new blank presentation.

1. Select the File tab to go to backstage view.




2. Select New on the left side of the window, then click Blank Presentation.



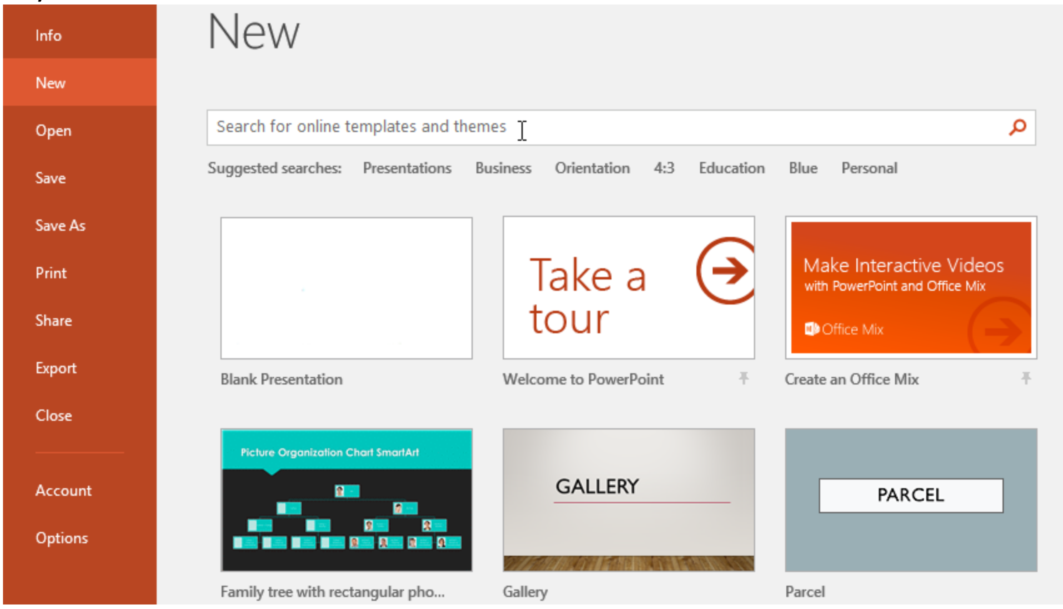

3. A new presentation will appear.

To create a new presentation from a template:

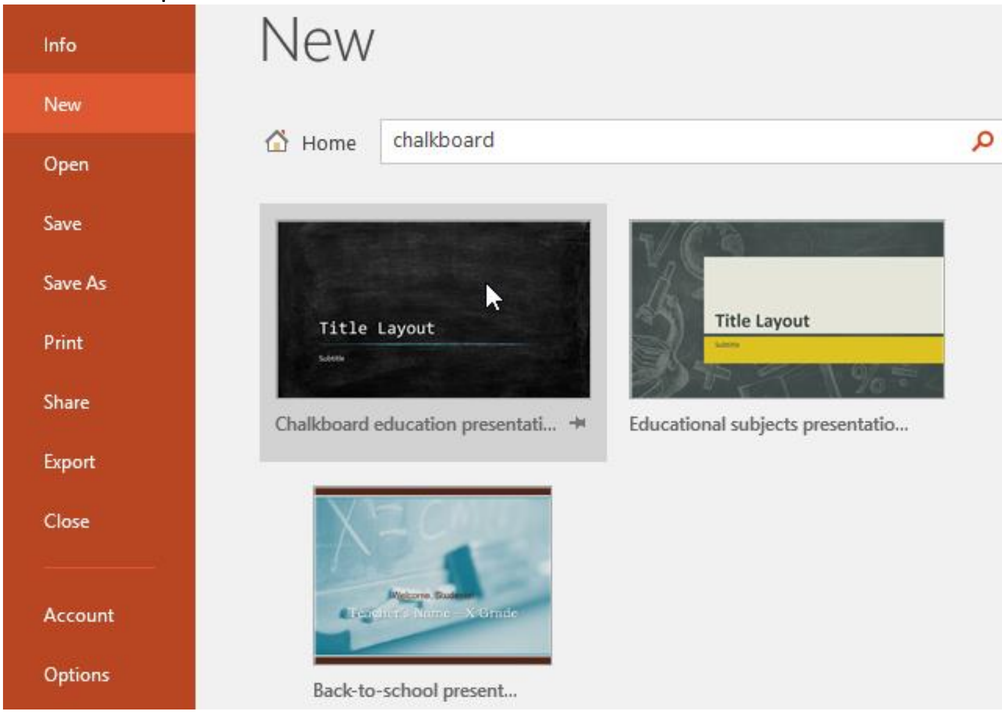
A template is a predesigned presentation you can use to create a new slide show quickly. Templates often include custom formatting and designs, so they can save you a lot of time and effort when starting a new project.

1. Click the File tab to access backstage view, then select New.

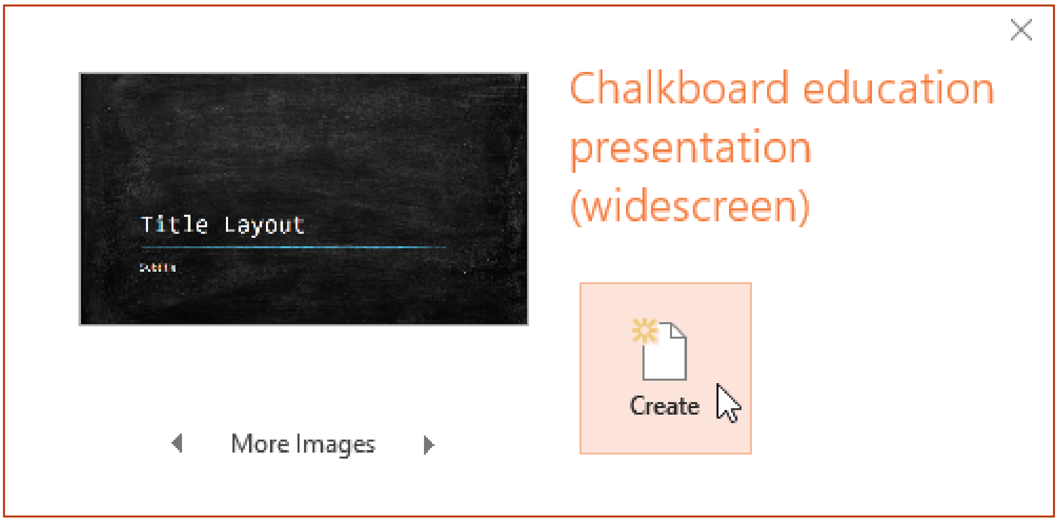
2. You can click a suggested search to find templates or use the search bar to find something more specific. In our example, we'll search for the keyword chalkboard.




3. Select a template to review it.




4. A preview of the template will appear, along with additional information on how the template can be used.
5. Click Create to use the selected template.



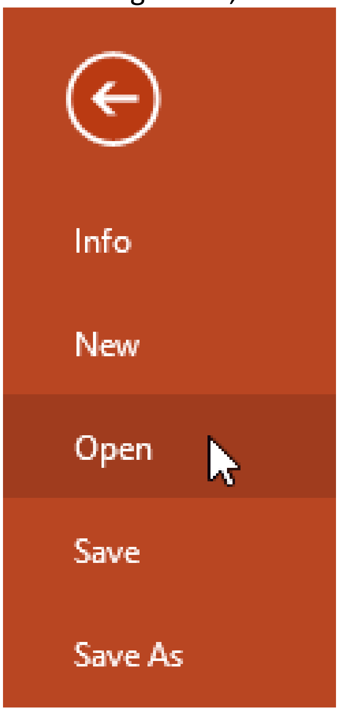

6. A new presentation will appear with the selected template.

It's important to note that not all templates are created by Microsoft. Many are created by third-party providers and even individual users, so some templates may work better than others.

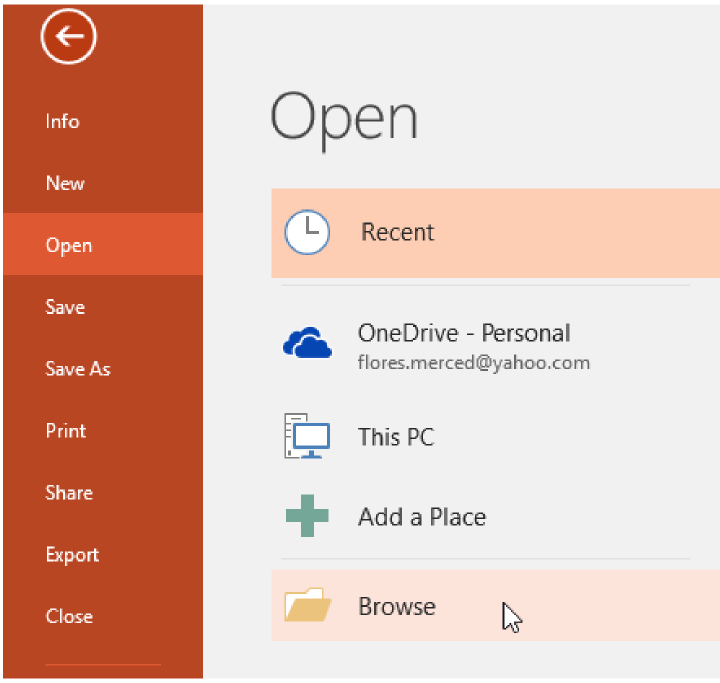
**To open an existing presentation:**

In addition to creating new presentations, you'll often need to open a presentation that was previously saved. To learn more about saving presentations, visit our lesson on Saving Presentations.

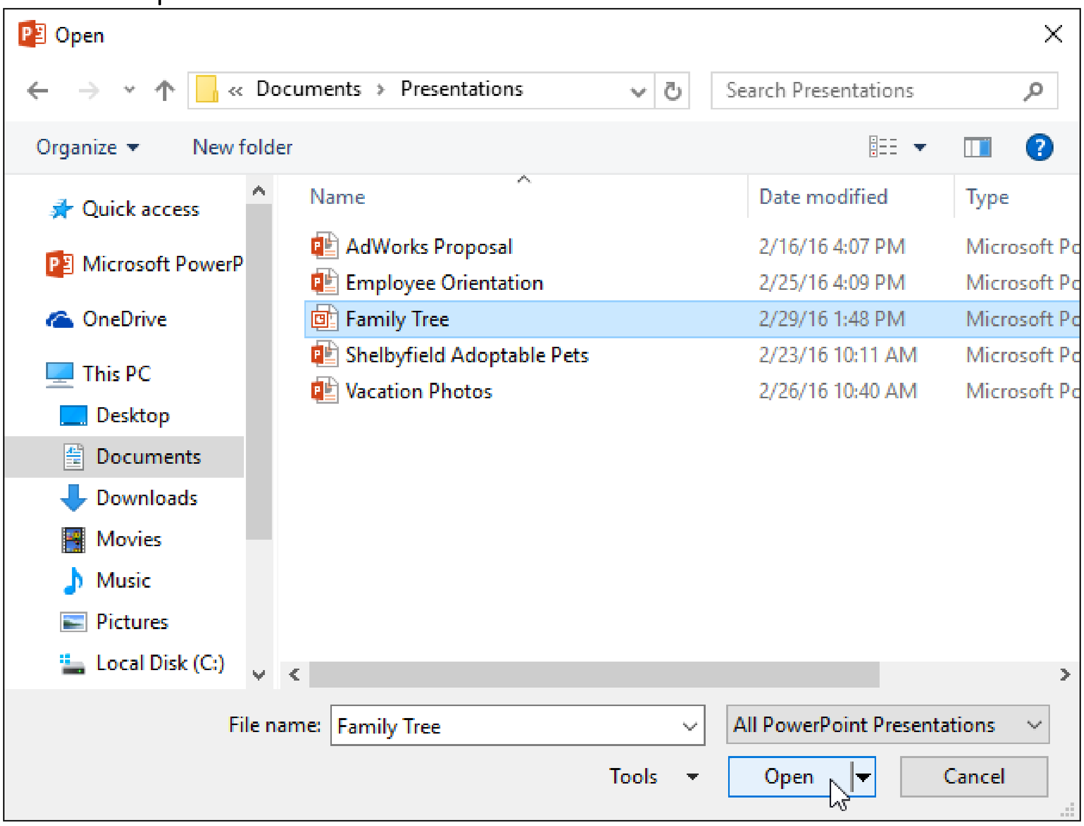
1. Select the File tab to go to Backstage view, then click Open.




2. Click Browse. Alternatively, you can choose OneDrive to open files stored on your OneDrive.




3. The Open dialog box will appear. Locate and select your presentation, then click Open.

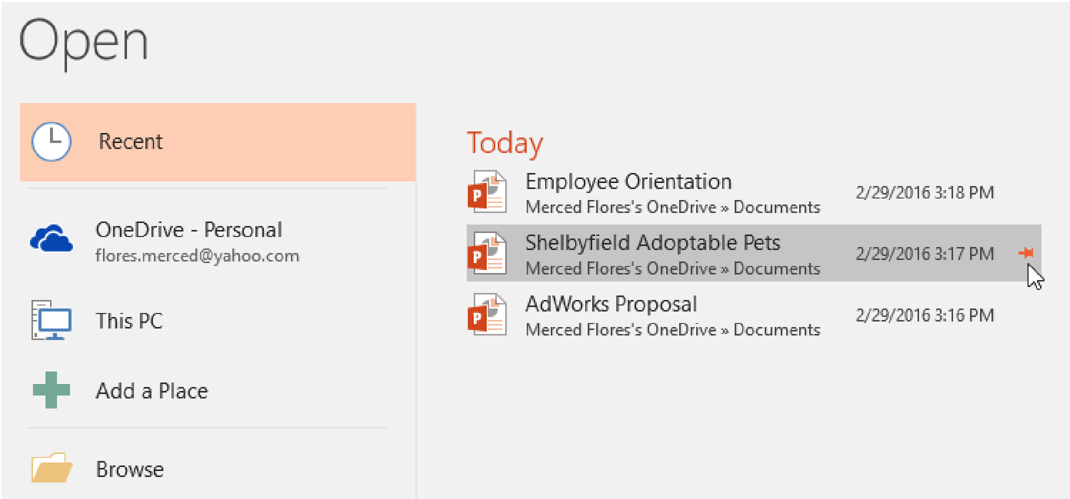



Most features in Microsoft Office, including PowerPoint, are geared toward saving and sharing documents online. This is done with OneDrive, which is an online storage space for your documents and files. If you want to use OneDrive, make sure you're signed in to PowerPoint with your Microsoft account. Review our lesson on Understanding OneDrive to learn more.

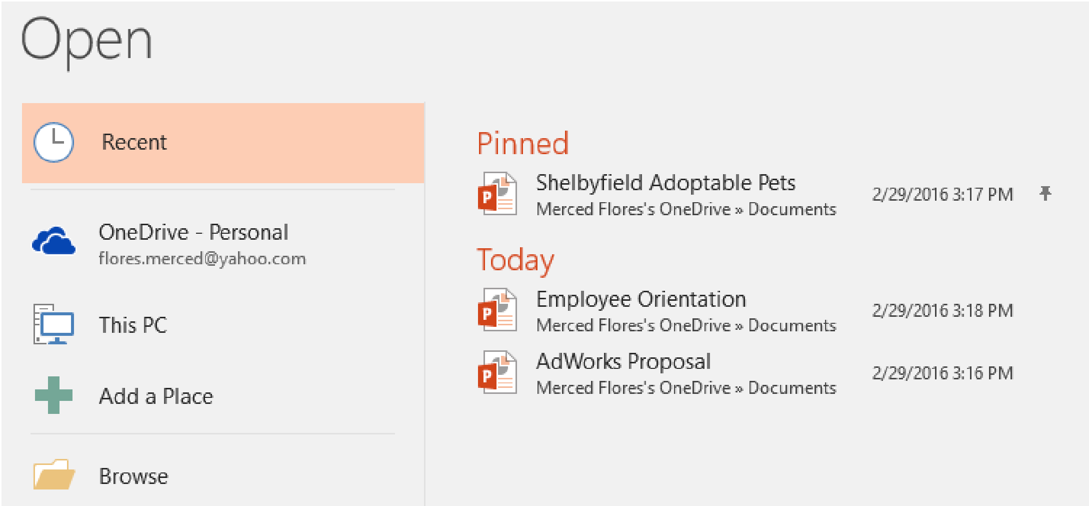
To pin a presentation:

If you frequently work with the same presentation, you can pin it to Backstage view for easy access.

1. Select the File tab to go to Backstage view, then click Open. Your Recent Presentations will appear.
2. Hover the mouse over the presentation you want to pin, then click the pushpin icon.




3. The presentation will stay in the Recent presentations list until it is unpinned. To unpin a presentation, click the pushpin icon again.

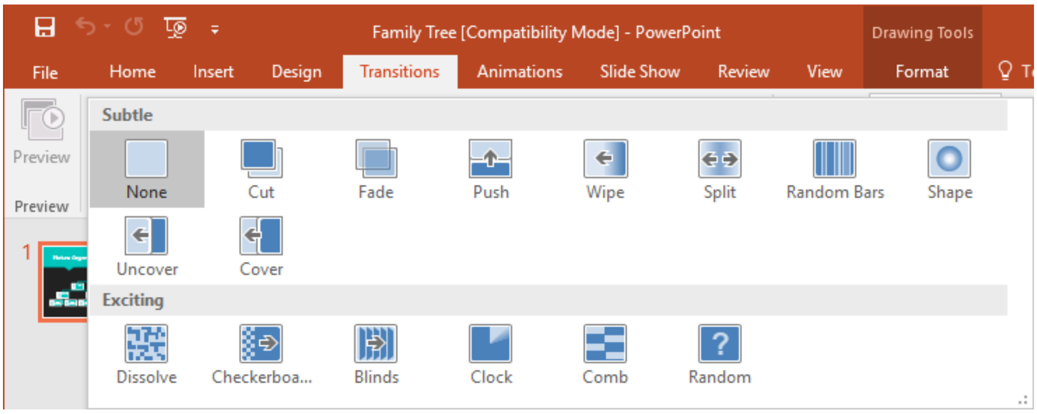



Compatibility Mode

Sometimes you may need to work with presentations that were created in earlier versions of PowerPoint, like PowerPoint 2003 or PowerPoint 2000. When you open these types of presentations, they will appear in Compatibility Mode.

Compatibility Mode disables certain features, so you'll only be able to access commands found in the program that was used to create the presentation. For example, if you open a presentation created in PowerPoint 2003, you can only use tabs and commands found in PowerPoint 2003.

In the image below, you can see at the top of the window that the presentation is in Compatibility Mode. This will disable some PowerPoint 2016 features, including newer types of slide transitions.




To exit Compatibility Mode, you'll need to convert the presentation to the current version type. However, if you're collaborating with others who only have access to an earlier version of PowerPoint, it's best to leave the presentation in Compatibility Mode so the format will not change.

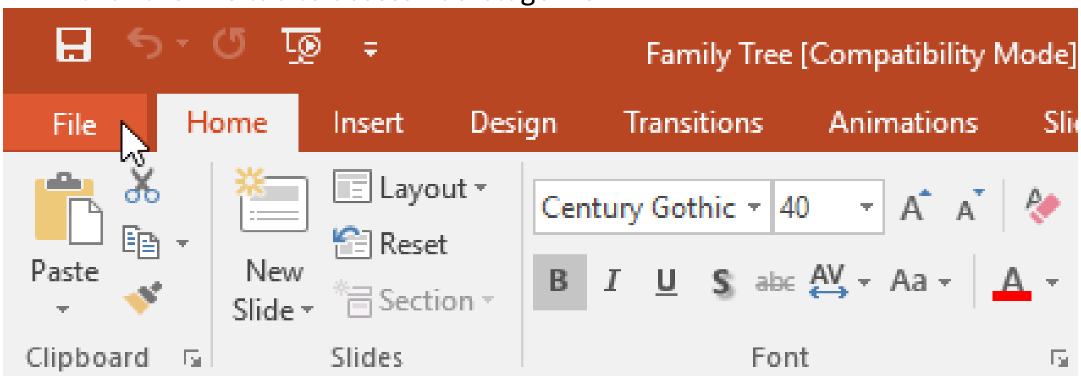
You can review this support page from Microsoft to learn more about which features are disabled in Compatibility Mode.

To convert a presentation:

If you want access to all PowerPoint 2016 features, you can convert the presentation to the 2016 file format.

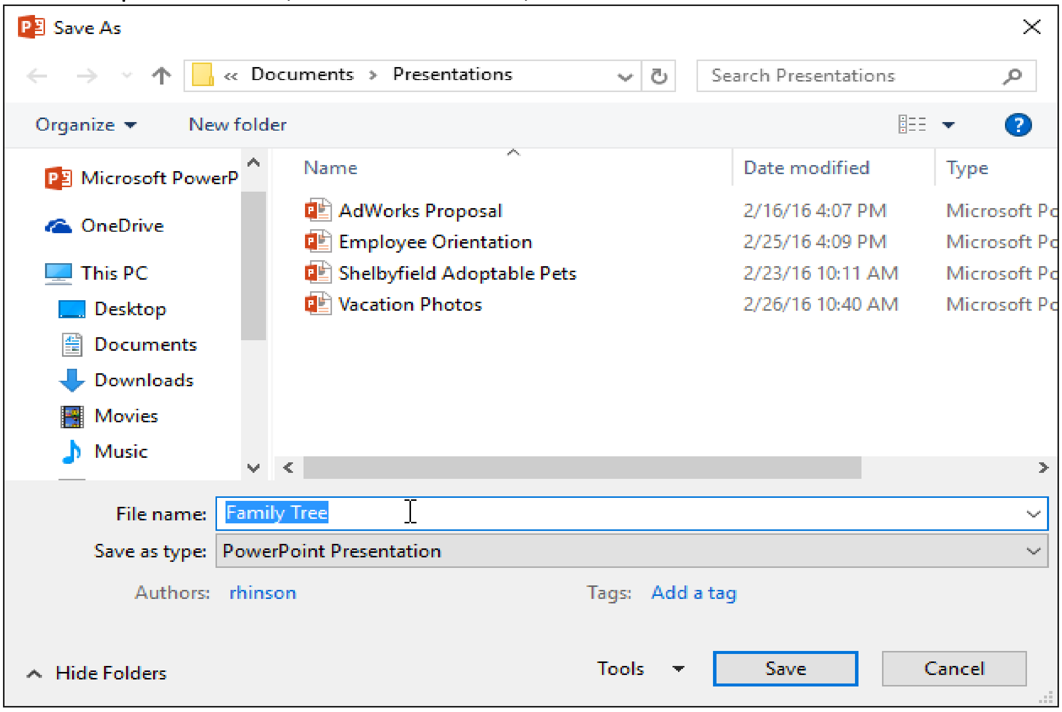
Note that converting a file may cause some changes to the original layout of the presentation.

1. Click the File tab to access Backstage view.




2. Locate and select the Convert command.


3. The Save As dialog box will appear. Select the location where you want to save the presentation, enter a file name, and click Save.




4. The presentation will be converted to the newest file type.

## 1.3 Saving Presentations

Whenever you create a new presentation in PowerPoint, you'll need to know how to save in order to access and edit it later. As with previous versions of PowerPoint, you can save files to your computer. If you prefer, you can also save files to the cloud using OneDrive. You can even export and share presentations directly from PowerPoint.

## Save and Save As

PowerPoint offers two ways to save a file: Save and Save As. These options work in similar ways, with a few important differences.

- Save: When you create or edit a presentation, you'll use the Save command to save your changes. You'll use this command most of the time. When you save a file, you'll only need to choose a file name and location the first time. After that, you can just click the Save command to save it with the same name and location.
- Save As: You'll use this command to create a copy of a presentation while keeping the original. When you use Save As, you'll need to choose a different name and/or location for the copied version.

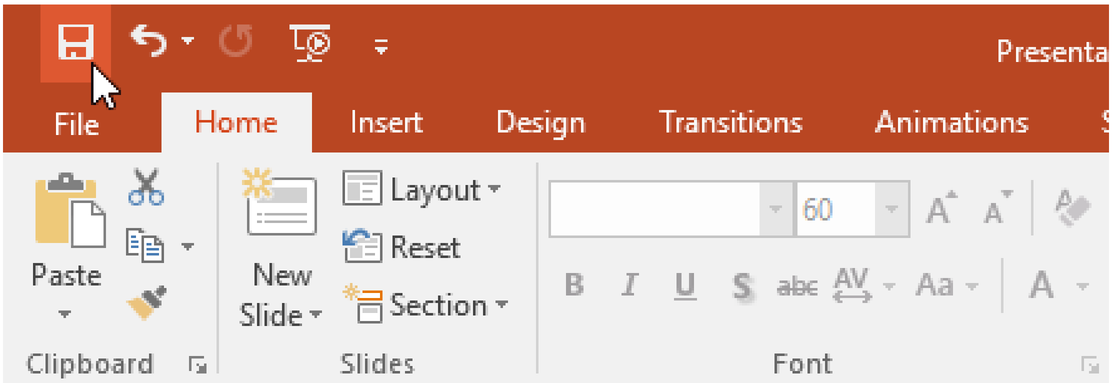
## About OneDrive

Most features in Microsoft Office, including PowerPoint, are geared toward saving and sharing documents online. This is done with OneDrive, which is an online storage space for your documents and files. If you want to use OneDrive, make sure you're signed in to PowerPoint with your Microsoft account. Review our lesson on Understanding OneDrive to learn more.

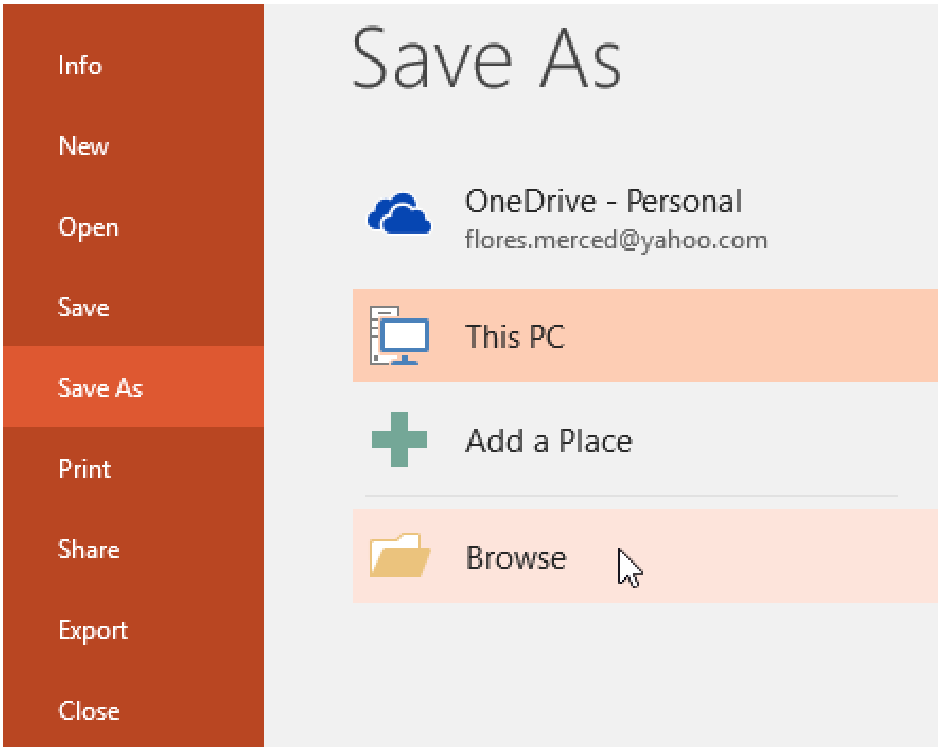
## To save a presentation:

It's important to save your presentation whenever you start a new project or make changes to an existing one. Saving early and often can prevent your work from being lost. You'll also need to pay close attention to where you save the presentation so it will be easy to find later.

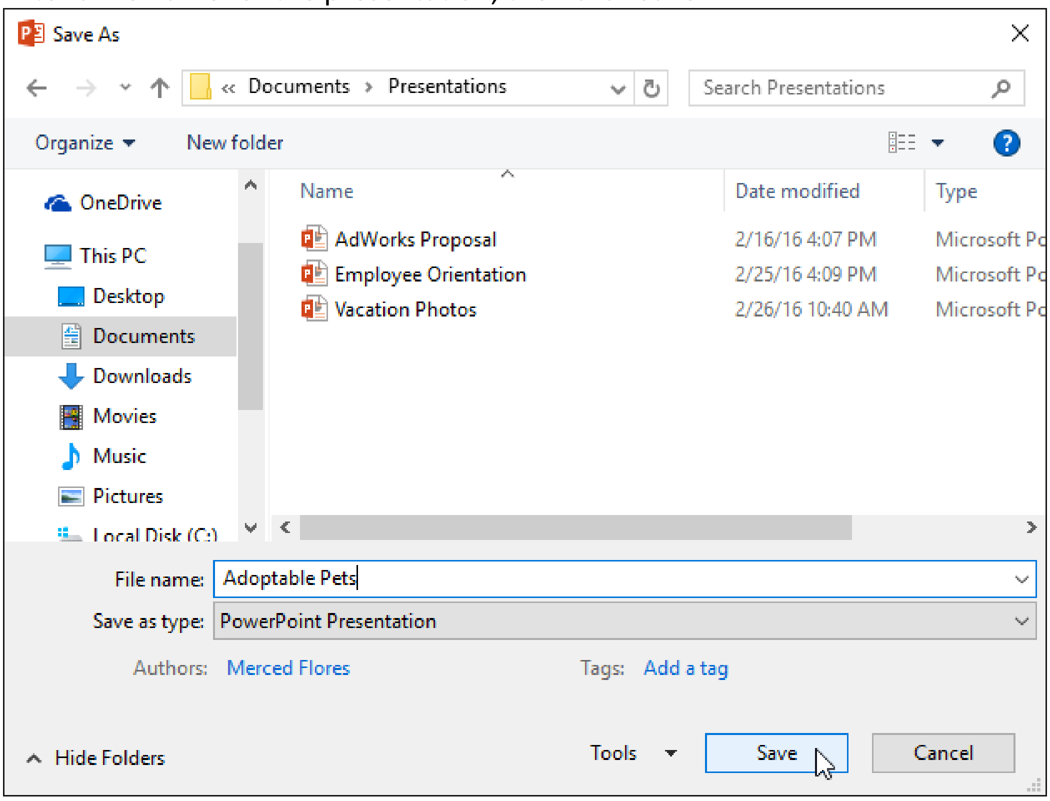
1. Locate and select the Save command on the Quick Access Toolbar.




2. If you're saving the file for the first time, the Save As pane will appear in Backstage view.
3. You'll then need to choose where to save the file and give it a file name. Click Browse to select a location on your computer. Alternatively, you can click OneDrive to save the file to your OneDrive.




4. The Save As dialog box will appear. Select the location where you want to save the presentation.
5. Enter a file name for the presentation, then click Save.



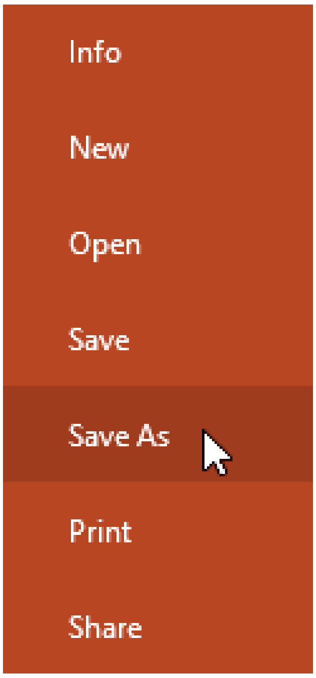

6. The presentation will be saved. You can click the Save command again to save your changes as you modify the presentation.

You can also access the Save command by pressing Ctrl+S on your keyboard.

Using Save As to make a copy

If you want to save a different version of a presentation while keeping the original, you can create a copy. For example, if you have a file named Client Presentation you could save it as Client Presentation 2 so you'll be able to edit the new file and still refer back to the original version.

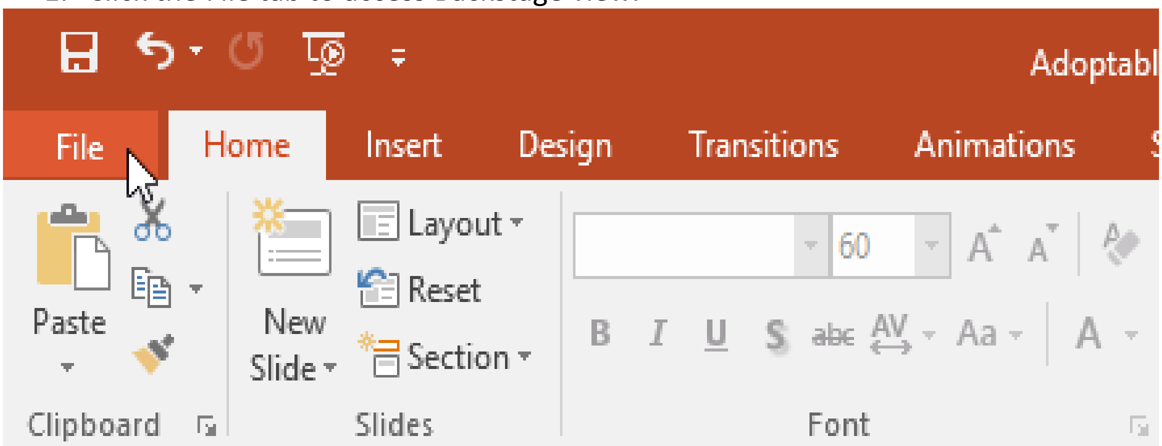
To do this, you'll click the Save As command in Backstage view. Just like when saving a file for the first time, you'll need to choose where to save the file and give it a new file name.




To change the default save location:

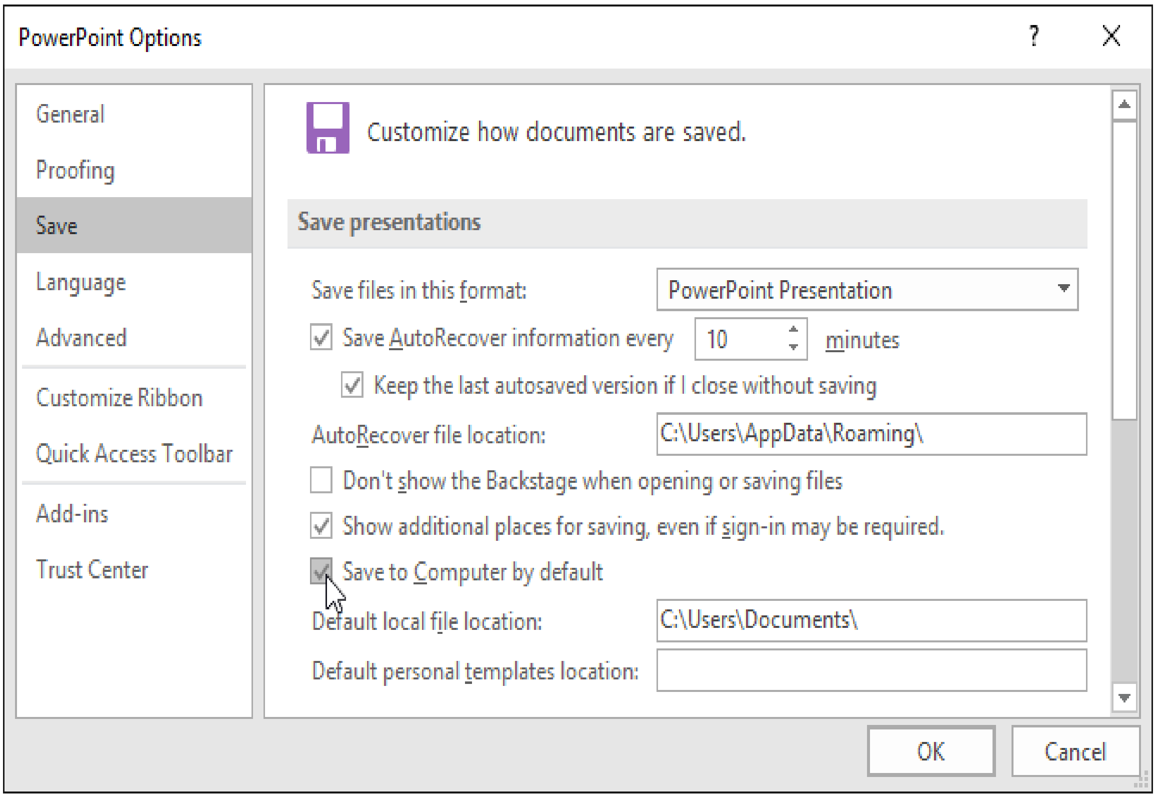
If you don't want to use OneDrive, you may be frustrated that OneDrive is selected as the default location when saving. If you find this inconvenient, you can change the default save location so This PC is selected by default.

1. Click the File tab to access Backstage view.




2. Click Options.


3. The PowerPoint Options dialog box will appear. Select Save, check the box next to Save to Computer by default, then click OK. The default save location will be changed.

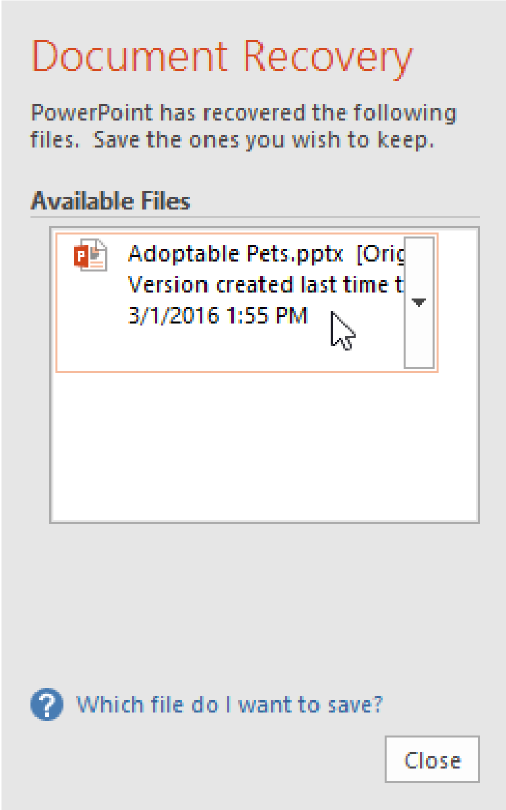



Using Auto Recover

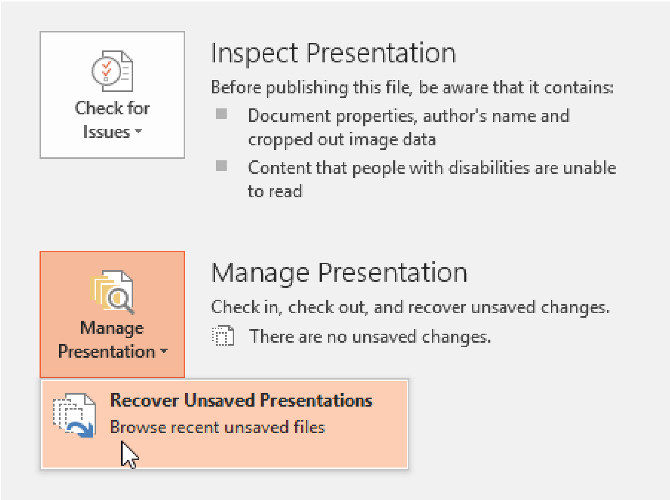
PowerPoint automatically saves your presentations to a temporary folder while you are working on them. If you forget to save your changes or if PowerPoint crashes, you can restore the file using AutoRecover.

To use Auto Recover:

1. Open PowerPoint. If autosaved versions of a file are found, the Document Recovery pane will appear.
2. Click to open an available file. The presentation will be recovered.




By default, PowerPoint autosaves every 10 minutes. If you are editing a presentation for less than 10 minutes, PowerPoint may not create an autosaved version.
If you don't see the file you need, you can browse all autosaved files from Backstage view. Just select the File tab, click Manage Presentation, then choose Recover Unsaved Presentations.




## 1.4 Exporting presentations

By default, PowerPoint presentations are saved in the .pptx file type. However, there may be times when you need to use another file type, such as a PDF or PowerPoint 97-2003 presentation. It's easy to export your presentation from PowerPoint in a variety of file types.

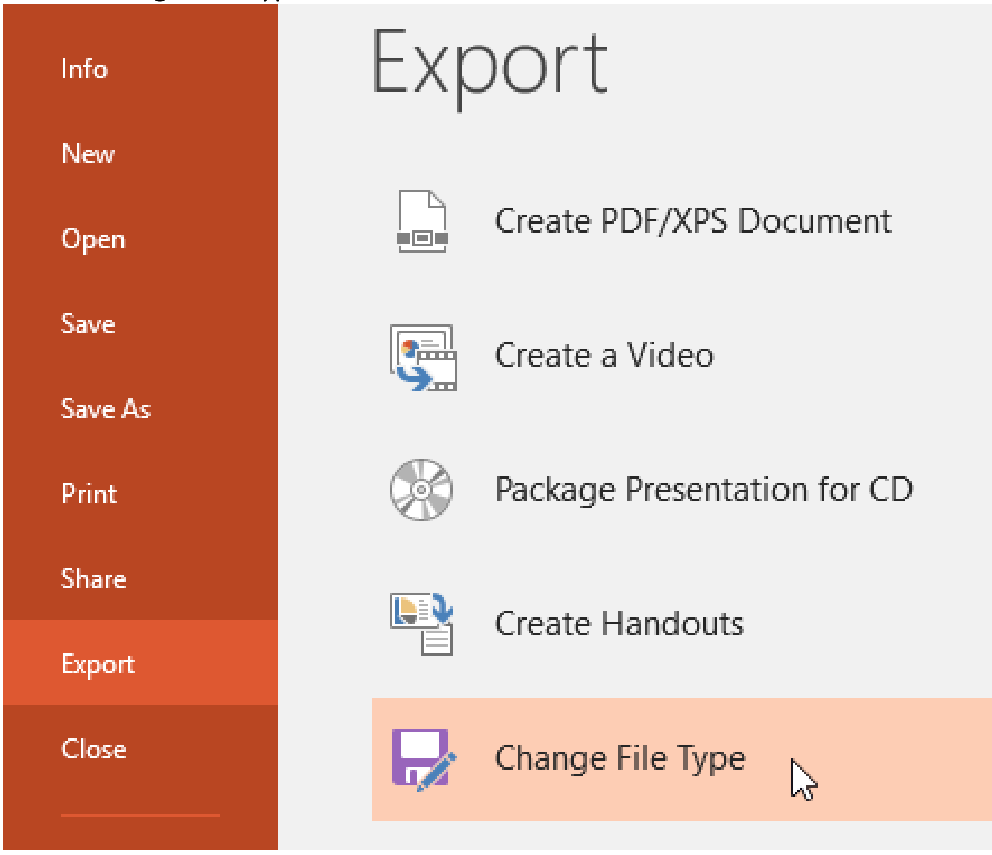
- PDF: Saves the presentation as a PDF document instead of a PowerPoint file

- Video: Saves the presentation as a video
- Package for CD: Saves the presentation in a folder along with the Microsoft PowerPoint Viewer, a special slide show player anyone can download
- Handouts: Prints a handout version of your slides
- Other file type: Saves in other file types, including PNG and PowerPoint 97-2003

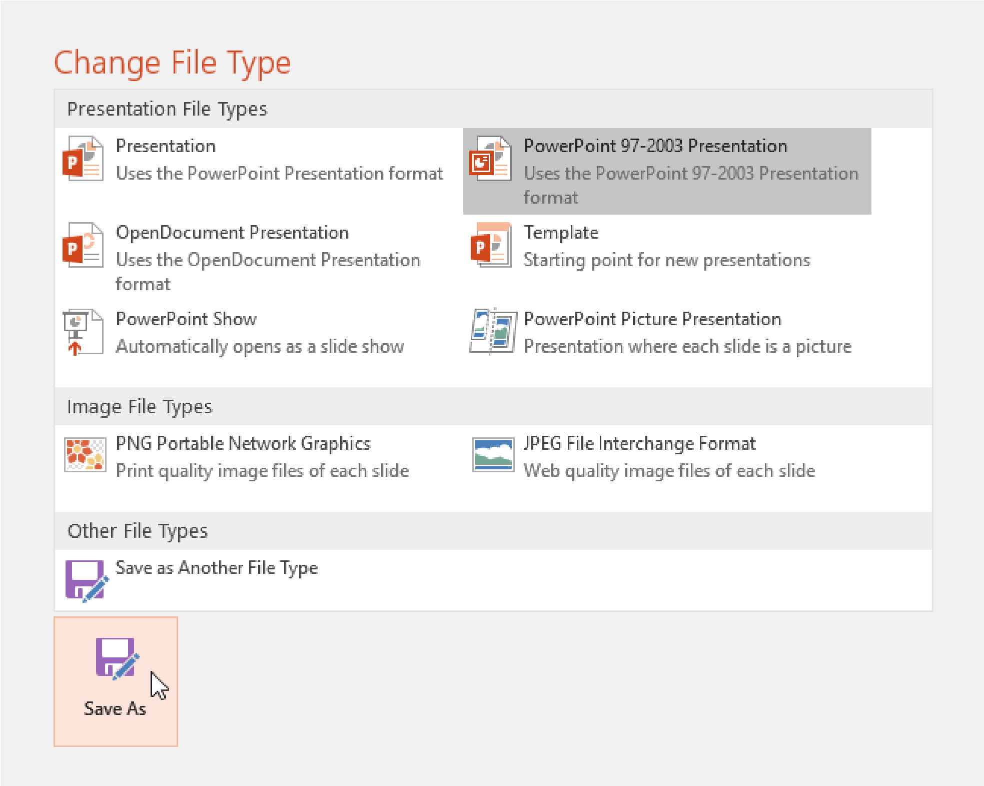
To export a presentation:

In our example, we'll save the presentation as a PowerPoint 97-2003 file.

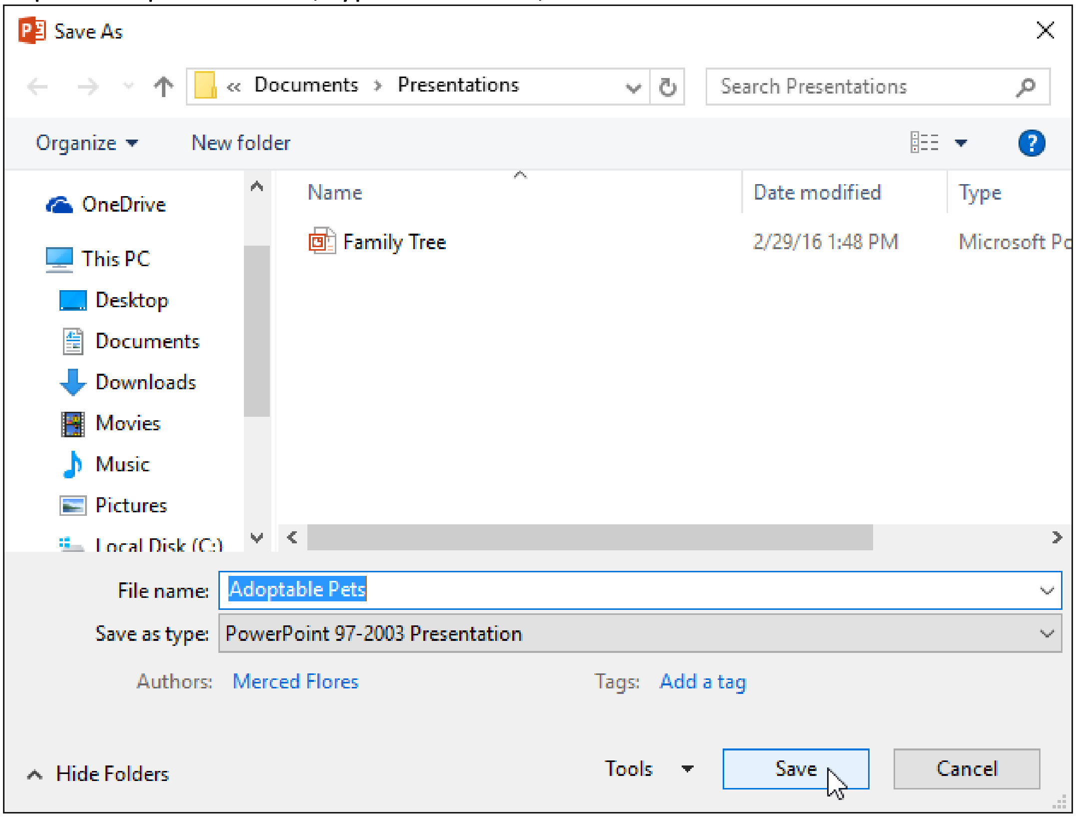
1. Click the File tab to access Backstage view.
2. Click Export, then choose the desired option. In our example, we'll select Change File Type.



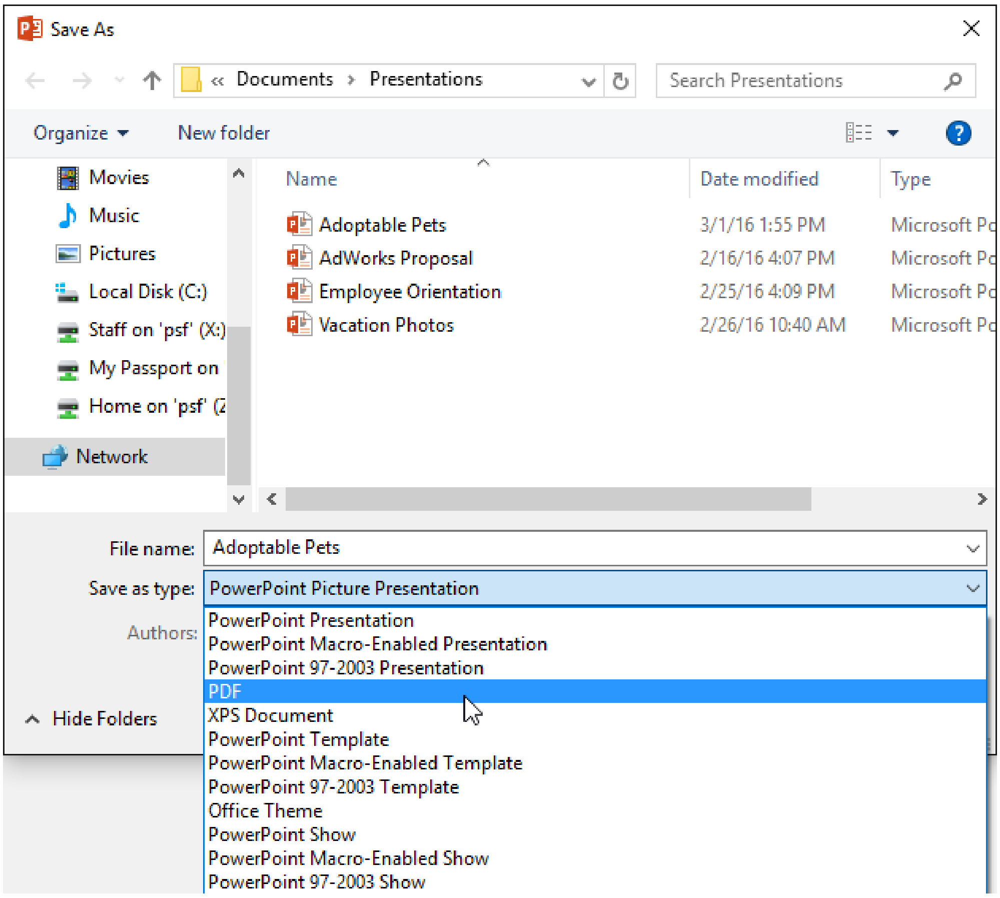

3. Select a file type, then click Save As.




4. The Save As dialog box will appear. Select the location where you want to export the presentation, type a file name, then click Save.




You can also use the Save as type drop-down menu in the Save As dialog box to save presentations in a variety of file types. Be careful to choose a file type others will be able to open.




## 1.5 Sharing presentations

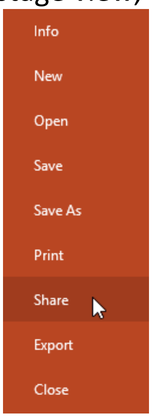
PowerPoint makes it easy to share and collaborate on presentations using OneDrive. In the past, if you wanted to share a file with someone you could send it as an email attachment. While convenient, this system also creates multiple versions of the same file, which can be difficult to organize.

When you share a presentation from PowerPoint, you're actually giving others access to the exact same file. This lets you and the people you share with edit the same presentation without having to keep track of multiple versions.

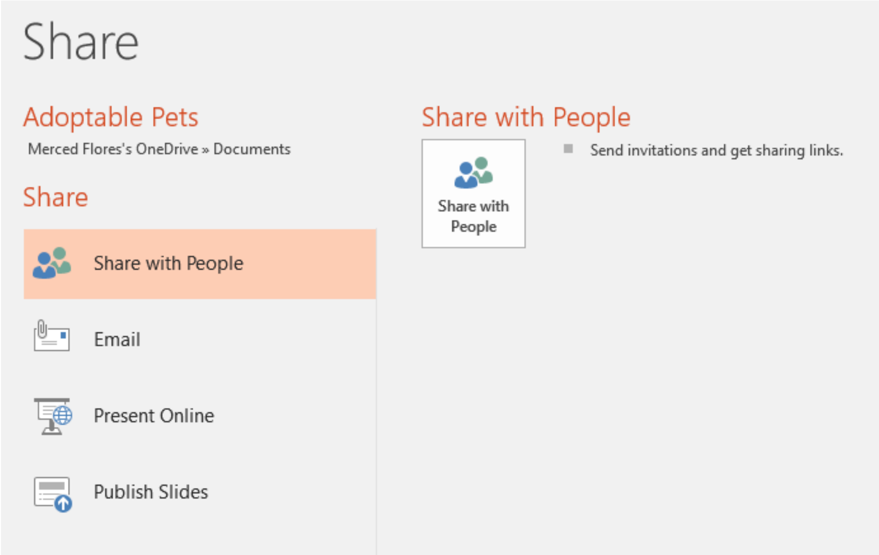
In order to share a presentation, it must first be saved to your OneDrive.

To share a presentation:

1. Click the File tab to access Backstage view, then click Share.




2. The Share pane will appear.



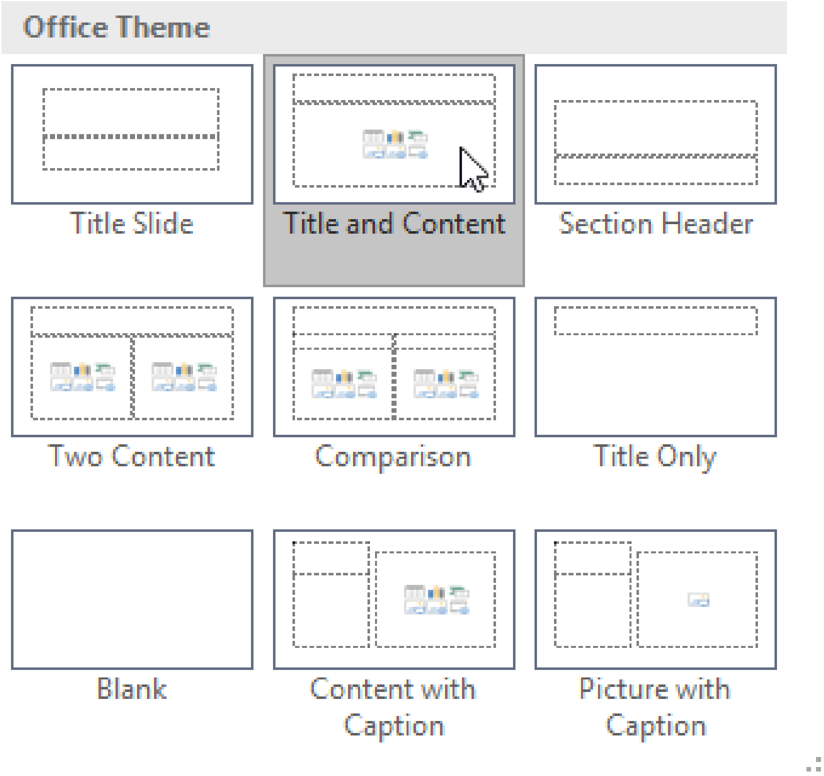

## Lesson 2: Working with Slides

### 2.1 Slide Basics

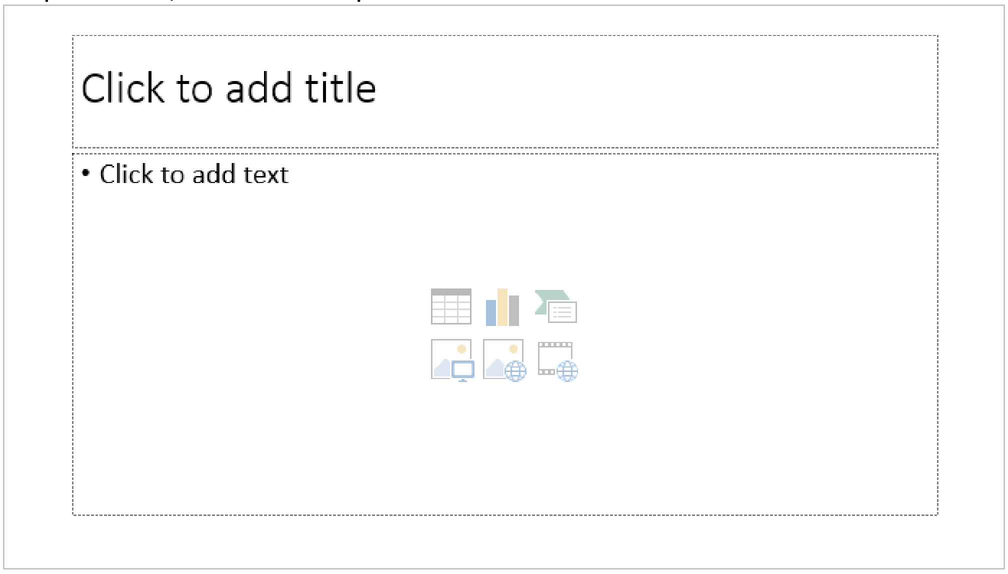
Every PowerPoint presentation is composed of a series of slides. To begin creating a slide show, you'll need to know the basics of working with slides. You'll need to feel comfortable with tasks such as inserting a new slide, changing the layout of a slide, arranging existing slides, changing the slide view, and adding notes to a slide.

#### Understanding slides and slide layouts

When you insert a **new slide**, it will usually have **placeholders** to show you where content will be placed. Slides have different **layouts** for placeholders, depending on the type of information you want to include. Whenever you create a new slide, you'll need to choose a slide layout that fits your content.



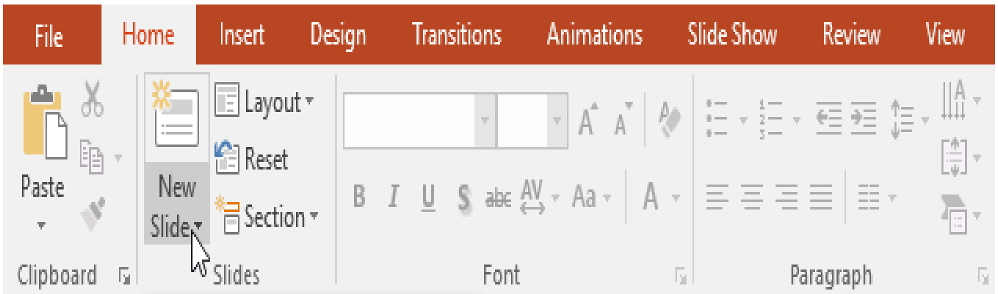

Placeholders can contain different types of content, including text, images, and videos. Many placeholders have **thumbnail icons** you can click to add specific types of content. In the example below, the slide has placeholders for the **title** and **content**.



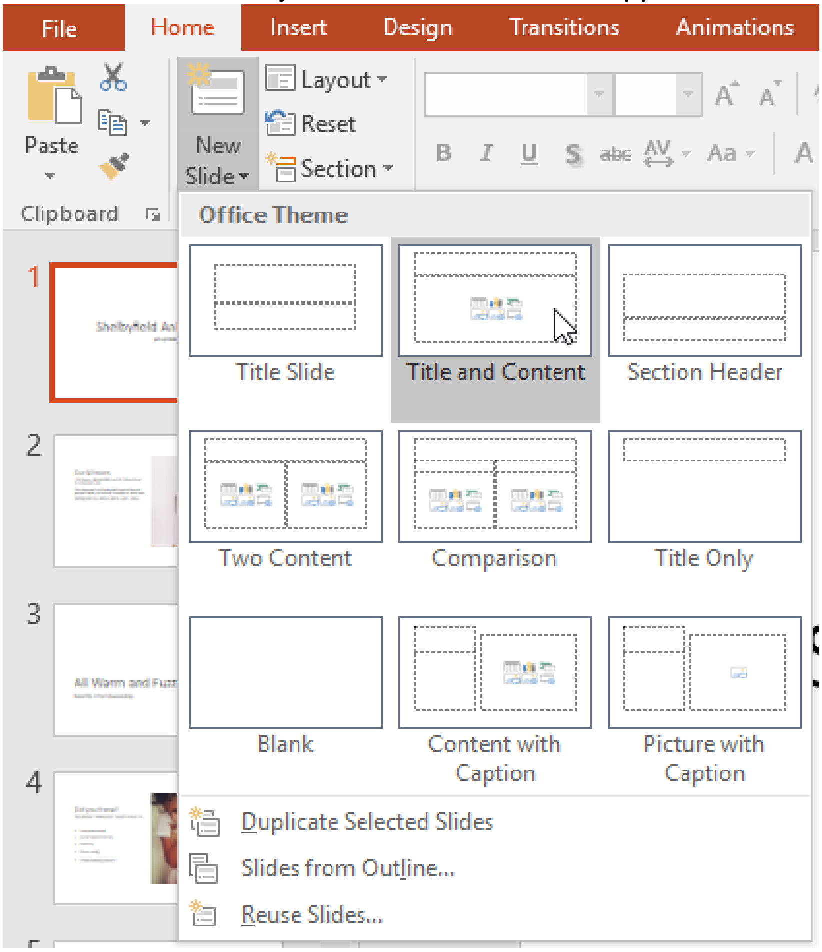

To insert a new slide:

Whenever you start a new presentation, it will contain **one slide** with the **Title Slide** layout. You can insert as many slides as you need from a variety of layouts.

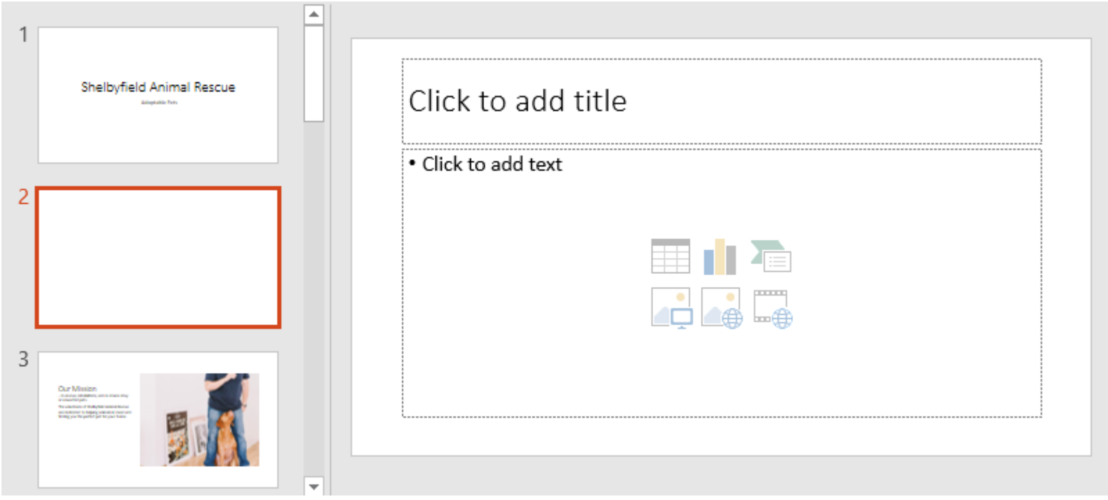
1. From the **Home** tab, click the **bottom half** of the **New Slide** command.



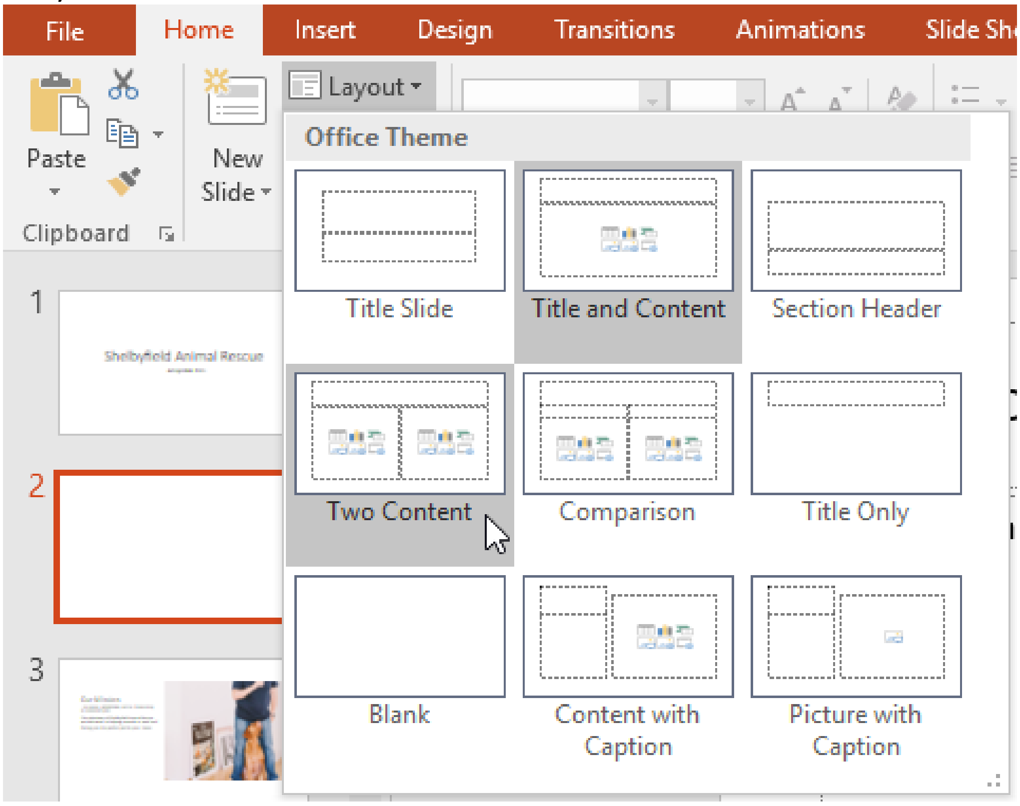

2. Choose the desired **slide layout** from the menu that appears.



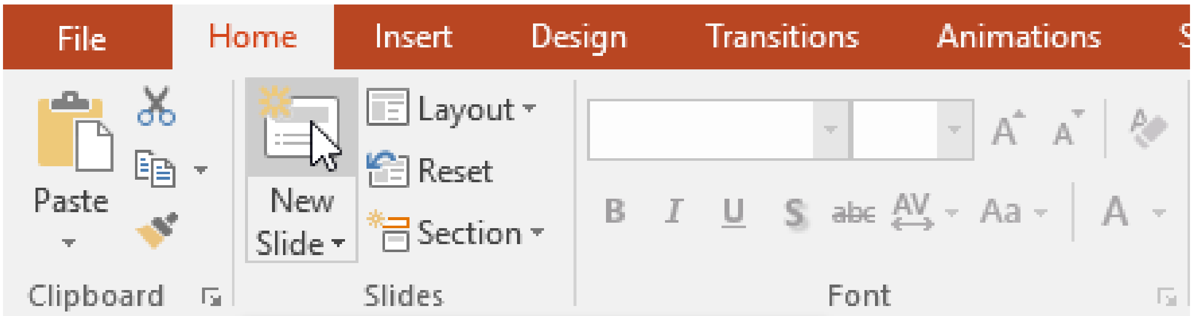

3. The new slide will appear. Click any **placeholder** and begin typing to add text. You can also click an **icon** to add other types of content, such as a **picture** or a **chart**.




To change the layout of an existing slide, click the **Layout** command, then choose the desired layout.

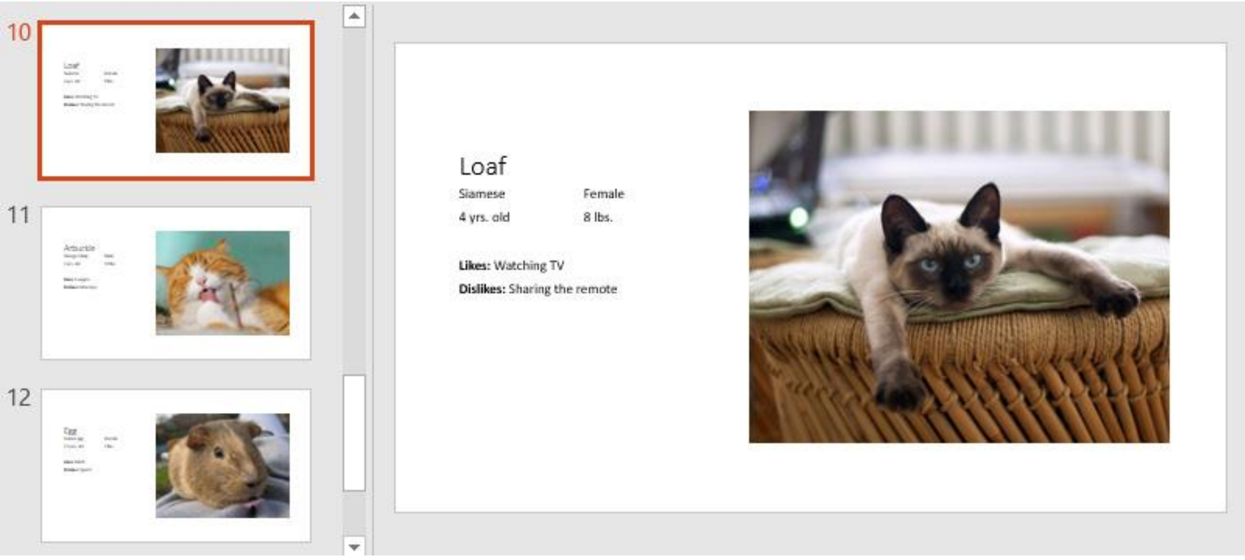



To quickly add a slide that uses the same layout as the selected slide, click the **top half** of the **New Slide** command.



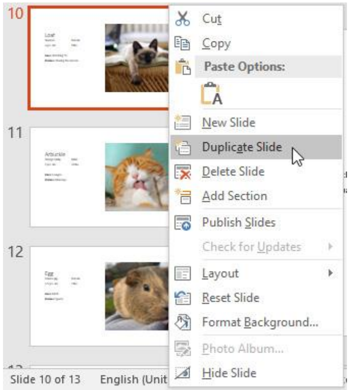
## 2.2 Organizing slides

PowerPoint presentations can contain as many slides as you need. The **Slide Navigation pane** on the left side of the screen makes it easy to **organize** your slides. From there, you can **duplicate**, **rearrange**, and **delete** slides in your presentation.




Working with slides

- **Duplicate slides:** If you want to copy and paste a slide quickly, you can **duplicate** it. To duplicate slides, select the slide you want to **duplicate**, right-click the mouse, and choose **Duplicate Slide** from the menu that appears. You can also duplicate **multiple slides** at once by selecting them first.



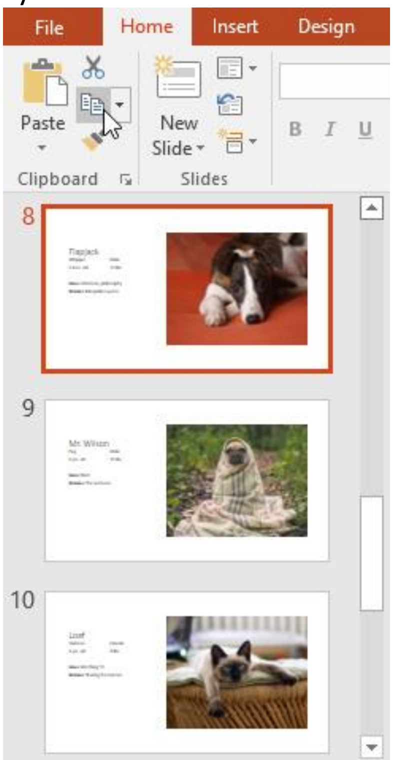

- **Move slides:** It's easy to change the **order** of your slides. Just click and drag the **desired slide** in the Slide Navigation pane to the desired position.


- **Delete slides:** If you want to remove a slide from your presentation, you can **delete** it. Simply select the slide you want to delete, then press the **Delete** or **Backspace** key on your keyboard.

To copy and paste slides:

If you want to create several slides with the same layout, you may find it easier to **copy and paste** a slide you've already created instead of starting with an empty slide.

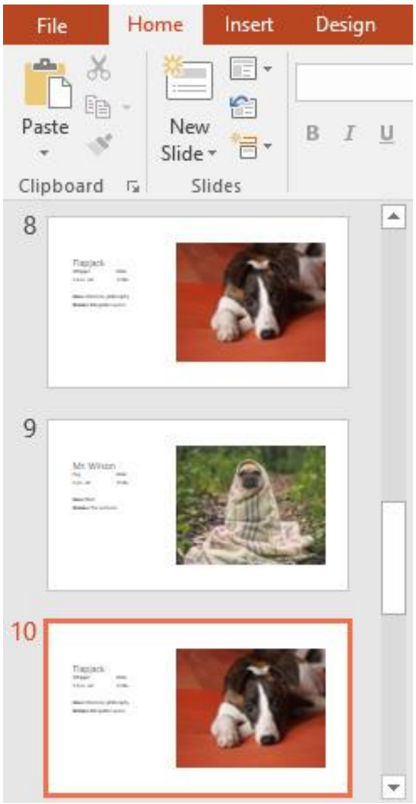
1. Select the **slide** you want to copy in the Slide Navigation pane, then click the **Copy** command on the **Home** tab. Alternatively, you can press **Ctrl+C** on your keyboard.



2. In the Slide Navigation pane, click just below a slide (or between two slides) to choose a paste location. A **horizontal insertion point** will appear.


3. Click the **Paste** command on the **Home** tab. Alternatively, you can press **Ctrl+V** on your keyboard.


4. The slide will appear in the selected location.




## 2.3 Customizing slide layouts

Sometimes you may find that a slide layout doesn't exactly fit your needs. For example, a layout might have too many—or too few—placeholders. You might also want to change how the placeholders are arranged on the slide. Fortunately, PowerPoint makes it easy to adjust slide layouts as needed.

Adjusting placeholders

- **To select a placeholder:** Hover the mouse over the edge of the placeholder and click (you may need to click the text in the placeholder first to see the border). A selected placeholder will have a **solid line** instead of a dotted line.


- **To move a placeholder:** Select the placeholder, then click and drag it to the desired location.

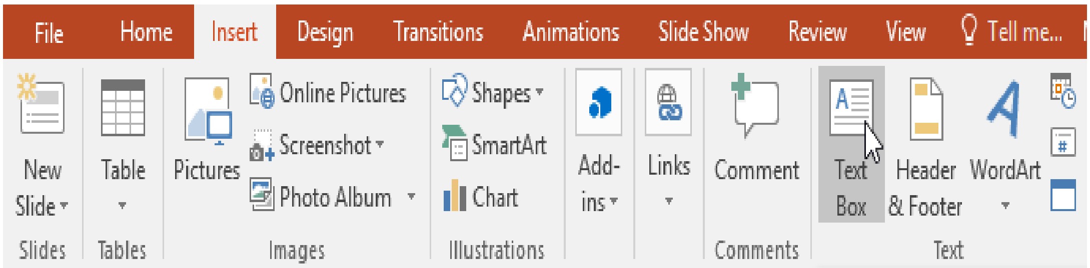

- **To resize a placeholder:** Select the placeholder you want to resize. **Sizing handles** will appear. Click and drag the **sizing handles** until the placeholder is the desired size. You can use the corner sizing handles to change the placeholder's **height** and **width** at the same time.


- **To delete a placeholder:** Select the placeholder you want to delete, then press the **Delete** or **Backspace** key on your keyboard.

To add a text box:

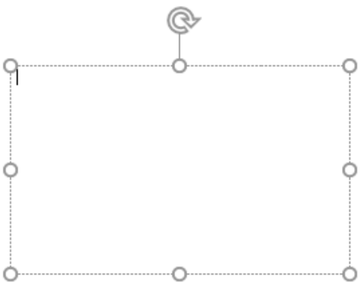
Text can be inserted into both **placeholders** and **text boxes**. Inserting **text boxes** allows you to add to the slide layout. Unlike placeholders, text boxes always stay in the same place, even if you change the theme.

1. From the **Insert** tab, select the **Text Box** command.




2. Click and drag to draw the text box on the slide.

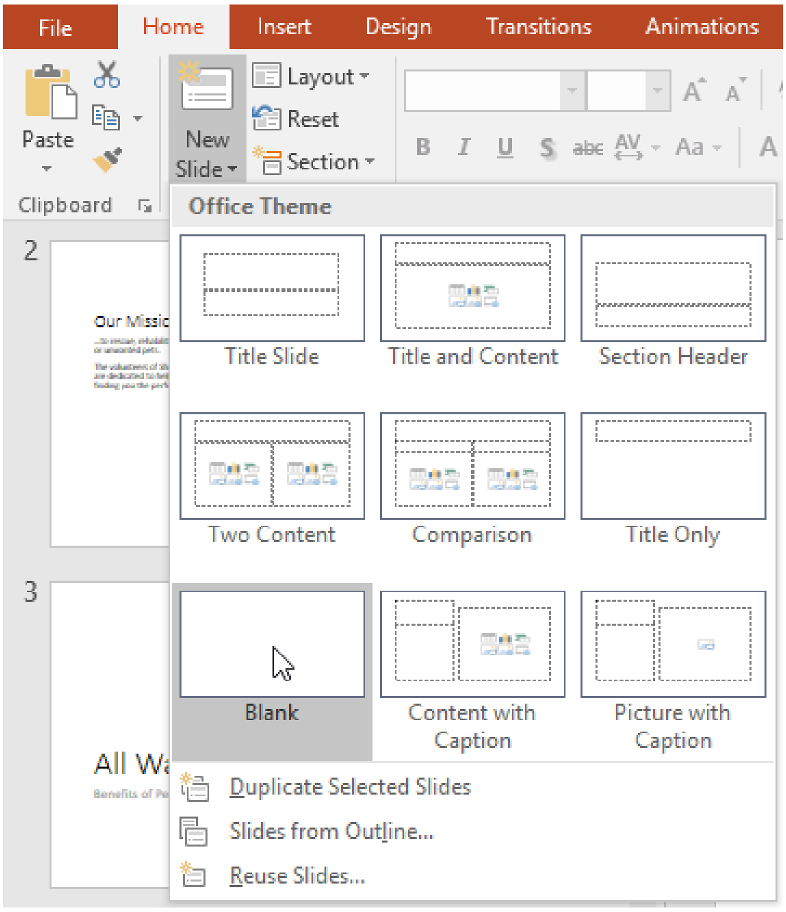
3. The text box will appear. To add text, simply click the text box and begin typing.



Using blank slides

If you want even more control over your content, you may prefer to use a **blank slide**, which contains no placeholders. Blank slides can be customized by adding your own text boxes, pictures, charts, and more.

- To insert a blank slide, click the bottom half of the **New Slide** command, then choose **Blank** from the menu that appears.

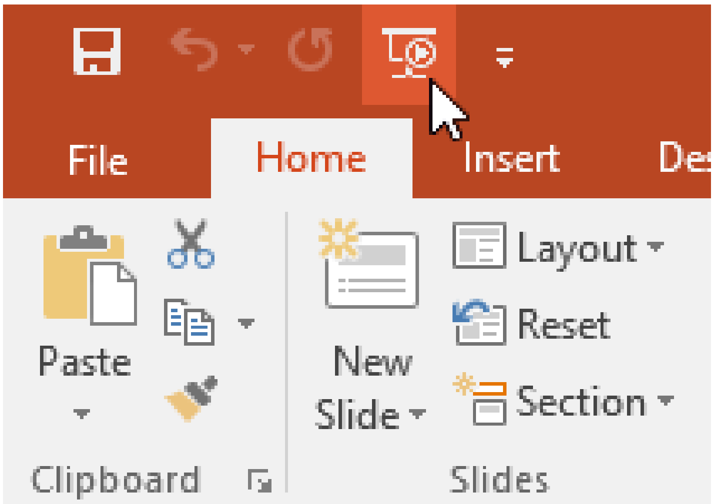



While blank slides offer more flexibility, keep in mind that you won't be able to take advantage of the predesigned layouts included in each theme.

To play the presentation:

Once you've arranged your slides, you may want to **play** your presentation. This is how you will present your slide show to an audience.

1. Click the **Start From Beginning** command on the Quick Access Toolbar to see your presentation.




2. The presentation will appear in full-screen mode.
3. You can advance to the next slide by **clicking your mouse** or pressing the **spacebar** on your keyboard. Alternatively, you can use the **arrow**

**keys** on your keyboard to move forward or backward through the presentation.

4. Press the **Esc** key to exit presentation mode.

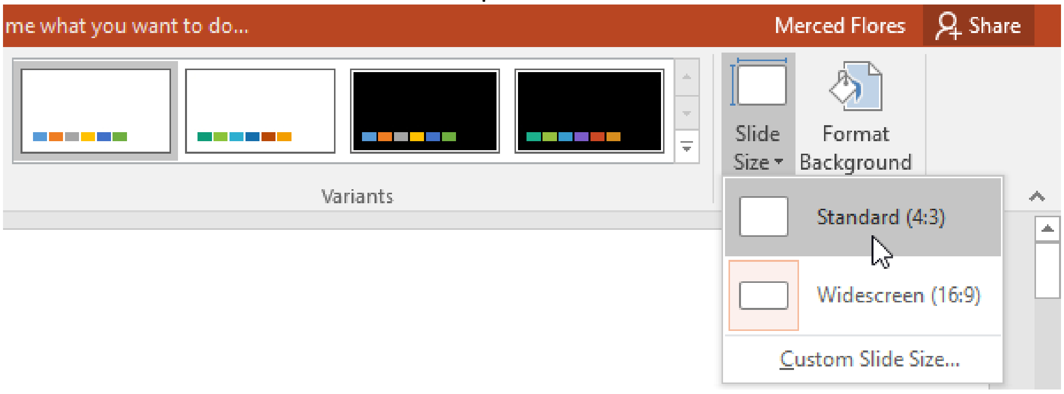
You can also press the **F5** key at the top of your keyboard to start a presentation.

2.4 Customizing slides

To change the slide size:

By default, all slides in PowerPoint 2013 use a **16-by-9**—or **widescreen**—aspect ratio. You might know that widescreen TVs also use the 16-by-9 aspect ratio. Widescreen slides will work best with widescreen monitors and projectors. However, if you need your presentation to fit a **4-by-3** screen, it's easy to change the slide size to fit.

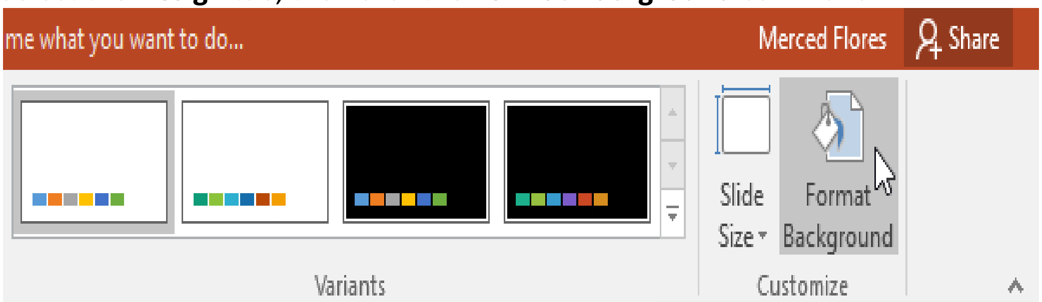
- To change the slide size, select the **Design** tab, then click the **Slide Size** command. Choose the desired slide size from the menu that appears, or click **Custom Slide Size** for more options.



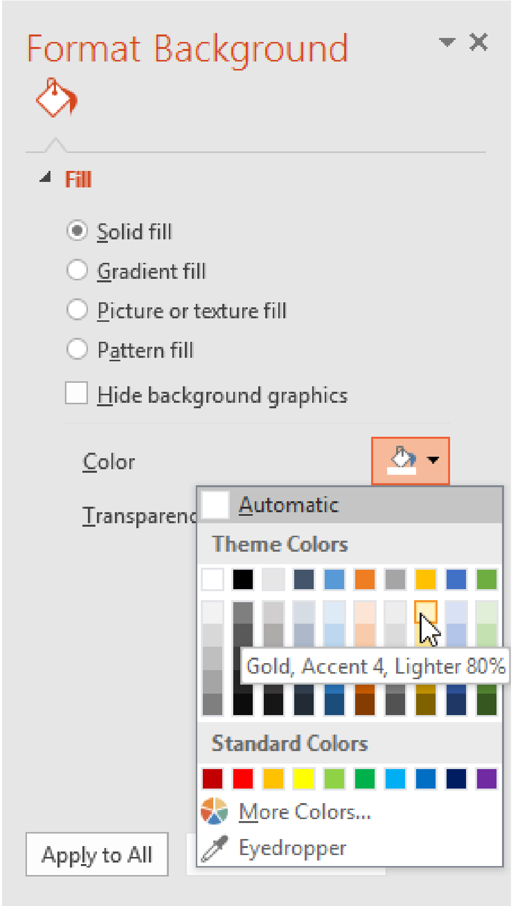

To format the slide background:

By default, all slides in your presentation use a **white background**. It's easy to change the background style for some or all of your slides. Backgrounds can have a **solid**, **gradient**, **pattern**, or **picture** fill.

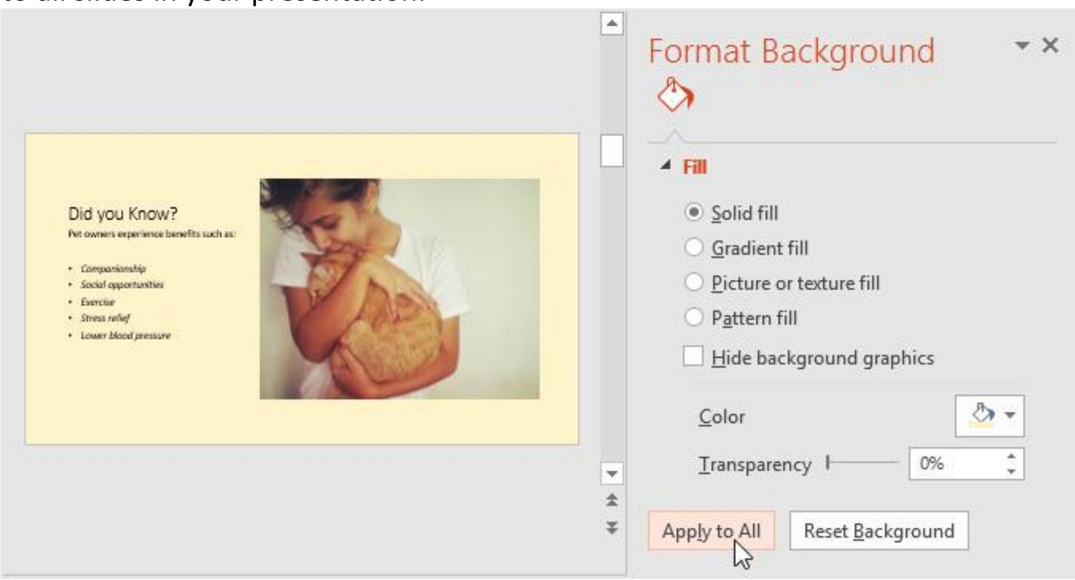
1. Select the **Design** tab, then click the **Format Background** command.




2. The **Format Background** pane will appear on the right. Select the desired fill options. In our example, we'll use a **Solid fill** with a **light gold** color.



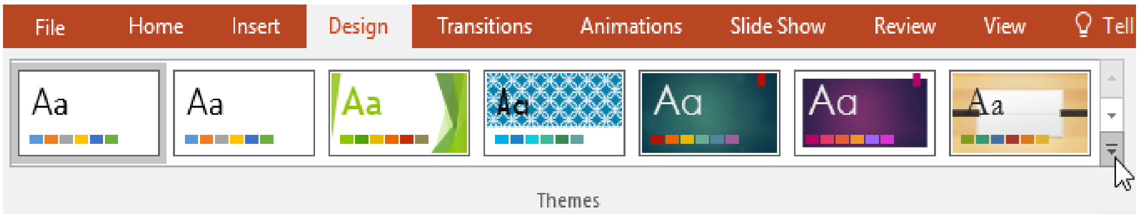

3. The background style of the selected slide will update.
4. If you want, you can click **Apply to All** to apply the same background style to all slides in your presentation.



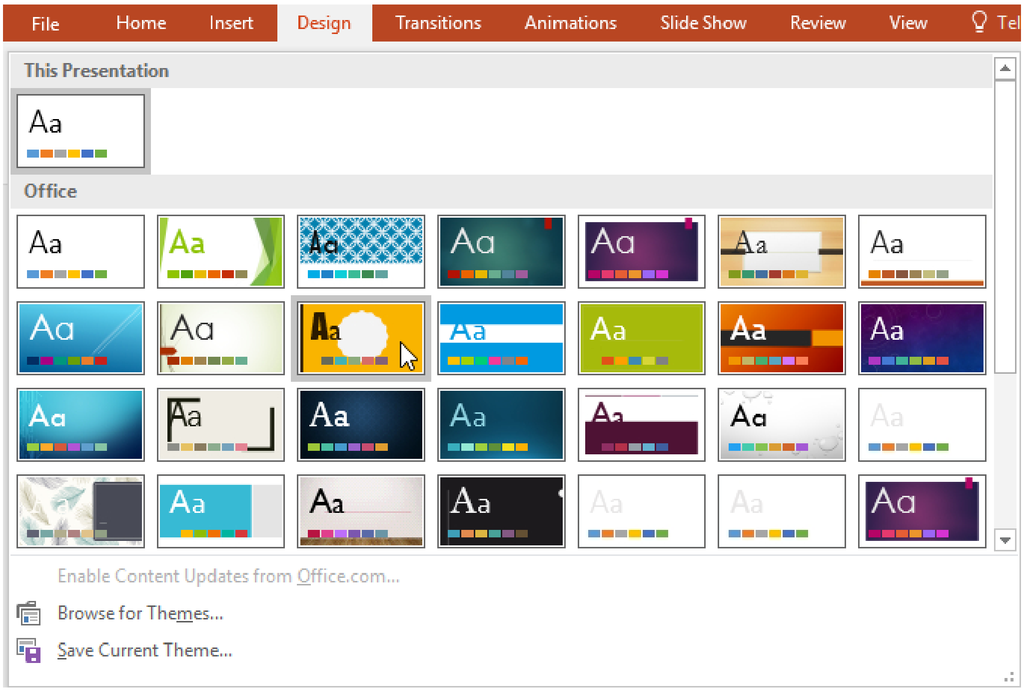

To apply a theme:

A theme is a **predefined combination** of colors, fonts, and effects that can quickly change the look and feel of your entire slide show. Different themes also use different **slide layouts**, which can change the arrangement of your existing placeholders. We'll talk more about themes later in our **Applying Themes** lesson.

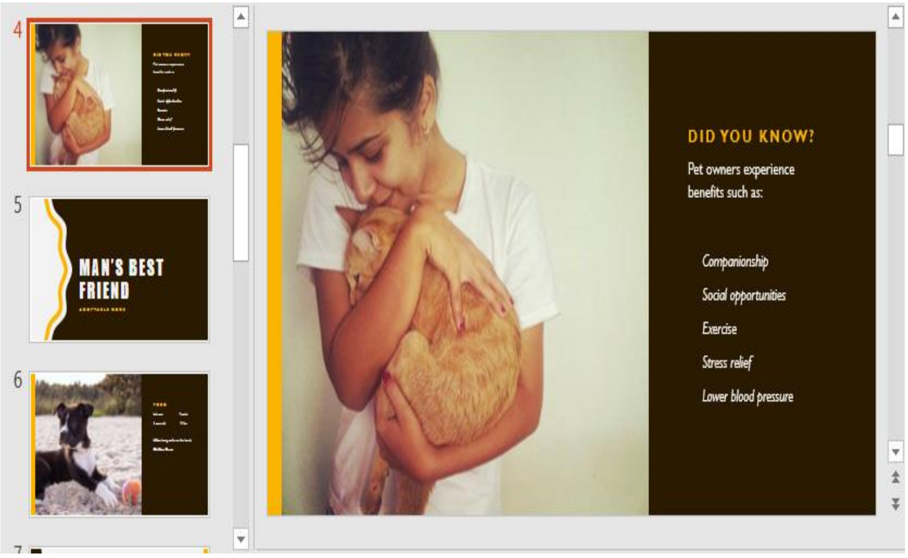
1. Select the **Design** tab on the Ribbon, then click the **More** drop-down arrow to see all of the available themes.




2. Select the **desired theme**.




3. The theme will be applied to your **entire presentation**.




Try applying a few different themes to your presentation. Some themes will work better than others, depending on your content.

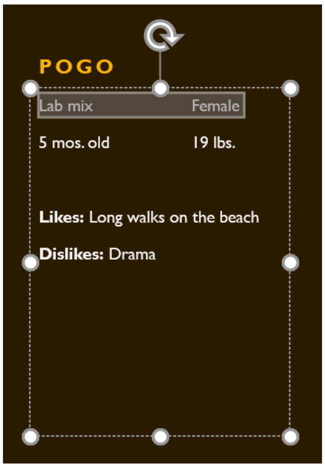
## 2.5 Text Basics

If you're new to PowerPoint, you'll need to learn the basics of working with text. In this lesson, you'll learn how to cut, copy, paste, and format text.

To select text:

Before you can move or arrange text, you'll need to **select** it.

- Click next to the text you want to select, drag the mouse over the text, then release your mouse. The text will be selected.

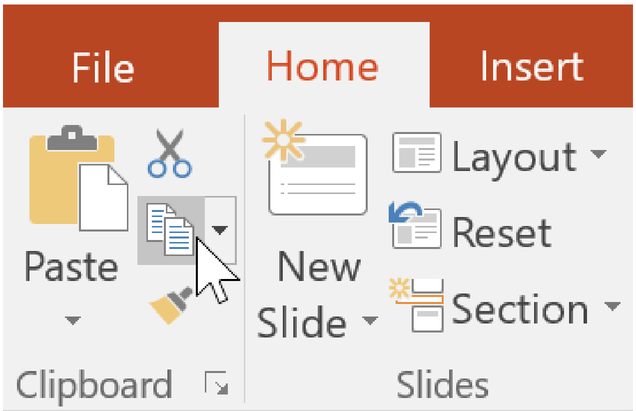



Copying and moving text

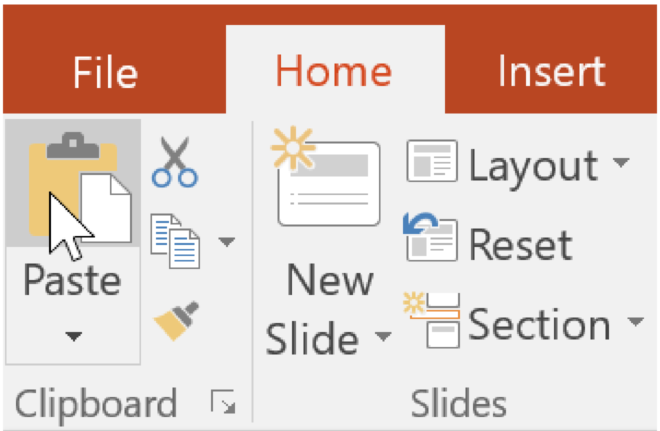
PowerPoint allows you to **copy** text that is already on a slide and **paste** it elsewhere, which can save you time. If you want to **move** text, you can **cut and paste** or **drag and drop** the text.

To copy and paste text:

1. Select the **text** you want to copy, then click the **Copy** command on the **Home** tab.



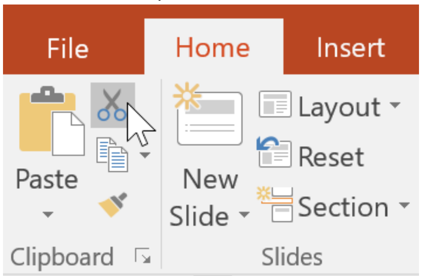

2. Place the insertion point where you want the text to appear.
3. Click the **Paste** command on the **Home** tab.



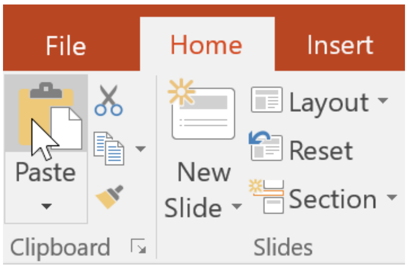

4. The copied text will appear.

To cut and paste text:

1. Select the **text** you want to move, then click the **Cut** command.




2. Place the insertion point where you want the text to appear, then click the **Paste** command.



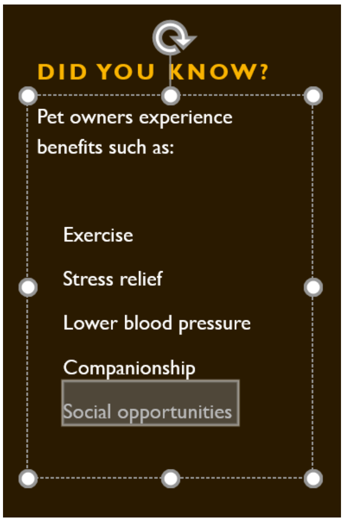

3. The text will appear in the new location.

You can access the **cut**, **copy**, and **paste** commands by using keyboard shortcuts. Press **Ctrl+X** to cut, **Ctrl+C** to copy, and **Ctrl+V** to paste.

To drag and drop text:

1. Select the **text** you want to move, then click and drag the text to the **desired location**.

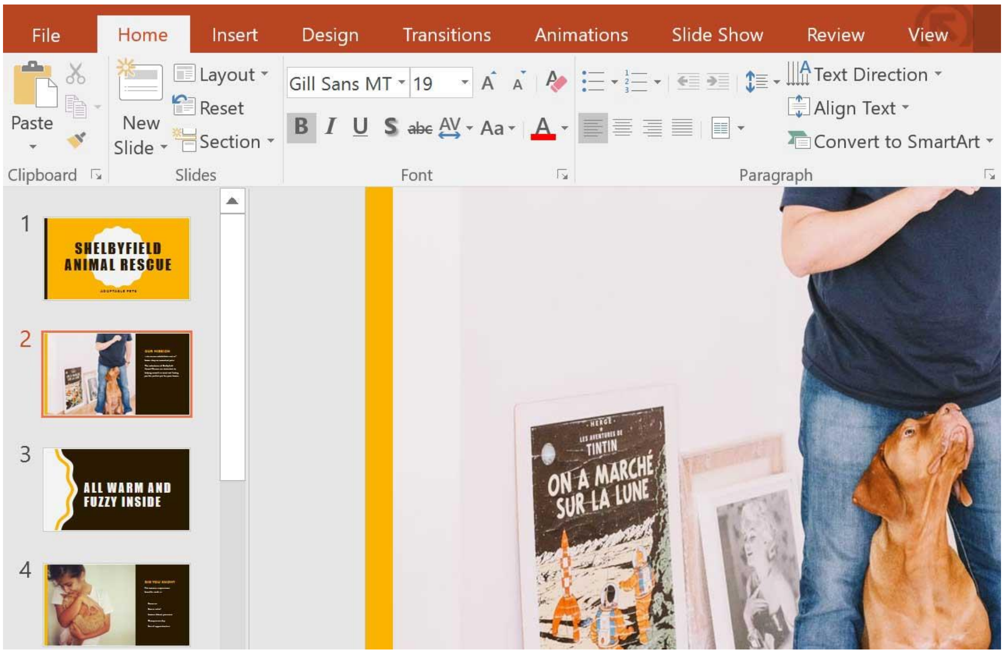

2. The text will appear in the new location.




## Formatting and aligning text

Formatted text can draw your audience's attention to specific parts of a presentation and emphasize important information. In PowerPoint, you have several options for adjusting your text, including size and color. You can also adjust the alignment of the text to change how it is displayed on the slide.

Click the buttons in the interactive below to learn about the different commands in the Font and Paragraph groups.



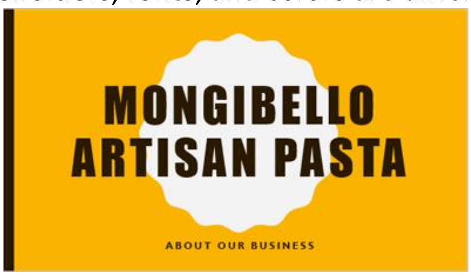

## 2.6 Applying Themes

A theme is a predefined combination of colors, fonts, and effects. Different themes also use different slide layouts. You've already been using a theme, even if you didn't know it: the default Office theme. You can choose from a variety of new themes at any time, giving your entire presentation a consistent, professional look.

What is a theme?

In PowerPoint, **themes** give you a quick and easy way to change the design of your presentation. They control your primary color palette, basic fonts, slide layout, and other important elements. All of the elements of a theme will work well together, which means you won't have to spend as much time formatting your presentation.

Each theme uses its own set of **slide layouts**. These layouts control the way your content is arranged, so the effect can be dramatic. In the examples below, you can see that the **placeholders**, **fonts**, and **colors** are different.

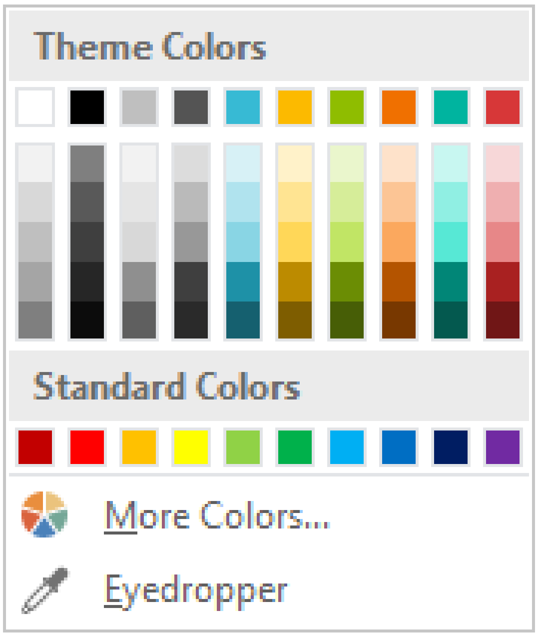




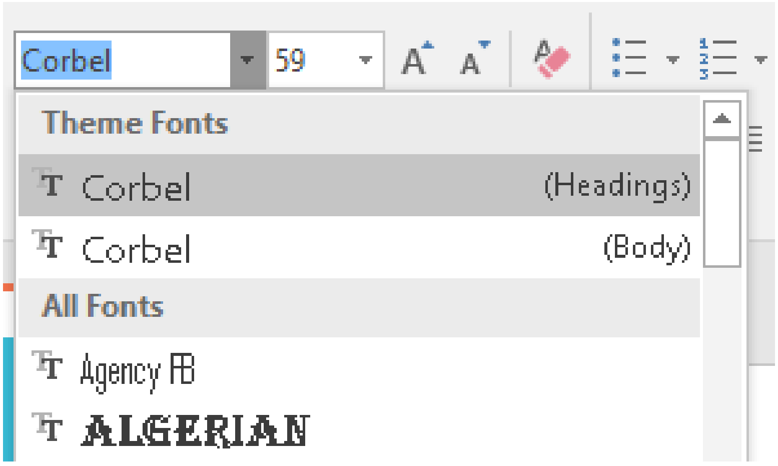
If you use a **unique** slide layout—such as **Quote with Caption** or **Name Card**—and then switch to a theme that does not include that layout, it may give unexpected results.

Every PowerPoint theme—including the default Office theme—has its own **theme elements**. These elements are:

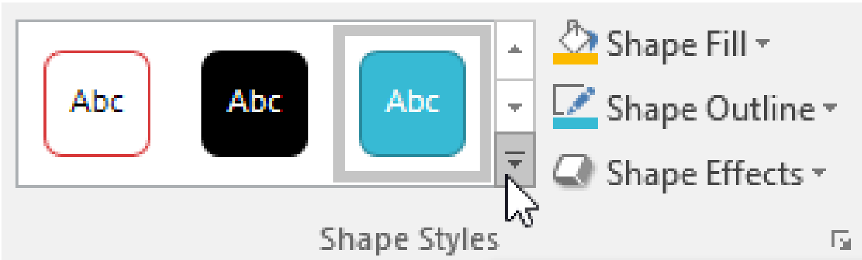
- **Theme Colors**: There are **10 theme colors**, along with darker and lighter variations, available from every **Color** menu.




- **Theme Fonts**: There are **two theme fonts** available at the top of the **Font** menu under Theme Fonts.




- **Theme Effects**: These affect the preset **shape styles**. You can find shape styles on the **Format** tab whenever you select a shape or SmartArt graphic.




When you switch to a different theme, **all of these elements will update** to reflect the new theme. You can drastically change the look of your presentation in a few clicks.
If you apply a font or color that isn't part of the theme, it won't change when you select a different theme. This includes colors selected from the **Standard Colors** or **More Colors** options and fonts selected from **All Fonts**. Using non-theme elements can be useful when you want certain text to be a specific color or font, like a logo.

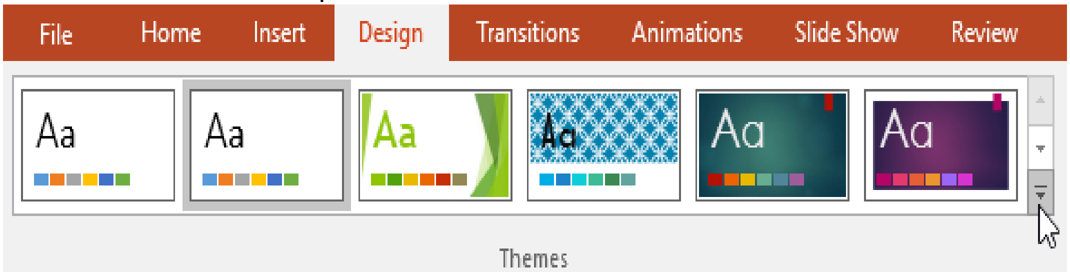
You can also customize themes and define theme elements yourself. To learn more, see our **Modifying Themes** lesson.

Applying themes

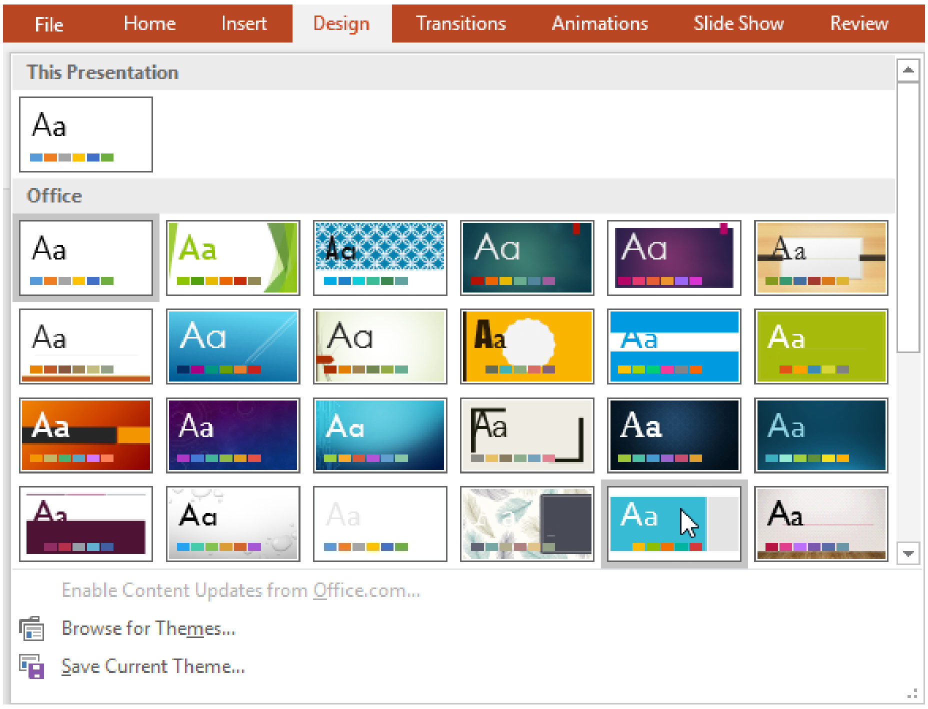
All themes included in PowerPoint are located in the **Themes** group on the **Design** tab. Themes can be applied or changed at any time.

To apply a theme:

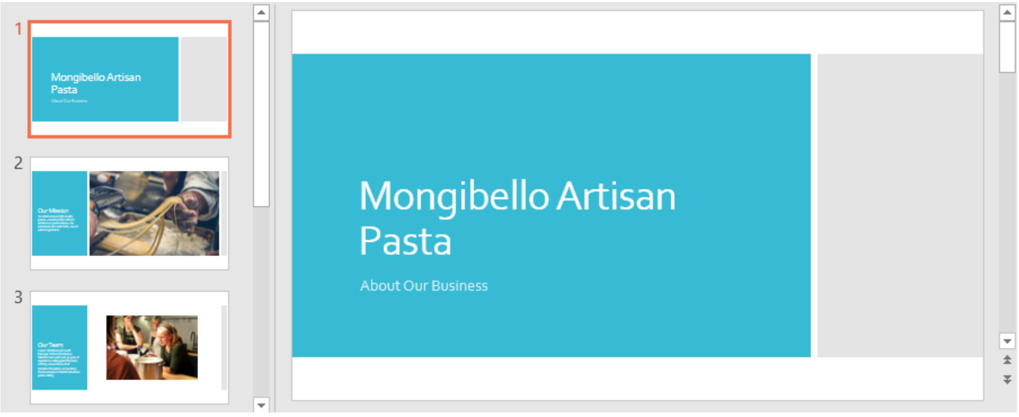
1. Select the **Design** tab on the Ribbon, then locate the **Themes** group. Each image represents a theme.
2. Click the **More** drop-down arrow to see all available themes.



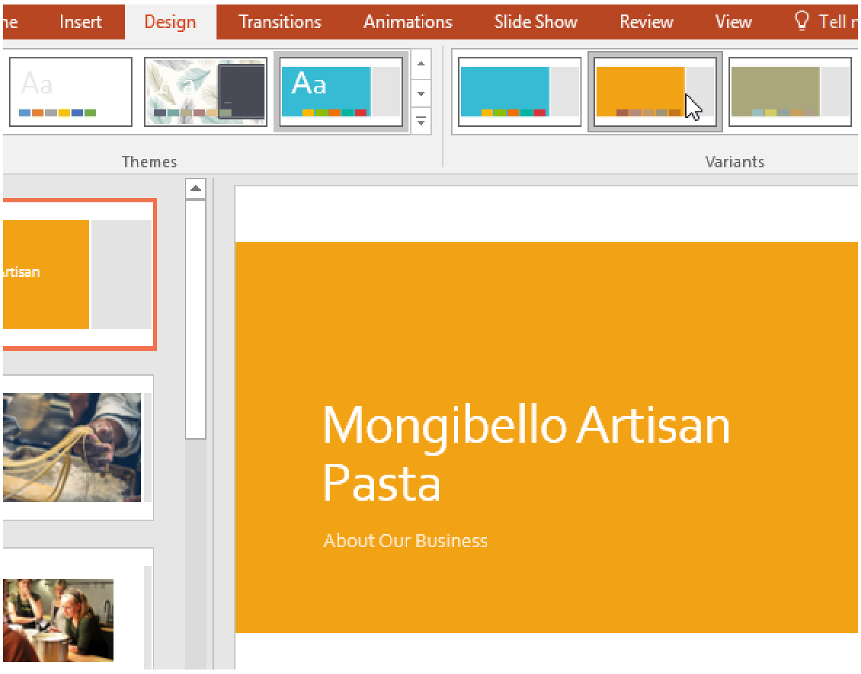

3. Select the **desired theme**.




4. The theme will be applied to the entire **presentation**. To apply a different theme, simply select it from the Design tab.




Once you've applied a theme, you can also select a **variant** for that theme from the **Variants** group. Variants use **different theme colors** while preserving a theme's overall look.



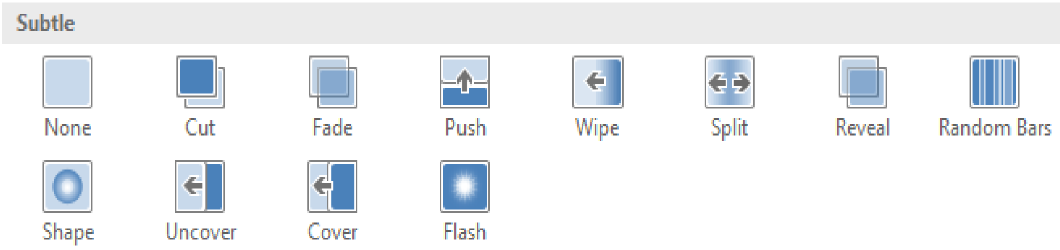

## 2. 7 Applying Transitions

If you've ever seen a PowerPoint presentation that had special effects between each slide, you've seen slide transitions. A transition can be as simple as fading to the next slide or as flashy as an eye-catching effect. PowerPoint makes it easy to apply transitions to some or all of your slides, giving your presentation a polished, professional look.

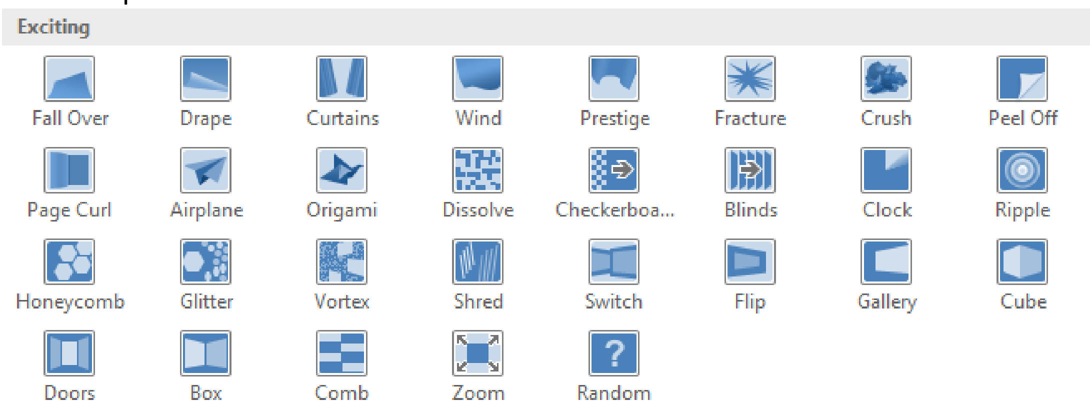
About transitions

There are **three categories** of unique transitions to choose from, all of which can be found on the **Transitions** tab.

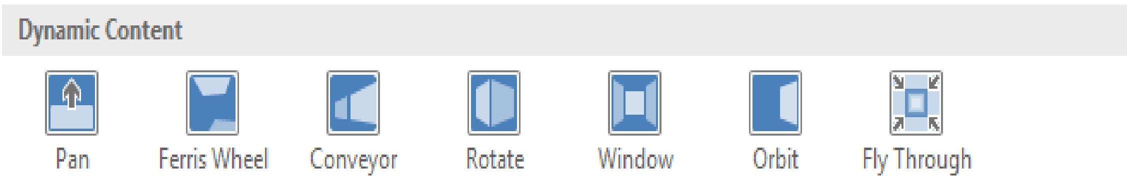
- **Subtle:** These are the most basic types of transitions. They use **simple animations** to move between slides.




- **Exciting:** These use more **complex animations** to transition between slides. While they're more visually interesting than **Subtle** transitions, adding too many can make your presentation look less professional. However, when used in moderation they can add a nice touch between important slides.




- **Dynamic Content:** If you're transitioning between two slides that use similar **slide layouts**, dynamic transitions will move only the **placeholders**, not the slides themselves. When used correctly, dynamic transitions can help **unify** your slides and add a further level of polish to your presentation.

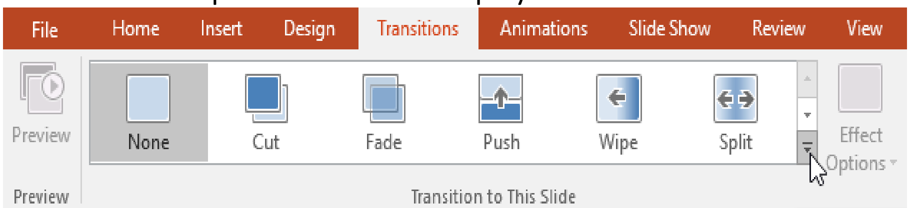



Transitions are best used in moderation. Adding too many transitions can make your presentation look a little silly and can even be distracting to your audience. Consider using mostly subtle transitions, or not using transitions at all.

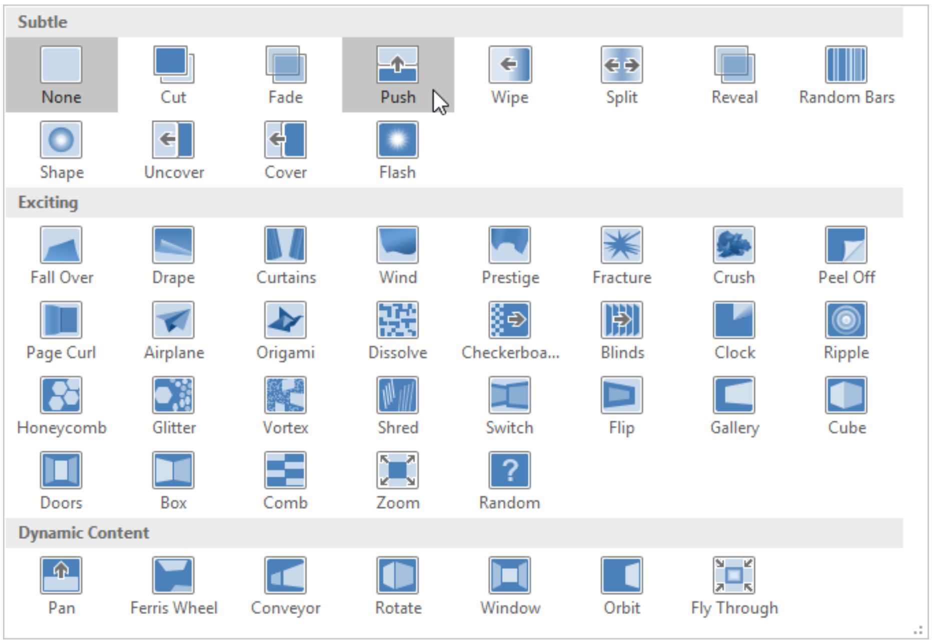
To apply a transition:

1. Select the **desired slide** from the **Slide Navigation** pane. This is the slide that will appear **after** the transition.

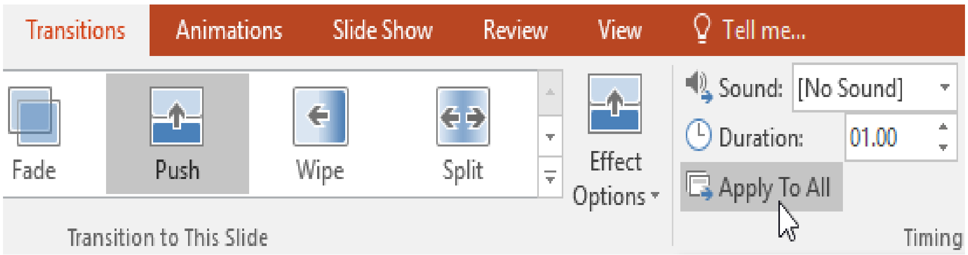

2. Click the **Transitions** tab, then locate the **Transition to This Slide** group. By default, **None** is applied to each slide.
3. Click the **More** drop-down arrow to display all transitions.




4. Click a **transition** to apply it to the selected slide. This will automatically preview the transition.




You can use the **Apply To All** command in the **Timing** group to apply the same transition to all slides in your presentation. Keep in mind that this will modify any other transitions you've applied.

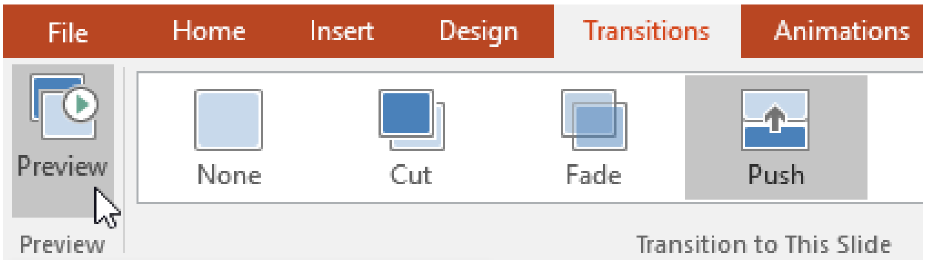



Try applying a few different types of transitions to various slides in your presentation. You may find that some transitions work better than others, depending on the content of your slides.

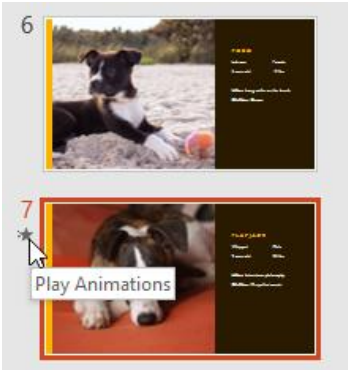
To preview a transition:

You can **preview** the transition for a selected slide at any time using either of these two methods:

- Click the **Preview** command on the **Transitions** tab.




- Click the **Play Animations** command in the **Slide Navigation** pane.

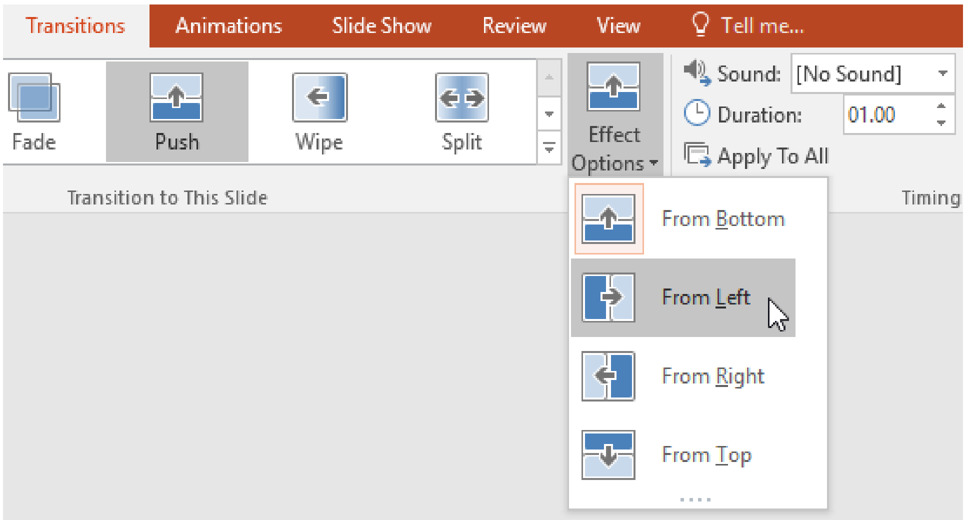



Modifying transitions

To modify the transition effect:

You can quickly customize the look of a transition by changing its **direction**.

1. Select the **slide** with the transition you want to modify.
2. Click the **Effect Options** command and choose the desired option. These options will vary depending on the selected transition.

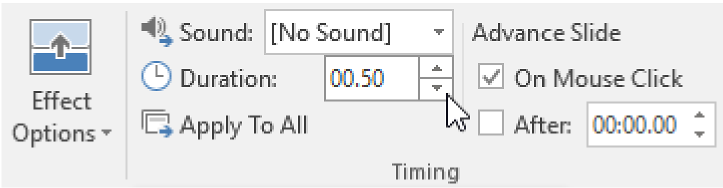



3. The transition will be **modified**, and a **preview** of the transition will appear.

Some transitions do not allow you to modify the direction.

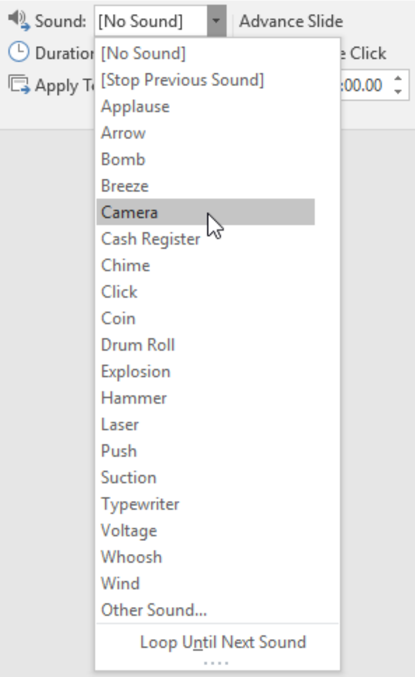
To modify the transition duration:

1. Select the **slide** with the transition you want to modify.
2. In the **Duration** field in the **Timing** group, enter the **desired time** for the transition. In this example, we'll decrease the time to half a second—or 00.50—to make the transition **faster**.




**To add sound:**

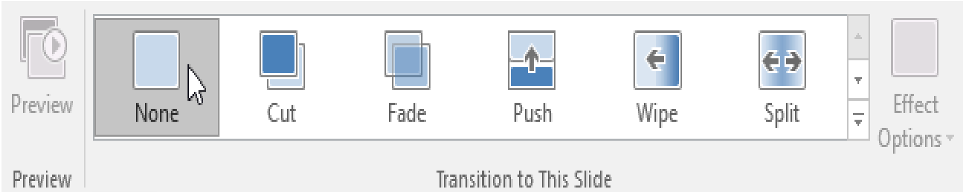
1. Select the **slide** with the transition you want to modify.
2. Click the **Sound** drop-down menu in the **Timing** group.
3. Click a **sound** to apply it to the selected slide, then preview the transition to hear the sound.




Sounds are best used in moderation. Applying a sound between every slide could become overwhelming or even annoying to an audience when presenting your slide show.

To remove a transition:

1. Select the **slide** with the transition you want to remove.
2. Choose **None** from the **Transition to This Slide** group. The transition will be removed.



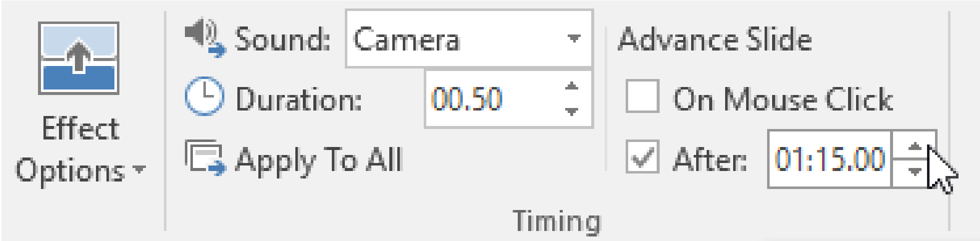

To remove transitions from **all slides**, apply the **None** transition to a slide, then click the **Apply to All** command.

## 2.8 Advancing slides

Normally, in Slide Show view you would advance to the next slide by clicking your mouse or by pressing the spacebar or arrow keys on your keyboard. The **Advance Slides** setting in the **Timing** group allows the presentation to advance **on its own** and display each slide for a specific amount of time. This feature is especially useful for **unattended presentations**, such as those at a trade show booth.

To advance slides automatically:

1. Select the slide you want to modify.
2. Locate the **Timing** group on the **Transitions** tab. Under **Advance Slide**, uncheck the box next to **On Mouse Click**.
3. In the **After** field, enter the amount of time you want to display the slide. In this example, we will advance the slide automatically after 1 minute and 15 seconds, or 01:15:00.



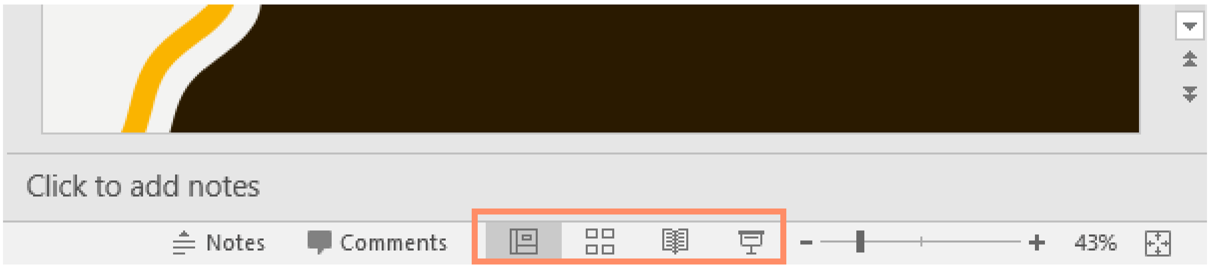

4. Select another slide and repeat the process until all slides have the desired timing. You can also click the **Apply to All** command to apply the same timing to all slides.

## Lesson 3: Managing Slides

As you add more slides to a presentation, it can be difficult to keep everything organized. Fortunately, PowerPoint offers tools to help you organize and prepare your slide show.

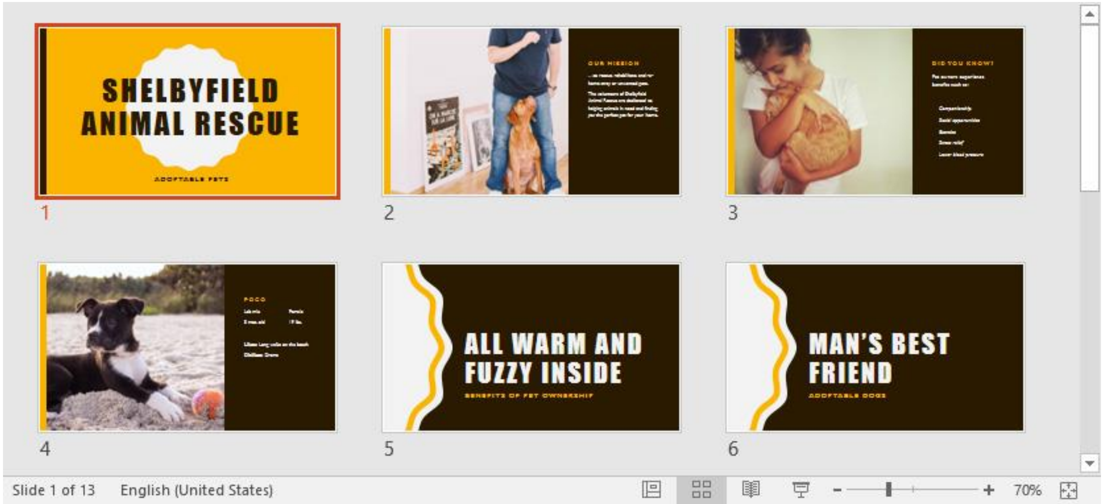
### 3.1 About slide views

PowerPoint includes several different **slide views**, which are all useful for various tasks. The **slide view commands** are located in the bottom-right of the PowerPoint window. There are four main slide views.




- **Normal view:** This is the **default** view, where you create and edit slides. You can also move slides in the Slide Navigation pane on the left.


- **Slide sorter view:** In this view, you'll see a **thumbnail version** of each slide. You can drag and drop slides to reorder them quickly.




- **Reading view:** This view fills the PowerPoint window with a **preview** of your presentation. It includes easily accessible **navigation buttons** at the bottom-right.

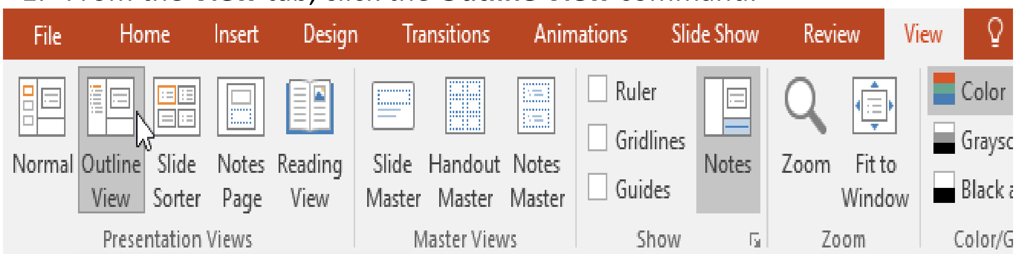

- **Slide show view:** This is the view you'll use to **present** to an audience. This command will begin the presentation from the **current slide**. You can also press **F5** on your keyboard to start from the beginning. A menu will appear in the bottom-left corner when you move the mouse. These commands allow you to navigate through the slides and access other features, such as the **pen** and **highlighter**.


3.2 Outline view

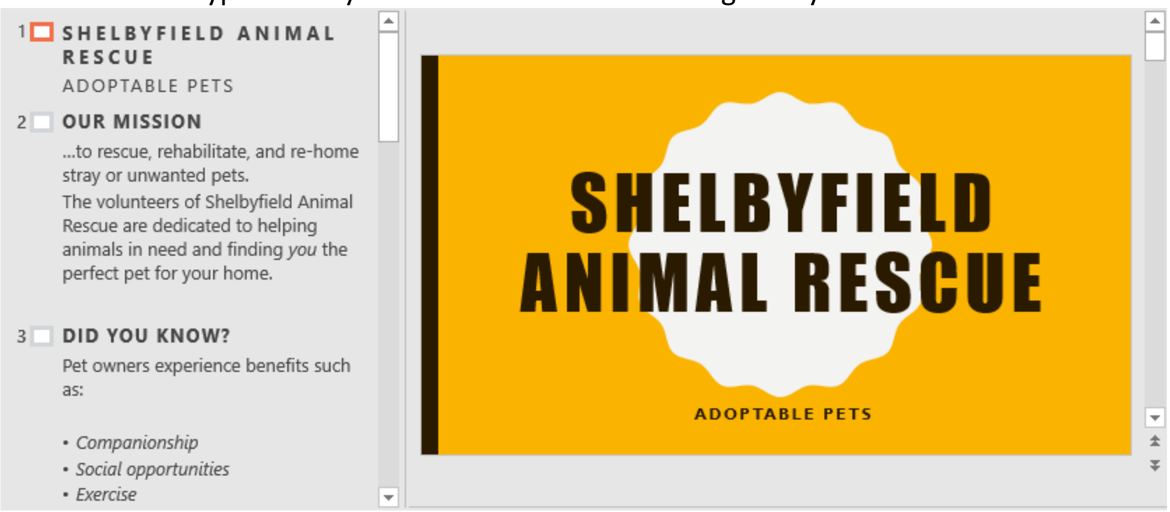
**Outline view** shows your slide text in **outline** form. This allows you to quickly edit your slide text and view the content of multiple slides at once. You could use this layout to review the organization of your slide show and prepare to deliver your presentation.

To view an outline:

1. From the **View** tab, click the **Outline View** command.




2. An **outline** of your slide text will appear in the slide navigation pane.
3. You can type directly in the outline to make changes to your slide text.



3.3 Slide notes

You can add **notes** to your slides from the **Notes** pane. Often called **speaker notes**, they can help you deliver or prepare for your presentation.

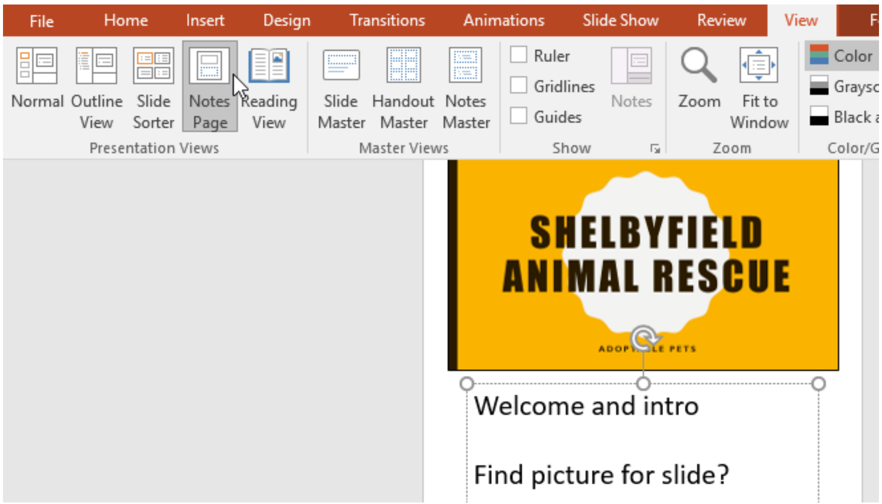
To add notes:

1. Click the **Notes** command at the bottom of the screen to open the **Notes** pane.


2. Click and drag the **edge** of the pane to **resize** it if desired.


3. Click the **Notes** pane, and begin typing to add notes.


You can also access **Notes Page view** to edit and review your notes. Just click the **Notes Page** command from the **View** tab. From there, you can type notes in the **text box** below each slide.



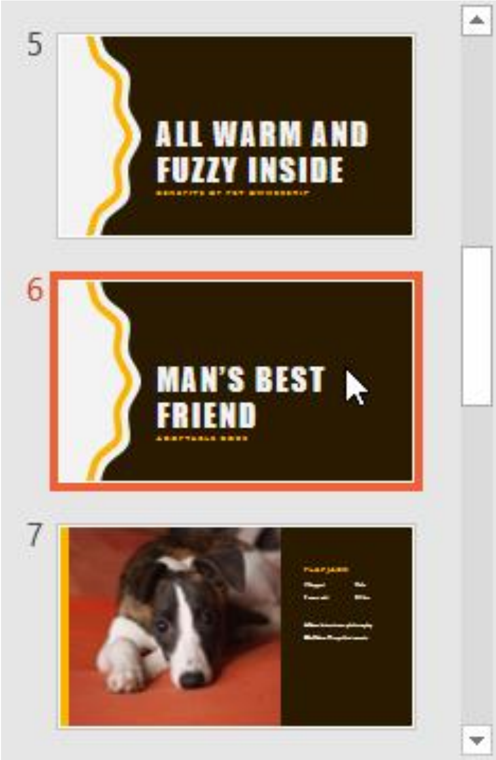

## 3.4 Slide sections

If you have a lot of slides, you can organize them into **sections** to make your presentation easier to navigate. Sections can be collapsed or expanded in the Slide Navigation pane and named for easy reference.

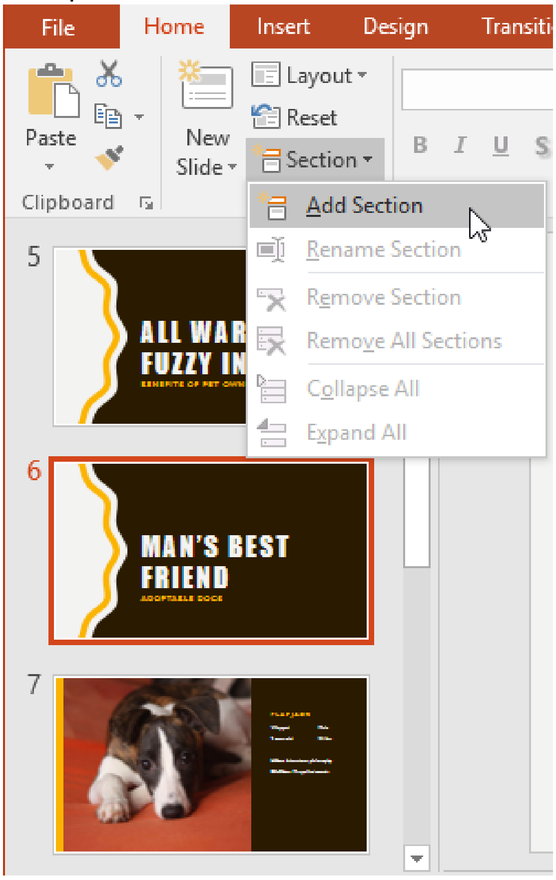
To create slide sections:

In our example, we will add two sections: one for dogs that are available for adoption, and another for cats and other pets.

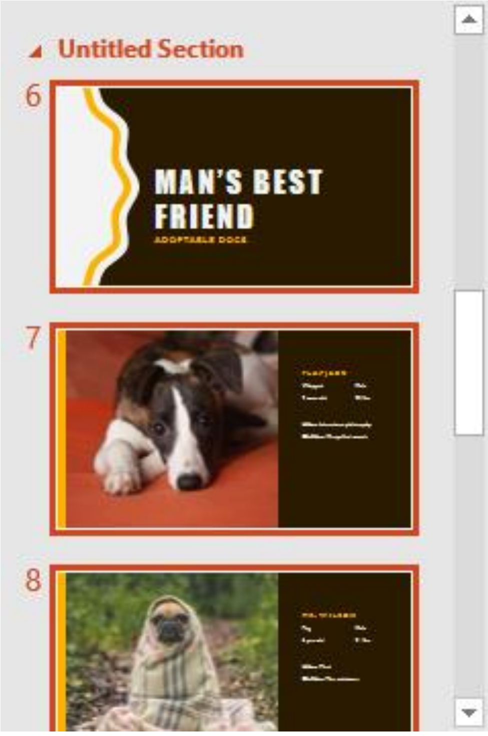
1. Select the **slide** you want to begin a section.



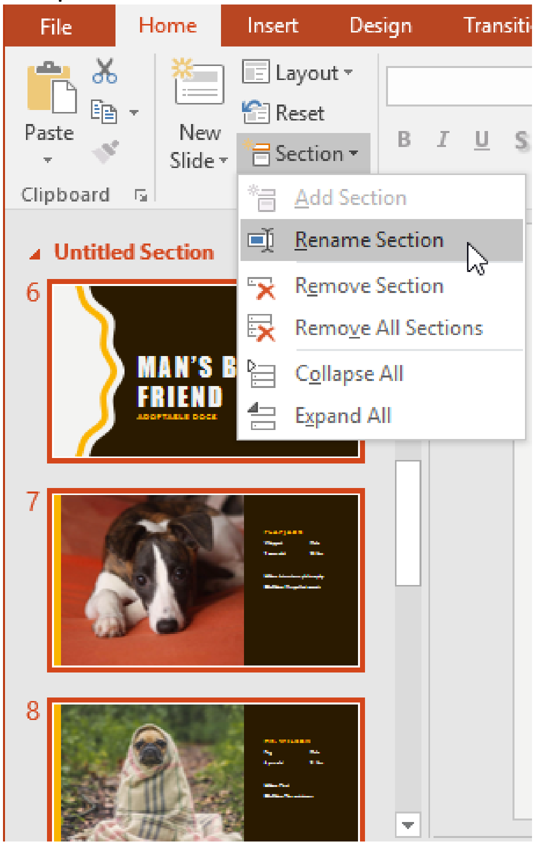

2. From the **Home** tab, click the **Section** command, then choose **Add Section** from the drop-down menu.



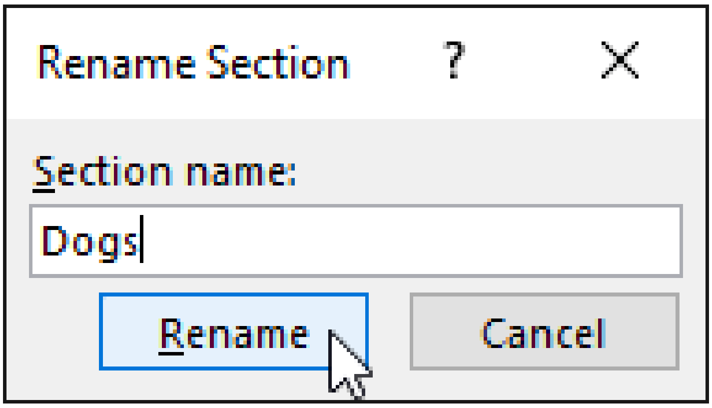

3. An **Untitled Section** will appear in the Slide Navigation pane.




4. To **rename** the section, click the **Section** command, then choose **Rename Section** from the drop-down menu.

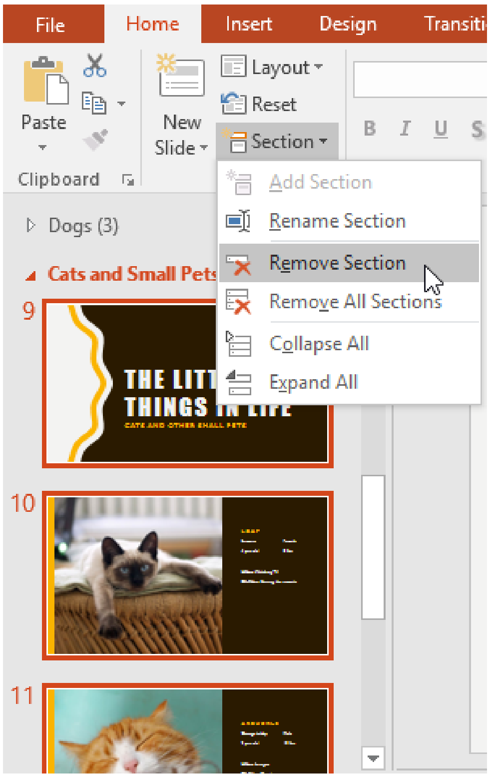



5. Type the new section name in the dialog box, then click **Rename**.




6. Repeat to add as many sections as you need.
7. In the Slide Navigation pane, click the **arrow** next to a section name to **collapse** or **expand** it.


To **remove** a section, click the **Section** command, then click **Remove Section**. You can also click **Remove All Sections** to remove all sections from your slides.

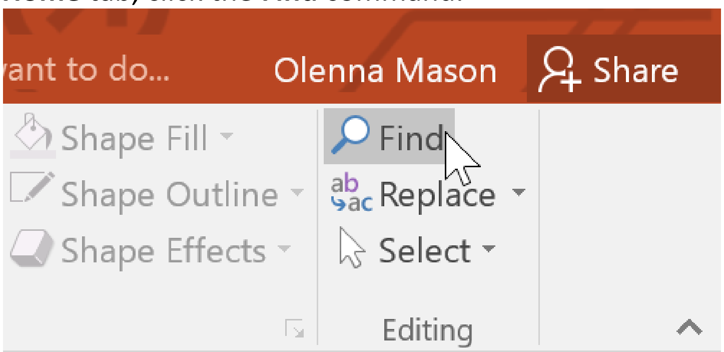



## 3.5 Using Find & Replace

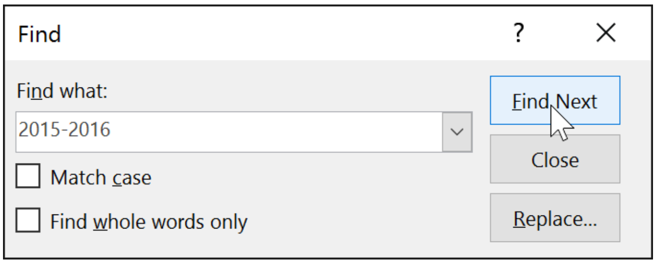
When you're working with longer presentations, it can be difficult and time consuming to locate a specific word or phrase. PowerPoint can automatically search your presentation using the Find feature, and it allows you to quickly change words or phrases using the Replace feature.

To find text:

1. From the **Home** tab, click the **Find** command.




2. A dialog box will appear. Enter the **text** you want to find in the **Find what:** field, then click **Find Next**.



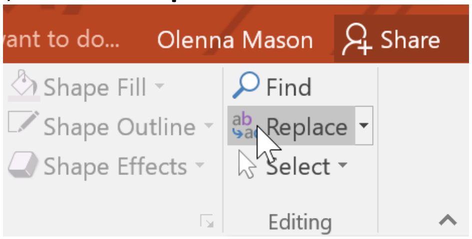
3. If the text is found, it will be selected.


You can also access the Find command by pressing **Ctrl+F** on your keyboard.

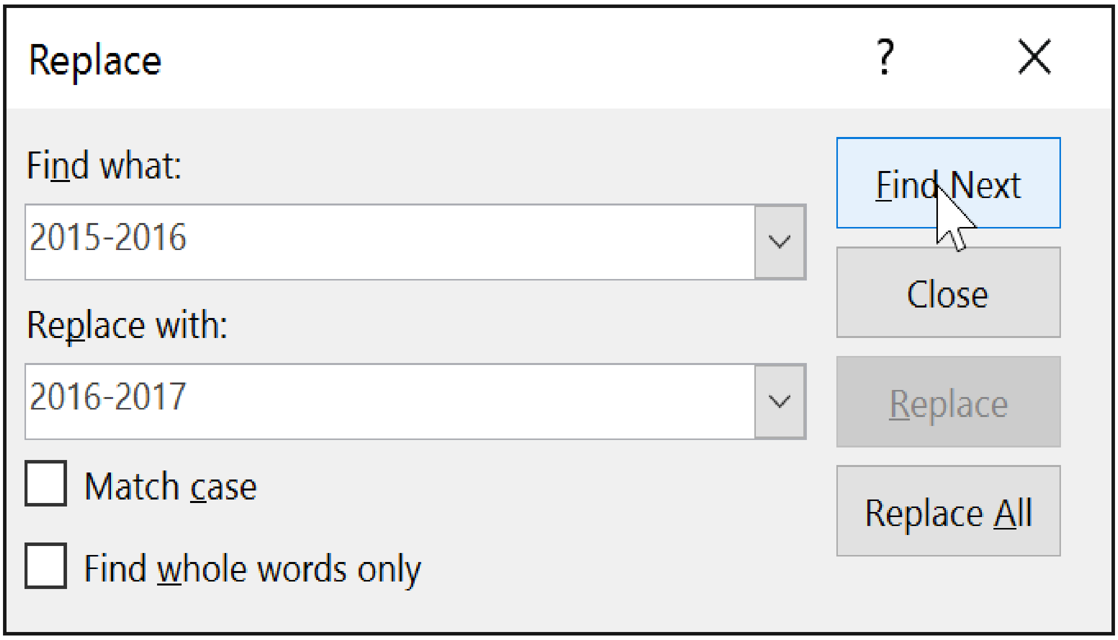
3.6 To replace text:

At times, you may discover that you've repeatedly made a mistake throughout your presentation—such as misspelling someone's name—or that you need to exchange a particular word or phrase for another. You can use the **Replace** feature to make quick revisions.

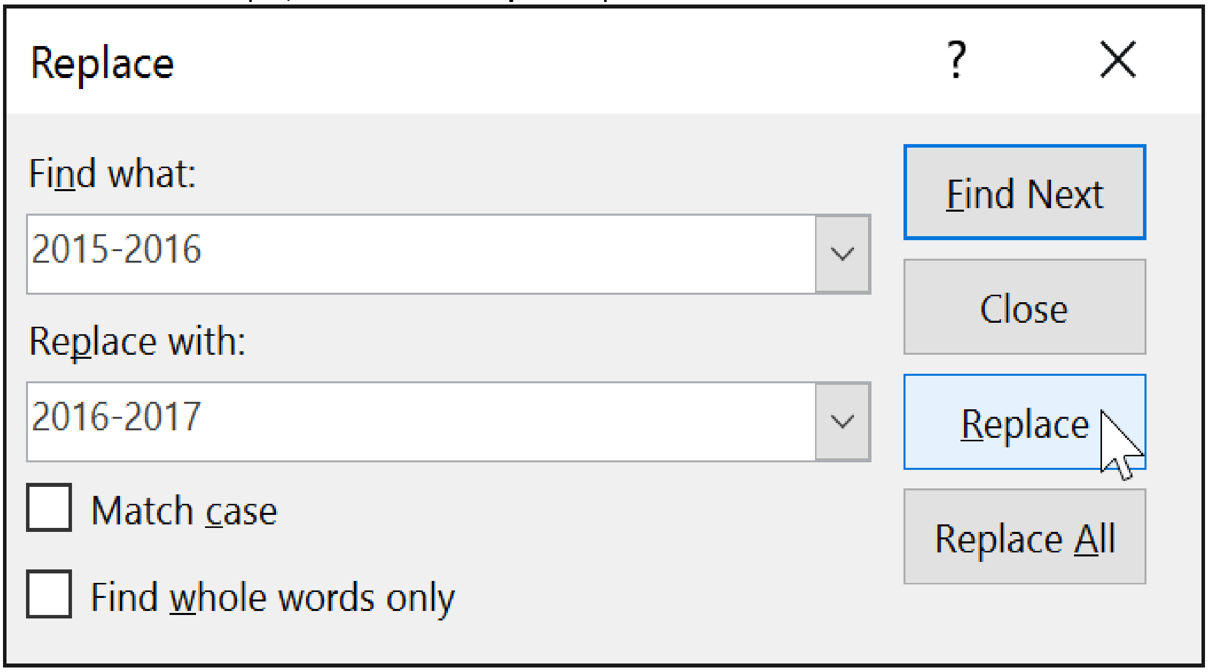
1. From the **Home** tab, click the **Replace** command.




2. A dialog box will appear. Type the text you want to find in the **Find what:** field.
3. Type the text you want to replace it with in the **Replace with**: field, then click **Find Next**.




4. If the text is found, it will be selected. Review the text to make sure you want to replace it.
5. If you want to replace it, select one of the **replace** options. **Replace** will replace individual instances, and **Replace All** will replace every instance. In our example, we'll use the **Replace** option.




6. The selected text will be **replaced**.


7. PowerPoint will move to the next instance of the text in the presentation. When you are finished replacing text, click **Close** to exit the dialog box.

When it comes to using **Replace All**, it's important to remember that it could find matches you didn't anticipate and might not actually want to change. Only use this option if you're absolutely sure it won't replace anything you didn't intend it to.

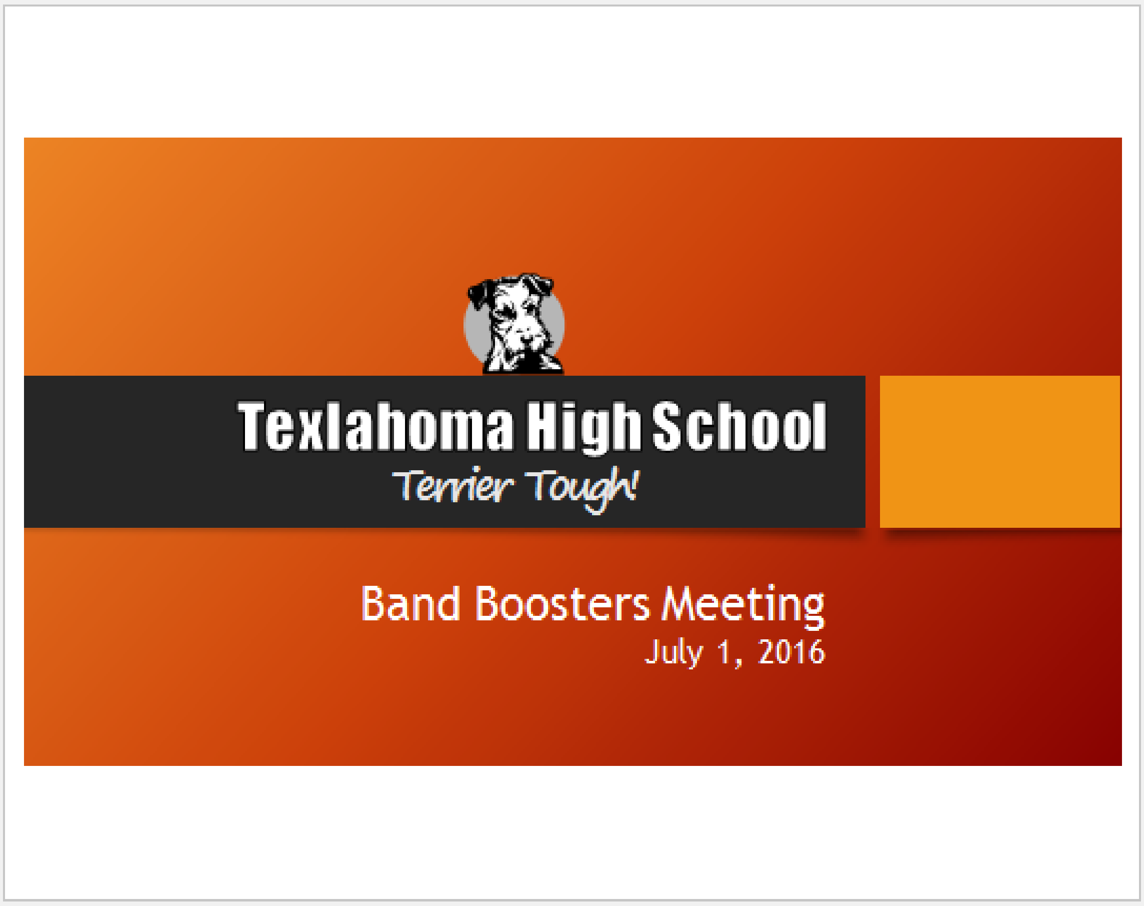
## Lesson 4: Printing

Even though PowerPoint presentations are designed to be viewed on a computer, there may be times when you want to print them. You can even print custom versions of a presentation, which can be especially helpful when presenting your slide show. The Print pane makes it easy to preview and print your presentation.

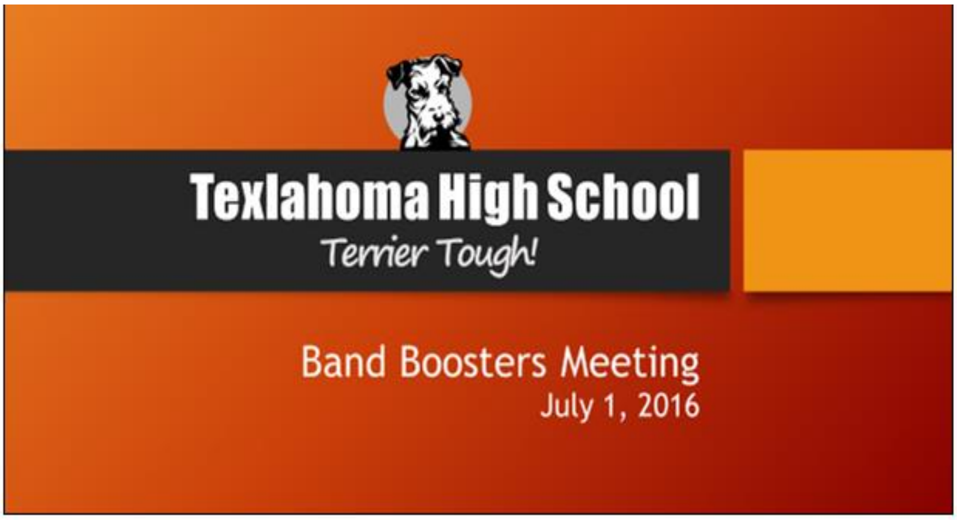
### 4.1 Print layouts

PowerPoint offers several **layouts** to choose from when printing a presentation. The layout you choose will mostly depend on **why** you're printing the slide show. There are four types of print layouts.

- **Full Page Slides:** This prints a full page for **each slide** in your presentation. This layout is most useful if you need to **review** or **edit** a printed copy of your presentation.




- **Notes Pages:** This prints each slide, along with any **speaker notes** for the slide. If you've included a lot of notes for each slide, you could keep a printed copy of the notes with you while presenting.




Meeting goals:

- Thanks previous year's officers
- Introduce new officers
- Discuss yearly fundraising goals
- Plan for next meeting

Leslie will be in the Terry the Terrier costume to help pump up the crowd!

- **Outline:** This prints an overall **outline** of the slide show. You could use this to review the organization of your slide show and prepare to deliver your presentation.

1

Band Boosters Meeting
July 1, 2016

2 **Agenda**

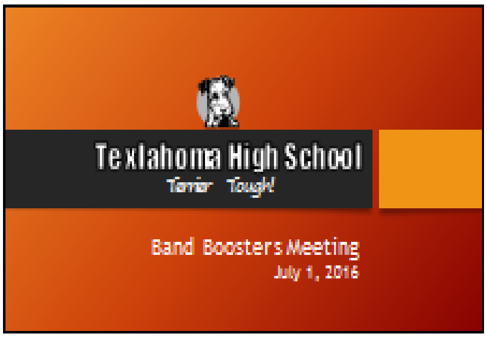
- New Officers
  - Elections and Thank You
  - Announce New Officers
  - Distribute Officer Contact Info
- Fundraising
  - Past and Present Ideas
  - Review Yearly Results

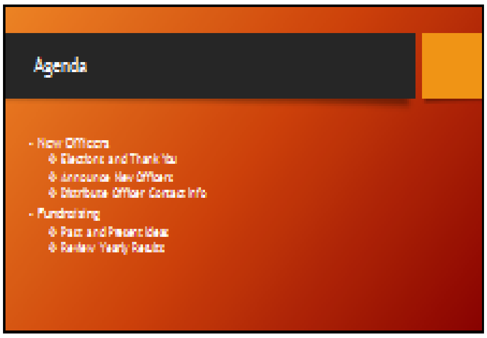
3 **New Officer Announcement**

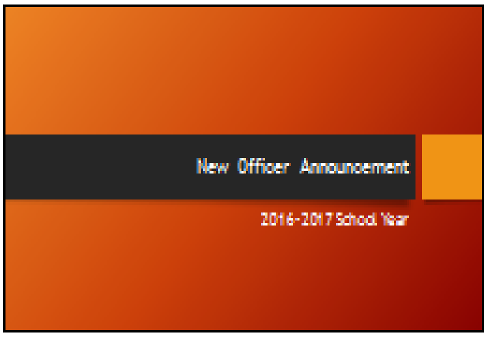
2016-2017 School Year

4 **Elections and Appreciation**

- **Handouts:** This prints **thumbnail versions** of each slide, with optional space for **notes**. This layout is especially useful if you want to give your audience a **physical copy** of the presentation. The optional space allows them to **take notes** on each slide.

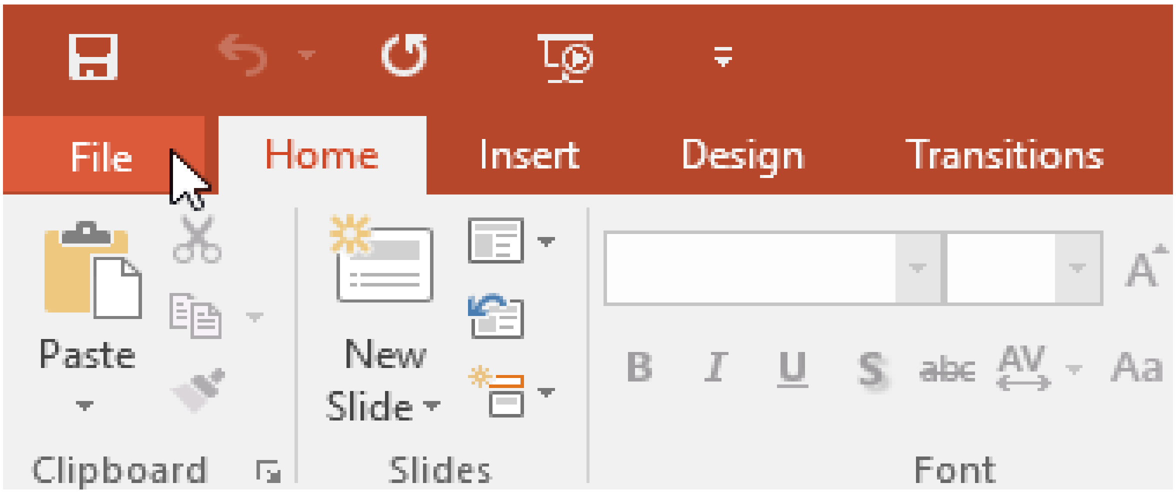


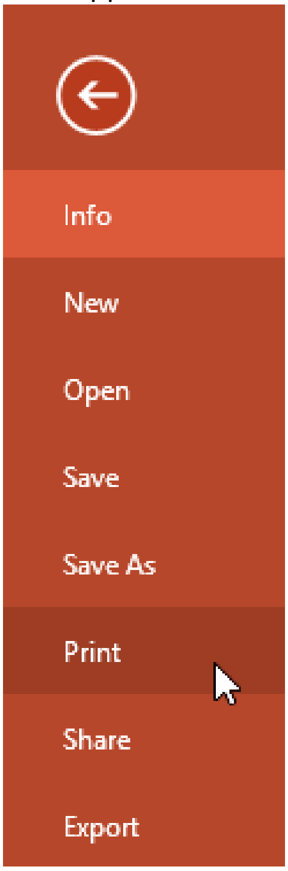




4.2 To access the Print pane:

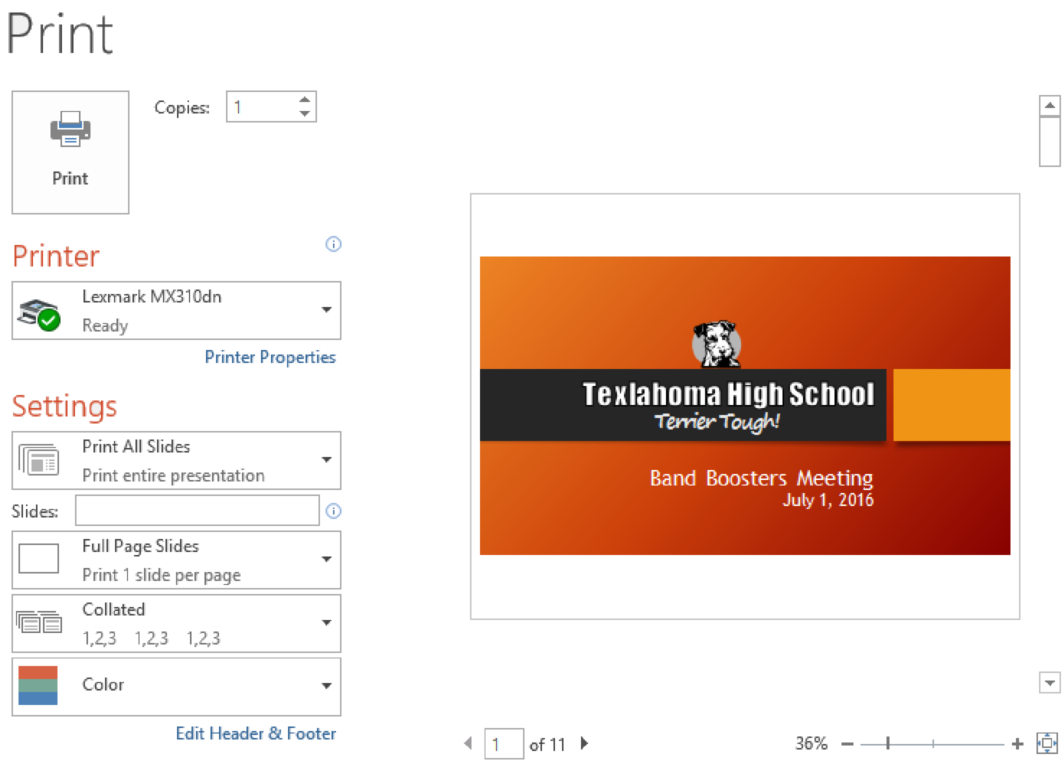
1. Select the **File** tab. **backstage view** will appear.




2. Select **Print**. The **Print** pane will appear.



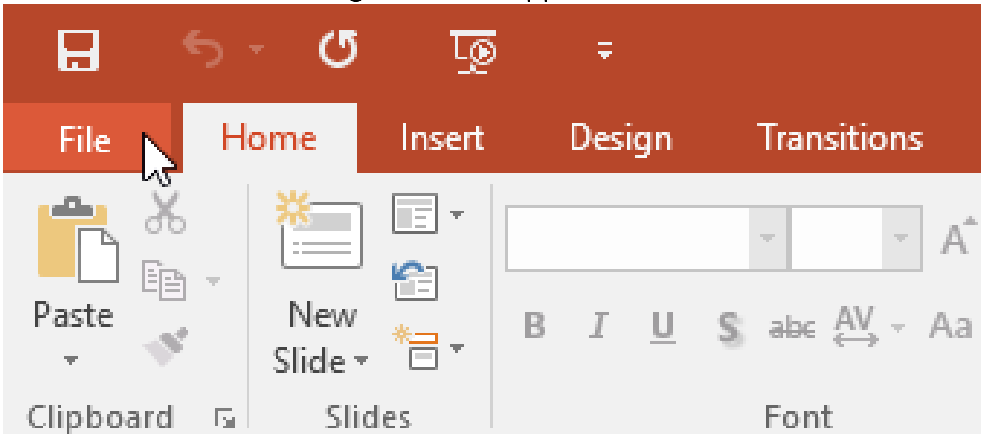

Click the buttons in the interactive below to learn more about using the Print pane.




You can also access the Print pane by pressing **Ctrl+P** on your keyboard.

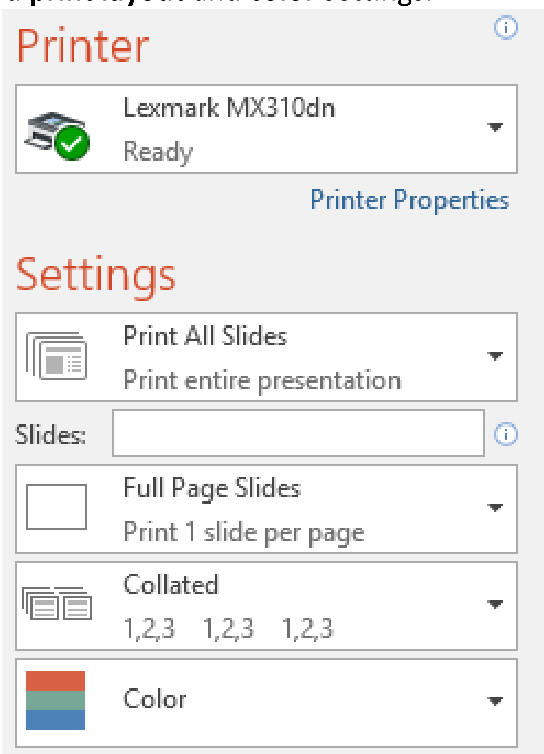
4.3 To print a presentation:

1. Select the **File** tab. **backstage view** will appear.

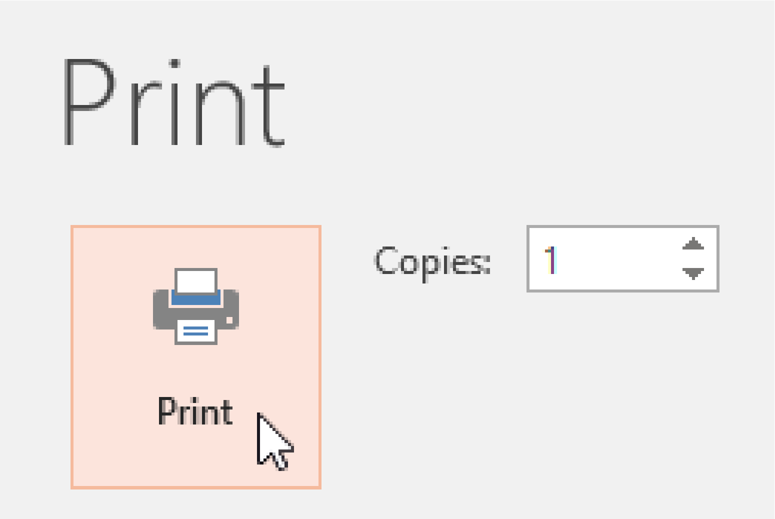



2. Select **Print**. The **Print pane** will appear.


3. Choose the desired **printer** and **print range**.
4. Chose the desired **print layout** and **color** settings.




5. When you're done modifying the settings, click **Print**.




## Lesson 5: Presenting Your Slide Show

Once your slide show is complete, you'll need to learn how to present it to an audience. PowerPoint offers several tools and features to help make your presentation smooth, engaging, and professional.

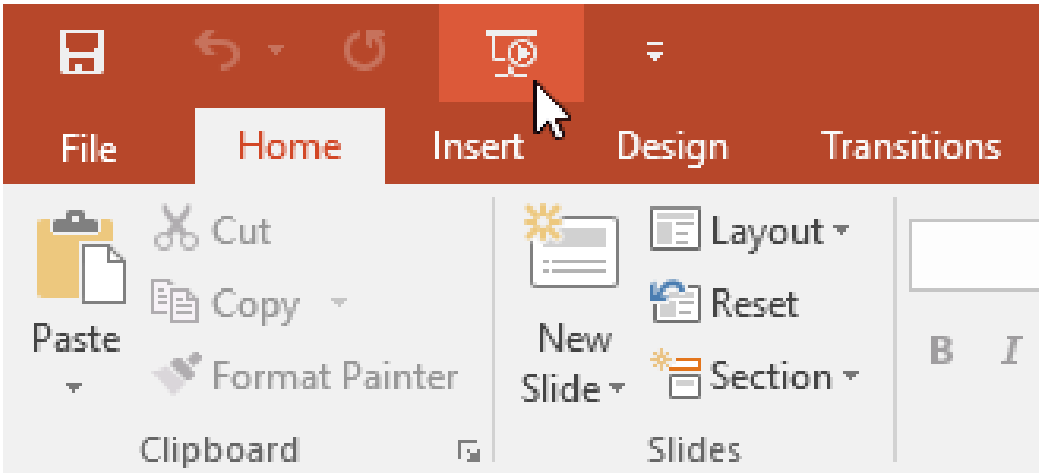
### 5.1 Presenting a slide show

Before you present your slide show, you'll need to think about the type of **equipment** that will be available for your presentation. Many presenters use **projectors** during presentations, so you might want to consider using one as well. This allows you to control and preview slides on one monitor while presenting them to an audience on another screen.

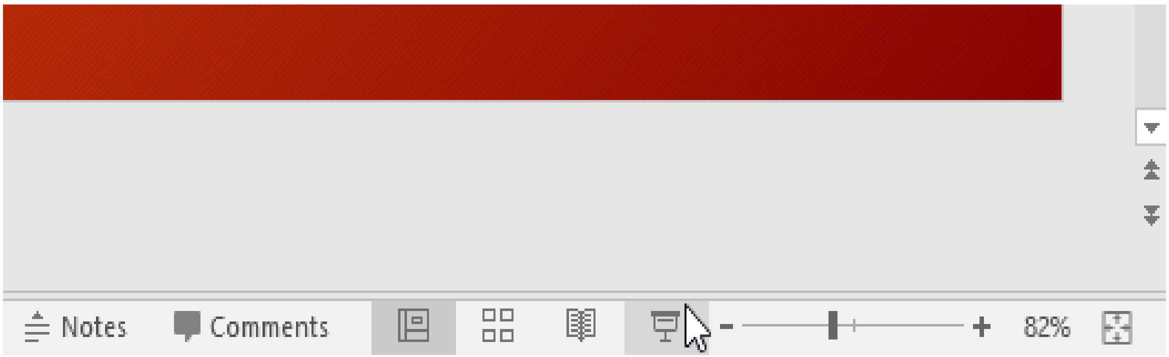
To start a slide show:

There are several ways you can begin your presentation:

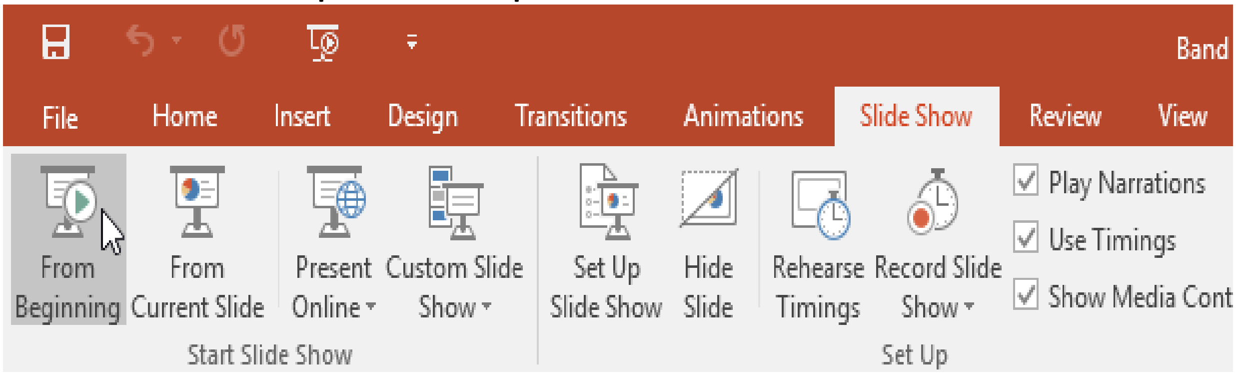
- Click the **Start from beginning** command on the Quick Access Toolbar, or press the **F5** key at the top of your keyboard. The presentation will appear in full-screen mode.




- Select the **Slide Show view** command at the bottom of the PowerPoint window to begin a presentation from the current slide.



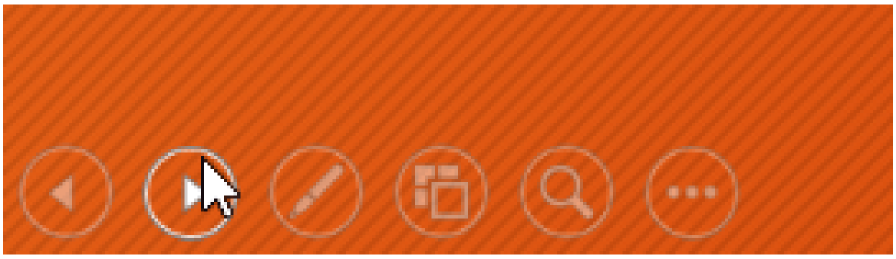

- Go to the **Slide Show** tab on the Ribbon to access even more options. From here, you can start the presentation **from the current slide** and access **advanced presentation options**.




## 5.2 To advance and reverse slides:

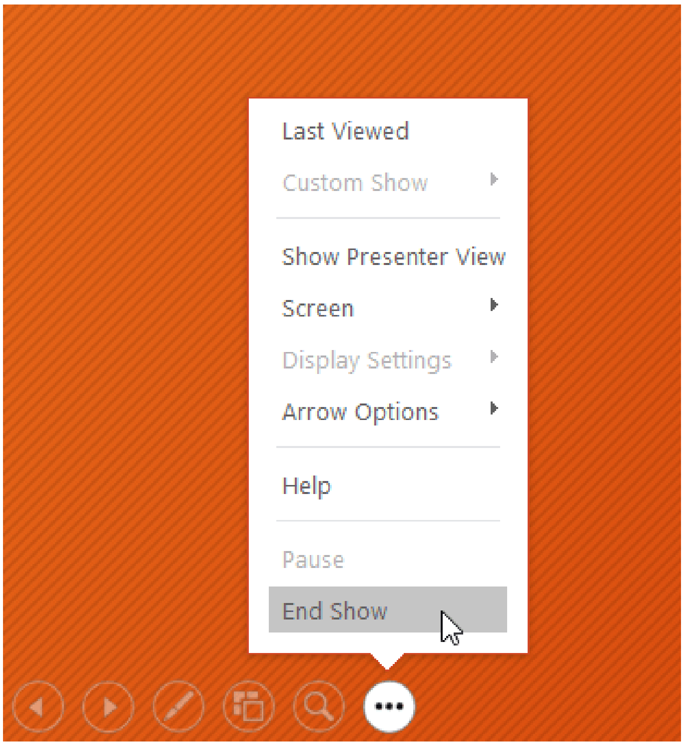
You can advance to the next slide by **clicking your mouse** or pressing the **spacebar** on your keyboard. Alternatively, you can use or **arrow keys** on your keyboard to move forward or backward through the presentation.

You can also hover your mouse over the bottom-left and click the **arrows** to move forward or backward.

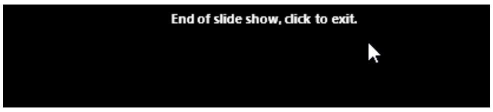


To stop a slide show:

You can exit presentation mode by pressing the **Esc** key on your keyboard. Alternatively, you can click the **Slide Show Options** button in the bottom-left and select **End Show**.




The presentation will also end after the **last slide**. You can click the mouse or press the spacebar to return to Normal view.



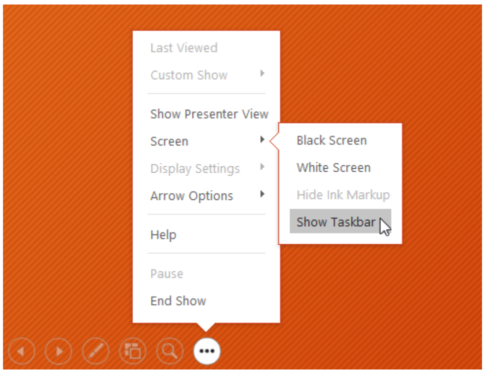

## Lesson 6: Presentation tools and features

PowerPoint provides convenient tools you can use while presenting your slide show. For example, you can change your mouse pointer to a **pen** or **highlighter** to draw attention to items in your slides. In addition, you can **jump around** to slides in your presentation or access other programs from your **taskbar** if needed.

### 6.1 To show the taskbar

Sometimes you may need to access the Internet or other files and programs on your computer during your presentation. PowerPoint allows you to access your **taskbar** without ending the presentation.

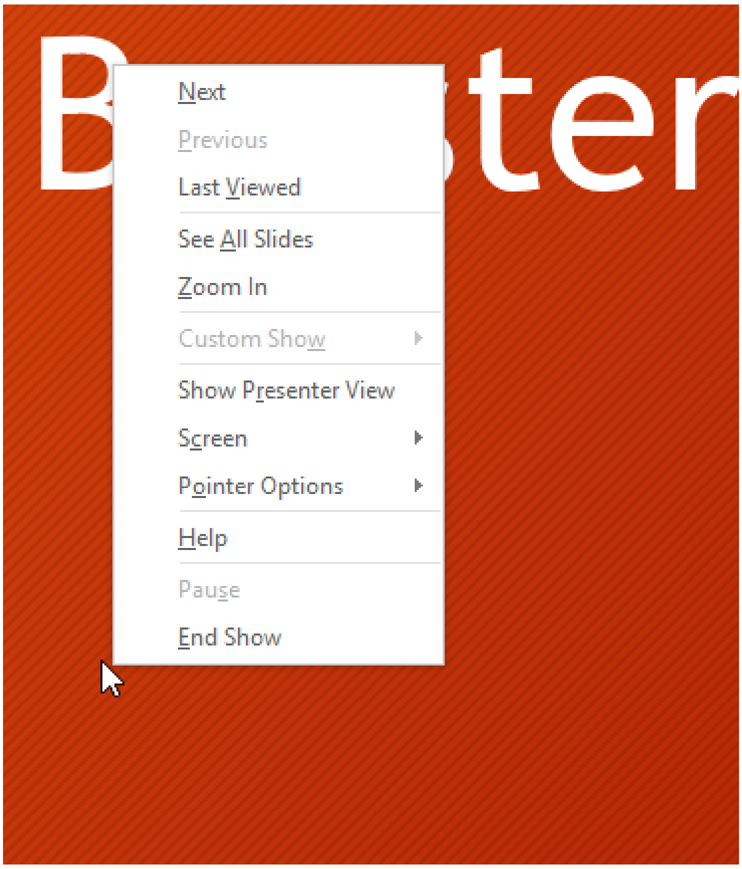
1. Locate and select the **Slide Options button** in the bottom-left corner.
2. Select **Screen**, then click **Show Taskbar**.



3. Your **taskbar** will appear. Choose a program you want to open, such as a web browser. When you're done, close the window or click the PowerPoint icon on the taskbar to return to the presentation.


## 6.2 Slide options

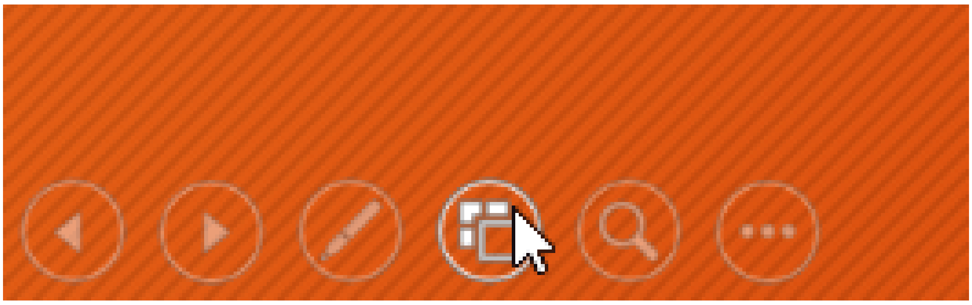
You can also access any of the menu items above by **right-clicking** anywhere on the screen during your slide show.



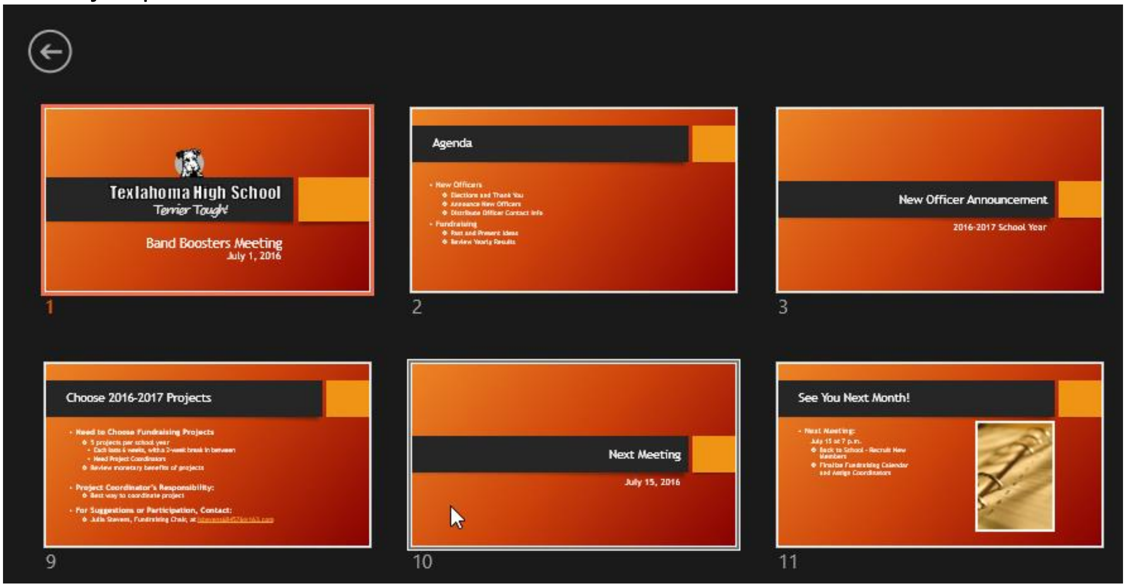

## 6.3 To skip to a nonadjacent slide

You can jump to slides **out of order** if needed.

1. Locate and select the **See All Slides** button in the bottom-left corner.



2. **Thumbnail versions** of each slide will appear. Select the slide you want to jump to.

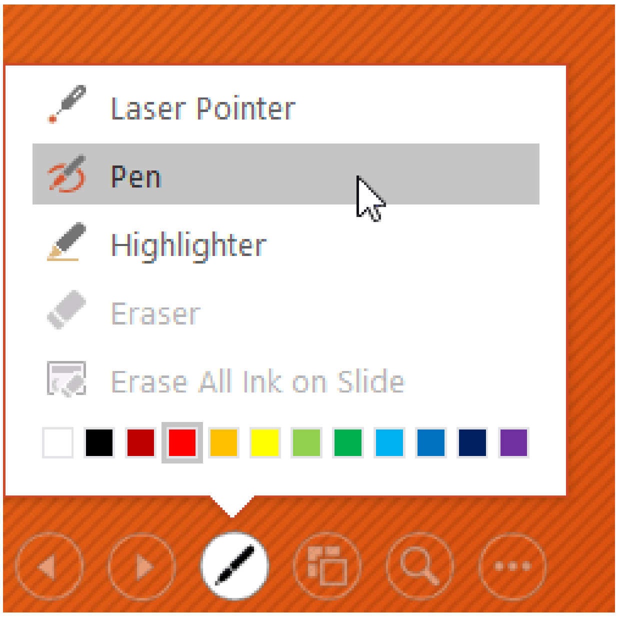



3. The selected slide will appear.

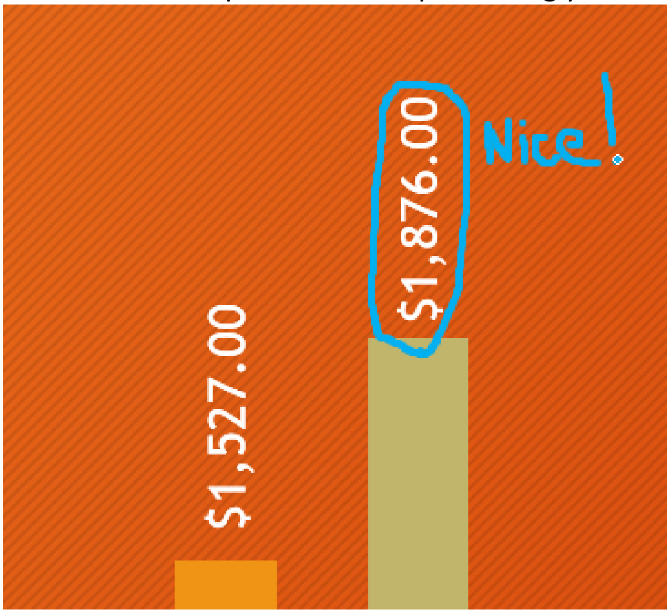
## 6.4 To access drawing tools:

Your mouse pointer can act as **pen** or **highlighter** to draw attention to items in your slides.

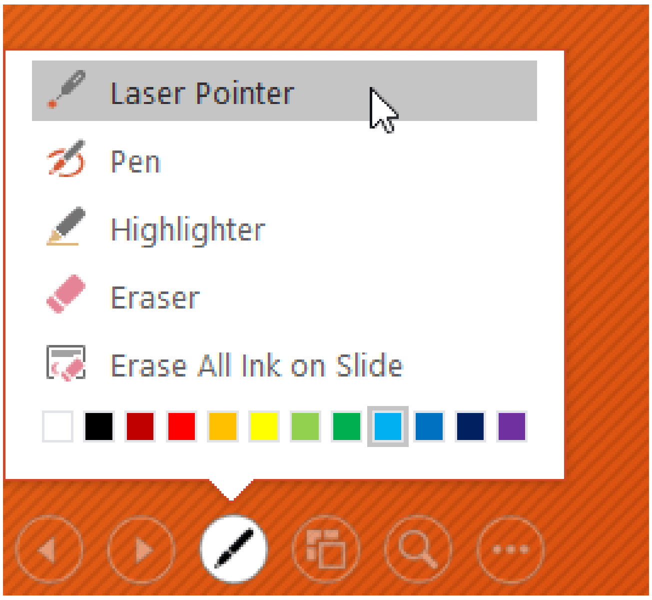
1. Locate and select the **Pen Tools** button in the bottom-left corner.
2. Select **Pen** or **Highlighter** based on your preference. You can also choose a different **color** from the menu.




3. Click and drag the mouse to **mark** your slides. You can also press **Ctrl+P** on your keyboard to access the pen tool while presenting your slide show.

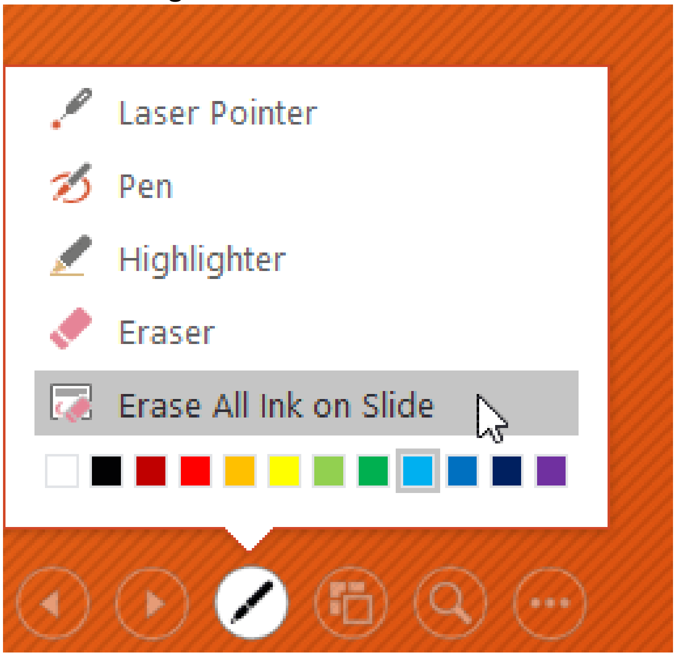



You can also use the **laser pointer** feature to draw attention to certain parts of your slide. Unlike the pen and highlighter, the laser pointer will not leave markings on your slides. To use the laser pointer, select it from Pen Tools, or press and hold the **Ctrl** key and the left mouse button.

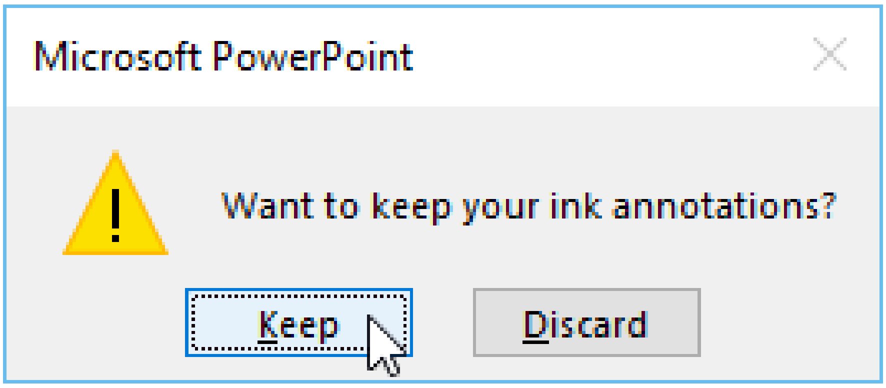



## 6.5 To erase ink markings:

1. Locate and select the **Pen Tools** button in the bottom-left corner.
2. Select **Eraser** to erase individual ink markings, or select **Erase All Ink on Slide** to erase all markings.




When you end a slide show, you'll also have the option to **Keep** or **Discard** any ink annotations made during your presentation. If you keep ink markings, they'll appear as **objects** on your slides in Normal view.

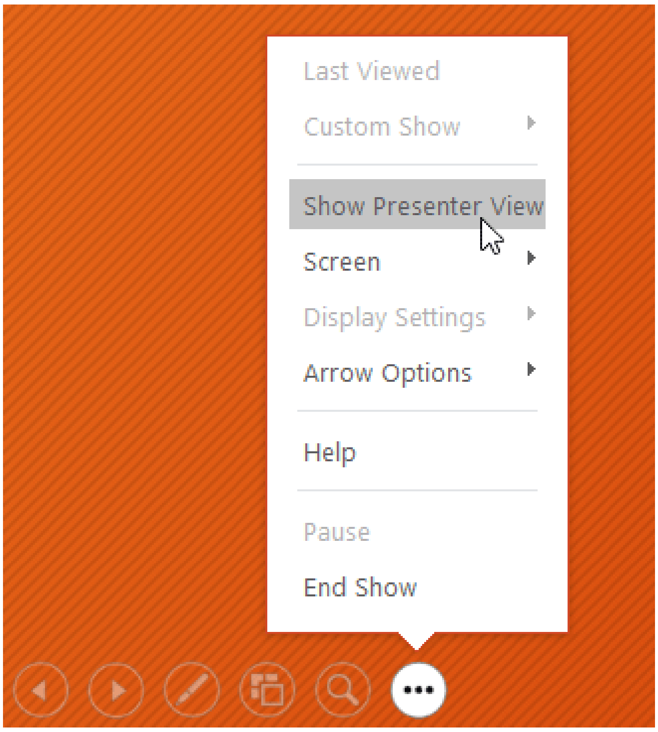



## 6.6 Presenter view

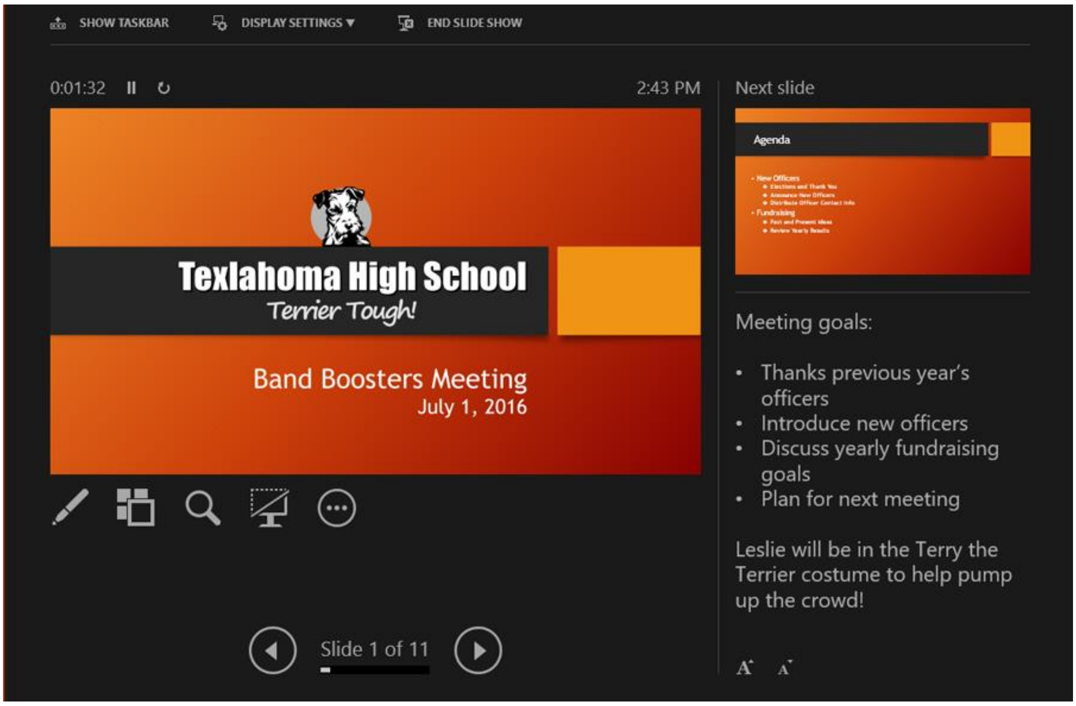
If you're presenting your slide show with a second display—like a projector—you can use **Presenter view**. Presenter view gives you access to a special set of controls on your screen that the audience won't see, allowing you to easily reference **slide notes**, preview the **upcoming slide**, and much more.

To access Presenter view:

Start your slide show as you normally would, then click the **Slide Options** button and select **Presenter View**. Alternatively, you can press **Alt+F5** on your keyboard to start the slide show in Presenter view.




Click the buttons in the interactive below to learn more about using Presenter view.

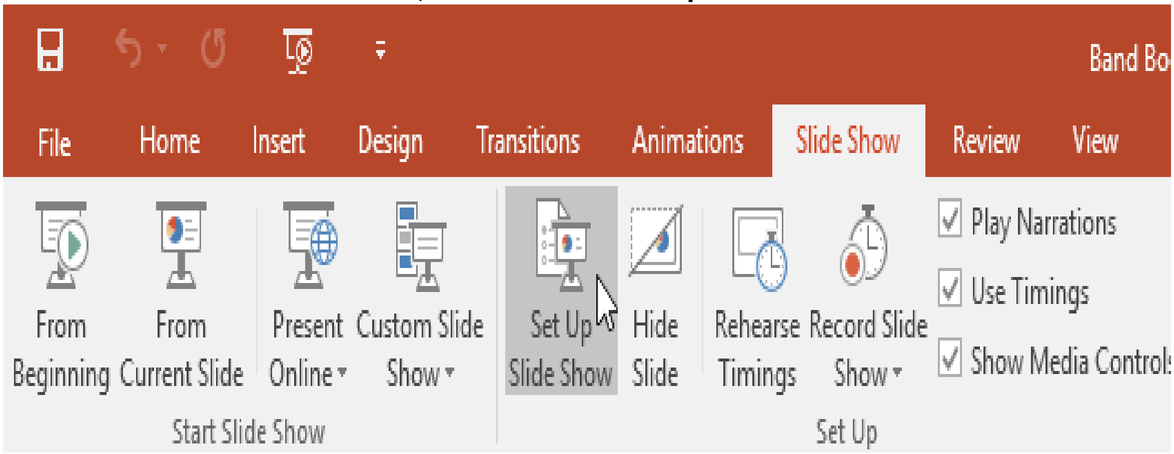



## Lesson 7: Slide show setup options

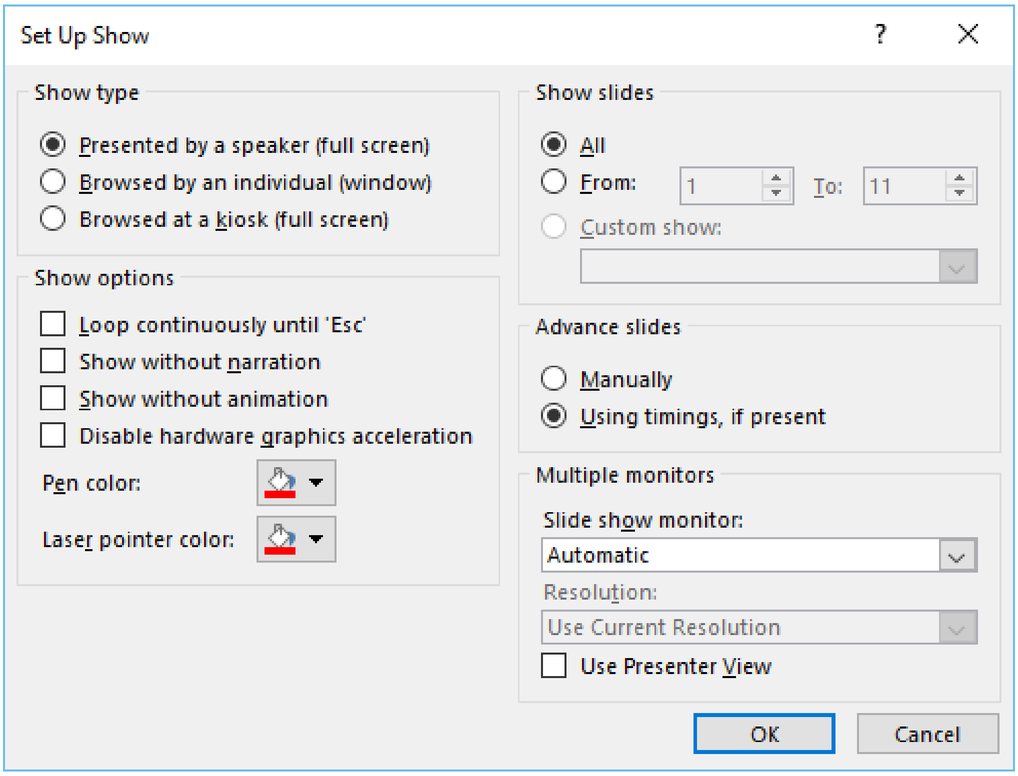
PowerPoint has various options for setting up and playing a slide show. For example, you can set up an unattended presentation that can be displayed at a kiosk and make your slide show repeat with continuous looping.

### 7.1 To access slide show setup options:

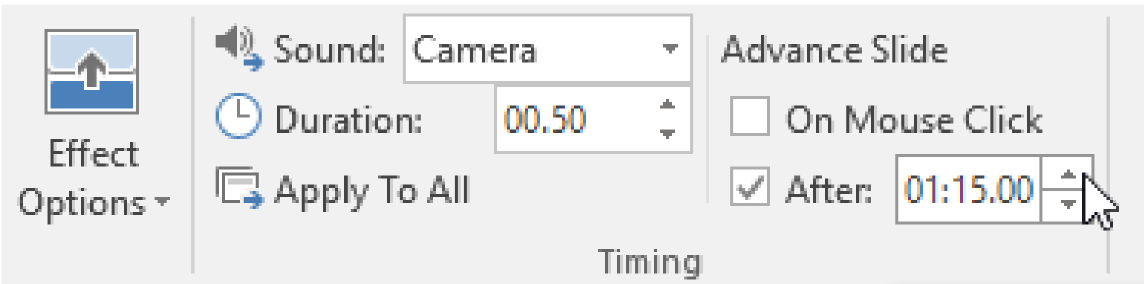
1. Select the **Slide Show** tab, then click the **Set Up Slide Show** command.




2. The **Set Up Show** dialog box will appear. From here, you can select the desired options for your presentation.




To advance slides automatically, you'll need to customize the slide timing on the **Transitions** tab. Review our lesson on Applying Transitions to learn how.



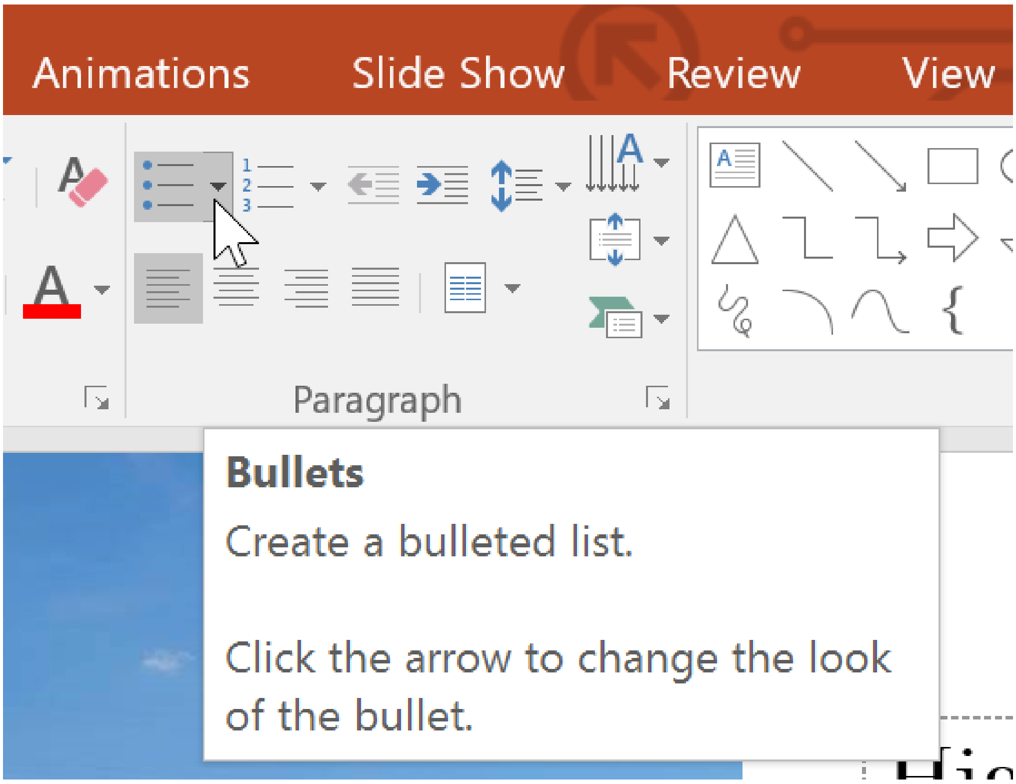

## Lesson 8: Text and Objects

8.1 Lists

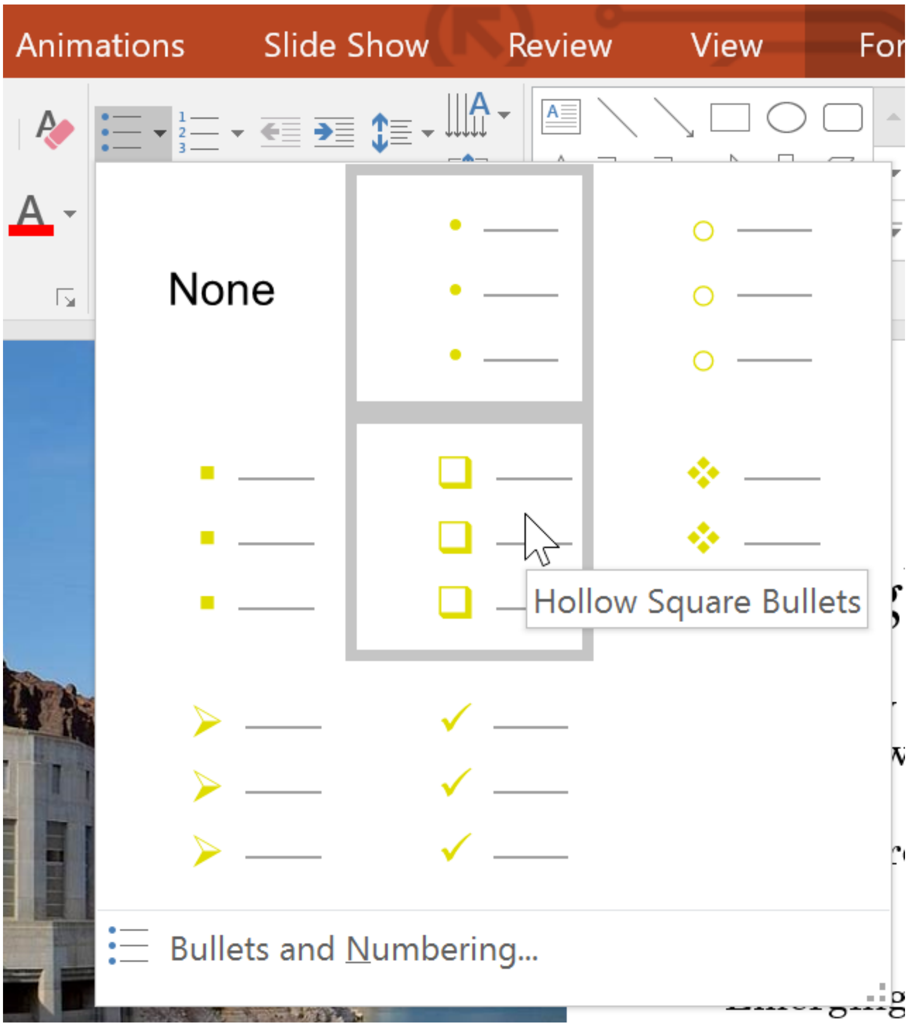
To create effective PowerPoint presentations, it's important to make your slides easy for the audience to read. One of the most common ways of doing this is to format the text as a bulleted or numbered list. By default, when you type text into a placeholder, a bullet is placed at the beginning of each paragraph—automatically creating a bulleted list. If you want, you can modify a list by choosing a different bullet style or by switching to a numbered list.

8.2 To modify the bullet style:

1. Select an existing list you want to format.
2. On the **Home** tab, click the **Bullets** drop-down arrow.



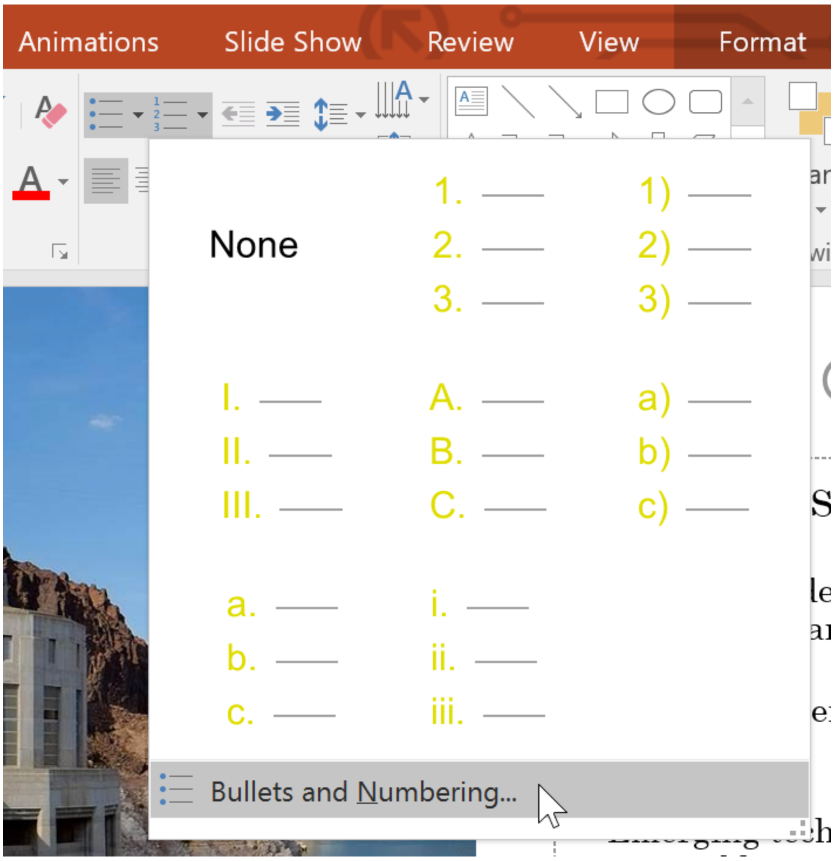

3. Select the desired **bullet style** from the menu that appears.



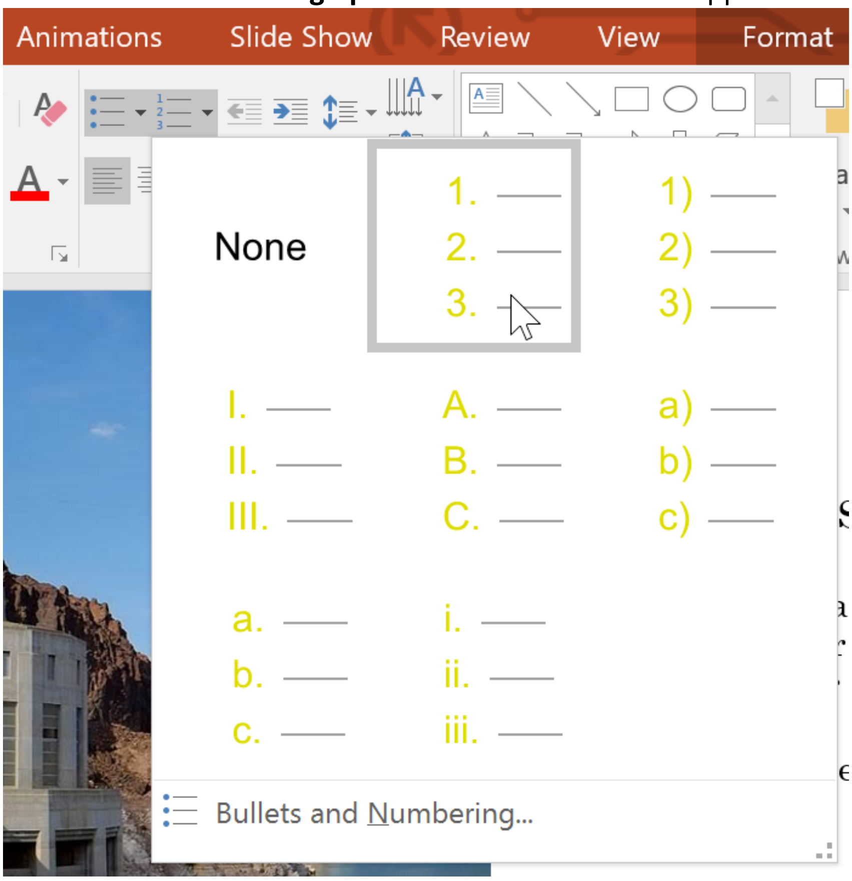

4. The bullet style will appear in the list.

## 8.3 To modify a numbered list:

1. Select an existing list you want to format.
2. On the **Home** tab, click the **Numbering** drop-down arrow.




3. Select the desired **numbering option** from the menu that appears.

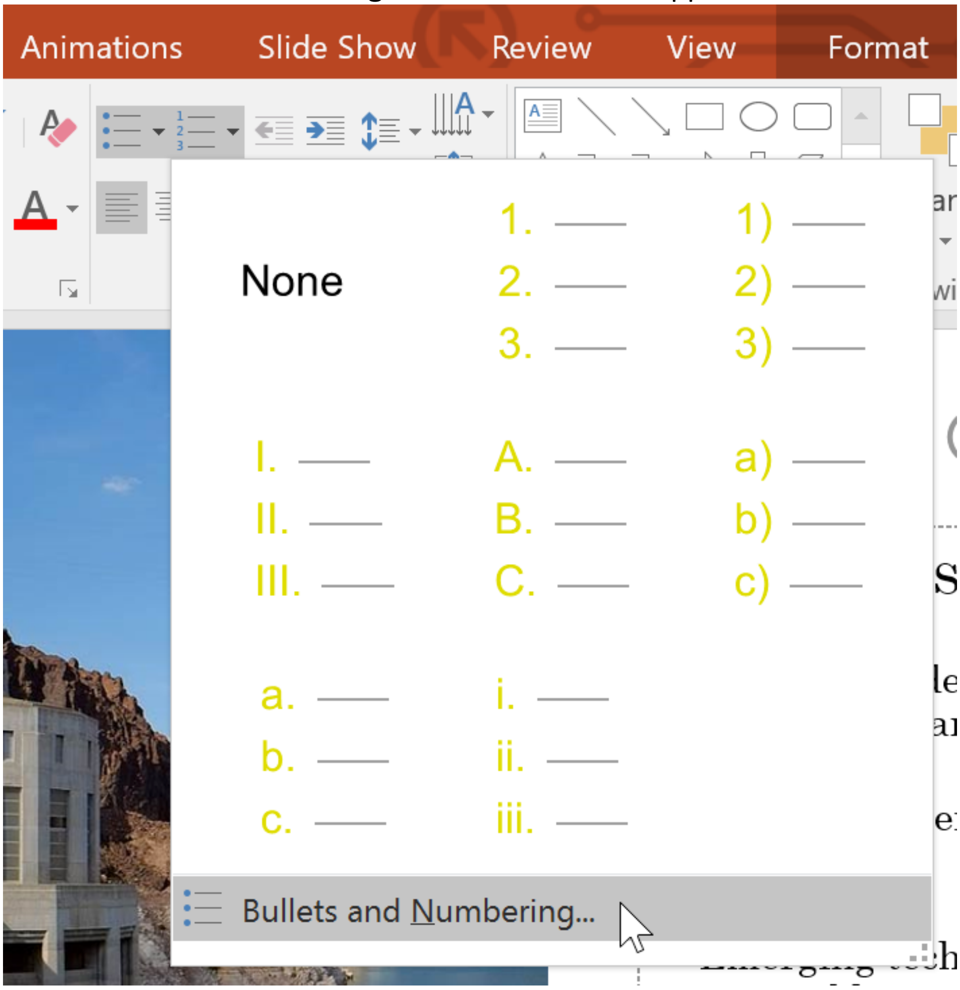



4. The numbering style will appear in the list.

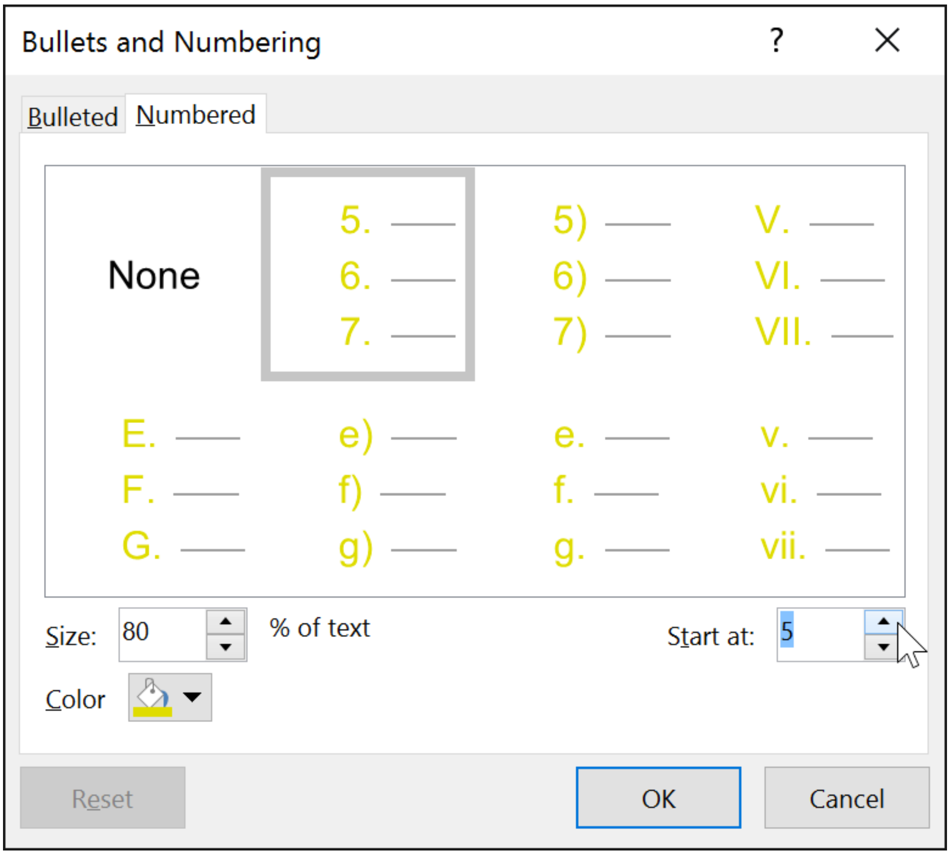
## 8.4 To change the starting number:

By default, numbered lists count from the number 1. However, sometimes you may want to start counting from a different number, like if the list is a continuation from a previous slide.

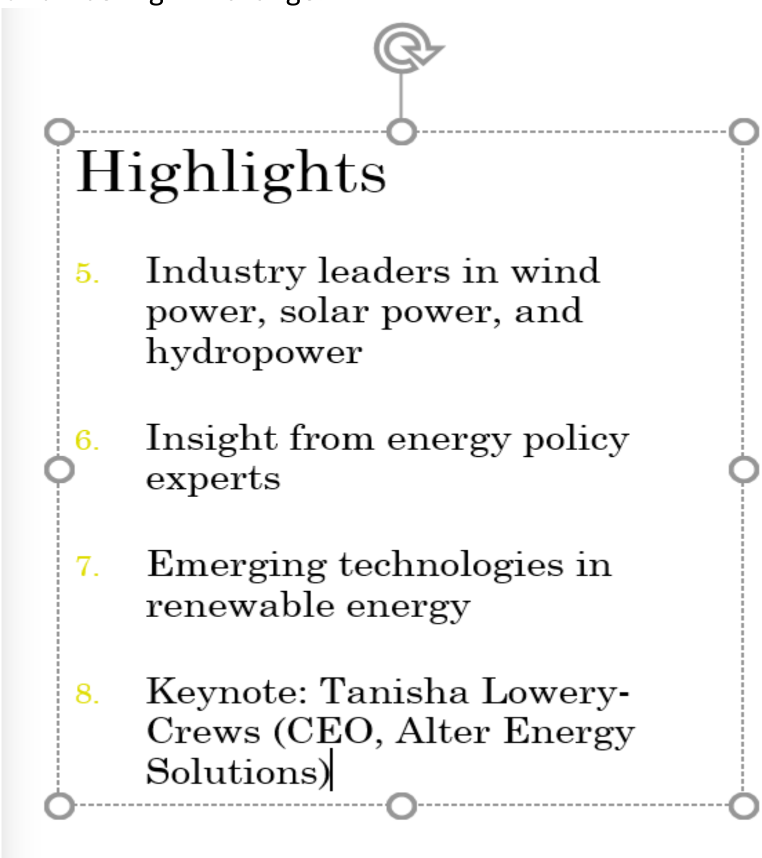
1. Select an existing numbered list.
2. On the **Home** tab, click the **Numbering** drop-down arrow.
3. Select **Bullets and Numbering** from the menu that appears.




4. A dialog box will appear. In the **Start At** field, enter the desired starting number.




5. The list numbering will change.

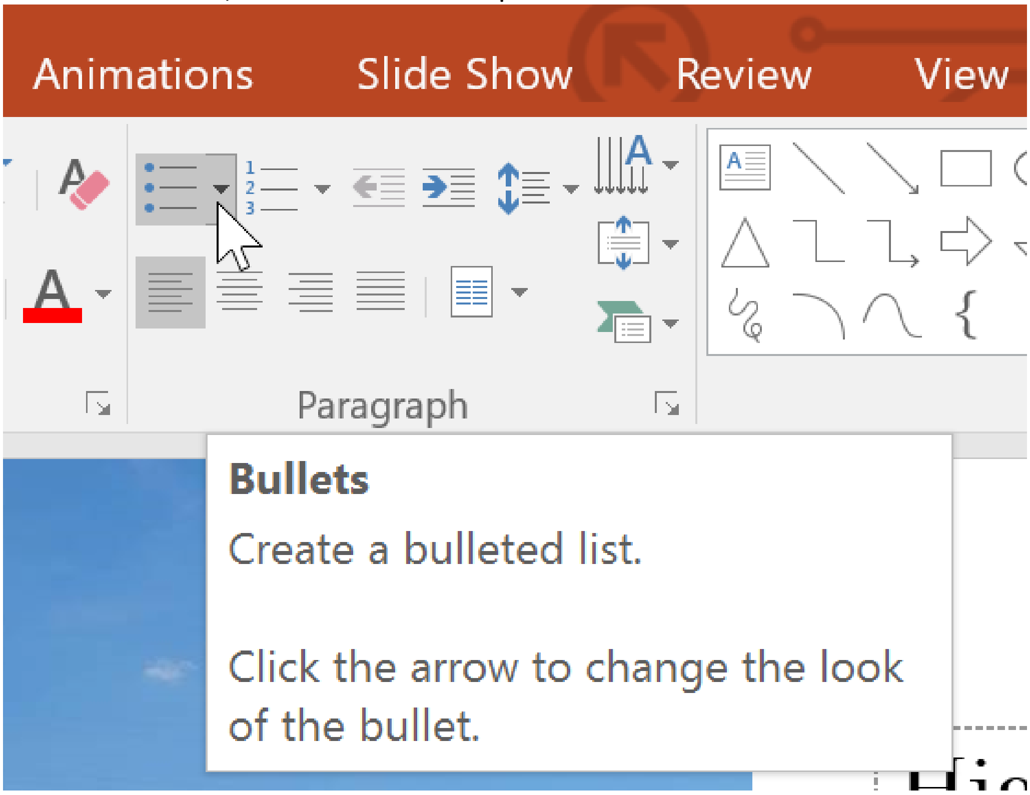


## 8.5 Modifying the list's appearance

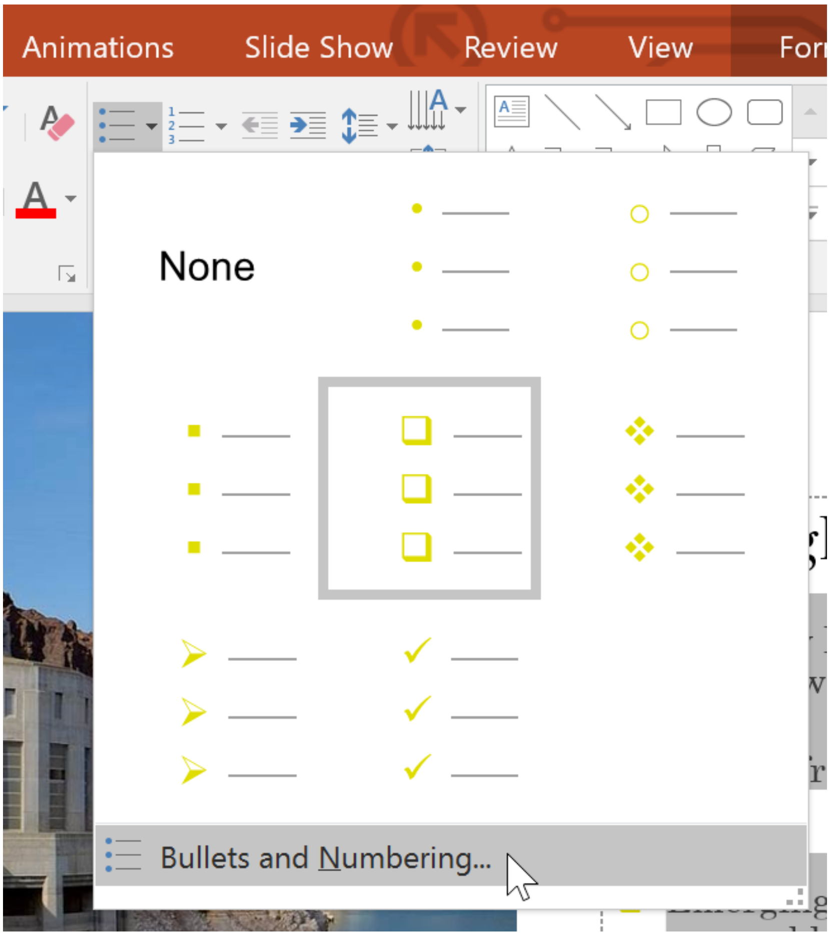
Whether you're using a bulleted or numbered list, you may want to change its appearance by adjusting the size and color of the bullets or numbers. This can make your list stand out and match the appearance of your presentation.

To modify the size and color:

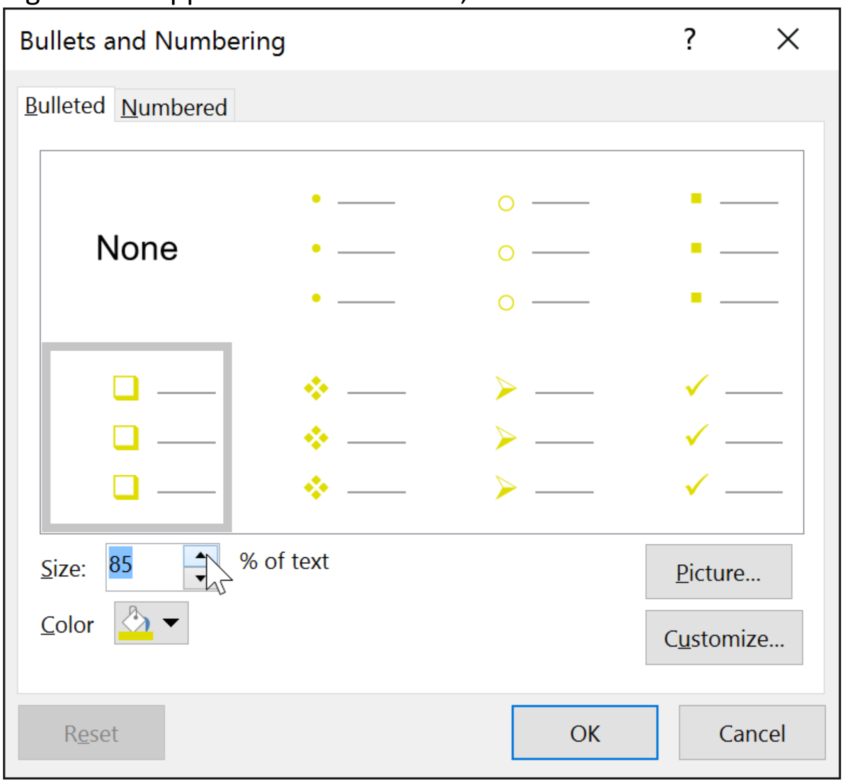
1. Select an existing bulleted list.
2. On the **Home** tab, click the **Bullets** drop-down arrow.



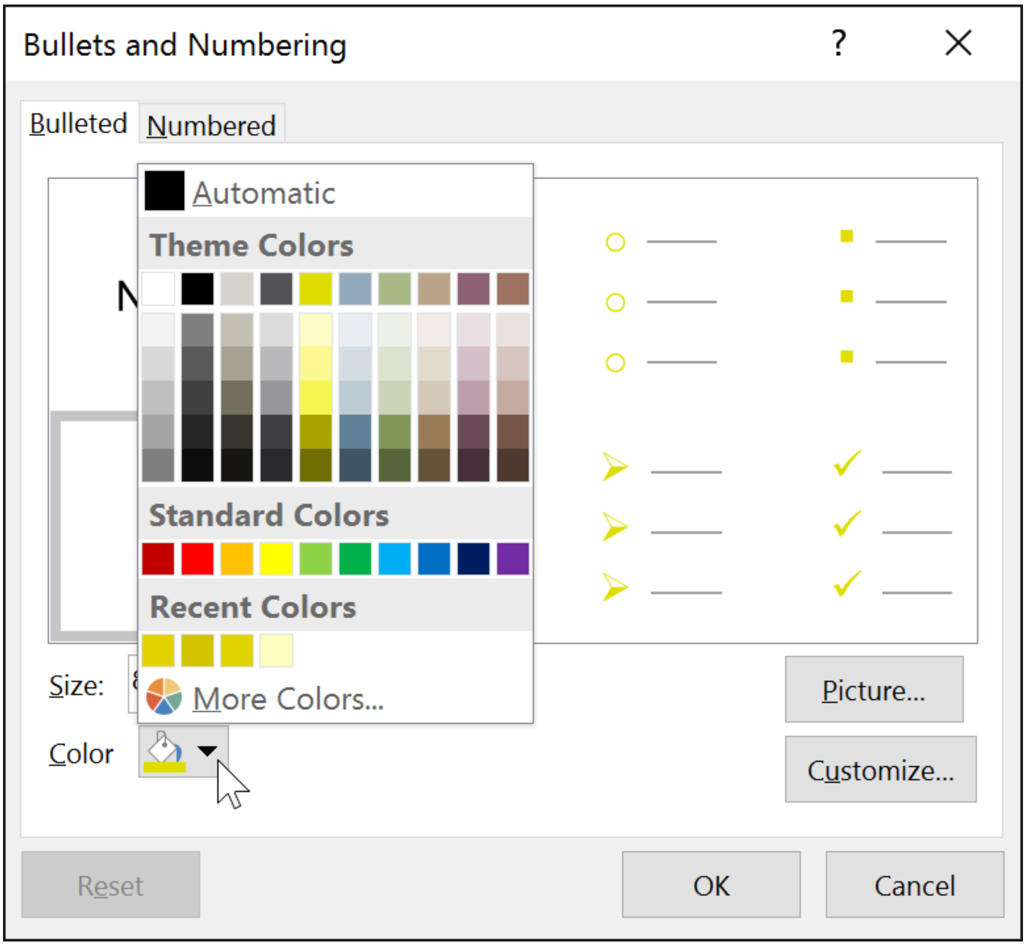

3. Select **Bullets and Numbering** from the menu that appears.




4. A dialog box will appear. In the **Size** field, set the bullet size.




5. Click the **Color** drop-down box and select a color.



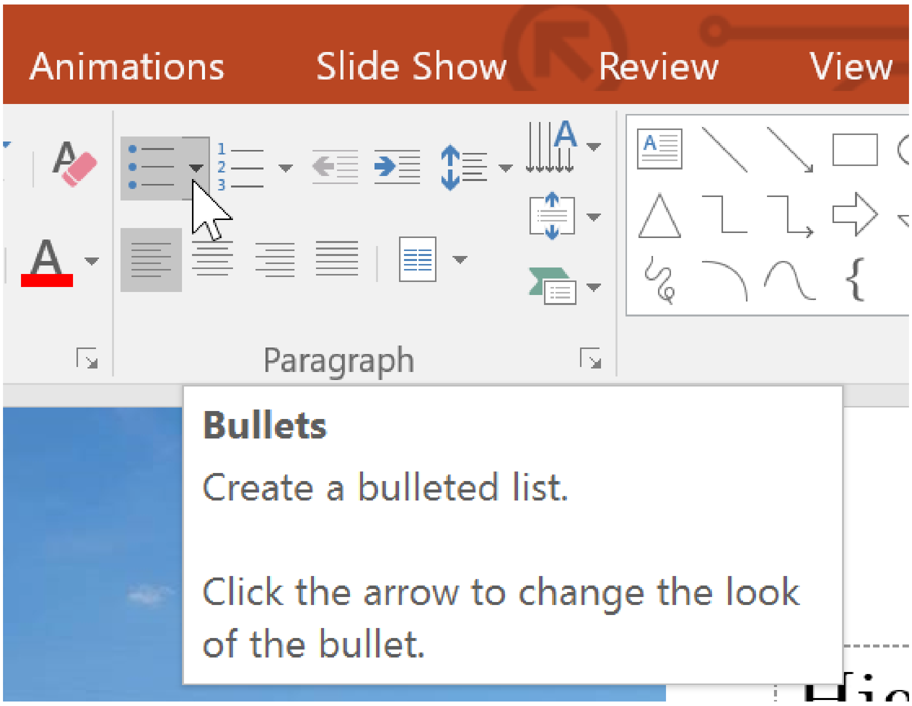

6. Click **OK**. The list will update to show the new bullet size and color.

## 8.6 Customizing bullets

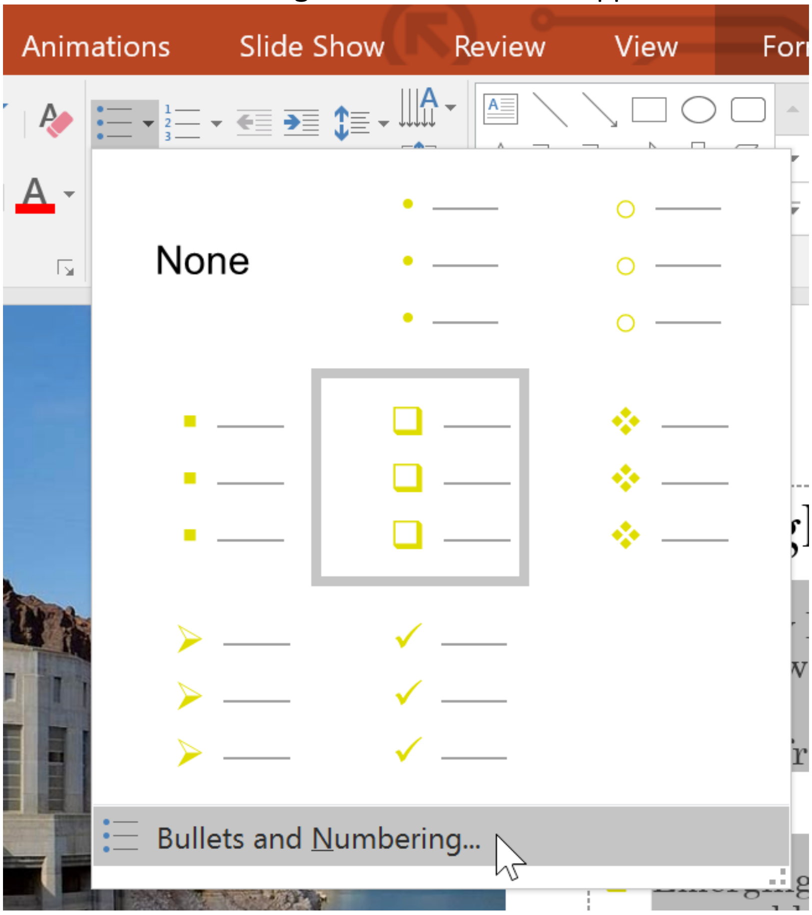
Customizing the look of the bullets in your list can help you emphasize certain list items or personalize the design of your list. A common way to customize bullets is to use **symbols**.

To use a symbol as a bullet:

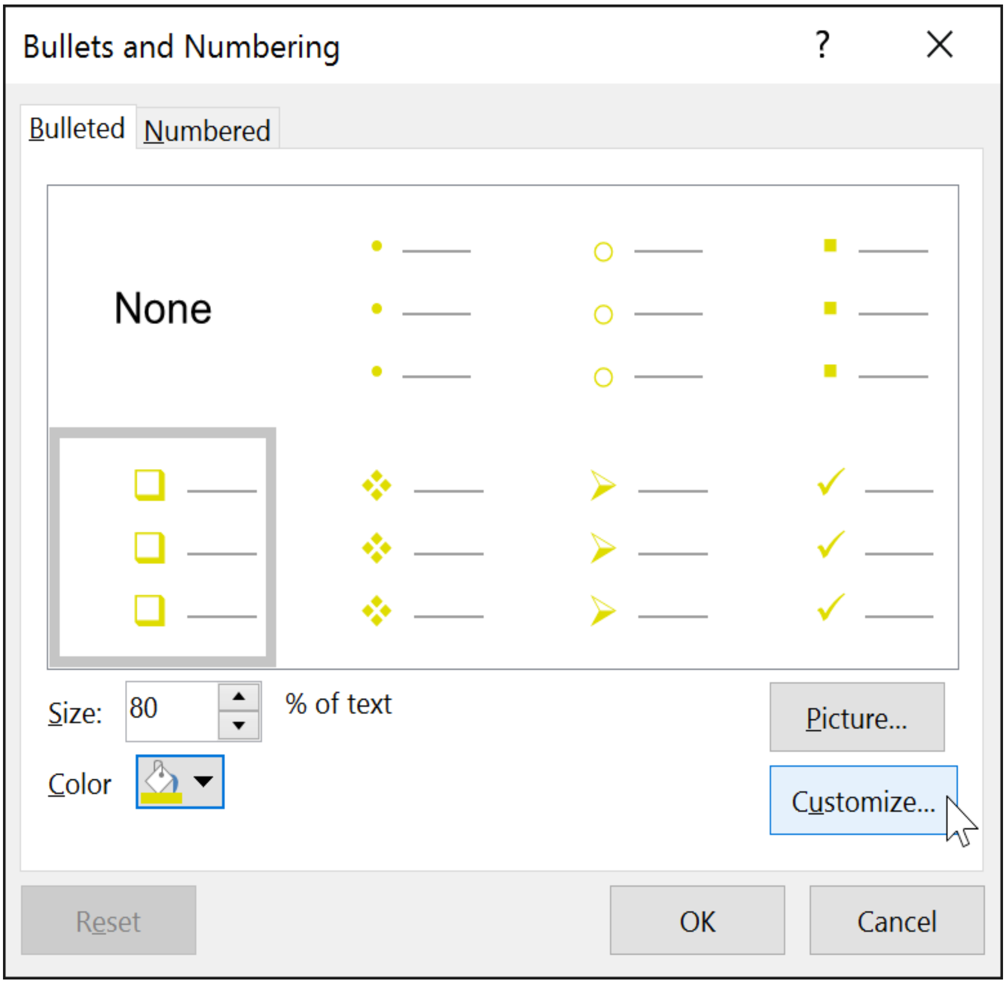
1. Select an existing bulleted list.
2. On the **Home** tab, click the **Bullets** drop-down arrow.



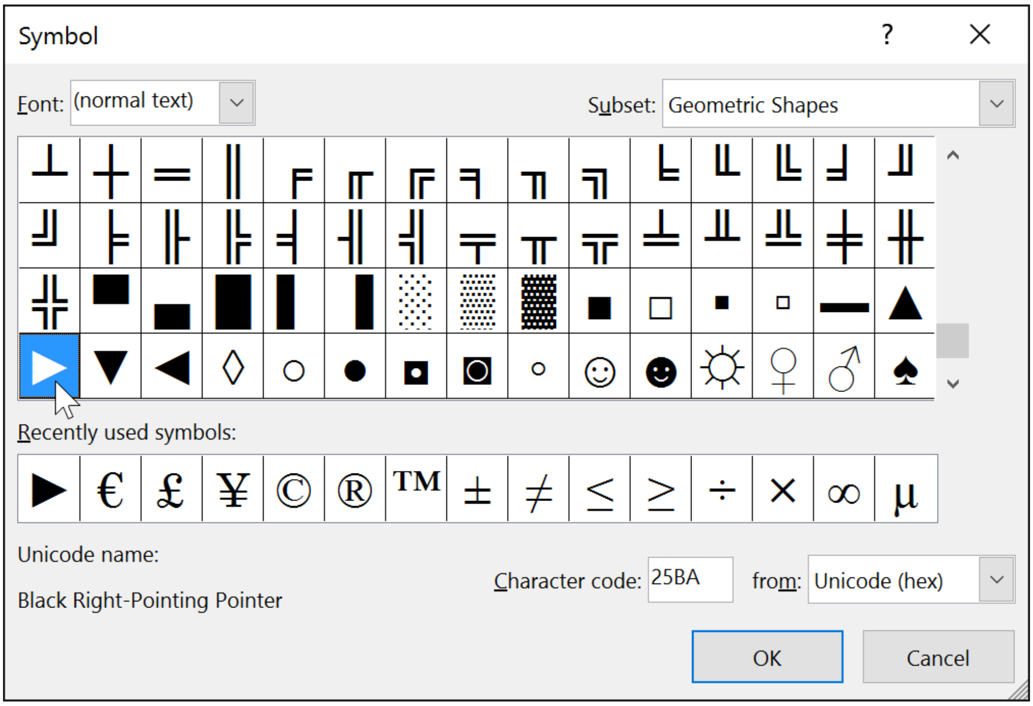

3. Select **Bullets and Numbering** from the menu that appears.



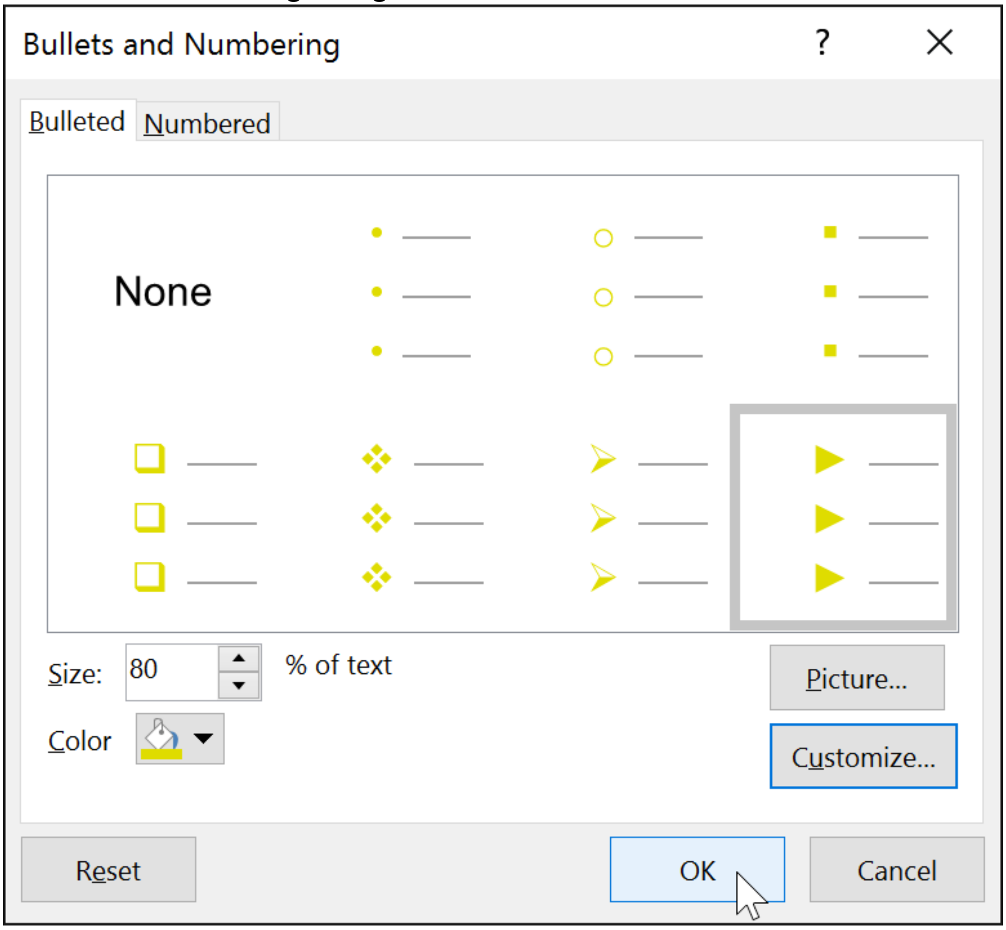

4. A dialog box will appear. On the Bulleted tab, click **Customize**.




5. The **Symbol** dialog box will appear.
6. Click the **Font** drop-down box and select a font.
   The **Wingdings** and **Symbol** fonts are good choices because they have a lot of useful symbols.
7. Select the desired symbol.




8. Click **OK**. The symbol will now appear as the selected bullet option in the Bullets and Numbering dialog box.




9. Click **OK** again to apply the symbol to the list in the document.

To change the distance between the bullets and the text, you can move the **first-line indent marker** on the Ruler.

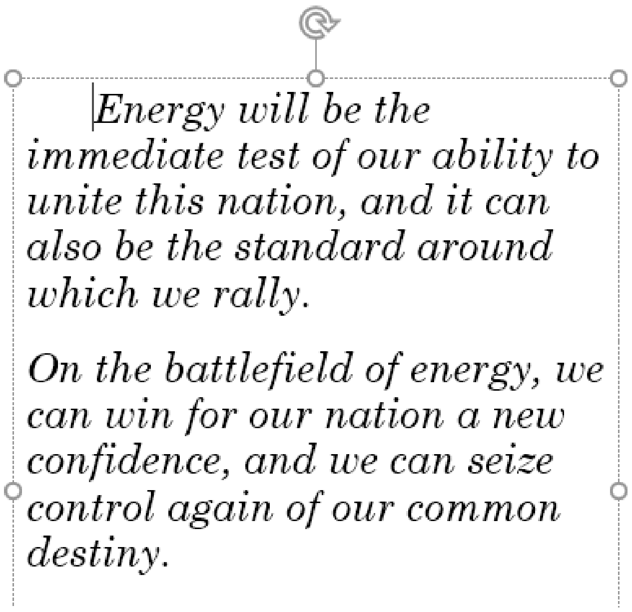
## Lesson 9: Indents and Line Spacing

Indents and line spacing are two important features you can use to change the way text appears on a slide. Indents can be used to create multilevel lists or to visually set paragraphs apart from one another. Line spacing can be adjusted to improve readability or to fit more lines on a slide.

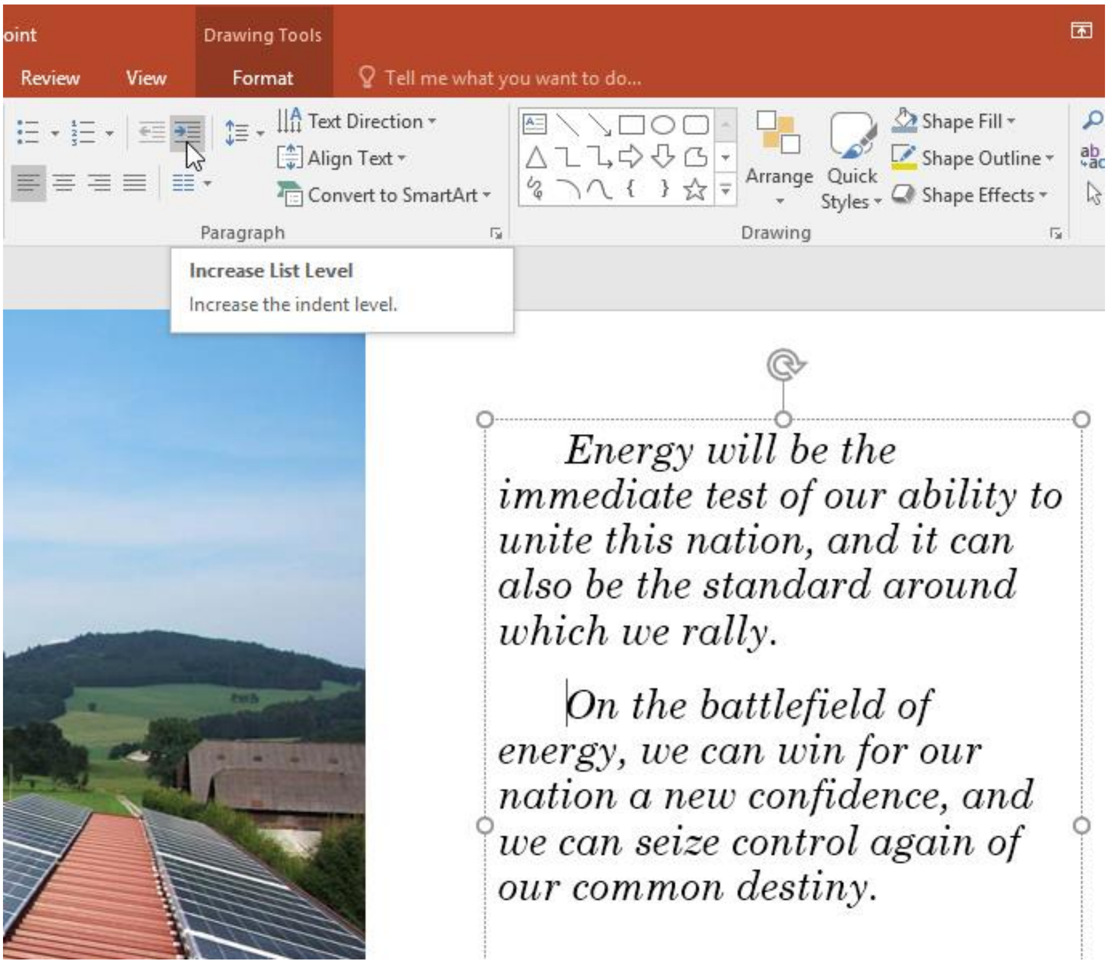
9.1 To indent text:

Indenting helps to format the layout of text so it appears more organized on your slide. The fastest way to indent is to use the **Tab** key. An alternative method is to use one of the **Indent** commands. With these commands, you can either **increase** or **decrease** the indent.

- **To indent using the Tab key**: Place the insertion point **at the very beginning** of the line you want to indent, then press the **Tab** key.




- **To indent using the Indent commands**: Place the insertion point at the very beginning of the line you want to indent. From the **Home** tab, select the **Increase List Level** command.




To decrease an indent, select the desired line, then press **Shift+Tab** or the **Decrease List Level** command.

## 9.2 Indenting lists and paragraphs

Indenting will give different results, depending on whether you are working with a list or a paragraph.

- **Paragraph**: Indenting the first line of a paragraph using the **Tab** key creates a **first-line** indent. This helps to separate paragraphs from each other, as in the examples above.
- **List**: Indenting a line of a list creates a **multilevel** list. This means the indented line is a subtopic of the line above it. **Multilevel** lists are useful if you want to create an **outline** or **hierarchy**.

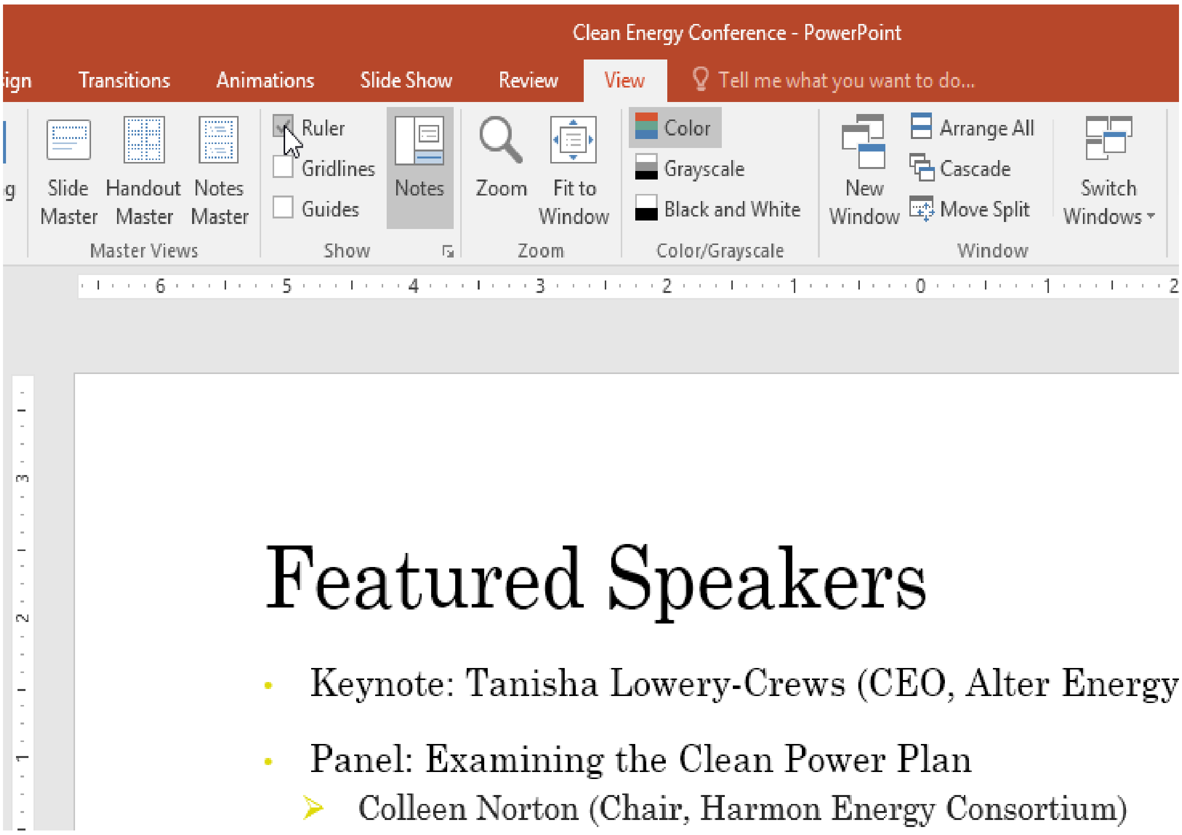

Once you've created a multilevel list, you may want to choose a **different bullet style** for different levels of the list to make them stand out even more.


## 9.3 Fine-tuning indents

Sometimes you may want to fine-tune the indents in your presentations. You can do this by adjusting the **indent markers** on the **Ruler**. By default, the Ruler is hidden, so you'll first need to show the Ruler.

To show the Ruler:

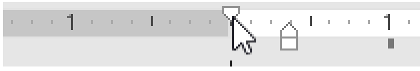
1. Select the **View** tab on the **Ribbon**.
2. In the **Show** group, check the box next to **Ruler**. The Ruler will appear.



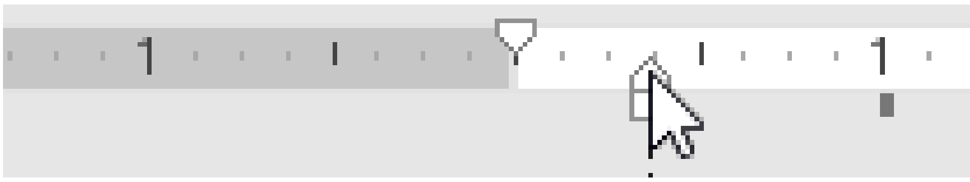

## Indent markers

**Indent markers** are located to the left of the horizontal ruler, and they provide several indentation options.

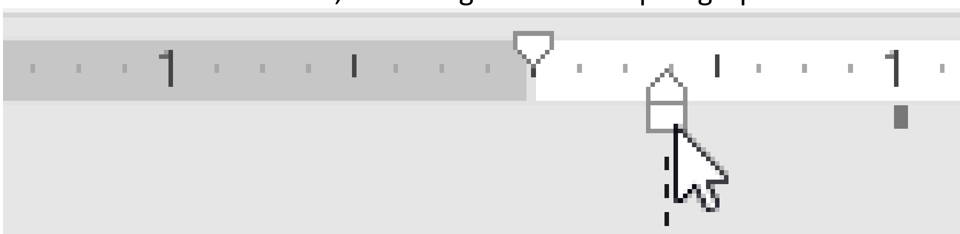
- **First-line indent marker**: Adjusts the **first line** of a paragraph



- **Hanging indent marker**: Adjusts every line of a paragraph **except for the first line**



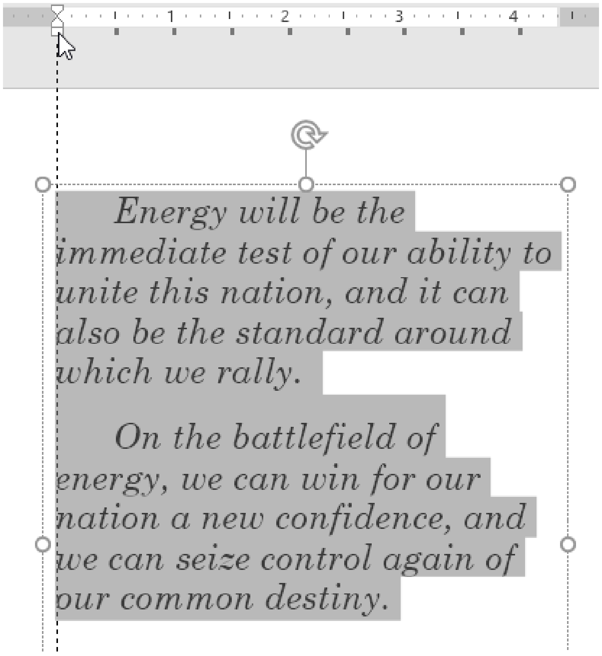
- **Left indent marker**: Moves **both** the first-line indent and hanging indent markers at the same time, indenting all lines in a paragraph



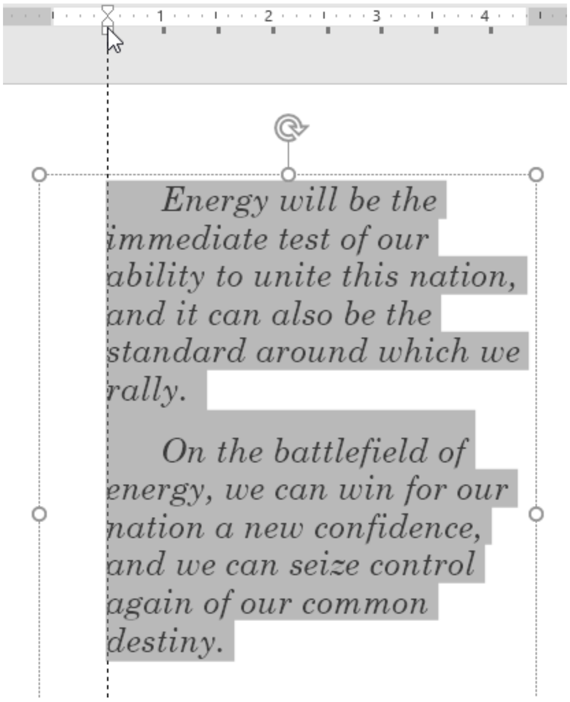
To indent using indent markers:

1. Place the **insertion point** anywhere in the paragraph where you want to indent, or select one or more paragraphs.

2. Go to the desired **indent marker**. In our example, we'll use the **left** indent marker.




3. Click and drag the indent marker as needed. When you're done, the selected text will be indented.

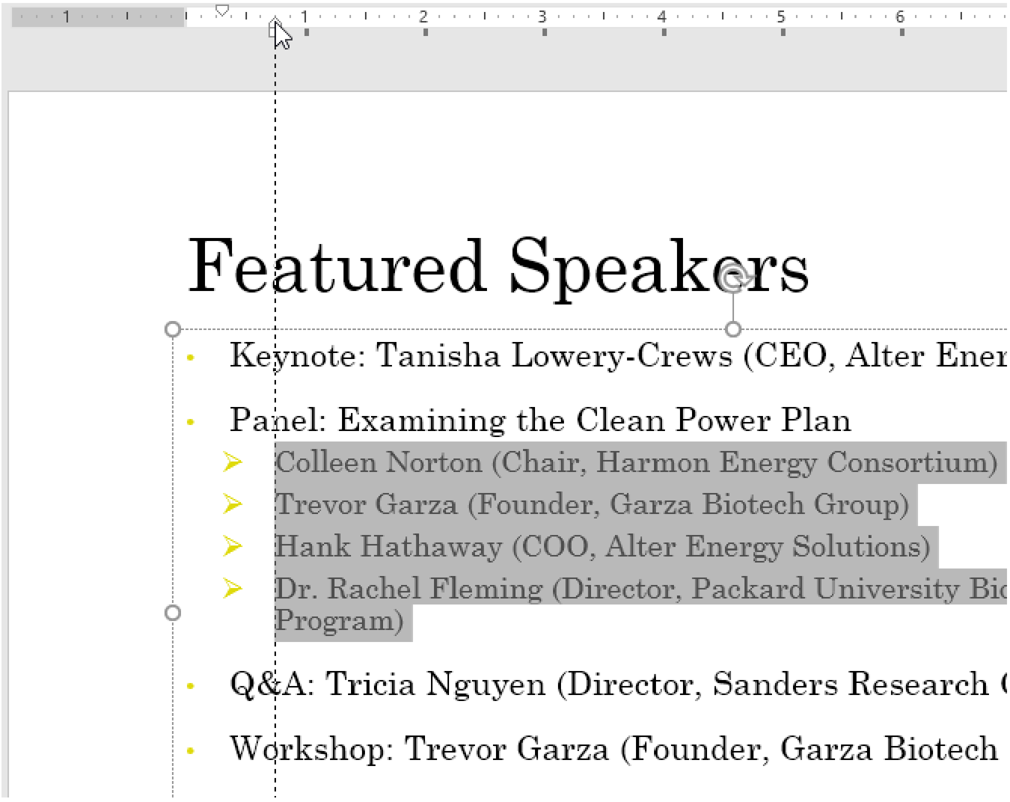



## 9.4 Customizing bullet spacing

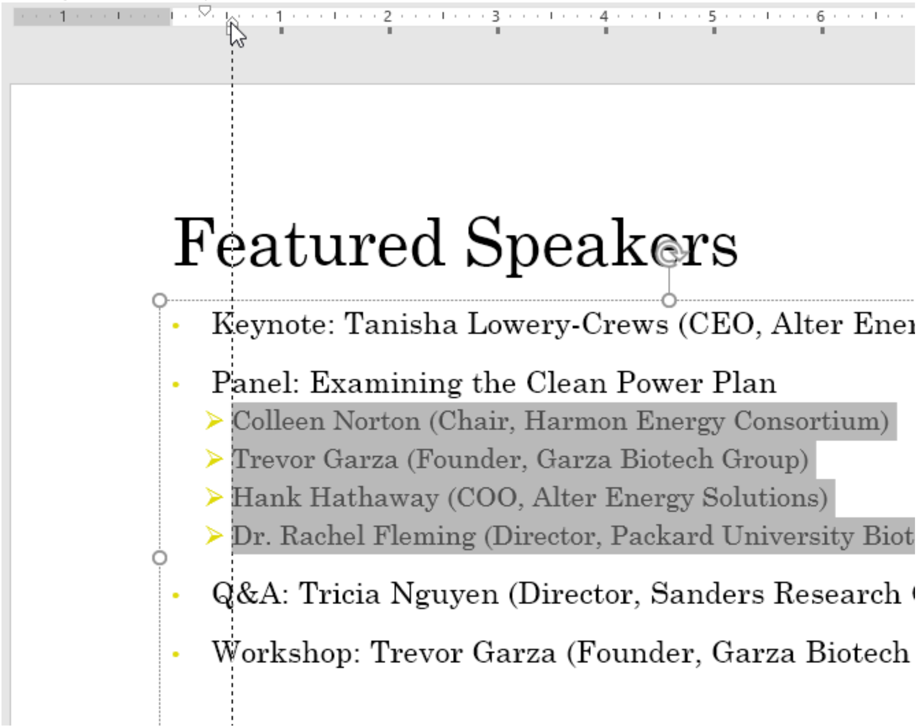
When working with lists, PowerPoint allows you to fine-tune the space between **bullets** and **text** by using the **first-line indent marker** or the **hanging indent marker**.

To change the bullet spacing:

1. Select the lines you want to change, then go to the desired **indent marker**. In our example, we'll use the **hanging** indent marker.




2. Click and drag the indent marker as needed. When you're done, the bullet spacing will be adjusted.

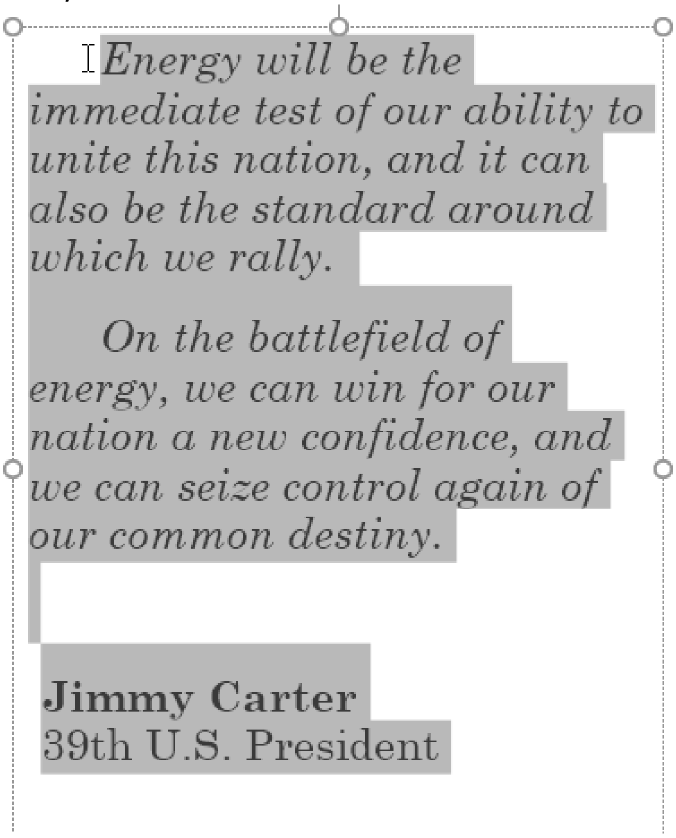



## 9.5 Line spacing

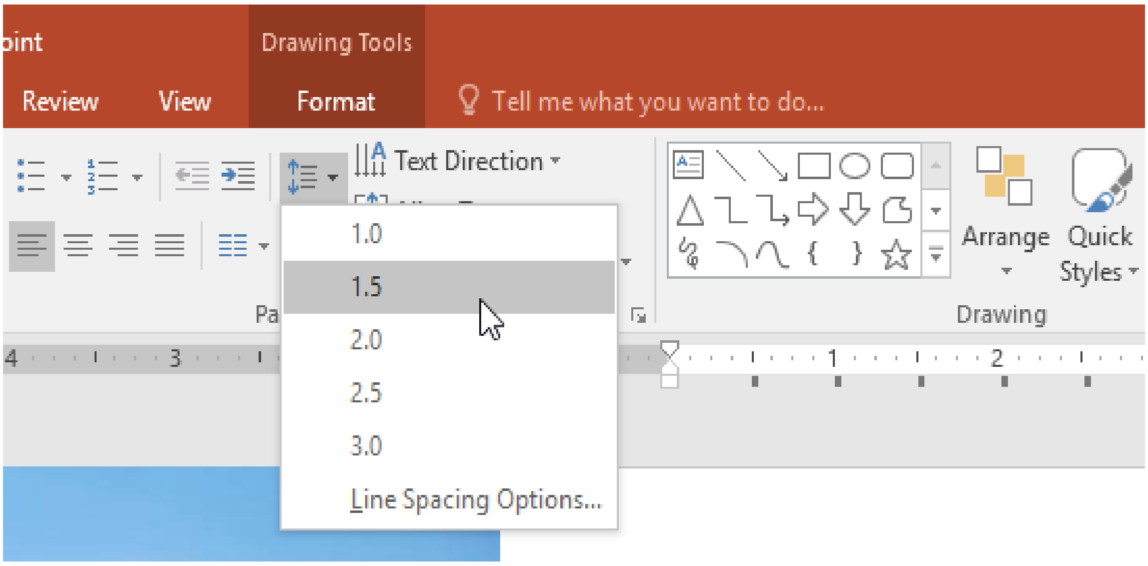
PowerPoint allows you to adjust the amount of space between each line in a list or paragraph. You can **reduce** the line spacing to fit more lines on a slide, or you can **increase** it to improve readability. In some instances, PowerPoint may automatically change the font size when you adjust the line spacing, so increasing the line spacing too much may cause the text to be too small.

To format line spacing:

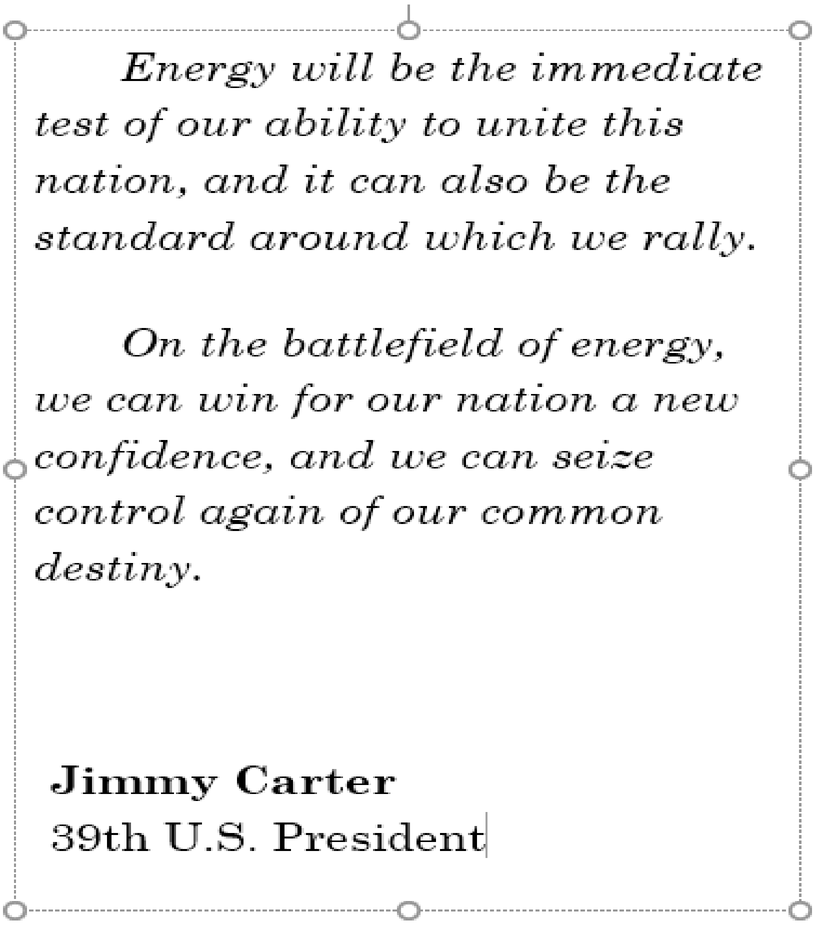
1. **Select** the text you want to format.




2. On the **Home** tab, locate the **Paragraph** group, click the **Line Spacing** command, then select the desired **line spacing** option from the menu.




3. The line spacing will be adjusted.

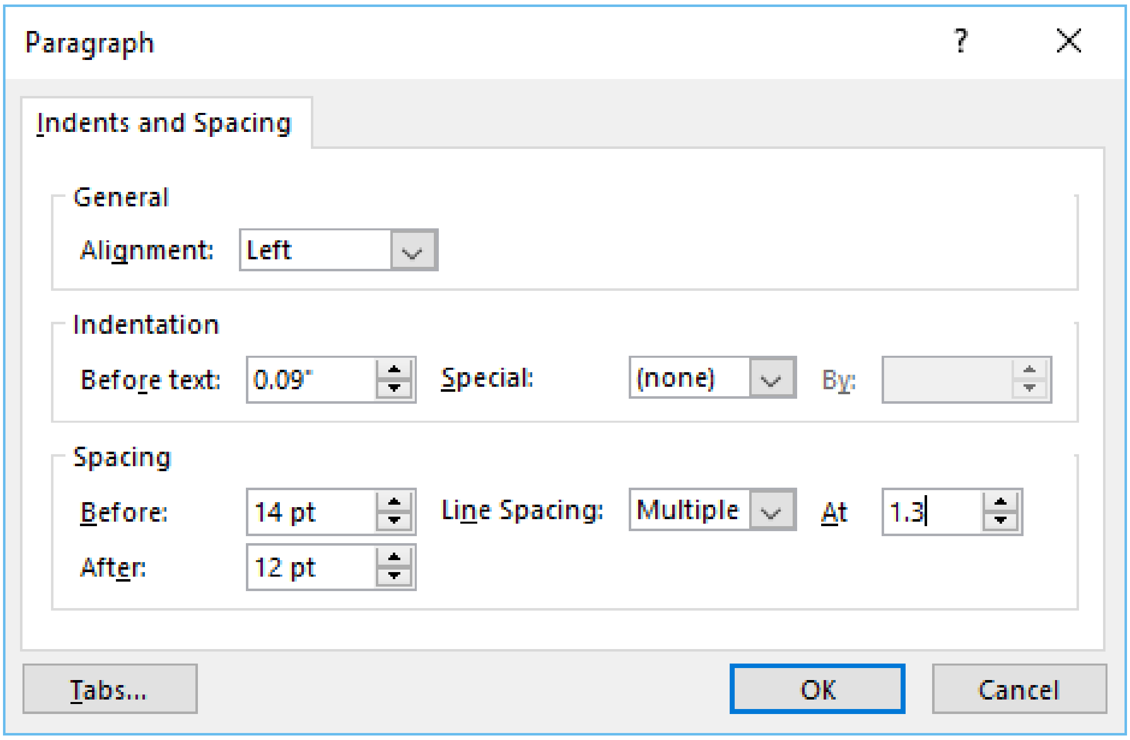


*Energy will be the immediate test of our ability to unite this nation, and it can also be the standard around which we rally.*

*On the battlefield of energy, we can win for our nation a new confidence, and we can seize control again of our common destiny.*

**Jimmy Carter**
39th U.S. President

If you want to adjust the line spacing with even more precision, select **Line Spacing Options** from the drop-down menu. The **Paragraph** dialog box will appear, allowing you to **fine-tune the line spacing** and adjust the **paragraph spacing**, which is the amount of space that is added **before** and **after** each paragraph.

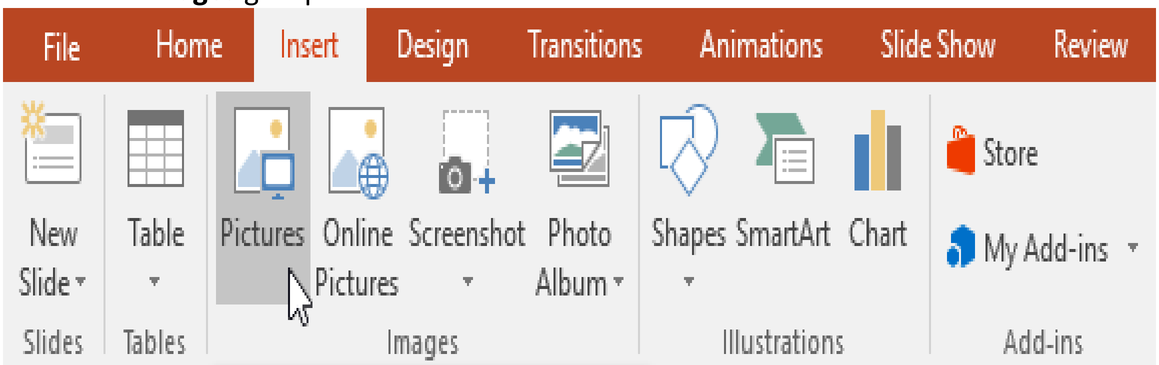



## Lesson 10: Inserting Pictures

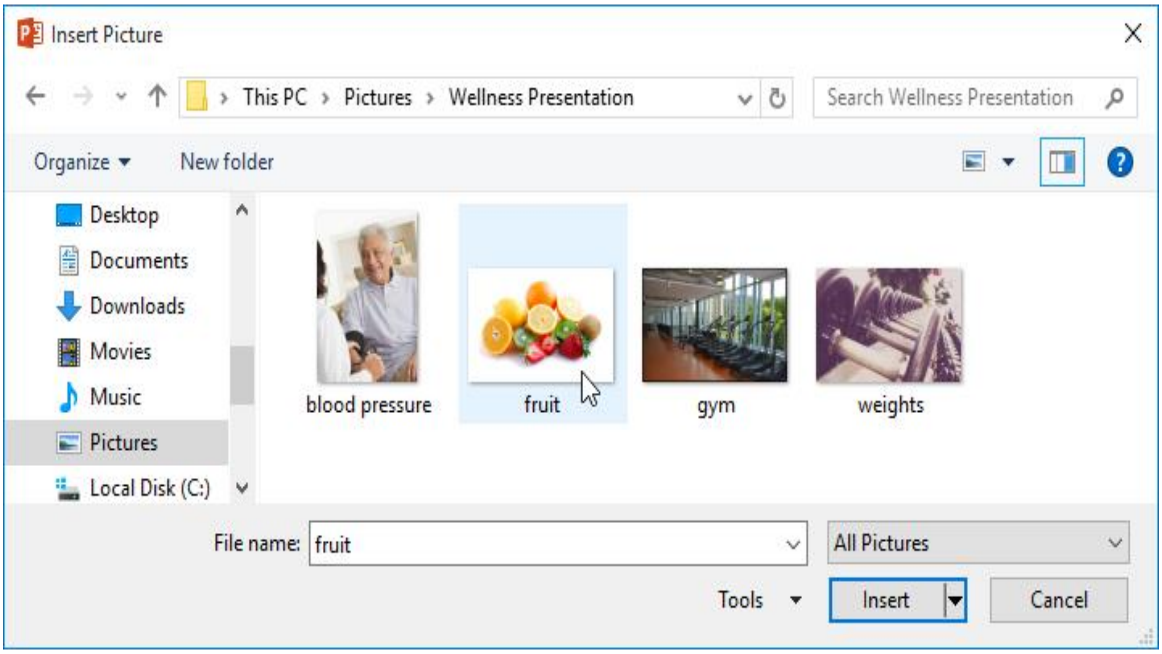
Adding pictures can make your presentations more interesting and engaging. You can insert a picture from a file on your computer onto any slide. PowerPoint even includes tools for finding online pictures and adding screenshots to your presentation.

10.1 To insert a picture from a file:

1. Select the **Insert** tab, then click the **Pictures** command in the **Images** group.

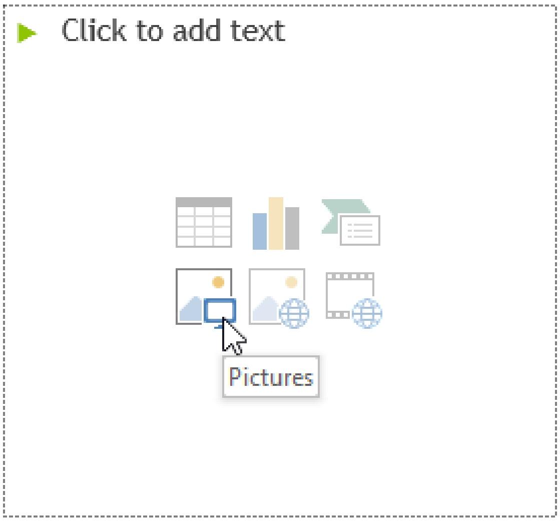



2. A dialog box will appear. Locate and select the **desired image file**, then click **Insert**.




3. The picture will appear on the currently selected slide.

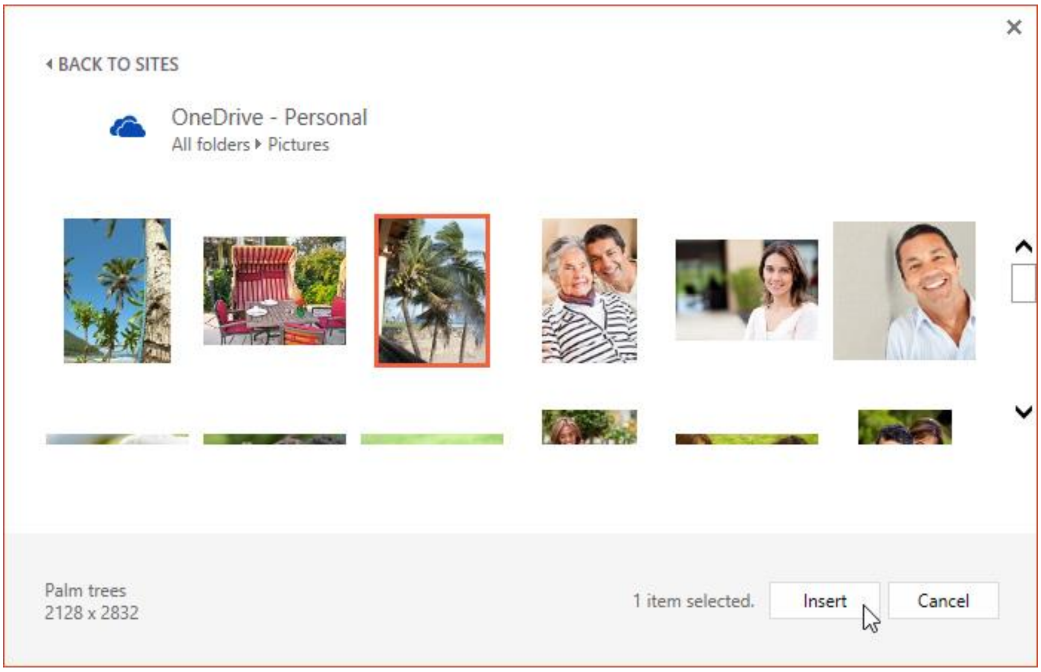

You can also click the **Pictures** command in a **placeholder** to insert images.



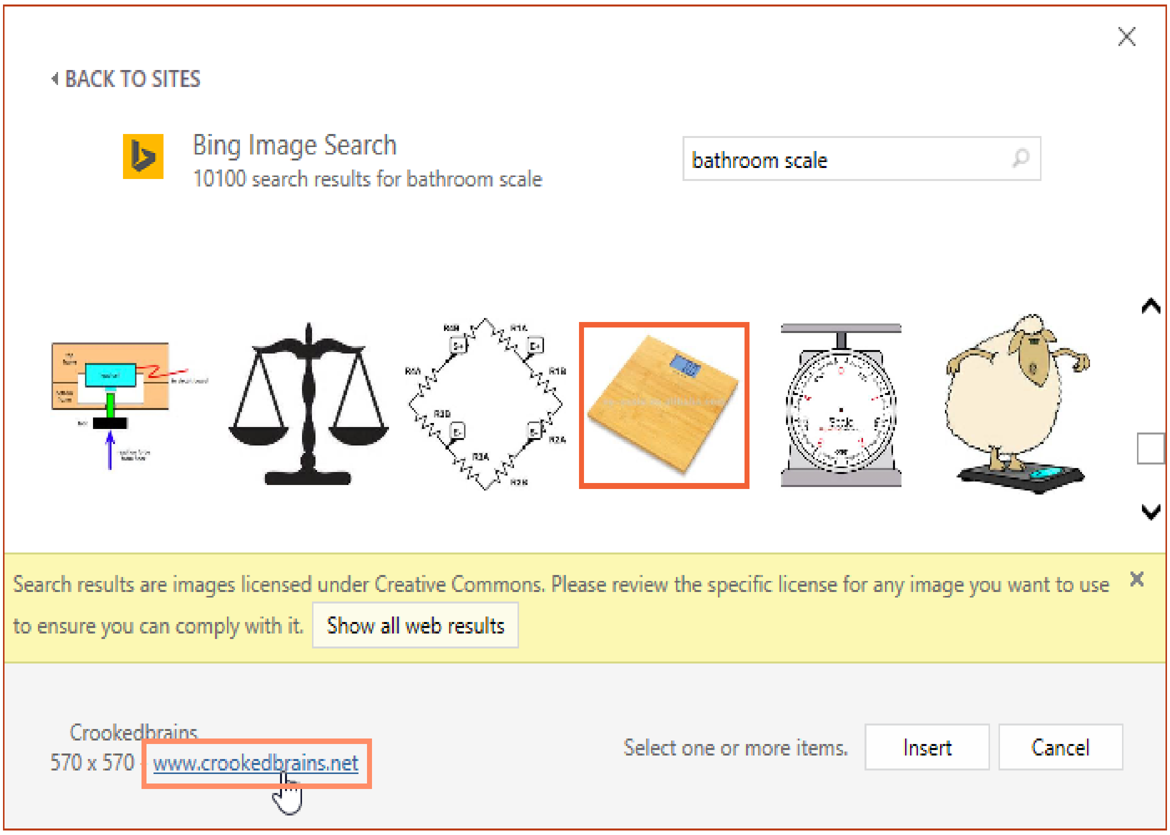

## 10.2 Inserting online pictures

If you don't have the picture you want on your computer, you can **find a picture online** to add to your presentation. PowerPoint offers two options for finding online pictures.

- **OneDrive:** You can insert an image stored on your **OneDrive**. You can also link other **online accounts** with your Microsoft account, such as Facebook or Flickr.

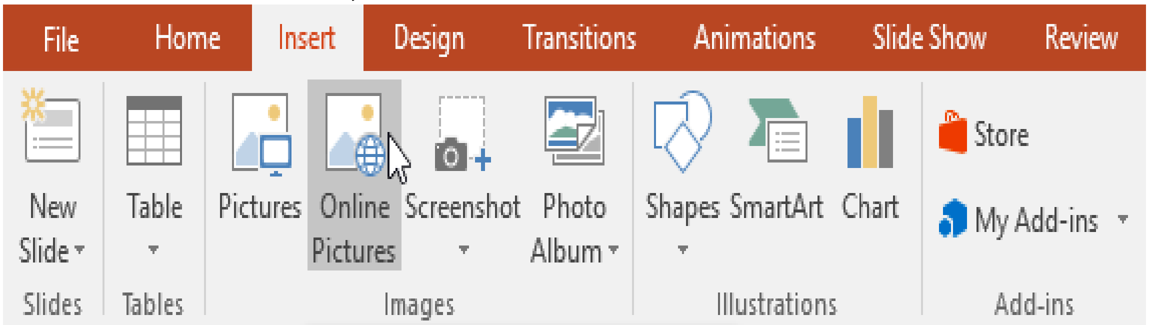



- **Bing Image Search**: You can use this option to search the Internet for images. By default, Bing only shows images that are licensed under **Creative Commons**, which means you can use them for your own projects. However, you should go to the image's website to see if there are any restrictions on how it can be used.

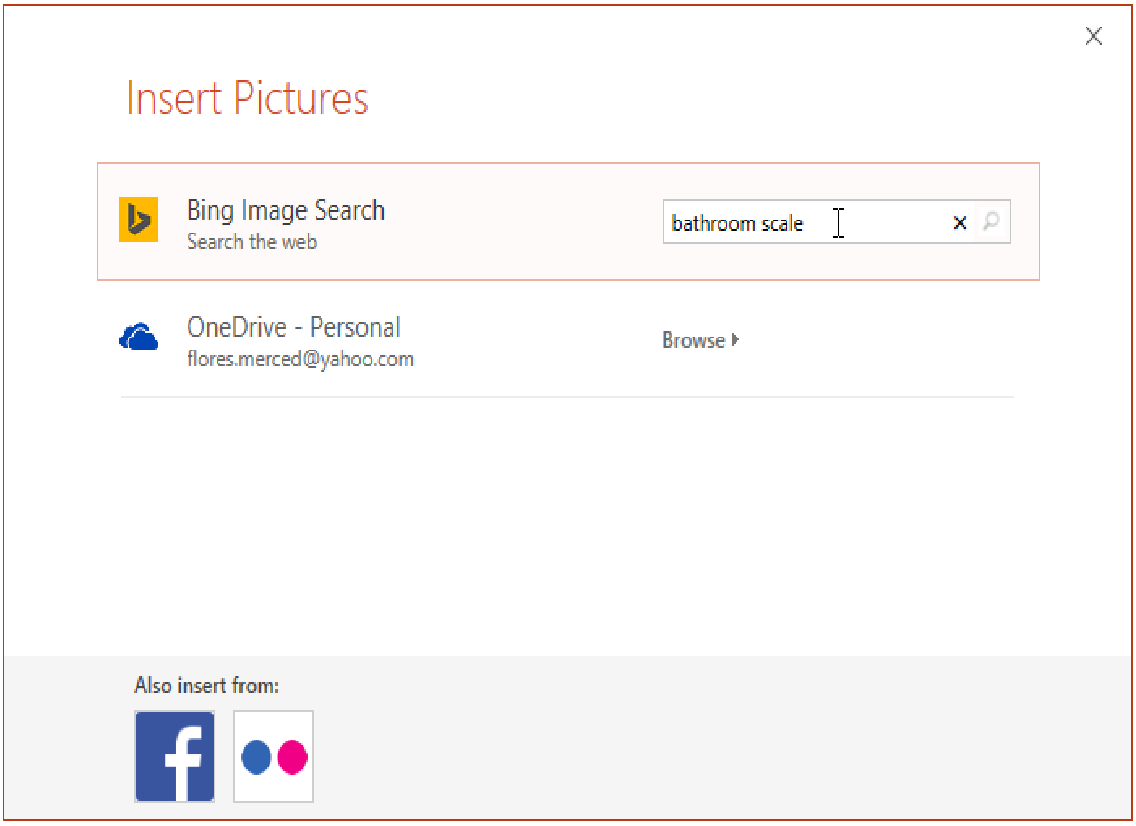



To insert an online picture:

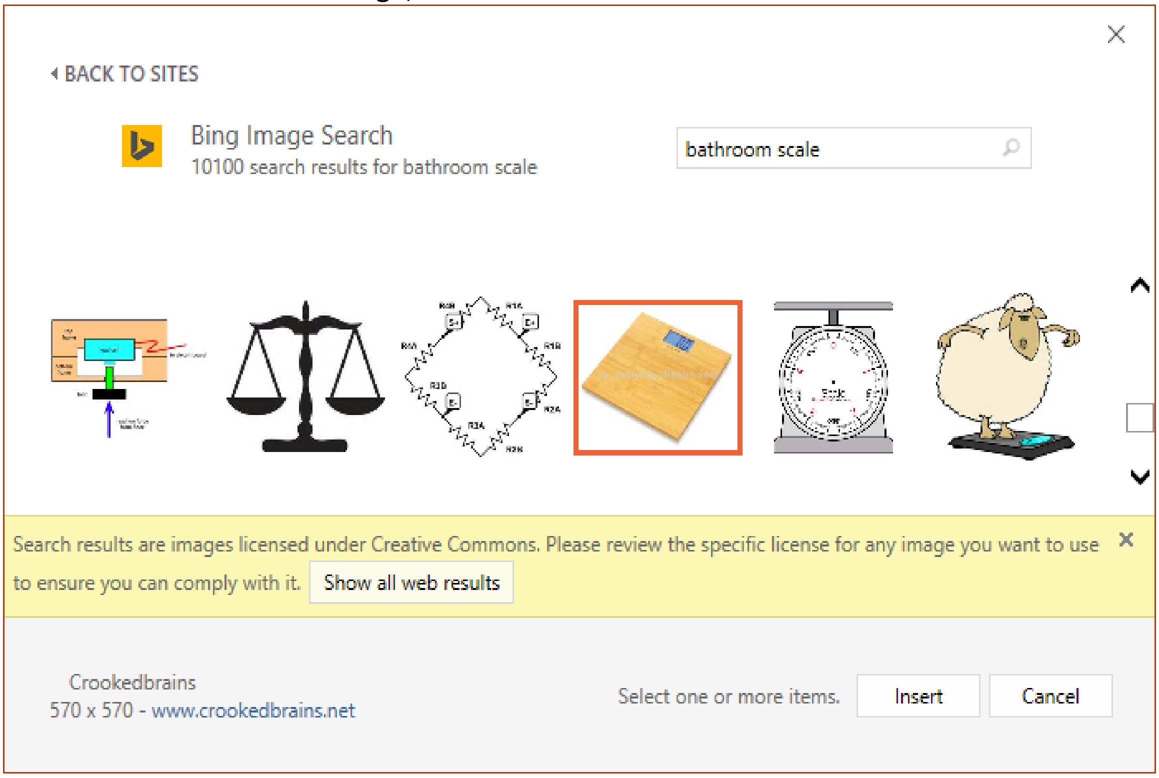
1. Select the **Insert** tab, then click the **Online Pictures** command.




2. The **Insert Pictures** dialog box will appear.
3. Choose **Bing Image Search** or your **OneDrive**. In our example, we'll use Bing Image Search.

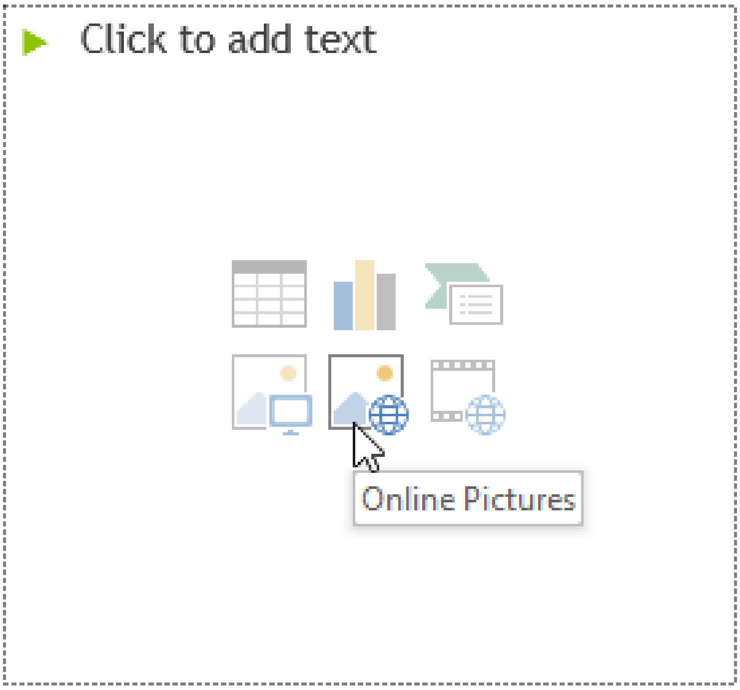



4. Press the **Enter** key. Your search results will appear in the dialog box.
5. Select the desired image, then click **Insert**.




6. The image will appear on the currently selected slide.


You can also click the **Online Pictures** command in a **placeholder** to insert online images.




When adding images, videos, and music to your own projects, it's important to make sure you have the legal right to use them. Most things you buy or download online are **protected by copyright**, which means you may not be allowed to use them.

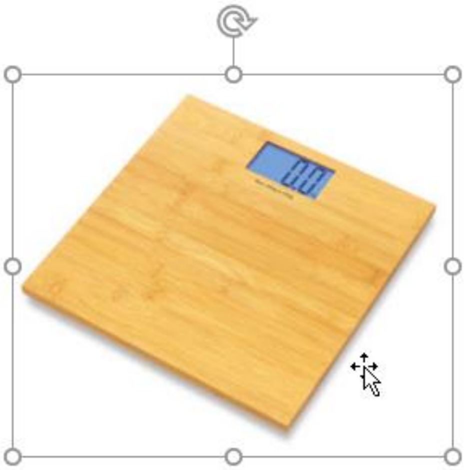
## 10.2 Moving and resizing pictures

Once you've inserted a picture, you may want to move it to a **different location** on the slide or change its **size**. PowerPoint makes it easy to **arrange** pictures in your presentation.

### To select a picture:

Before you can modify a picture, you'll need to **select** it.

- Simply click to select a picture. A **solid line** will appear around a selected picture.



To resize a picture:

- Click and drag the **corner sizing handles** until the picture is the desired size.

The corner sizing handles will resize a picture while preserving its **original aspect ratio**. If you use the side sizing handles, the image will become **distorted**.

To rotate a picture:

- Click and drag the arrow above an image to **rotate** it right or left.

Hold the **Shift** key on your keyboard when rotating an image to snap it to angles in 15-degree increments.

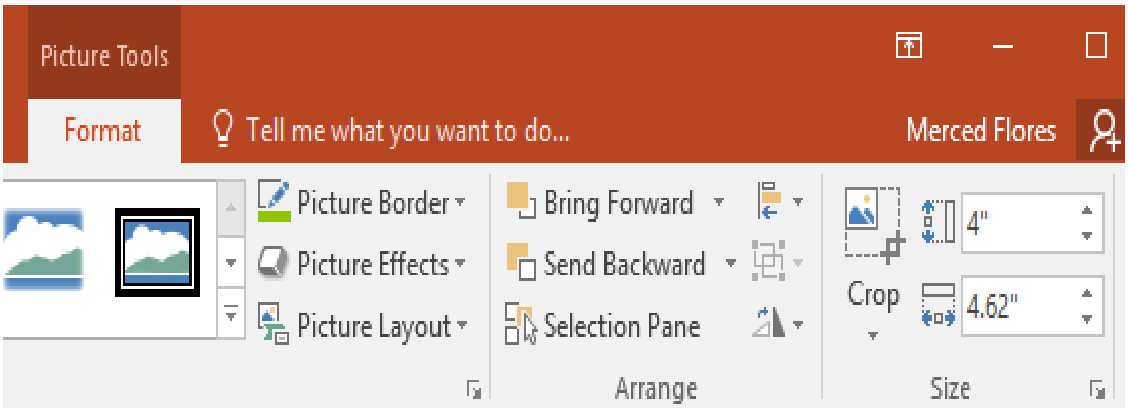
To move a picture:

- Click and drag to **move** a picture to a new location on a slide.

To delete a picture:

- Select the picture you want to delete, then press the **Backspace** or **Delete** key on your keyboard.

You can access even more picture formatting options from the **Format** tab.

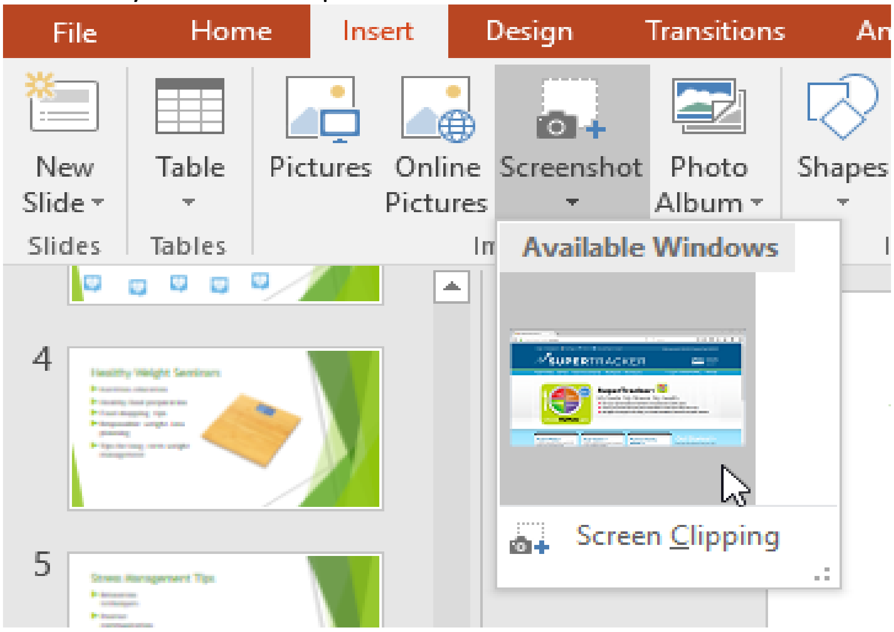


## 10.3 Inserting screenshots

**Screenshots** are basically snapshots of your computer screen. You can take a screenshot of almost any program, website, or open window. PowerPoint makes it easy to insert a screenshot of an **entire window** or a **screen clipping** of part of a window in your presentation.

To insert screenshots of a window:

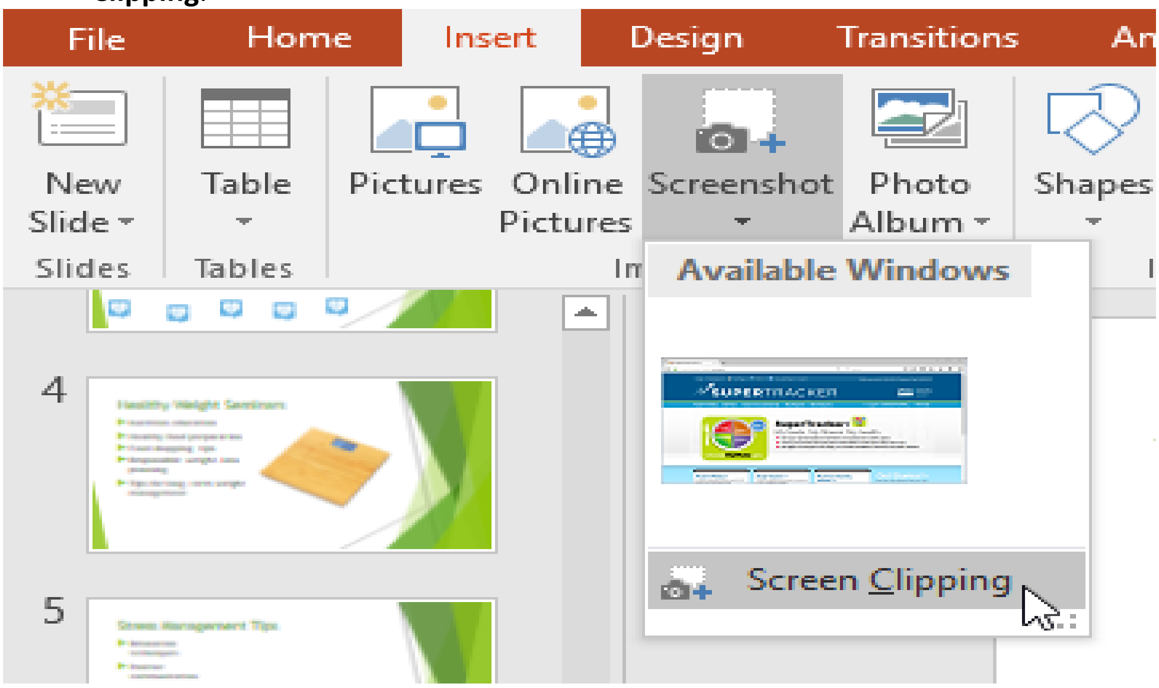
1. Select the **Insert** tab, then click the **Screenshot** command in the **Images** group.
2. The **Available Windows** from your desktop will appear. Select the **window** you want to capture as a screenshot.




3. The screenshot will appear on the currently selected slide.

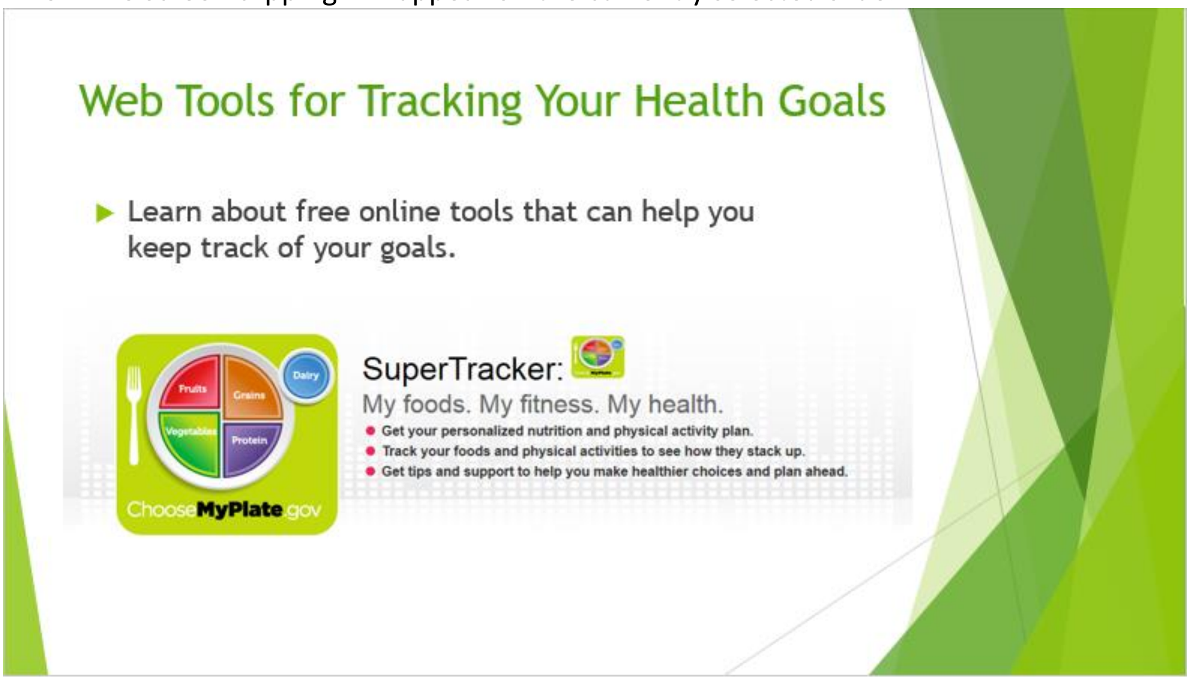

To insert a screen clipping:

1. Select the **Insert** tab, click the **Screenshot** command, then select **Screen Clipping**.




2. A view of other open windows will appear. Click and drag to select the area you want to capture as a screen clipping.


3. The screen clipping will appear on the currently selected slide.



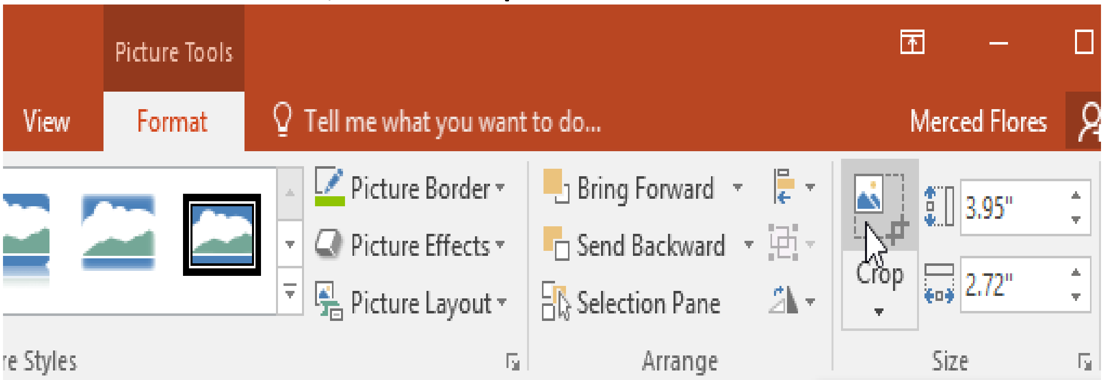

10.4 Formatting Pictures

There are a variety of ways to format the pictures in your slide show. The picture tools in PowerPoint make it easy to personalize and modify the images in interesting ways. PowerPoint allows you to change the picture style and shape, add a border, crop and compress pictures, add artistic effects, and more.

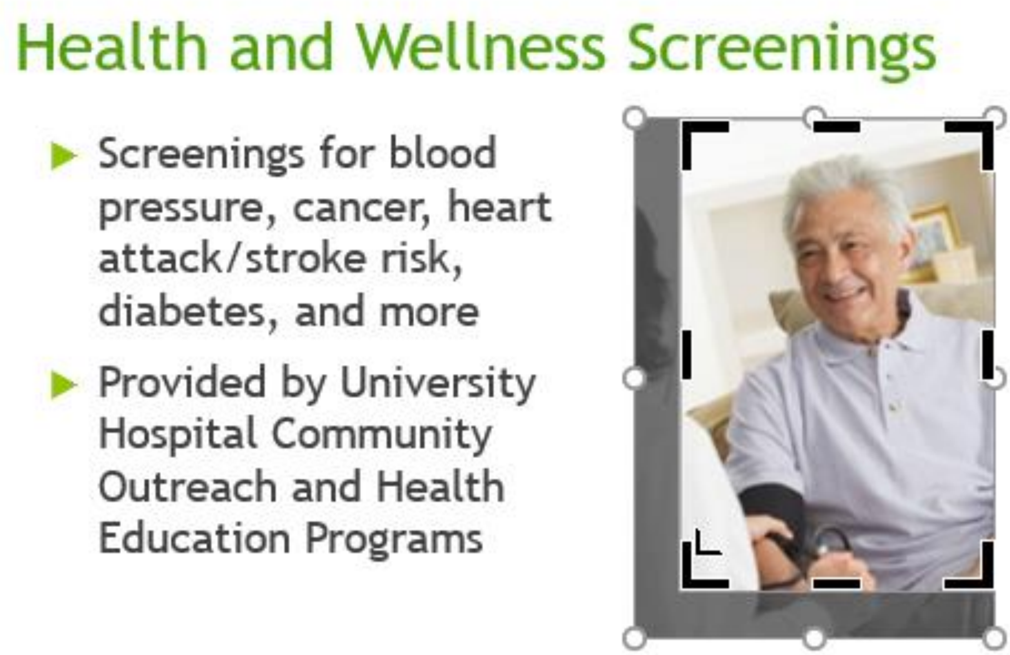
To crop an image:

When you crop an image, a part of the picture is removed. Cropping may be helpful when a picture has a lot of content and you want to focus on only part of it.

1. Select the image you want to crop. The **Format** tab appears.
2. On the Format tab, click the **Crop** command.



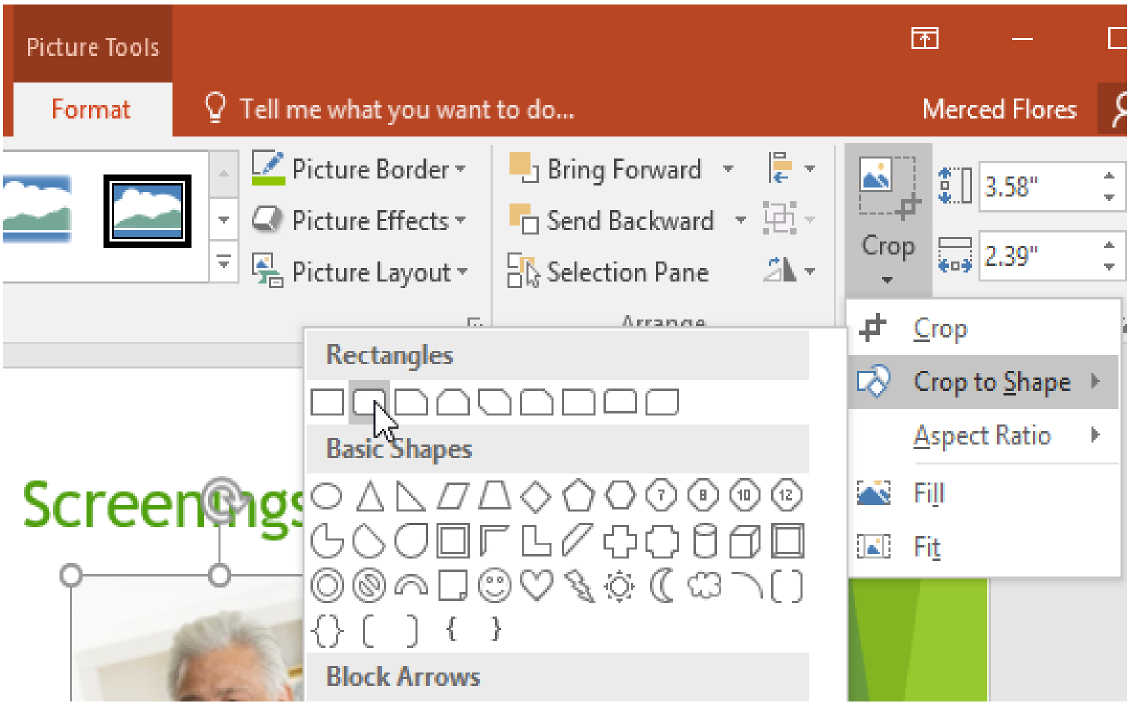

3. **Cropping handles** will appear around the image. Click and drag one of the handles to crop the image. Make sure the mouse is right over the black cropping handle so you don't accidentally select a resizing handle.




4. Click the **Crop** command again. The image will be cropped.

To crop an image to a shape:

1. Select the image you want to crop, then click the **Format** tab.
2. Click the **Crop** drop-down arrow. Hover the mouse over **Crop to Shape**, then select the desired **shape** from the drop-down menu that appears.

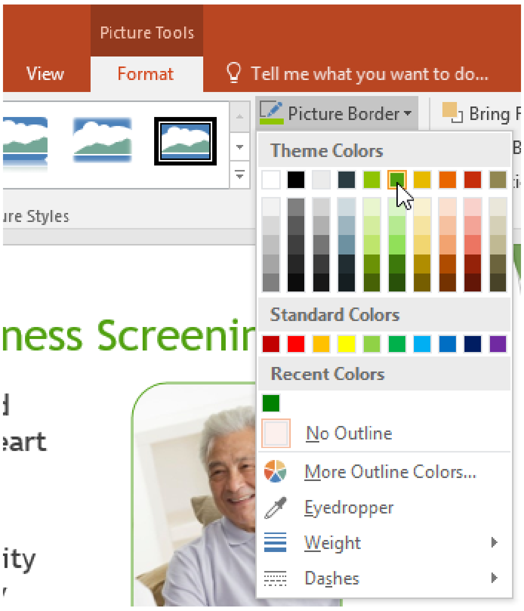



3. The image will appear formatted as the shape.

You may want to crop the image to the desired size before cropping it to a shape.

To add a border to an image:

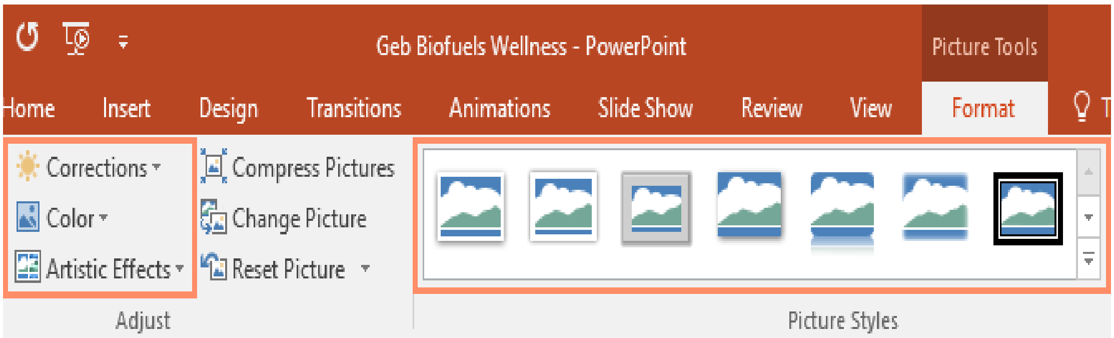
1. Select the image you want to add a border to, then click the **Format** tab.
2. Click the **Picture Border** command. A drop-down menu will appear.
3. From here, you can select a **color**, **weight** (thickness), and whether the line is **dashed**.




4. The border will appear around the image.

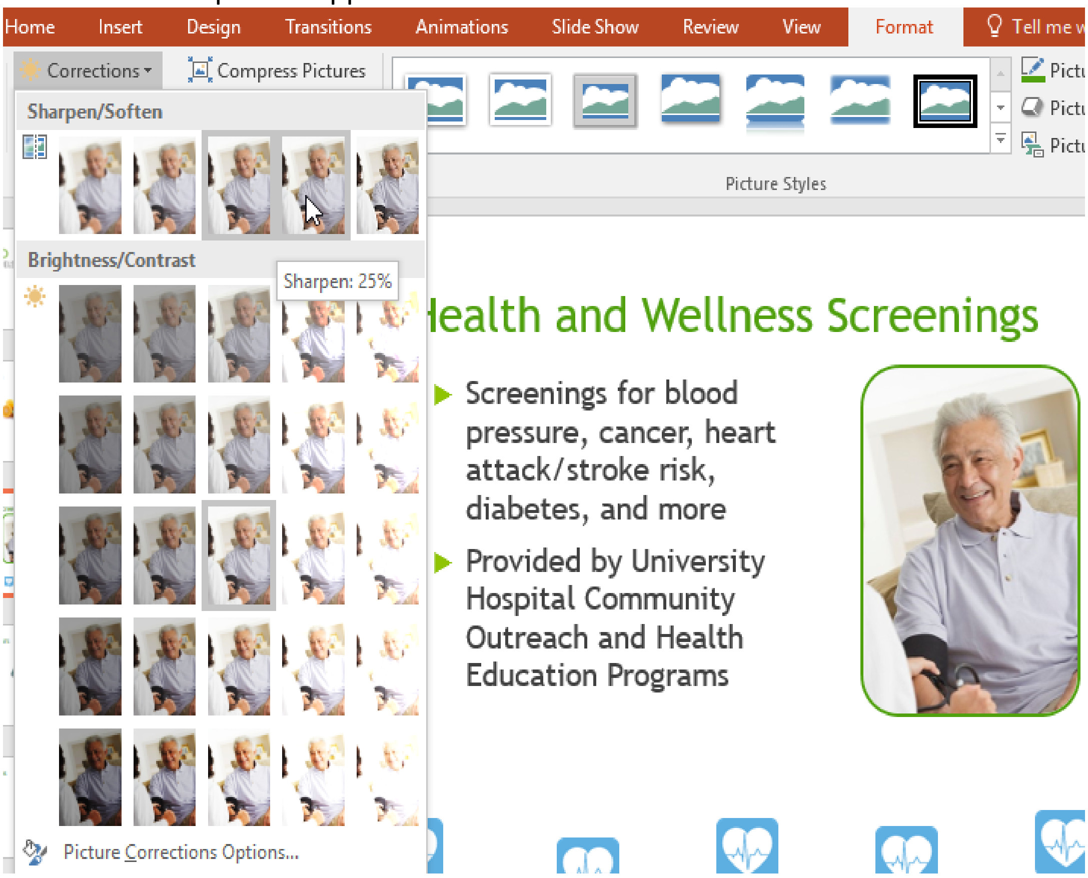
Image adjustments

PowerPoint offers several options for changing the way images appear in your slide show. For example, you can add a **frame**, make image **corrections**, change the image's **color** or **brightness**, and even add some stylish **artistic effects**. These options are located in the **Adjust** and **Picture Styles** groups on the **Format** tab.

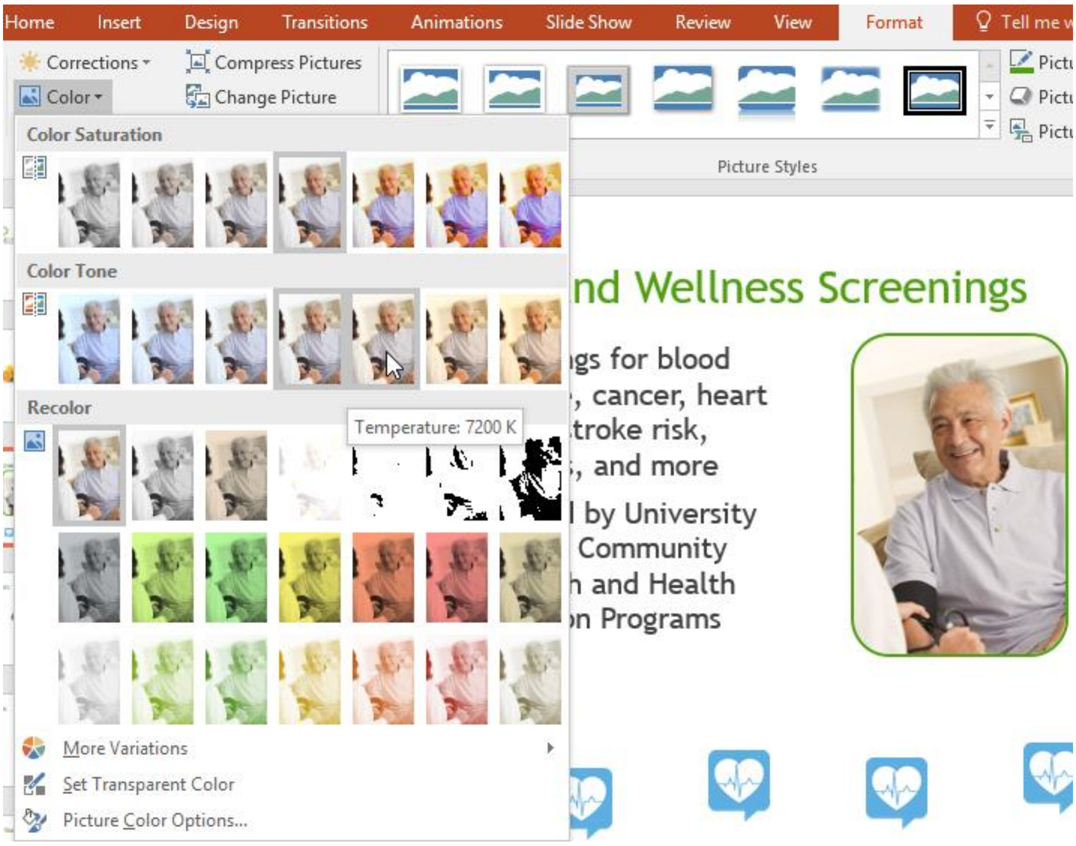



When you're ready to make adjustments or experiment with the look of an image, select the picture and choose one of these options from the Format tab.

- **Corrections**: This command is located in the **Adjust** group. From here, you can **sharpen** or **soften** the image to adjust how blurry or clear it appears. You can also adjust the **brightness** and **contrast**, which controls how light or dark the picture appears.

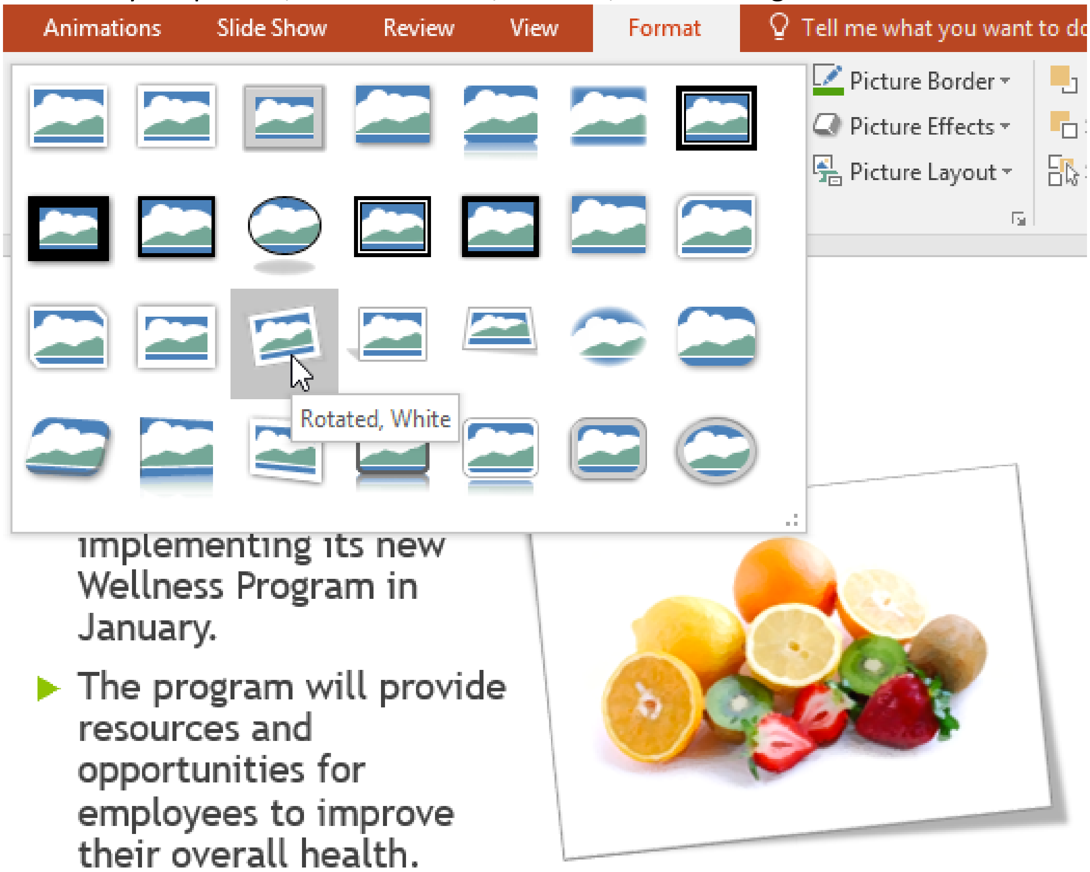



- **Color**: This command is located in the **Adjust** group. From here, you can adjust the image's **saturation** (how vivid the colors are), **tone** (the temperature of the image, from cool to warm), and **coloring** (changing the overall color of the image).




- **Artistic Effects**: This command is located in the **Adjust** group. From here, you can add artistic effects such as pastels, watercolors, and glowing edges.

- **Picture Styles Group**: This group contains a variety of styles you can apply to your picture, such as frames, borders, and soft edges.



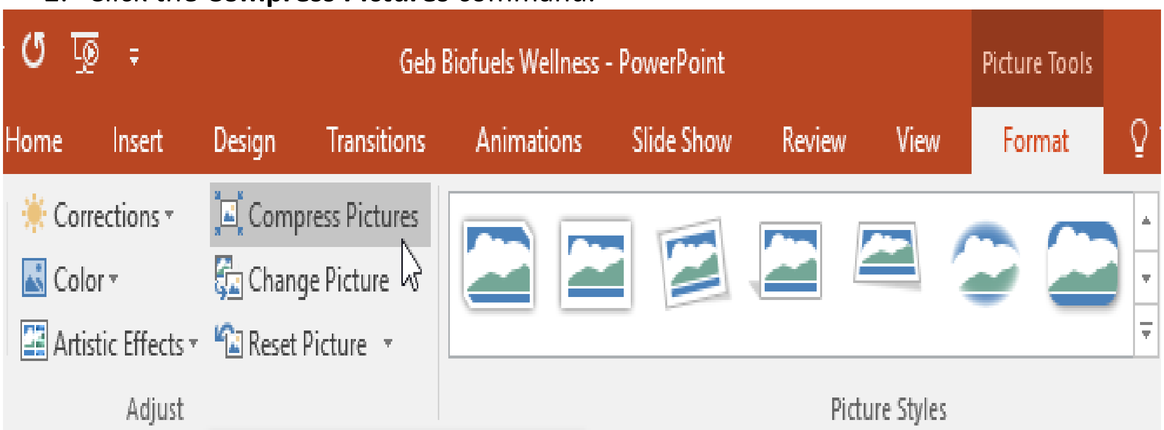

Compressing pictures

If you want to email a presentation that contains pictures, you'll need to monitor its **file size**. Large high-resolution pictures can quickly cause your presentation to become very large, which may make it difficult or impossible to attach to an email.

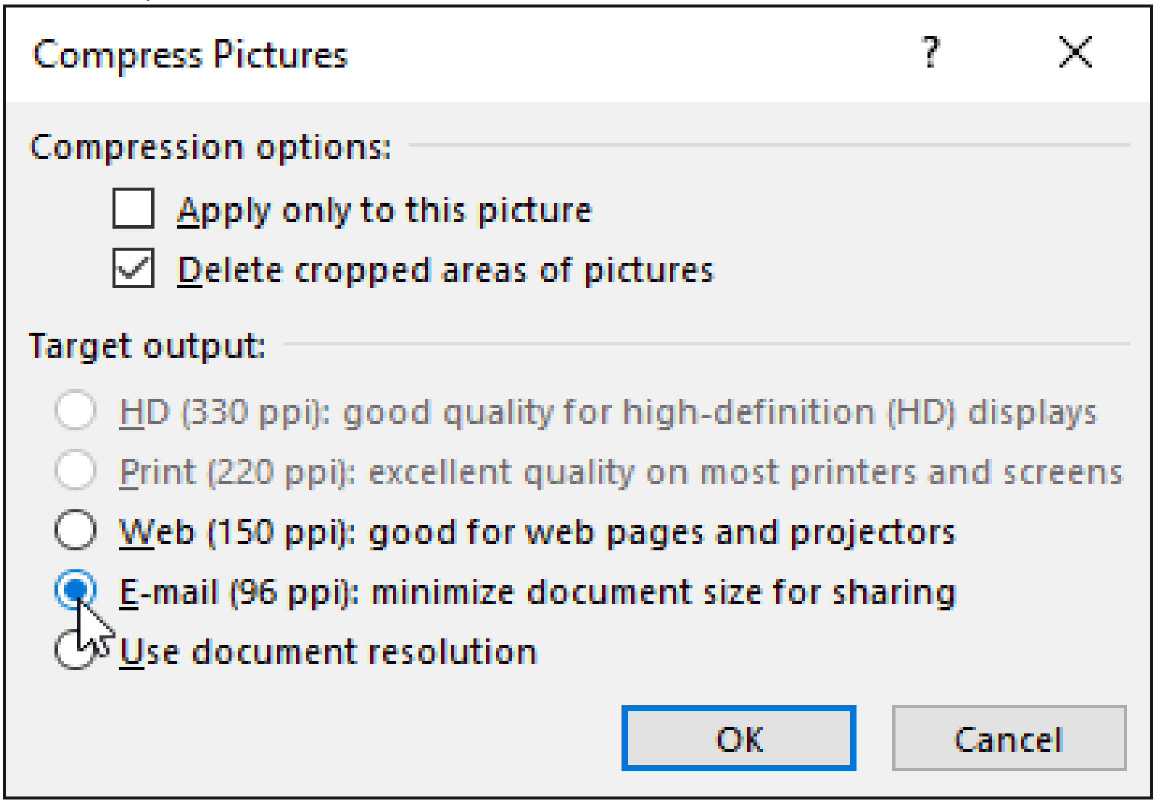
Additionally, **cropped areas** of pictures are saved with the presentation by default, which can add to the file size. PowerPoint can reduce the file size by **compressing** pictures, lowering their **resolution**, and **deleting cropped areas**.

To compress a picture:

1. Select the picture you want to compress, then click the **Format** tab.
2. Click the **Compress Pictures** command.



3. A dialog box will appear. Place a check mark next to **Delete cropped areas of pictures**. You can also choose whether to apply the settings to **this picture only** or to all pictures in the presentation.
4. Choose a **Target output**. If you are emailing your presentation, you may want to select **Email**, which produces the smallest file size. When you are done, click **OK**.



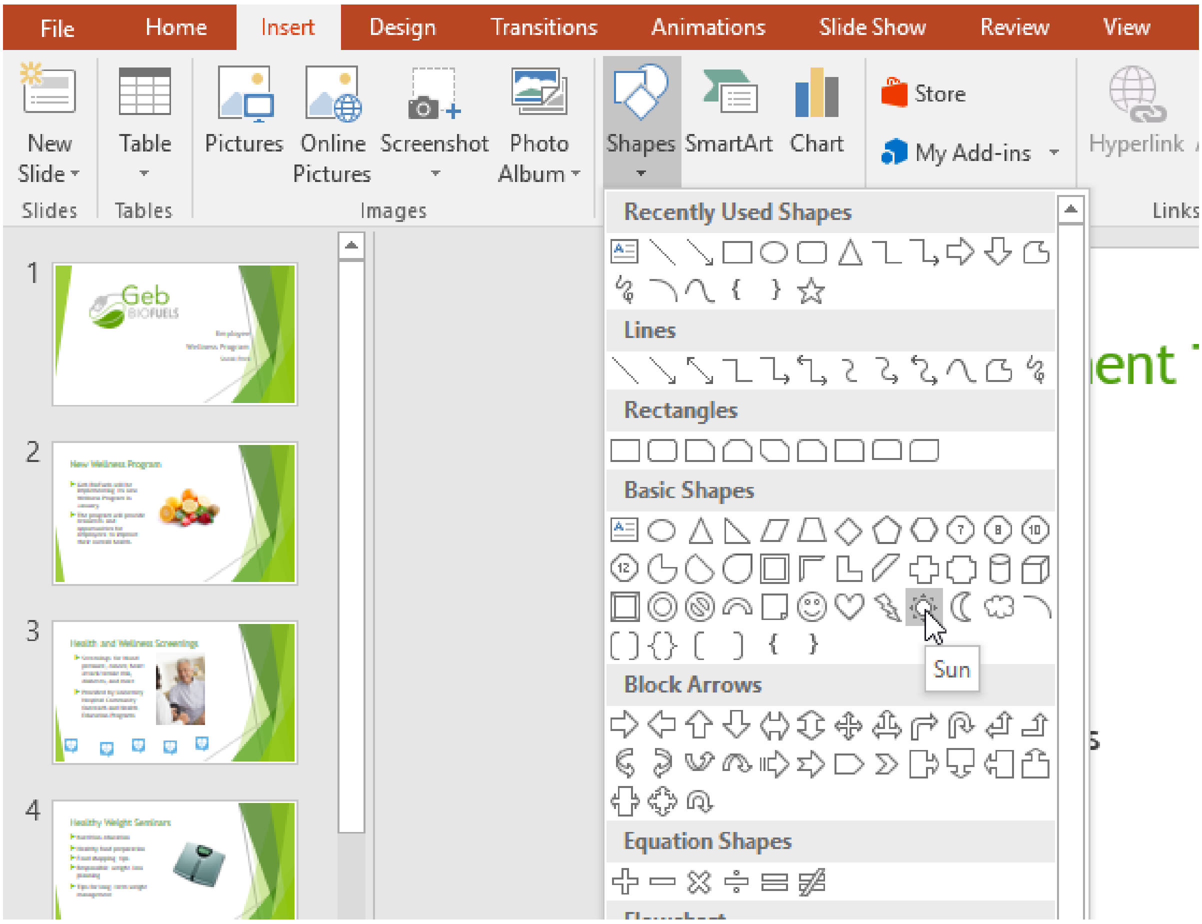

Compressing your pictures in PowerPoint may not reduce the file size enough for your needs. For better results, you can use an image editing program to resize the image before you insert it in your presentation.

## Lesson 11: Shapes

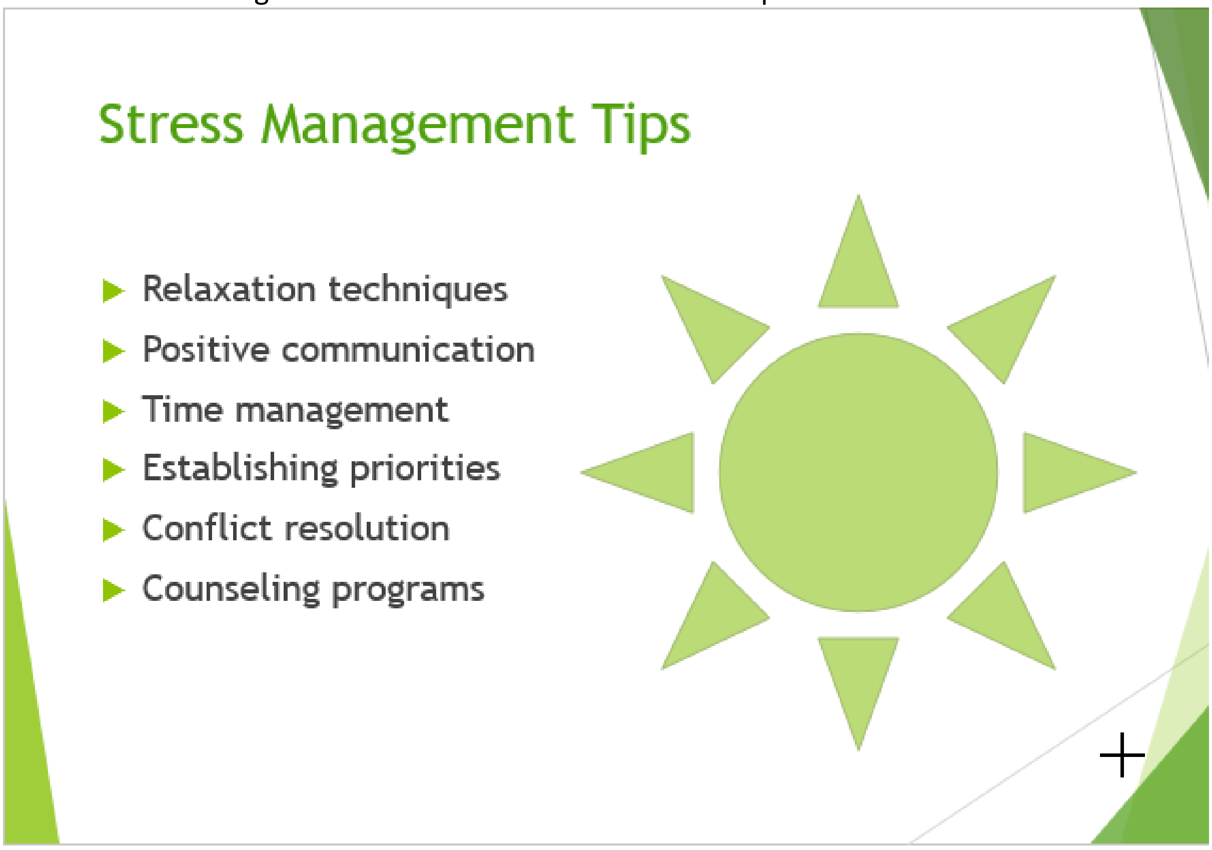
Shapes are a great way to make your presentations more interesting. PowerPoint gives you a lot of different shapes to choose from, and they can be customized to suit your needs, using your own color palette, preferences, and more. While you may not need shapes in every presentation you create, they can add visual appeal.

11.1 To insert a shape:

1. Select the **Insert** tab, then click the **Shapes** command in the **Illustrations** group. A drop-down menu of shapes will appear.
2. Select the desired **shape**.



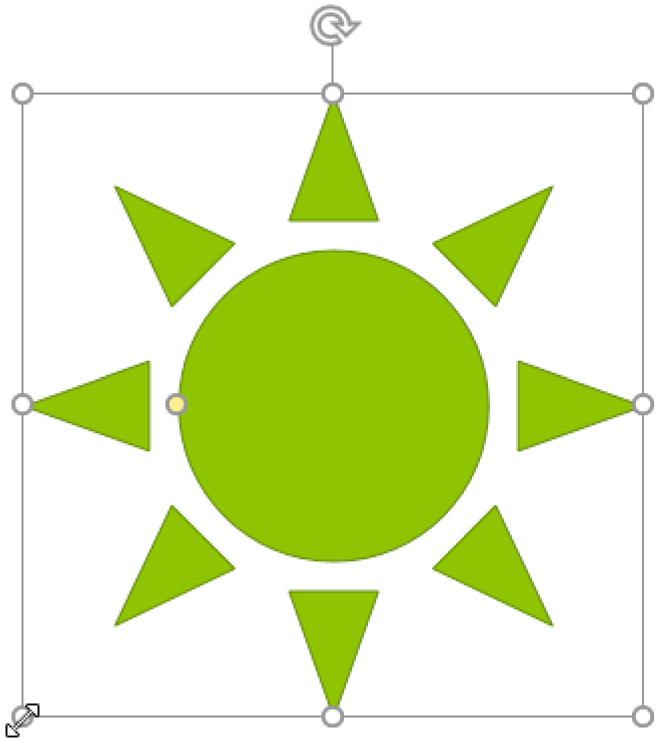

3. Click and drag in the desired location to add the shape to the slide.



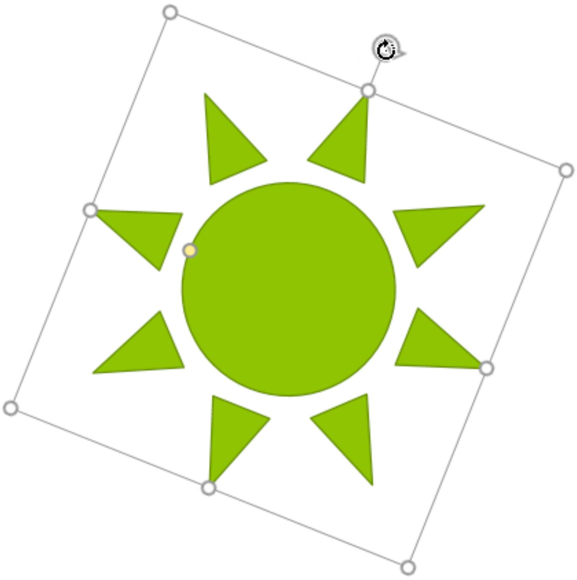
11.2 Modifying a shape or text box

When you click a shape or text box, **handles** will appear that let you manipulate the shape. There are several types of handles.

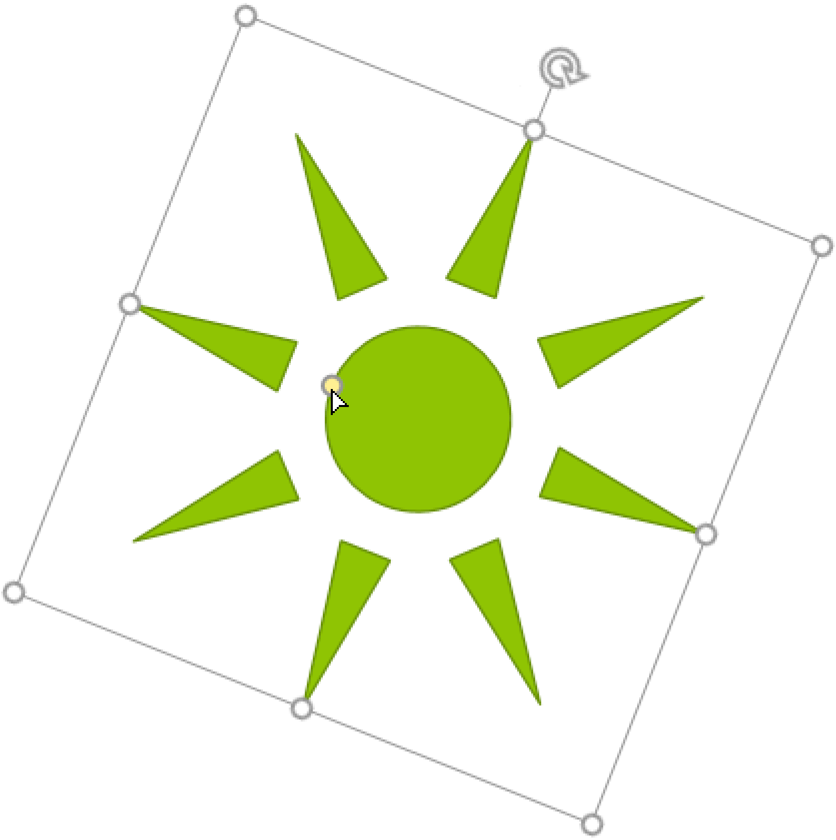
- **Sizing handles**: Click and drag the **sizing handles** until the shape or text box is the desired size. You can use the corner sizing handles to change the **height** and **width** at the same time.



- **Rotation handle**: Click and drag the **rotation** handle to rotate the shape.



- **Yellow handles**: Some shapes have one or more **yellow handles** that can be used to customize the shape. For example, with the sun shape, you can change the proportions of the shape.



In addition to resizing, customizing, and rotating shapes, you can align, order, and group them. To learn more, see our **Aligning, Ordering, and Grouping Objects** lesson.

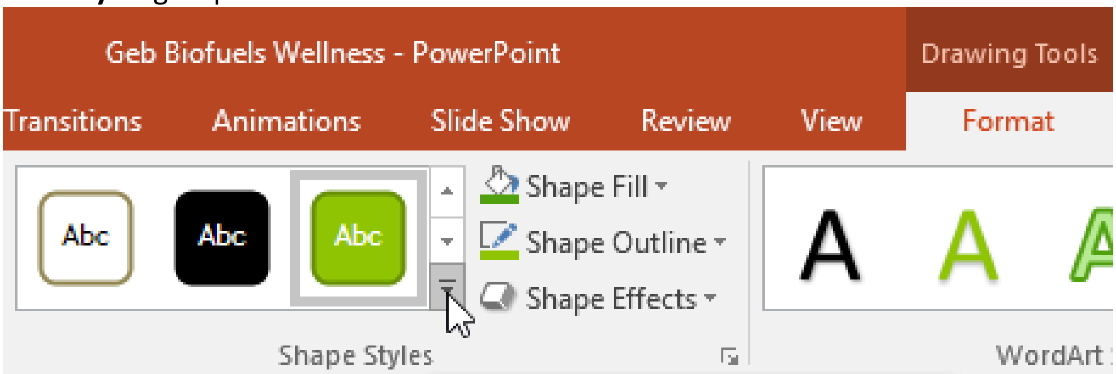
11.3 Formatting shapes and text boxes

PowerPoint allows you to modify shapes and text boxes in a variety of ways so you can tailor them to your projects. You can **change** shapes and text boxes into **different shapes**, **format their style and color**, and add **effects**.

To change the shape style:

Choosing a **shape style** allows you to apply preset colors and effects to quickly change the appearance of your shape or text box. These options will depend on the colors that are part of your current theme.

1. Select the shape or text box you want to change.
2. On the **Format** tab, click the **More** drop-down arrow in the **Shape Styles** group.

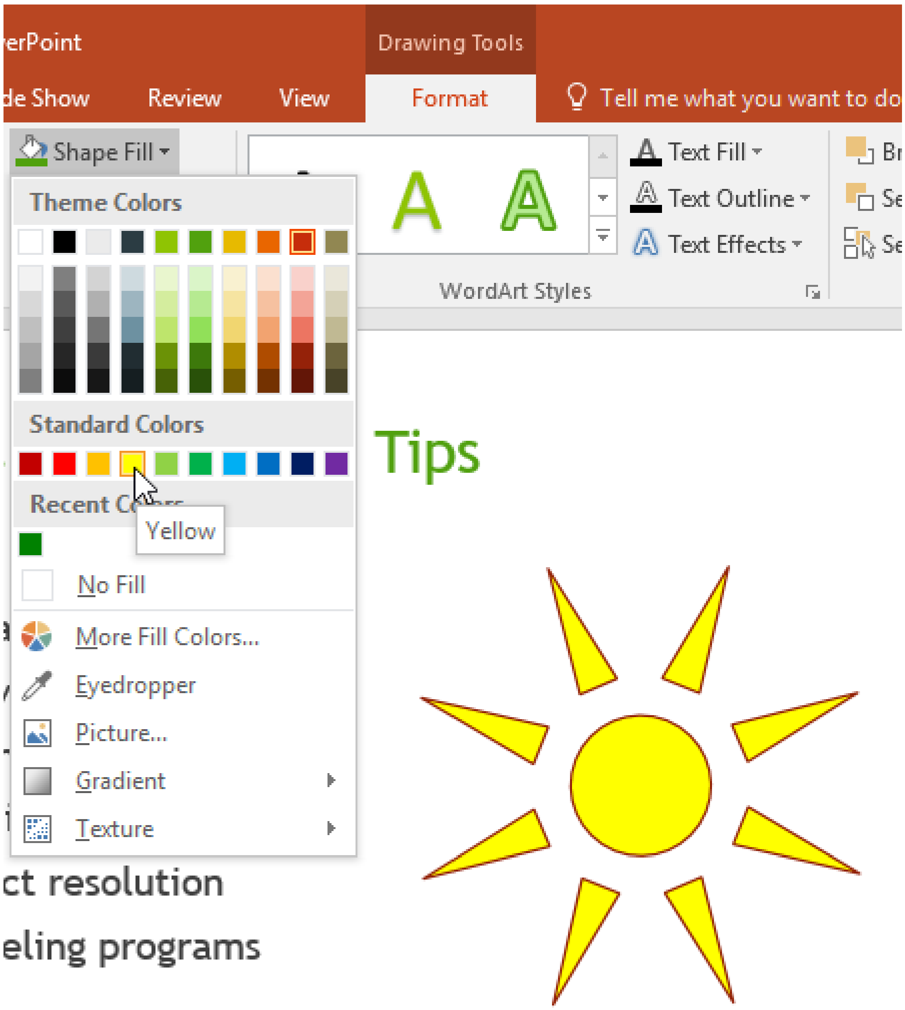



3. A drop-down menu of styles will appear. Select the **style** you want to use.


4. The shape or text box will appear in the selected style.

11.4 To change the shape fill color:

1. Select the shape or text box you want to change.
2. On the **Format** tab, click the **Shape Fill** drop-down arrow. The **Shape Fill** menu appears.
3. Move the mouse over the various colors. Select the **color** you want to use. To view more color options, select **More Fill Colors**.

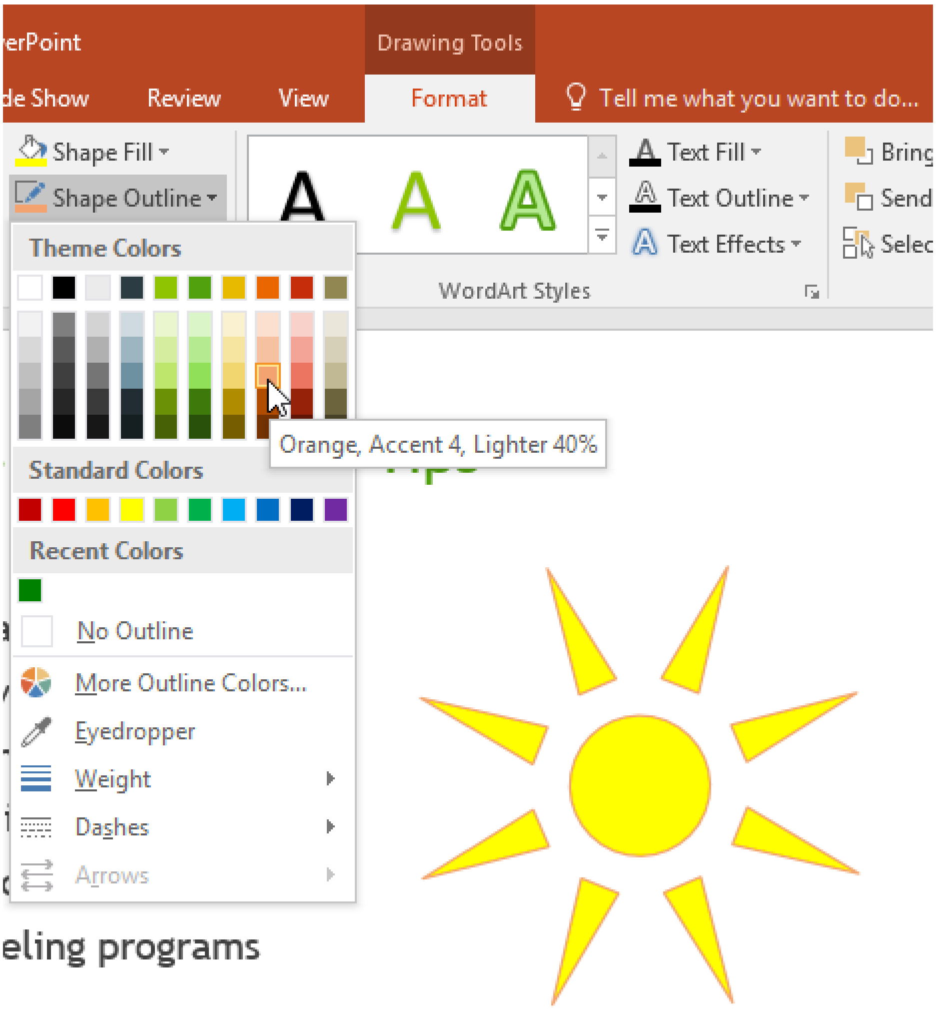



4. The shape or text box will appear in the selected color.

If you want to use a different type of fill, select **Gradient** or **Texture** from the drop-down menu. You can also select **No Fill** to make it transparent.

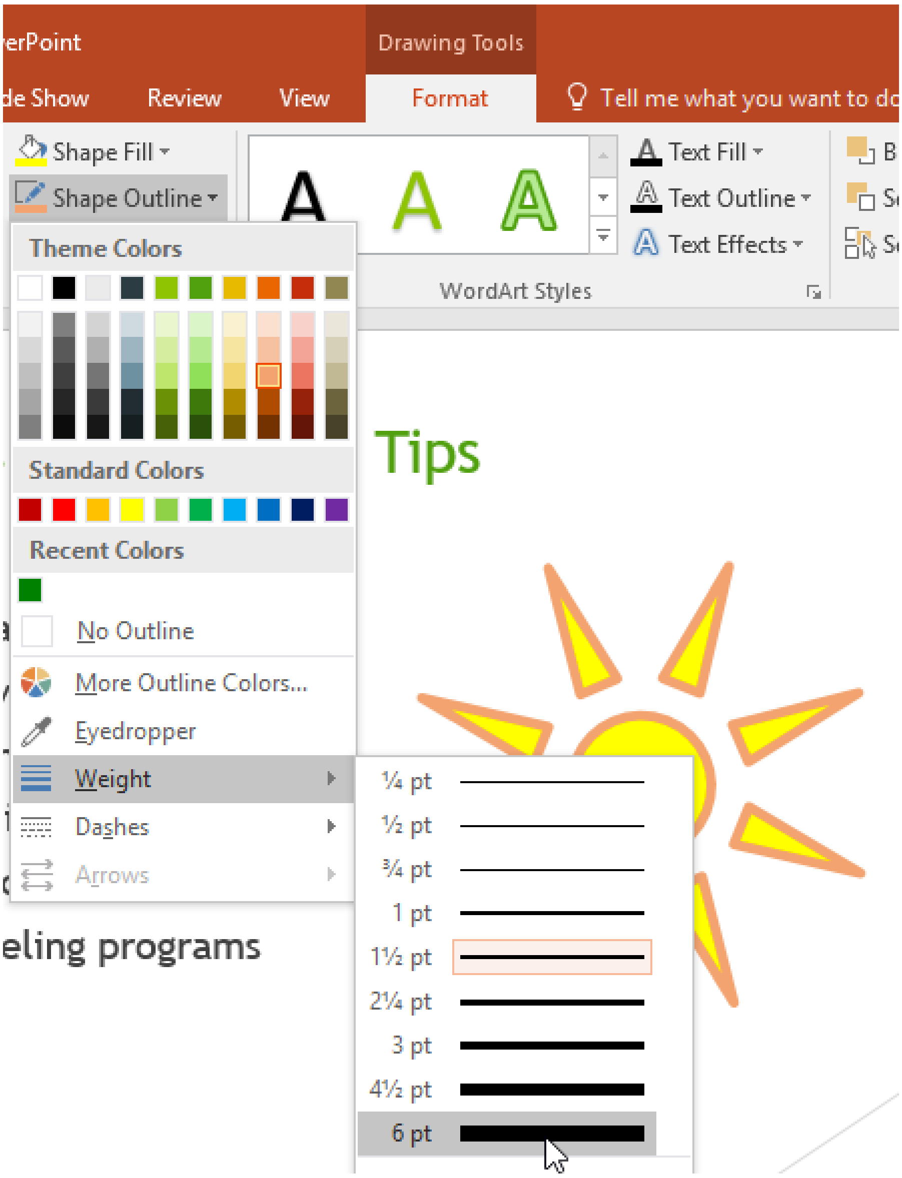
11.5 To change the shape outline:

1. Select the shape or text box you want to change.
2. On the **Format** tab, click the **Shape Outline** drop-down arrow. The **Shape Outline** menu will appear.
3. Select the **color** you want to use. If you want to make the outline transparent, select **No Outline**.



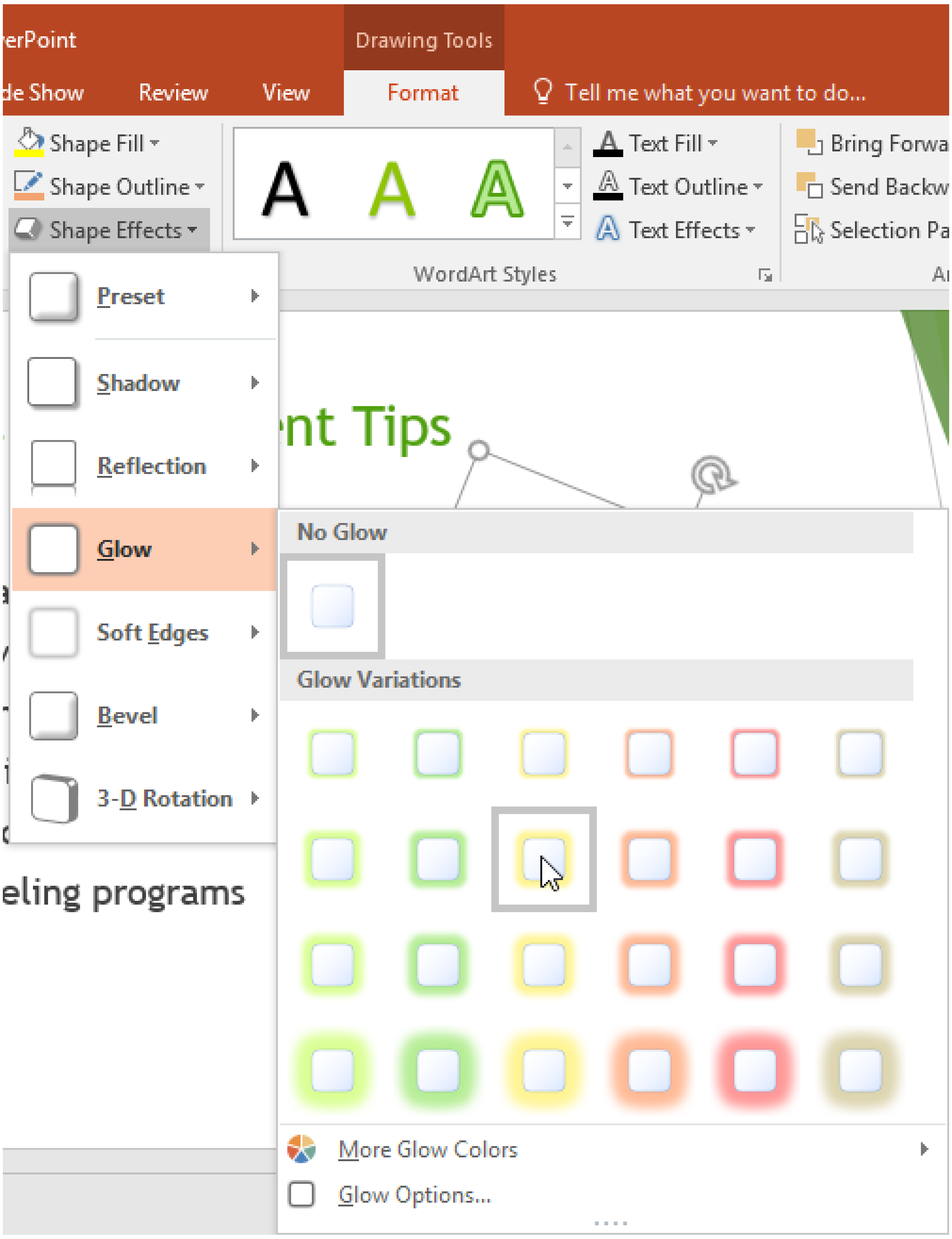

4. The shape or text box will appear in the selected outline color.

From the drop-down menu, you can change the outline **color**, **weight** (thickness), and whether it is a **dashed** line.



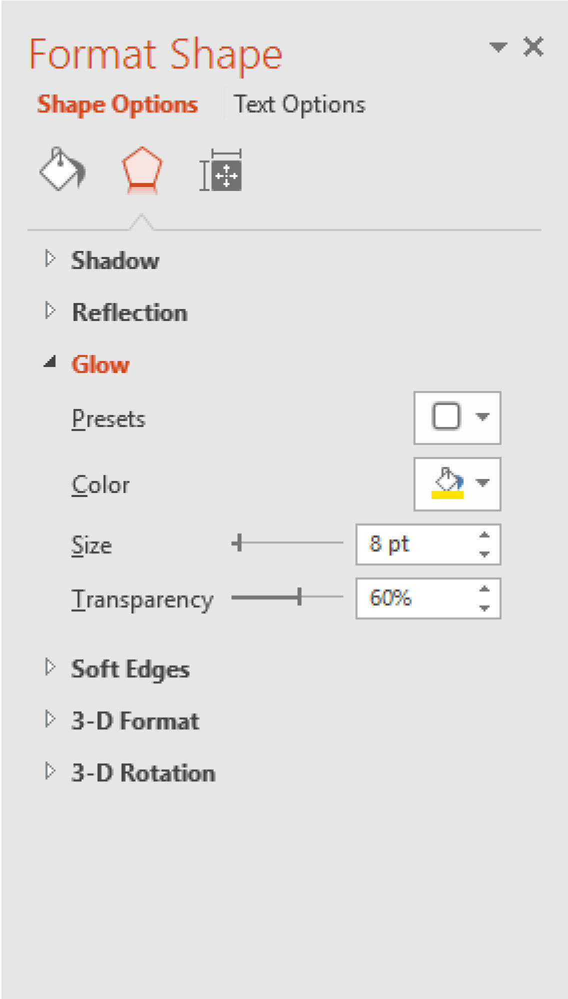

11.6 To add shape effects:

1. Select the shape or text box you want to change.
2. On the **Format** tab, click the **Shape Effects** drop-down arrow. In the menu that appears, hover the mouse over the style of effect you want to add, then select the desired preset effect.



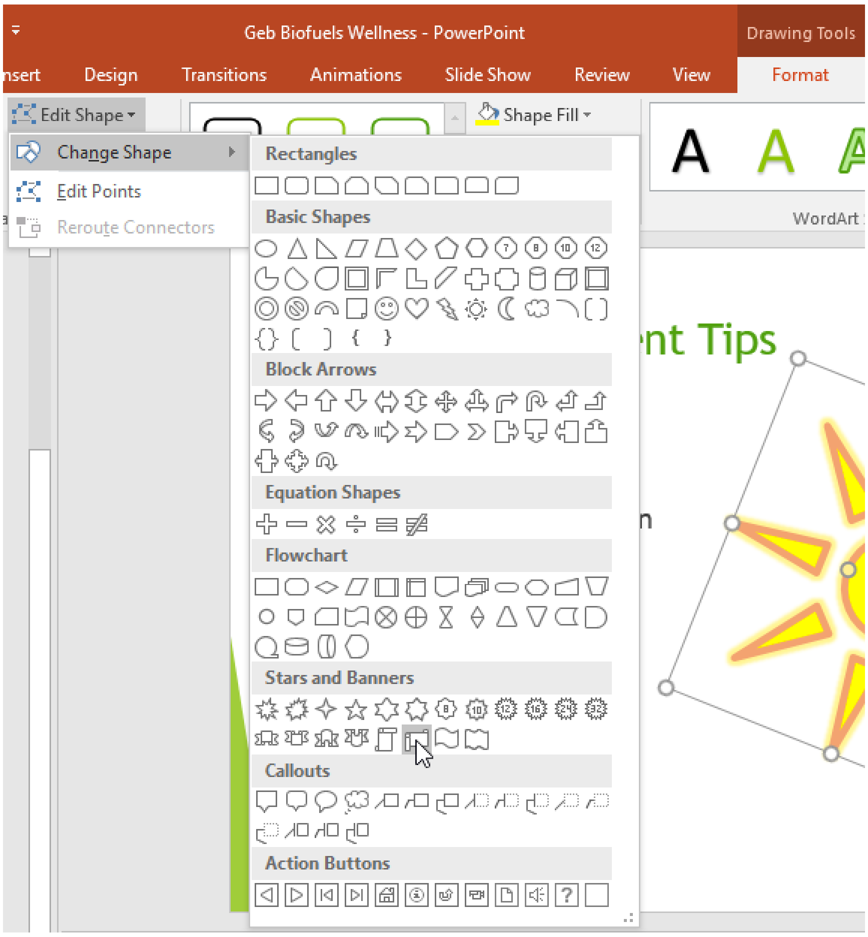

3. The shape will appear with the selected effect.

To further adjust your shape effects, select **Options** at the end of each menu. The Format Shape pane will appear, allowing you to customize the effects.



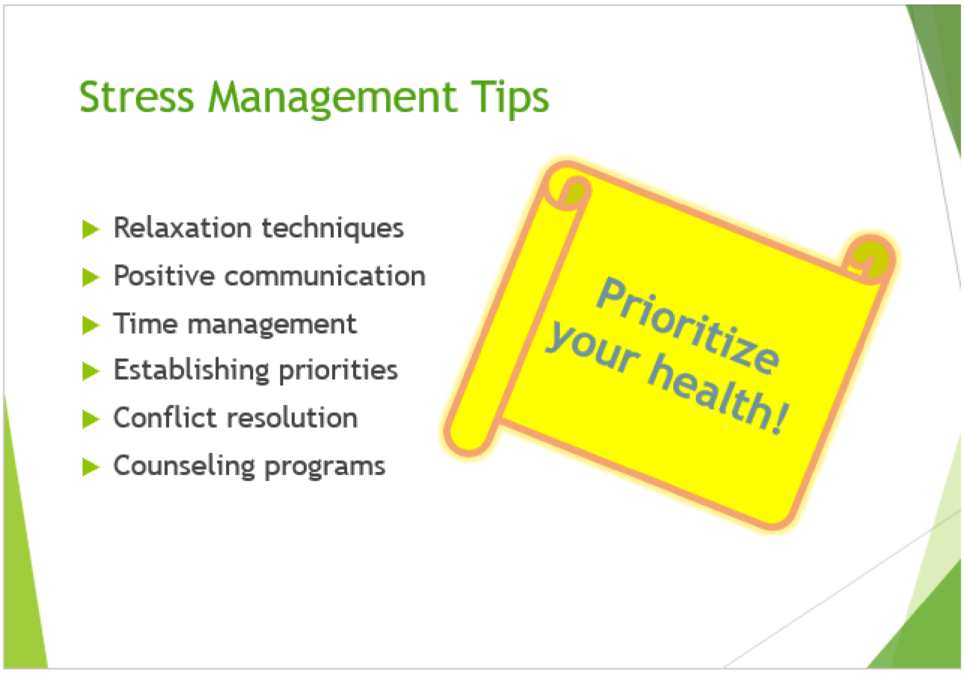

11.7 To change to a different shape:

1. Select the shape or text box you want to change. The **Format** tab will appear.
2. On the **Format** tab, click the **Edit Shape** command. In the menu that appears, hover the mouse over **Change Shape** and select the desired **shape**.




3. The new shape will appear.


If you want, you can enter text in a shape. When the shape appears in your document, you can simply begin typing. You can then use the **formatting options** on the **Home** tab to change the font, font size, or color of the text.




## Lesson 12: Aligning, Ordering, and Grouping Objects

In PowerPoint, each slide may have multiple items, such as pictures, shapes, and text boxes. You can arrange the objects the way you want by aligning, ordering, grouping, and rotating them in various ways.

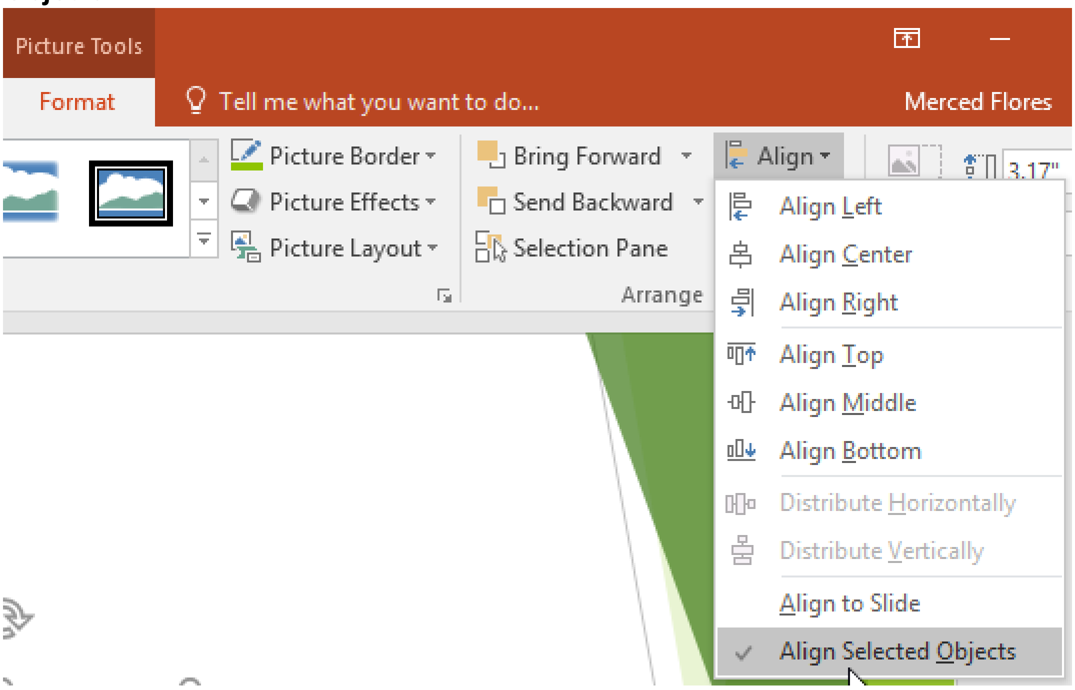
### 12.1 Aligning objects

When you move objects in PowerPoint, **alignment guides** and **spacing guides** will appear as dashed orange lines and arrows around the objects to help you align them. However, if you have many different objects on a slide, it may be difficult and time consuming to get them perfectly aligned. Luckily, PowerPoint provides you with several alignment commands that allow you to **easily arrange** and position objects.

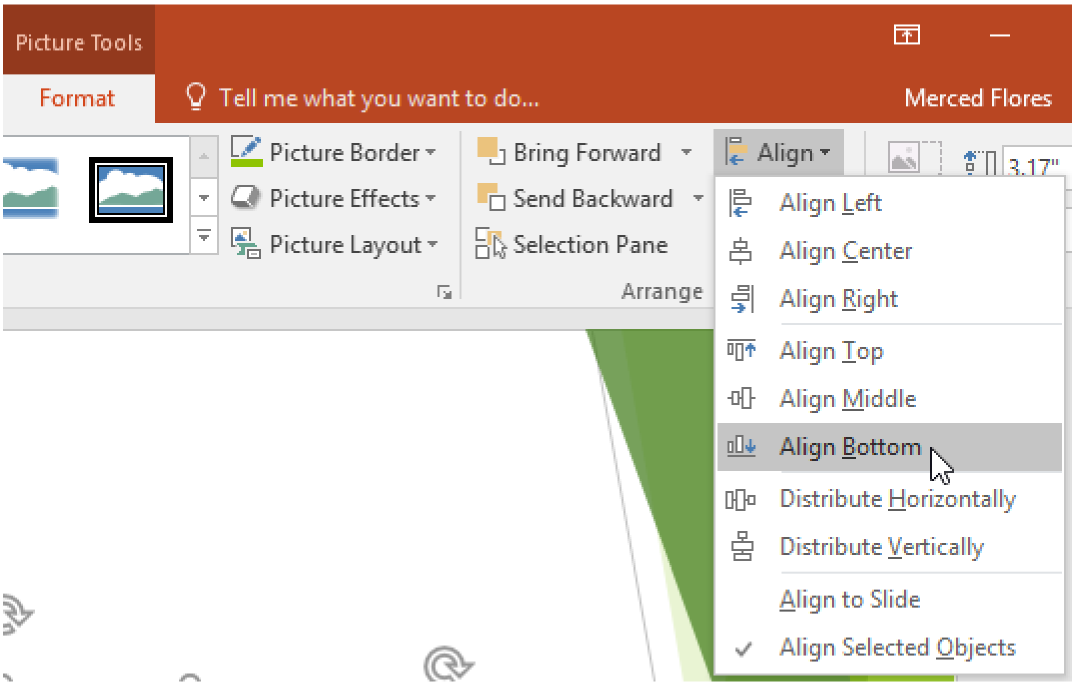
To align two or more objects:

1. Select the objects you want to align. To select multiple objects at once, hold the Shift key while you click. The **Format** tab will appear.

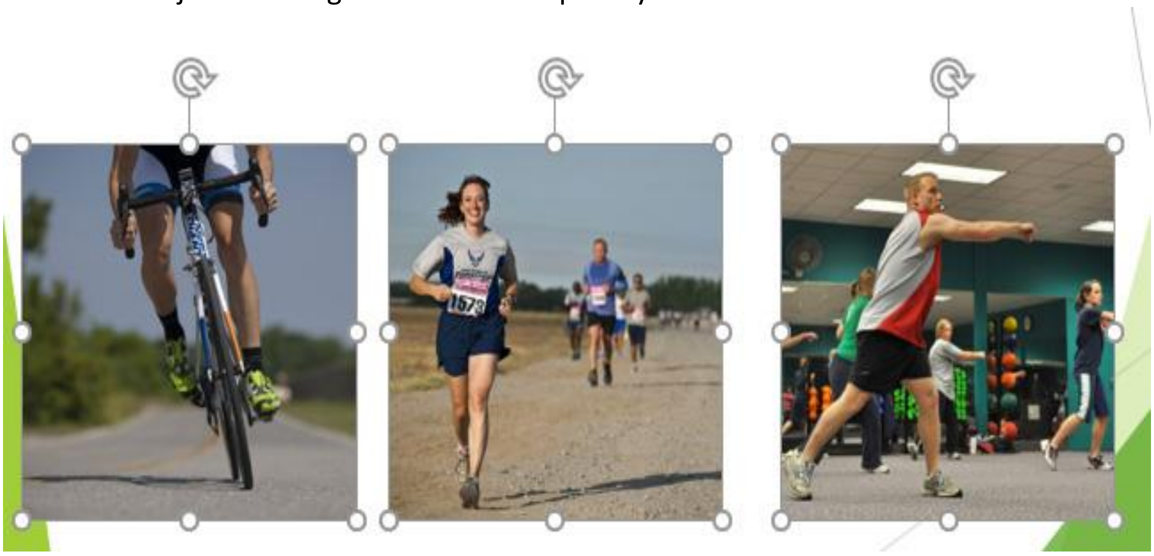
2. From the **Format** tab, click the **Align** command, then select **Align Selected Objects**.




3. Click the **Align** command again, then select one of the six **alignment options**.



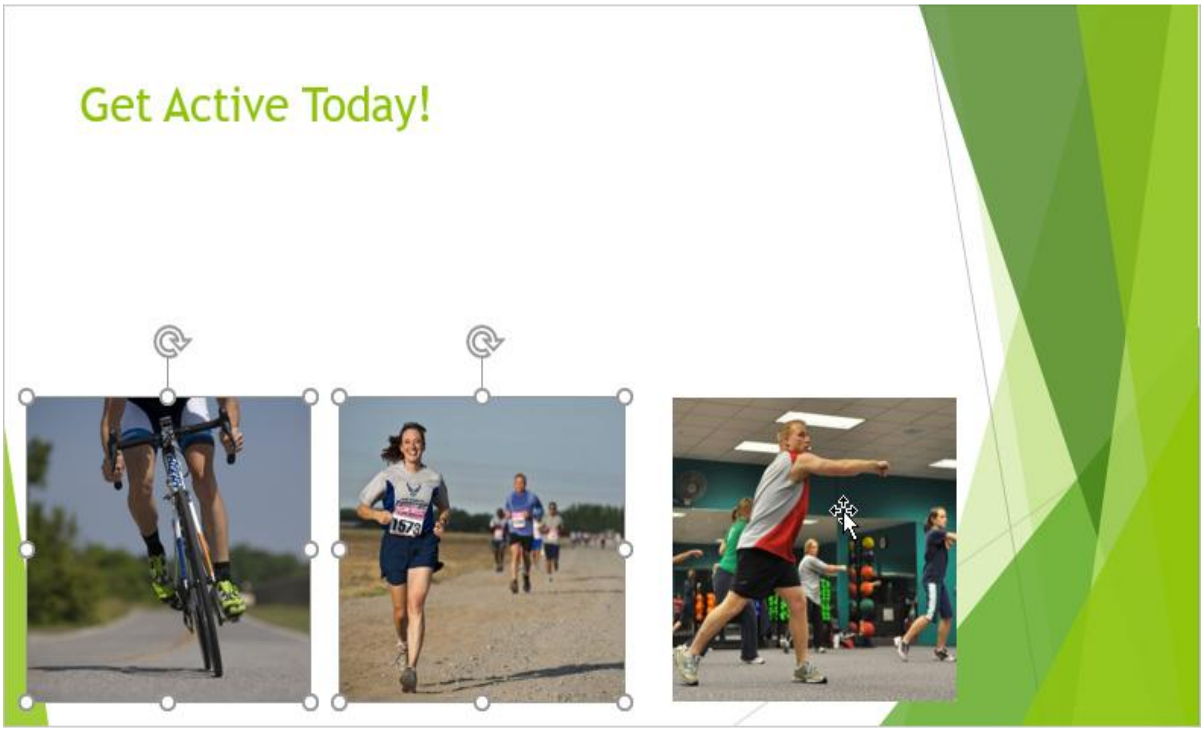

4. The objects will align based on the option you selected.



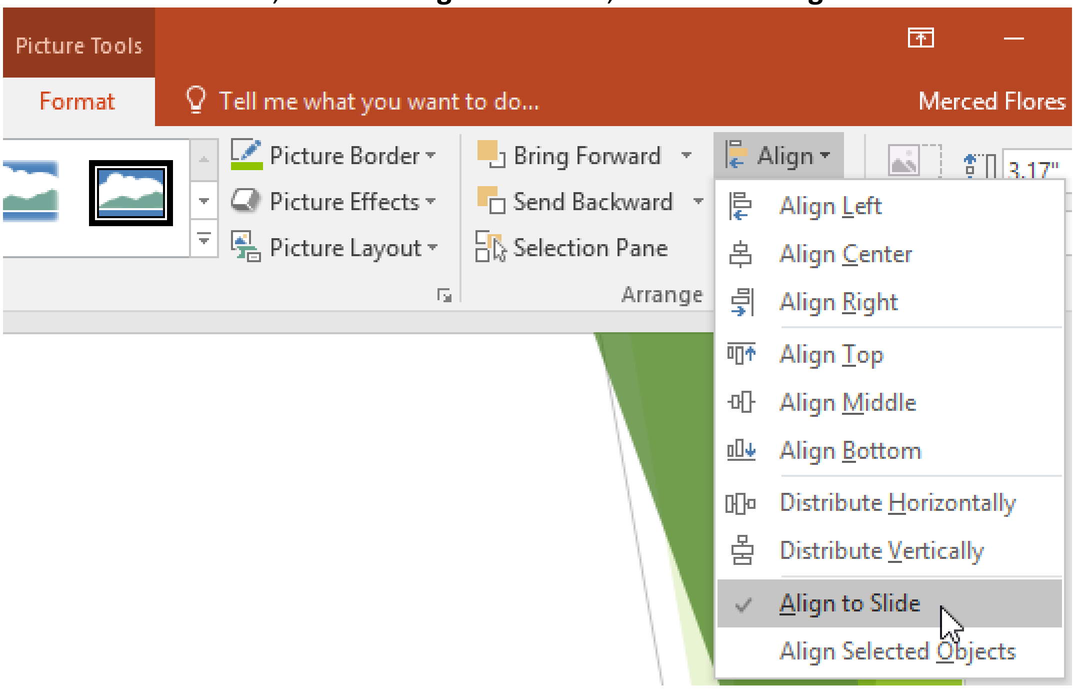
To align objects to the slide:

Sometimes you may want to align one or more objects to a **specific location within the slide**, such as at the top or bottom. You can do this by selecting the **Align to Slide** option before aligning the objects.

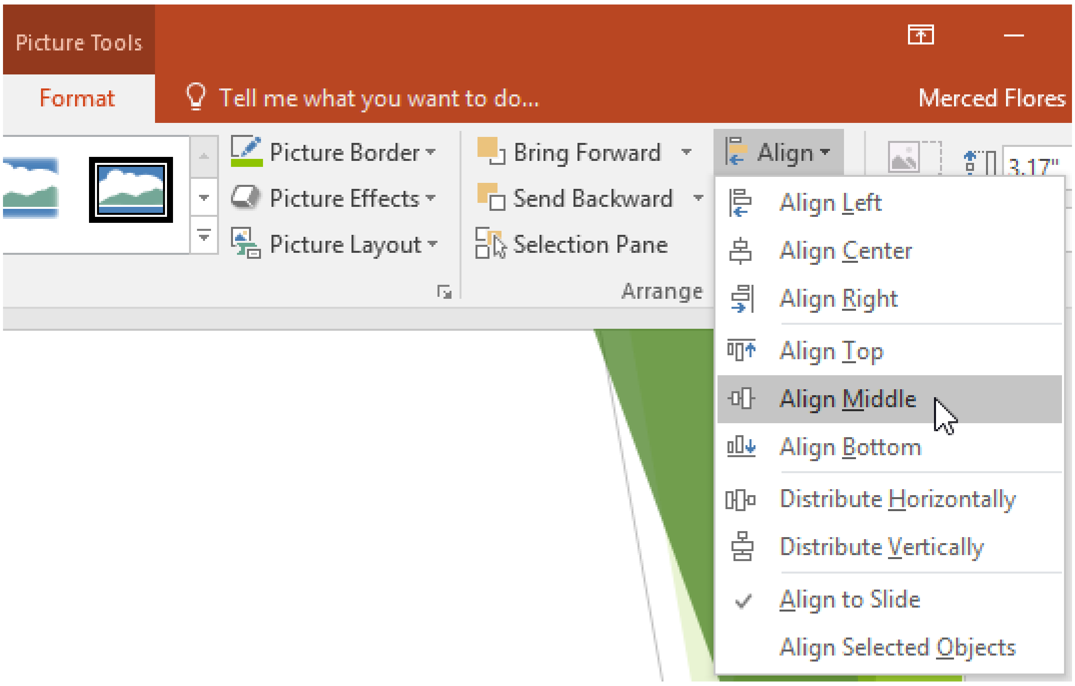
1. Select the objects you want to align. To select multiple objects at once, hold the Shift key while you click.



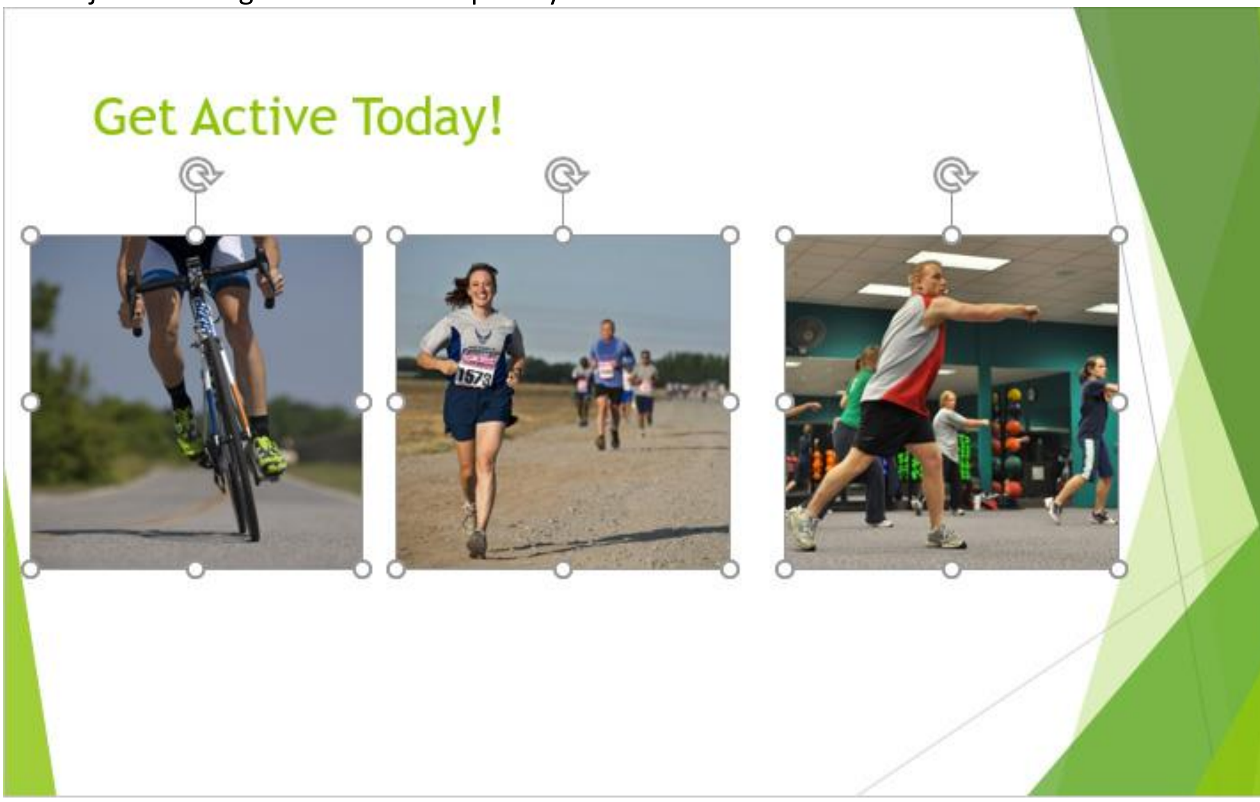

2. From the **Format** tab, click the **Align** command, then select **Align to Slide**.




3. Click the **Align** command again, then select one of the six **alignment options**.




4. The objects will align based on the option you selected.

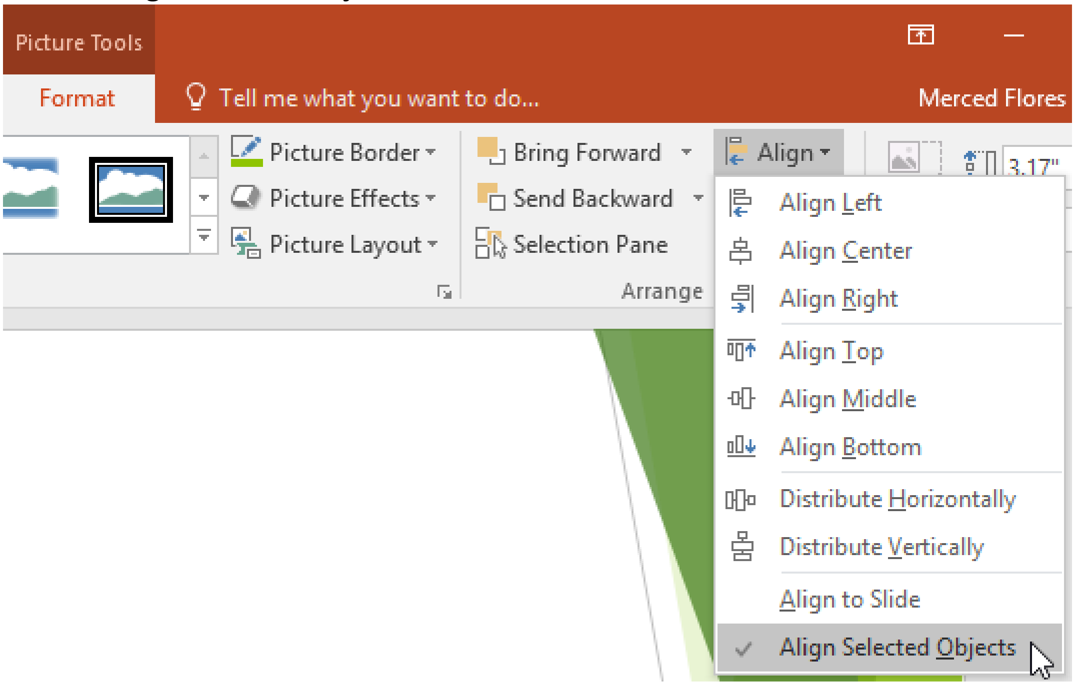



To distribute objects evenly:

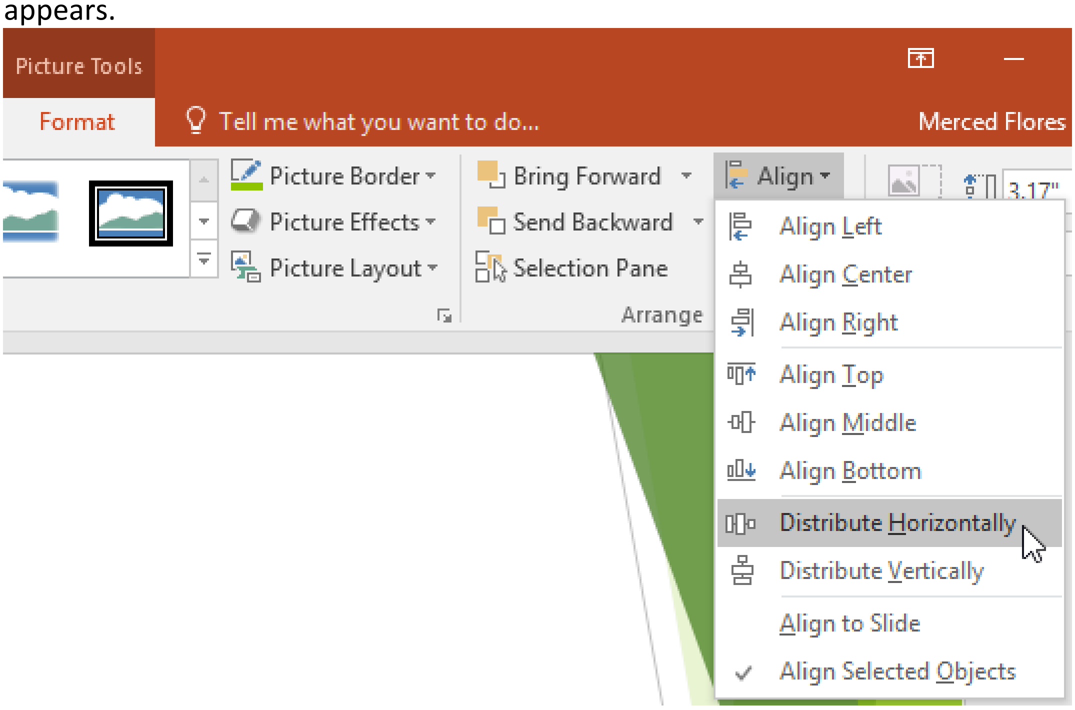
If you have arranged objects in a row or column, you may want them to be an **equal distance** from one another for a neater appearance. You can do this by **distributing the objects** horizontally or vertically.

1. Select the objects you want to align. To select multiple objects at once, hold the Shift key while you click.

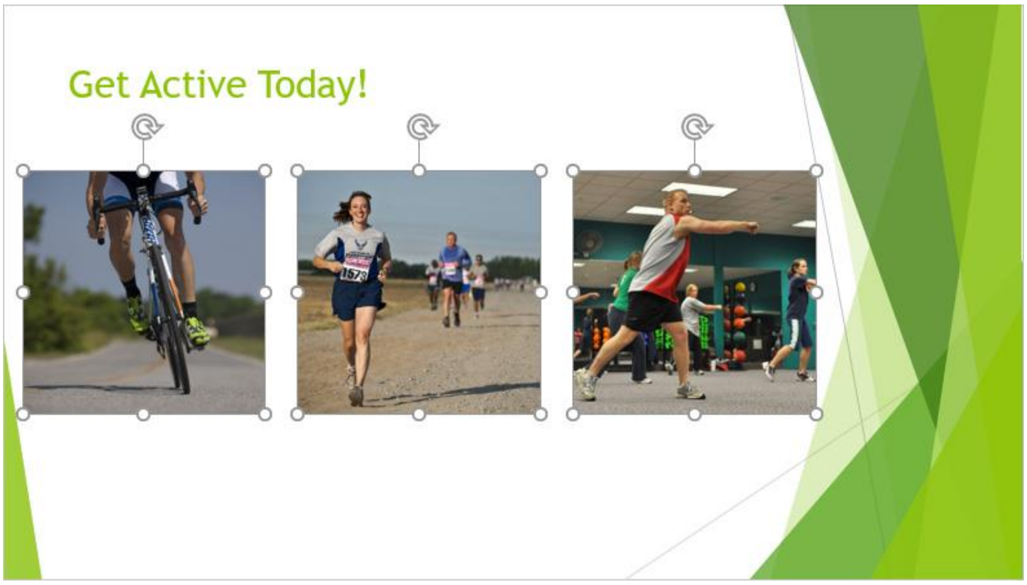
2. From the **Format** tab, click the **Align** command, then select **Align to Slide** or **Align Selected Objects**.




3. Click the **Align** command again, then select **Distribute Horizontally** or **Distribute Vertically** from the drop-down menu that appears.



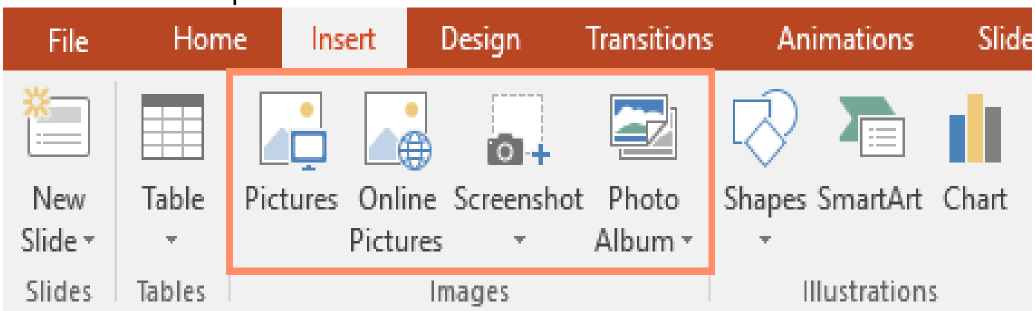

4. The objects will distribute evenly.




## 12.2 Grouping objects

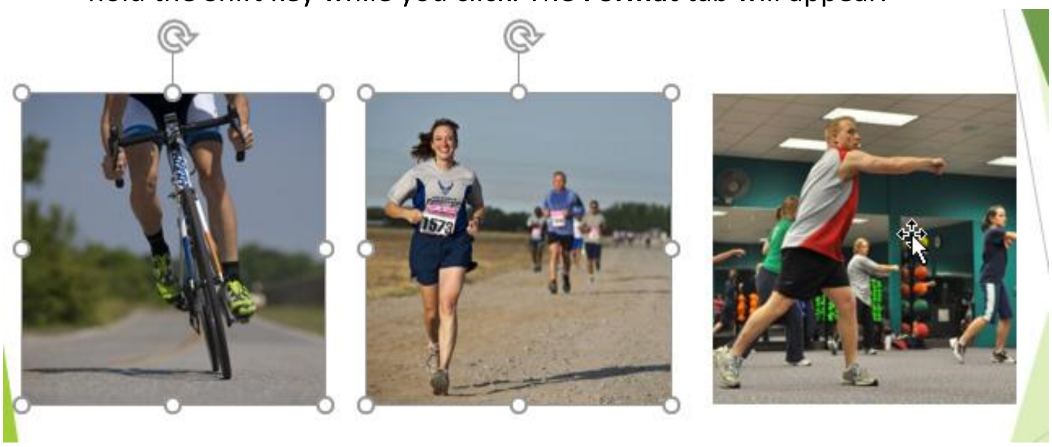
You may want to **group** multiple objects into **one object** so they will stay together if they are moved or resized. This is often easier than selecting all of the objects each time you want to move them.

Pictures, shapes, clip art, and text boxes can all be grouped;
however, **placeholders** cannot be grouped. If you will be grouping pictures, use one of the commands in the **Images** group on the **Insert** tab to insert pictures instead of the picture icon inside the placeholder.

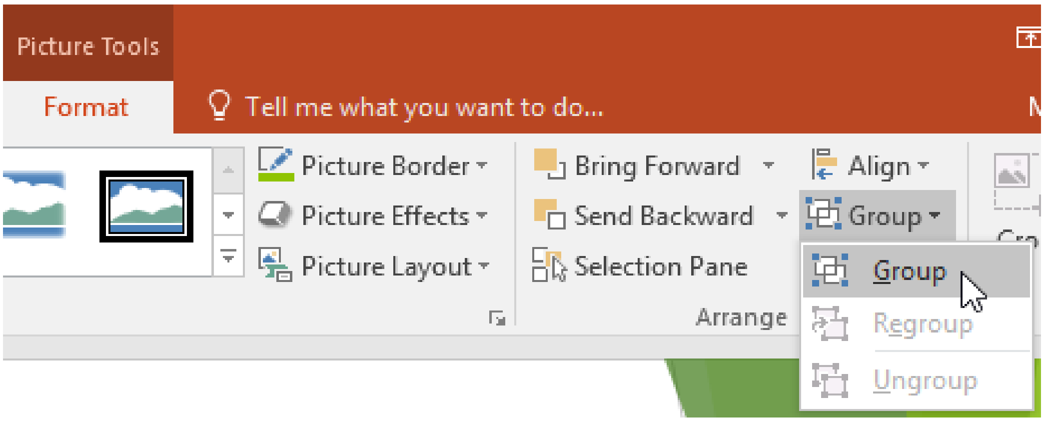



To group objects:

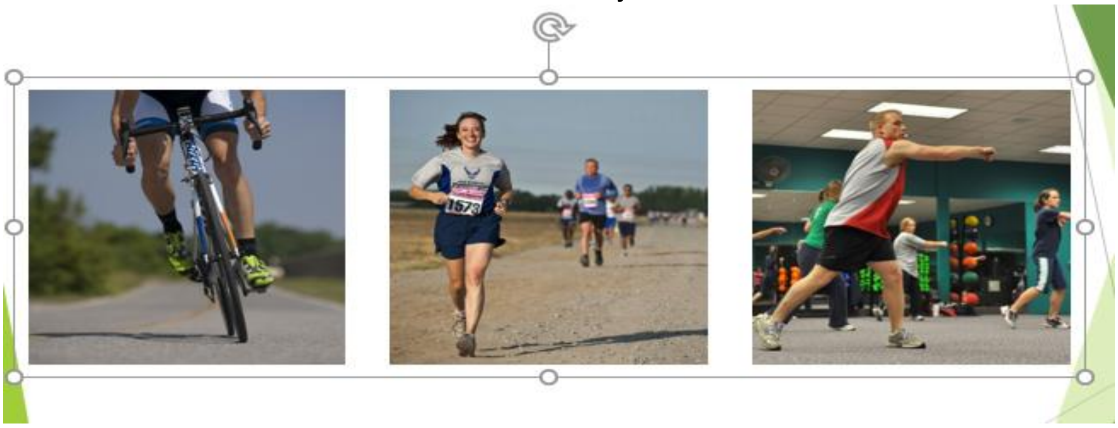
1. Select the objects you want to align. To select multiple objects at once, hold the Shift key while you click. The **Format** tab will appear.



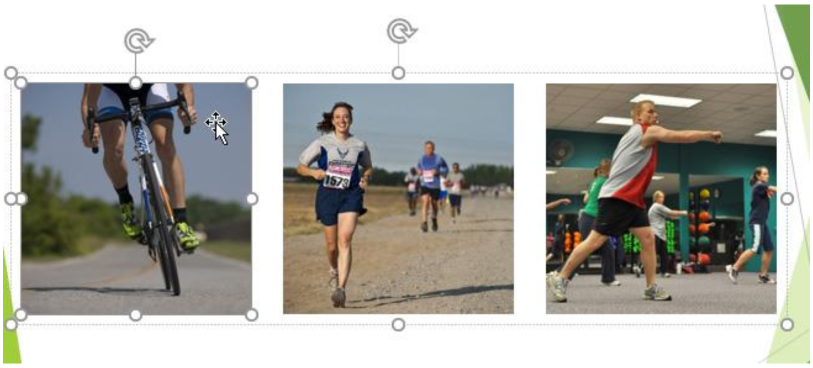
2. From the **Format** tab, click the **Group** command, then select **Group**.



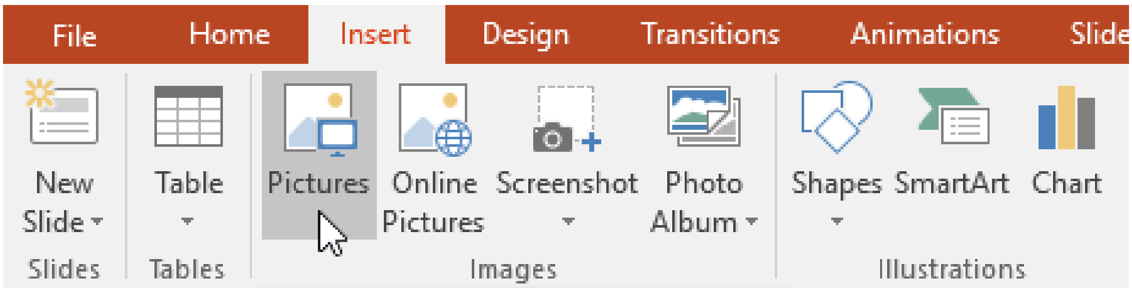

3. The selected objects will now be grouped. There will be a **single box with sizing handles** around the entire group to show that they are one group. You can now move or resize all of the objects at once.



If you want to edit or move one of the objects in the group, double-click to select the object. You can then edit it or move it to the desired location.

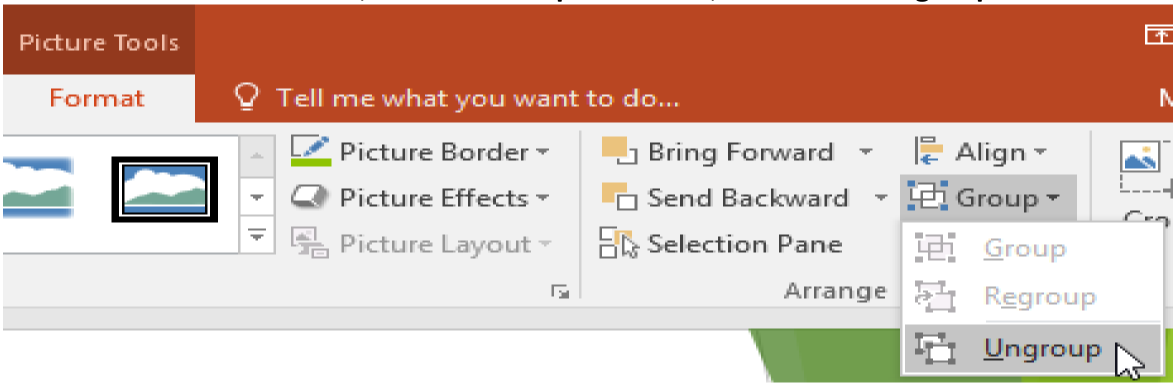


If you select the objects and the **Group** command is disabled, it may be because one of the objects is inside a **placeholder**. If this happens, try **reinserting** the images by using the **Pictures** command on the **Insert** tab.

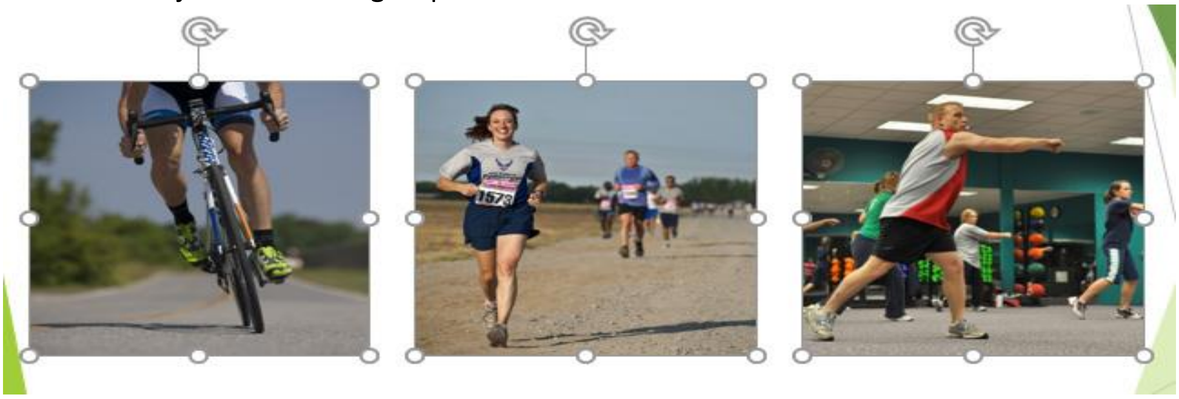


To ungroup objects:

1. Select the object group you want to ungroup.
2. From the **Format** tab, click the **Group** command, then select **Ungroup**.




3. The objects will be ungrouped.



## 12.3 Ordering objects

In addition to aligning objects, PowerPoint gives you the ability to **arrange objects** in a **specific order**. The ordering is important when two or more objects **overlap** because it will determine which objects are in the **front** or the **back**.

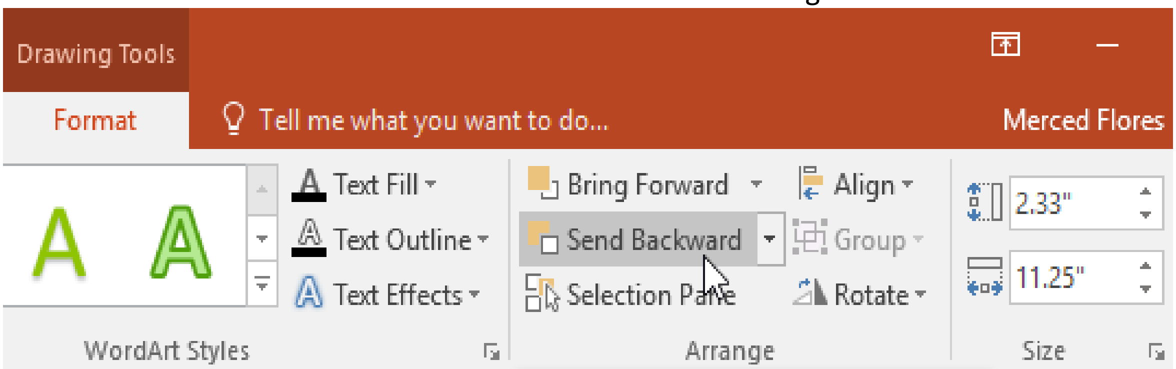
Understanding levels

When objects are inserted into a slide, they are placed on **levels** according to the **order** in which they were inserted into the slide. In our example, we've drawn an arrow on the top level, but we can **change the level** to put it behind the other objects.

**To change the ordering by one level:**

1. Select an object. The **Format** tab will appear.

2. From the **Format** tab, click the **Bring Forward** or **Send Backward** command to change the object's ordering by **one level**. If there are multiple objects on the slide, you may need to click the command **several times** to achieve the desired ordering.

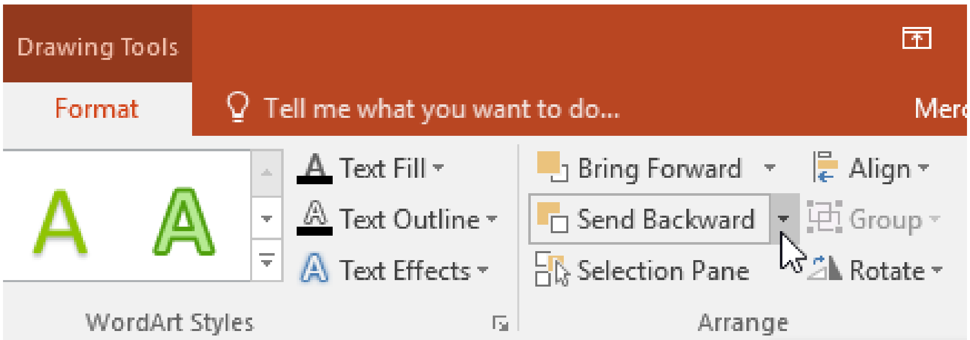



3. The objects will reorder.

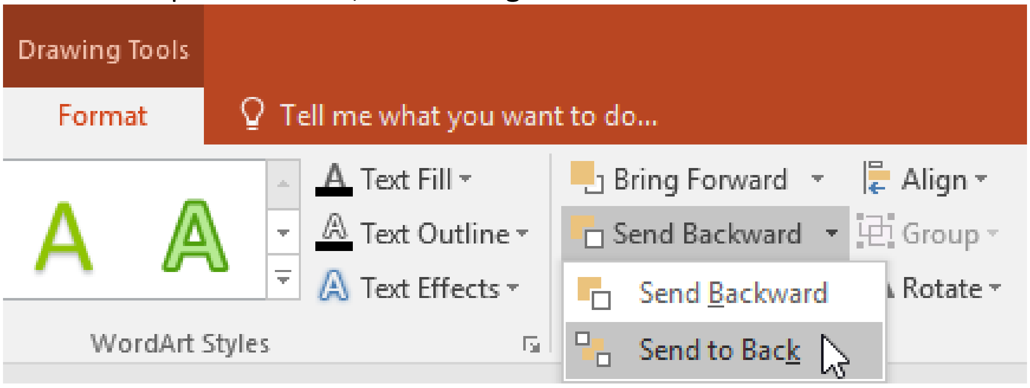
To bring an object to the front or back:

If you want to move an object behind or in front of several objects, it's usually faster to **bring it to front** or **send it to back** instead of clicking the ordering commands multiple times.

1. Select an object.
2. From the **Format** tab, click the **Bring Forward** or **Send Backward** drop-down arrow.

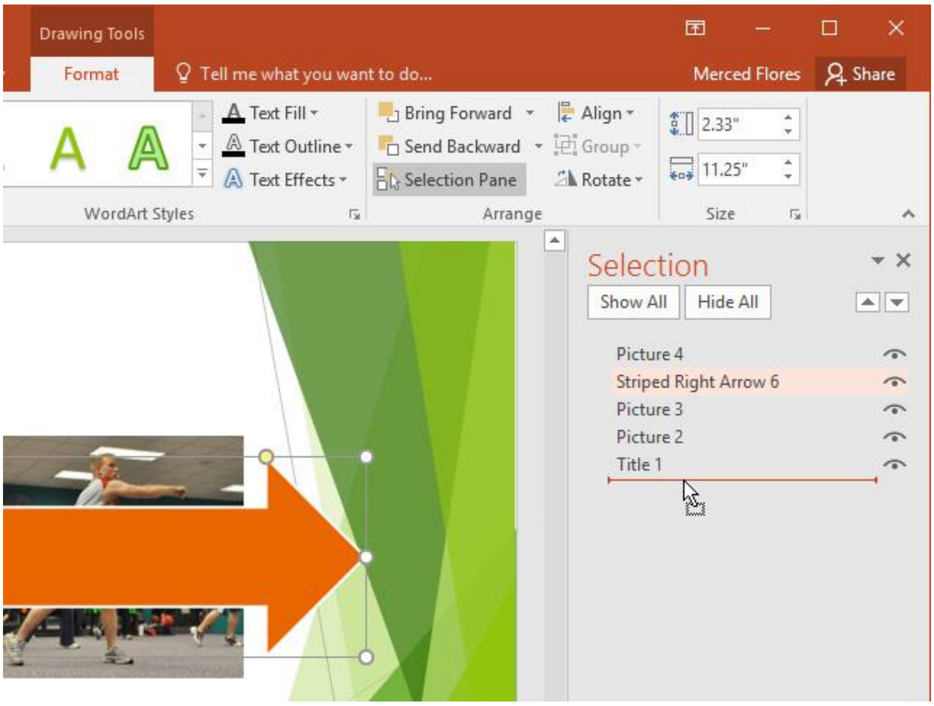



3. From the drop-down menu, select **Bring to Front** or **Send to Back**.




4. The objects will reorder.

If you have several objects placed on top of each other, it may be difficult to select an individual object. The **Selection pane** allows you to easily drag an object to a new location. To access the Selection pane, click **Selection Pane** on the **Format** Tab.

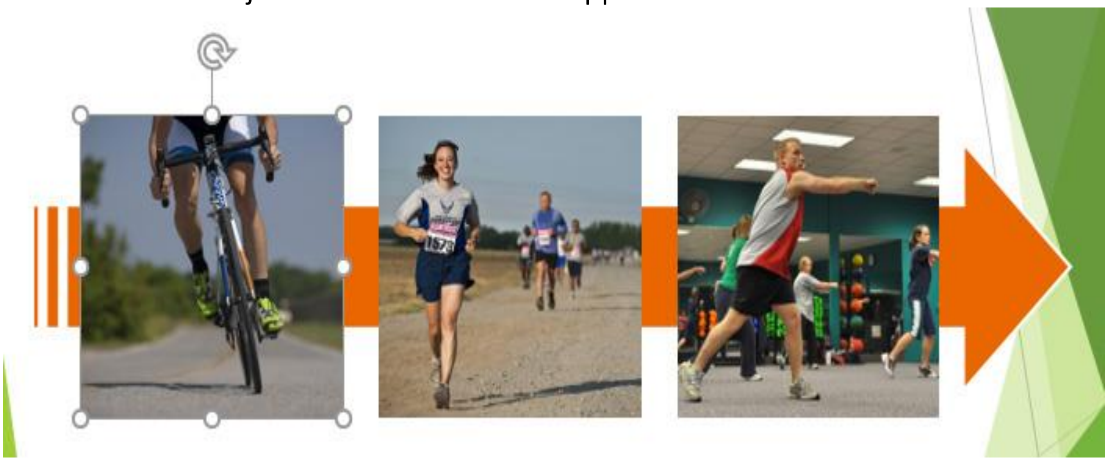



## Rotating objects

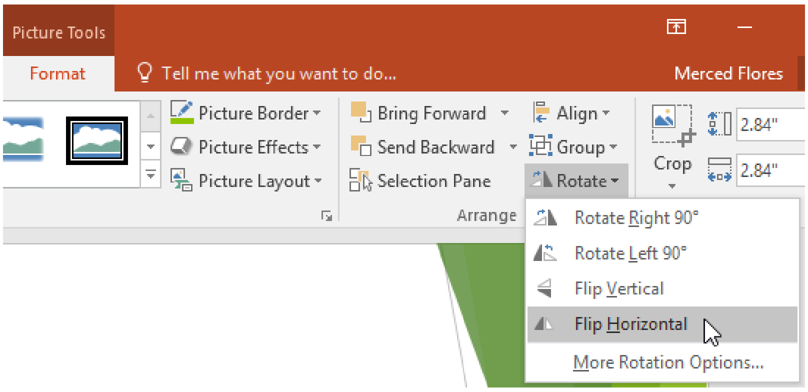
If you need to turn an object so it faces a different direction, you can **rotate it to the left or right** or **flip it horizontally or vertically**.

To rotate an object:

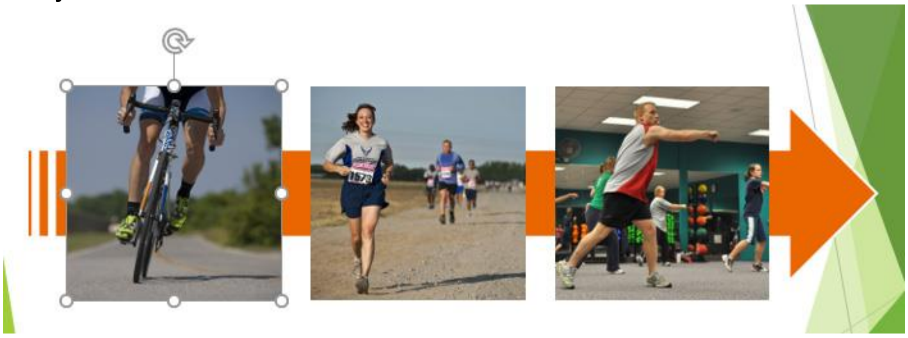
1. Select an object. The Format tab will appear.



2. From the **Format** tab, click the **Rotate** command. A drop-down menu will appear.
3. Select the desired **rotation option**.




4. The object will rotate.



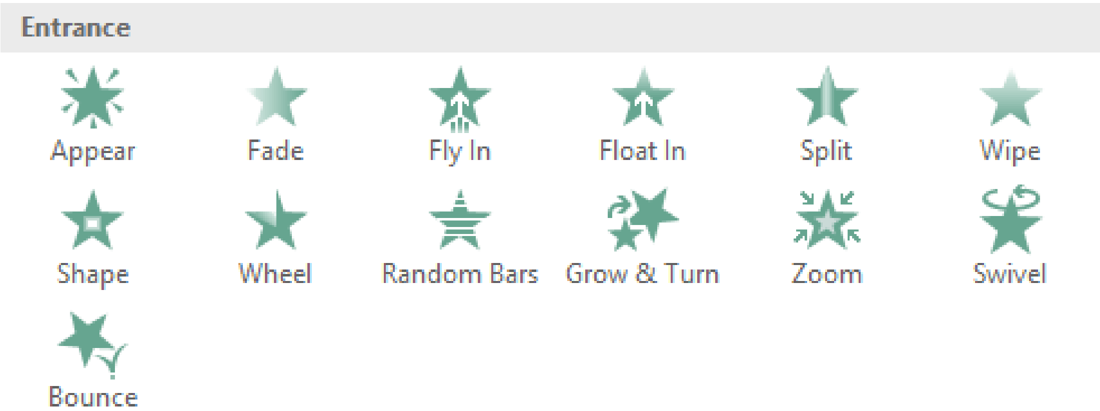
## Lesson 13: Animating Text and Objects

In PowerPoint, you can animate text and objects such as clip art, shapes, and pictures. Animation—or movement—on the slide can be used to draw the audience's attention to specific content or to make the slide easier to read.

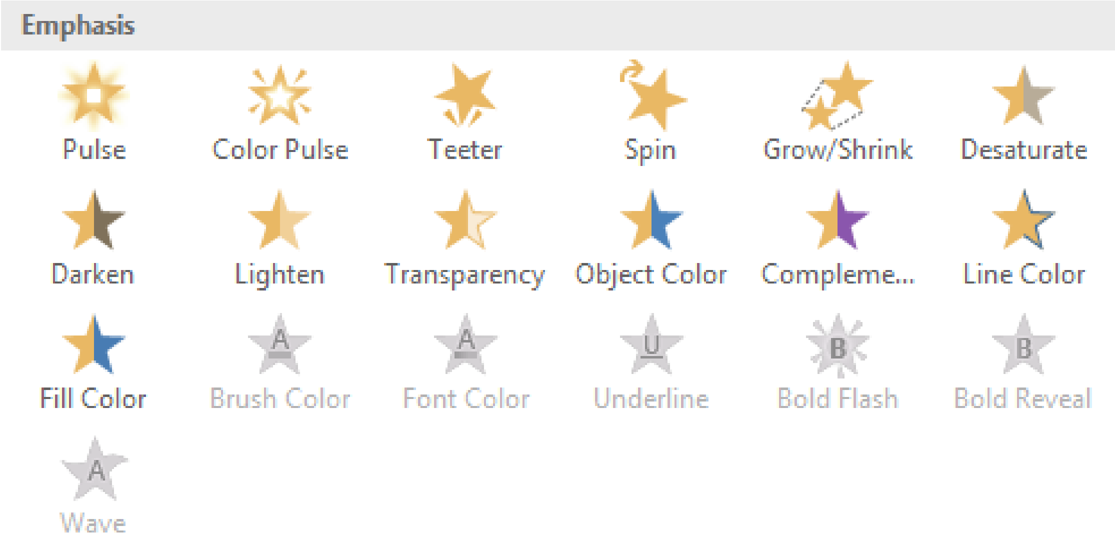
### 13.1 The four types of animations

There are several animation affects you can choose from, and they are organized into four types.

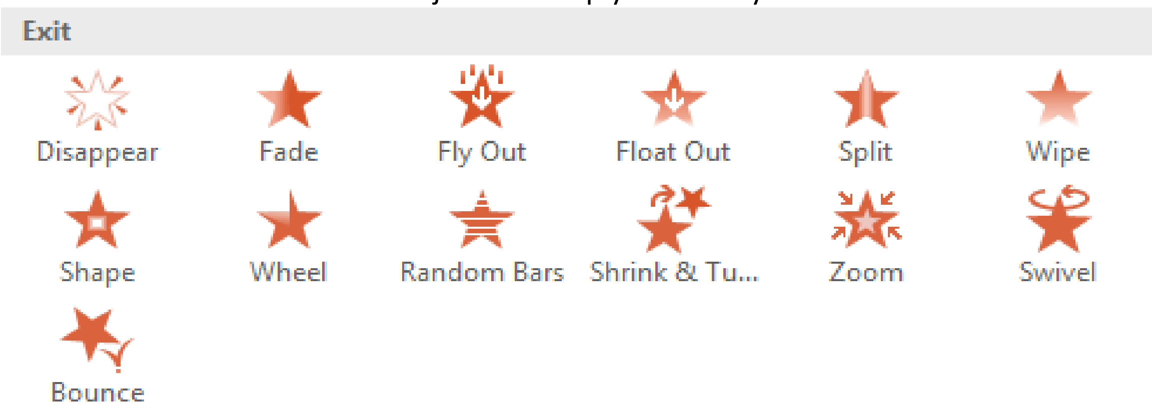
- **Entrance:** These control how the object enters the slide. For example, with the **Bounce** animation the object will "fall" onto the slide and then bounce several times.



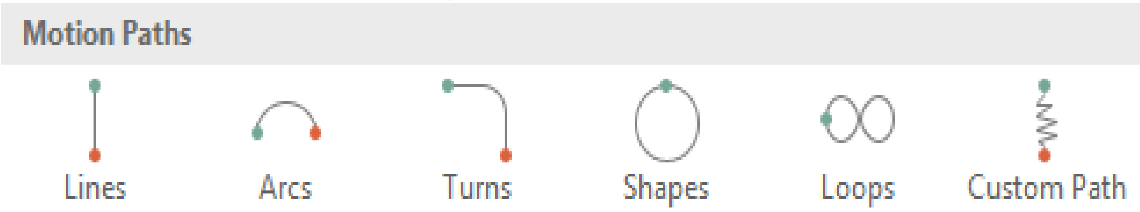

- **Emphasis:** These animations occur while the object is on the slide, often triggered by a **mouse click**. For example, you can set an object to **spin** when you click the mouse.




- **Exit:** These control how the object exits the slide. For example, with the **Fade** animation the object will simply fade away.

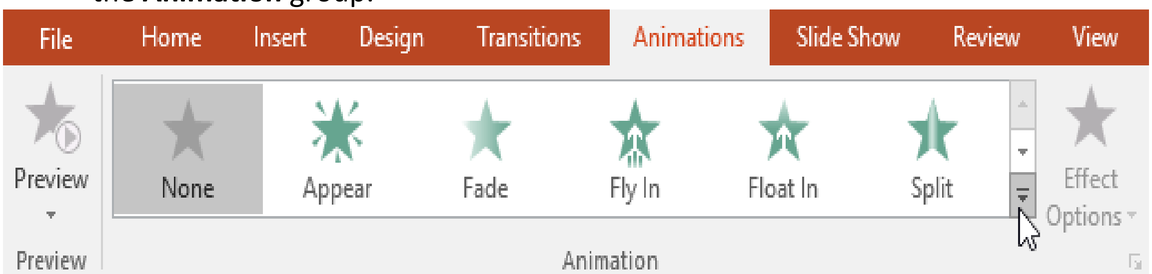



- **Motion Paths:** These are similar to **Emphasis** effects, except the object moves within the slide along a predetermined path, like a **circle**.

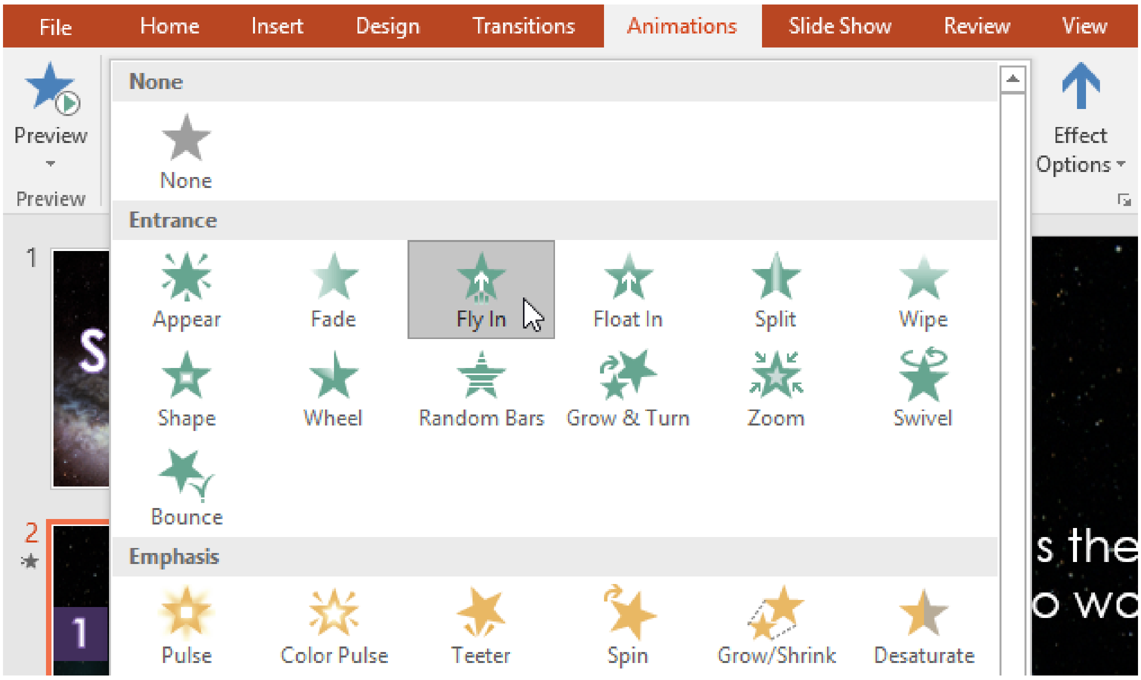



## 13.2 To apply an animation to an object:

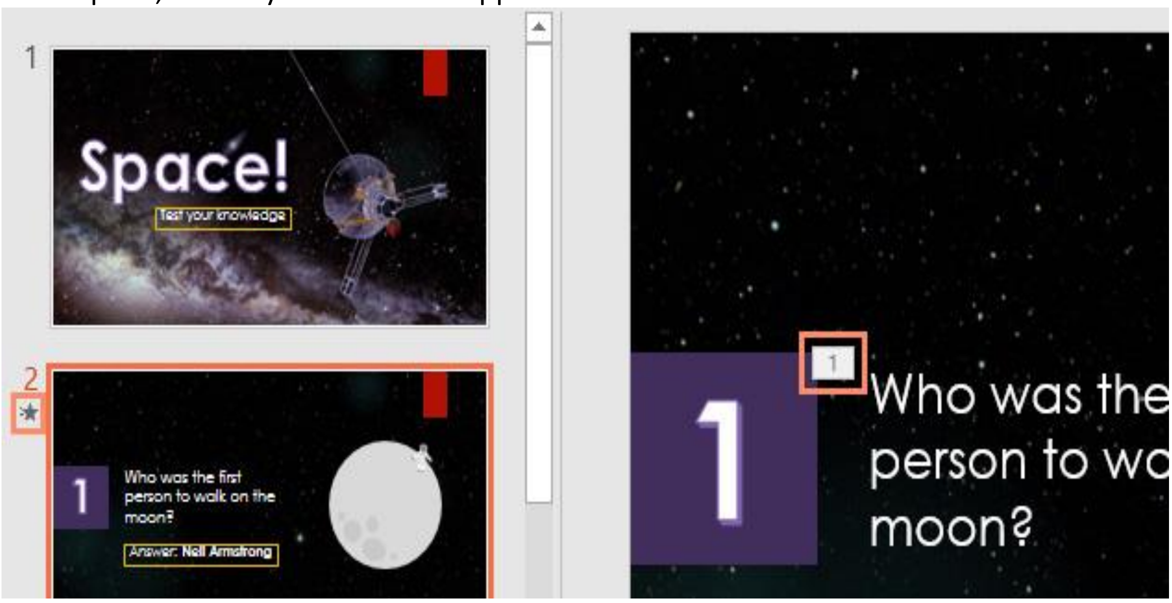
1. Select the object you want to animate.
2. On the **Animations** tab, click the More drop-down arrow in the **Animation** group.



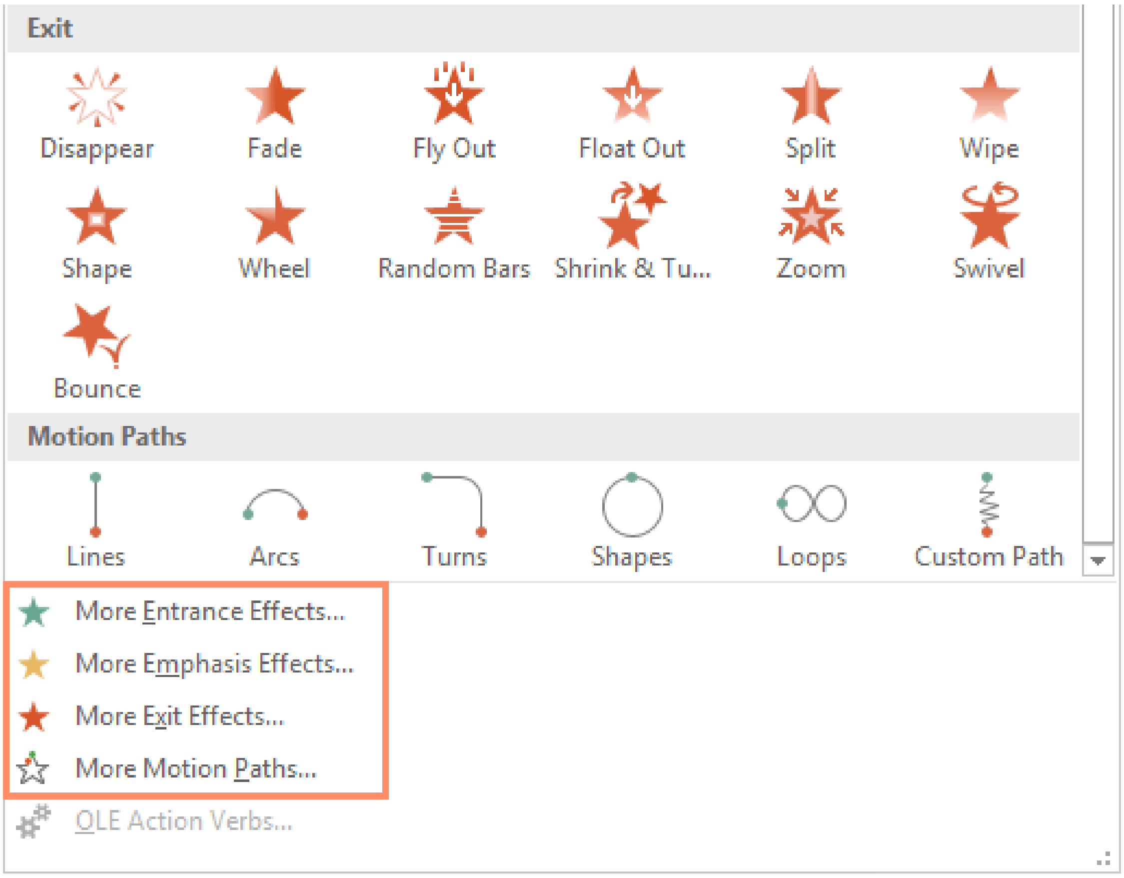
3. A drop-down menu of animation effects will appear. Select the desired effect.




4. The effect will apply to the object. The object will have a small **number** next to it to show that it has an animation. In the Slide pane, a **star** symbol also will appear next to the slide.

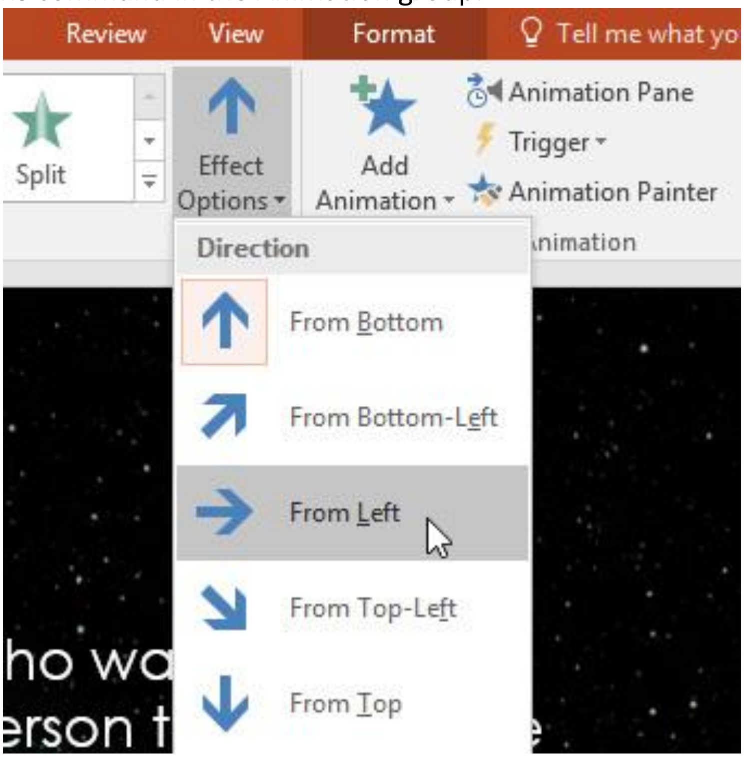



At the bottom of the menu, you can access even more effects.



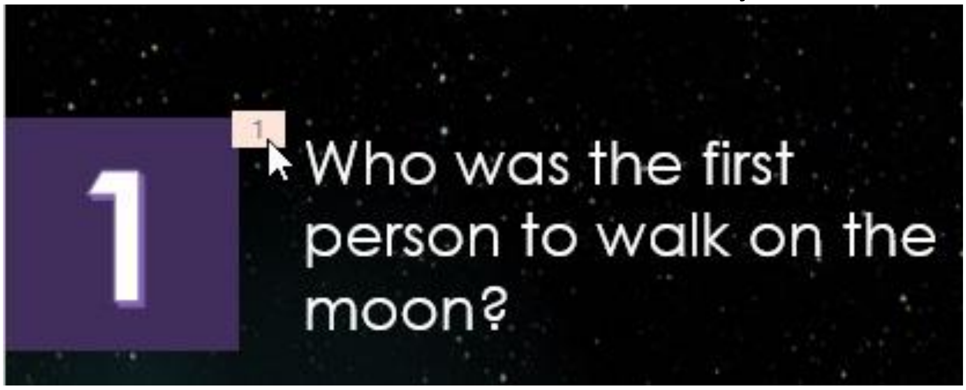

## 12.3 Effect options

Some effects will have **options** you can change. For example, with the **Fly In** effect you can control **which direction** the object comes from. These options can be accessed from the **Effect Options** command in the Animation group.



To remove an animation:

1. Select the small **number** located next to the animated object.




2. Press the **Delete** key. The animation will be deleted.

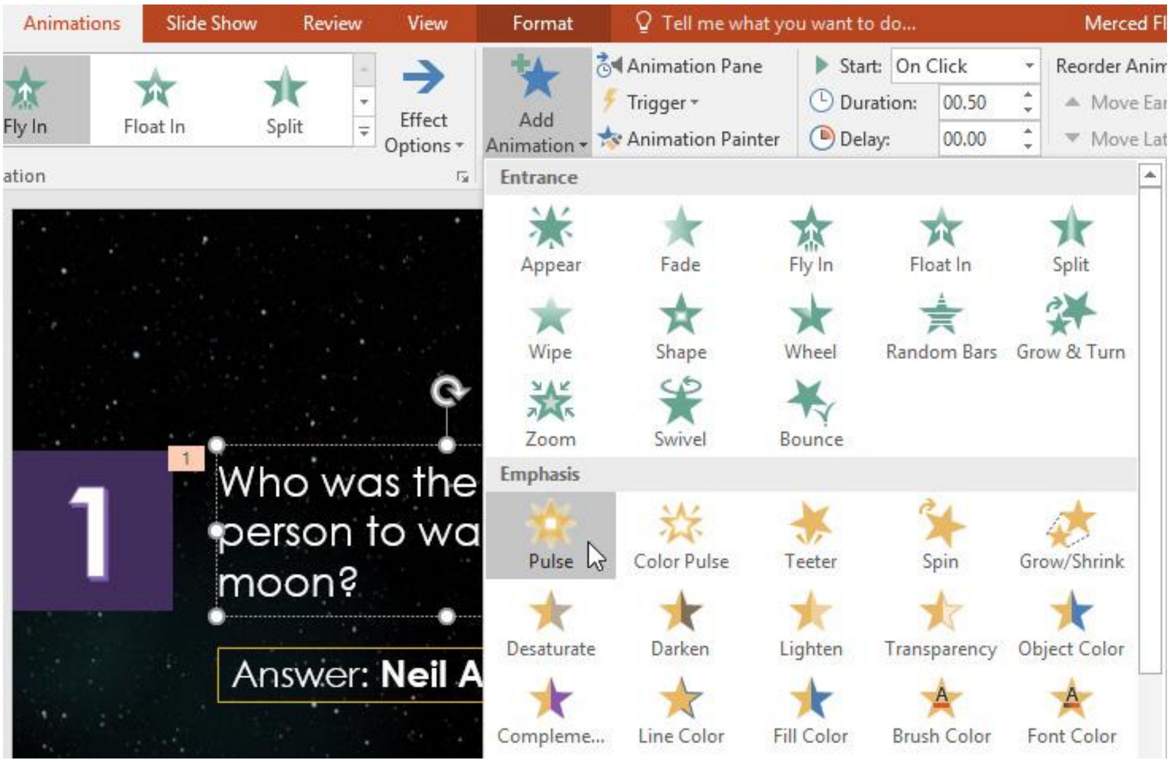
Animations are best used in moderation. Adding too many animations can make your presentation look a little silly and can even be distracting to your audience. Consider using mostly subtle animations, or not using animations at all.

## 12.4 Working with animations

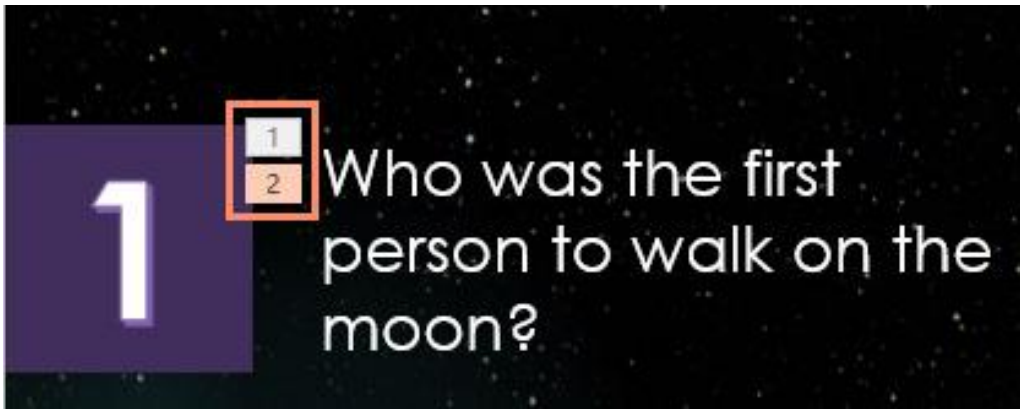
To add multiple animations to an object:

If you select a new animation from the the menu in the Animation group, it will **replace the object's current animation**. However, you'll sometimes want to place **more than one animation** on an object, like an **Entrance** and an **Exit** effect. To do this, you'll need to use the **Add Animation** command, which will allow you to keep your current animations while adding new ones.

1. Select an object.
2. Click the **Animations** tab.
3. In the **Advanced Animation** group, click the **Add Animation** command to view the available animations.
4. Select the desired animation effect.

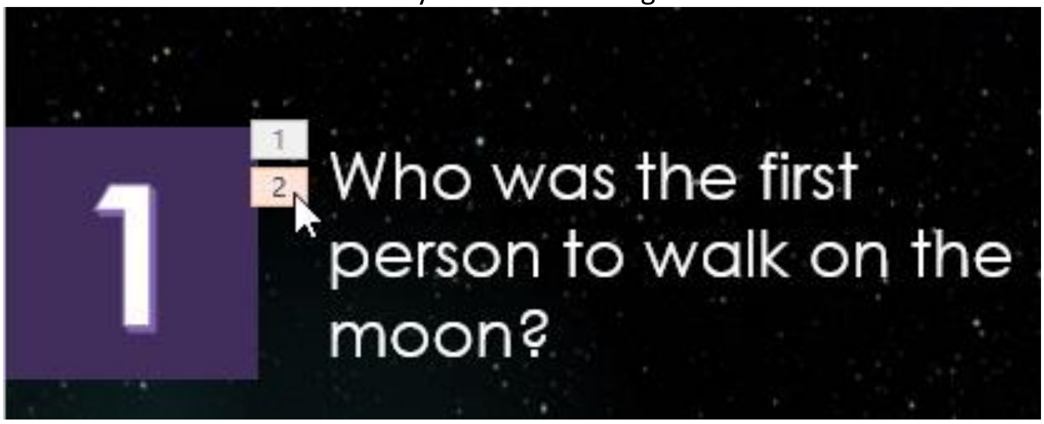



5. If the object has more than one effect, it will have a different **number** for each effect. The numbers indicate the **order** in which the effects will occur.

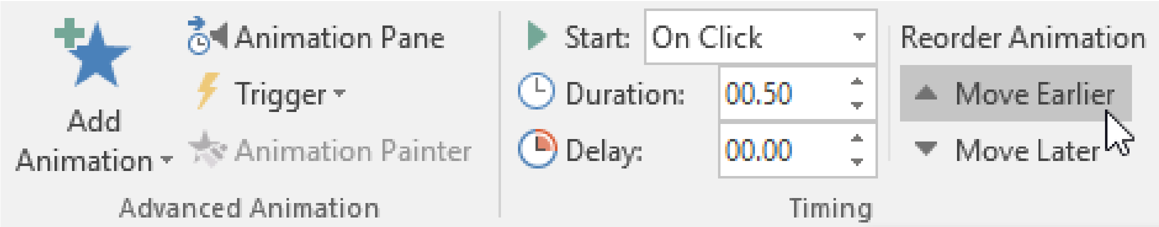



To reorder the animations:

1. Select the **number** of the effect you want to change.



2. From the **Animations** tab, click the **Move Earlier** or **Move Later** commands to change the ordering.

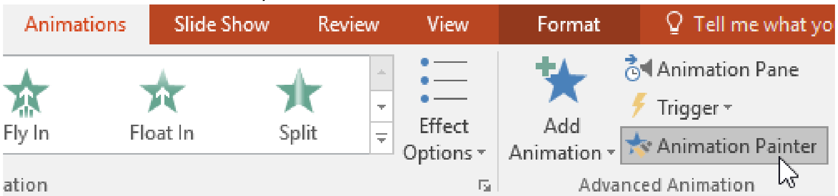



To copy animations with the Animation Painter:

In some cases, you may want to apply the same effects to more than one object. You can do this by **copying** the effects from one object to another using the **Animation Painter**. In our example, we want to copy an animation from one slide to another because they have similar layouts.

1. Click the **object** that has the **effects** you want to copy. In our example, we'll click our answer text.


2. From the **Animations** tab, click the **Animation Painter** command.

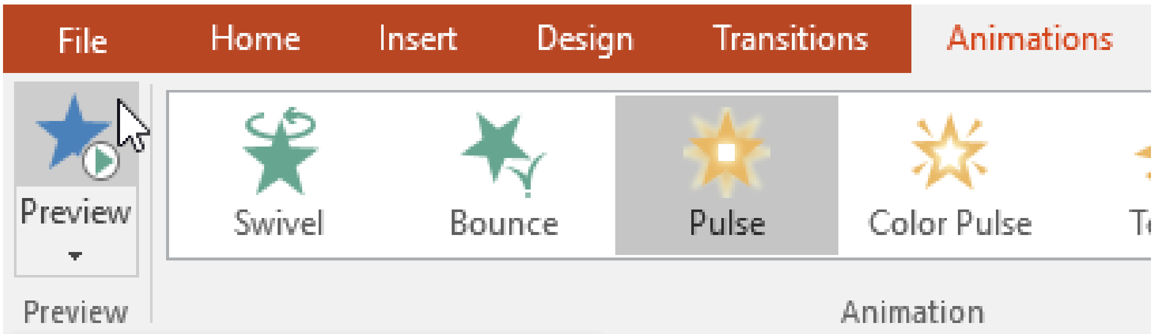



3. Click the **object** you want to copy the effects to. In our example, we'll click the answer text on the next slide. Both objects now have the same effect.


To preview animations:

Any animation affects you have applied will show up when you play the slide show. However, you can also quickly **preview** the animations for the current slide without viewing the slide show.

1. Navigate to the **slide** you want to preview.
2. From the **Animations** tab, click the **Preview** command. The animations for the current slide will play.

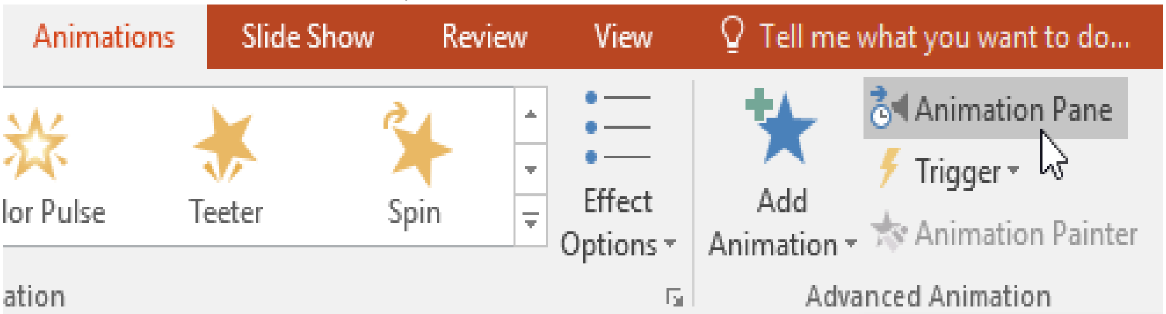



## 12.5 The Animation Pane

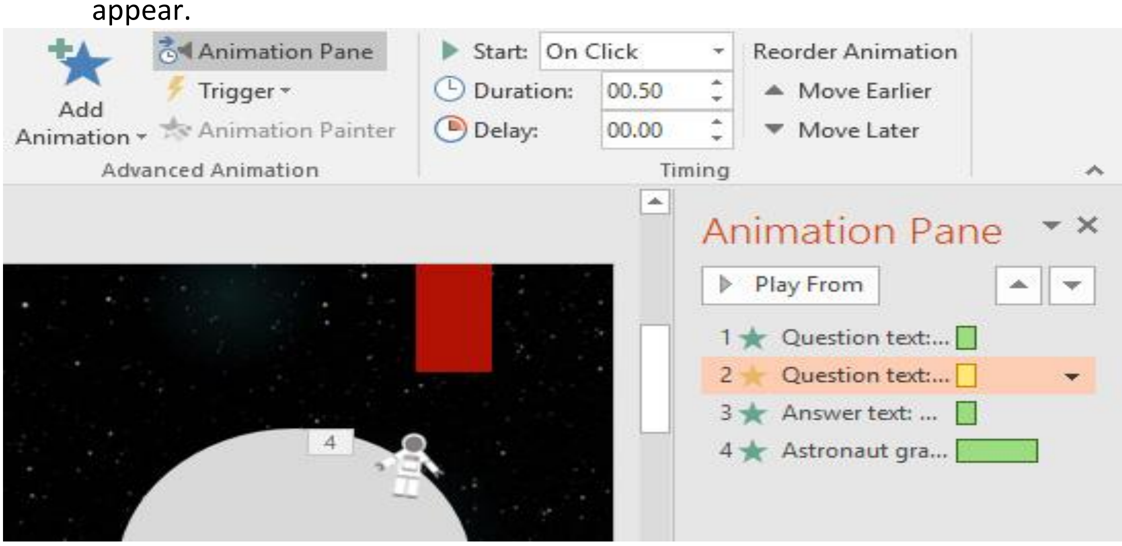
The **Animation Pane** allows you to view and manage all of the effects that are on the current slide. You can **modify** and **reorder** effects directly from the Animation Pane, which is especially useful when you have several effects.

To open the Animation Pane:

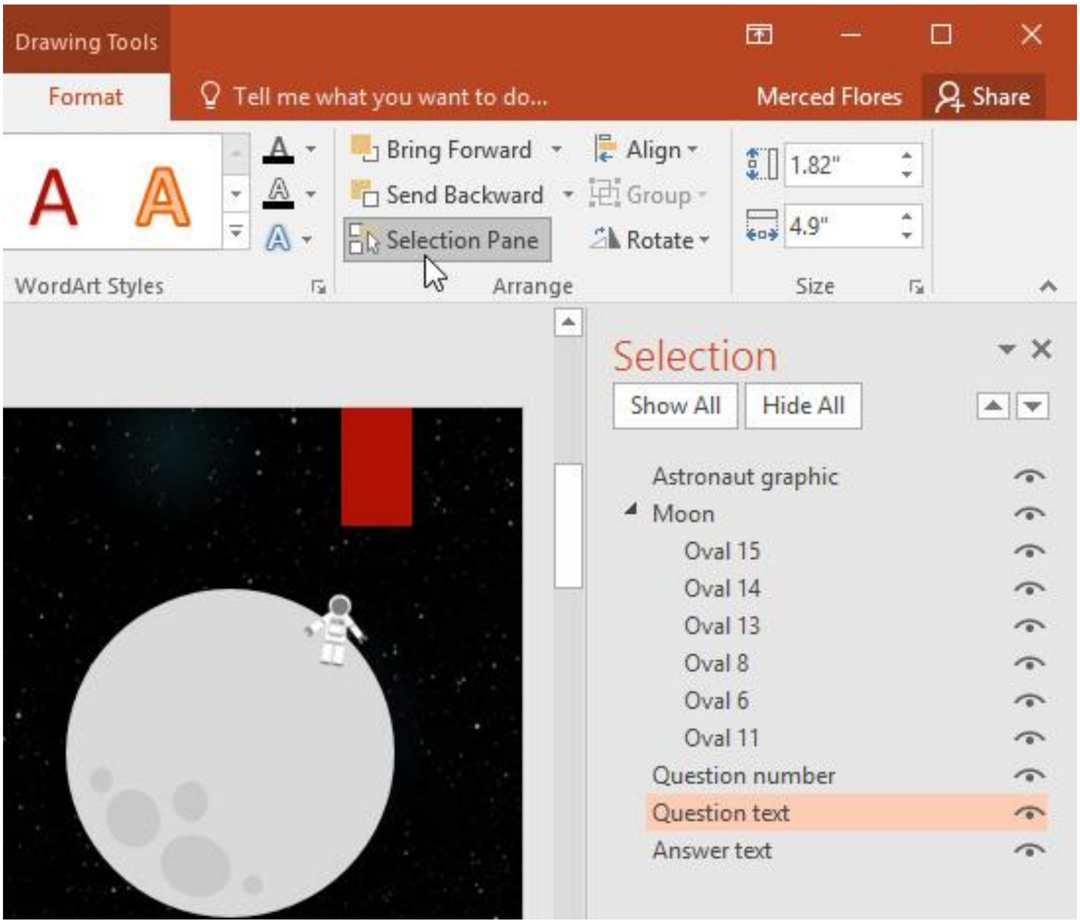
1. From the **Animations** tab, click the **Animation Pane** command.




2. The Animation Pane will open on the right side of the window. It will show all of the effects for the current slide in the order in which they will appear.

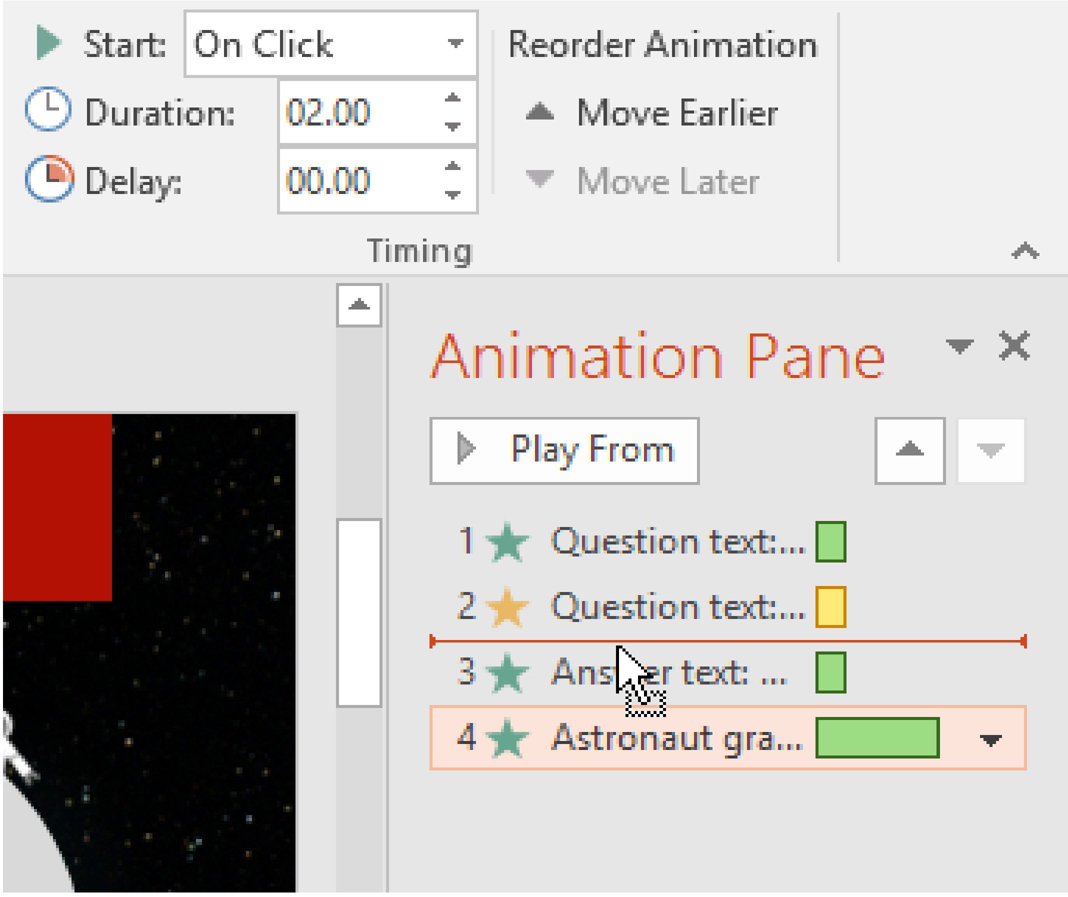



If you have several animated objects, it may help to rename the objects before reordering them in the Animation Pane. You can rename them in the **Selection Pane**. To open the Selection Pane, click an **object**, then from the **Format** tab click **Selection Pane**. Double-click the name of an object to rename it.




To reorder effects from the Animation Pane:

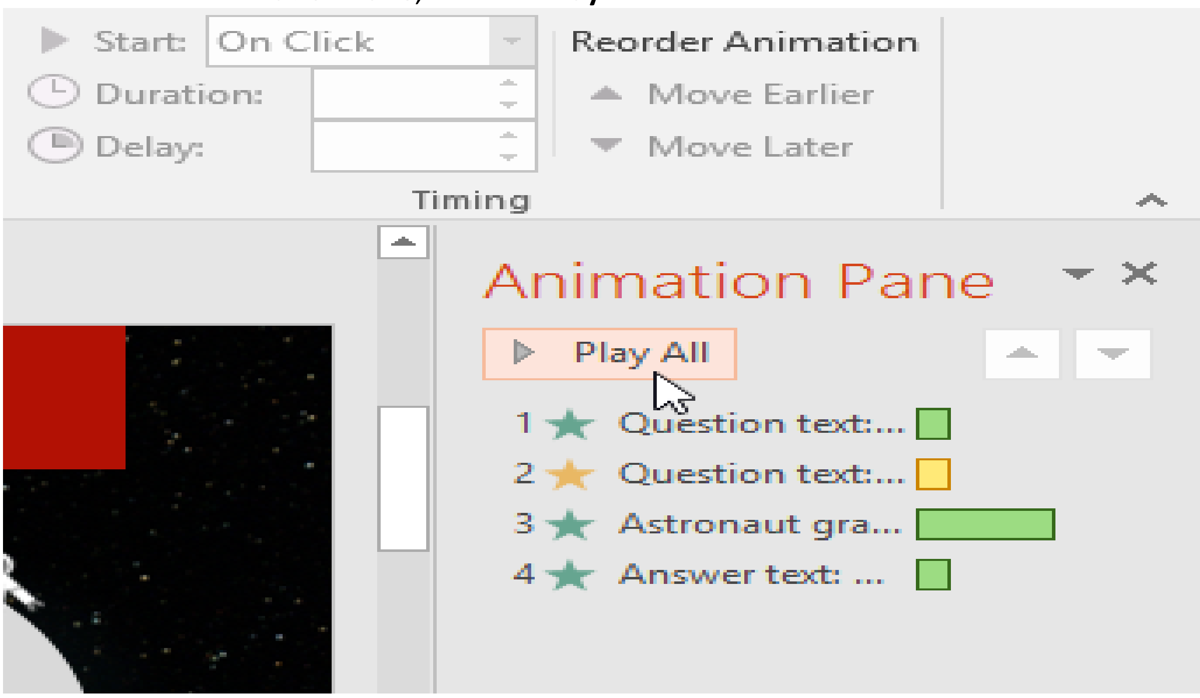
1. On the **Animation Pane**, click and drag an effect up or down.



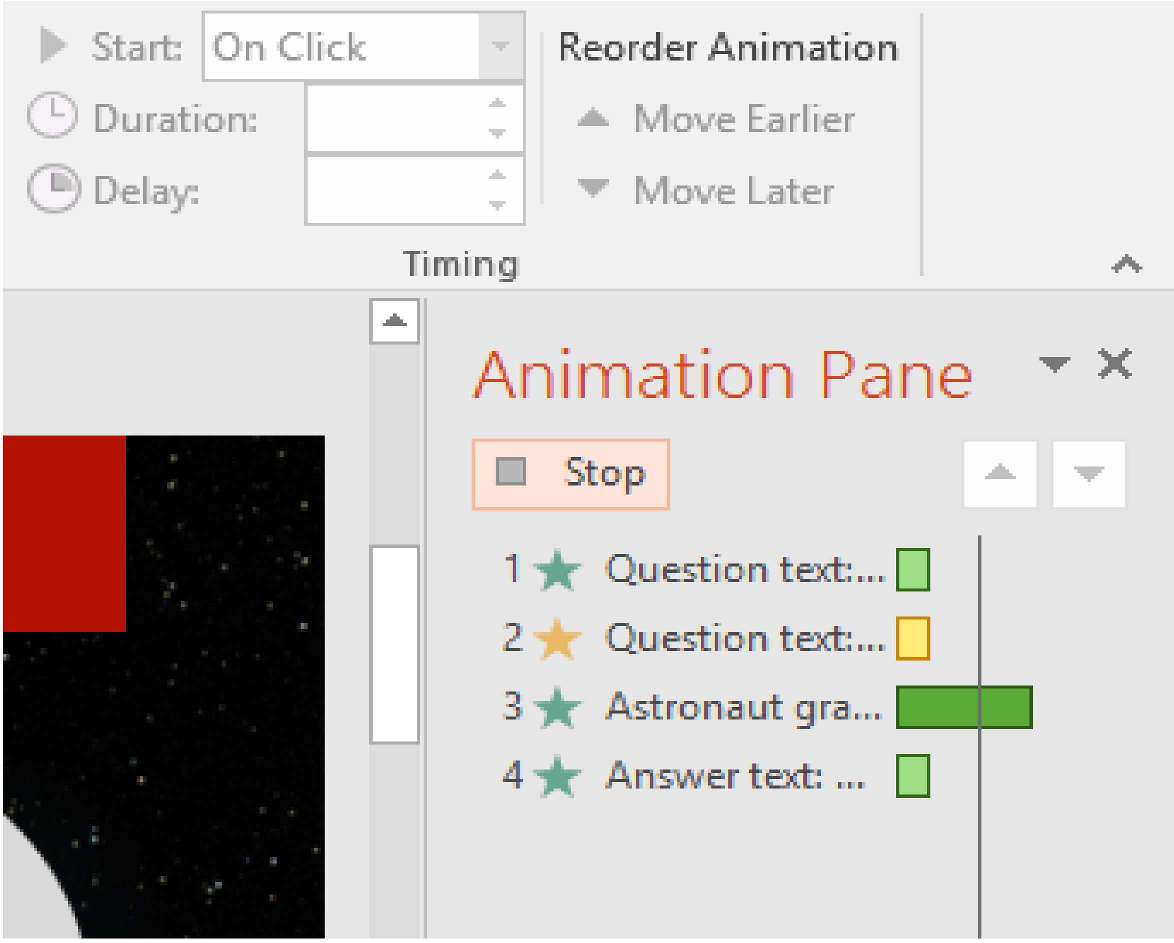

2. The effects will reorder themselves.

To preview effects from the Animation Pane:

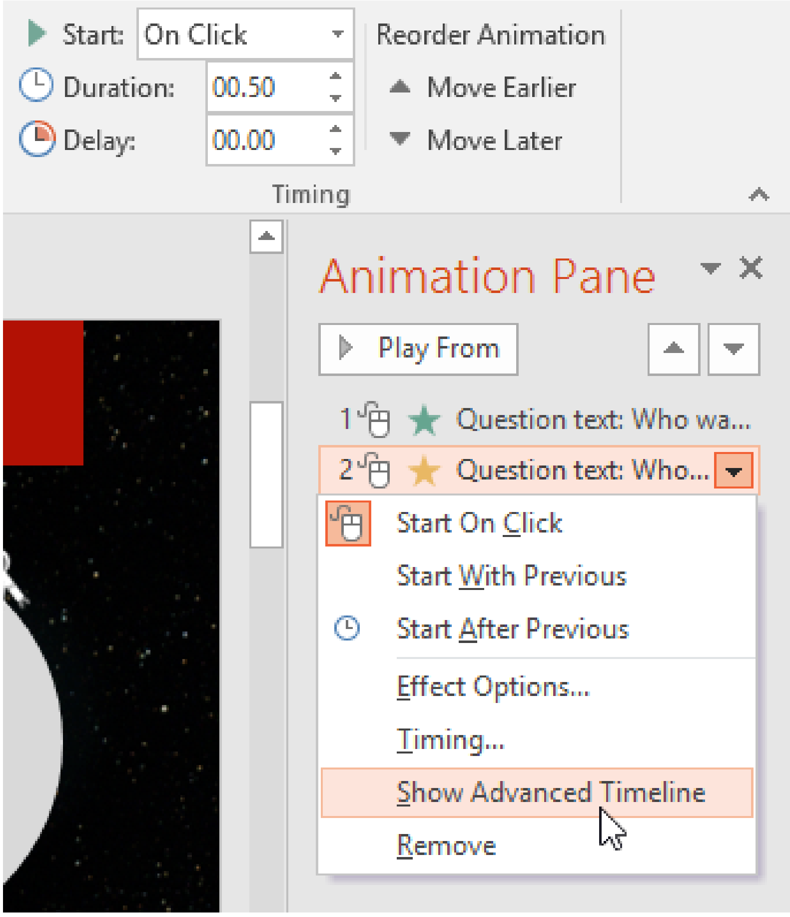
1. From the **Animation Pane**, click the **Play** button.



2. The effects for the current slide will play. On the right side of the Animation Pane, you will be able to see a **timeline** that shows the progress through each effect.



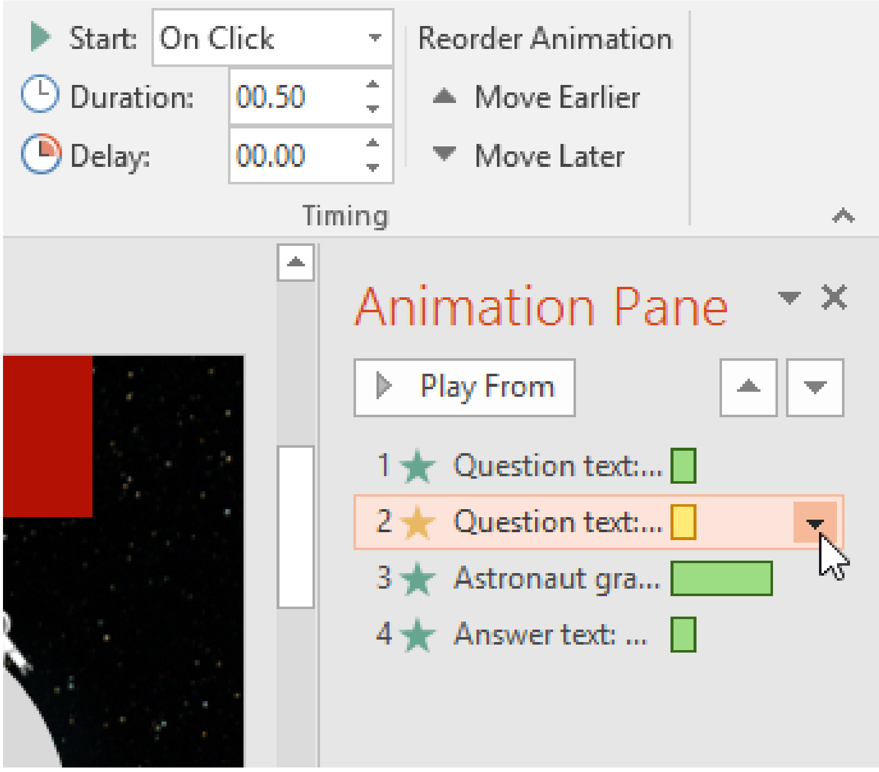

If the timeline is not visible, click the drop-down arrow for an effect, then select **Show** Advanced Timeline.



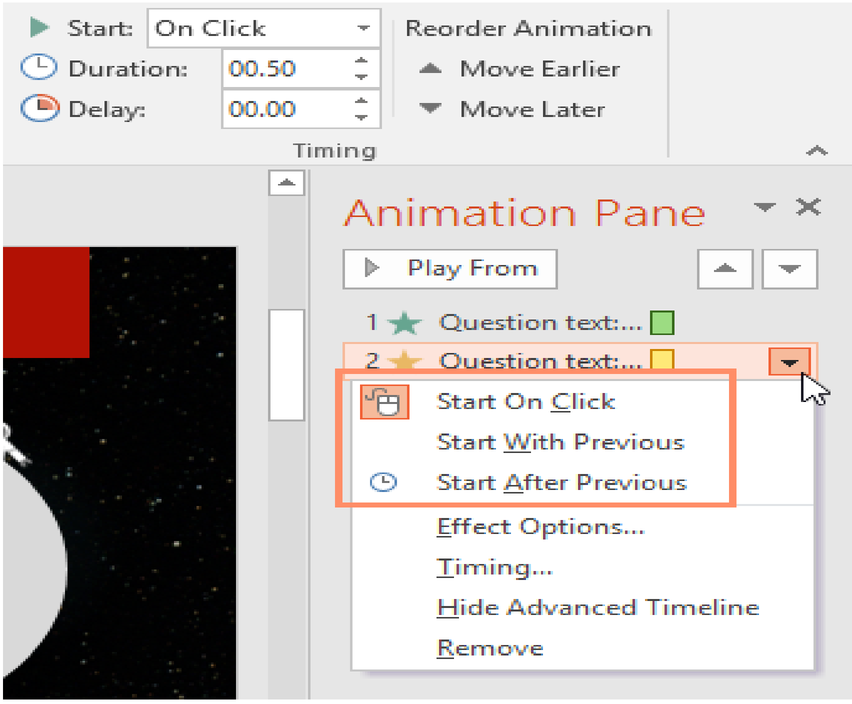

To change an effect's start option:

By default, an effect starts playing when you click the mouse during a slide show. If you have multiple effects, you will need to click multiple times to start each effect individually. However, by changing the **start option** for each effect, you can have effects that automatically play **at the same time** or **one after the other**.

1. From the **Animation Pane**, select an effect. A drop-down arrow will appear next to the effect.




2. Click the drop-down arrow and select one of the three desired start options. **Start on Click** will start the effect when the mouse is clicked, **Start With Previous** will start the effect at the same time as the previous effect, and **Start After Previous** will start the effect when the previous effect ends.



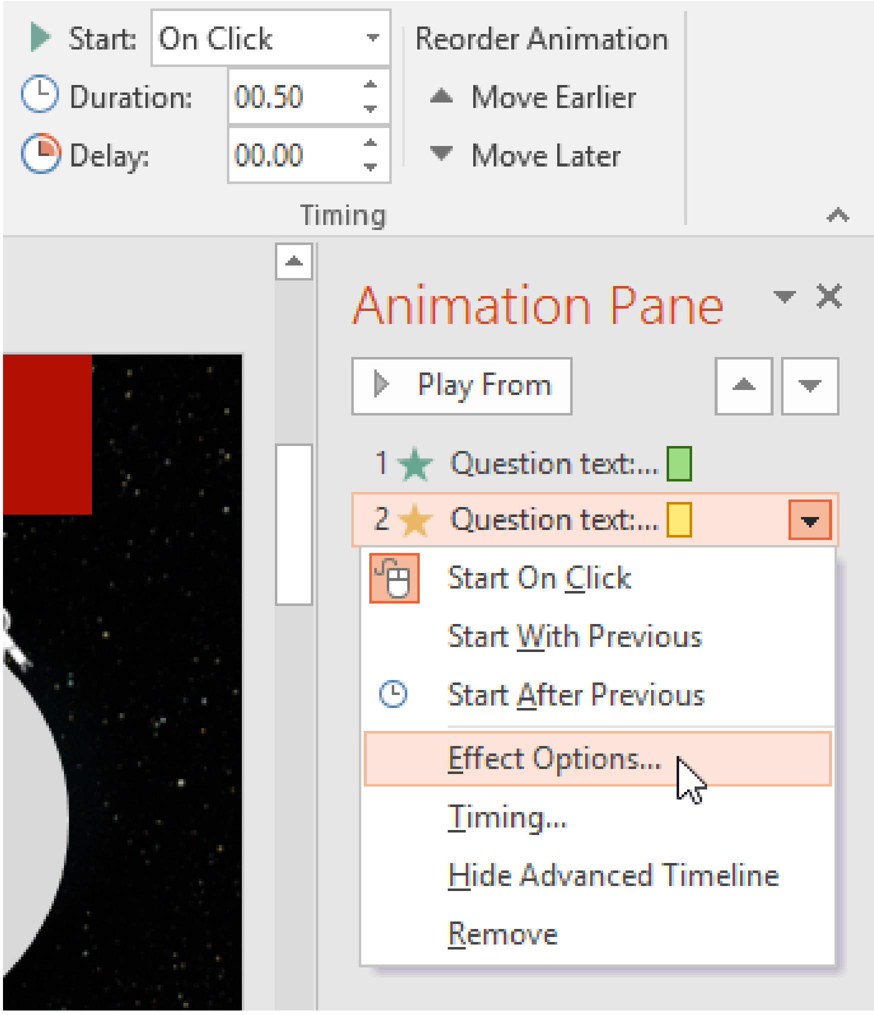

When you **preview** the animations, all of the effects will play through automatically. To test effects that are set to **Start on Click**, you will need to play the slide show.

The Effect Options dialog box

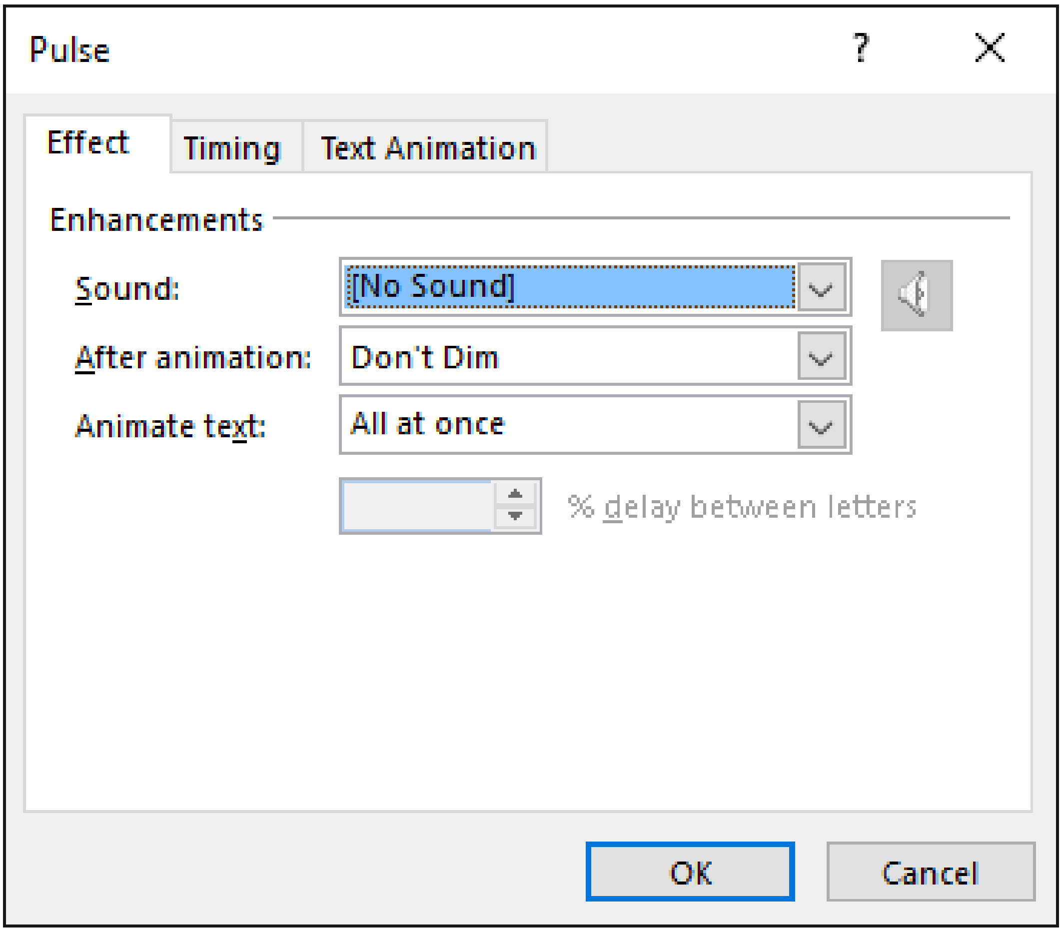
From the Animation Pane, you can access the **Effect Options** dialog box, which contains more advanced options you can use to fine tune your animations.

To open the Effect Options dialog box:

1. From the **Animation Pane**, select an effect. A drop-down arrow will appear next to the effect.
2. Click the drop-down arrow, then select **Effect Options**.



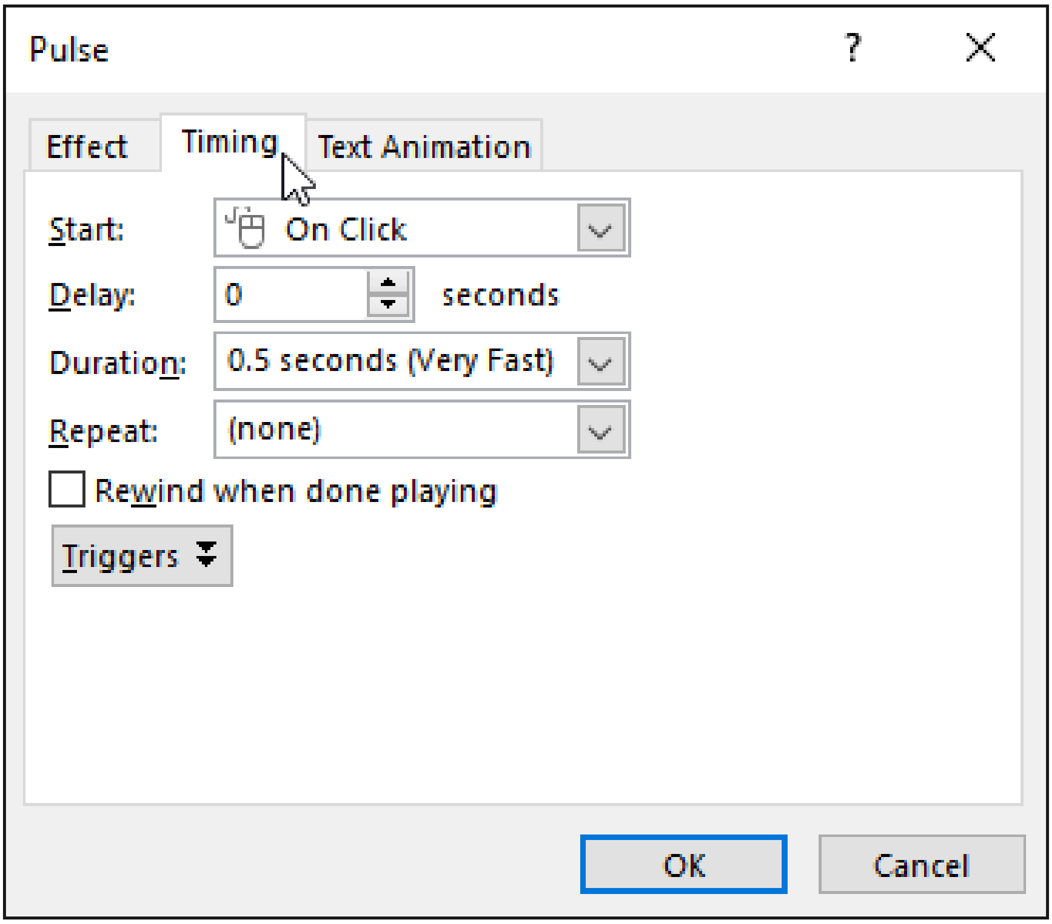

3. The Effect Options dialog box will appear. Click the drop-down menus and select the desired enhancement. You can add a **sound** to the animation, add an effect **after** the **animation** is over, or **animate text** in a different sequence.



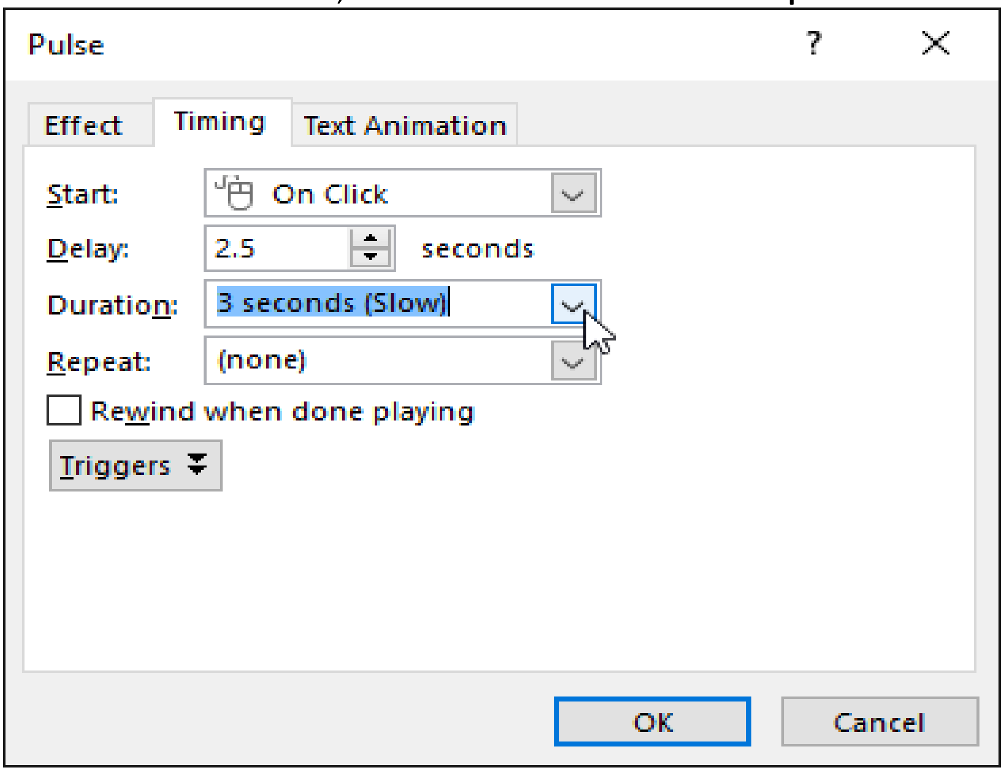

Some effects have **additional options** you can change. These will vary depending on which effect you have selected.

To change the effect timing:

1. From the **Effect Options** dialog box, select the **Timing** tab.




2. From here, you can add a **delay** before the effect starts, change the **duration** of the effect, and control whether the effect **repeats**.



# Lesson 13: More Objects

## 13.1 Inserting Videos

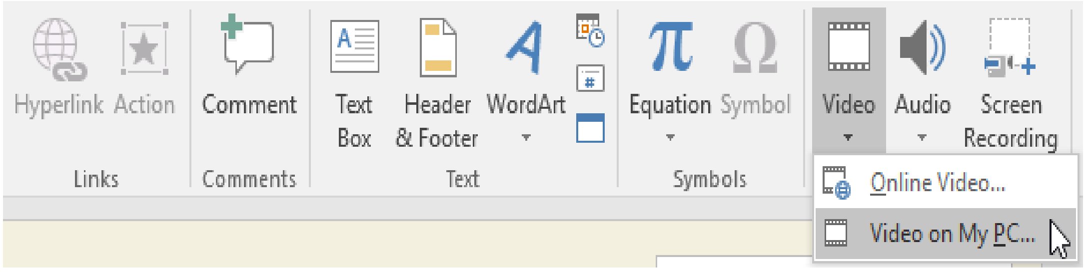
PowerPoint allows you to insert a video onto a slide and play it during your presentation. This is a great way to make your presentation more engaging for your audience.

You can even edit the video within PowerPoint and customize its appearance. For example, you can trim the video's length, add a fade in, and much more.

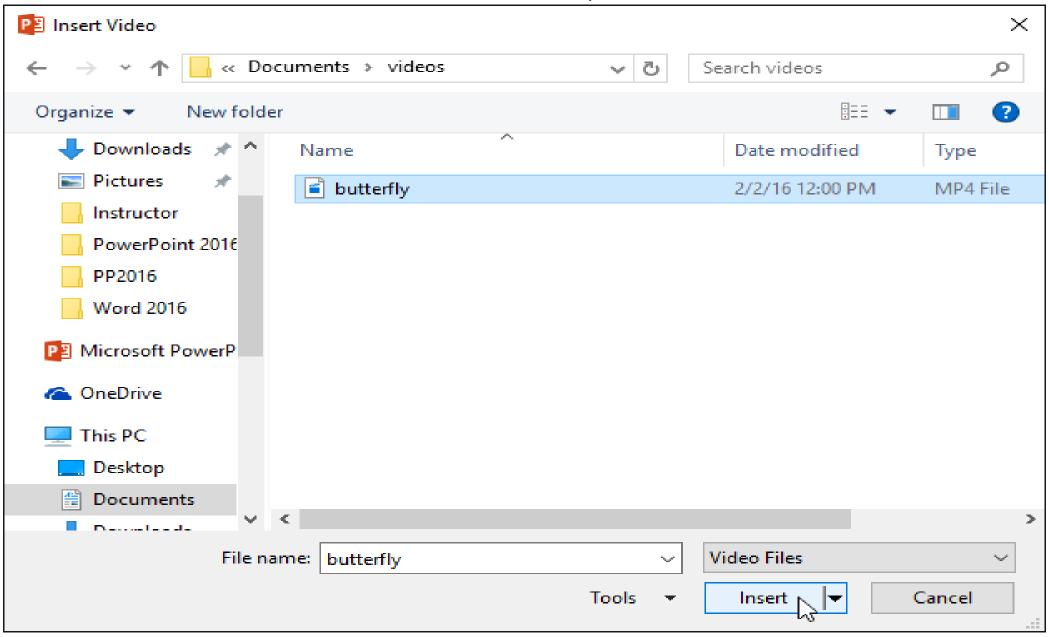
To insert a video from a file:

In our example, we'll **insert a video from a file** saved locally on our computer. If you'd like to work along with our example, right-click this **link to our example video** and save it to your computer.

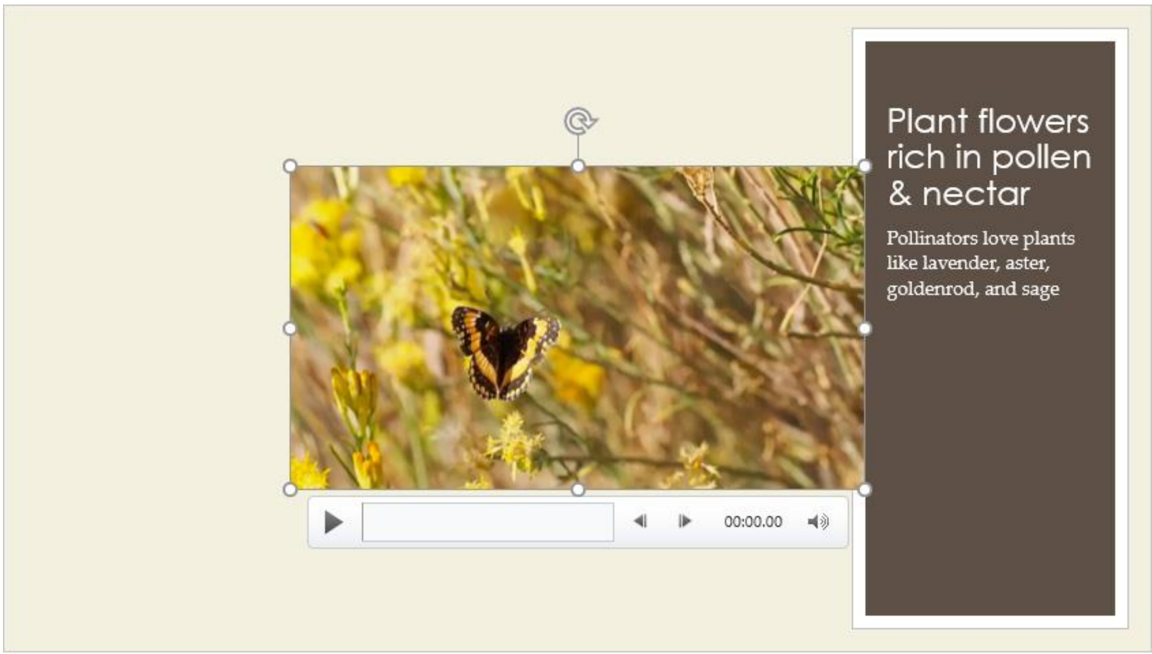
1. From the **Insert** tab, click the **Video** drop-down arrow, then select **Video on My PC**.



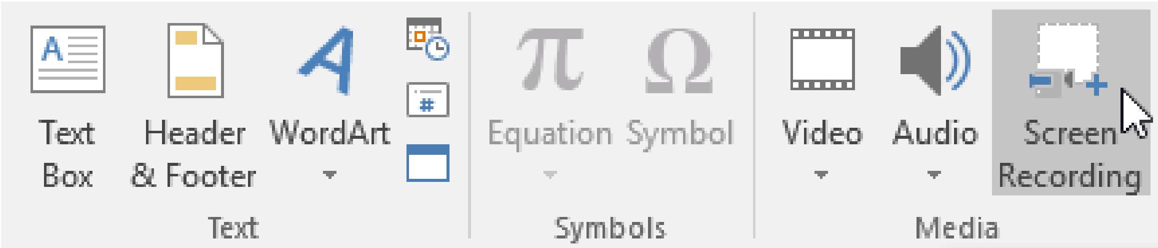

2. Locate and select the desired video file, then click **Insert**.




3. The video will be added to the slide.

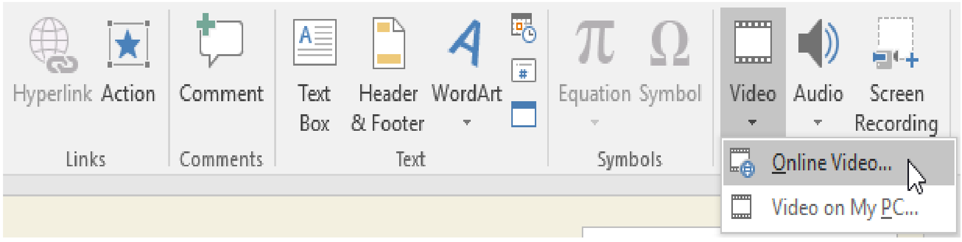



With the Screen Recording feature on the Insert tab, you can create a video of anything you are doing on your computer and insert it into a slide.




To insert an online video:

Some websites—like YouTube—allow you to **embed** videos into your slides. An embedded video will still be hosted on its original website, meaning the video itself won't be added to your file. Embedding can be a convenient way to reduce the file size of your presentation, but you'll also need to be connected to the Internet for the video to play.




## 13.2 Working with videos

To preview a video:

1. Click a video to select it.
2. Click the **Play/Pause** button below the video. The video will begin playing, and the **timeline** next to the Play/Pause button will advance.


3. To jump to a different part of the video, click anywhere on the **timeline**.


To resize a video:

- Click and drag the **corner sizing handles** until the video is the desired size.


The corner sizing handles will resize a video while preserving its **original aspect ratio**. If you use the side sizing handles, the video will become **distorted**.

To move a video:

- Click and drag to **move** a video to a new location on a slide.


To delete a video:

- Select the video you want to delete, then press the **Backspace** or **Delete** key on your keyboard.

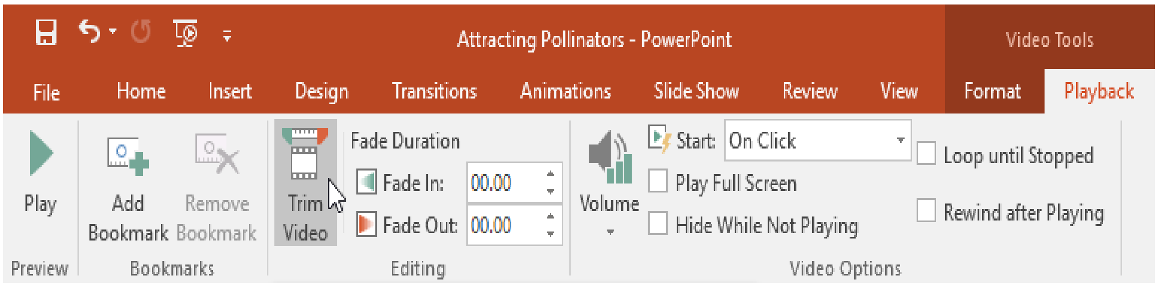
## 13.3 Editing and formatting videos

The **Playback** tab has several options you can use to **edit** your video. For example, you can **trim** your video to play an excerpt from the original, add a **fade in** and **fade out**, and add **bookmarks** that allow you to jump to specific points in the video.

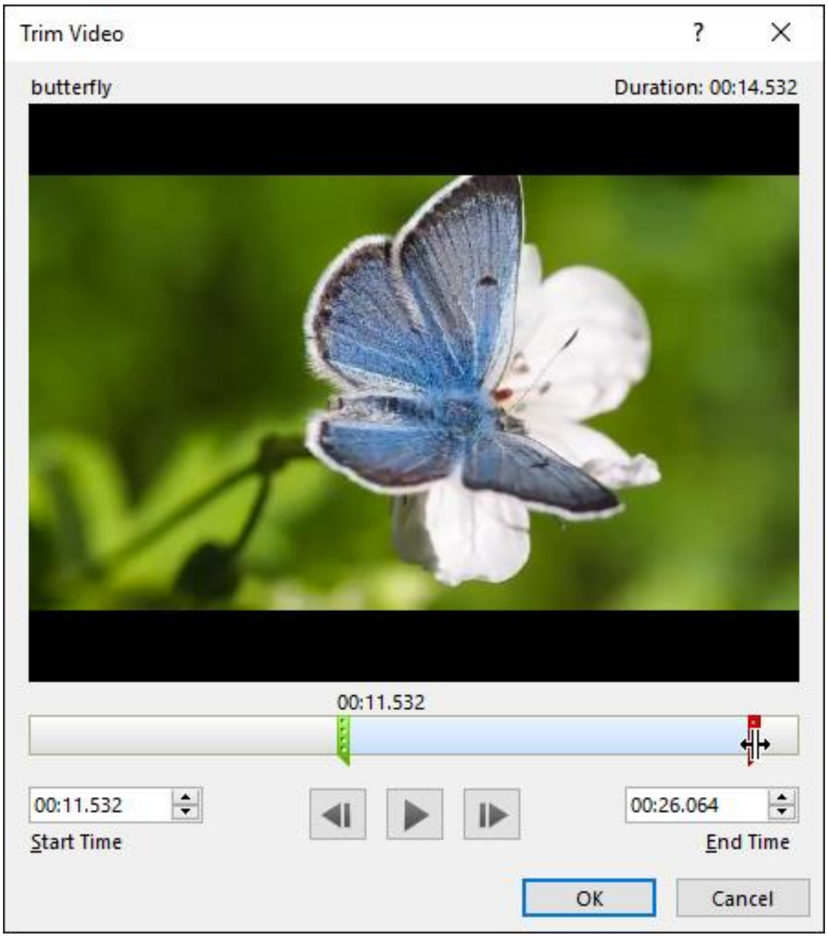
Most of the features on the Playback tab can only be used with videos that are inserted **from a file**. They will not work with embedded videos.

To trim a video:

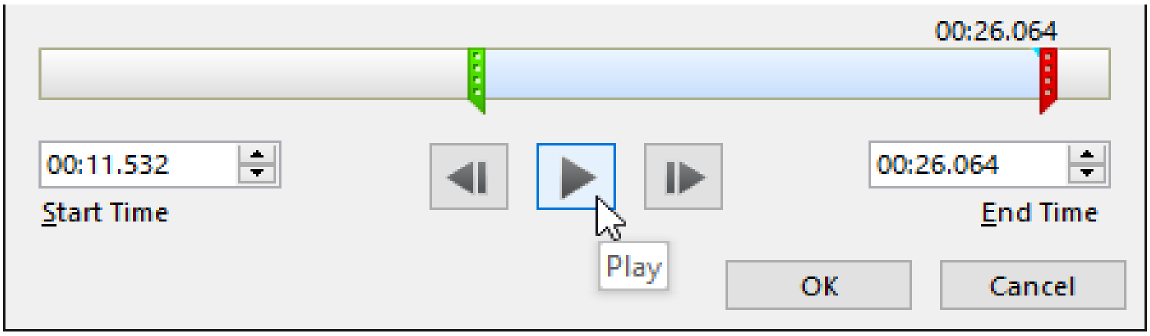
1. Select the video, then click the **Playback** tab on the Ribbon.
2. Click the **Trim Video** command.




3. A dialog box will appear. Use the **green handle** to set the **start time** and the **red handle** to set the **end time**.



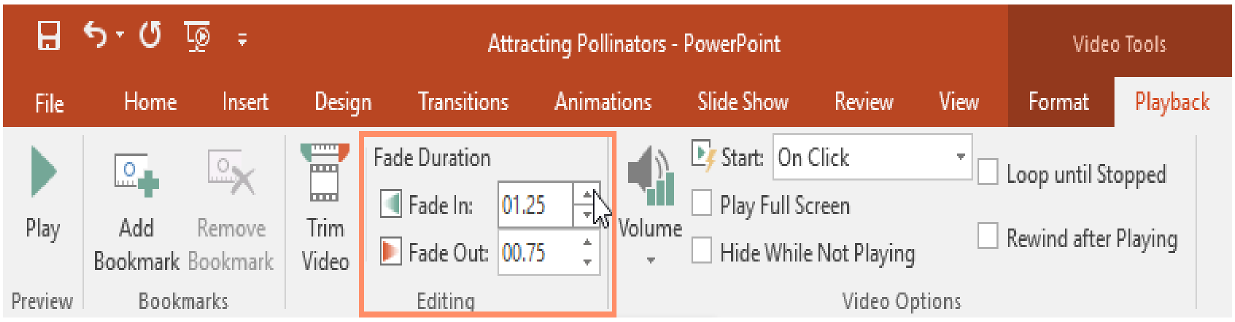

4. To preview the video, click the **Play** button.




5. When you're done trimming the video, click **OK**.

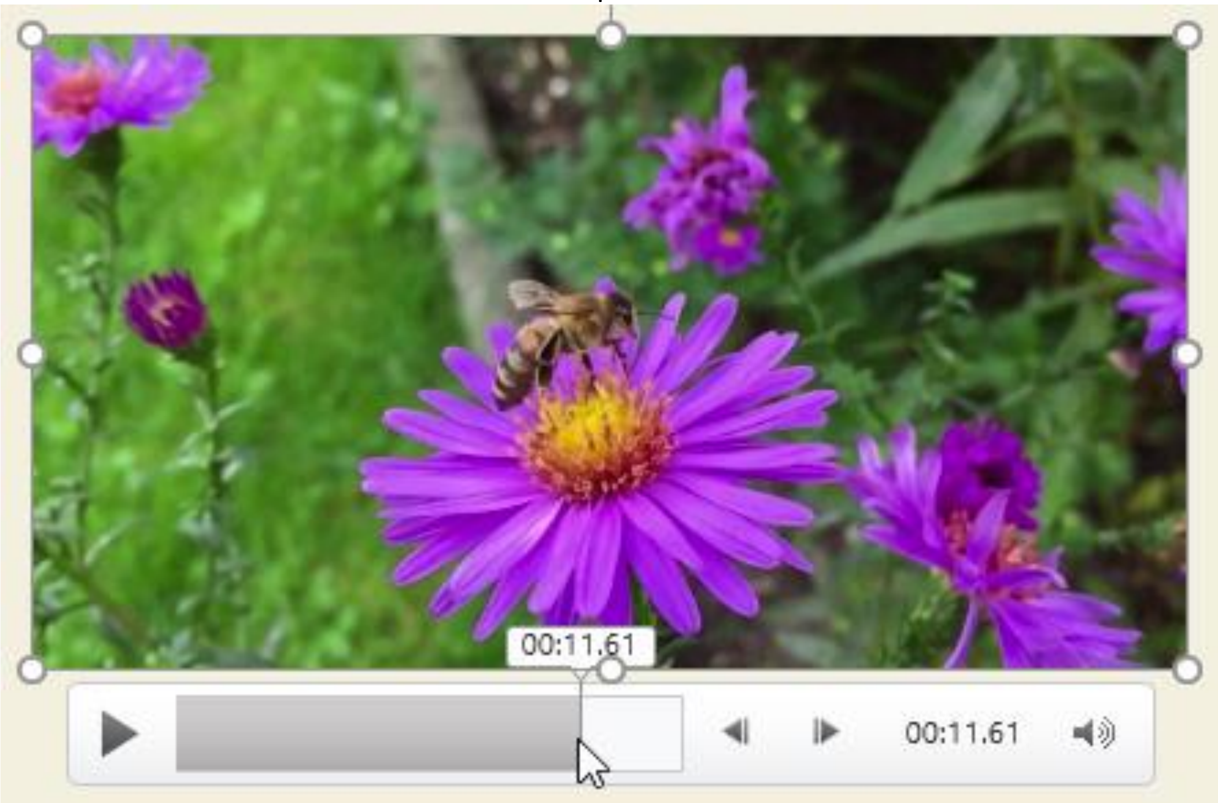
To add a fade in and fade out:

1. On the **Playback** tab, locate the **Fade In:** and **Fade Out:** fields.
2. Type the desired values, or use the **up** and **down** arrows to adjust the fade times.

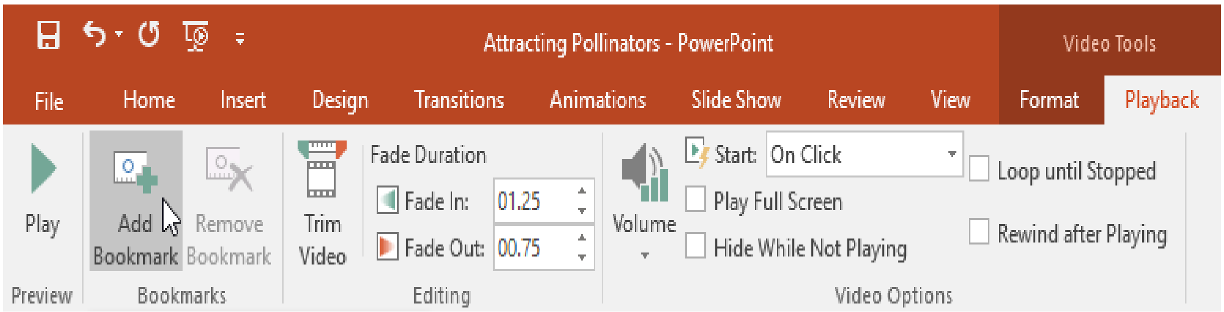



To add a bookmark:

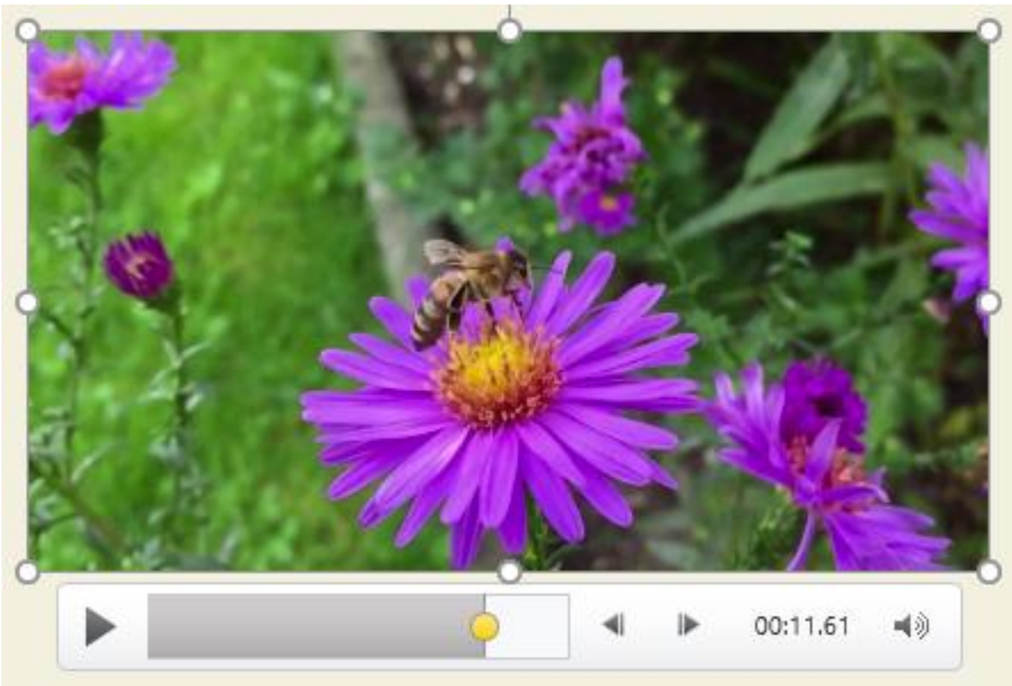
1. Click the **timeline** to locate the desired part of the video.




2. From the **Playback** tab, click the **Add Bookmark** command.

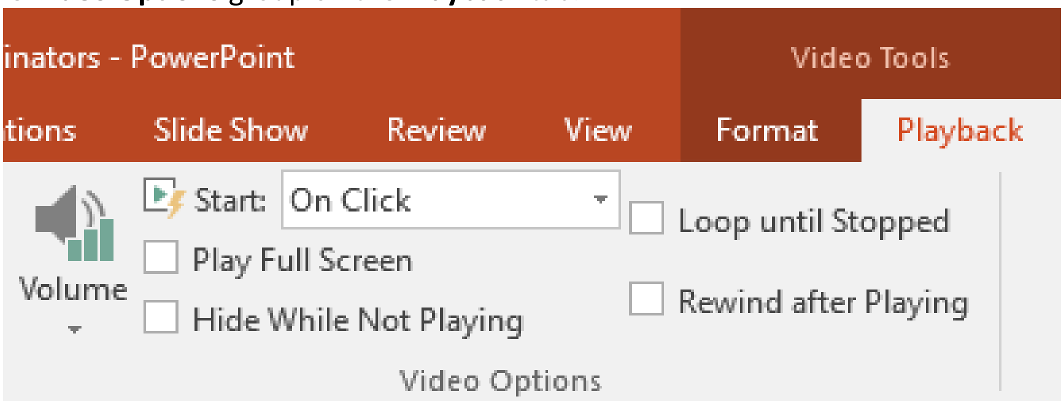



3. The bookmark will appear on the timeline. Click the bookmark to jump to that location.




Video options

There are other options you can set to control how your video will play. These are found in the **Video Options** group on the **Playback** tab.




- **Volume**: Changes the audio volume for the video
- **Start**: Controls whether the video starts **automatically** or when the mouse is **clicked**
- **Play Full Screen**: Lets the video fill the entire screen while playing
- **Hide While Not Playing**: Hides the video when not playing

- **Loop until Stopped**: Replays the video until stopped
- **Rewind after Playing**: Returns the video to the beginning when it is finished playing

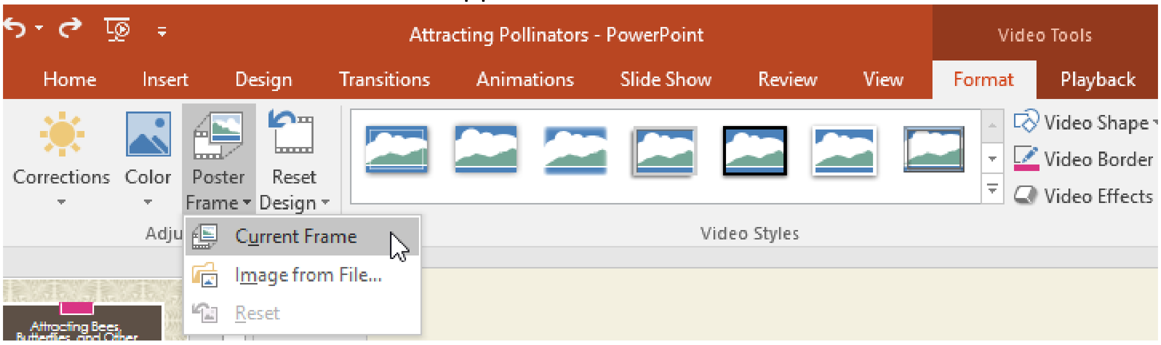
Formatting the appearance of a video

Like **pictures**, PowerPoint allows you to **format the appearance** of a video by applying a **video style**, adding a **border**, changing the **shape**, and applying various **effects**.

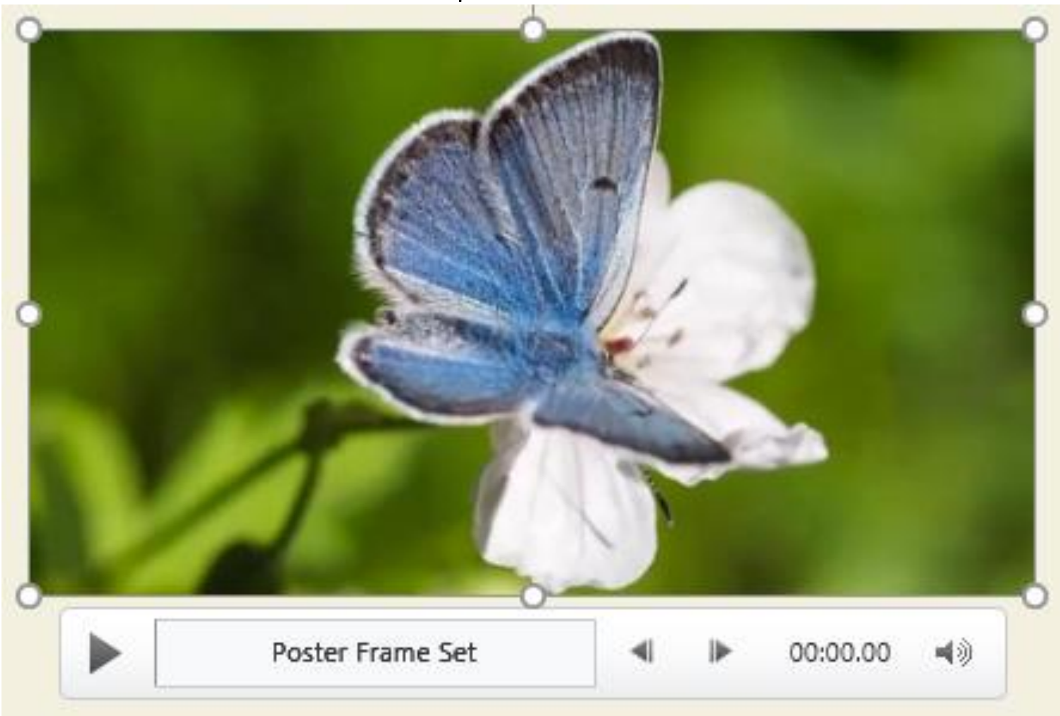
To create a poster frame:

You can add a **poster frame** to a video, which is the **placeholder image** your audience will see before the video starts playing. The poster frame is usually just a **frame** taken from the video itself.

1. Click the **timeline** to locate the desired part of the video.
2. From the **Format** tab, click the **Poster Frame** command. Select **Current Frame** from the menu that appears.



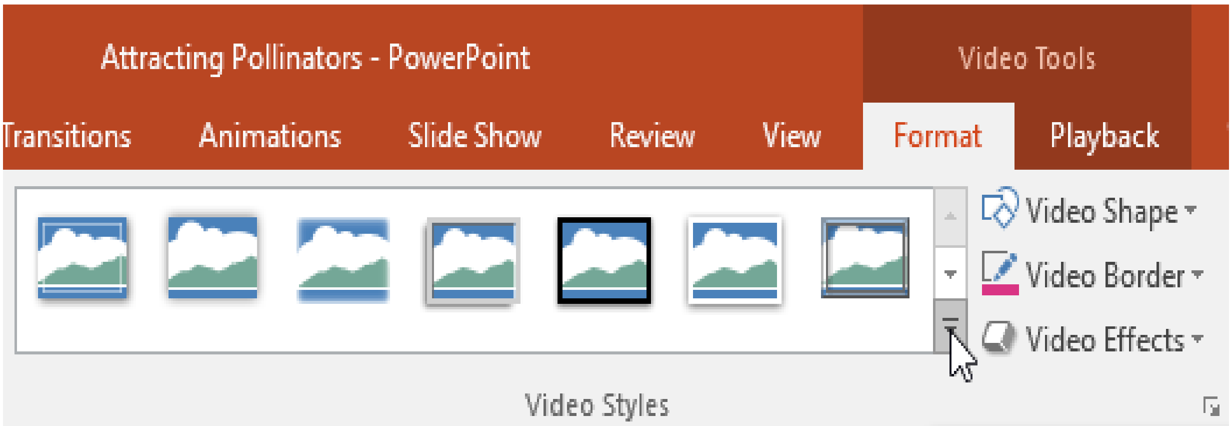

3. The current frame will become the poster frame.



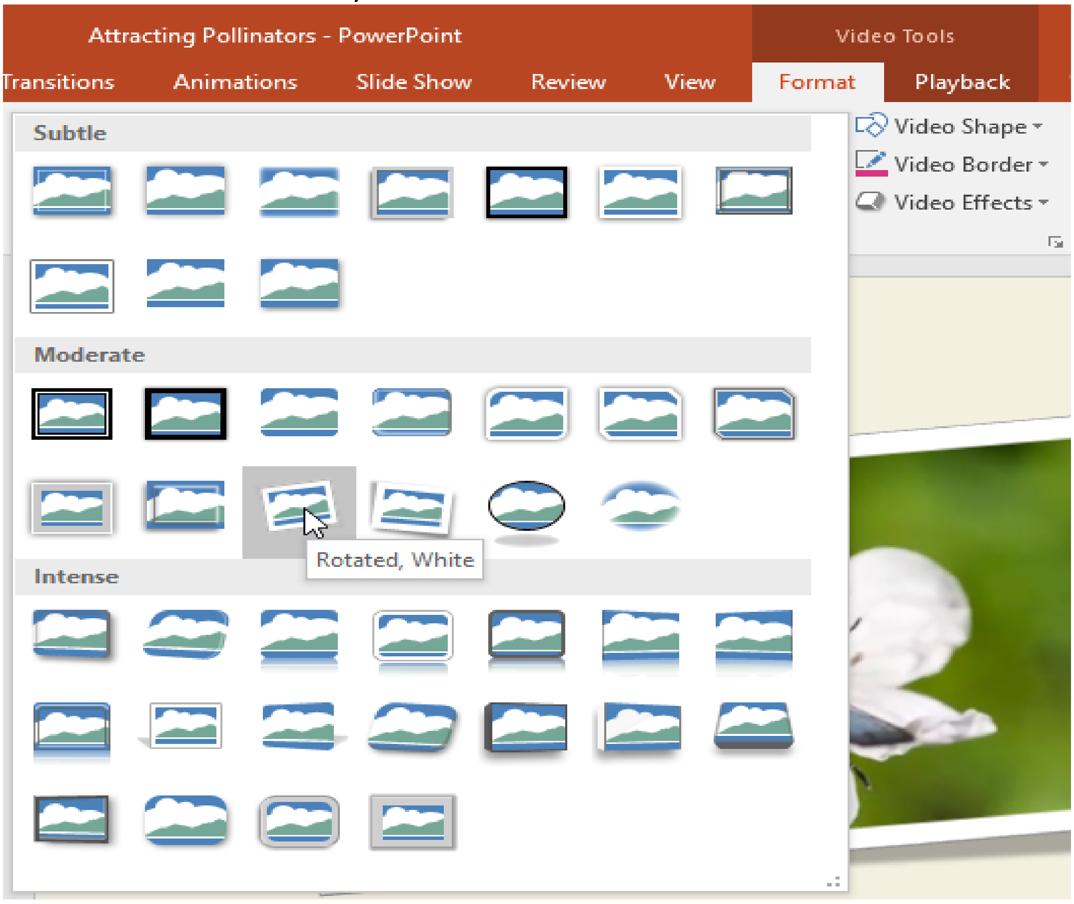

If you want to use a picture from your computer, select **Image from file**.

To apply a video style:

1. Select the video, then click the **Format** tab on the Ribbon.
2. In the **Video Styles** group, click the **More** drop-down arrow to display available video styles.




3. Select the desired style.




4. The new style will be applied to the video.

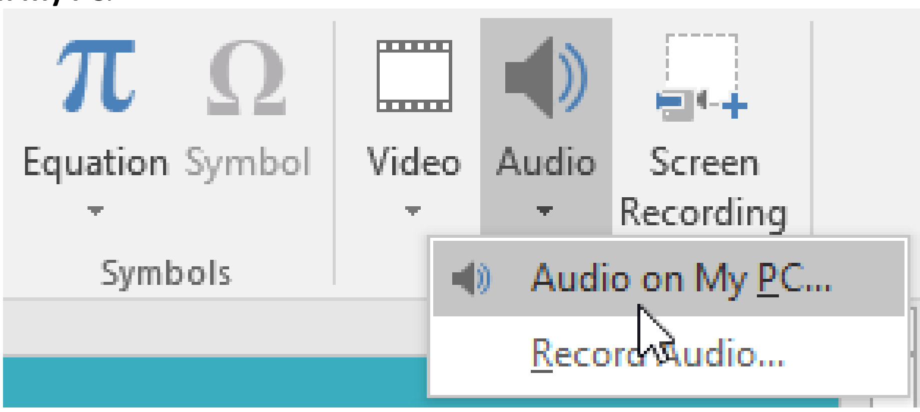

## 14. Inserting Audio

PowerPoint allows you to add audio to your presentation. For example, you could add background music to one slide, a sound effect to another, and even record your own narration or commentary. You can then edit the audio to customize it for your presentation.

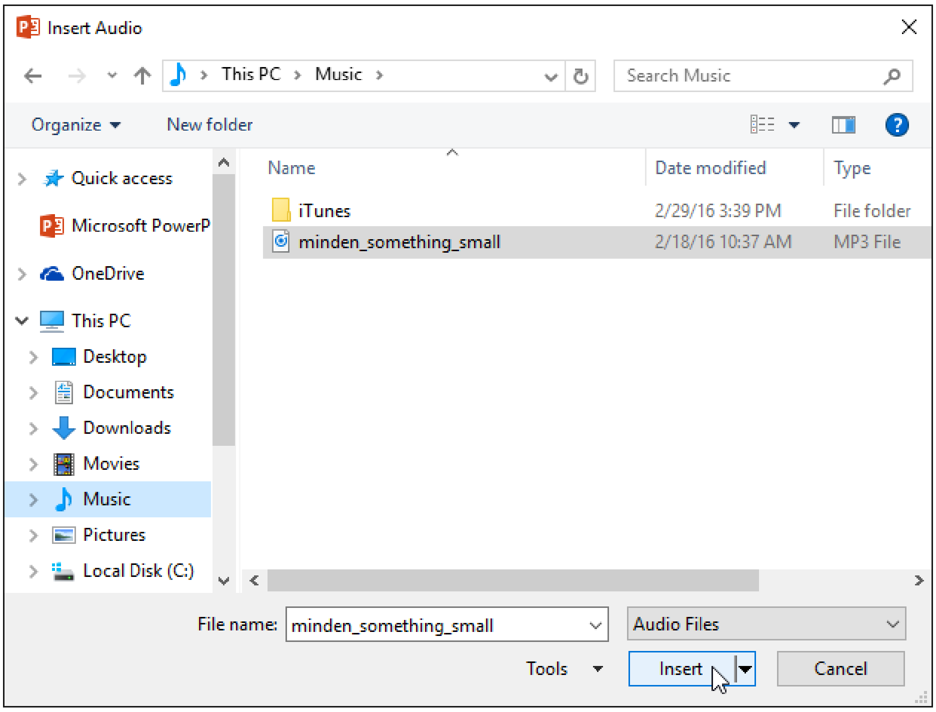
### 14.1 To insert audio from a file:

In our example, we'll **insert an audio file** saved locally on our computer. If you'd like to work along with our example, right-click this **link to our example file** and save it to your computer (music credit: **Something Small (Instrumental)** by **Minden**, **CC BY-NC 3.0**).

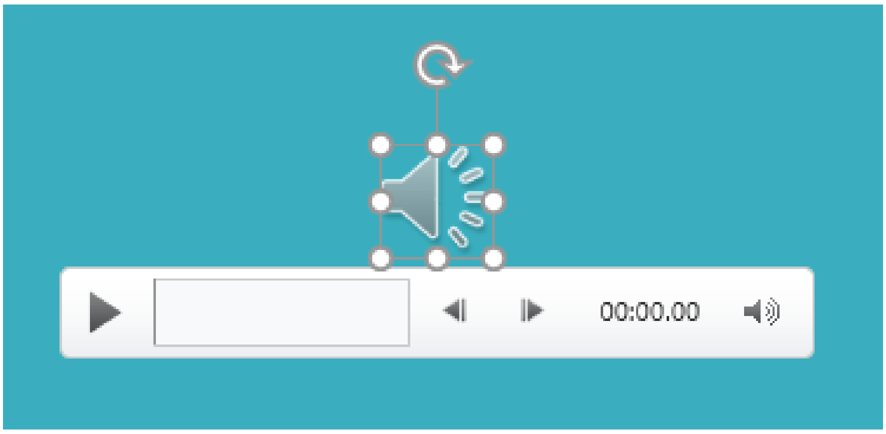
1. From the **Insert** tab, click the **Audio** drop-down arrow, then select **Audio on My PC**.




2. Locate and select the desired audio file, then click **Insert**.




3. The audio file will be added to the slide.

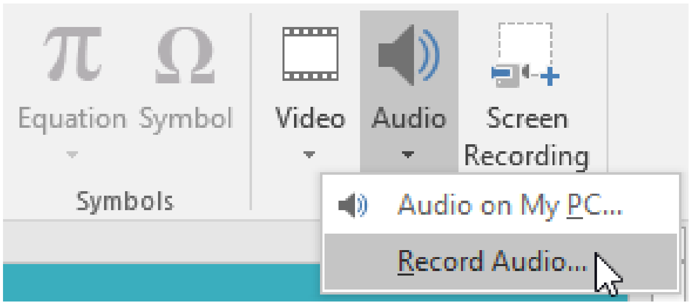



14.2 Recording your own audio

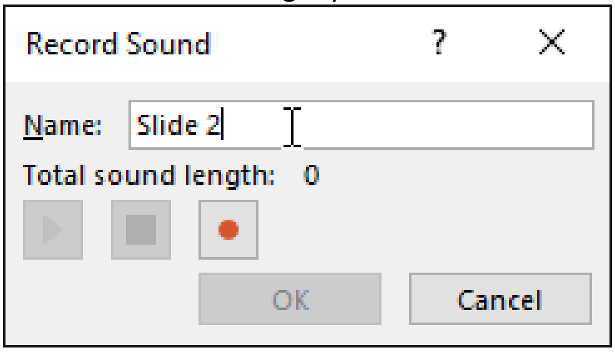
Sometimes you may want to **record** audio directly into a presentation. For example, you might want the presentation to include **narration**. Before you begin, make sure you have a **microphone** that is compatible with your computer; many computers have **built-in microphones** or ones that can be **plugged in** to the computer.

To record audio:

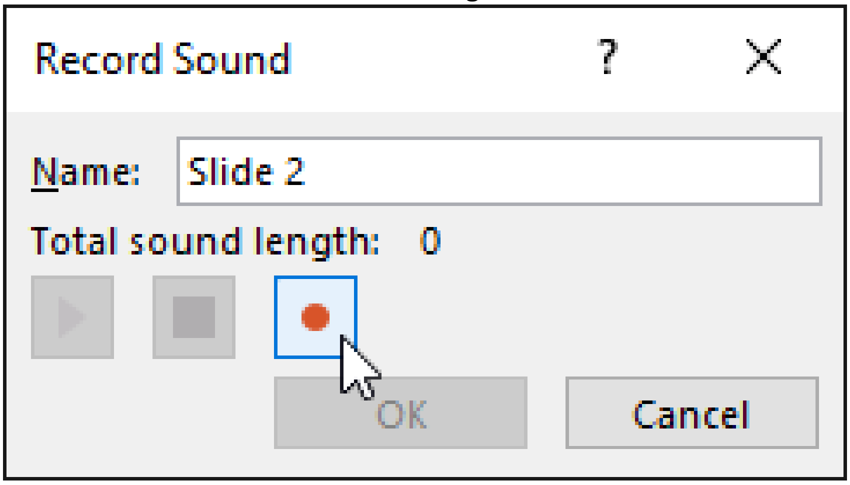
1. From the **Insert** tab, click the **Audio** drop-down arrow, then select **Record Audio**.



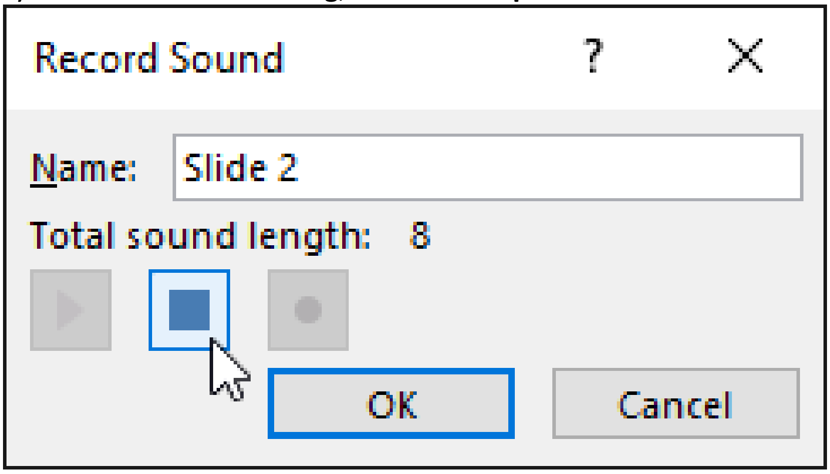
2. Type a **name** for the audio recording if you want.



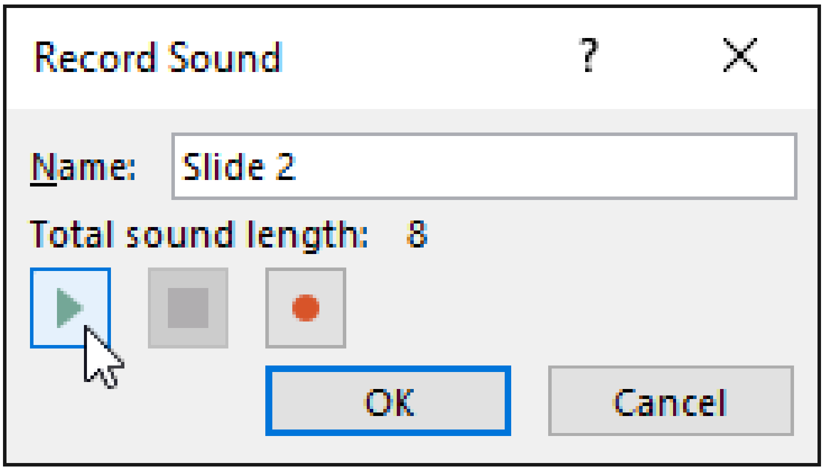

3. Click the **Record** button to start recording.



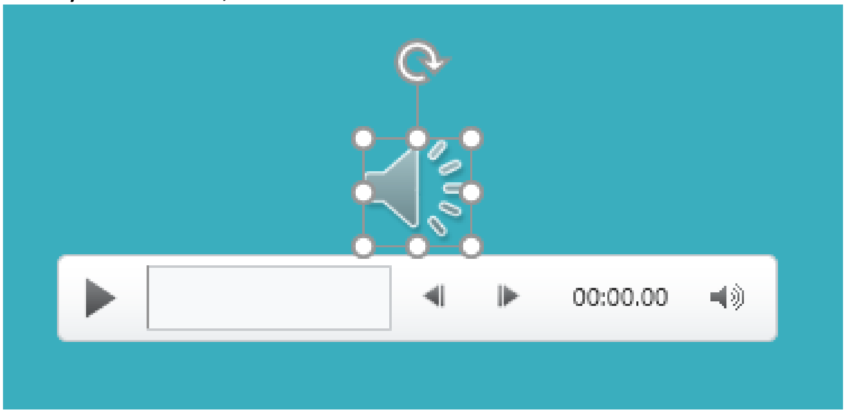

4. When you're finished recording, click the **Stop** button.




5. To preview your recording, click the **Play** button.



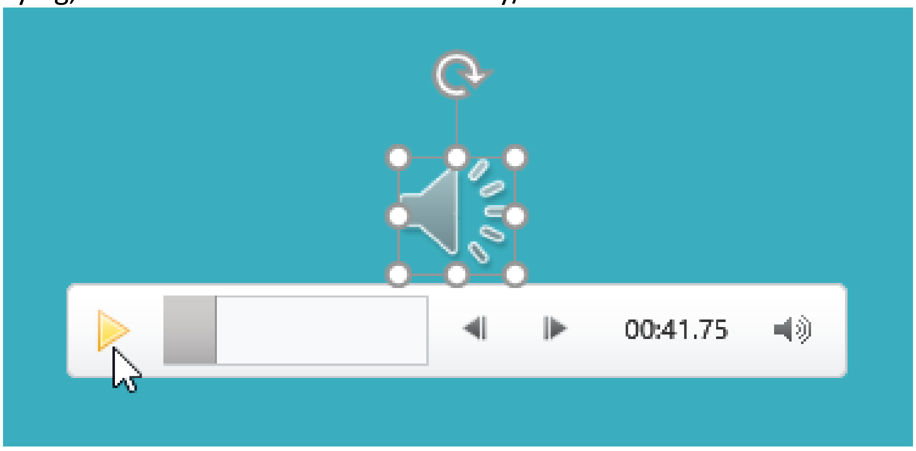

6. When you're done, click **OK**. The audio file will be inserted into the slide.




14.3 Working with audio

To preview an audio file:

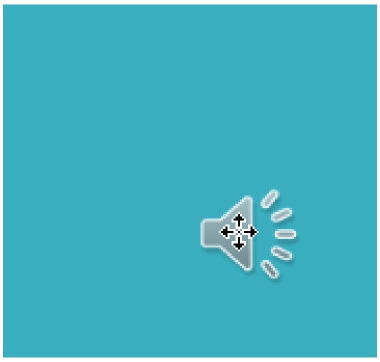
1. Click an audio file to select it.
2. Click the **Play/Pause** button below the audio file. The sound will begin playing, and the **timeline** next to the Play/Pause button will advance.




3. To jump to a different part of the file, click anywhere on the **timeline**.

To move an audio file:

- Click and drag to **move** an audio file to a new location on a slide.



To delete an audio file:

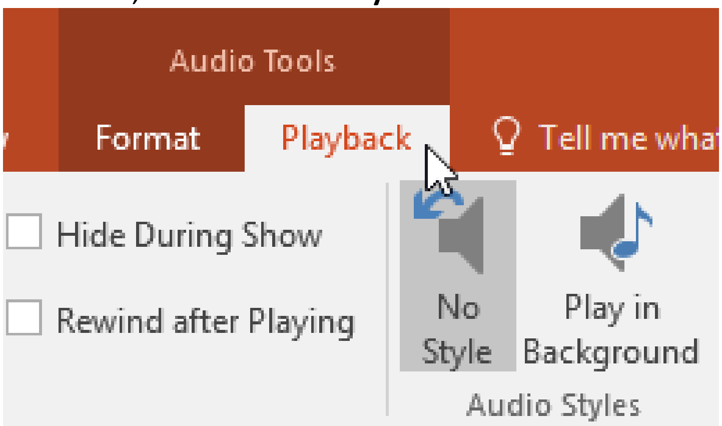
- Select the audio file you want to delete, then press the **Backspace** or **Delete** key on your keyboard.

## 14.4 Editing audio

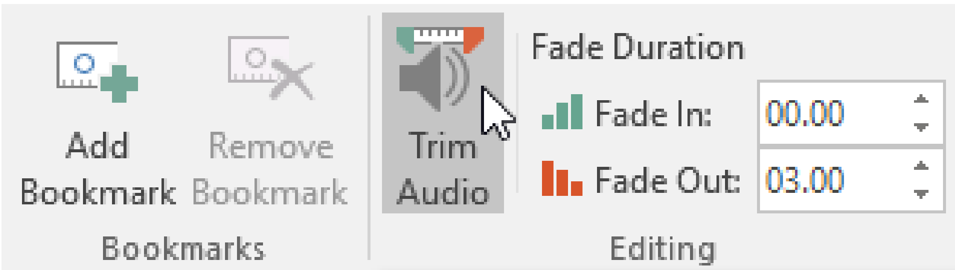
You can modify your audio files using the commands on the **Playback** tab. For example, if you add a song to a slide you can **trim** it to play only a brief section. You can also add a **fade in** and **fade out** and can add **bookmarks** that allow you to jump to specific points in the audio file.

To trim an audio file:

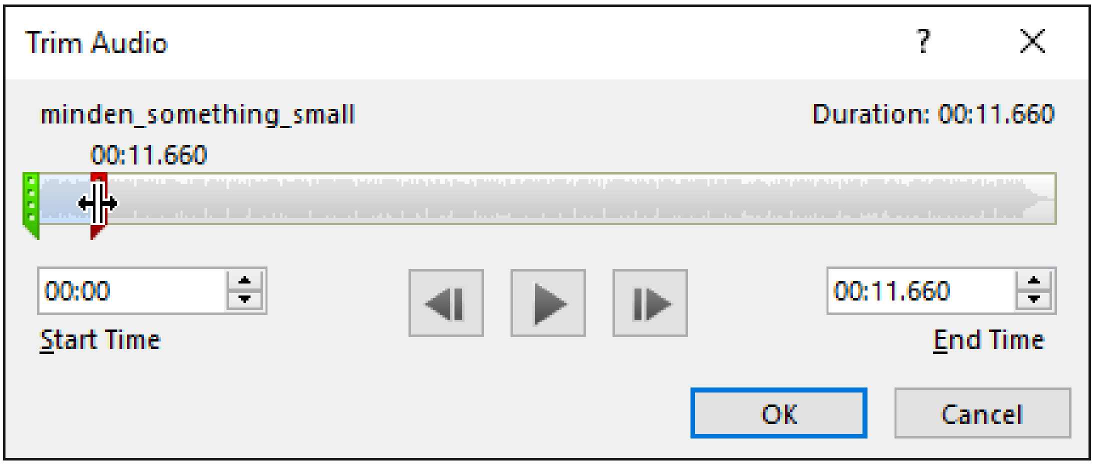
1. Select the audio file, then click the **Playback** tab on the Ribbon.



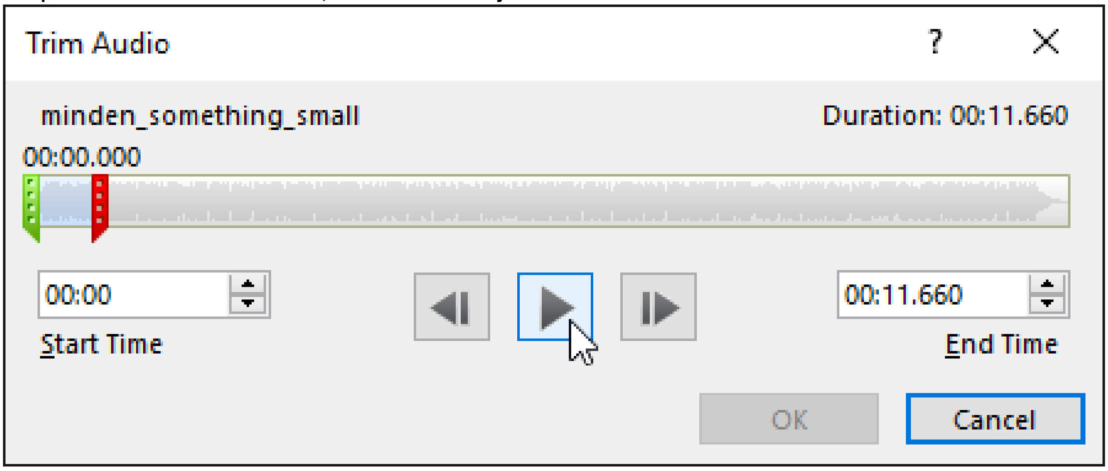

2. Click the **Trim Audio** command.




3. A dialog box will appear. Use the **green handle** to set the **start time** and the **red handle** to set the **end time**.



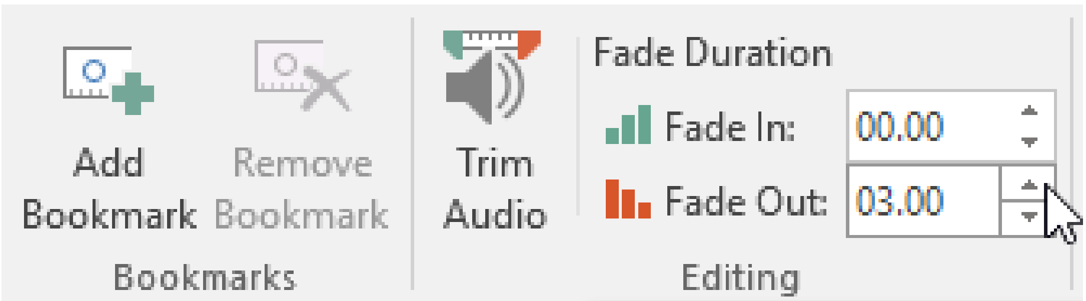

4. To preview the audio file, click the **Play** button.




5. Adjust the handles again if necessary, then click **OK**.

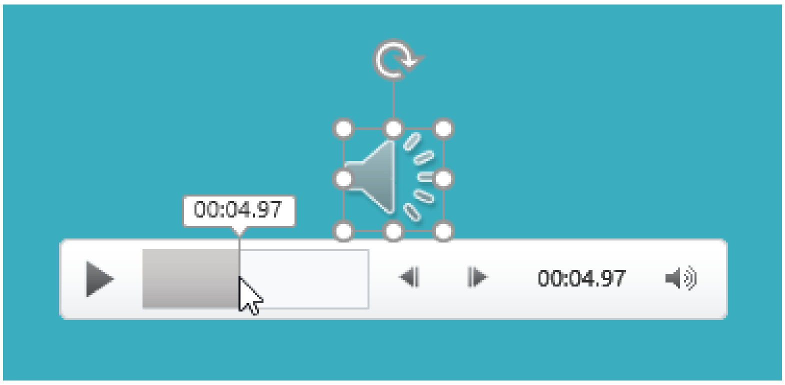
To add a fade in and fade out:

1. On the **Playback** tab, locate the **Fade In:** and **Fade Out:** fields.
2. Type the desired values, or use the **up** and **down** arrows to adjust the times.

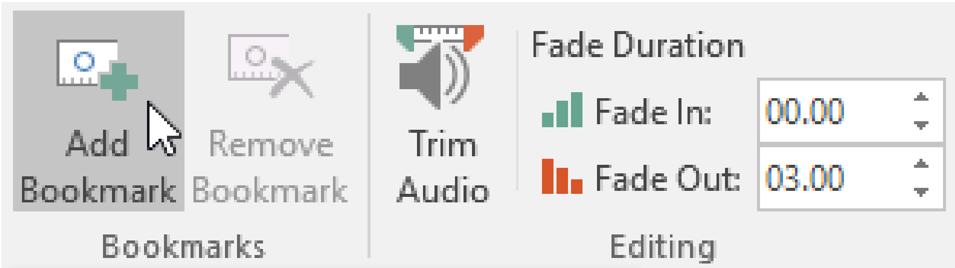



To add a bookmark:

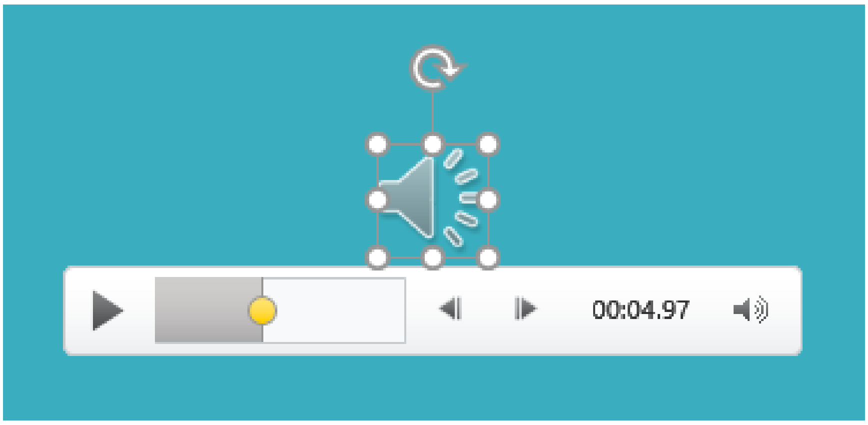
1. Click the **timeline** to locate the desired part of the audio file.




2. From the **Playback** tab, click the **Add Bookmark** command.

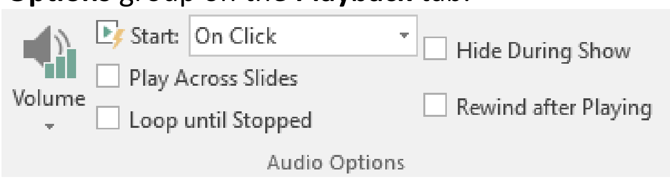



3. The bookmark will appear on the timeline. Click the bookmark to jump to that location.




Audio options

There are other options you can set to control how your audio file will play. These are found in the **Audio Options** group on the **Playback** tab.



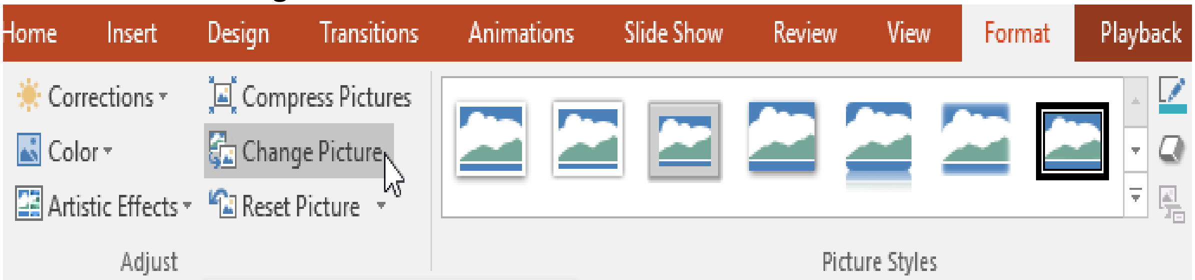

- **Volume**: Changes the audio volume
- **Start**: Controls whether the audio file starts **automatically** or when the mouse is **clicked**
- **Hide During Show**: Hides the audio icon while the slide show is playing
- **Play Across Slides**: Continues playing the audio file across multiple slides instead of just the current slide
- **Loop until Stopped**: Replays the audio file until stopped

- **Rewind after Playing**: Returns the audio file to the beginning when it is finished playing

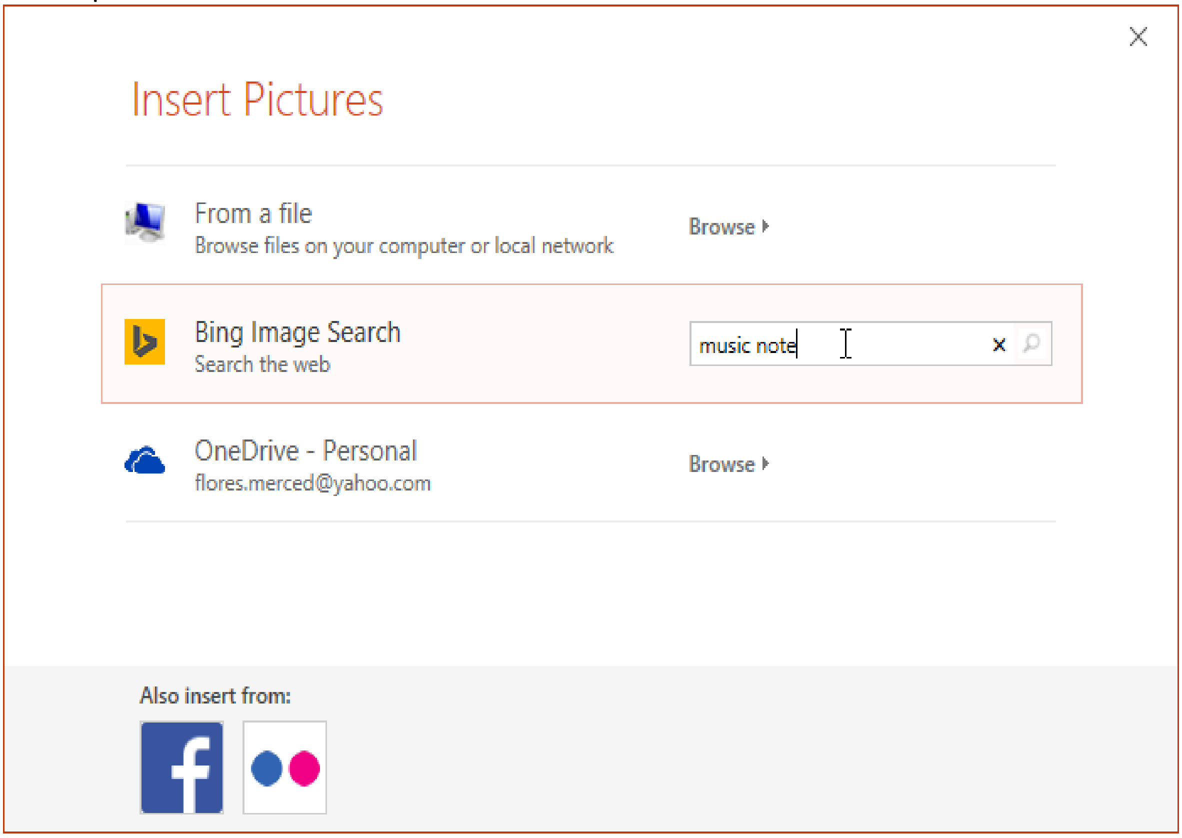
To change the audio icon:

By default, an audio file will appear as a **speaker icon** in the slide. If you want, you can change the icon to a different picture.

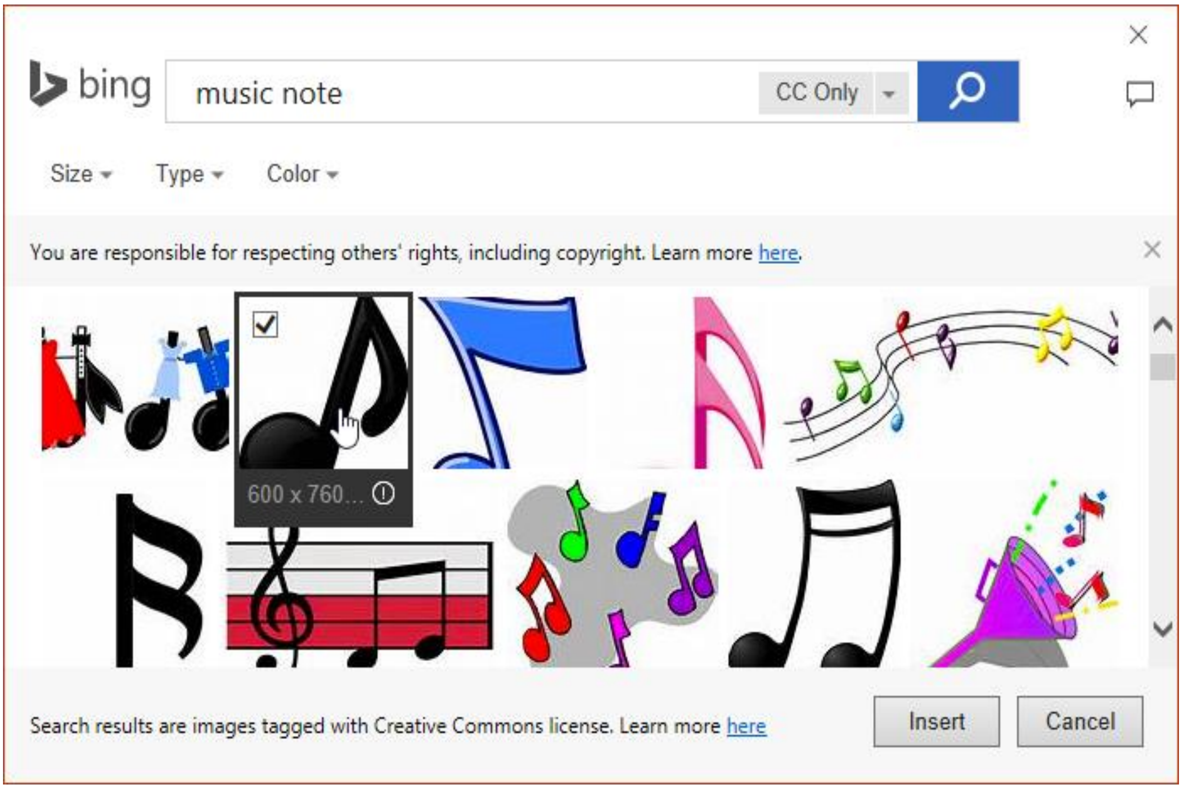
1. Select the audio file, then click the **Format** tab.
2. Click the **Change Picture** command.



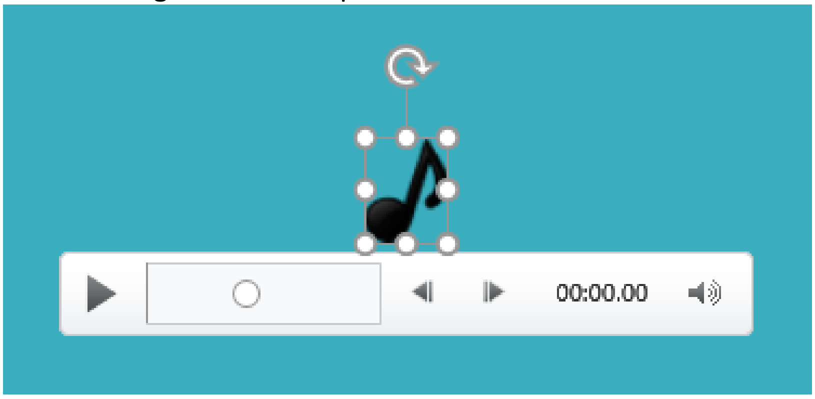

3. The **Insert Pictures** dialog box will appear. Click **Browse** to select a file from your computer. Alternatively, you can use the **online image search tools** to locate an image online. In our example, we'll search using the phrase **music note**.




4. Locate and select the **desired picture**, then click **Insert**.




5. The icon will change to the new picture.

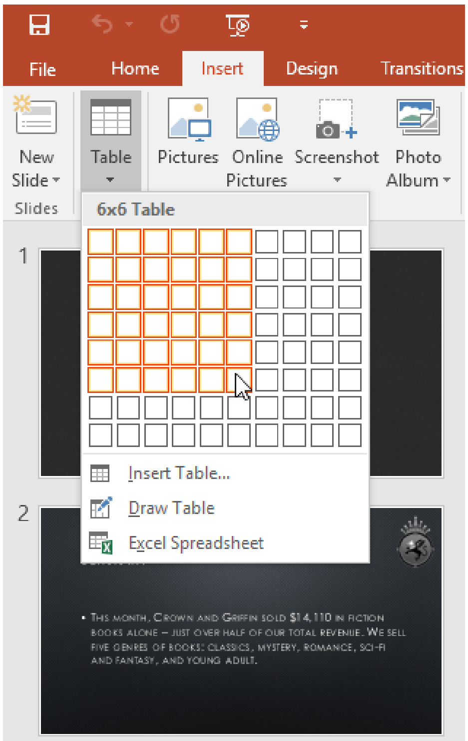



## Lesson 15: Tables

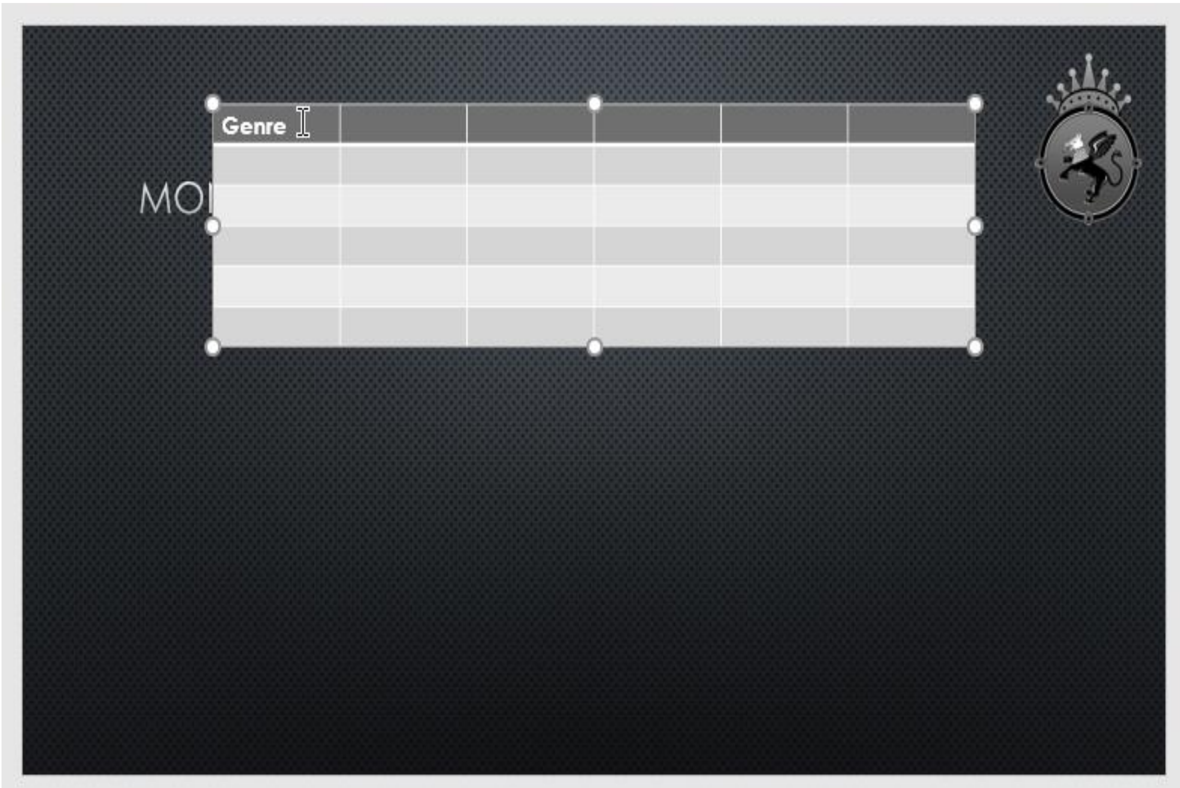
Tables are another tool you can use to display information in PowerPoint. A table is a grid of cells arranged in rows and columns. Tables are useful for various tasks, including presenting text information and numerical data. You can even customize tables to fit your presentation.

15.1 To insert a table:

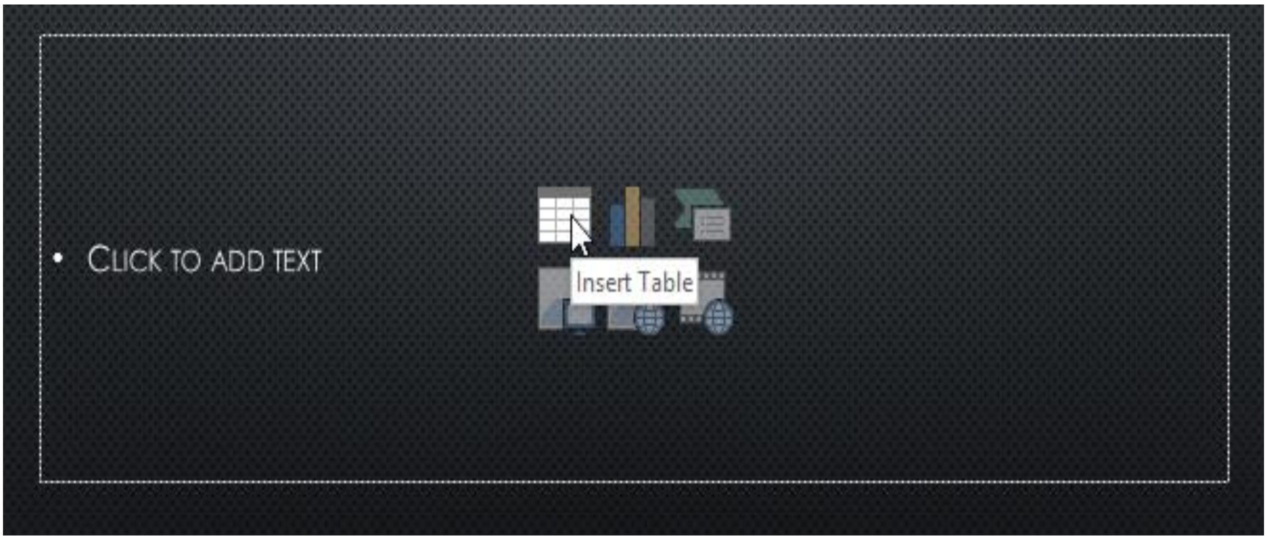
1. From the **Insert** tab, click the **Table** command.
2. Hover the mouse over the grid of squares to select the desired number of **columns** and **rows** in the table. In our example, we'll insert a table with **six rows** and **six columns** (6x6).




3. The table will appear on the currently selected slide. In our example, that's slide 3.
4. Click anywhere in the table, and begin typing to add text. You can also use the **Tab** key or the **arrow keys** on your keyboard to navigate through the table.




You can also insert a table by clicking the **Insert Table** command in a **placeholder**.

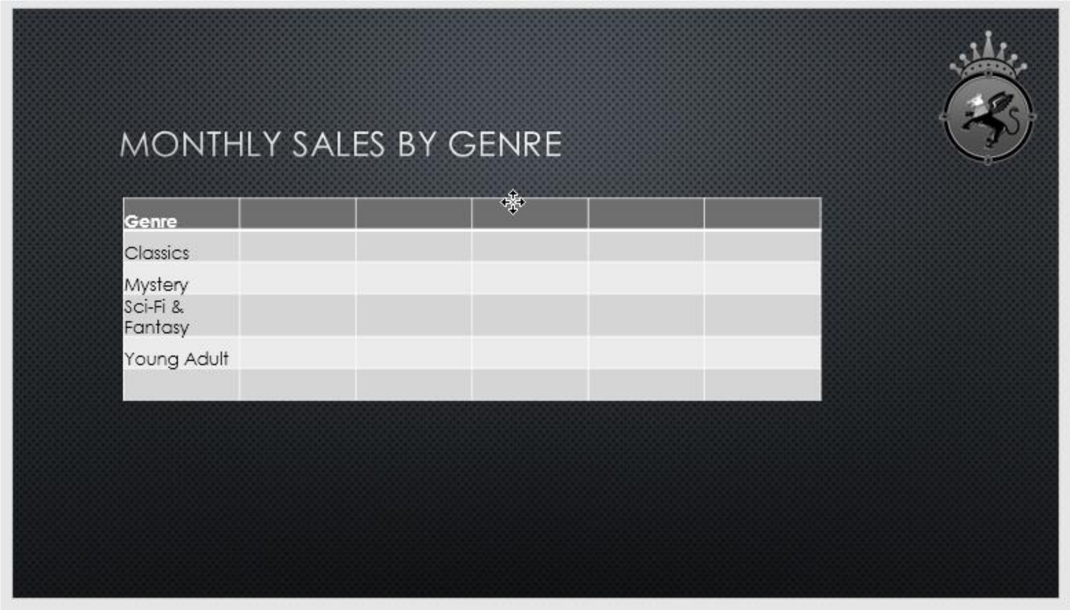



## 15.2 Modifying tables

PowerPoint includes several options for customizing tables, including **moving** and **resizing**, as well as **adding rows** and **columns**.

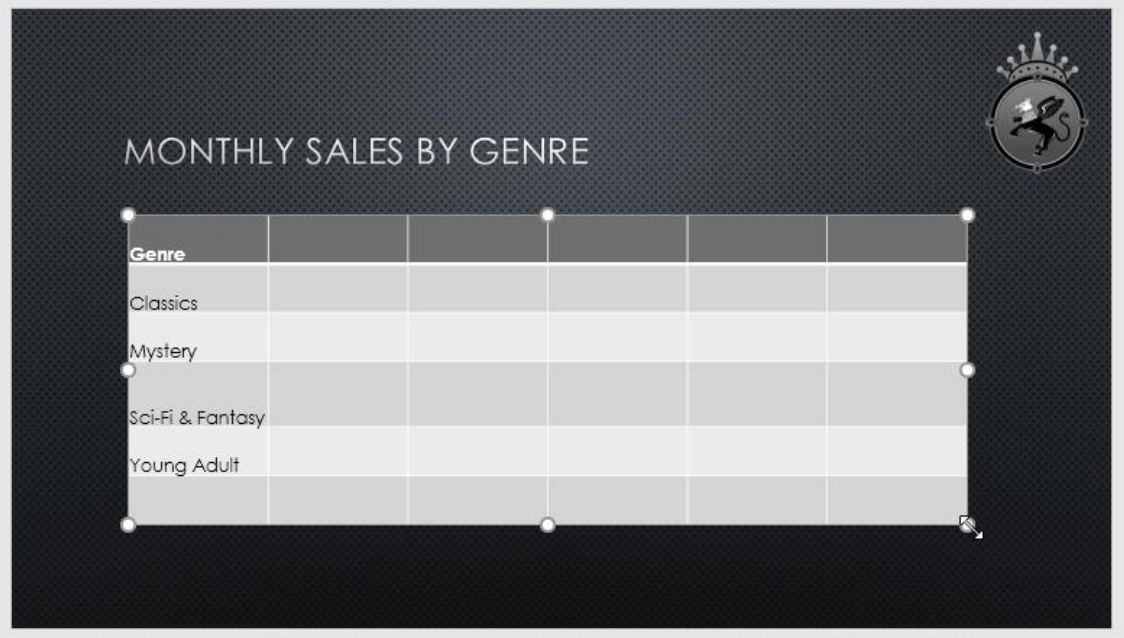
To move a table:

- Click and drag the **edge** of a table to **move it** to a new location on a slide.



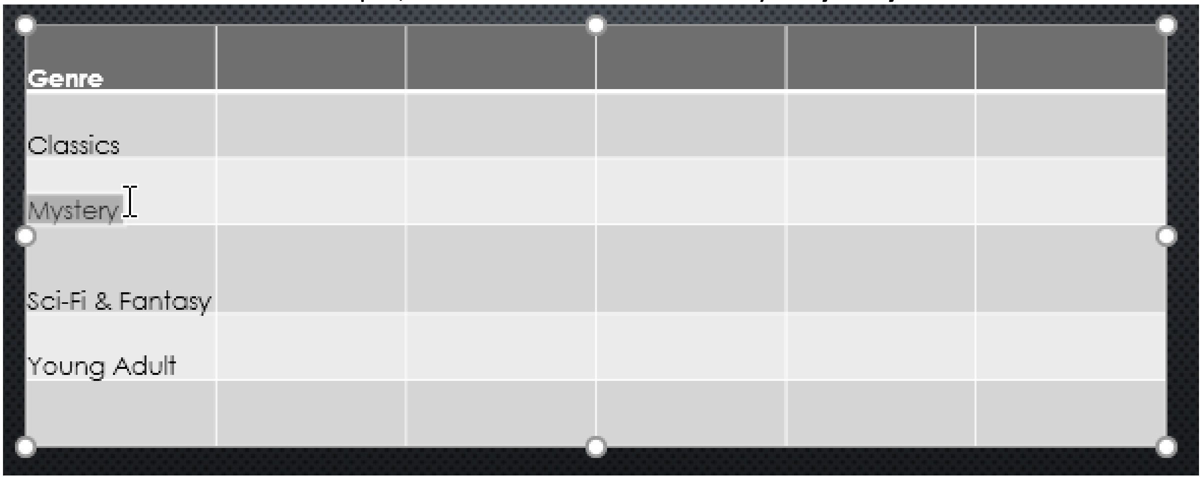

To resize a table:

- Click and drag the **sizing handles** until the table is the desired size.

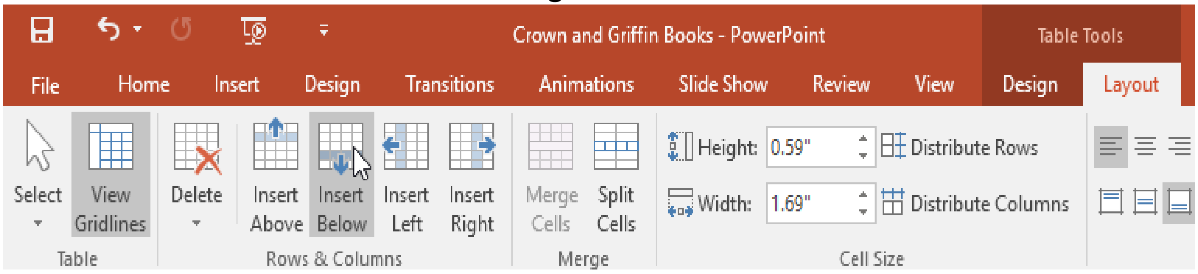



To add a row or column:

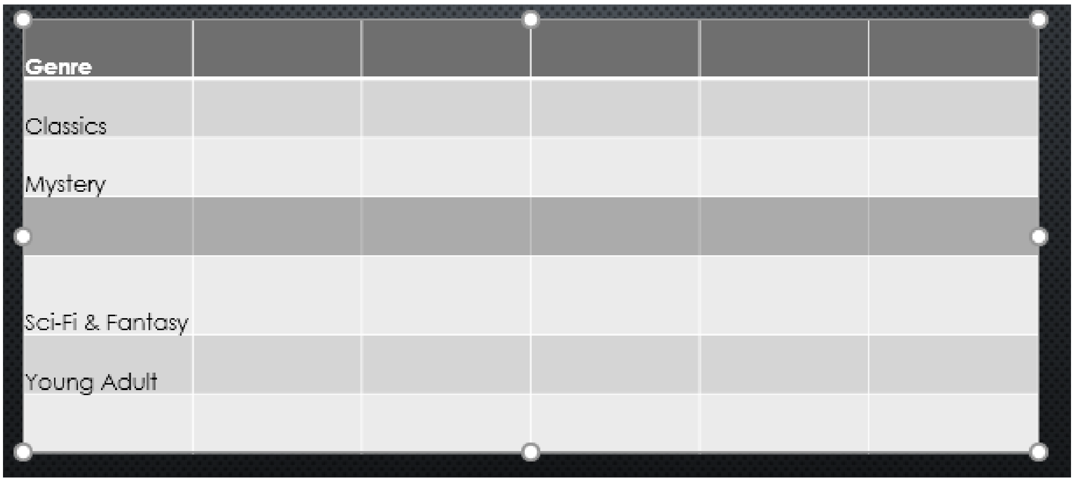
1. Click a cell **adjacent to** the location where you want to add a row or column. In our example, we'll select the cell that says **Mystery**.




2. Click the **Layout** tab on the right side of the Ribbon.
3. Locate the **Rows & Columns** group. If you want to insert a new **row**, select either **Insert Above** or **Insert Below**. If you want to insert a new **column**, select either **Insert Left** or **Insert Right**.

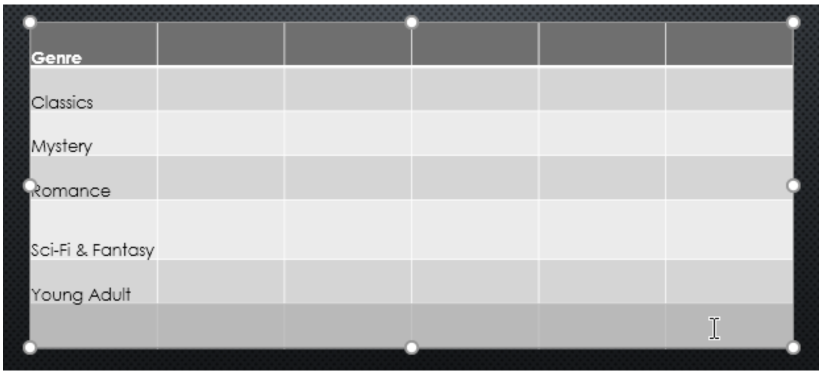



4. The new row or column will appear.

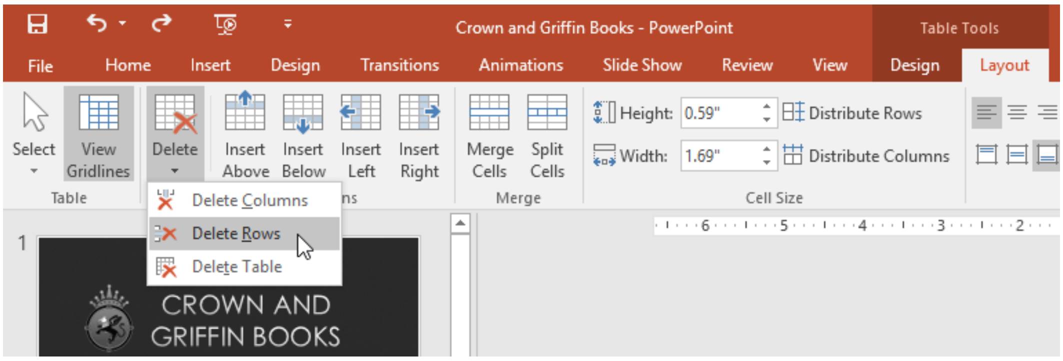



To delete a row or column:

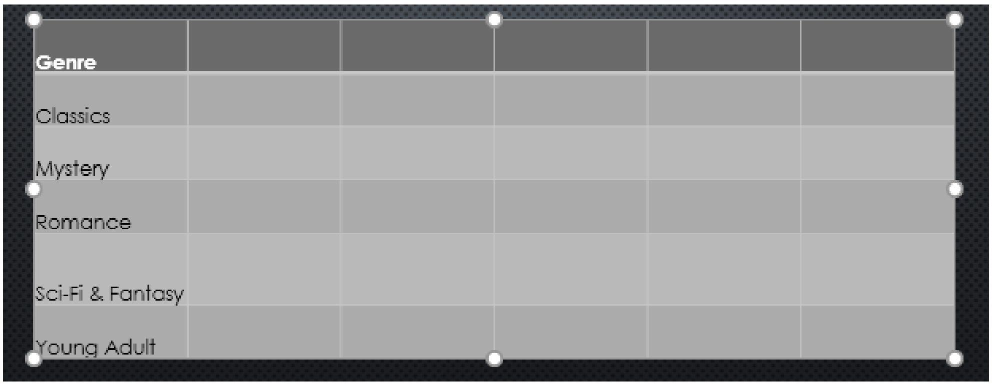
1. Select the desired row or column. In our example, we'll select the **empty row** at the bottom of the table.



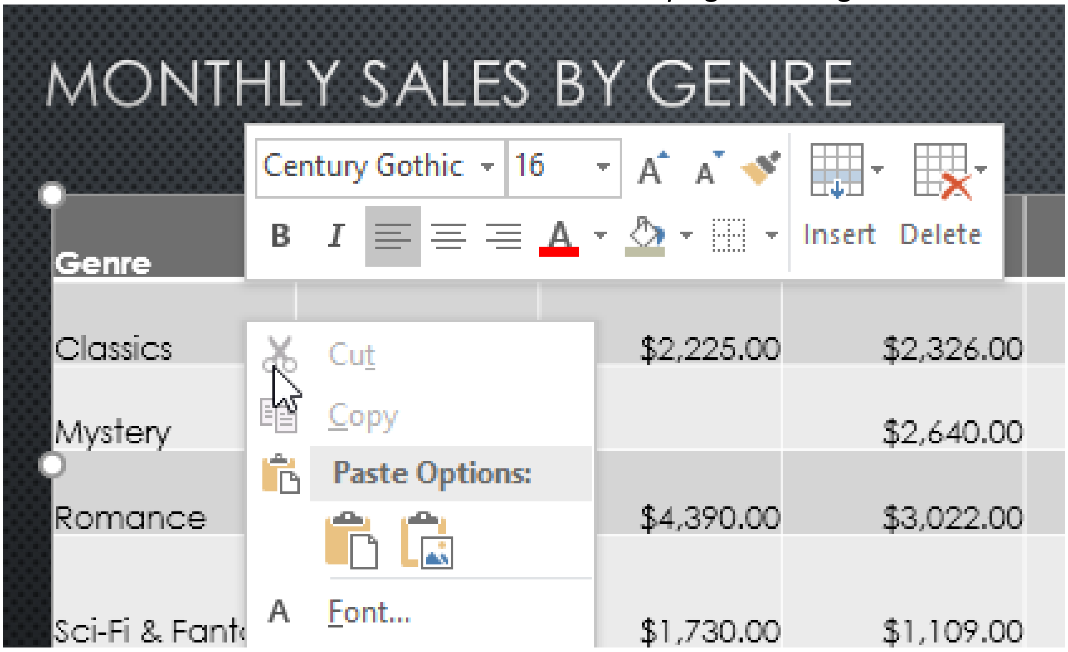

2. From the **Layout** tab in the **Rows & Columns group**, click the **Delete** command, then select **Delete Rows** or **Delete Columns** from the menu.




3. The selected row or column will be deleted.




You can also access the **Insert** and **Delete** commands by right-clicking a table.



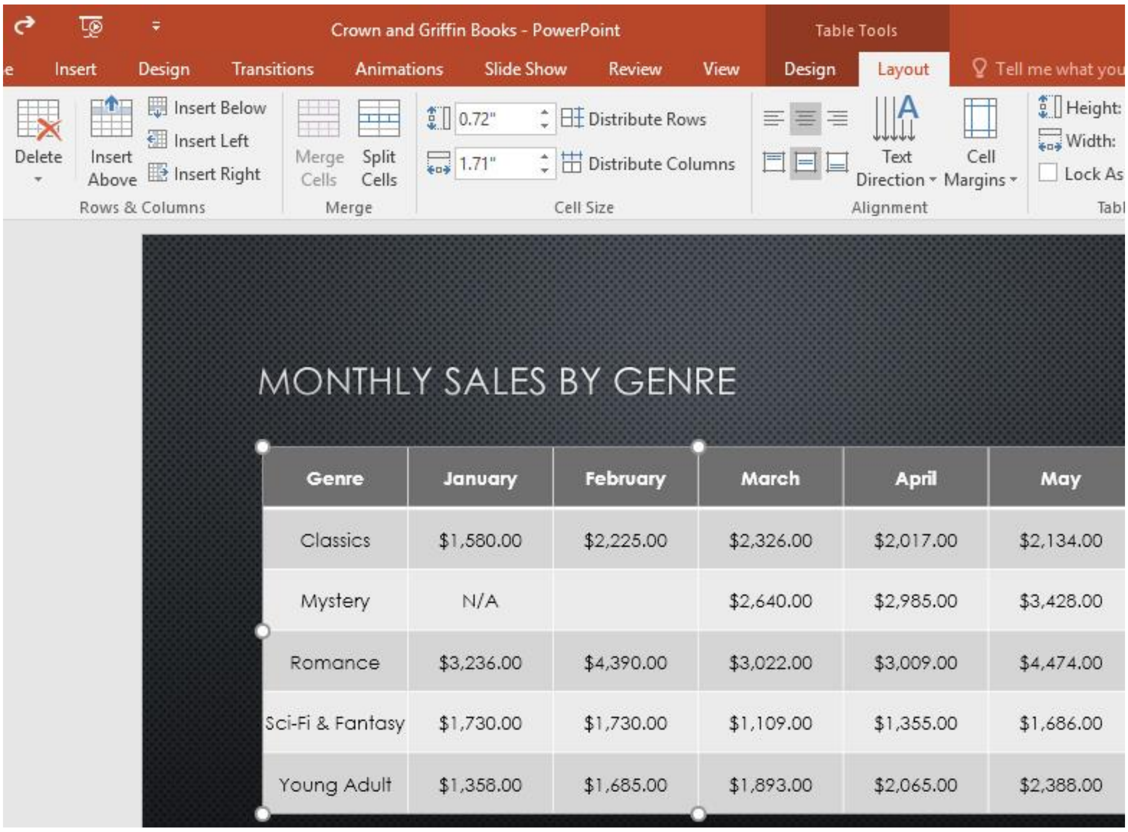

To delete a table:

- Click the edge of the table you want to delete, then press the **Backspace** or **Delete** key on your keyboard.

## 15.3 Modifying tables with the Layout tab

When you select a table, the **Design** and **Layout** tabs will appear on the right side of the Ribbon. You can make a variety of changes to a table using the commands on the **Layout** tab.

Click the buttons in the interactive below to learn about the different commands on the Layout tab.

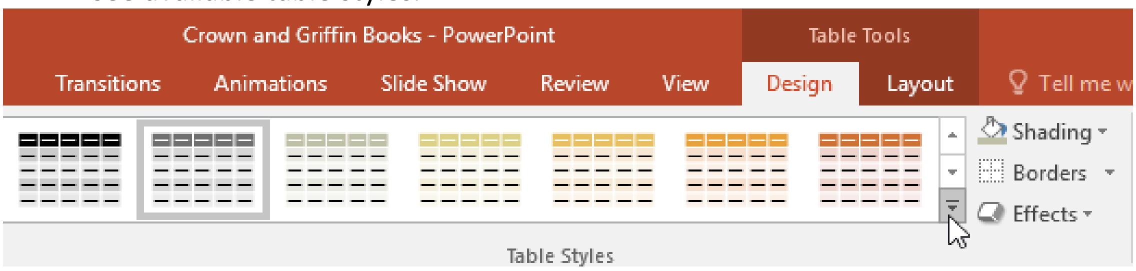



## Customizing tables

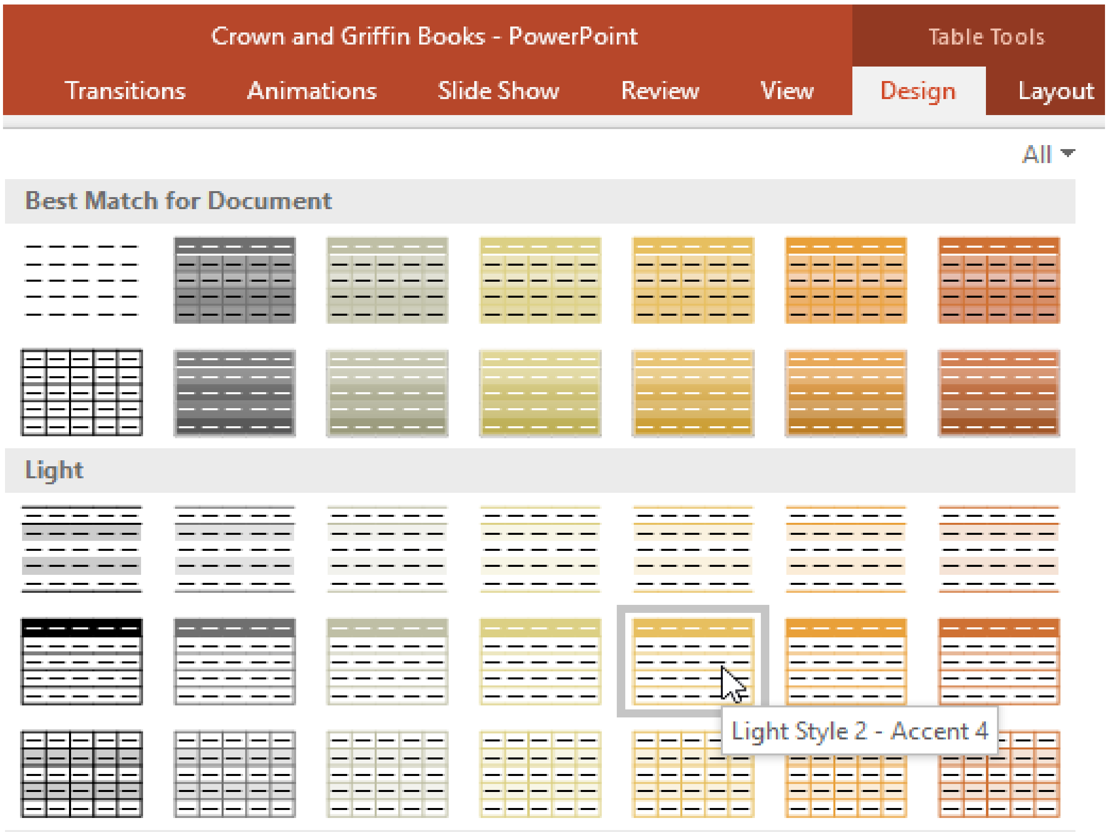
PowerPoint makes it easy to change the look and feel of your tables. For example, you can quickly apply different **table styles** and customize the **table borders**.

To apply a table style:

1. Select **any cell** in your table, then click the **Design** tab on the right side of the Ribbon.
2. Locate the **Table Styles** group, then click the **More** drop-down arrow to see available table styles.




3. Select the desired style.



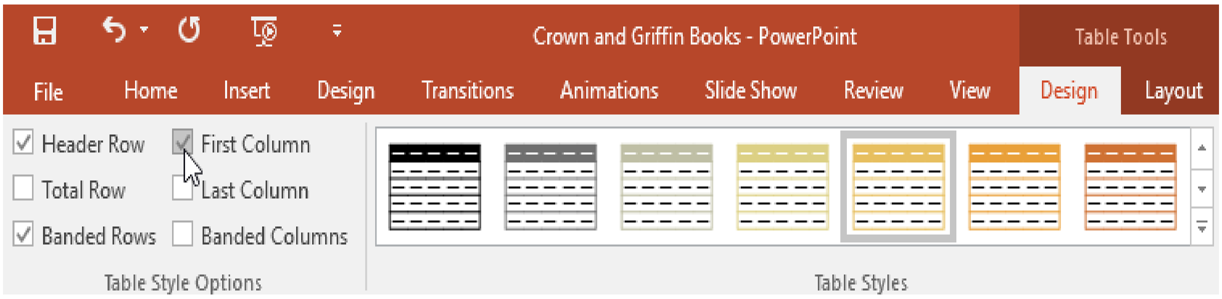

4. The selected table style will be applied.

| Genre | January | February | March | April | May |
|---|---|---|---|---|---|
| Classics | $1,580.00 | $2,225.00 | $2,326.00 | $2,017.00 | $2,134.00 |
| Mystery | N/A | | $2,640.00 | $2,985.00 | $3,428.00 |
| Romance | $3,236.00 | $4,390.00 | $3,022.00 | $3,009.00 | $4,474.00 |
| Sci-Fi & Fantasy | $1,730.00 | $1,730.00 | $1,109.00 | $1,355.00 | $1,686.00 |
| Young Adult | $1,358.00 | $1,685.00 | $1,893.00 | $2,065.00 | $2,388.00 |

To change table style options:

You can turn various options **on** or **off** to change the appearance of the table. There are six options: **Header Row**, **Total Row**, **Banded Rows**, **First Column**, **Last Column**, and **Banded Columns**.

1. Select **any cell** in your table.
2. From the **Design** tab, **check** or **uncheck** the desired options in the **Table Style Options** group.

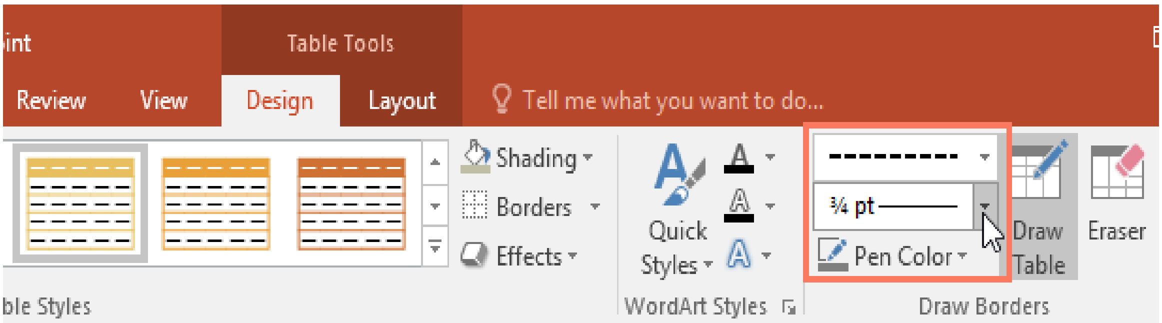



These options can affect your table style in various ways, depending on the type of content in your table. You may need to experiment with a few options to find the exact style you want.

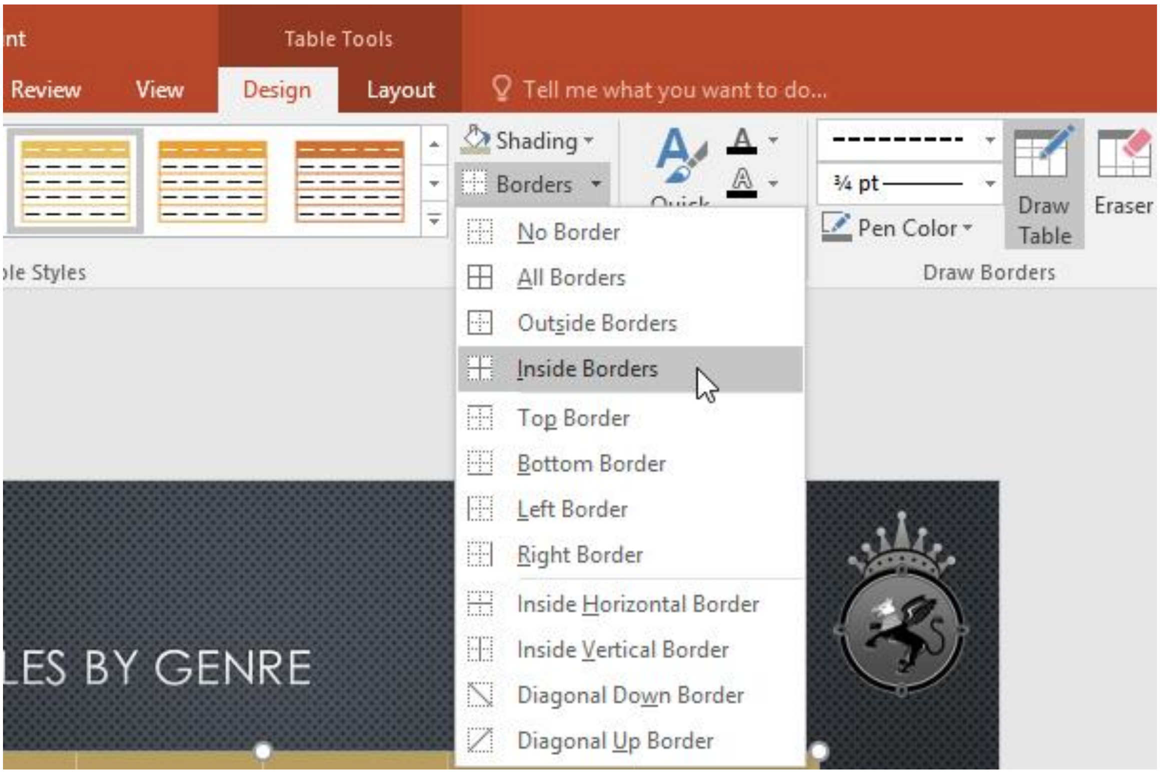
To add borders to a table:

You can add **borders** to help define different sections of a table. Certain table styles may include borders automatically, but it's easy to add them manually or customize them. You can control the border **weight**, **color**, and **line style** for some or all of a table.

1. Select the cells where you want to add borders. In our example, we'll select **every cell** in our table.
2. From the **Design** tab, select the desired **Line Style**, **Line Weight**, and **Pen Color**.




3. Click the **Borders** drop-down arrow, then select the desired **border type**.




4. The border will be added to the selected cells.

| Genre | January | February | March | April | May |
|---|---|---|---|---|---|
| Classics | $1,580.00 | $2,225.00 | $2,326.00 | $2,017.00 | $2,134.00 |
| Mystery | N/A | | $2,640.00 | $2,985.00 | $3,428.00 |
| Romance | $3,236.00 | $4,390.00 | $3,022.00 | $3,009.00 | $4,474.00 |
| Sci-Fi & Fantasy | $1,730.00 | $1,730.00 | $1,109.00 | $1,355.00 | $1,686.00 |
| Young Adult | $1,358.00 | $1,685.00 | $1,893.00 | $2,065.00 | $2,388.00 |

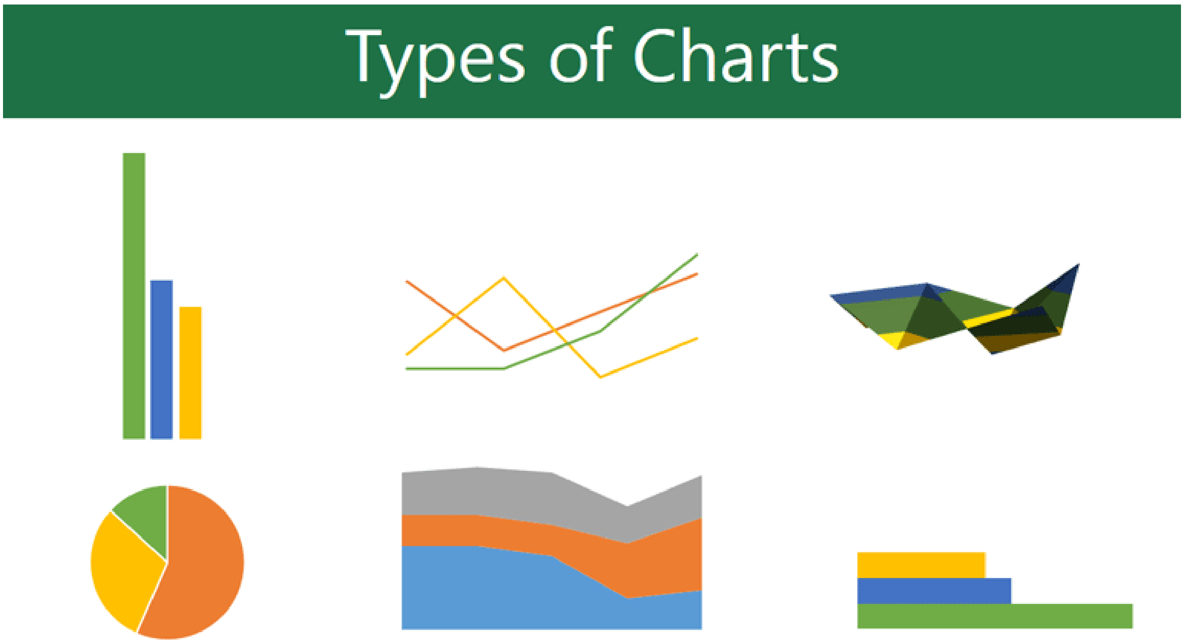
5. To **remove** borders, select the desired cells, click the **Borders** command, and select **No Border**.

## Lesson 16: Charts

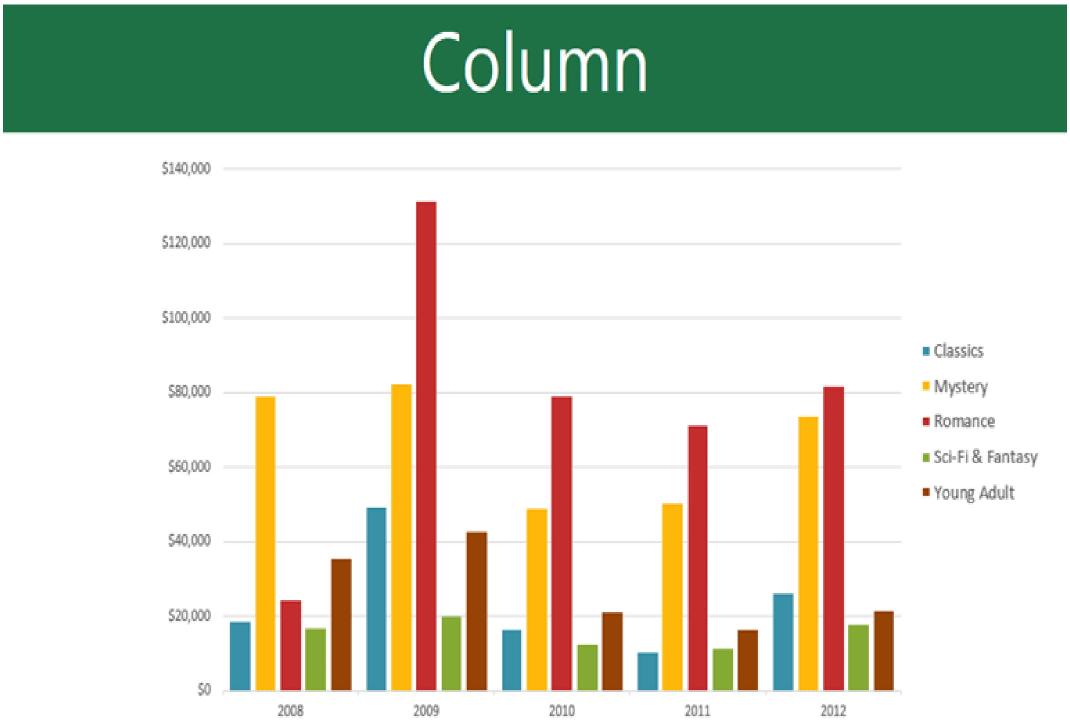
A chart is a tool you can use to communicate data graphically. Including a chart in a presentation allows your audience to see the meaning behind the numbers, which makes it easy to visualize comparisons and trends.

## 16.1 Types of charts

PowerPoint has several types of charts, allowing you to choose the one that best fits your data. In order to use charts effectively, you'll need to understand how different charts are used.



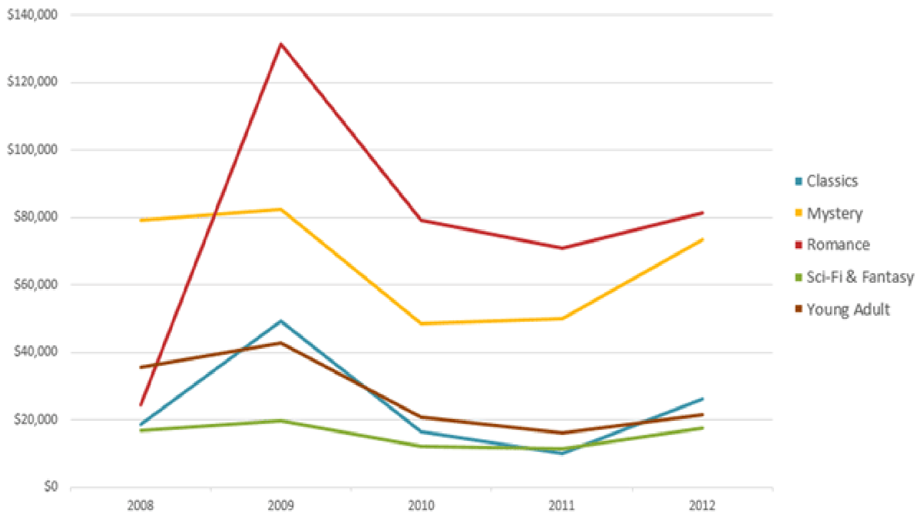

PowerPoint has a variety of chart types, each with its own advantages. Click the arrows to see some of the different types of charts available in PowerPoint.




•

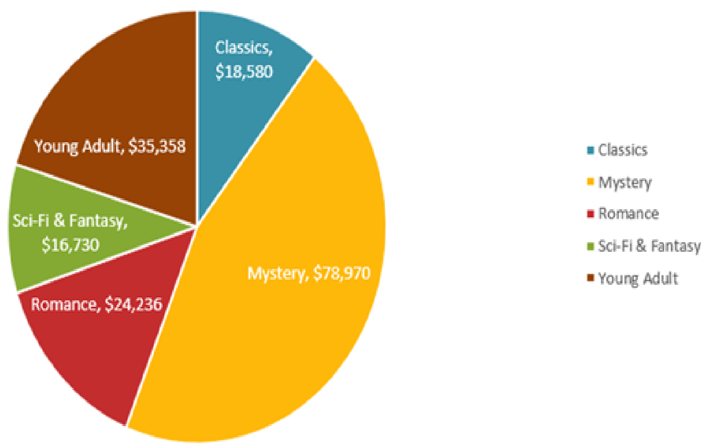
**Column charts** use vertical bars to represent data. They can work with many different types of data, but they're most frequently used for comparing information.

# Line



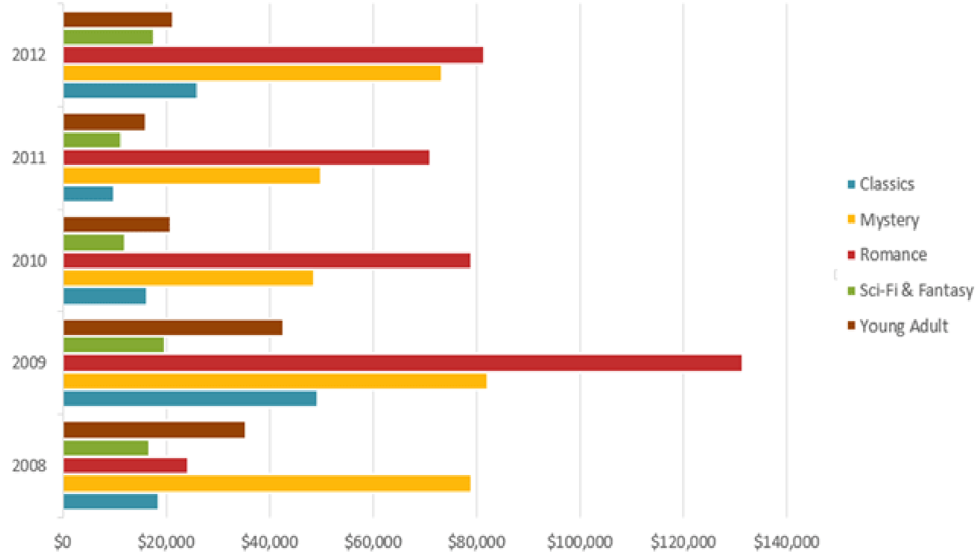

- **Line charts** are ideal for showing trends. The data points are connected with lines, making it easy to see whether values are increasing or decreasing over time.

# Pie



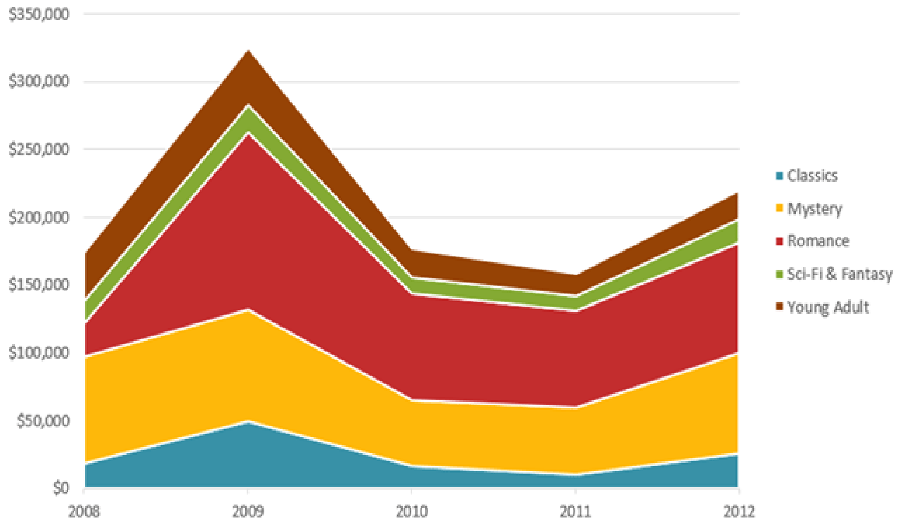

- **Pie charts** make it easy to compare proportions. Each value is shown as a slice of the pie, so it's easy to see which values make up the percentage of a whole.

# Bar



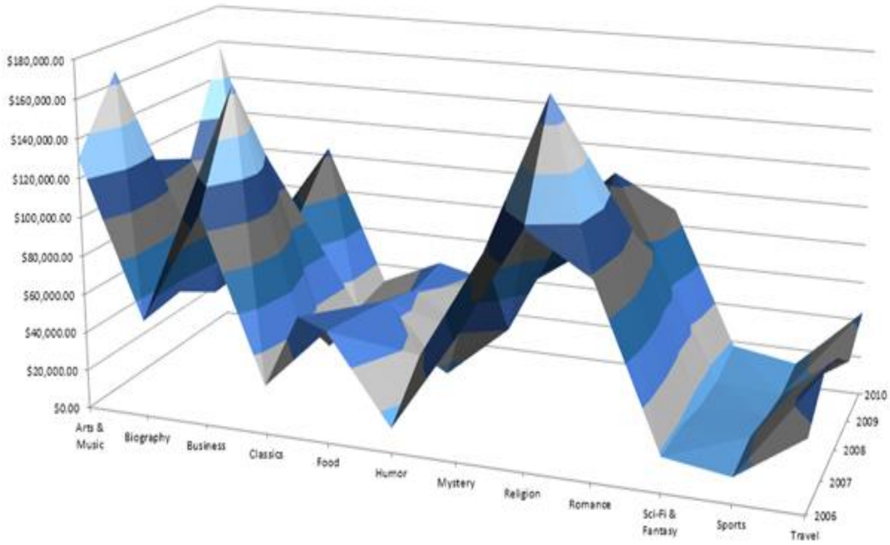

- **Bar charts** work just like column charts, but they use horizontal bars instead of vertical bars.

# Area




- **Area charts** are similar to line charts, except the areas under the lines are filled in.

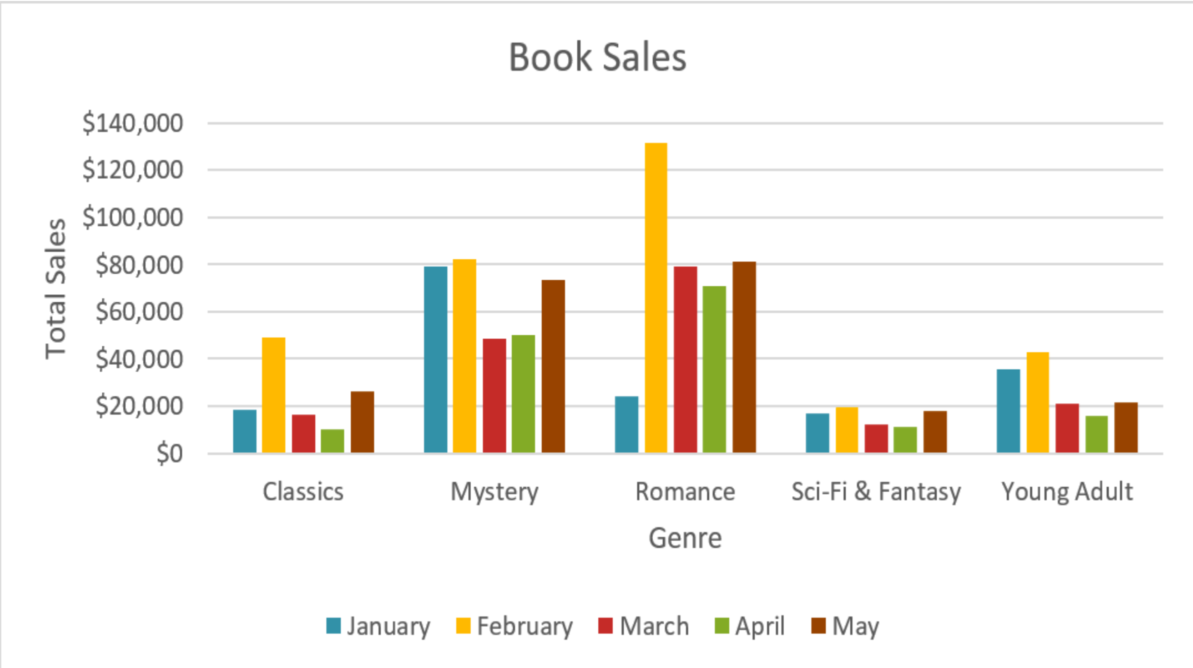
# Surface




- **Surface charts** allow you to display data across a 3D landscape. They work best with large data sets, allowing you to see a variety of information at the same time.

## 16.2 Identifying the parts of a chart

In addition to chart types, you'll need to understand how to **read a chart**. Charts contain several different elements—or parts—that can help you interpret data.

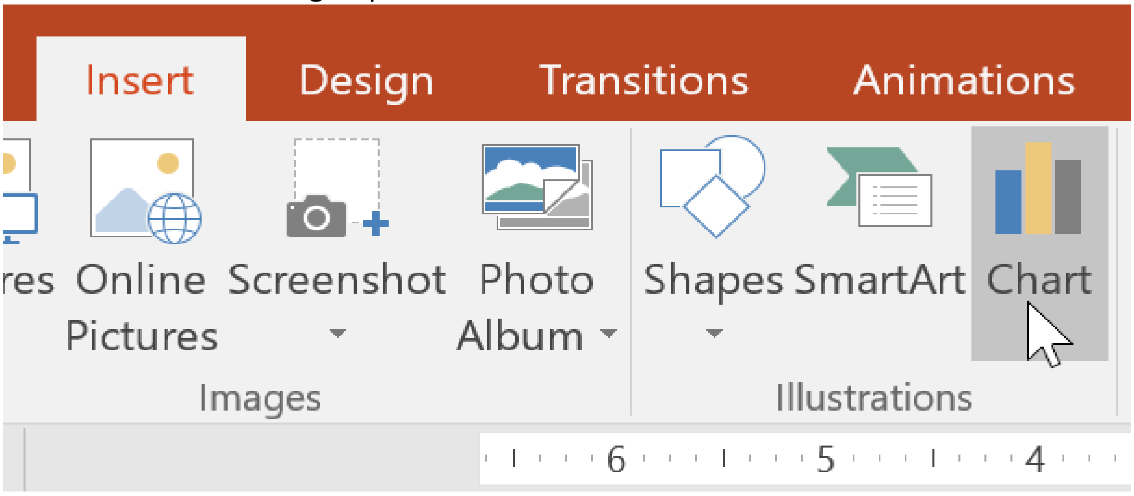


Inserting charts

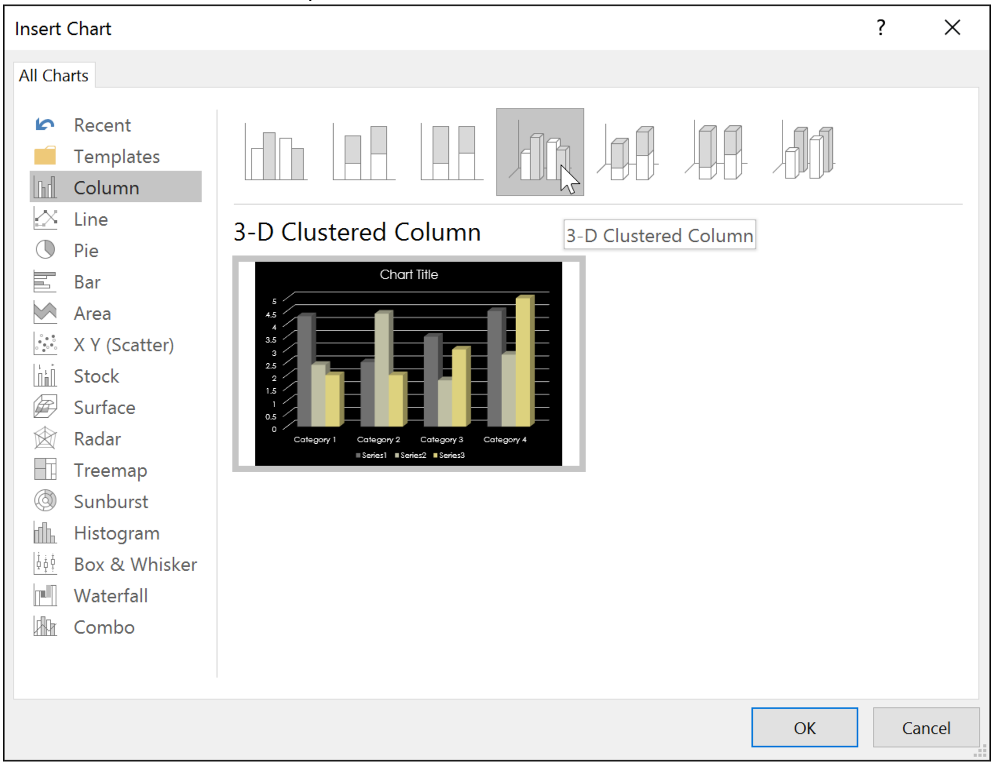
PowerPoint uses a **spreadsheet** as a placeholder for entering chart data, much like **Excel**.

To insert a chart:

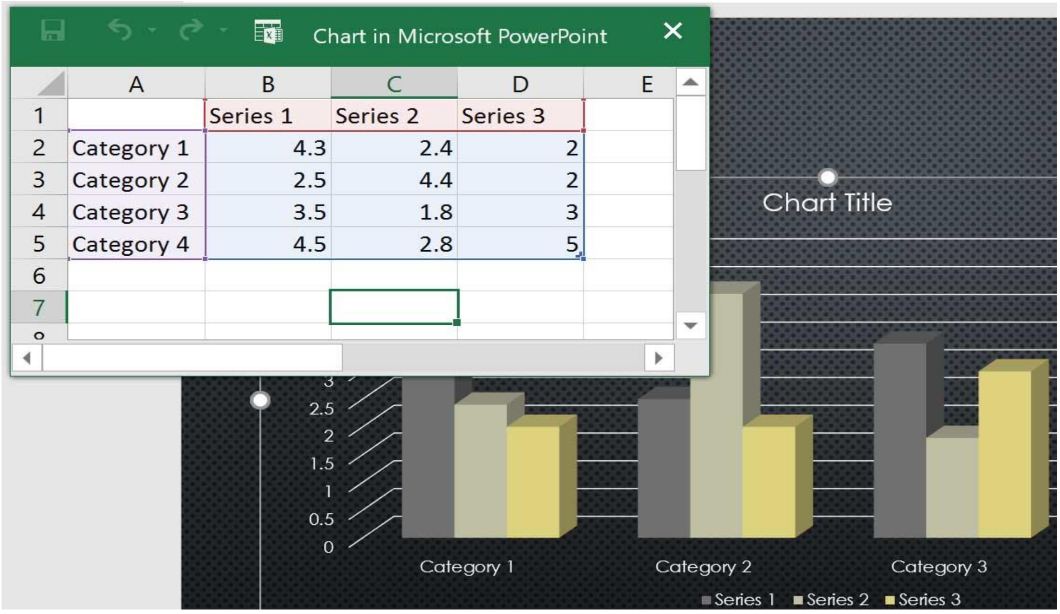
1. Select the **Insert** tab, then click the **Chart** command in the **Illustrations** group.



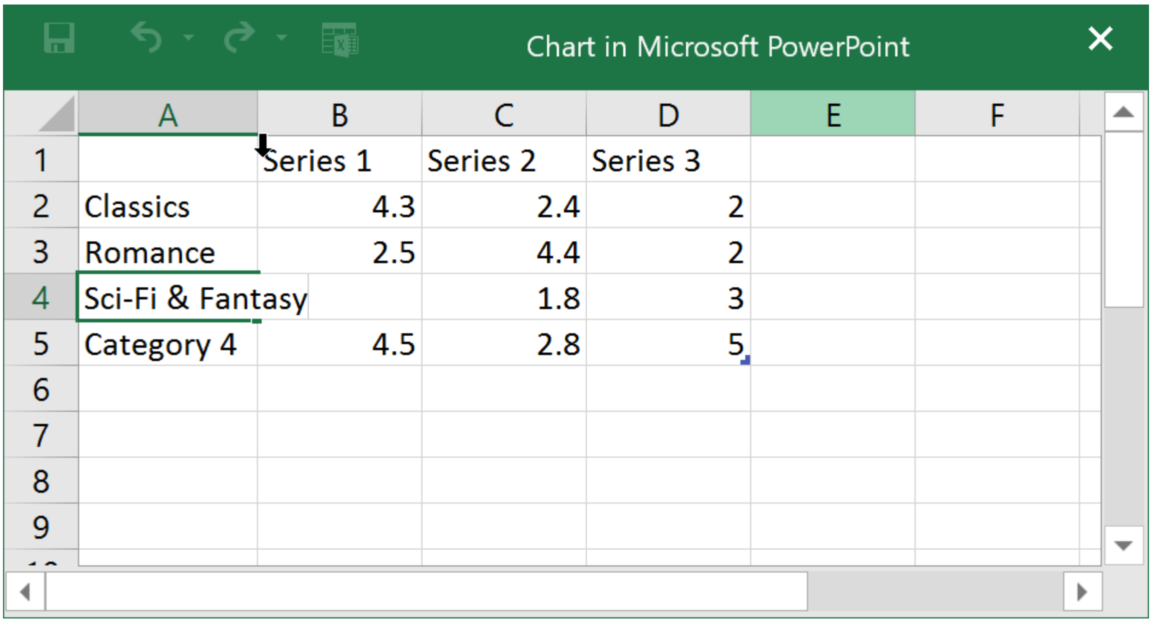

2. A dialog box will appear. Select a **category** from the left pane, and review the **charts** that appear in the right pane.
3. Select the desired **chart**, then click **OK**.



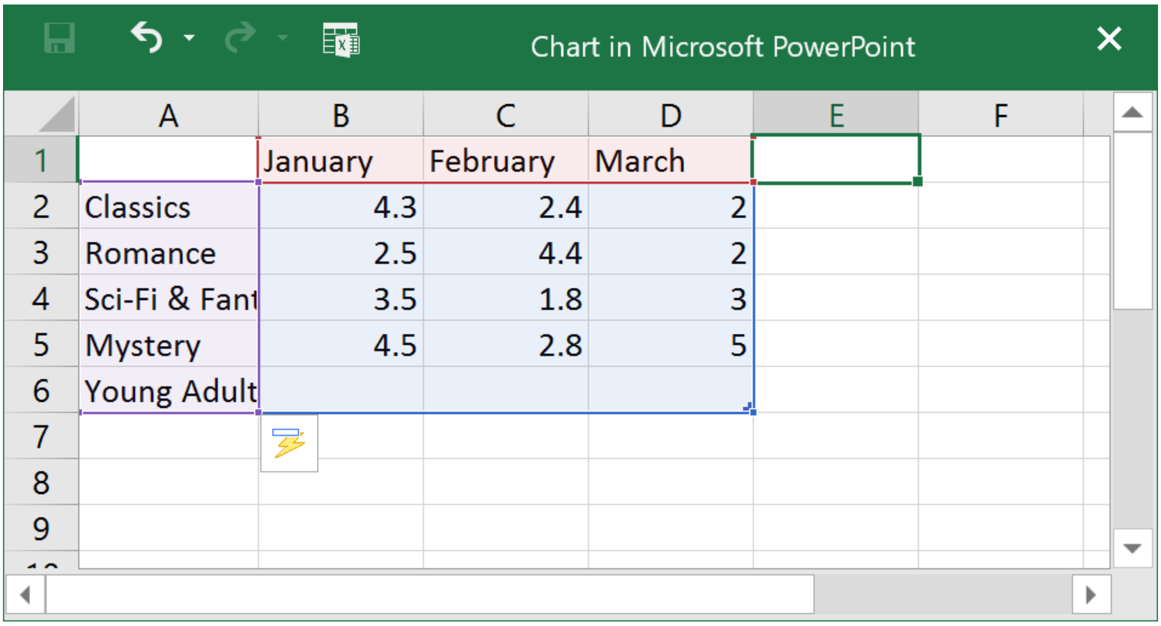

4. A chart and a spreadsheet will appear. The data that appears in the spreadsheet is **placeholder source data** you will replace with your own information. The source data is used to create the chart.



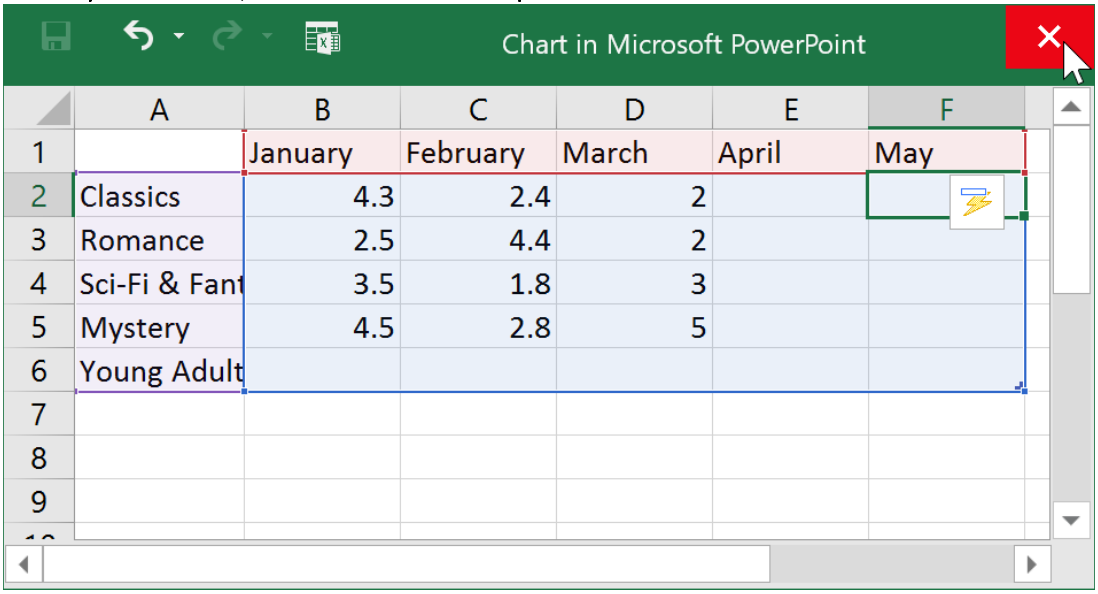

5. Enter **data** into the worksheet.



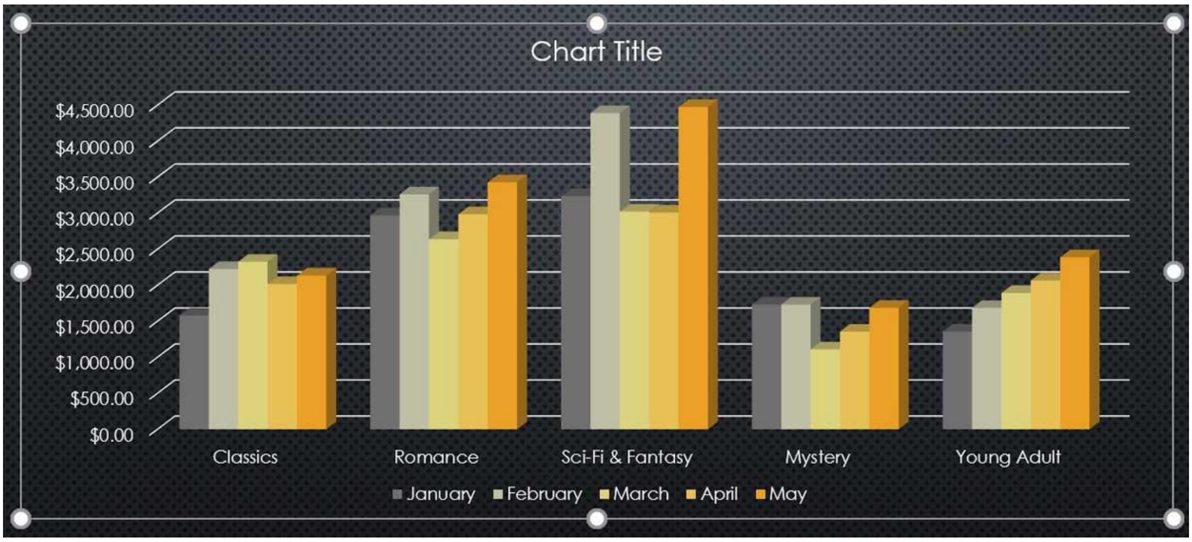

6. Only the data enclosed by the blue lines will appear in the chart, but this area will expand automatically as you continue to type.



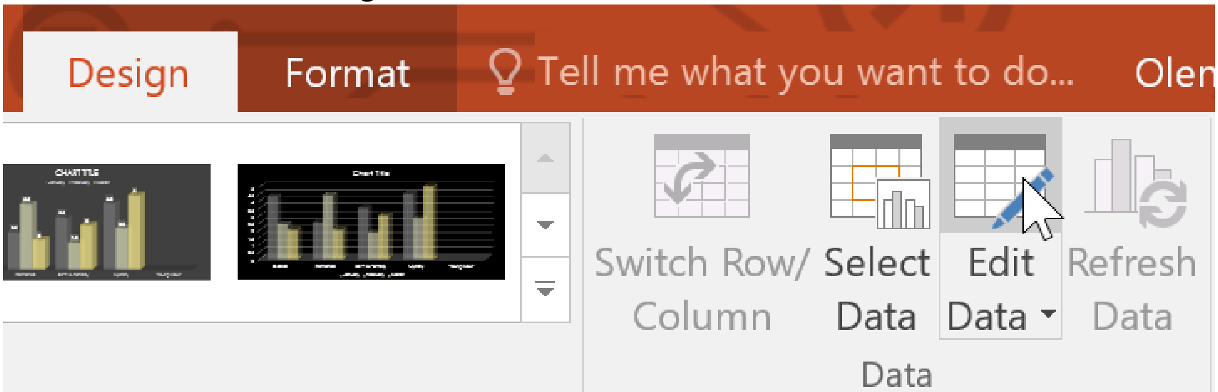

7. When you're done, click **X** to close the spreadsheet.



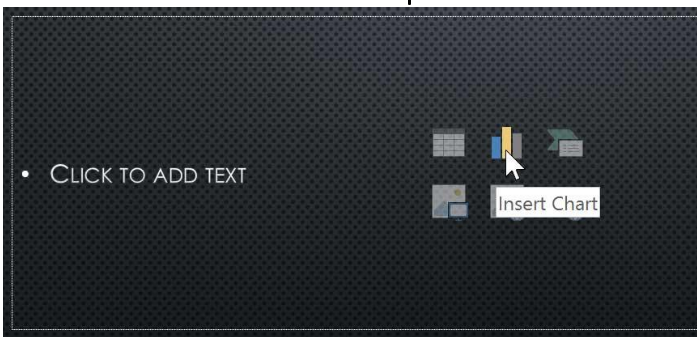

8. The chart will be completed.




You can edit the chart data at any time by selecting your chart and clicking the **Edit Data** command on the **Design** tab.




You can also click the **Insert Chart** command in a placeholder to insert a new chart.




Creating charts with existing Excel data

If you already have data in an existing **Excel file** you want to use for a chart, you can transfer the data by **copying** and **pasting** it. Just open the spreadsheet in Excel, select and copy the desired data, and paste it into the source data area for your chart.

You can also **embed** an existing Excel chart into your PowerPoint presentation. This may be useful when you know you'll need to update the data in your Excel file and want the chart to automatically update whenever the Excel data is changed.

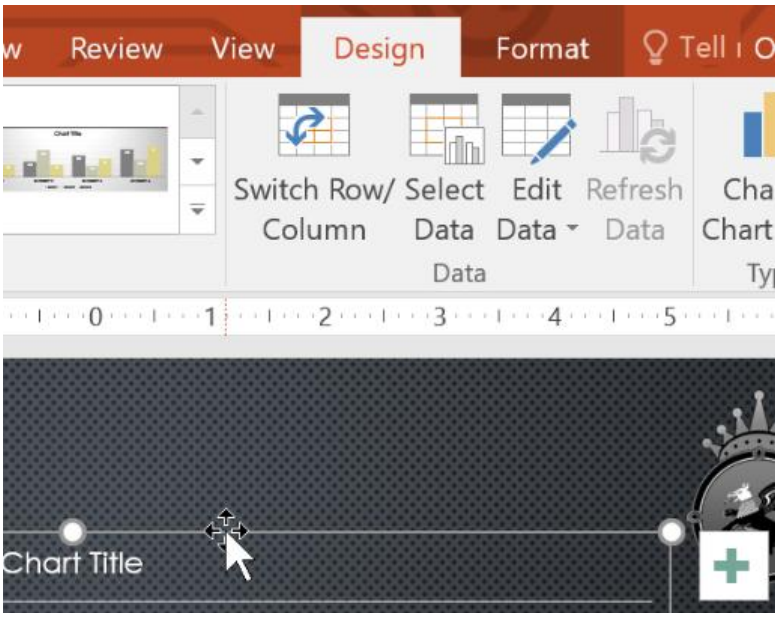
## 16.3 Modifying charts with chart tools

There are many other ways to customize and organize your charts. For example, PowerPoint allows you to change the **chart type**, **rearrange** a chart's data, and even change the **layout** and **style** of a chart.

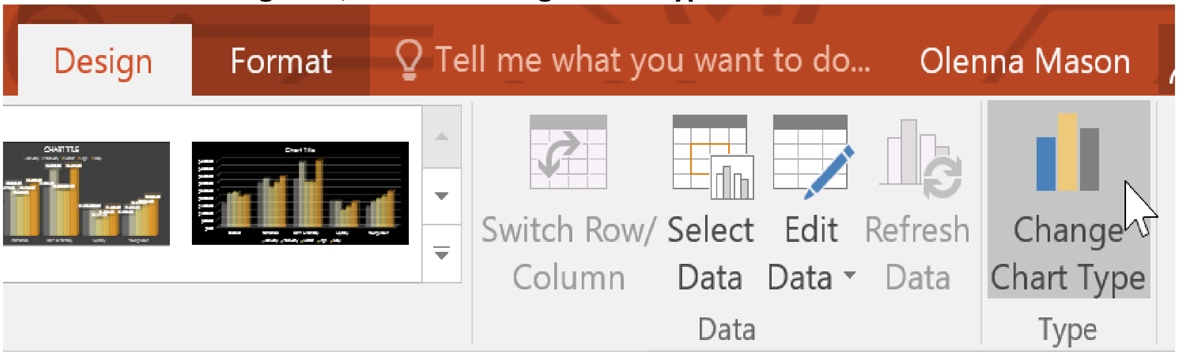
To change the chart type:

If you find that your data isn't well suited to a certain chart, it's easy to switch to a new **chart type**. In our example, we'll change our chart from a **column** chart to a **line** chart.

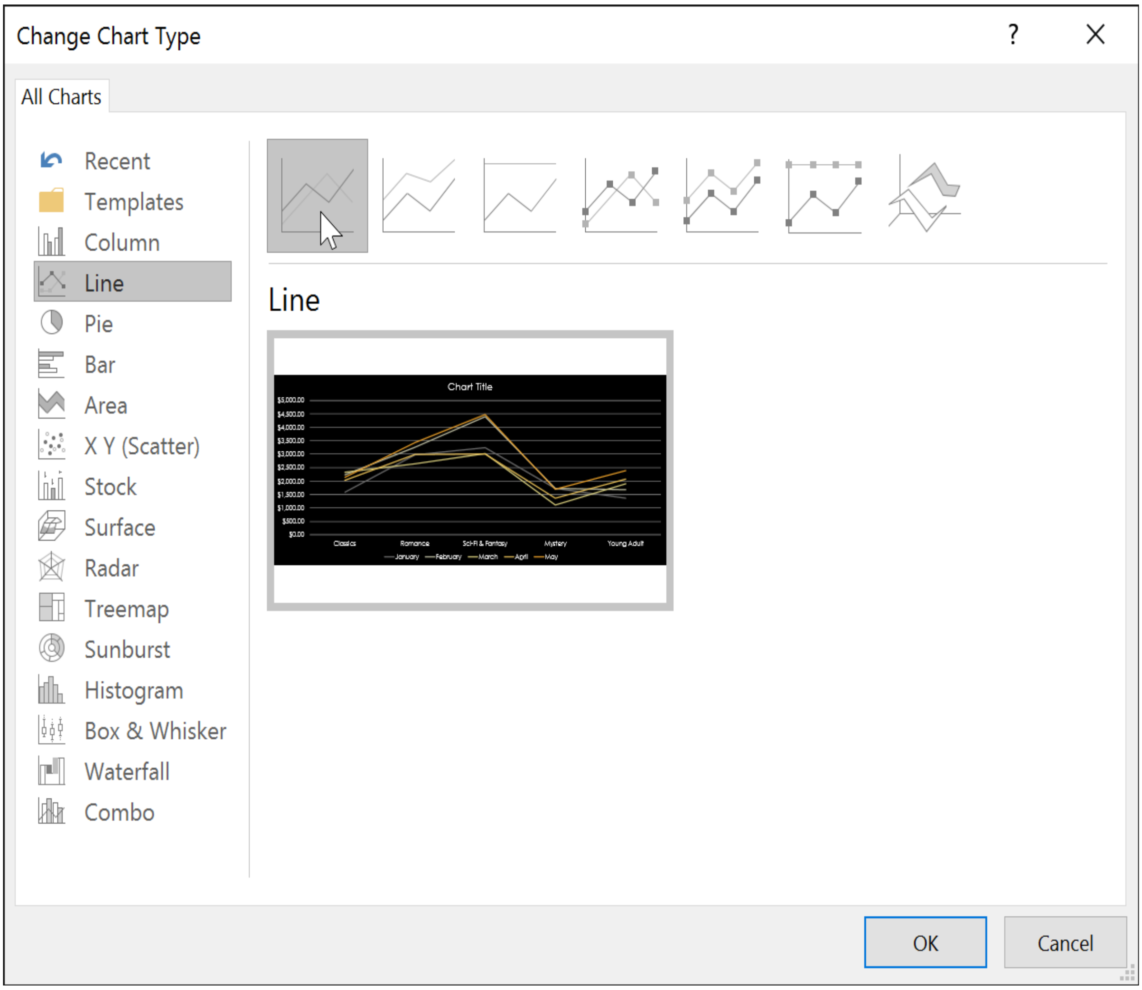
1. Select the chart you want to change. The **Design** tab will appear on the right side of the Ribbon.



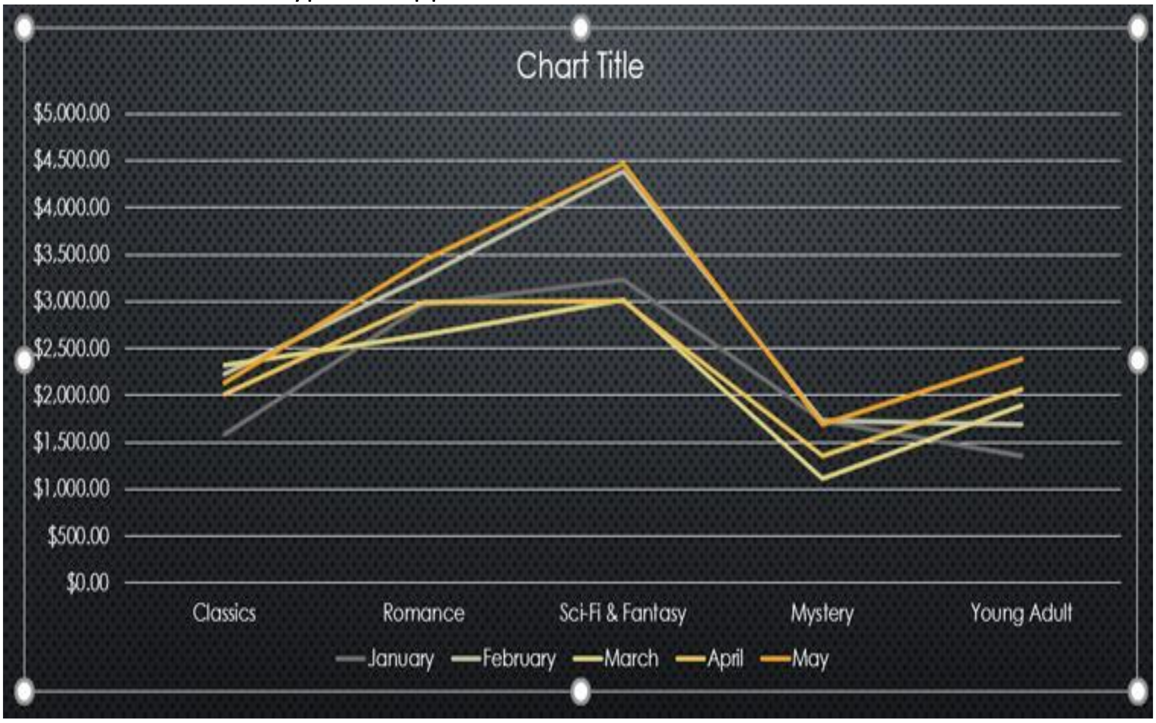

2. From the **Design** tab, click the **Change Chart Type** command.




3. A dialog box will appear. Select the desired chart **type**, then click **OK**.



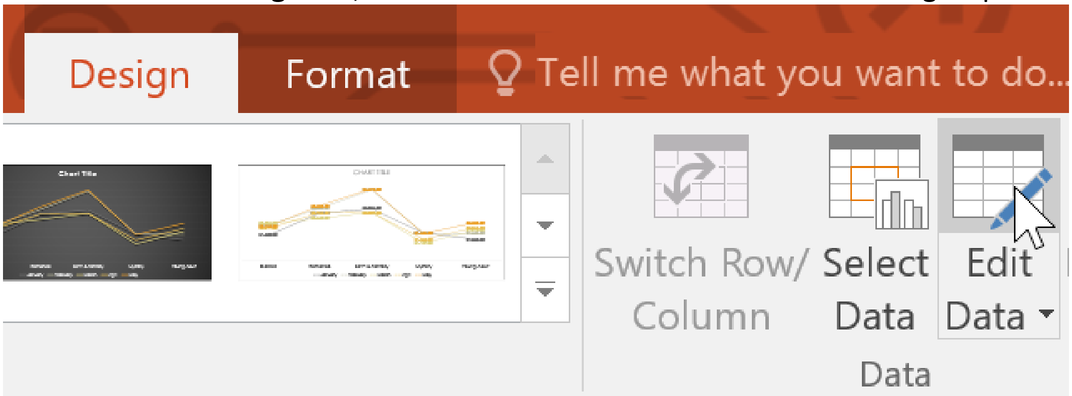

4. The new chart type will appear.



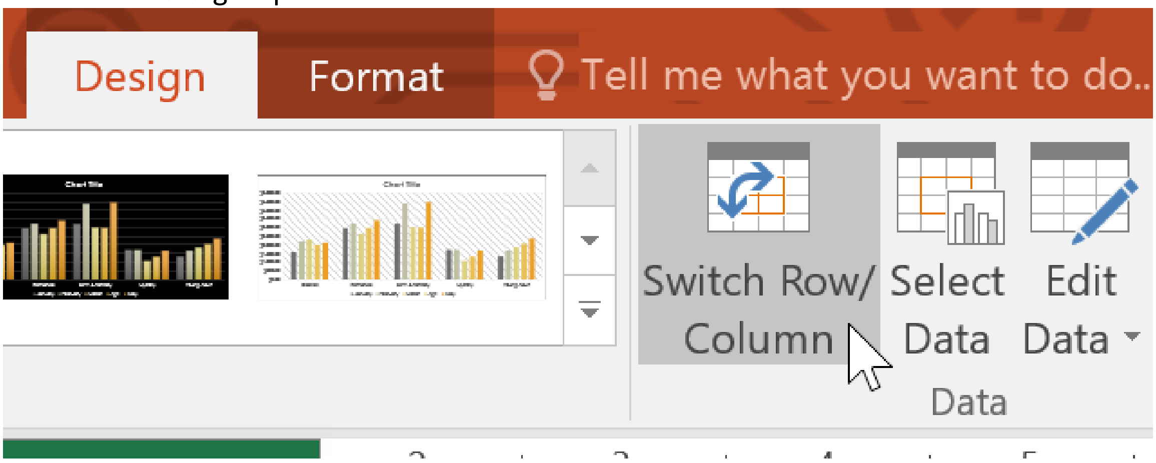
To switch row and column data:

Sometimes you may want to change the way charts **group** your data. For example, in the chart below the book sales data is grouped **by genre**, with lines for **each month**. However, we could switch the rows and columns so the chart will group the data **by month**, with lines for **each genre**. In both cases, the chart contains the same data; it's just organized differently.

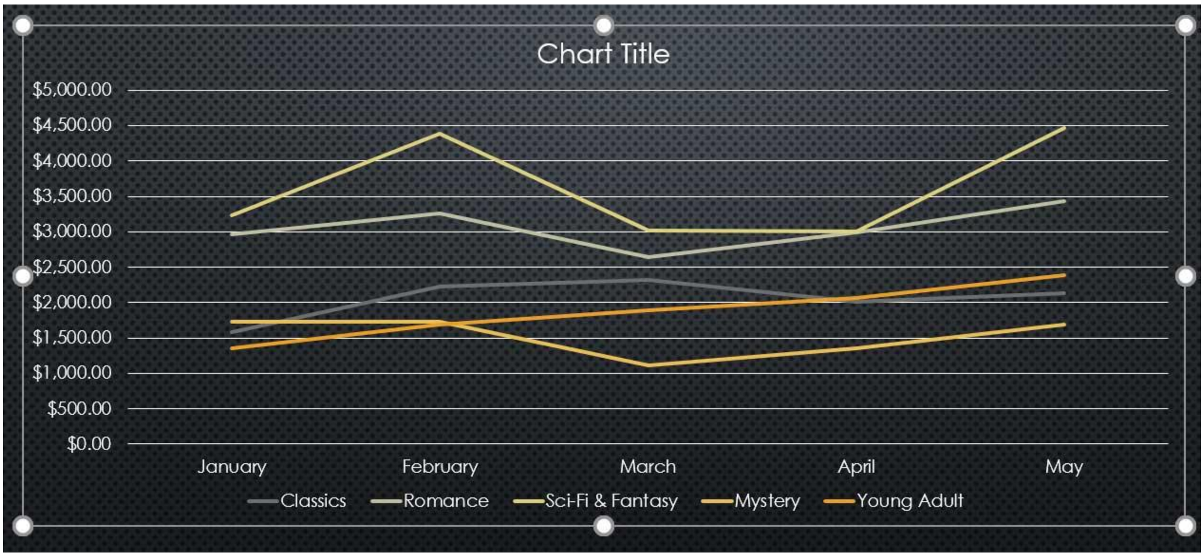
1. Select the **chart** you want to modify. The **Design** tab will appear.
2. From the **Design** tab, select the **Edit Data** command in the **Data** group.




3. Click the **chart** again, then select the **Switch Row/Column** command in the **Data** group.




4. The rows and columns will be **switched**. In our example, the data is now grouped by month, with lines for each genre.

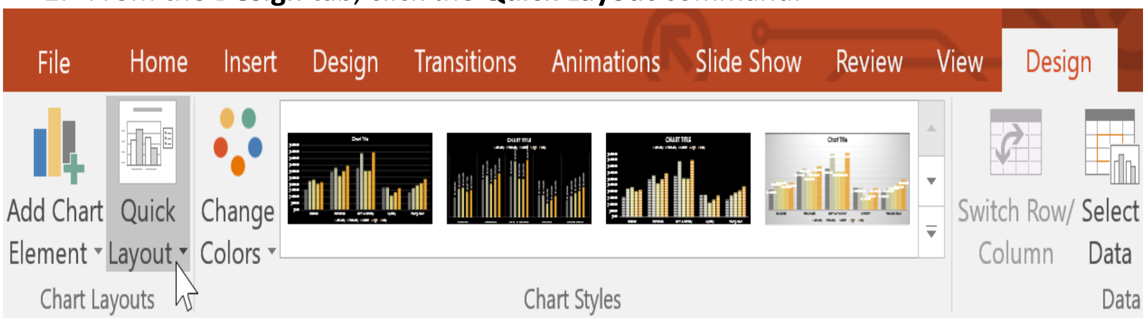



We've noticed that when **numerical data** has been entered in the **first column** of the spreadsheet, switching rows and columns may cause unexpected results. One solution is to **type an apostrophe before each** number, which tells the spreadsheet to format it as **text** instead of a numerical value. For example, the year **2016** would be entered as **'2016**.

## 16.4 To change the chart layout:

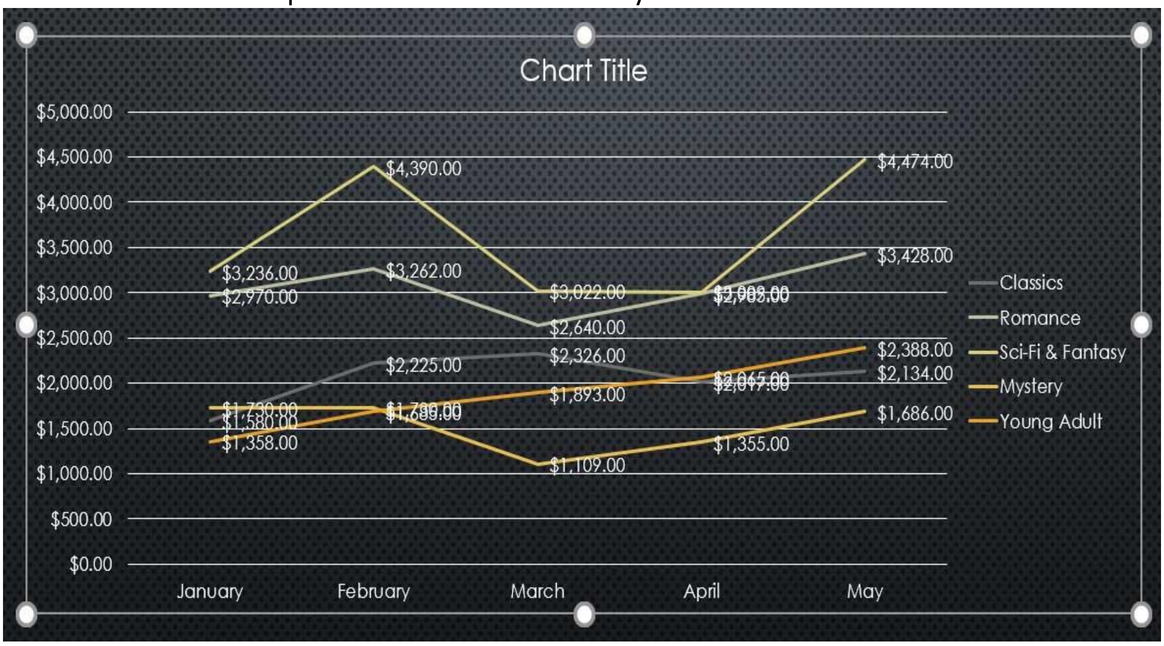
Predefined chart layouts allow you to modify chart elements—including **chart titles**, **legends**, and **data labels**—to make your chart easier to read.

1. Select the **chart** you want to modify. The **Design** tab will appear.
2. From the **Design** tab, click the **Quick Layout** command.




3. Select the desired predefined layout from the menu that appears.


4. The chart will update to reflect the new layout.

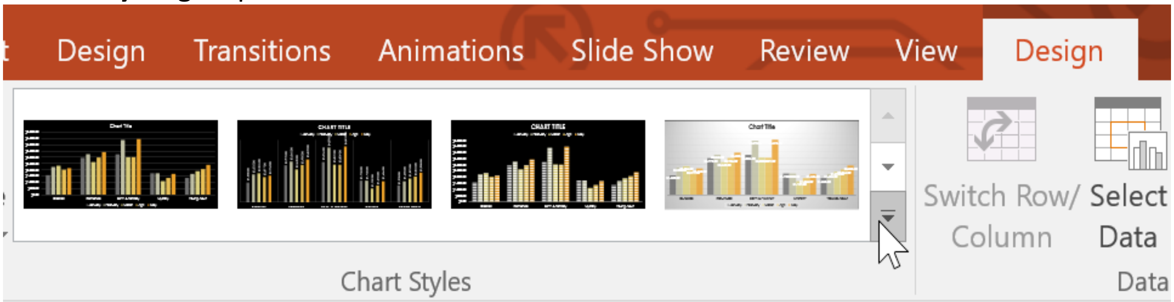



To change a chart element (such as the chart title), click the element and begin typing.

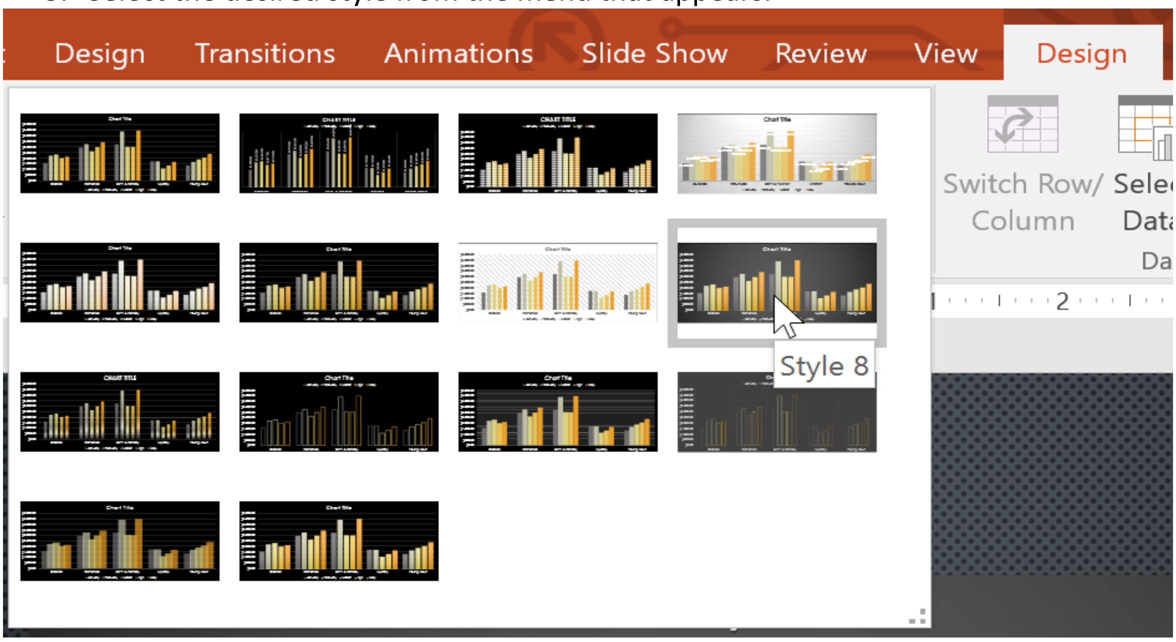

## 16.5 To change the chart style:

**Chart styles** allow you to quickly modify the look and feel of your chart.

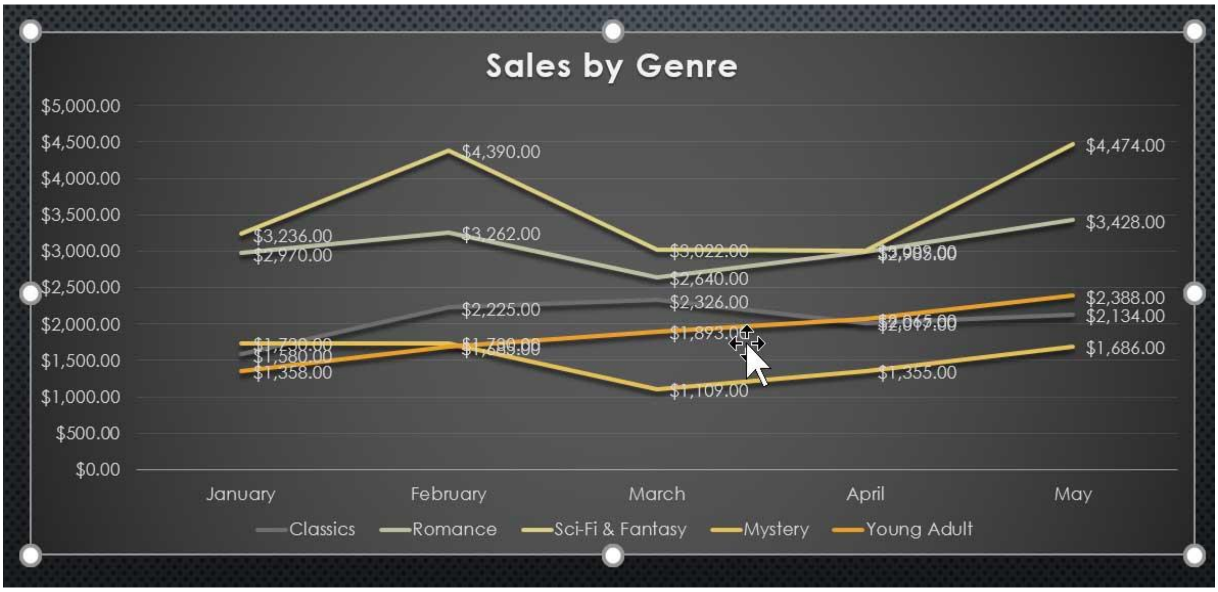
1. Select the **chart** you want to modify. The **Design** tab will appear.
2. From the **Design** tab, click the **More** drop-down arrow in the **Chart Styles** group.



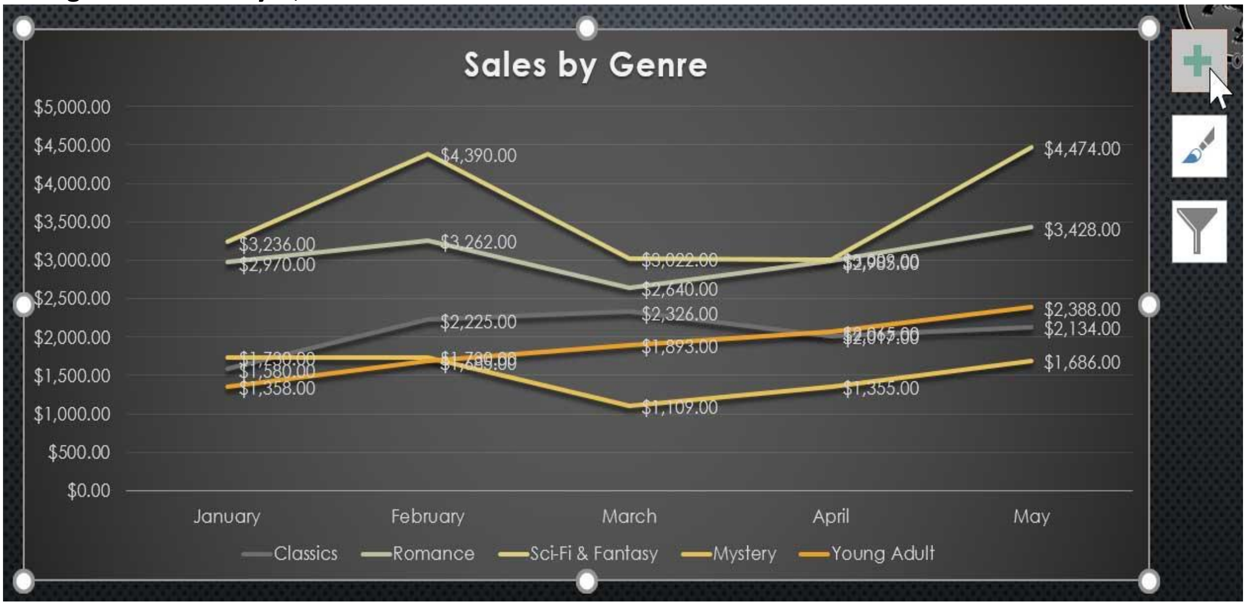

3. Select the desired style from the menu that appears.




4. The chart will appear in the selected style.




You can also use the chart formatting shortcut buttons to quickly **add chart elements**, change the **chart style**, and **filter** the chart data.

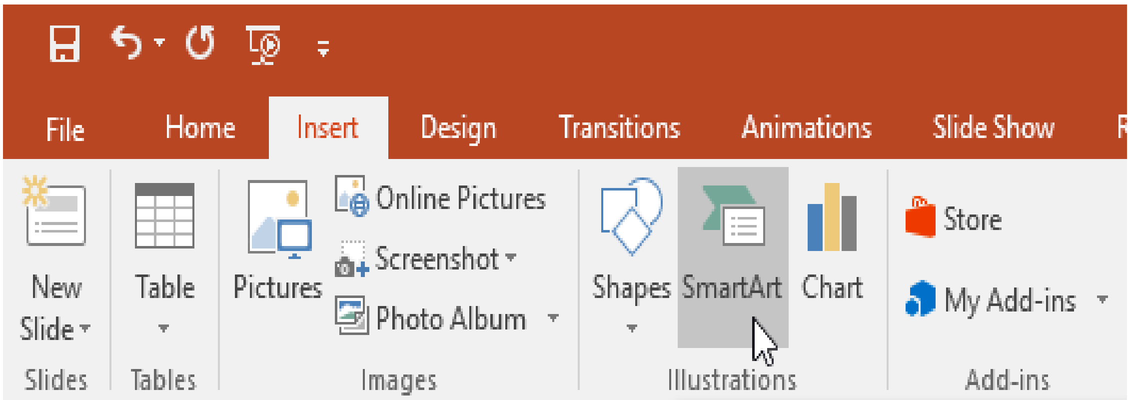



## 16.6 SmartArt Graphics

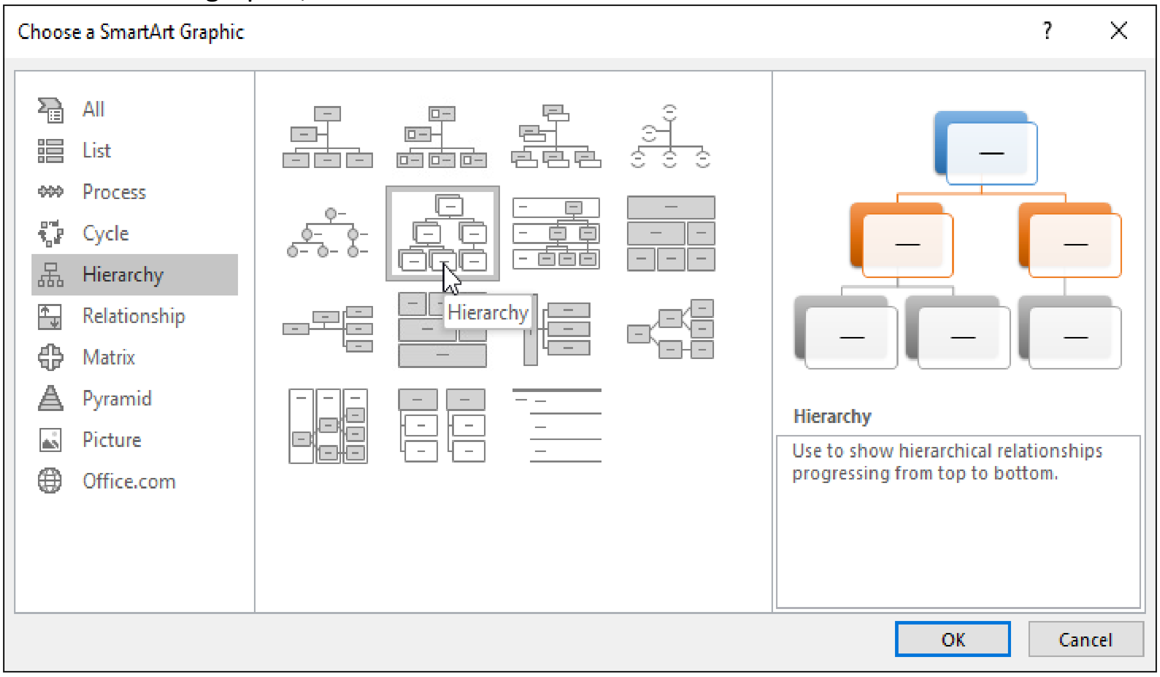
SmartArt allows you to communicate information with graphics instead of just using text. There are a variety of styles to choose from, which you can use to illustrate different types of ideas.

To insert a SmartArt graphic:

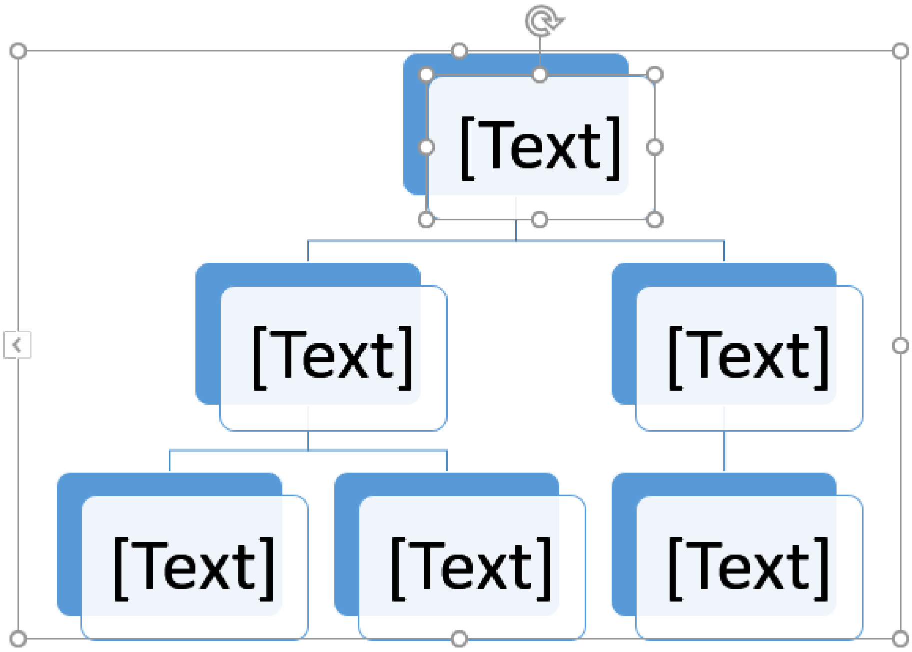
1. Select the slide where you want the SmartArt graphic to appear.
2. From the **Insert** tab, select the **SmartArt** command in the **Illustrations** group.



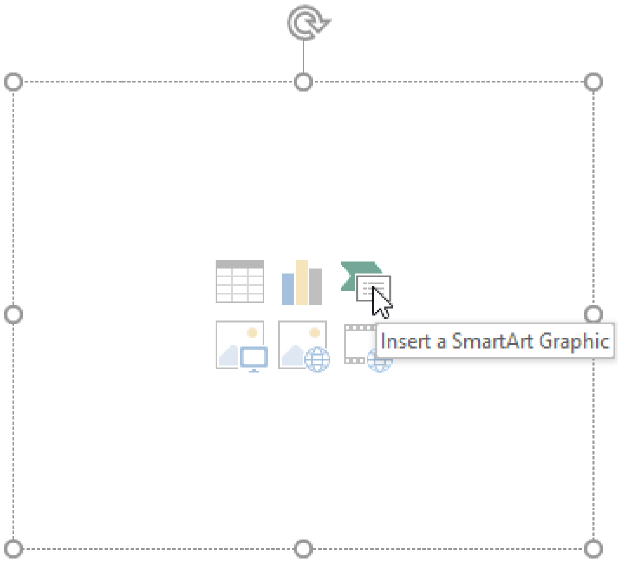

3. A dialog box will appear. Select a **category** on the left, choose the desired SmartArt graphic, then click **OK**.




4. The SmartArt graphic will appear on the current slide.

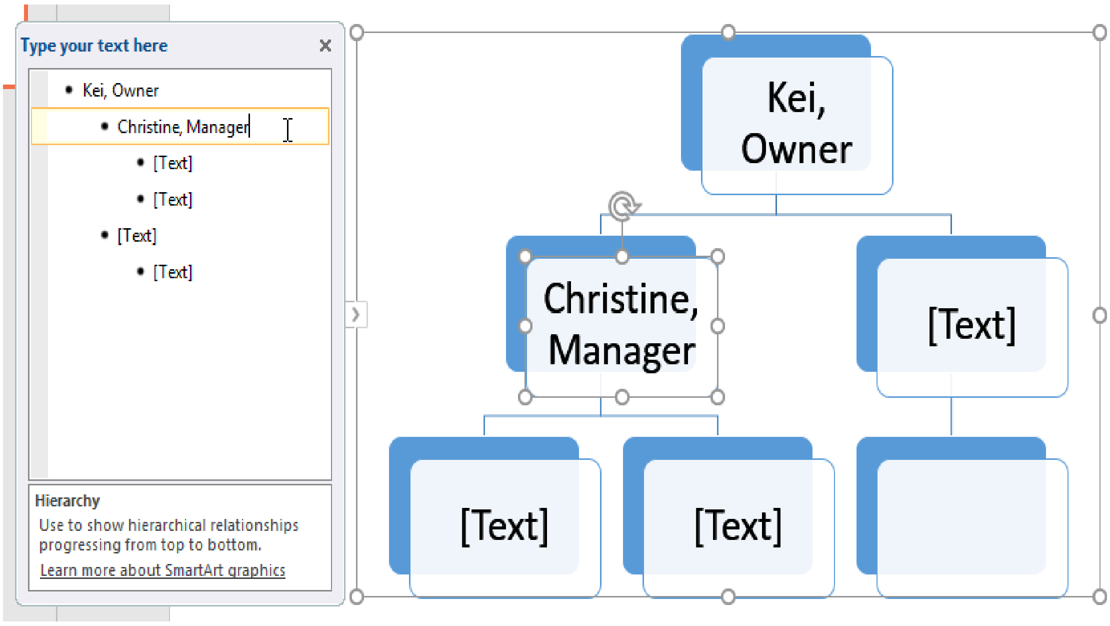



You can also click the **Insert a SmartArt Graphic** command in a **placeholder** to add SmartArt.

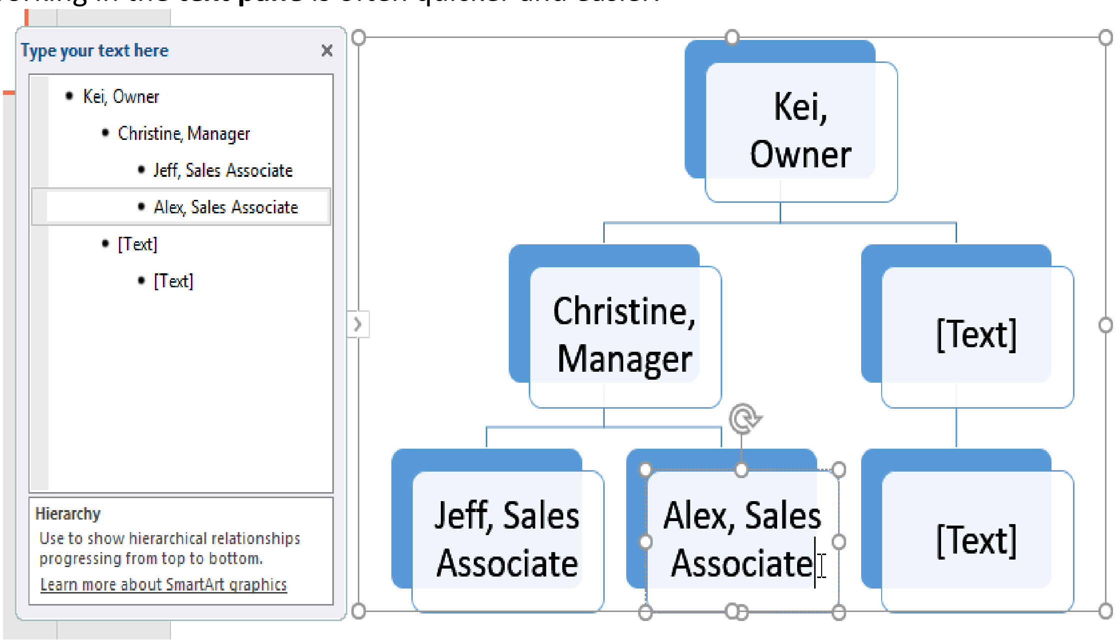



To add text to a SmartArt graphic:

1. Select the SmartArt graphic. The **text pane** will appear to the left
2. Enter text next to each bullet in the text pane. The text will appear in the corresponding shape. It will be resized automatically to fit inside the shape.



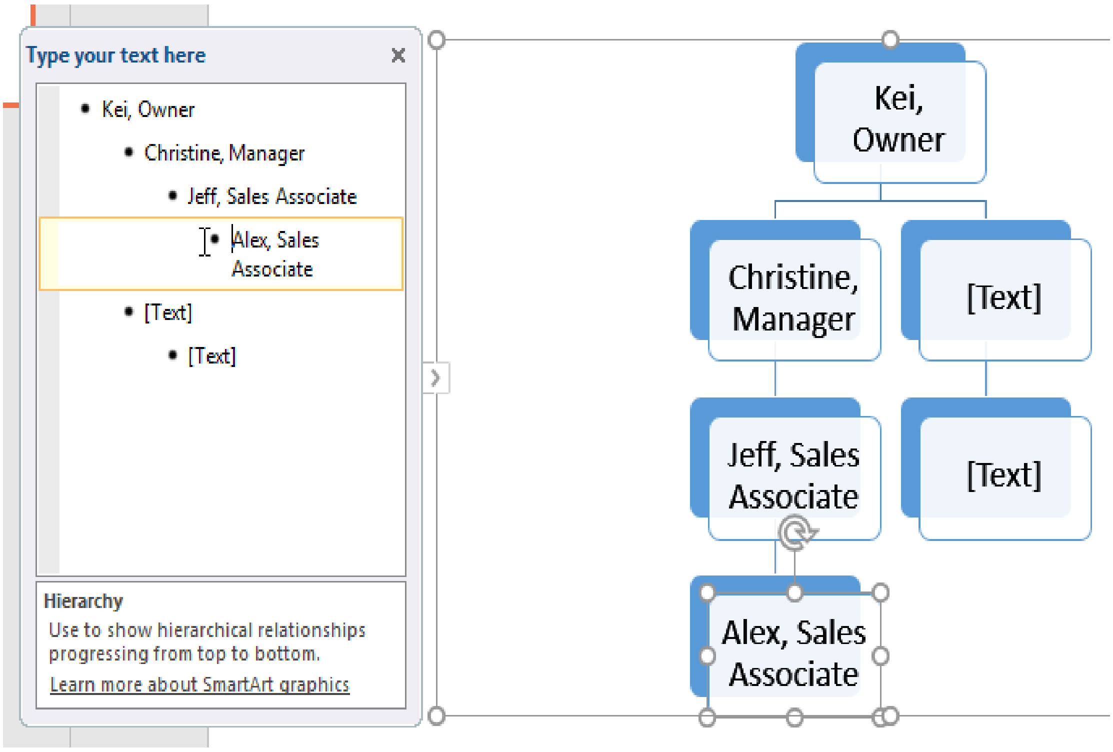

You can also add text by clicking the desired shape and then typing. This works well if you only need to add text to a **few shapes**. However, for more complex SmartArt graphics, working in the **text pane** is often quicker and easier.



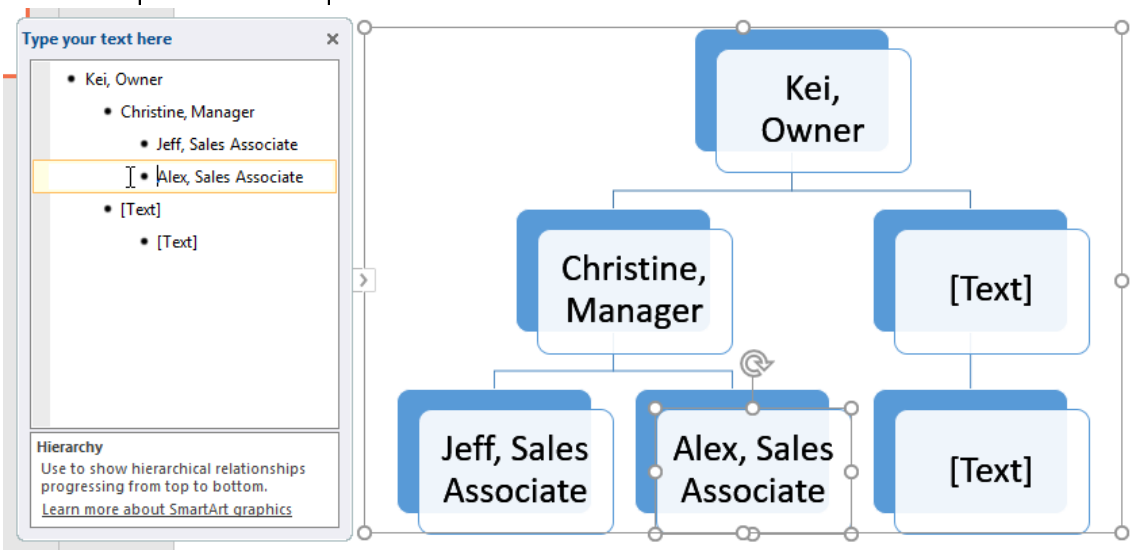

To reorder, add, and delete shapes:

It's easy to add new shapes, change their order, and even delete shapes from your SmartArt graphic. You can do all of this in the text pane, and it's a lot like creating an outline with a **multilevel list**. For more information on multilevel lists, you may want to review our **Lists** lesson.

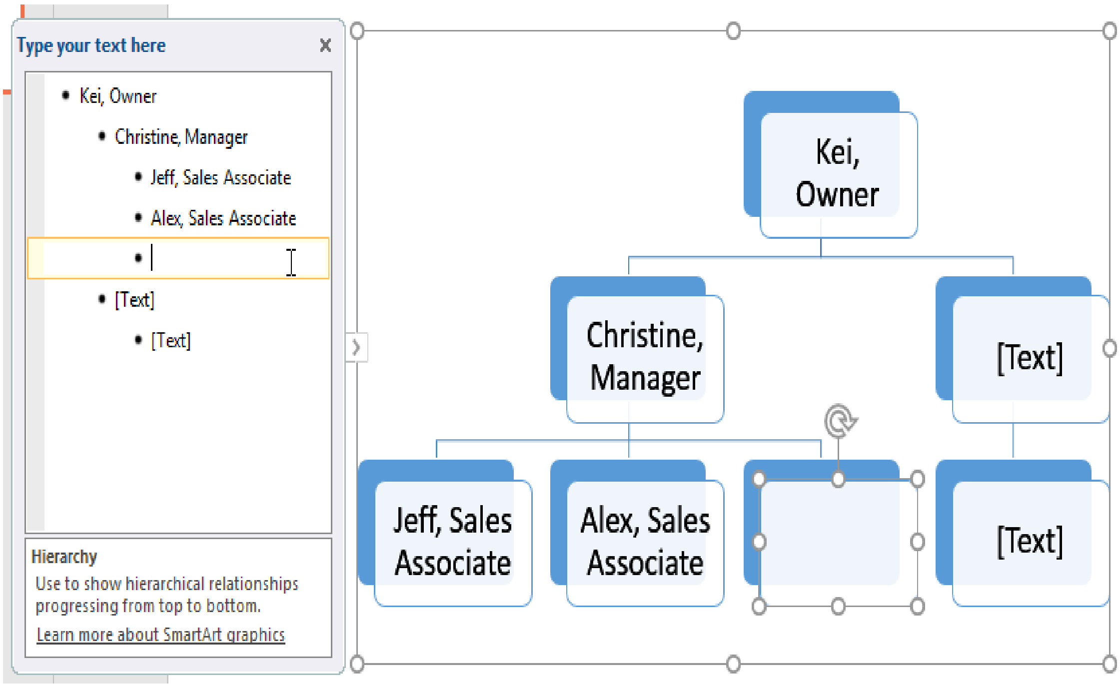
- To **demote a shape**, select the desired bullet, then press the **Tab** key. The bullet will move to the right, and the shape will move down one level.



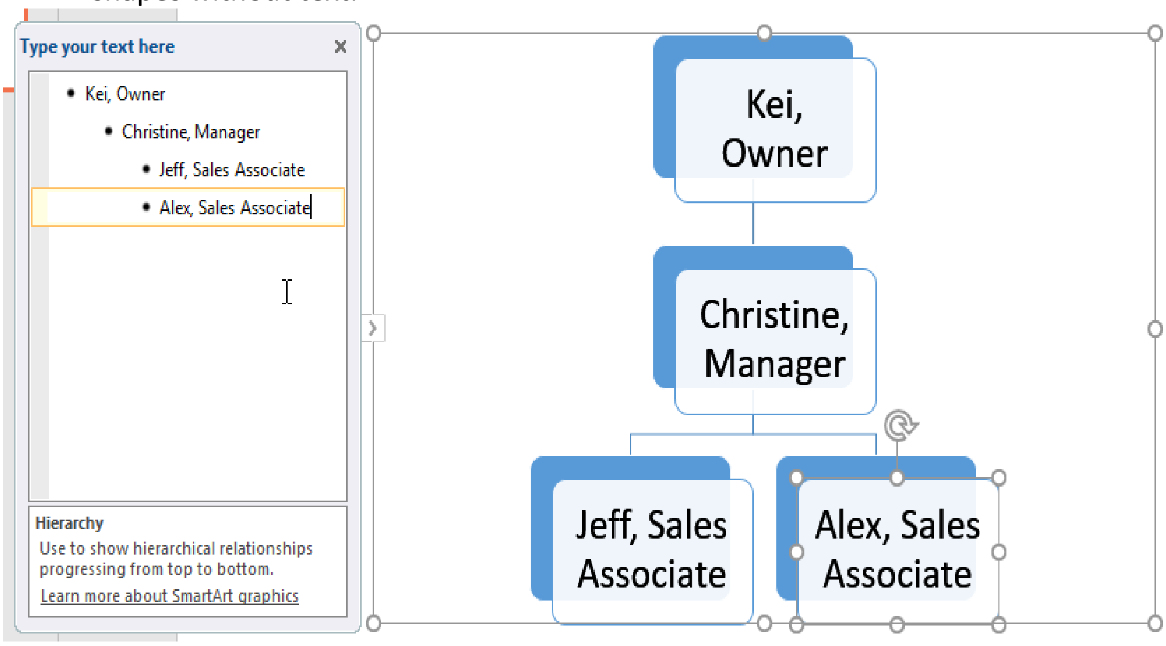

- To **promote a shape**, select the desired bullet, then press the **Backspace** key (or **Shift+Tab**). The bullet will move to the left, and the shape will move up one level.




- To **add a new shape**, place the insertion point after the desired bullet, then press **Enter**. A new bullet will appear in the text pane, and a new shape will appear in the graphic.



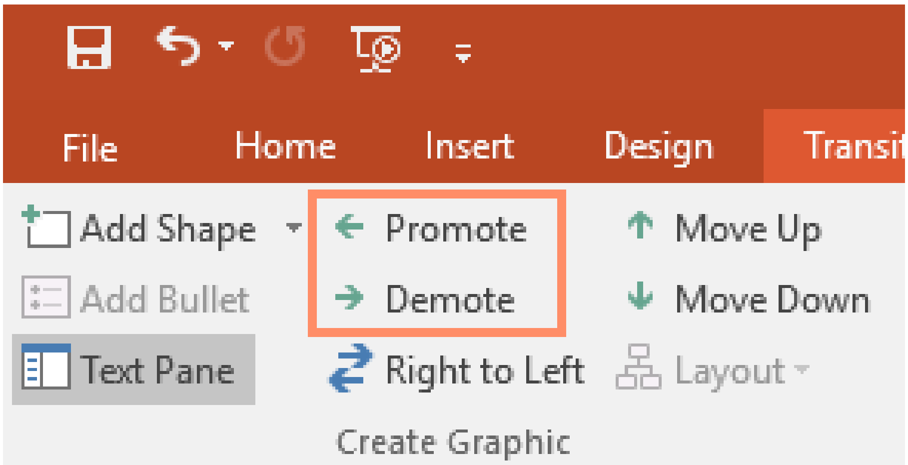

- To **remove a shape**, keep pressing **Backspace** until the bullet is deleted. The shape will then be removed. In our example, we'll delete all of the shapes without text.



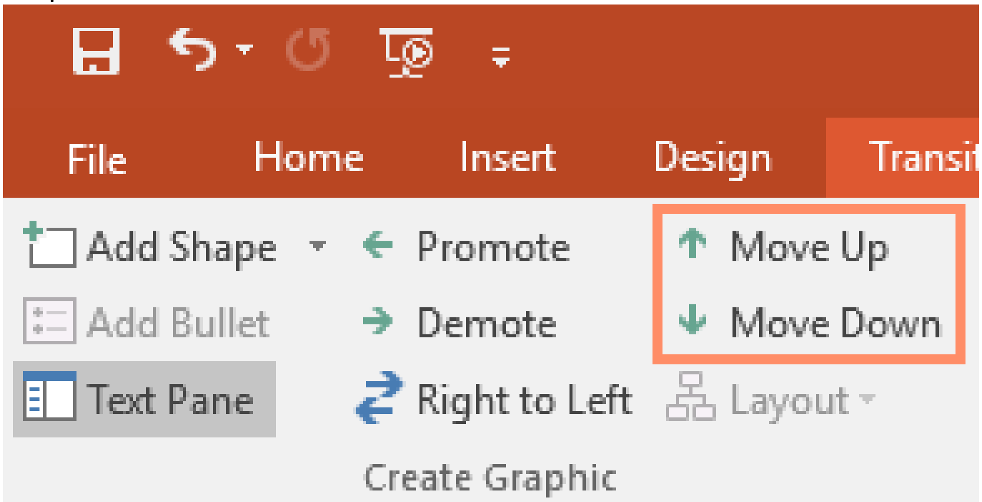

## 16.7 Organizing SmartArt from the Design tab

If you'd prefer not to use the text pane to organize your SmartArt, you can use the commands on the **Design** tab in the **Create Graphic** group. Just select the shape you want to modify, then choose the desired command.

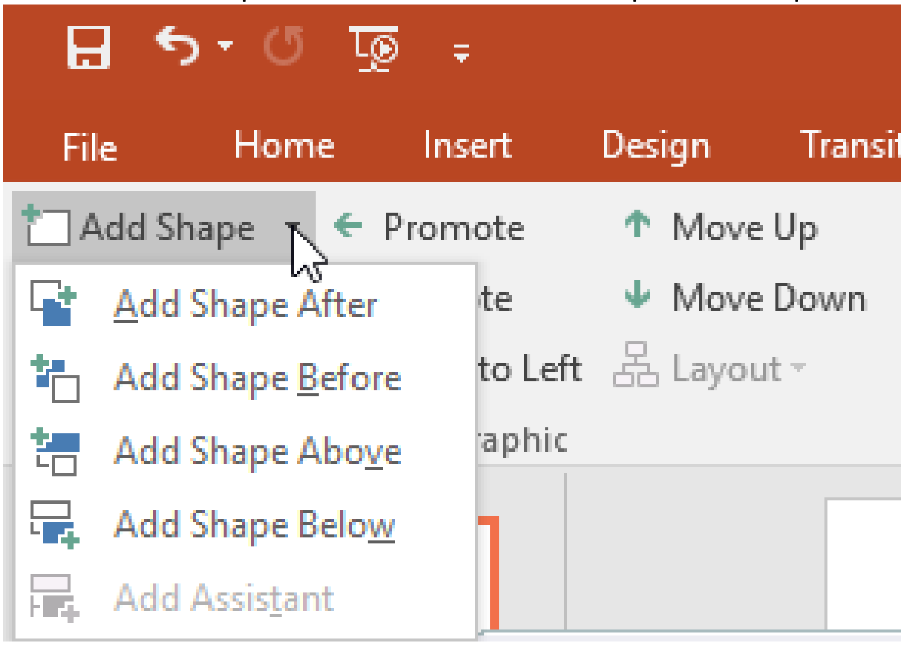
- **Promote** and **Demote**: Use these commands to move a shape up or down between levels.




- **Move Up** and **Move Down**: Use these commands to change the order of shapes on the same level.




- **Add Shape**: Use this command to add a new shape to your graphic. You can also click the drop-down arrow for more exact placement options.

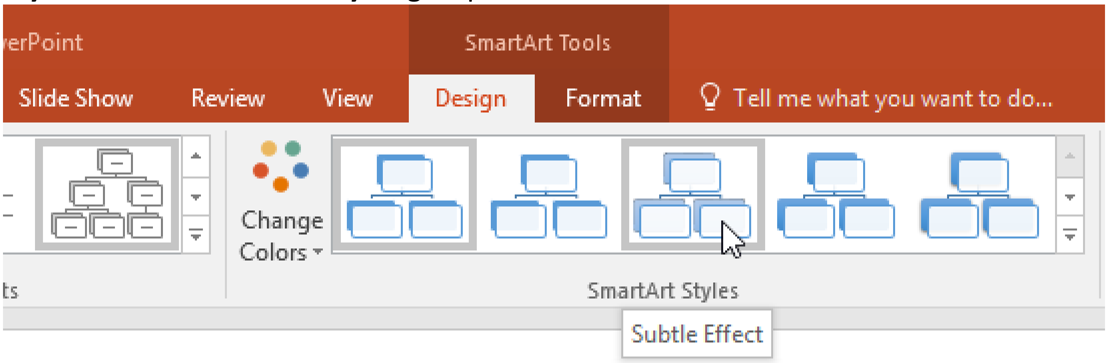


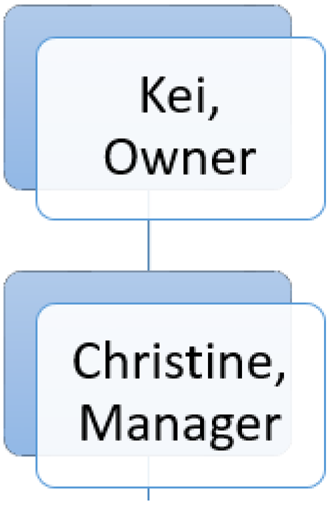
In our example, we've been organizing a graphic with a hierarchical layout. Not all SmartArt graphics use this type of layout, so remember that these commands may work differently (or not at all) depending on the layout of your graphic.

Customizing SmartArt

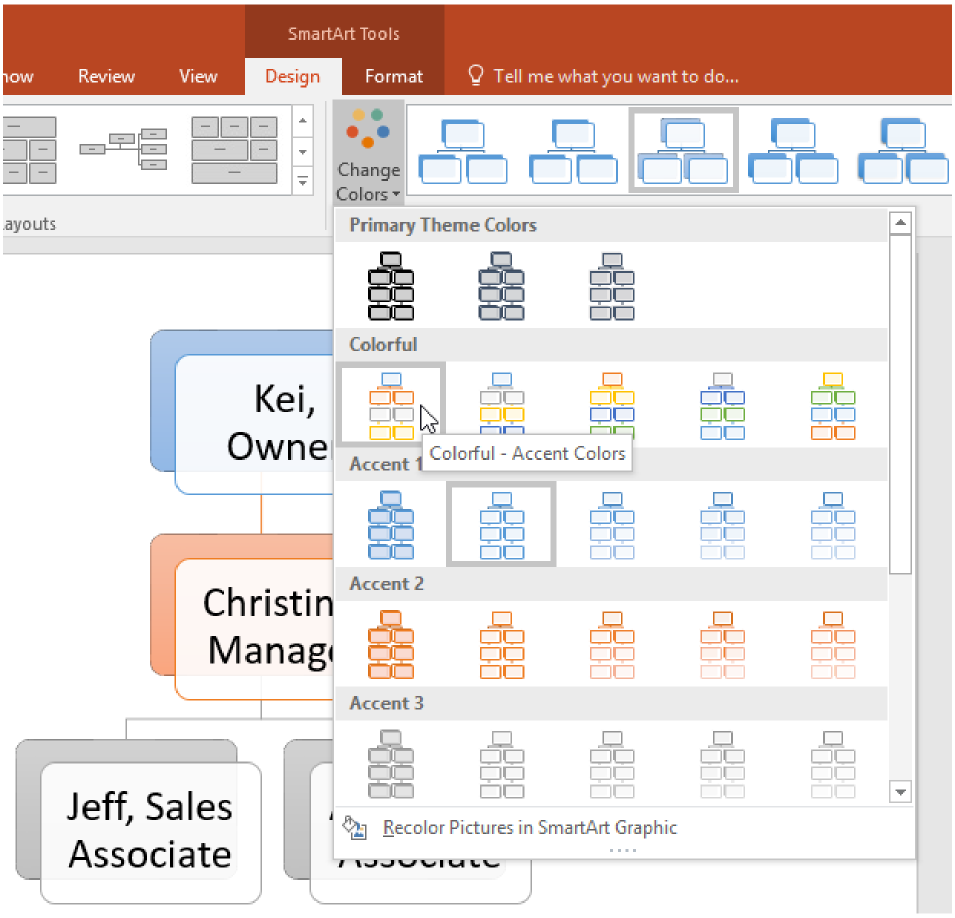
After inserting SmartArt, there are several things you might want to change about its appearance. Whenever you select a SmartArt graphic, the **Design** and **Format** tabs will appear on the right side of the Ribbon. From there, it's easy to edit the **style** and **layout** of a SmartArt graphic.

- There are several **SmartArt styles**, which allow you to quickly modify the look and feel of your SmartArt. To change the style, select the **desired style** from the **SmartArt styles** group.

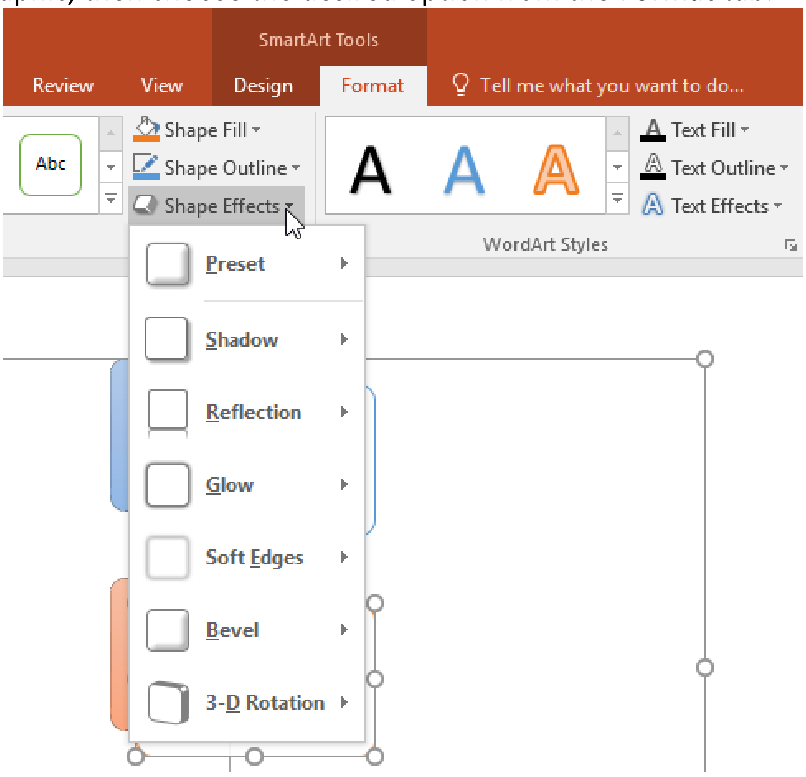



- You have a variety of **color schemes** to use with SmartArt. To change the colors, click the **Change Colors** command and choose the desired option from the drop-down menu.



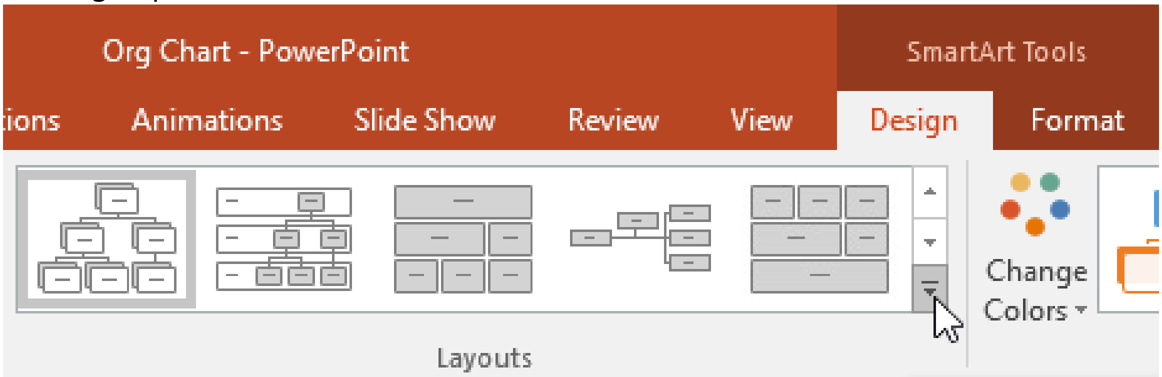

- You can also customize each shape independently. Just select any shape in the graphic, then choose the desired option from the **Format** tab.



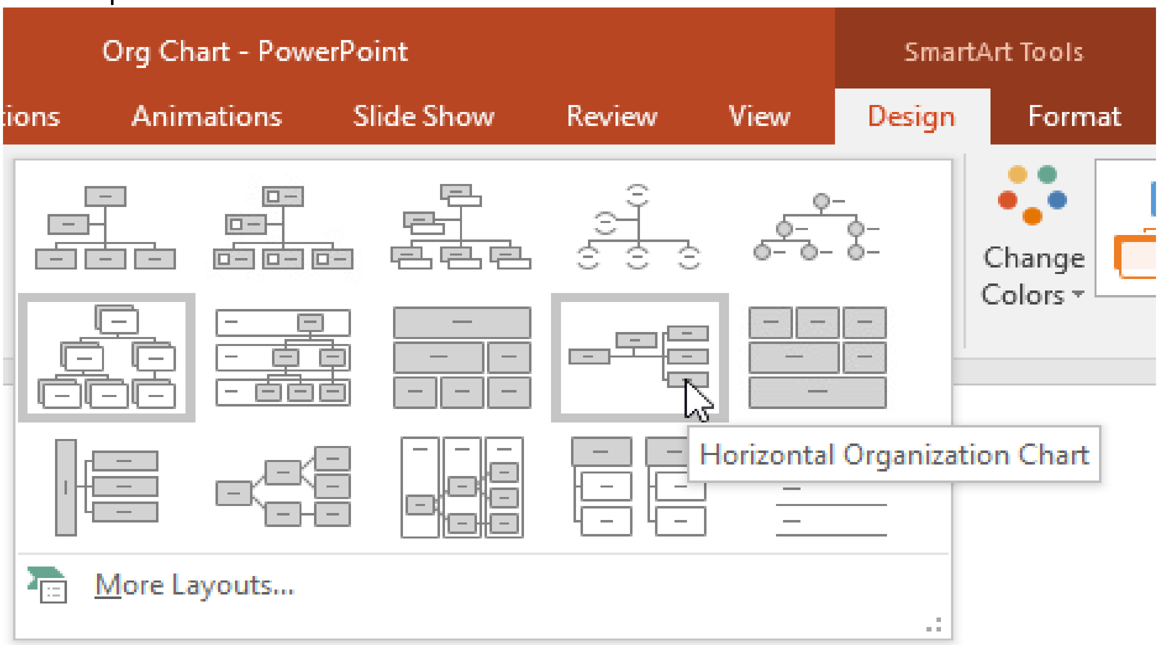
To change the SmartArt layout:

If you don't like the way your information is organized within a SmartArt graphic, you can always change its **layout** to better fit your content.

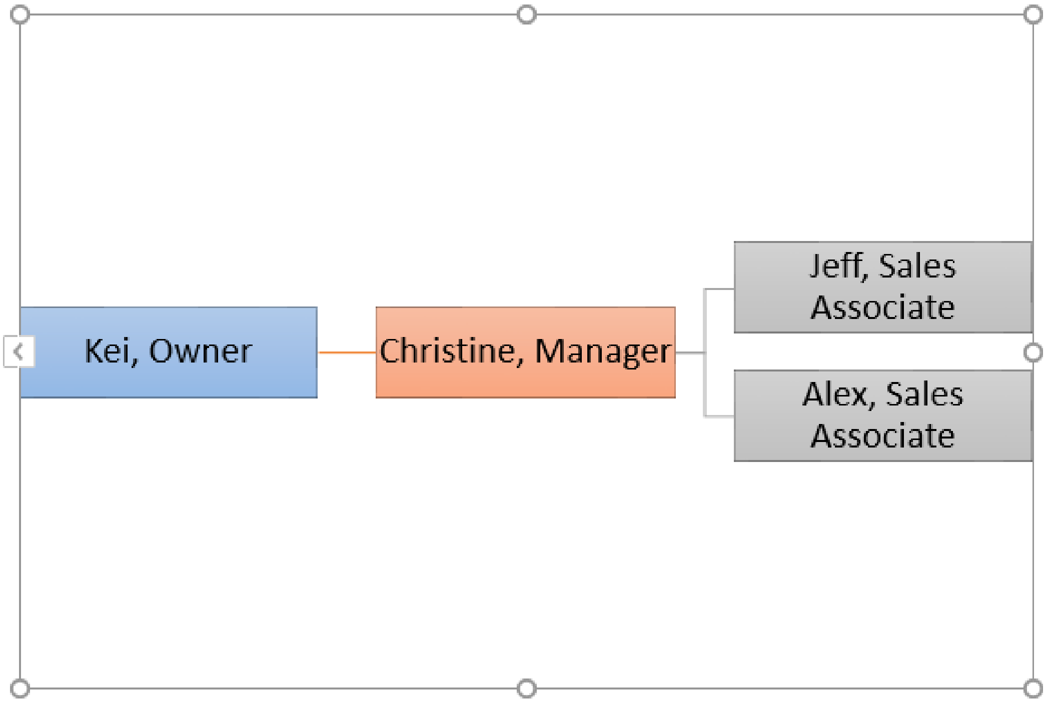
1. From the **Design** tab, click the **More** drop-down arrow in the Layouts group.




2. Choose the desired layout, or click **More Layouts** to see even more options.




3. The selected layout will appear.




If the new layout is too different from the original, some of your text may not appear. Before deciding on a new layout, check carefully to make sure no important information will be lost.

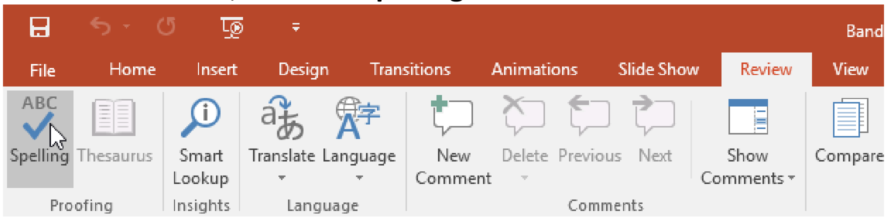
**Lesson 5: Review and Collaborating**

**5.1 Checking Spelling and Grammar**

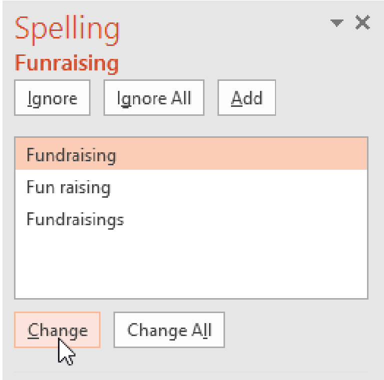
Worried about making mistakes when you type? Don't be. PowerPoint provides you with several proofing features—including the Spelling and Grammar tool—that can help you produce professional, error-free presentations.

**To run a spell check:**

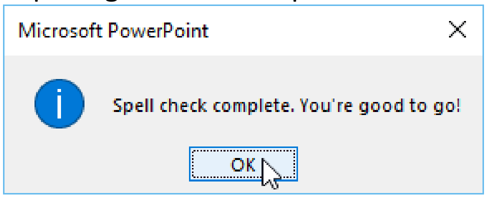
1. From the **Review** tab, click the **Spelling** command.




2. The **Spelling** pane will appear on the right. For each error in your presentation, PowerPoint will try to offer one or more **suggestions**. You can select a suggestion and click **Change** to correct the error.




3. PowerPoint will move through each error until you have reviewed them all. After the last error has been reviewed, a dialog box will appear confirming that the spelling check is complete. Click **OK**.

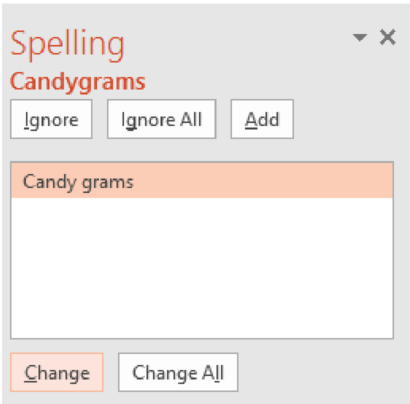



If no suggestions are given, you can manually type the correct spelling on the slide.

**Ignoring spelling "errors"**

The spell check is **not always correct**. It may sometimes think a word is spelled incorrectly when it's not. This often happens with people's names and proper nouns, which may not be in the dictionary. If PowerPoint says something is an error, you can choose **not** to change it using one of three options:

- **Ignore**: This will skip the word without changing it.
- **Ignore All**: This will skip the word without changing it, and it will also skip all other instances of the word in your presentation.
- **Add**: This adds the word to the dictionary so it will never come up as an error again. Make sure the word is spelled correctly before choosing this option.



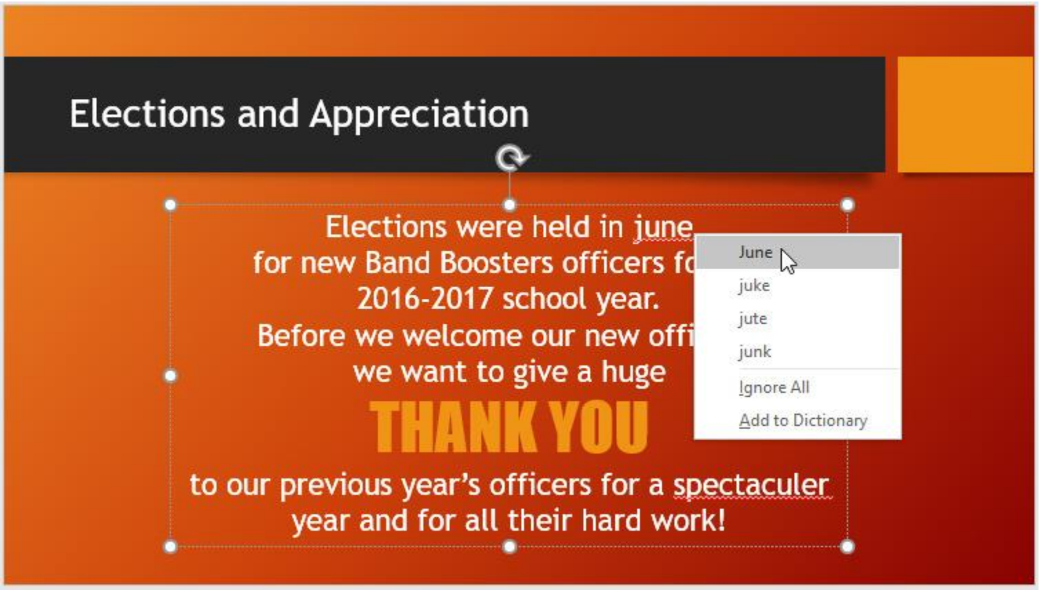

**Automatic spell check**

By default, PowerPoint **automatically** checks your presentation for spelling errors, so you may not even need to run a separate check using the Spelling command. These errors are indicated by **red wavy lines**.

**To use the automatic spell check feature:**

1. Right-click the **underlined word**. A menu will appear.

2. Click the **correct spelling** from the list of **suggestions**.




3. The correction will appear in the presentation.

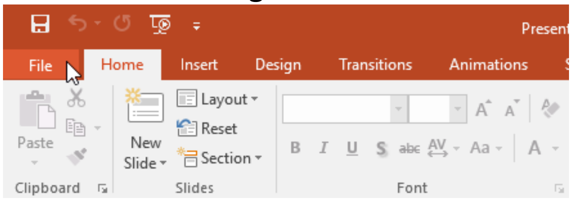
You can also choose to **Ignore** an underlined word or **Add to Dictionary**.

**Modifying proofing options**

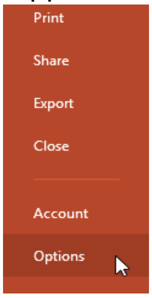
PowerPoint allows you to modify the proofing options, giving you more control over how it reviews your text. For example, you can customize the **automatic spell check** to change the way PowerPoint marks spelling errors. You can also enable the **grammar check** option to help you find and correct **contextual spelling errors** (like **their** vs. **they're**).

**To modify proofing options:**

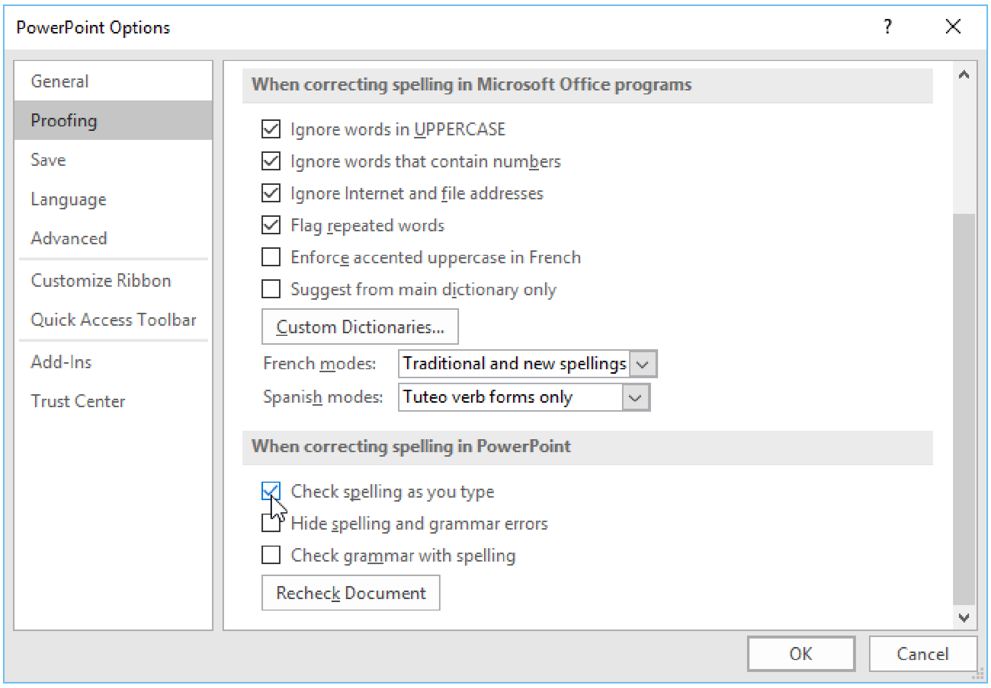
1. Click the **File** tab to access **Backstage view**.




2. Select **Options**. A dialog box will appear.




3. Select **Proofing**, then customize the options as needed. When you're finished, click **OK**.




Modifying settings in **PowerPoint Options**—including proofing—will affect **any presentation** you edit in PowerPoint, not just your current presentation.

### 5.2 Reviewing Presentations

Before delivering your presentation, you might ask someone else to review it and give you feedback on your slides. You might even work with a collaborator to create a presentation together. If you were revising a hard copy, you could add comments in the margins or compare your rough and final drafts side by side. You can do these things in PowerPoint using the Comments and Compare features.

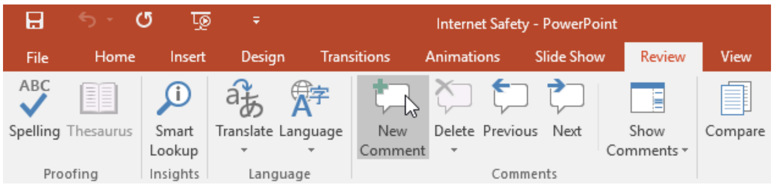
**Commenting on presentations**

When revising or collaborating on a presentation, you might want to make notes or suggestions without actually changing the slide. Leaving a **comment** allows you to take note of something without altering the slide itself. Comments can be added and read by the original author or any other reviewers.

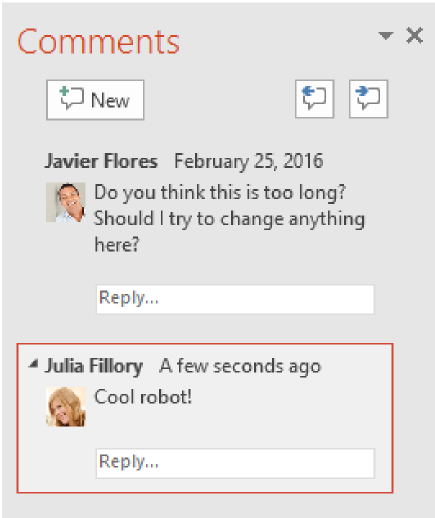
**To add a comment:**

1. Select the **text or object** (or click the area of the slide) where you want the comment to appear.

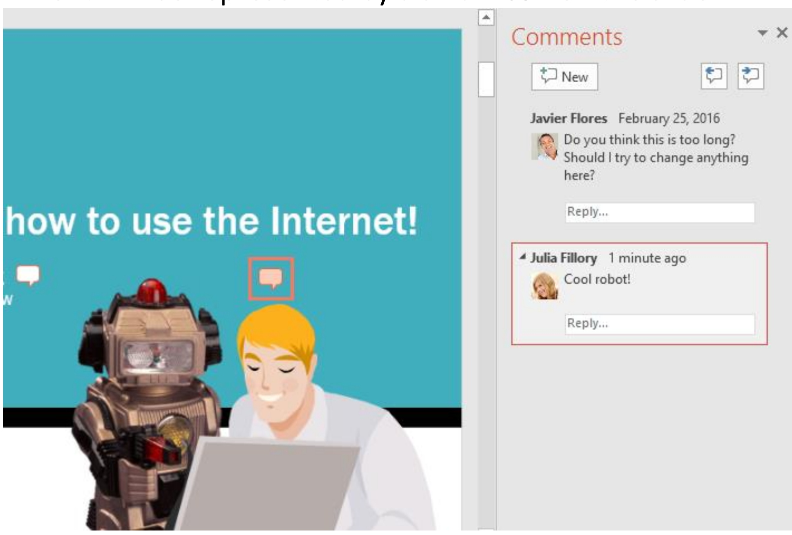

2. Go to the **Review** tab, then click the **New Comment** command.




3. The **Comments** pane will appear. In our example, it contains an existing comment by another review (**Javier**), plus a space for your comment.
4. Type your comment in the **box**, then press **Enter** or click anywhere outside the box to save the comment.

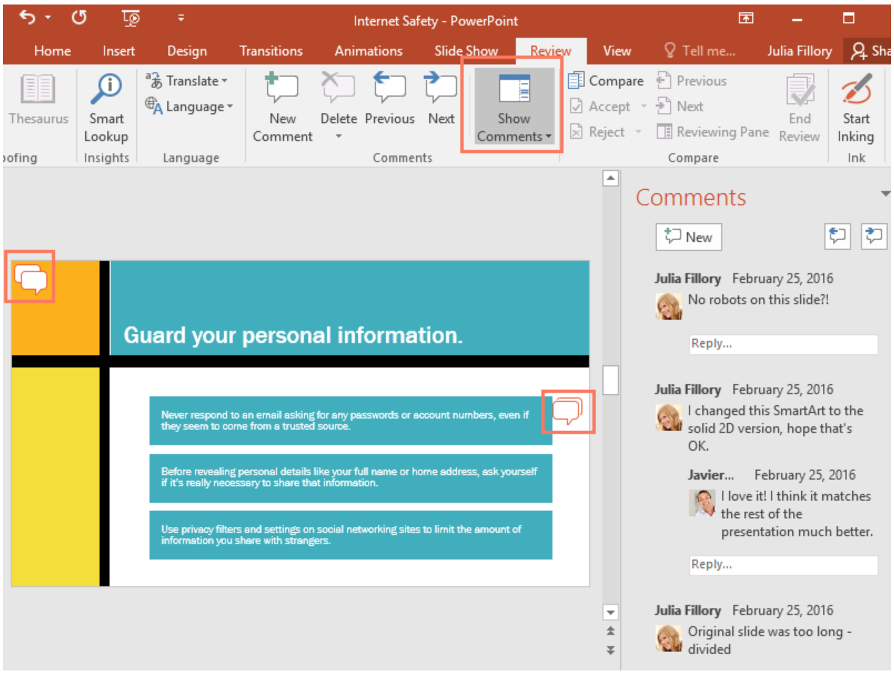



5. The comment will be represented by a small **icon** on the slide.



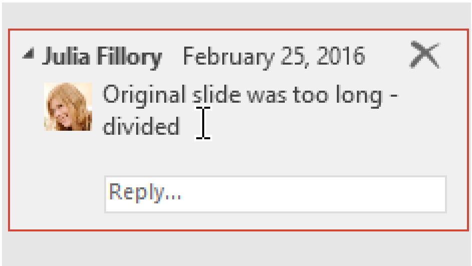

**Viewing comments**

You can view or reply to any comment—including other reviewers' comments—by returning to the **Comments** pane. Simply click a **comment icon** on the slide, or click the **Show Comments** command on the **Review** tab.

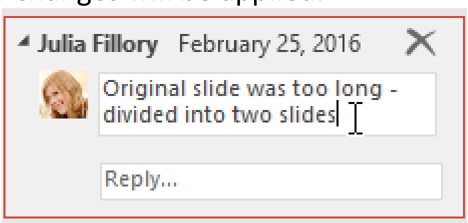



**To edit a comment:**

1. In the **Comments** pane, select the comment you want to edit.

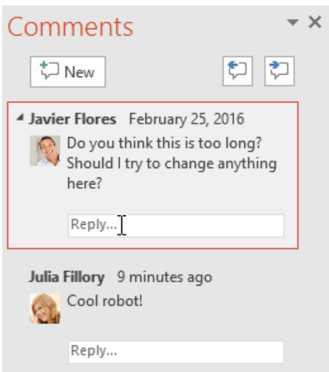



2. Type your desired changes, then press **Enter** or click anywhere outside the comment box. Your changes will be applied.

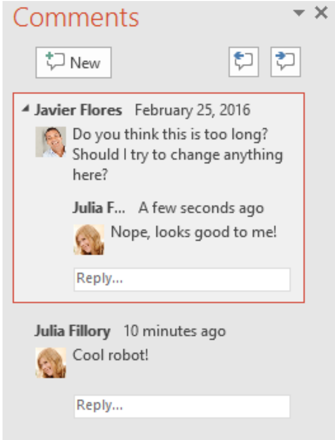



**To reply to a comment:**

1. In the **Comments** pane, click **Reply** below the comment you want to respond to.

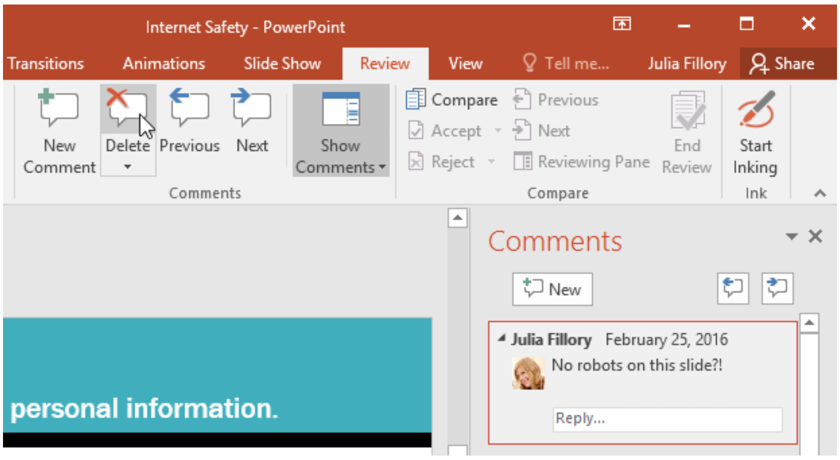


2. Type your response, then press **Enter** or click anywhere outside the box. Your comment will appear below the original comment, and an additional **icon** will be added to the slide.

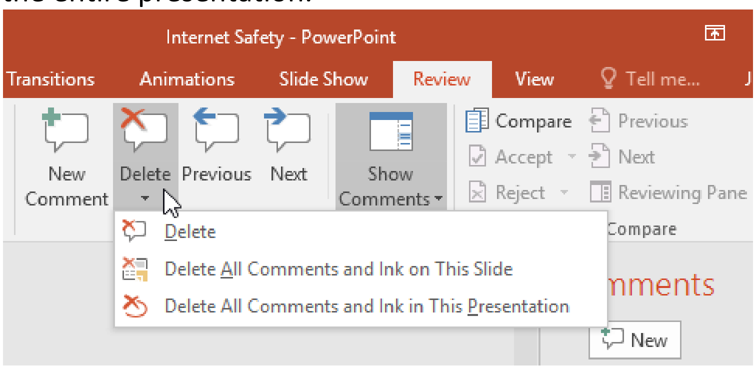



**Deleting comments**

- To **delete a comment**, select the comment you want to **delete**, then go to the **Review** tab and click the **Delete** command.




- To delete **multiple comments**, click the **drop-down arrow** below the **Delete** command. You can delete comments from your current slide or from the entire presentation.




**5.3 Inspecting and Protecting Presentations**

Before sharing a presentation, you'll want to make sure it doesn't include any information you want to keep private. You may also want to discourage others from editing your file. Fortunately, PowerPoint includes several tools to help inspect and protect your presentation.

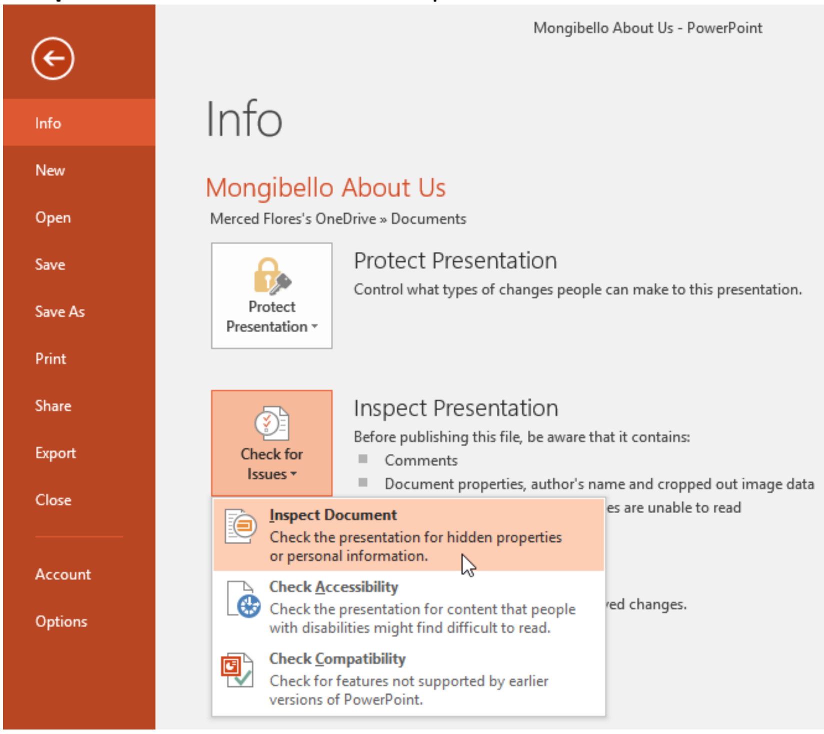
**Document Inspector**

Whenever you create or edit a presentation, certain **personal information** may be added to the file automatically—for example, information about the document's author. You can use **Document Inspector** to remove this type of information before sharing a presentation with others.

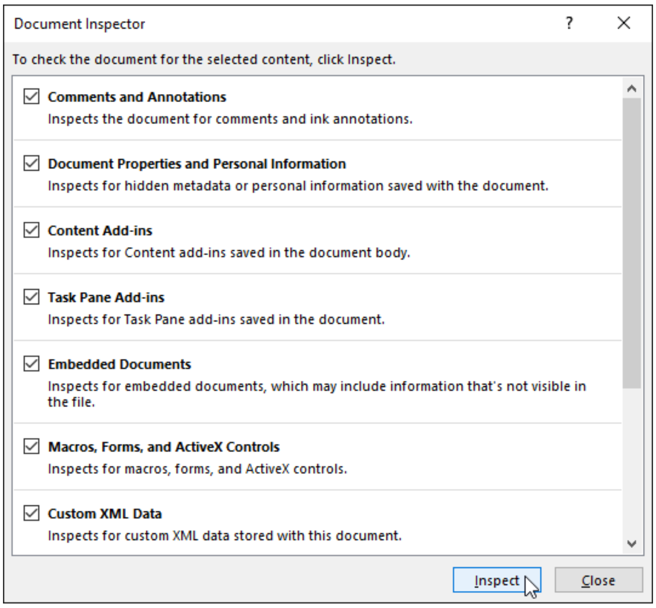
Because some changes may be permanent, it's a good idea to use **Save As** to create a backup copy of your presentation before using Document Inspector.

**To use Document Inspector:**

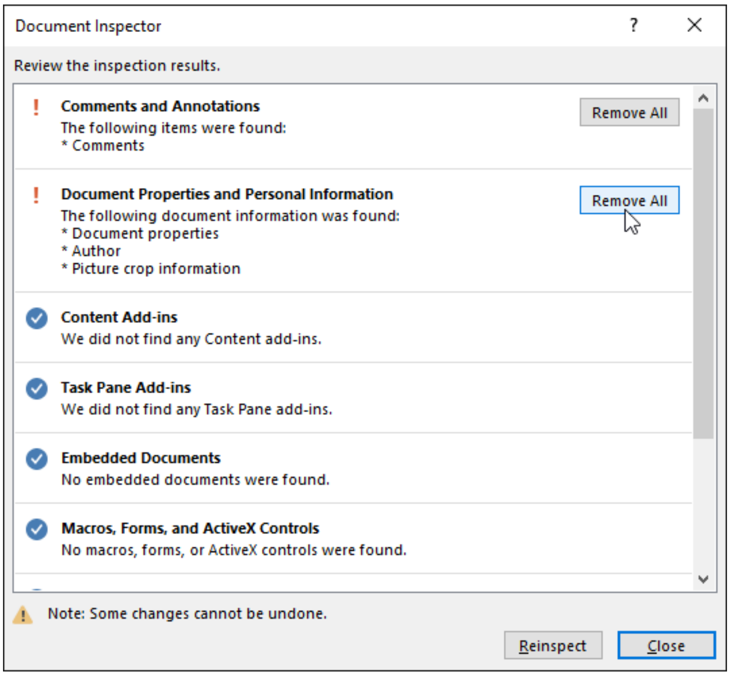
1. Click the **File** tab to go to **Backstage view**.
2. From the **Info** pane, click **Check for Issues**, then select **Inspect Document** from the drop-down menu.




3. **Document Inspector** will appear. Check or uncheck the boxes, depending on the content you want to review, then click **Inspect**. In our example, we'll use the default selections.




4. The **inspection results** will show an **exclamation mark** for any categories where it found potentially sensitive data, and it will also have a **Remove All** button for each of these categories. Click **Remove All** to remove the data.




5. When you're done, click **Close**.

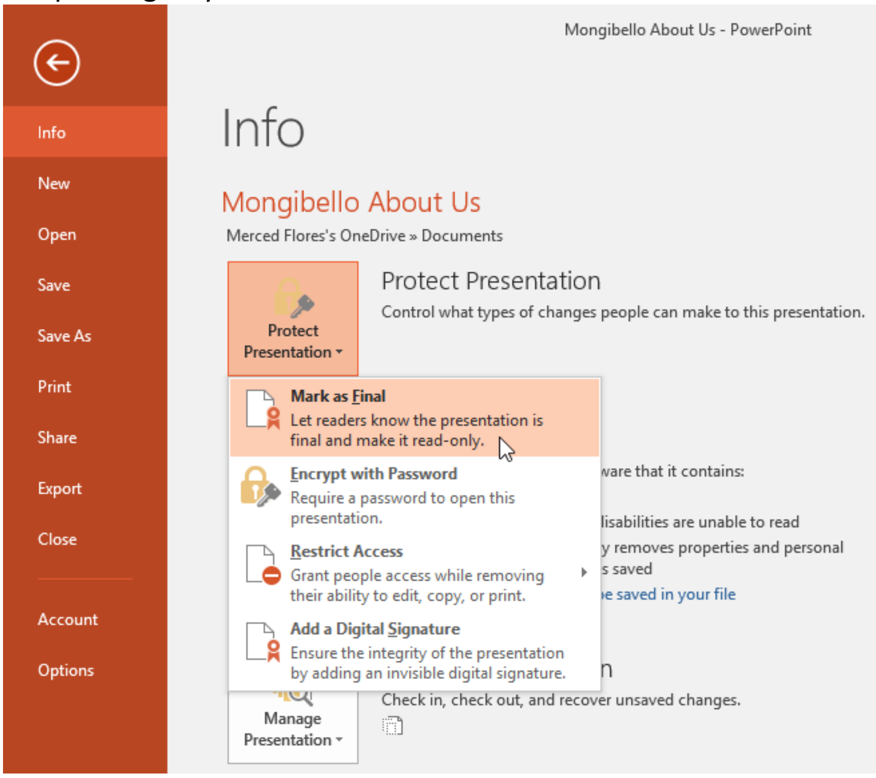
**Protecting your presentation**

By default, anyone with access to your presentation will be able to open, copy, and edit its content unless you **protect** it. There are several ways to protect a presentation, depending on your needs.

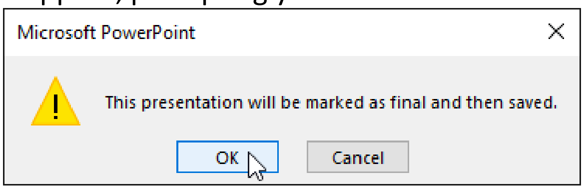
**To protect your document:**

1. Click the **File** tab to go to **Backstage view**.
2. From the **Info** pane, click the **Protect Presentation** command.

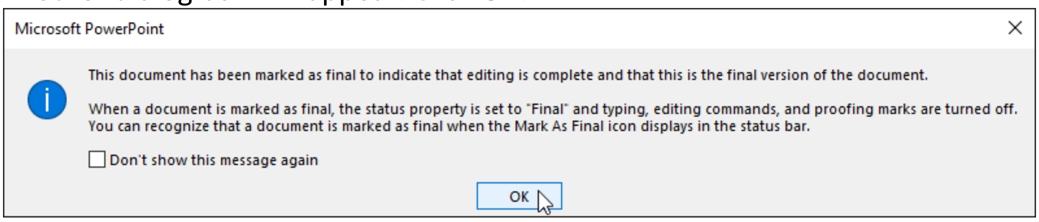
3. In the drop-down menu, choose the option that best suits your needs. In our example, we'll select **Mark as Final**. Marking your presentation as final is a good way to discourage others from editing the file, while the other options give you even more control if needed.



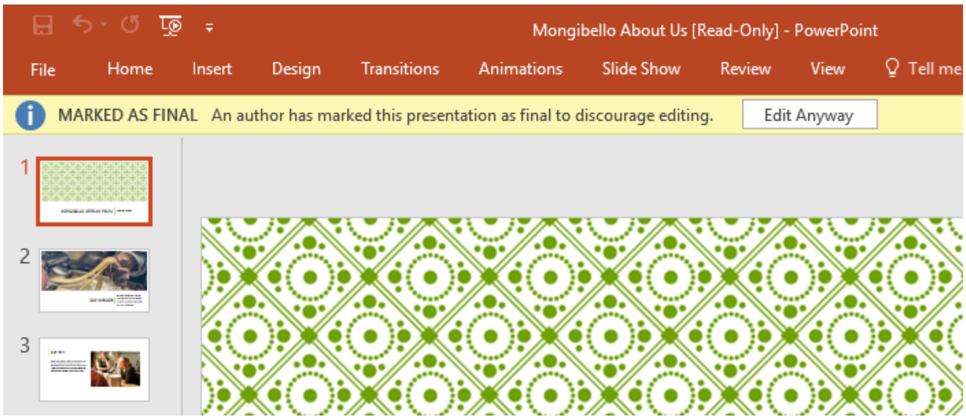

4. A dialog box will appear, prompting you to save. Click **OK**.




5. Another dialog box will appear. Click **OK**.




6. The presentation will be marked as final. Whenever others open the file, a bar will appear at the top to discourage them from editing the document.




Marking a presentation as final will not prevent someone from editing it because they can just select **Edit Anyway**. If you want to prevent people from editing it, you can use the **Restrict Access** option instead.

**5.4 Customizing Your Presentation**

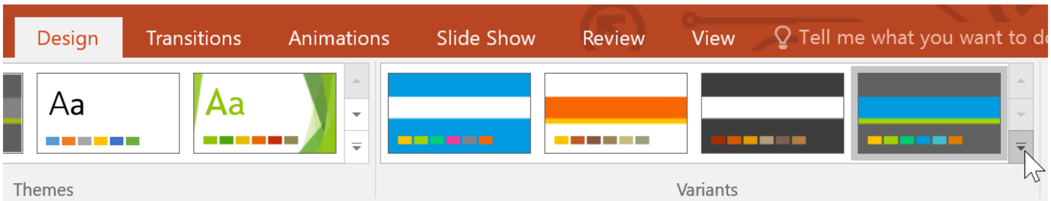
**5.1 Modifying Themes**

Let's say you really like the style of a theme, but you'd like to experiment with different color schemes. That's not a problem: You can mix and match colors, fonts, and effects to create a unique look for your presentation. If it still doesn't look exactly right, you can customize the theme any way you want.

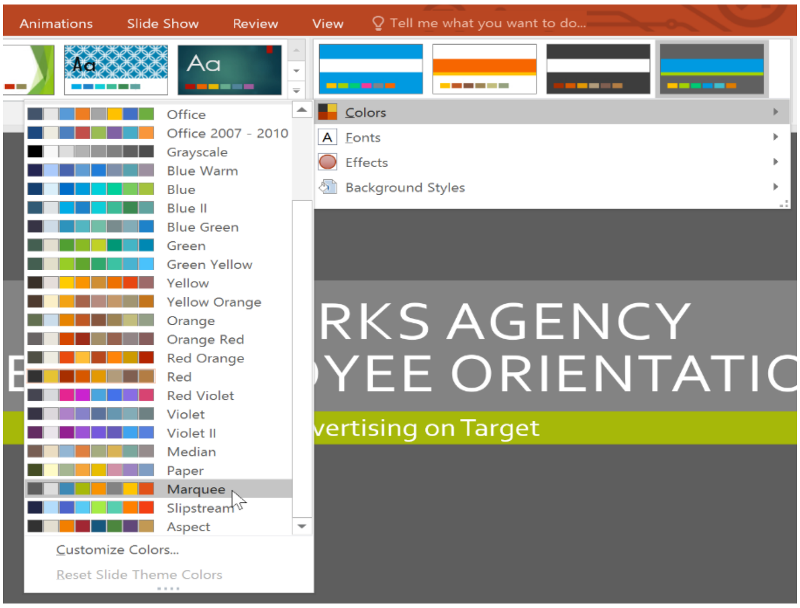
**To select new theme colors:**

If you don't like the colors of a particular theme, it's easy to apply **new theme colors**; everything else about the theme will remain unchanged.

1. From the **Design** tab, click the drop-down arrow in the **Variants** group and select **Colors**.



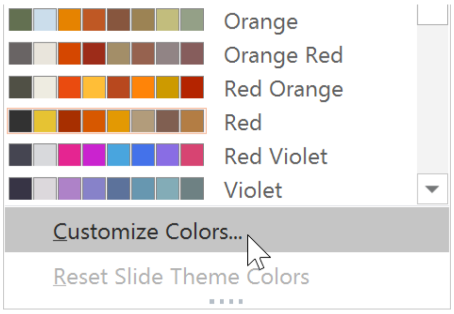

2. Select the desired theme colors.
3. The presentation will update to show the new theme colors.



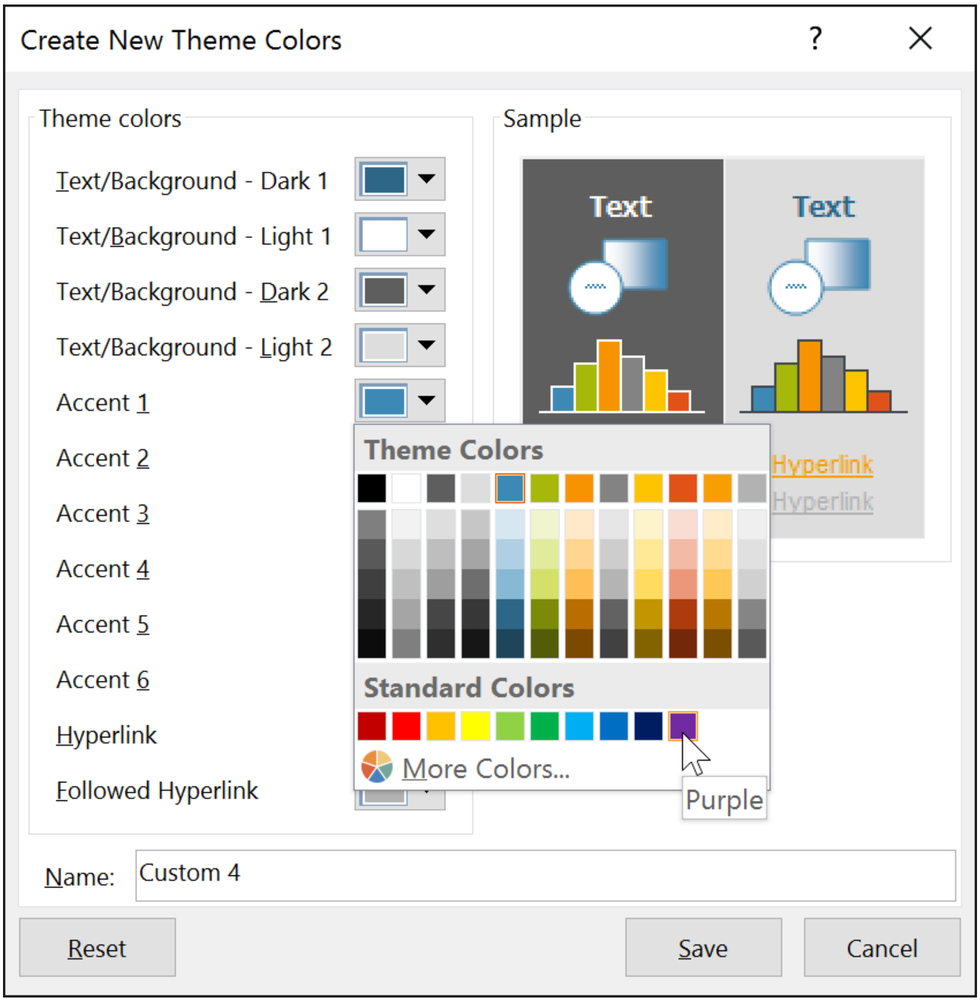

**To customize colors:**

Sometimes you might not like every color included in a set of theme colors. It's easy to change some or all of the colors to suit your needs.

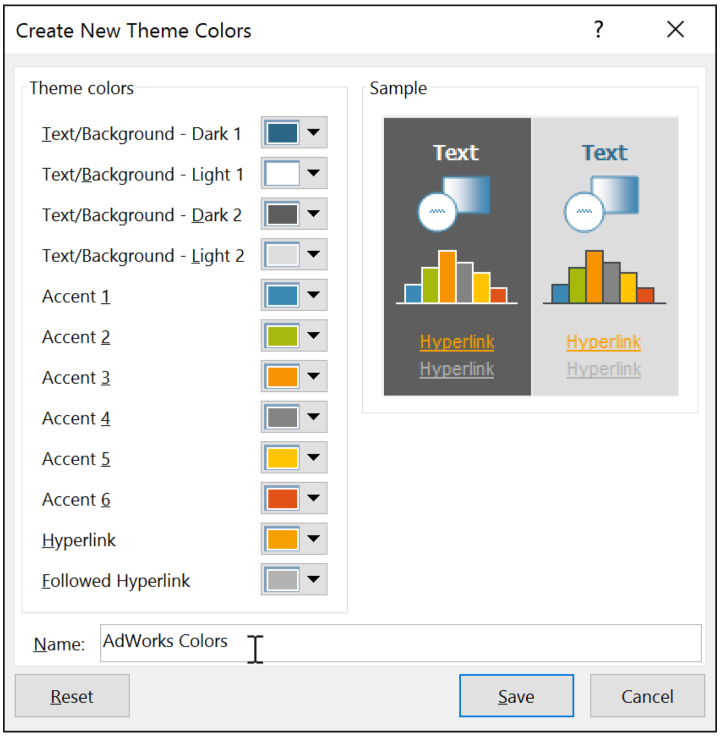
1. From the **Design** tab, click the drop-down arrow in the **Variants** group.
2. Select **Colors**, then click **Customize Colors**.




3. A dialog box will appear with the **12 current theme colors**. To edit a color, click the drop-down arrow and select a different color. You may need to click **More Colors** to find the exact color you want.




4. In the **Name:** field, type the desired name for the theme colors, then click **Save**.



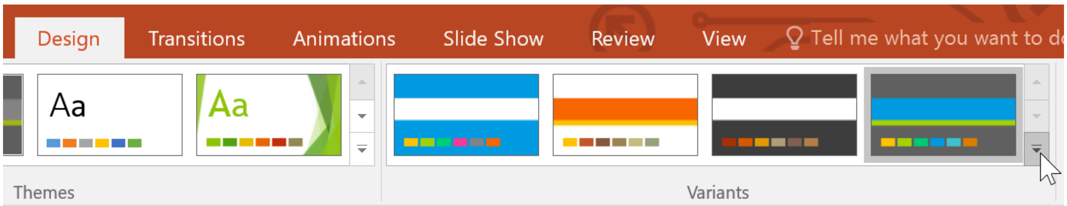
5. The presentation will update to show the new custom theme colors.

With some presentations, you may not notice a significant difference when changing the theme colors. For example, a **textured background** will not change when theme colors are changed. When trying different theme colors, it's best to select a slide that uses several colors to see how the new theme colors will affect your presentation.

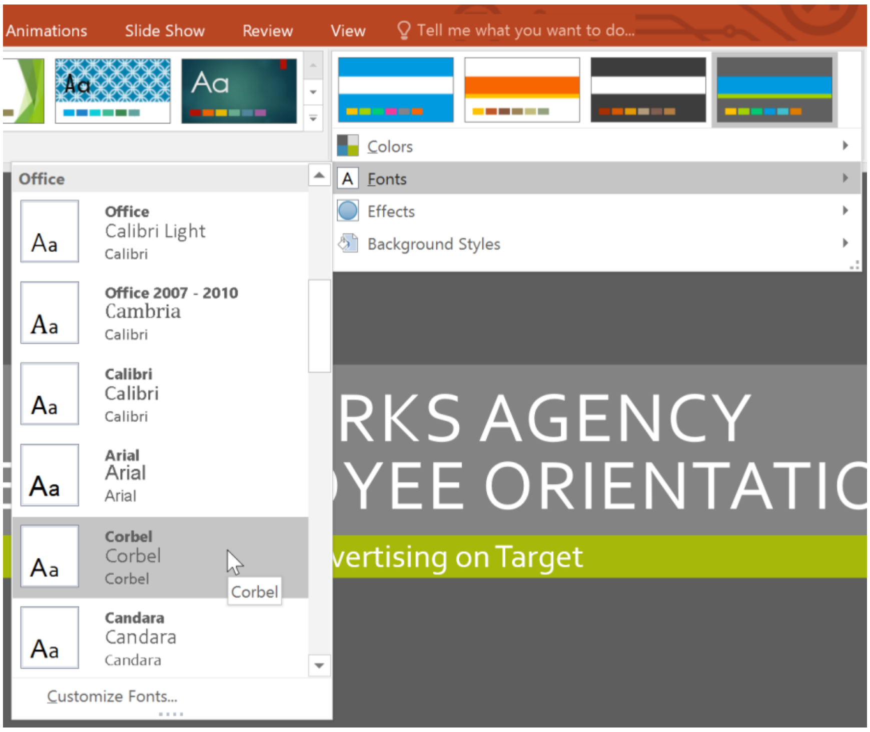
**To select new theme fonts:**

It's easy to apply a new set of **theme fonts** without changing a theme's overall look. The built-in theme fonts are designed to work well together, which can help to unify your presentation.

1. From the **Design** tab, click the drop-down arrow in the **Variants** group and select **Fonts**.




2. Select the desired theme fonts.

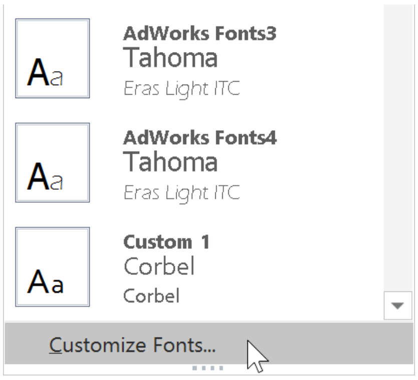



3. The presentation will update to show the new theme fonts.

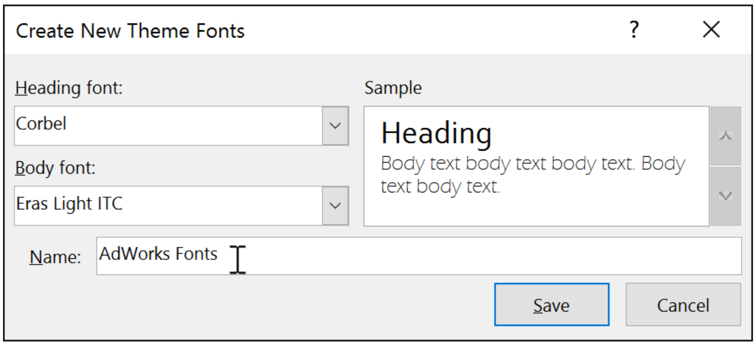
**To customize theme fonts:**

If you have specific fonts in mind for a presentation, it's easy to choose your own theme fonts.

1. From the **Design** tab, click the drop-down arrow in the **Variants** group.
2. Select **Fonts**, then click **Customize Fonts**.

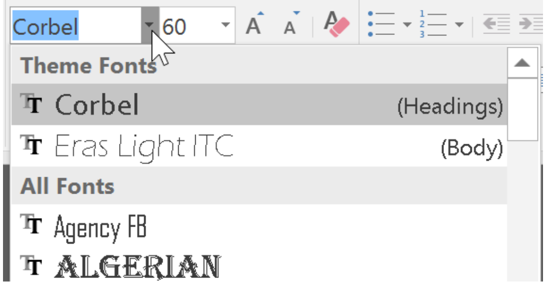



3. A dialog box will appear with the **two current theme fonts**. To change the fonts, click the drop-down arrows and select the desired fonts.
4. In the **Name**: field, type the desired name for the theme fonts, then click **Save**.




5. The presentation will update to show the new custom theme fonts.

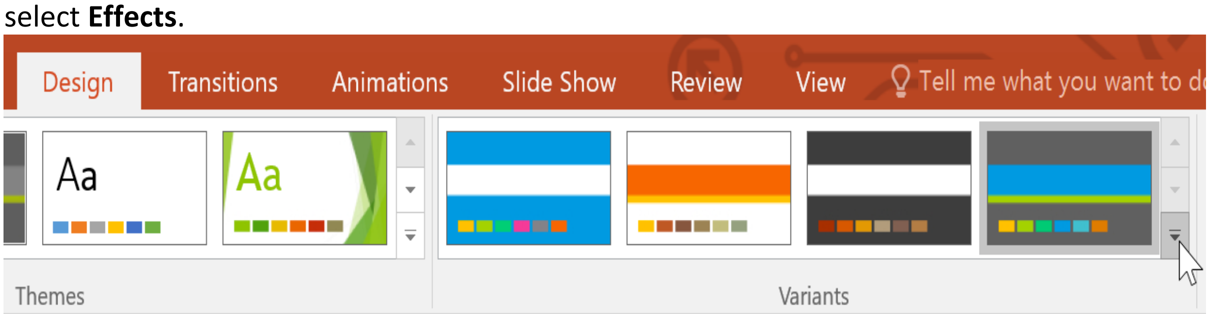
Changing the theme fonts will not necessarily update all text in your presentation. Only text using the **current theme fonts** will update when you change the theme fonts.



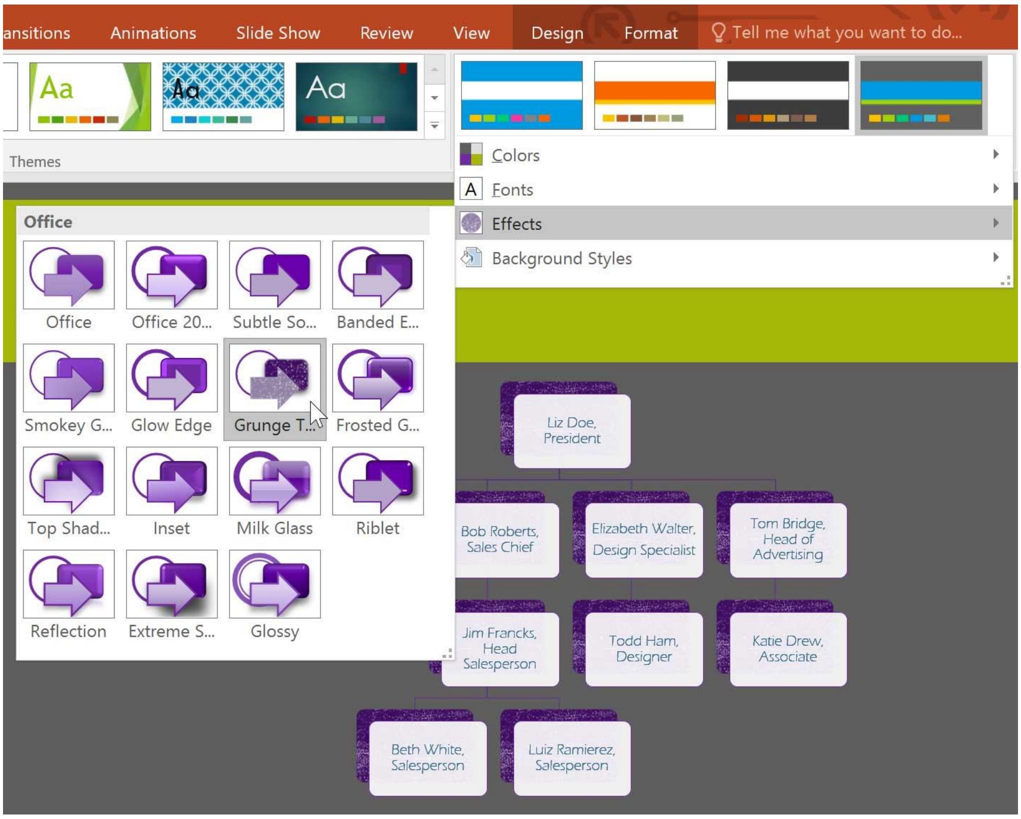

**To select new theme effects:**

PowerPoint makes it easy to apply **new theme effects**, which can quickly change the appearance of **shapes** in your presentation.

1. From the **Design tab**, click the drop-down arrow in the **Variants** group and select **Effects**.

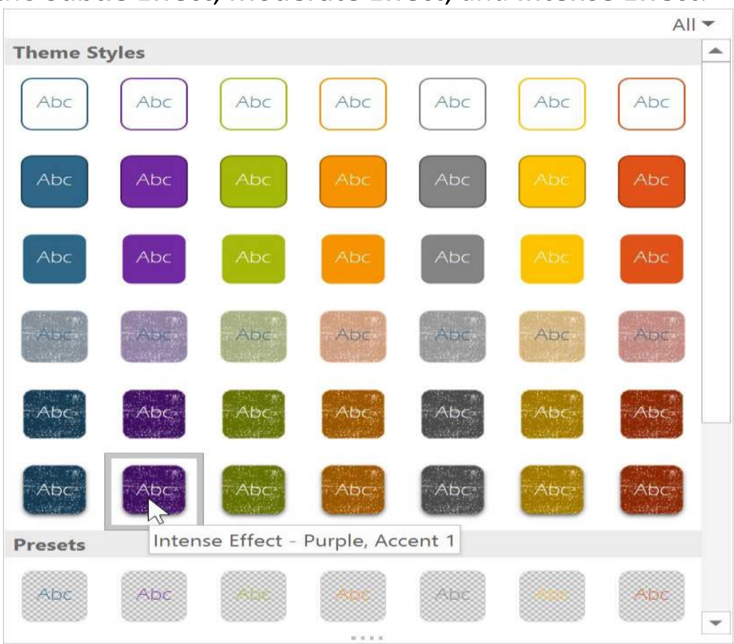



2. Select the desired theme effects.




3. The presentation will update to show the new theme effects.

Applying new theme effects will change different **shape styles** from the **Format** tab when editing a shape or SmartArt graphic. It's important to note that this change will only apply to shapes using the **Subtle Effect**, **Moderate Effect**, and **Intense Effect**.

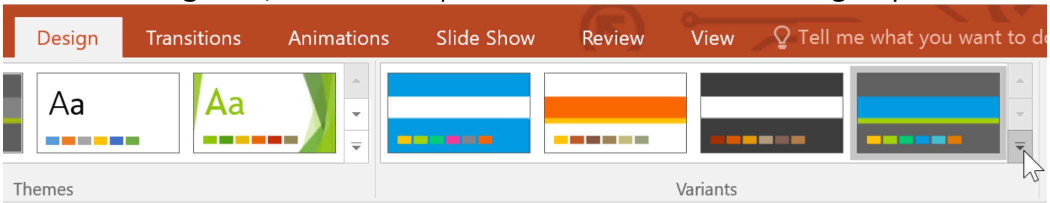



**Background styles**

To further customize your slides, you can change the **background color** by choosing a different **background style**. The available background styles will vary depending on the current theme.

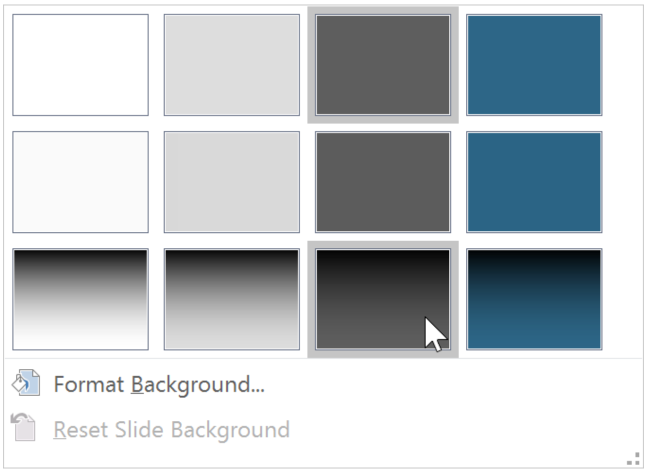
**To apply a background style:**

1. From the **Design** tab, click the drop-down arrow in the **Variants** group.



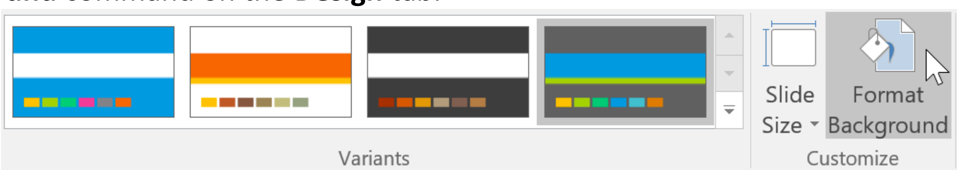

2. Select **Background Styles**.


3. Select the desired style. The available styles will change depending on the current **theme colors**.




4. The new background will appear in each slide of your presentation.

If you want even more control over the background, click the **Format Background** command on the **Design** tab.



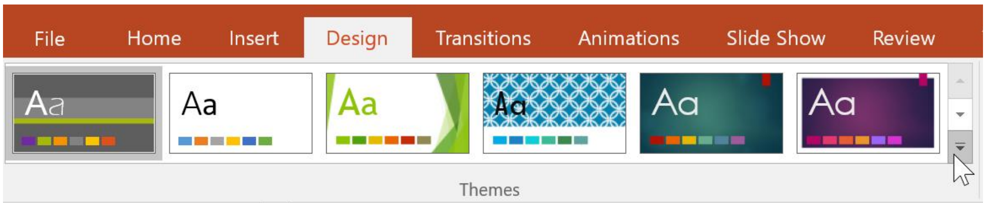

Different themes also include different **slide layouts** and **background graphics**.

**Saving custom themes**

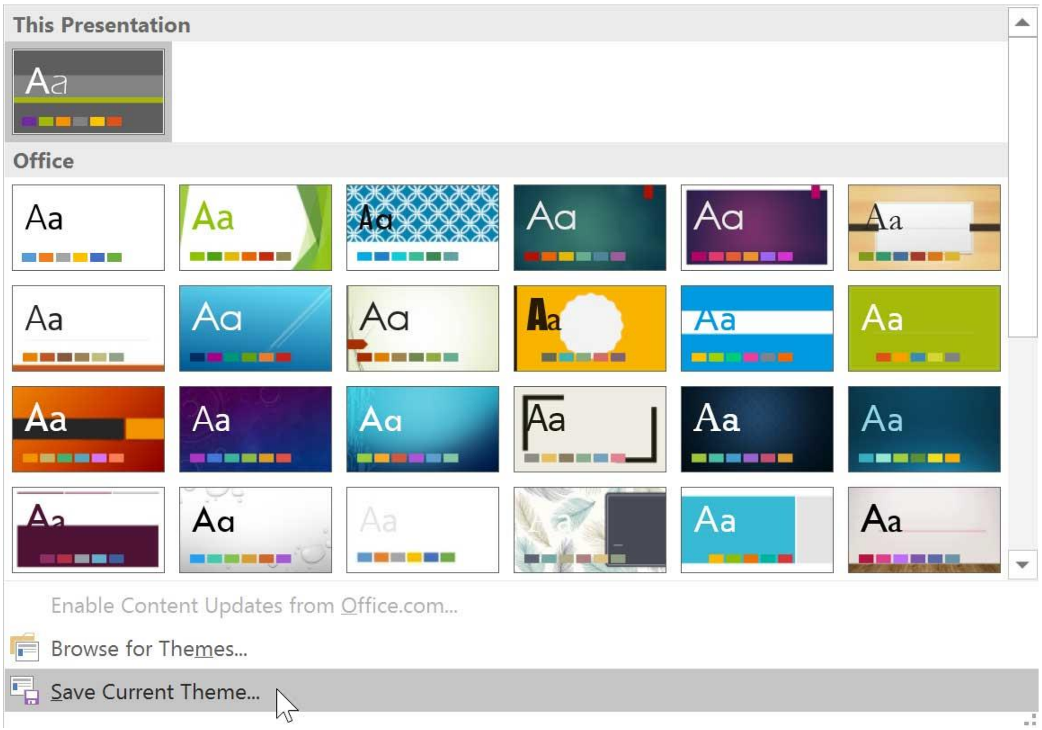
Once you've found settings you like, you may want to **save the theme** so you can use it in other presentations. If you only want to use the theme in the current presentation, you won't need to save it.

**To save a theme:**

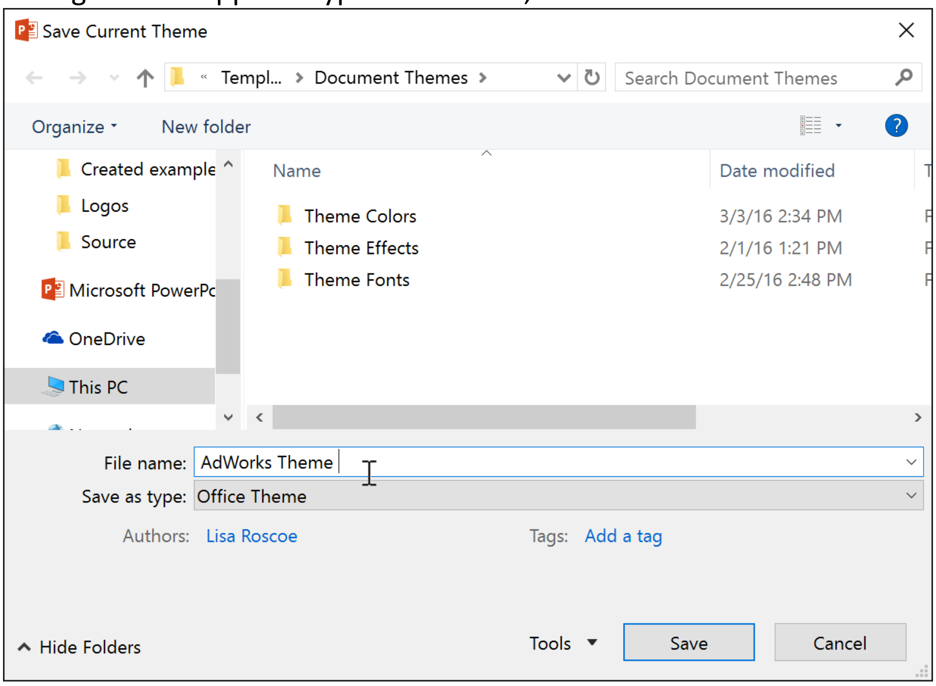
1. From the **Design** tab, click the drop-down arrow in the **Themes** group.



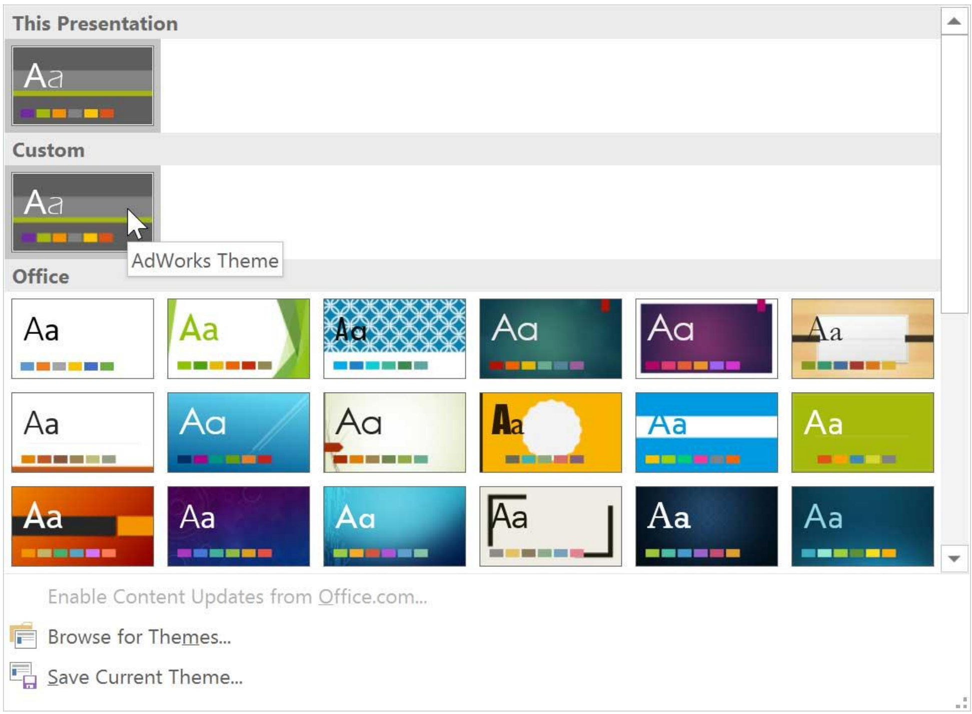

2. Click **Save Current Theme**.




3. A dialog box will appear. Type a **file name**, then click **Save**.




4. When you click the drop-down arrow in the **Themes** group, you'll see the custom theme under **Custom**.




Custom themes have another unique and powerful feature: Any custom theme you save in PowerPoint can actually be used in **other Microsoft Office applications**, such as Word and Excel.

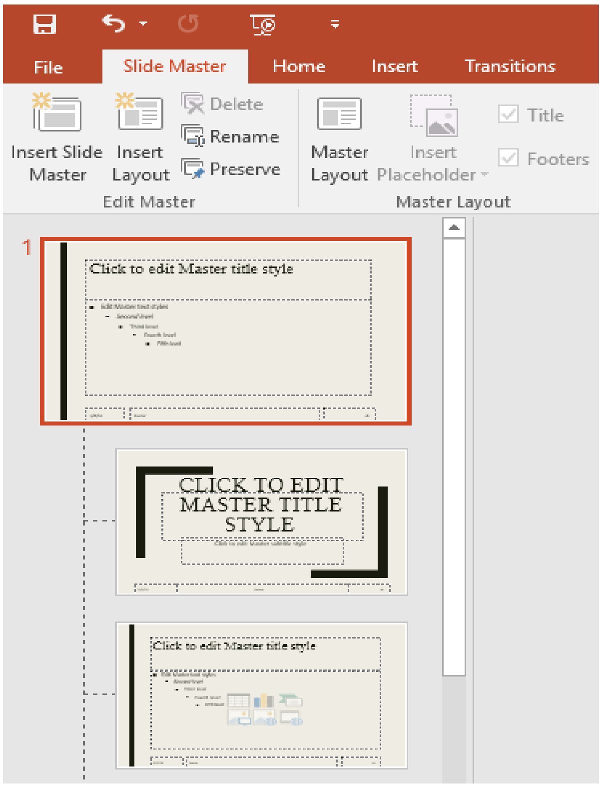
**5.2 Slide Master View**

You may have noticed that when you select a different theme in PowerPoint, it rearranges the text on your slides and adds shapes to the background. This is because each theme has built-in slide layouts and background graphics. You can edit these layouts with a feature called Slide Master view. Once you learn how to use Slide Master view, you'll be able to customize your entire slide show with just a few clicks.

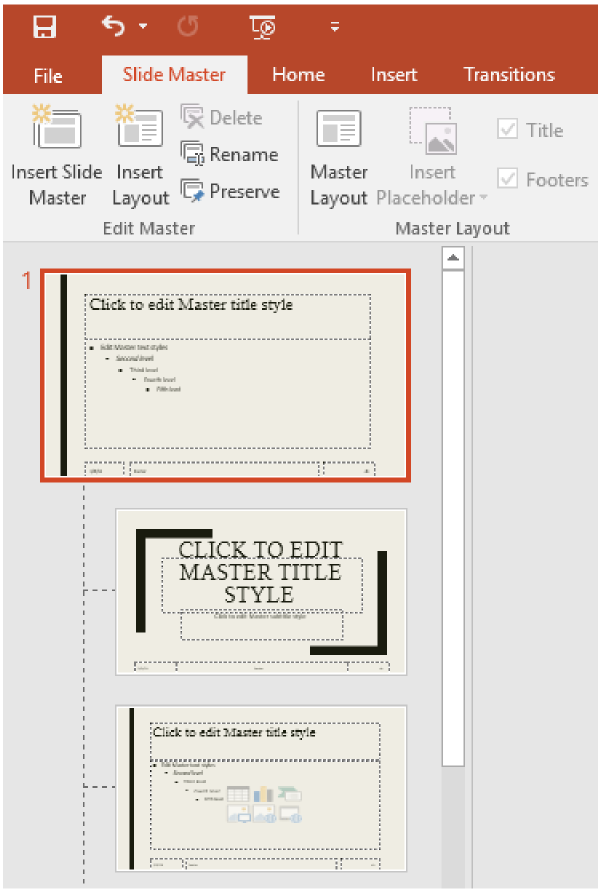
**What is Slide Master view?**

**Slide Master view** is a special feature in PowerPoint that allows you to quickly modify the slides and slide layouts in your presentation. From there, you can edit the **slide master**, which will affect **every slide** in the presentation. You can also modify individual **slide layouts**, which will change any slides using those layouts.

For example, let's say you find a theme you like but you don't like a few of the slide layouts. You could use Slide Master view to customize the layouts to look exactly the way you want**.**




In Slide Master view, the **Slide Master** tab will appear first on the Ribbon, but you'll still be able to access commands on different tabs as normal.




**Using Slide Master view**

Whether you're making **significant changes** to your slides or just a few **small tweaks**, Slide Master view can help you create a consistent, professional presentation without a lot of effort. You could use Slide Master view to change just about anything in your presentation, but here are some of its most common uses.

- **Modify backgrounds**: Slide Master view makes it easy to customize the **background** for all of your slides at the same time. For example, you could add a watermark or logo to each slide in your presentation, or you could modify the background graphics of an existing PowerPoint theme.
- **Rearrange placeholders**: If you find that you often rearrange the placeholders on each slide, you can save time by rearranging them in Slide Master view instead. When you adjust one of the layouts in Slide Master view, all of the slides with that layout will change.
- **Customize text formatting**: Instead of changing the text color on each slide individually, you could use the Slide Master to change the text color on all slides at once.
- **Create unique slide layouts**: If you want to create a presentation that looks different from regular PowerPoint themes, you could use Slide Master view to create your own layouts. Custom layouts can include your own **background graphics** and **placeholders**.

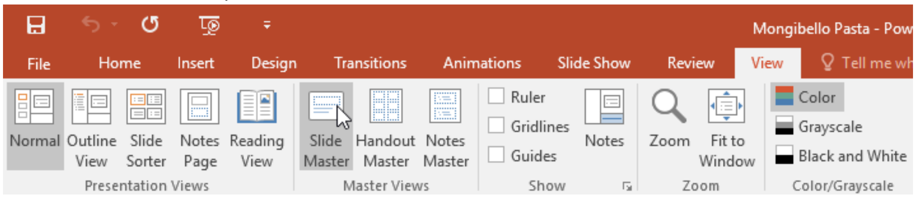
Some overall presentation changes—like customizing the **theme fonts** and **theme colors**—can be made quickly from the **Design** tab. Review our lesson on **Modifying Themes** to learn more.

**To make changes to all slides:**

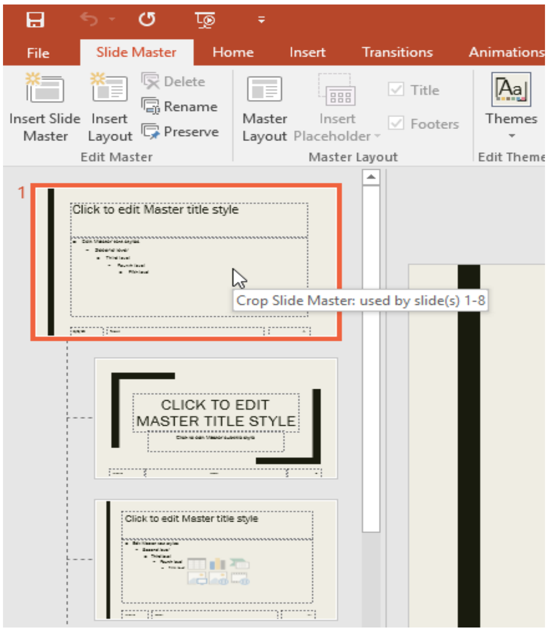
If you want to change something on all slides of your presentation, you can edit the Slide Master. In our example, we'll add a **logo** to every slide. If you'd like to work along with our example, right-click the image below and save it to your computer.

Mongibello
ARTISAN PASTA

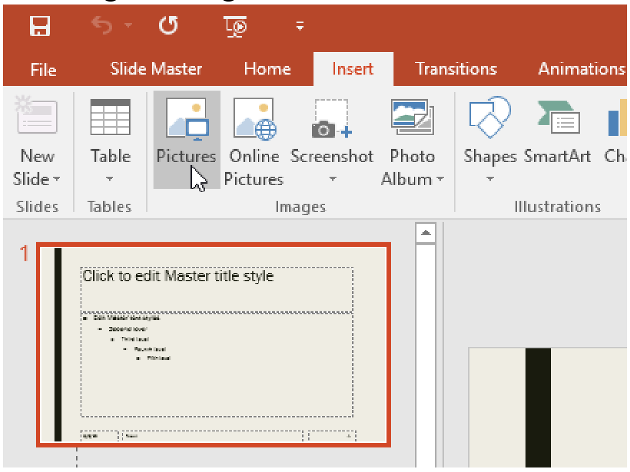
1. Select the **View** tab, then click the **Slide Master** command.



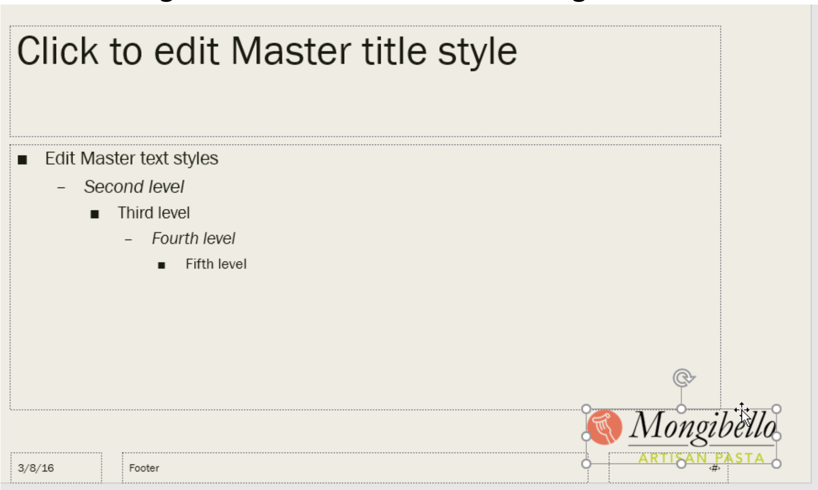

2. The presentation will switch to **Slide Master view**, and the **Slide Master** tab will be selected on the Ribbon.
3. In the left navigation pane, scroll up and select the **first slide**. This is the **slide master**.



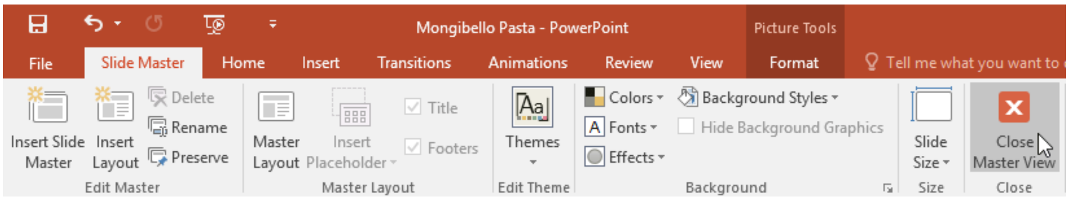

4. Make the desired changes to the slide master. In our example, we'll **insert a picture** of the Mongibello logo.



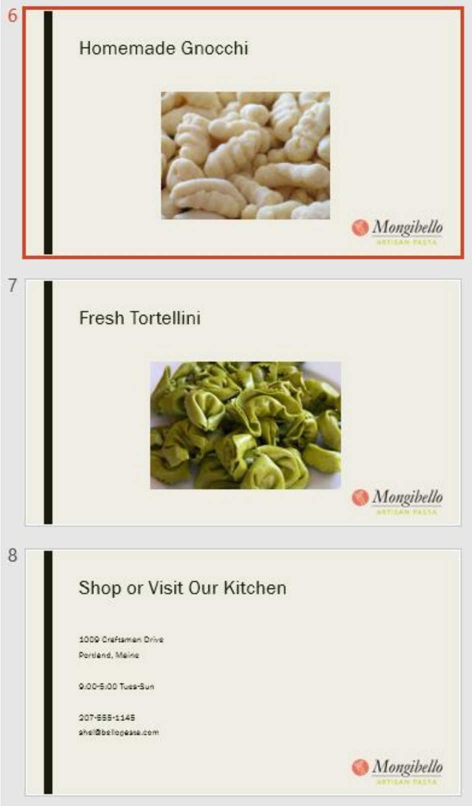

5. **Move**, **resize**, or **delete** slide objects as needed. In our example, we'll resize the logo and move it to the bottom-right corner.



6. When you're finished, click the **Close Master View** command on the **Slide Master** tab.




7. The change will appear on all slides of the presentation.




When you make a change to the slide master, it's a good idea to **review your presentation** to see how it affects each slide. You may find that some of your slides don't look exactly right. On the next page, we'll show you how to fix this by customizing individual slide layouts.

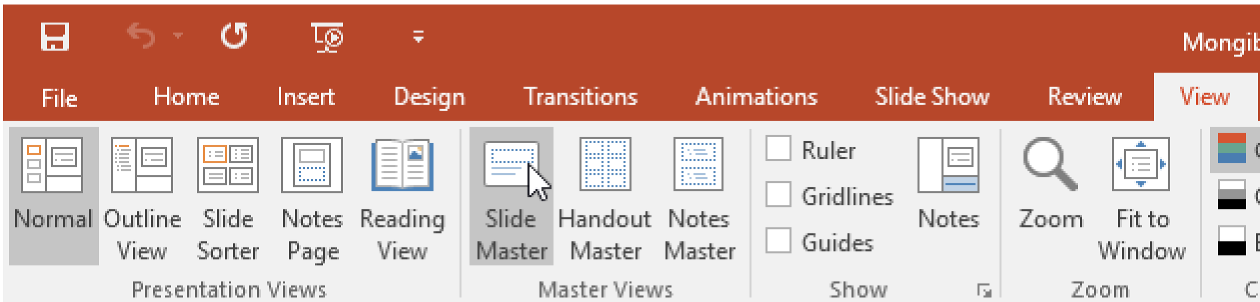
**Customizing slide layouts**

You can use Slide Master view to modify any **slide layout** in your presentation. It's easy to make small tweaks like adjusting background graphics and more significant changes like rearranging or deleting placeholders. Unlike the slide master, changes to a slide layout will only be applied to slides using that layout in your presentation.

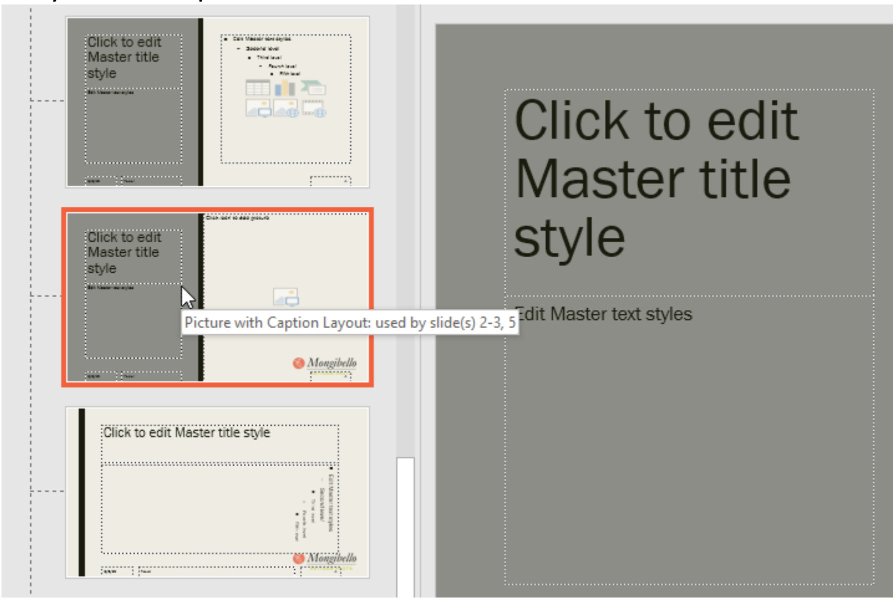
**To customize an existing slide layout:**

In our example, our newly added logo is hidden behind the photo in the **Picture with Caption Layout**. We'll customize this layout to make room for the logo.

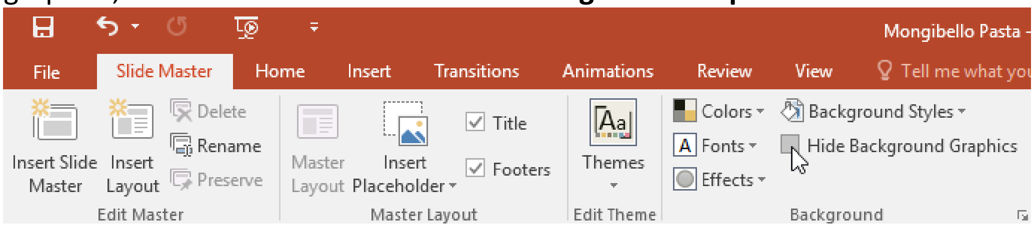
1. Navigate to **Slide Master** view.



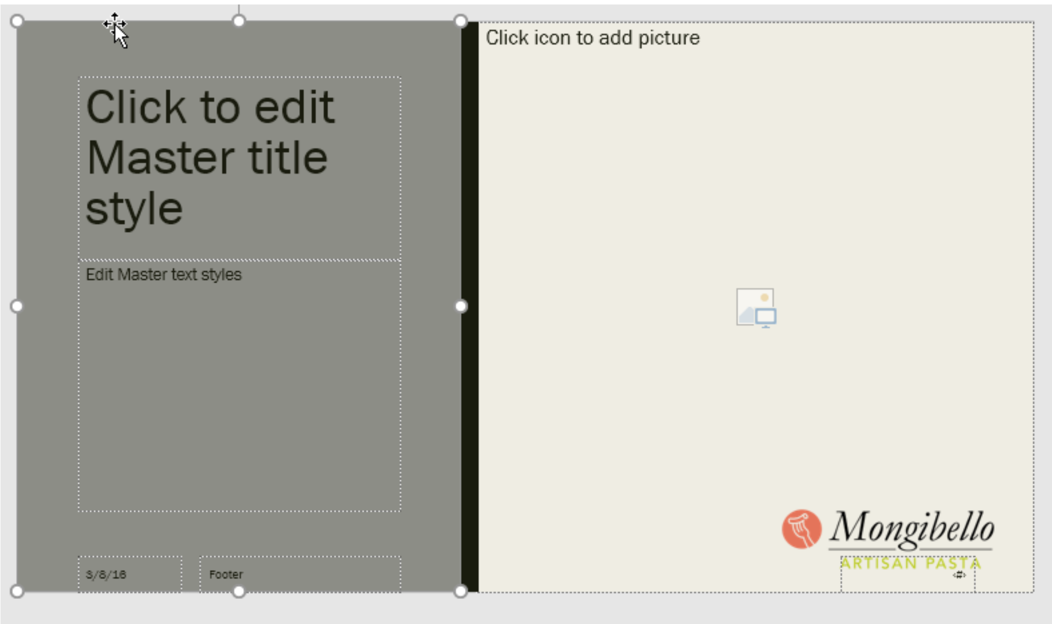

2. Locate and select the desired layout in the left navigation pane. You can hover the mouse over each layout to see which slides are currently using that layout in the presentation.



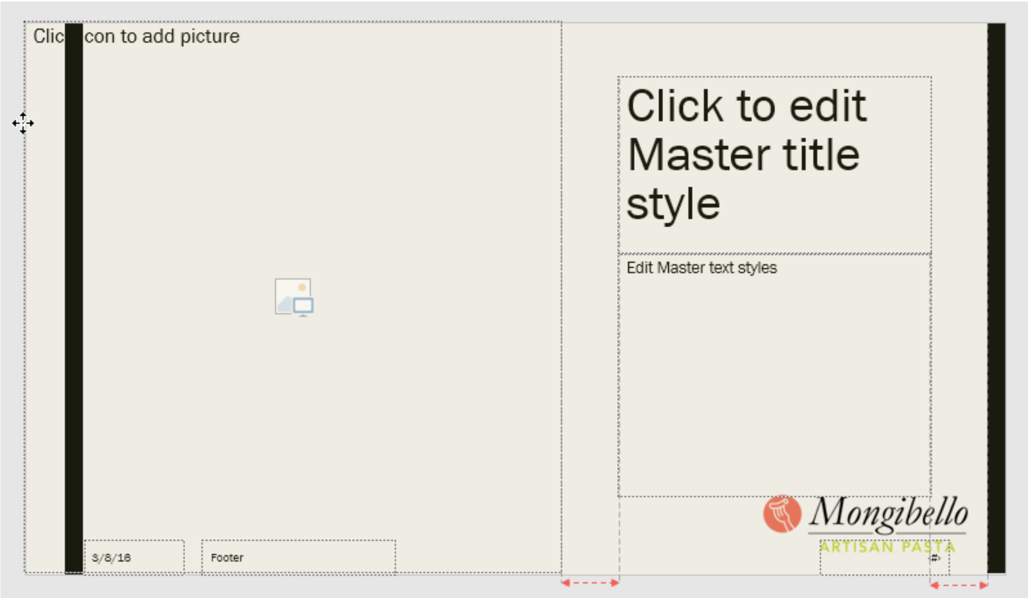

3. In some layouts, the background graphics may be hidden. To show the graphics, uncheck the box next to **Hide Background Graphics**.



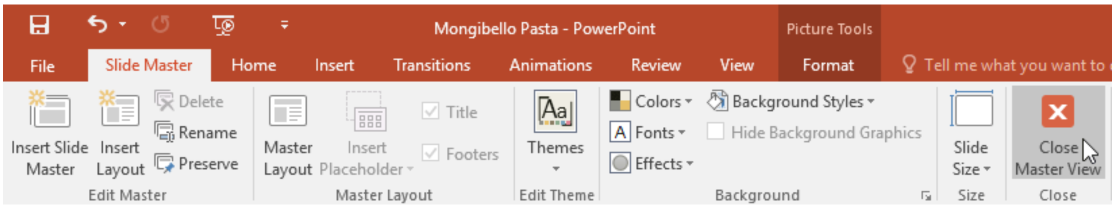

4. Add, move, or delete any **objects** as desired. In our example, we'll delete the gray background shape.




5. If you want to change the arrangement of the placeholders, you can move, resize, or delete any of them. In our example, we'll move our text placeholders and the black bar to the right side, and the photo placeholder to the left side.




6. When you're finished, click the **Close Master View** command on the **Slide Master** tab.

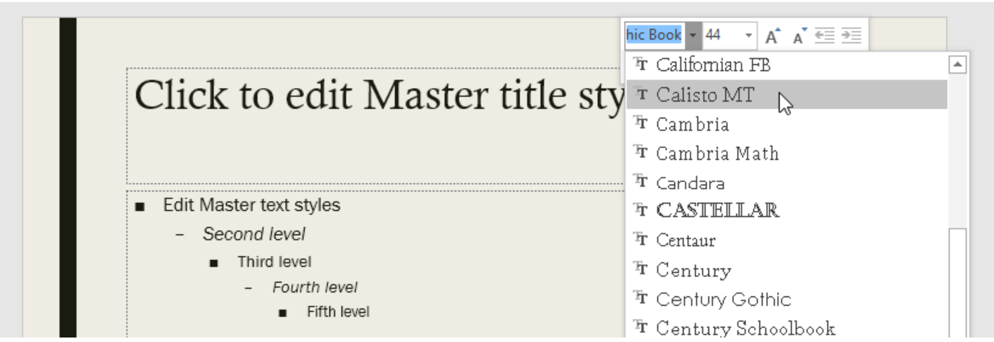



7. All slides using the layout will be updated.


You can also move placeholders on the **slide master**, which will move the placeholders on multiple slide layouts at the same time. However, some slide layouts may still need to be adjusted manually.

**Customizing text formatting**

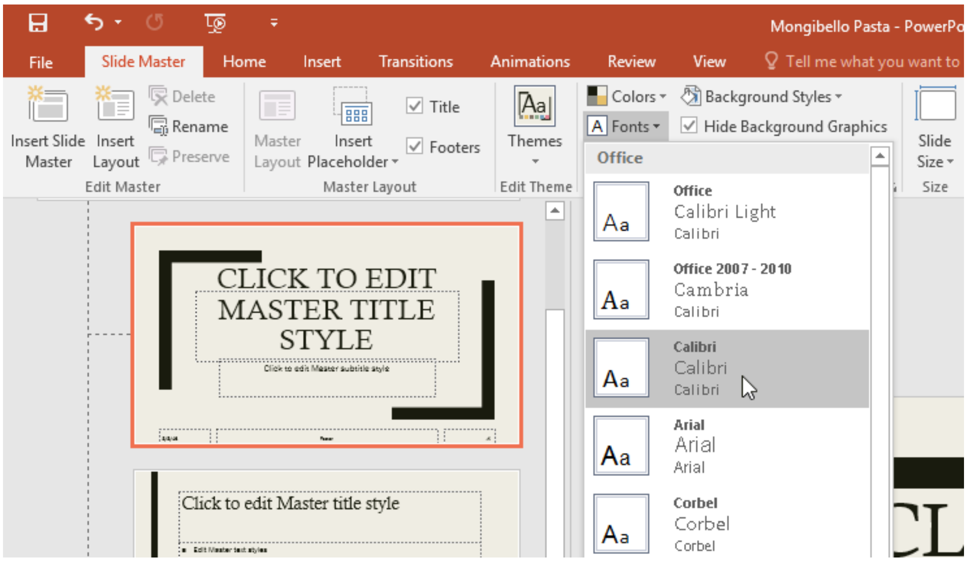
You can also customize the **text formatting** from Slide Master view, including the **font**, **text size**, **color**, and **alignment**. For example, if you wanted to change the font for every **title placeholder** in your presentation, you could modify the **master title style** on the slide master.




Each title placeholder is **connected** to the master title style on the slide master. For example, take a look at the slides before changing the title font.

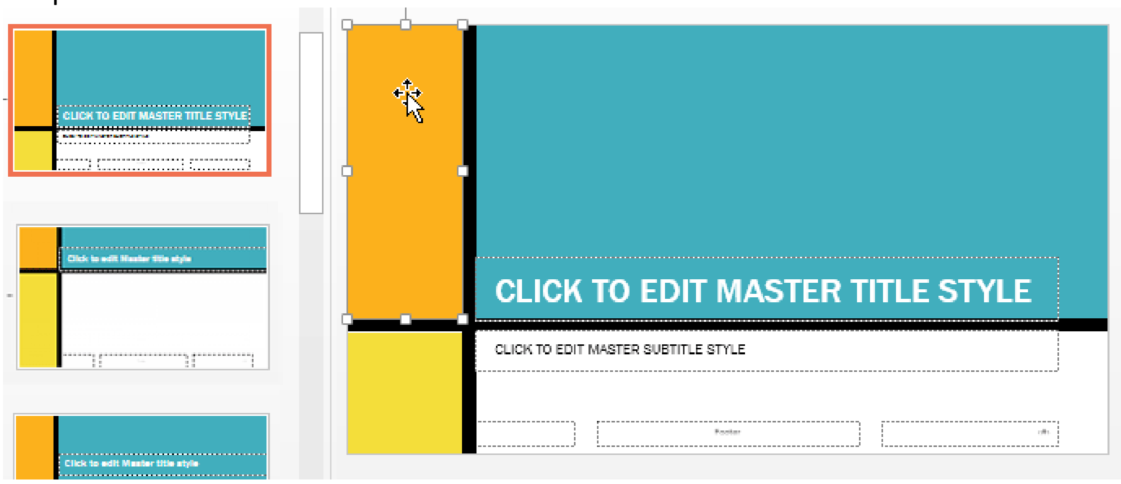

Now look at the same slides after changing the title font.


Instead of customizing individual placeholders, you could change the **theme fonts** for a presentation. From the **Slide Master** tab, click the **Fonts** command in the **Background** group, then select the desired fonts.



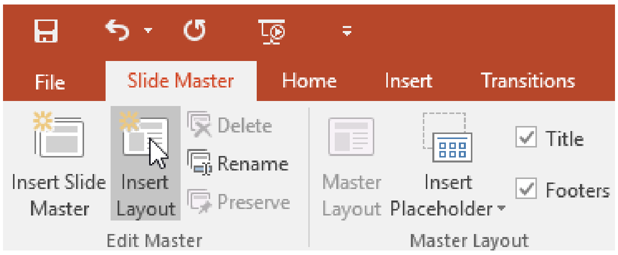

**Creating new slide layouts**

One of the most powerful features of Slide Master view is the option to create **new slide layouts**. This is an easy way to add interesting and unique slide layouts to an existing theme. You could even use this feature to design an entirely **new theme**, as in the example below.



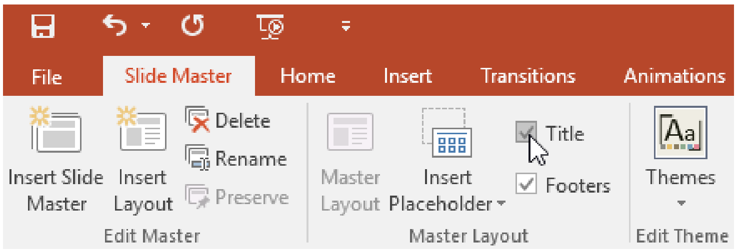

**To insert a new slide layout:**

1. Navigate to **Slide Master view**. From the **Slide Master** tab, click the **Insert Layout** command.

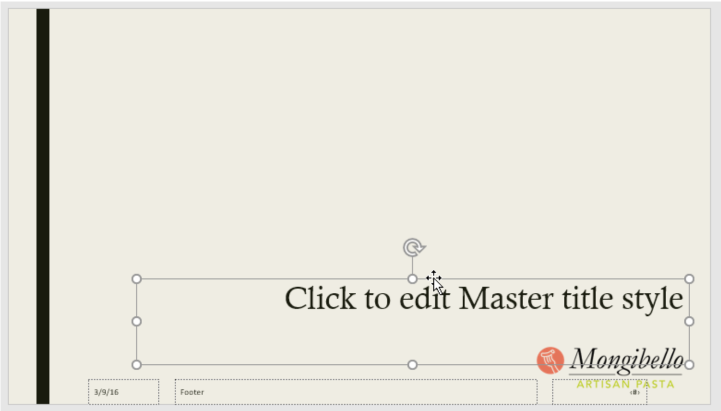



2. The new slide layout will appear.

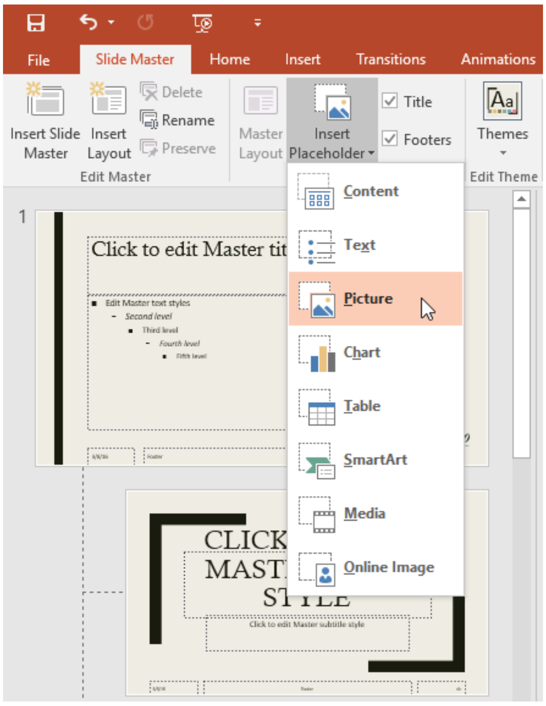

3. The layout will include **title** and **footer** placeholders by default. Click the **Title** and **Footers** boxes in the **Master Layout** group to toggle these placeholders on and off.



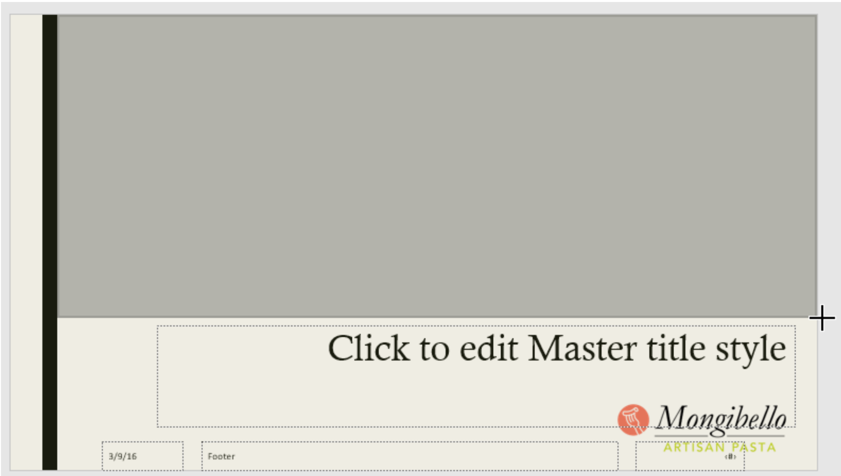

4. You can now add background graphics, shapes, and pictures to the slide layout. You can also move, adjust, and delete the existing placeholders. In our example, we'll **move the title placeholder** to the bottom-right corner. We've also **changed the text alignment to align right** instead of align left.




5. To add new placeholders, click the **bottom half** of the **Insert Placeholder** command, then select the desired placeholder type. In this example, we'll use the **Picture** placeholder.



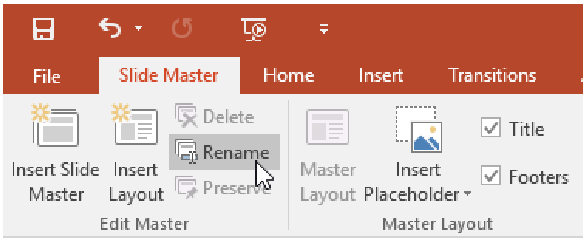

6. Click and drag to **draw the placeholder** on the slide.



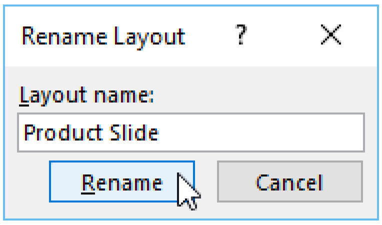

**To rename a custom layout:**

When you're done designing your custom layout, you'll want to give it a **unique name** so it will be easy to find.

1. From **Slide Master view**, select the desired layout, then click the **Rename** command.



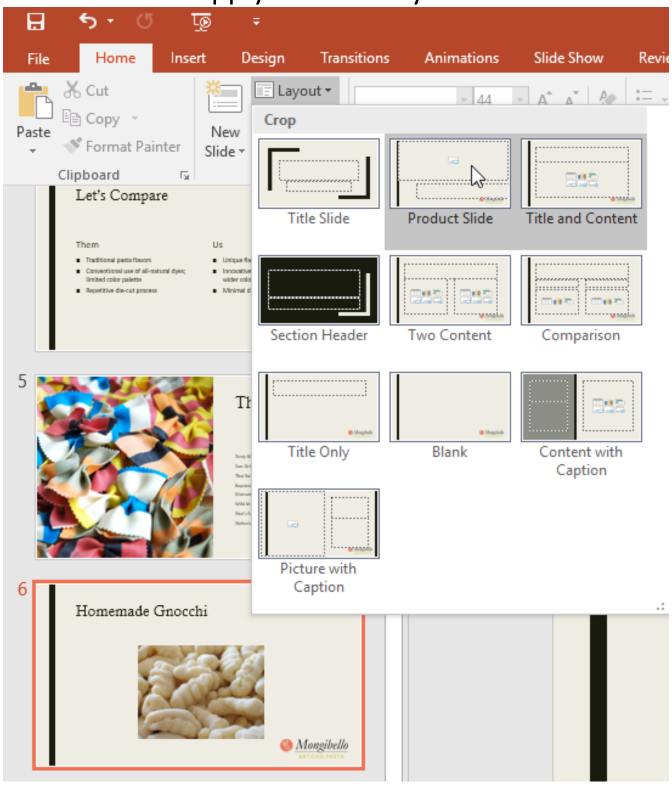

2. A dialog box will appear. Type the desired name, then click **Rename**.



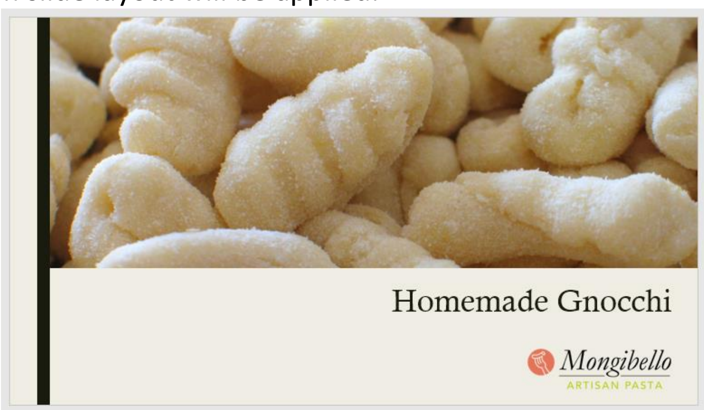

**To use a custom layout:**

Once you've created a custom slide layout, it's easy to add a new slide with that layout or apply it to an existing slide.

1. If you're currently in Slide Master view, click the **Close Master View** command on the **Slide Master** tab.
2. From the **Home** tab, you can **insert a new slide** with the custom layout or **apply it to an existing slide**. In our example, we'll select the **Layout** command and apply the new style to slide 6.




3. The custom slide layout will be applied.



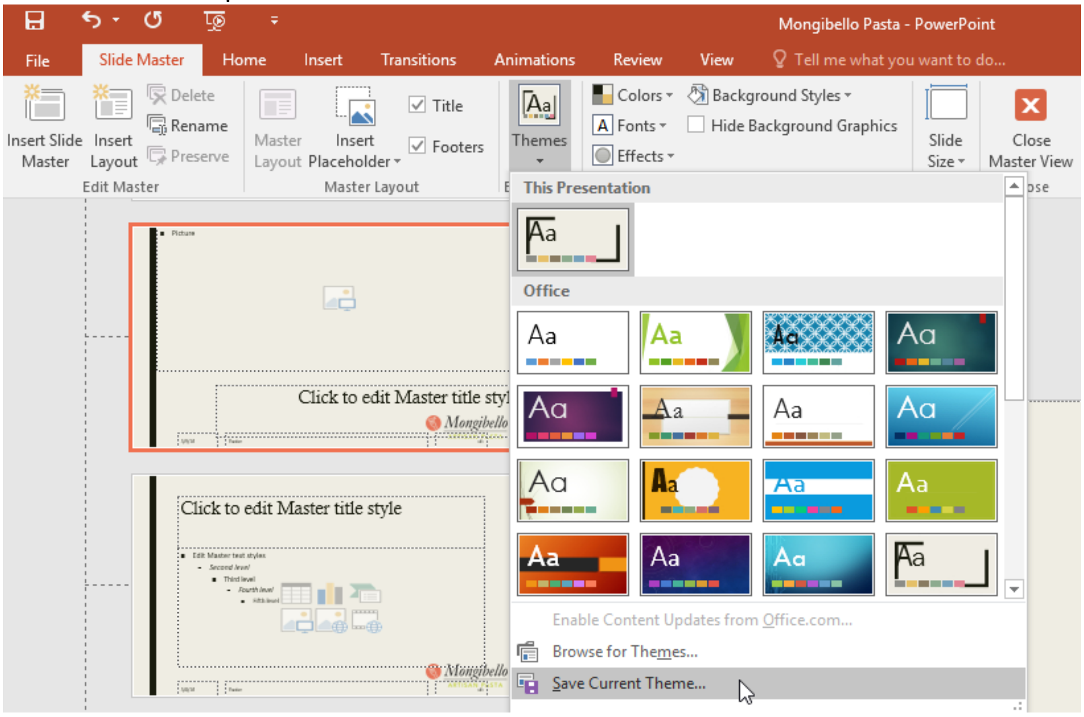

PowerPoint also allows you to add new placeholders to **existing** slide layouts.

**Using custom layouts in other presentations**

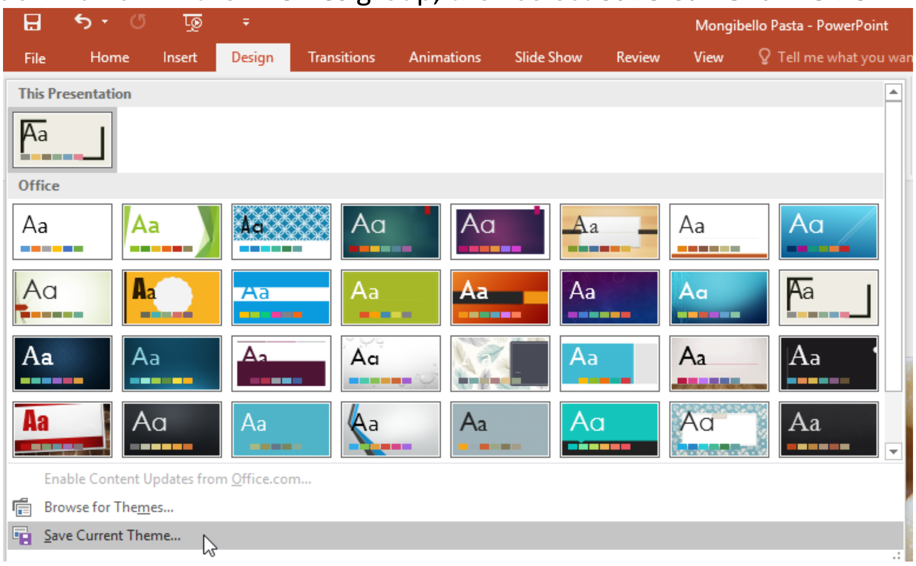
When you modify the slide master or slide layouts in Slide Master view, you're actually creating a custom version of the current theme. If you want to apply the theme to other presentations, you'll need to **save it**.

**To save a theme:**

From the the **Slide Master** tab, click the **Themes** command, then select **Save Current Theme** from the drop-down menu.




If you're not in Slide Master view, you can save the theme from the **Design** tab. Just click the drop-down arrow in the **Themes** group, then select **Save Current Theme**.




## 5.3 Hyperlinks

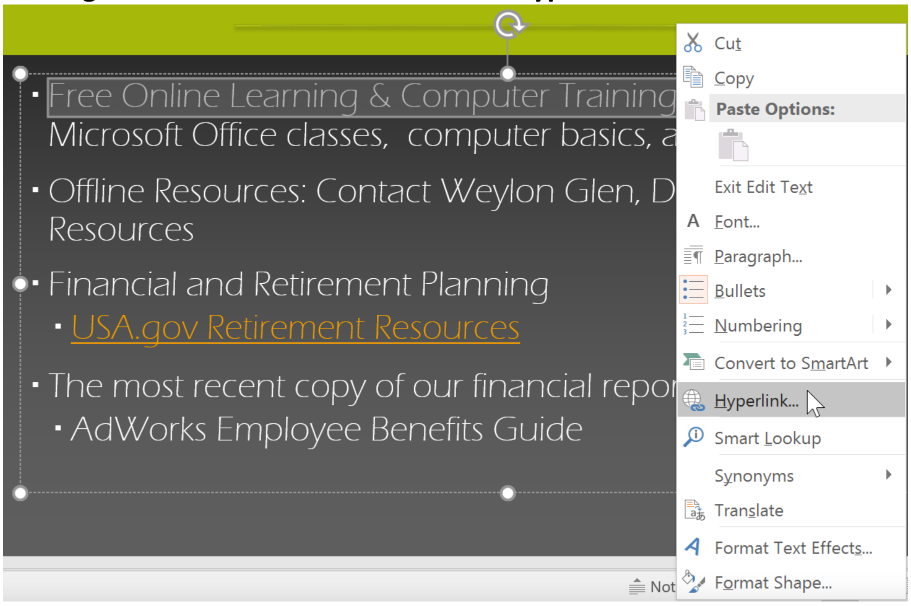
Whenever you use the Internet, you use hyperlinks to navigate from one webpage to another. If you want to include a web address or email address in your PowerPoint presentation, you can choose to format it as a hyperlink so a person can easily click it. It's also possible to link to files and other slides within a presentation.

**About hyperlinks**

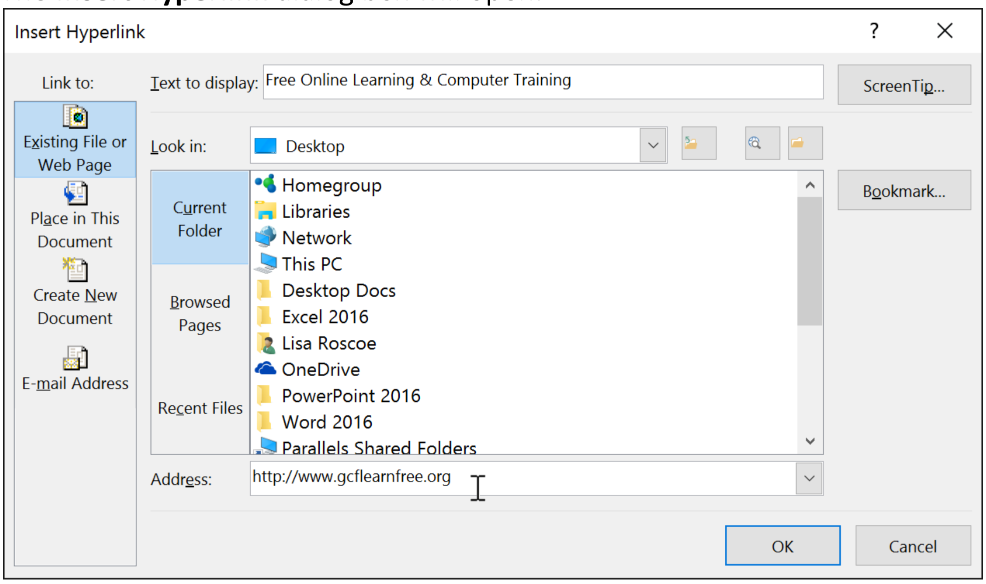
Hyperlinks have **two basic parts**: the **address** of the webpage, email address, or other location they are linking to, and the **display text** (which can also be a picture or a shape). For example, the address could be **https://www.youtube.com**, and **YouTube** could be the display text. In some cases, the display text might be the same as the address. When you're creating a hyperlink in PowerPoint, you'll be able to choose both the address and the display text or image.

**To insert a hyperlink:**

1. Select the image or text you want to make a hyperlink.
2. Right-click the selected text or image, then click **Hyperlink**. Alternatively, you can go to the **Insert** tab and click the **Hyperlink** command.




3. The **Insert Hyperlink** dialog box will open.

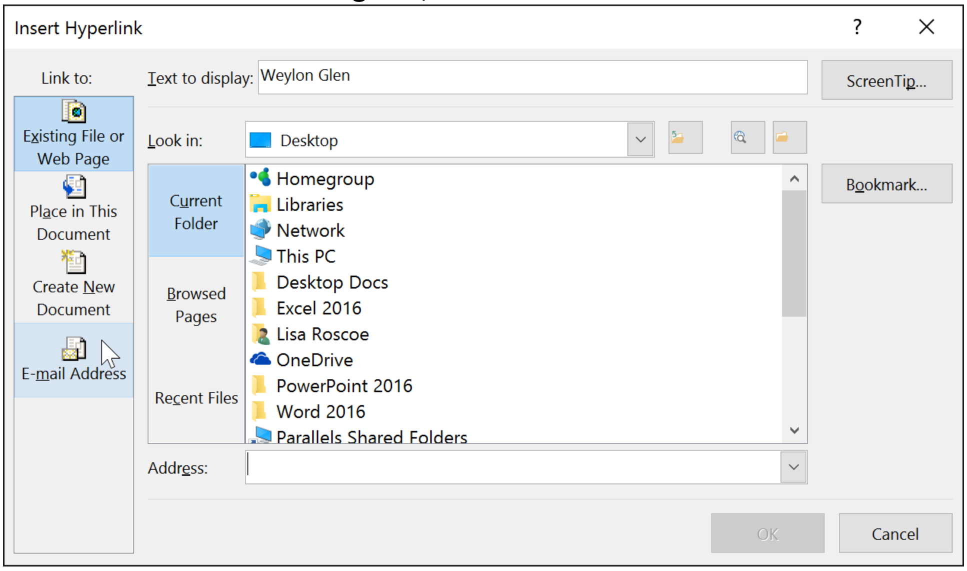



4. If you selected text, the words will appear in the **Text to display** field at the top. You can change this text if you want.

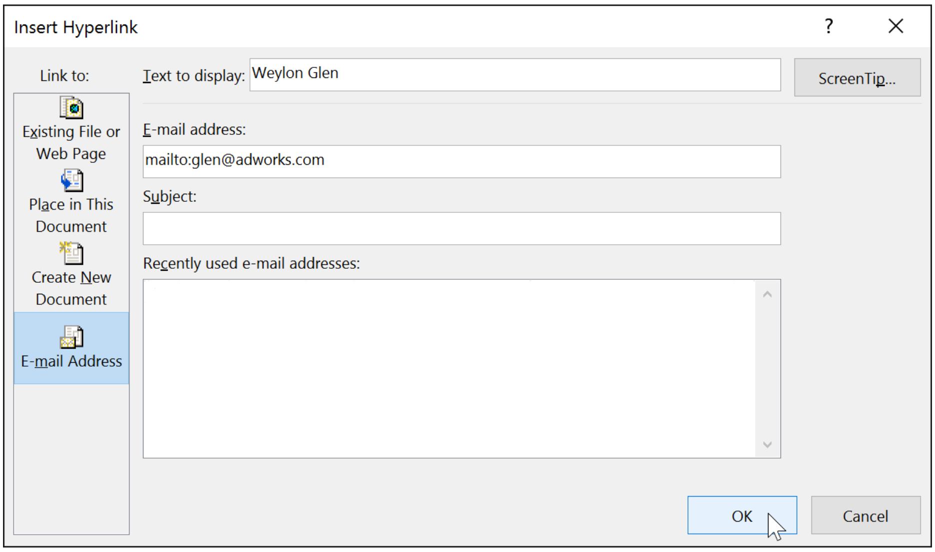
5. Type the address you want to link to in the **Address** field.
6. Click **OK**. The text or image you selected will now be a hyperlink to the web address.


**To insert a hyperlink to an email address:**

1. Right-click the selected text or image, then click **Hyperlink**.
2. The **Insert Hyperlink** dialog box will open.
3. On the left side of the dialog box, click **Email Address**.



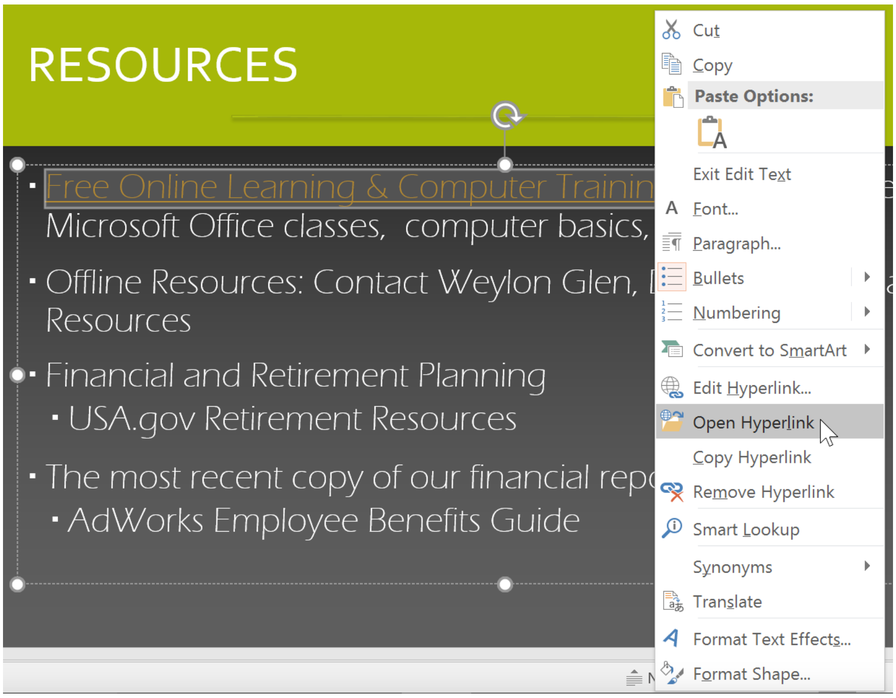

4. Type the email address you want to connect to in the **Email Address** box, then click **OK**.




PowerPoint often recognizes email and web addresses as you type and will format them as hyperlinks automatically after you press the **Enter** key or **spacebar**.

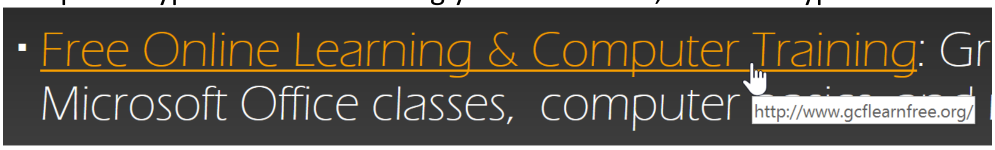
**To open and test a hyperlink:**

1. After you create a hyperlink, you should **test** it. Right-click the hyperlink, then click **Open Hyperlink**.



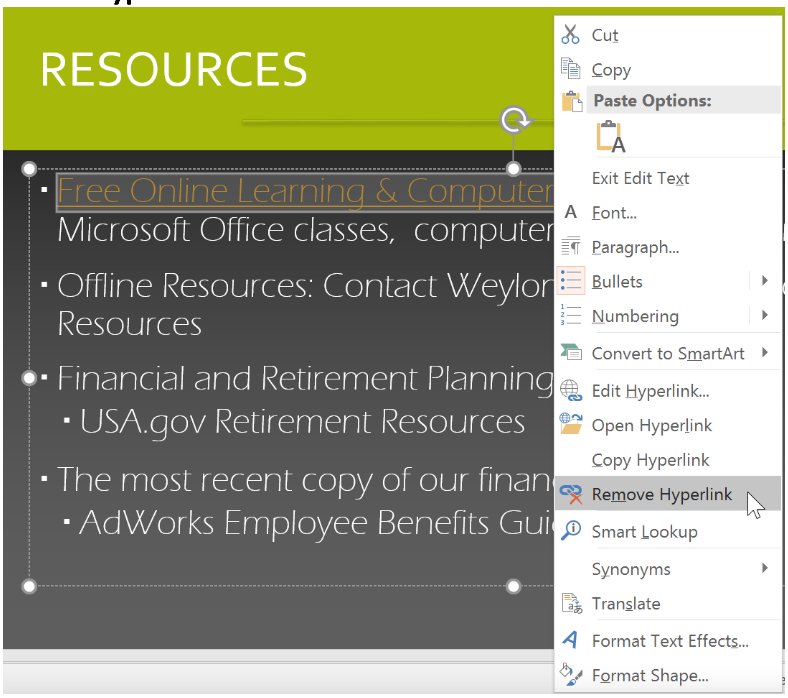

2. Your web browser should open and then navigate to the linked page. If it doesn't work, check the hyperlink address for any misspellings.

To open a hyperlink while viewing your slide show, click the hyperlink.




**To remove a hyperlink:**

1. Right-click the hyperlink.
2. Click **Remove Hyperlink**.

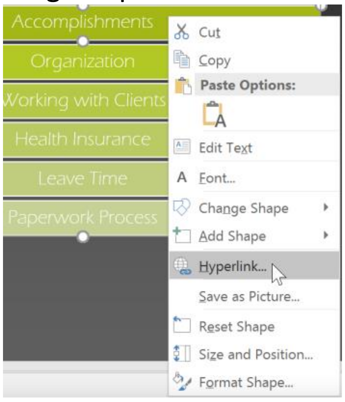



**More hyperlinks**

In PowerPoint, you can use hyperlinks to link to resources that are not online. To create a quick way to refer to another slide in your presentation, you can create a hyperlink to that slide. If you need to access a file stored on your computer, you can create a hyperlink to it. Additionally, PowerPoint allows you to format pictures and shapes as hyperlinks.

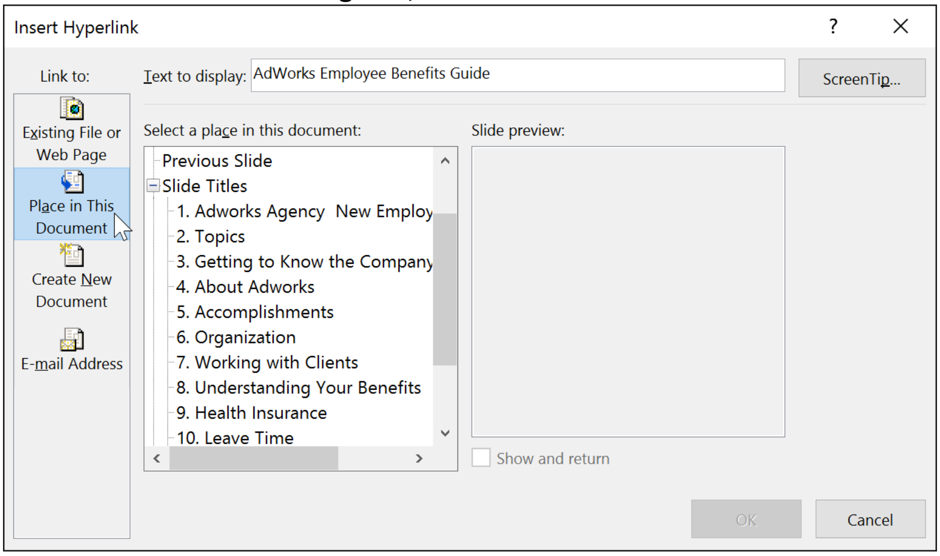
**Using shapes and pictures as hyperlinks**

Sometimes you might want to format **objects**—including shapes, text boxes, and pictures—as hyperlinks. This is especially helpful if you want the object to act like a **button**. To do this, right-click the desired object and select **Hyperlink** from the menu that appears. Click the object during the presentation to open the hyperlink.

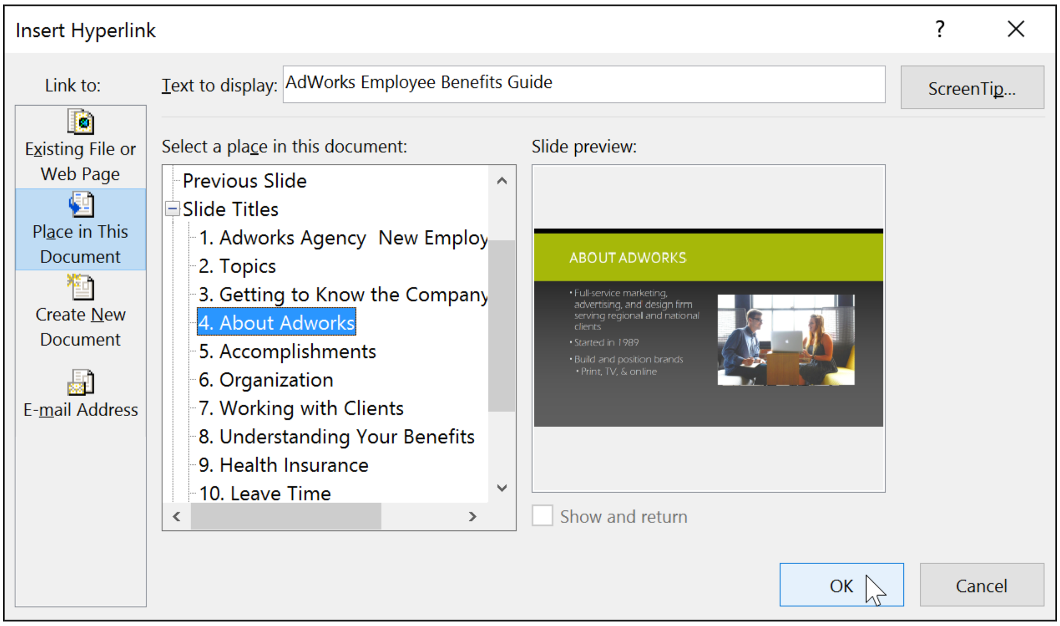



**To insert a hyperlink to another slide:**

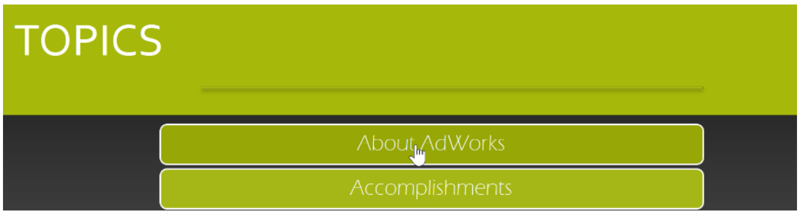
1. Right-click the selected text or image, then click **Hyperlink**.
2. The **Insert Hyperlink** dialog box will appear.
3. On the left side of the dialog box, click **Place in this Document**.




4. A list of other slides in your presentation will appear. Click the name of the slide you want to link to.



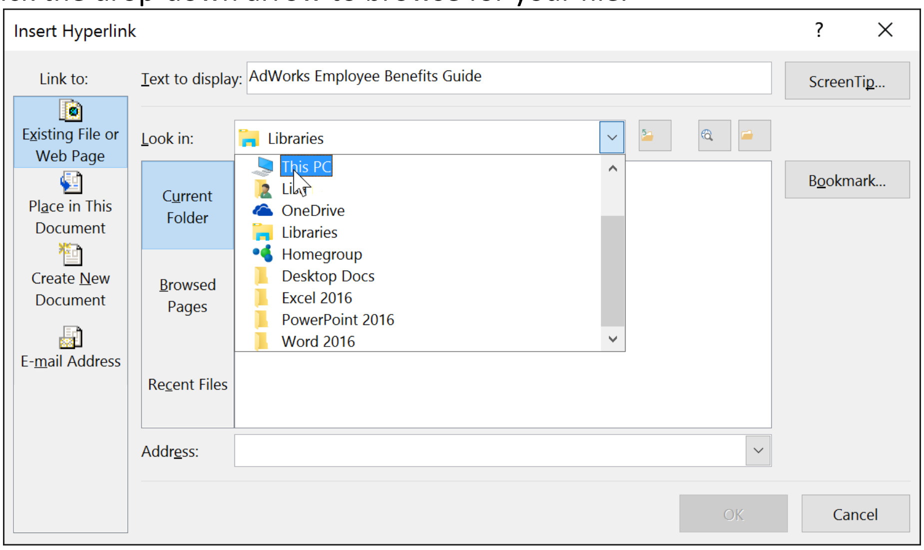

5. Click **OK**. The text or image will now be a hyperlink to the slide you selected.



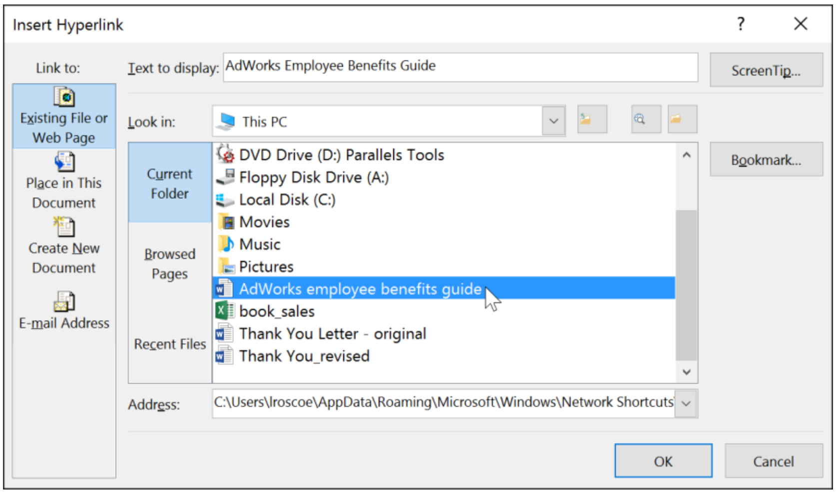

Adding a hyperlink to a shape is similar to creating an action button. We'll talk more about how to turn a shape into a button in our **Action Buttons** lesson.

**To insert a hyperlink to another file:**

1. Right-click the selected text or image, then click **Hyperlink**. The **Insert Hyperlink** dialog box will appear.
2. On the left side of the dialog box, click **Existing File or Webpage**.
3. Click the drop-down arrow to browse for your file.




4. Select the desired file.




5. Click **OK**. The text or image will now be a hyperlink to the file you selected.


If you plan on displaying your presentation on a different computer than you used to create it, your hyperlink to another file may not work. Make sure you have a copy of the linked file on the computer you are using to present, and always test hyperlinks before giving a presentation.

**5.4 Action Buttons**

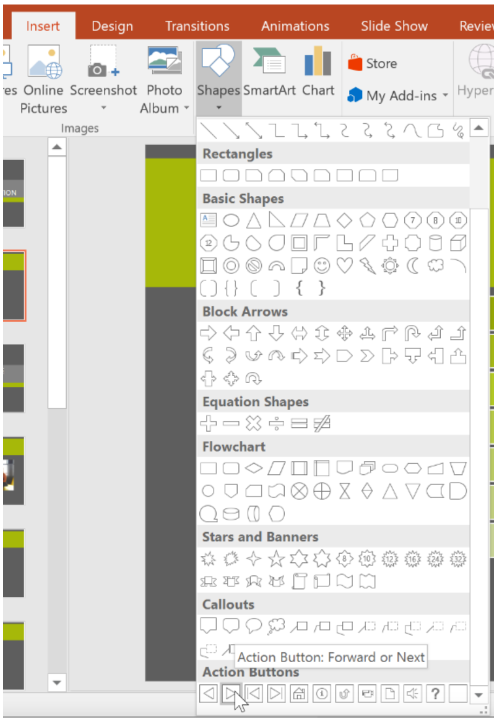
Another tool you can use to connect to a webpage, file, email address, or slide is called an action button. Action buttons are built-in shapes you can add to a presentation and set to link to another slide, play a sound, or perform a similar action. When someone clicks or hovers over the button, the selected action will occur. Action buttons can do many of the same things as hyperlinks. Their easy-to-understand style makes them especially useful for self-running presentations at booths and kiosks.

**Inserting action buttons**

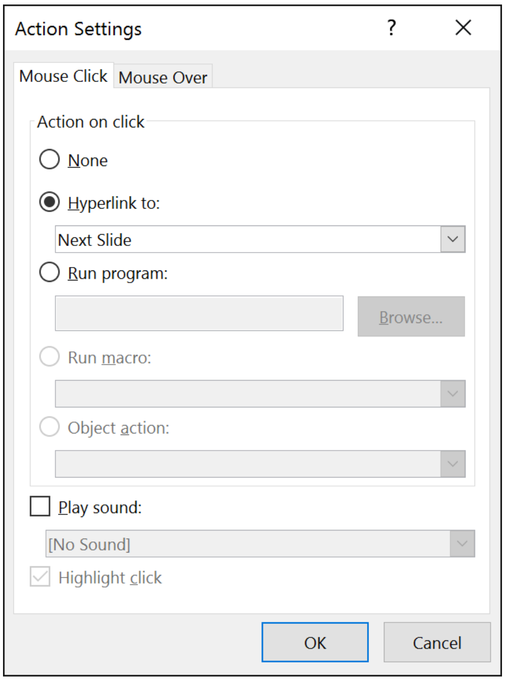
You can insert action buttons on one slide at a time, or you can insert an action button that will show up on every slide. The second option can be useful if you want every slide to link back to a specific slide, like the title page or table of contents.

**To insert an action button on one slide:**

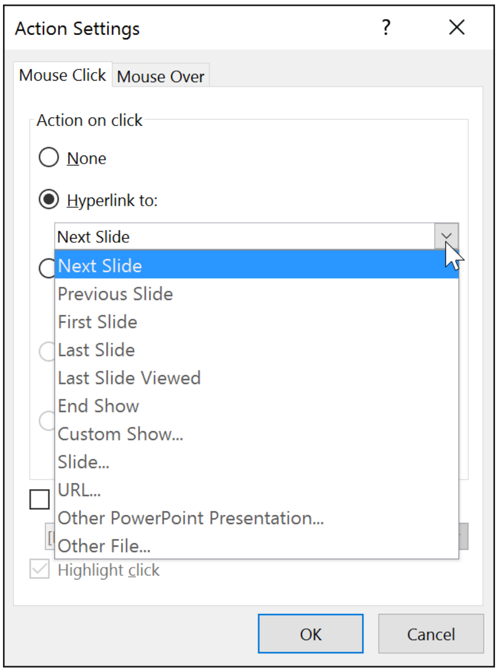
1. Click the **Insert** tab.
2. Click the **Shapes** command in the Illustrations group. A drop-down menu will appear with the **action buttons** located at the very bottom.



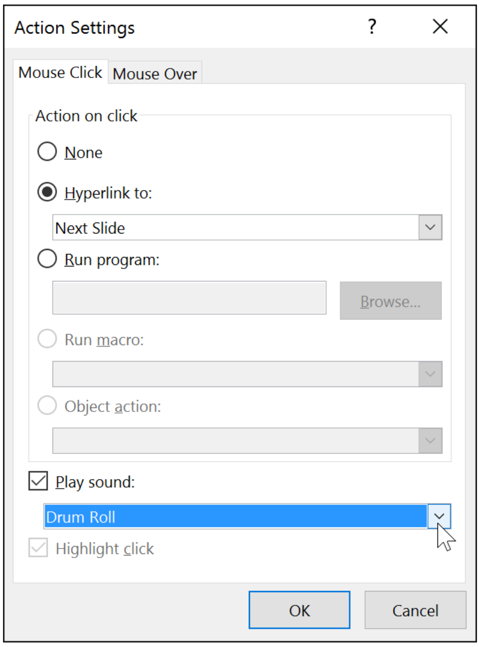

3. Select the desired **action button**.
4. Insert the button onto the slide by clicking the desired location.
   The **Action Settings** dialog box will appear.
5. Select the **Mouse Click** or **Mouse Over** tab. Selecting the Mouse Click tab means the action button will perform its action only when clicked. Selecting the **Mouse Over** tab will make the action button perform its action when you move the mouse over it.




6. In the **Action on click** section, select **Hyperlink to:**, then click the drop-down arrow and choose an option from the menu.



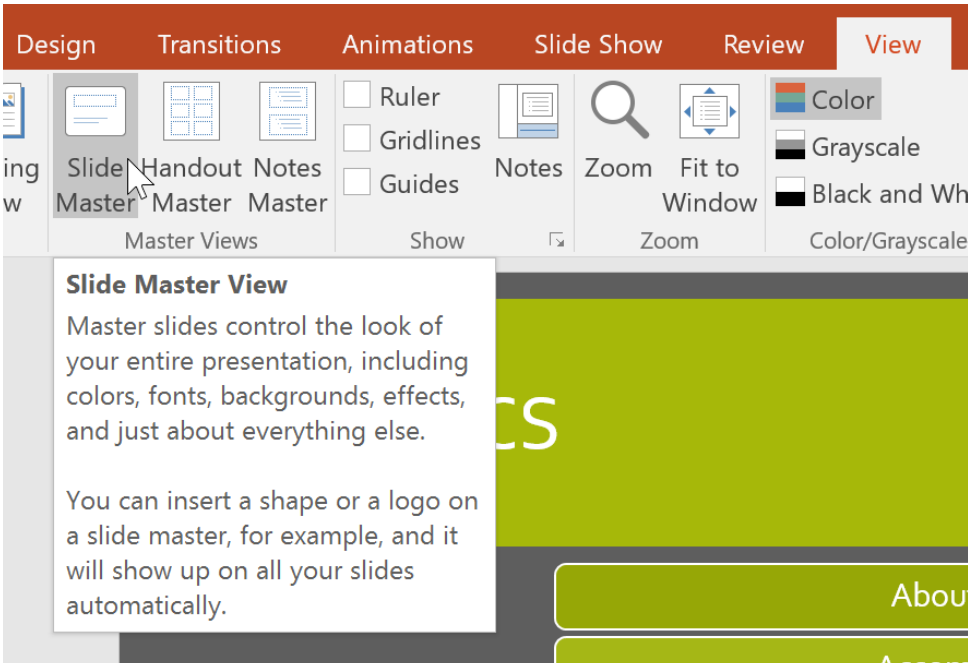

7. Check the **Play Sound** box if you want a sound to play when the action button is clicked. Select a sound from the drop-down menu, or select **Other sound** to use a sound file on your computer. When you're done, click **OK**.



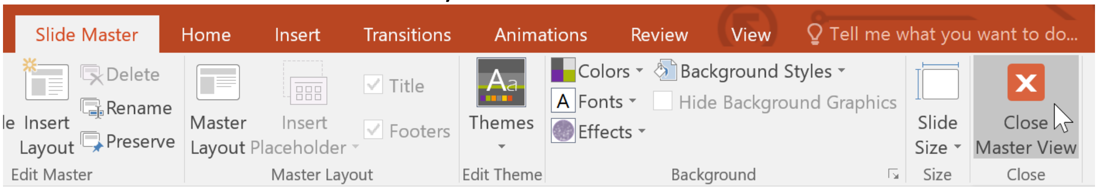

**To insert an action button on all slides:**

If you'd like to add an action button to every slide, you can do this with a feature called **Slide Master view**.

1. Click the **View** tab.
2. In the **Master Views** group, click the **Slide Master** command. In the left navigation pane, scroll up and select the first slide.

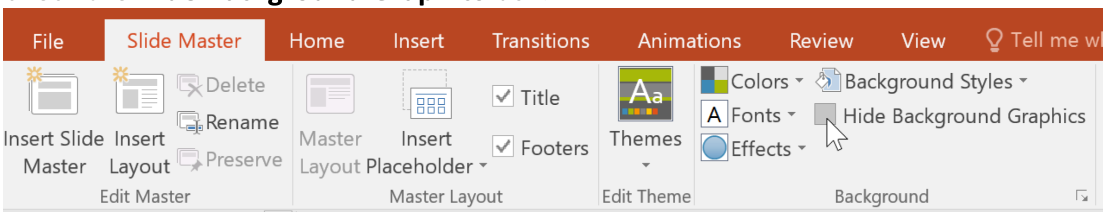



3. Go to the **Insert** tab and select an **action button** from the bottom of the **Shapes** menu. Click on the slide to add the action button, and choose the desired options from the dialog box that appears.
4. Return to the **Slide Master** tab and click **Close Master View**. The new action button will now be on every slide.




To edit, move, or delete an action button inserted this way, click the **View** tab, then **Slide Master**. Click **Close Master View** after making any desired changes.

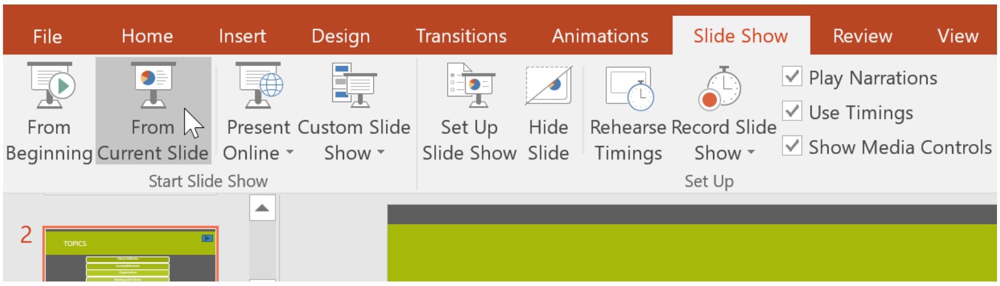
If you notice that an action button isn't appearing on certain slides, you may need to uncheck the **Hide Background Graphics** box.



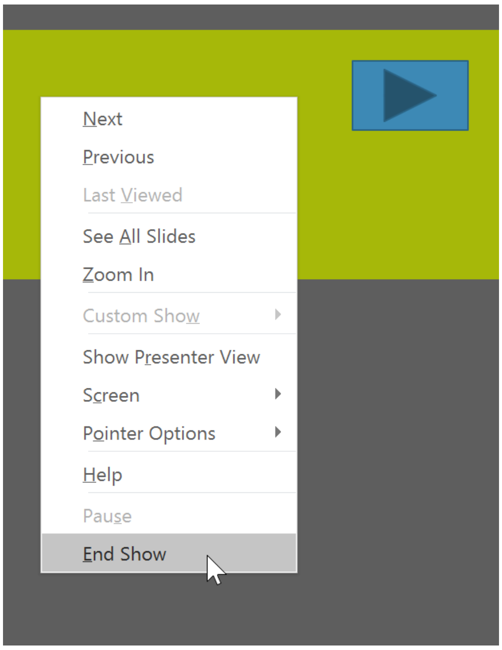

**To test an action button:**

After you create an action button, you should **test** it.

1. Click the **Slide Show** tab.
2. In the **Start Slide Show** group, click **From Current Slide**.



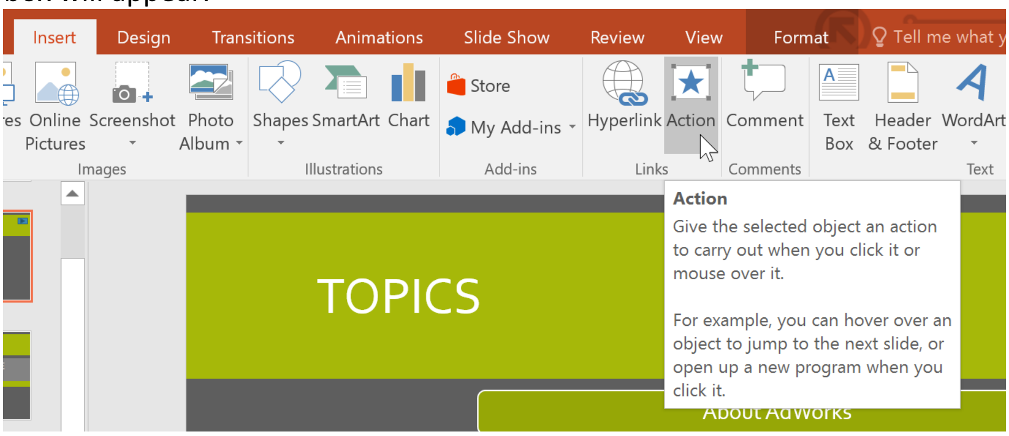

3. Click your action button.
4. After you have tested it, right-click anywhere on the screen and select **End Show**.




5. If your action button did not work as you intended, follow the instructions below to **edit** it.

**To edit an action button:**

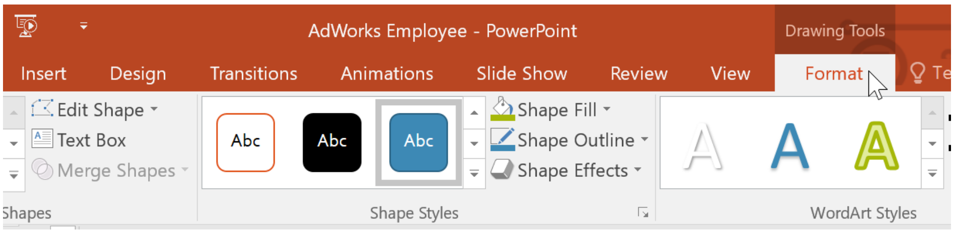
1. Select the action button.
2. Click the **Insert** tab.
3. In the **Links** group, click the **Action** command. The **Actions Settings** dialog box will appear.



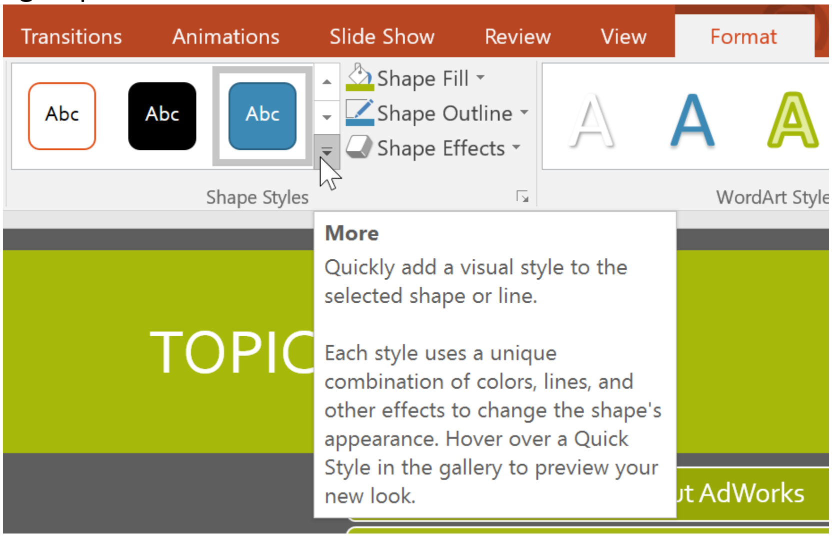

4. Edit the action or hyperlink, then click **OK**.

**To change the appearance of an action button:**

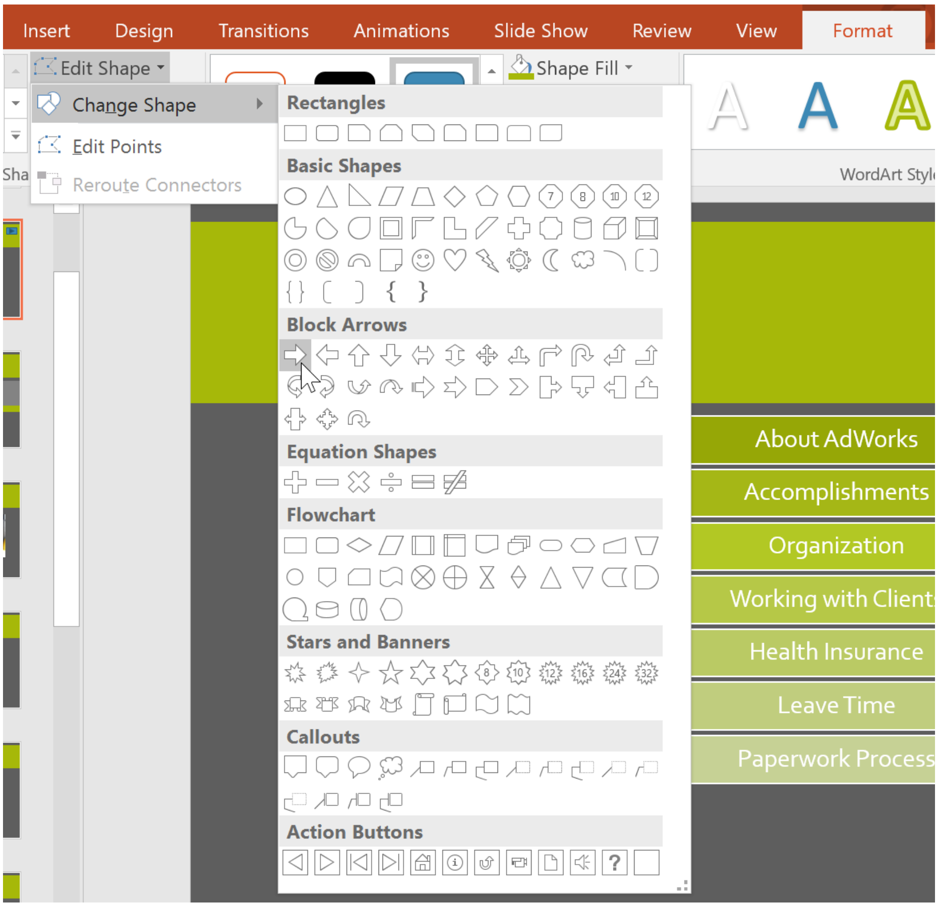
1. Select the action button.
2. Click the **Format** tab.




3. To change the button **style** or **color**, use the tools in the **Shape Styles** group.




4. To change the **shape** of the action button, click **Edit Shape** in the **Insert Shapes** group. Select a new shape from the drop-down menu.




## 5.5 Rehearsing and Recording Your Presentation

Fortunately, PowerPoint offers several tools that can help you rehearse your slide show. You can even record a copy with voiceover narration, allowing viewers to watch the presentation on their own.

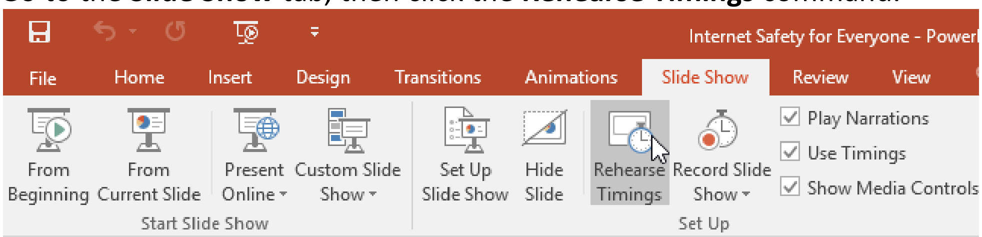
**Rehearsing slide show timings**

**Rehearsing timings** can be useful if you want to set up a presentation to play at a certain speed without having to click through the slides yourself. It also gives you the opportunity to **practice** your talking points. Using this feature, you can save timings for each slide and animation. PowerPoint will then play the presentation automatically using these timings.

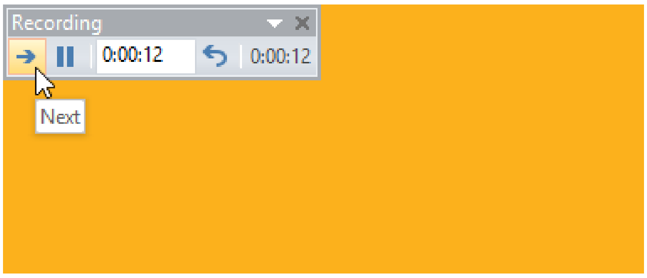
Rehearsing is often one of the last steps in creating a polished presentation.

**To rehearse timings:**

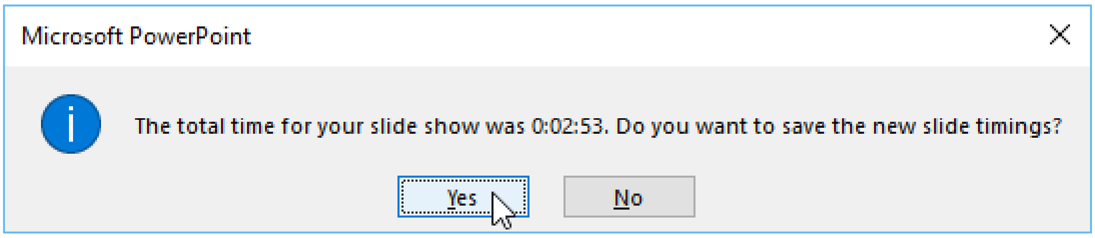
1. Go to the **Slide Show** tab, then click the **Rehearse Timings** command.




2. You'll be taken to a full-screen view of your presentation. Practice presenting your slide show. When you're ready to move to the next slide, click the **Next** button on the **Recording toolbar** in the upper-left corner. You also can also use the right arrow key on your keyboard.

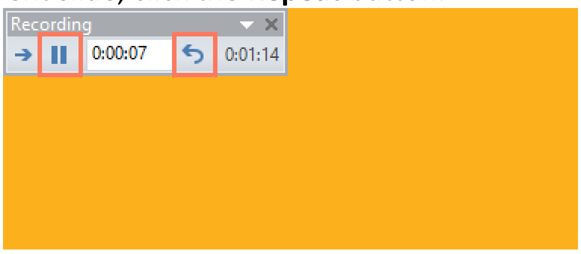



3. When you reach the end of the show, a dialog box will appear with the **total time** of your presentation. If you're satisfied with your timings, click **Yes**.




4. The timings will be saved. The next time you present, PowerPoint will use these timings to advance the slides **automatically**.

If you need more than one try to get the timings just right, the **Recording toolbar** can be used to take a break or start over on a slide. To pause the timer, click the **Pause** button. No actions taken while the timer is paused will be included in the timings. To re-record the timings on the current slide, click the **Repeat** button.

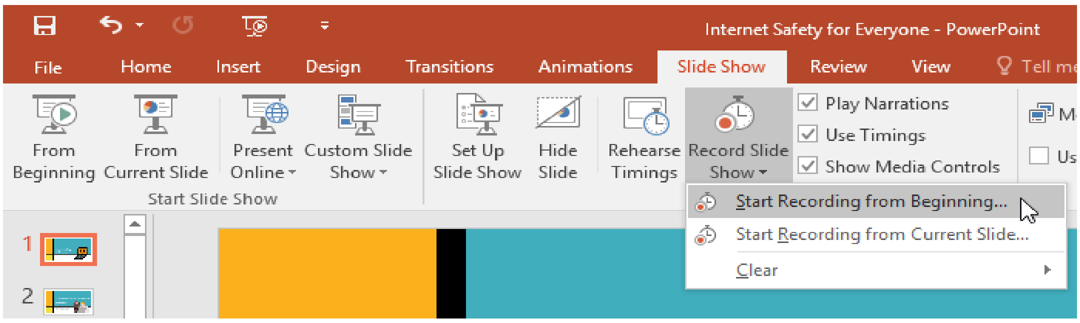



**Recording your slide show**

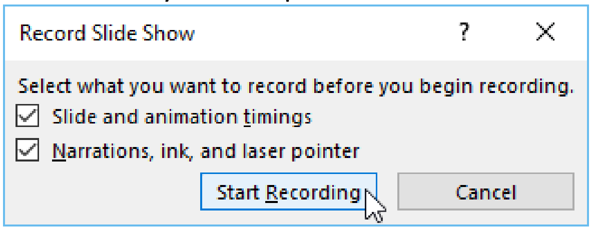
The **Record Slide Show** feature is similar to the **Rehearse Timings** feature, but it's a bit more comprehensive. If you have a microphone for your computer, you can **record voiceover narration** for the entire presentation. This is useful if you plan to use your slide show as a self-running presentation or video.

**To record a slide show:**

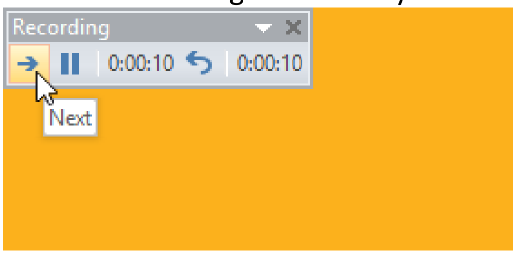
1. From the **Slide Show** tab, select the **Record Slide Show** drop-down arrow, then choose either **Start Recording from Beginning** or **Start Recording from Current Slide**.



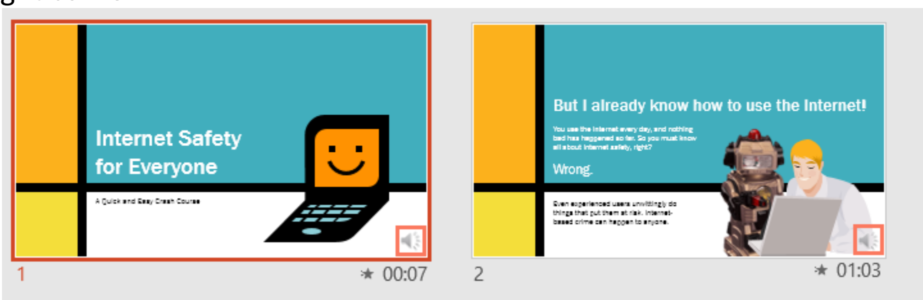
2. A dialog box will appear. Select the desired options, then click **Start Recording**. Remember, you can only record narration if you have a **microphone** attached to your computer.



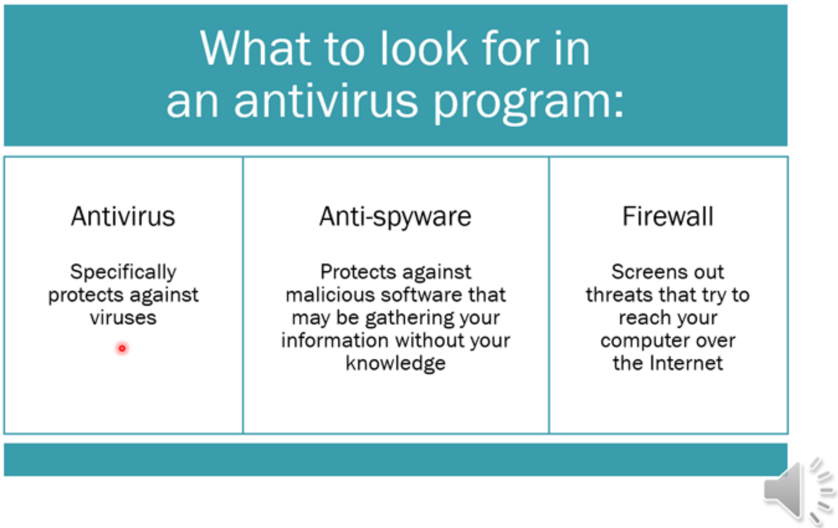

3. Your presentation will appear in full-screen view. Perform your slide show. Make sure to speak clearly into the microphone if you're recording narration.
4. When you're ready to move to the next slide, click the **Next** button on the **Recording toolbar** or use the right arrow key.




5. When you reach the end of the show, PowerPoint will close the full-screen view.
6. Your slide timings and narration are now part of your presentation. The slides with narration will be marked with a **speaker icon** in the bottom-right corner.



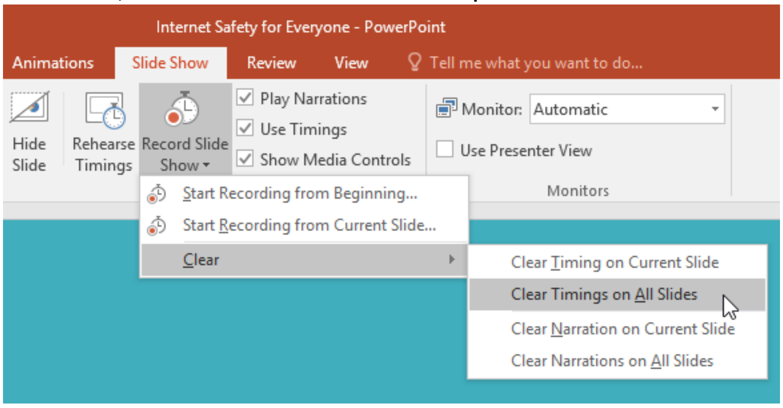

In recorded slide shows, the mouse pointer isn't visible in the finished product; therefore, if you want to point something out, you'll need to use the **laser pointer** feature. Simply hold **Ctrl** on your keyboard while you click and hold your mouse. The cursor will appear




as a small red dot.

**To remove slide timings or narration:**

If you change your mind about including slide timings or narration, you can easily remove one or both. You can clear them from the **entire presentation** or just the **current slide**. To do this, simply go to the **Slide Show** tab, click the **Record Slide Show** drop-down arrow, hover over **Clear**, then choose the desired option from the menu.




**5.6 Sharing Your Presentation Online**

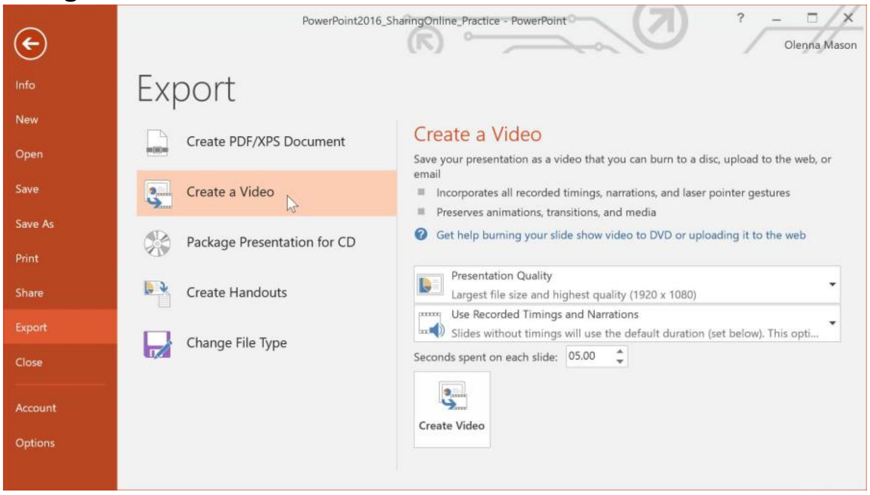
PowerPoint offers several options to enhance or even totally change the way you deliver presentations. Instead of presenting your slide show normally, you can choose to present it as a video, or you can even present it live online so others can view it remotely. No matter how you choose to give your presentation, you can enhance it by customizing your slide show to remove or reorder slides. All of these options can help you give a polished and professional presentation.

**Exporting a presentation as a video**

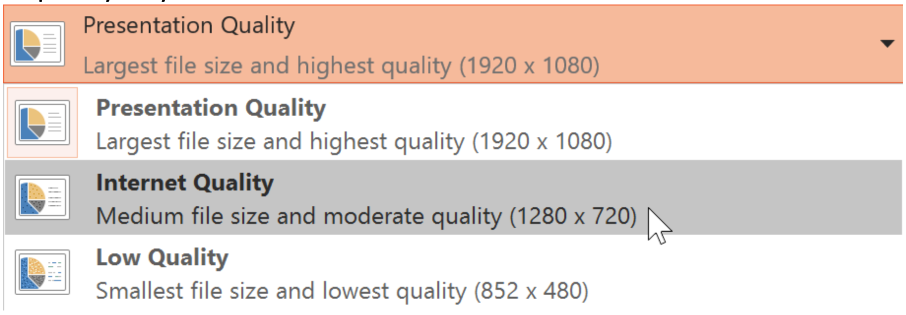
The **Create a Video** feature allows you to save your presentation as a video. This can be useful because it lets your viewers watch the presentation whenever they want. To make sure your viewers have enough time to view each slide, you might want to **rehearse** the timings or **record** your slide show before using this feature.

**To create a video:**

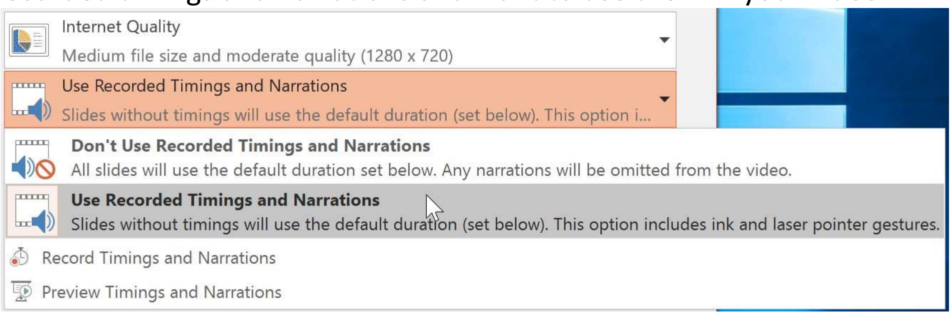
1. Click the **File** tab to access **Backstage view**.
2. Select **Export**, then click **Create a Video**. Video export options will appear on the right.



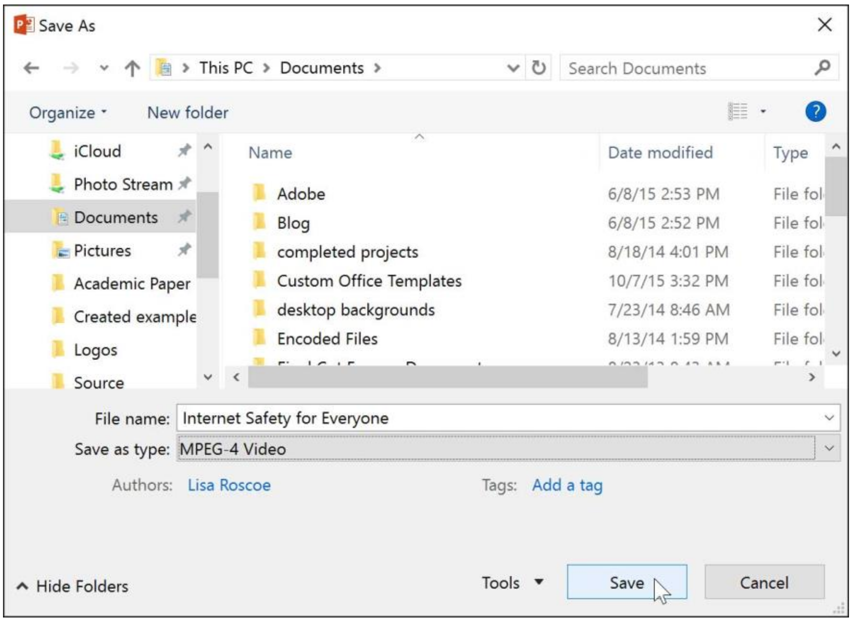

3. Click the drop-down arrow next to **Presentation Quality** to select the size and quality of your video.




4. Select the drop-down arrow next to **Use Recorded Timings and Narrations**. Choose **Don't Use Recorded Timings and Narrations** if you don't have or don't want to use recorded timings. You can also choose **Use Recorded Timings and Narrations** if you have already recorded timings and narrations and want to use them in your video.

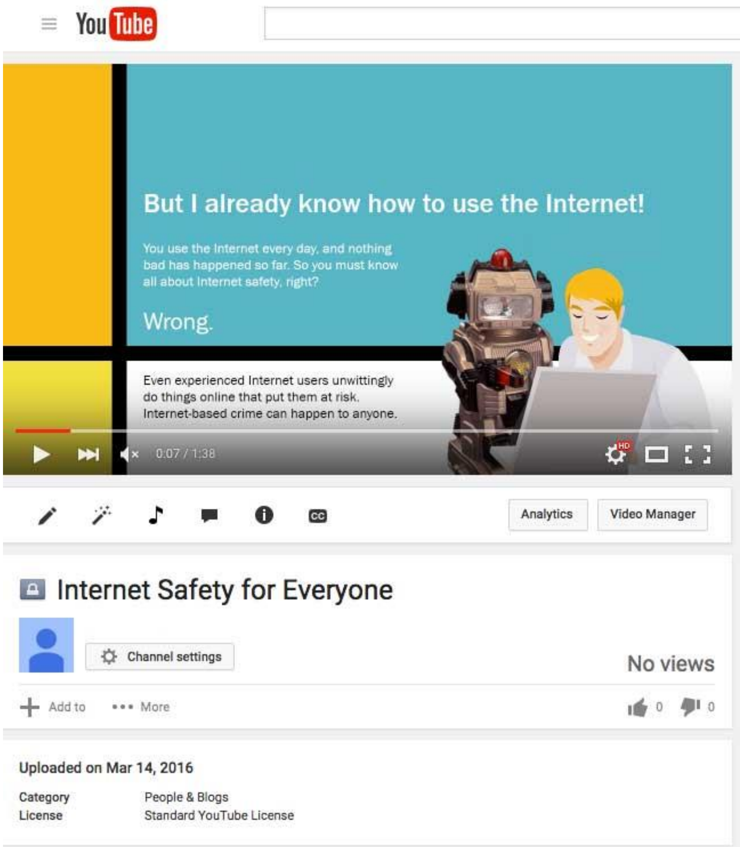



5. Click **Create Video**. The **Save As** dialog box will appear.
6. Select the location where you want to save the presentation, then enter a name for the presentation.




7. Click **Save**. As PowerPoint creates your video, a status bar will appear at the bottom of the PowerPoint window. When the bar is complete, your video is ready to view, send, or upload.


In addition to emailing your video, you can **upload** your video to free **video-sharing sites** like **YouTube**. Once your video is uploaded, you can give the link to anyone you want to see it. To learn more about using YouTube to share videos online, visit our **YouTube** tutorial.



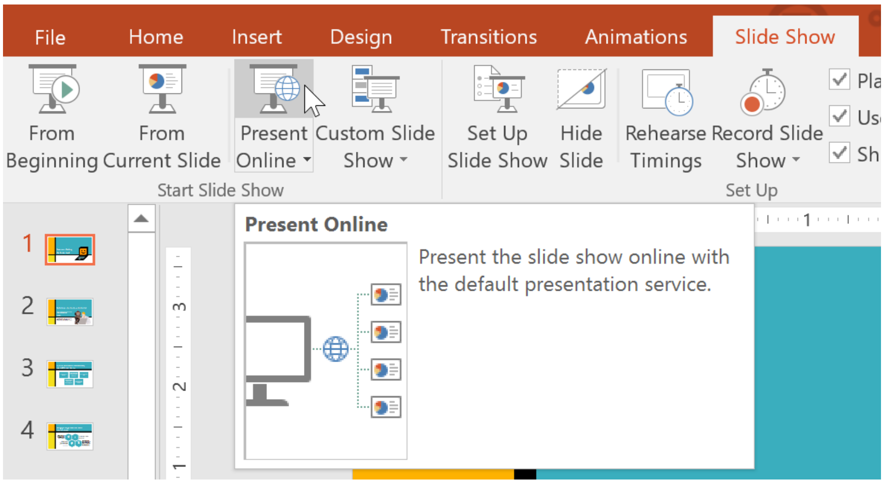

**Presenting your slide show online**

Presenting a slide show **online** is surprisingly easy. All you and your viewers need is an Internet connection—they don't even need PowerPoint. Once your viewers are connected, you can start the presentation as you normally would.

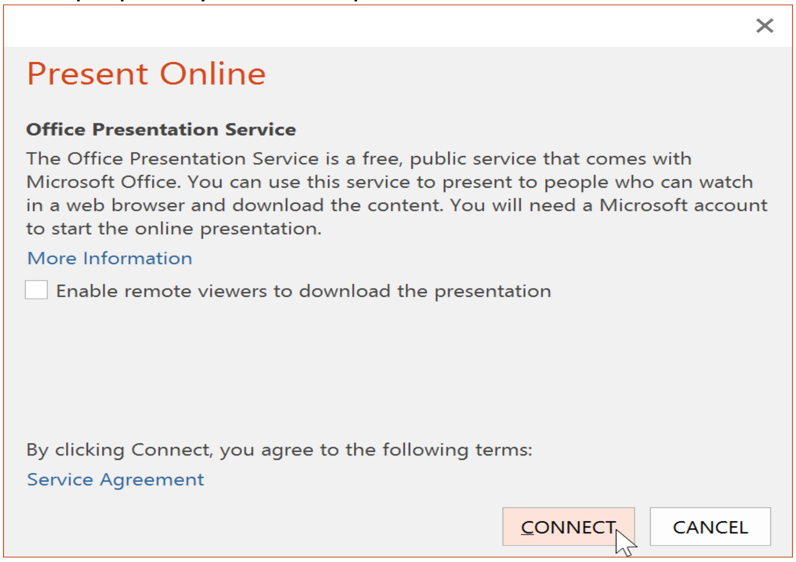
Please note that you cannot edit your presentation or mark it with a highlighter or pen while you are presenting a slide show online. You also cannot use PowerPoint to speak to your audience. Plan to communicate with your viewers through teleconferencing, or pre-record your narration.

**To present online:**

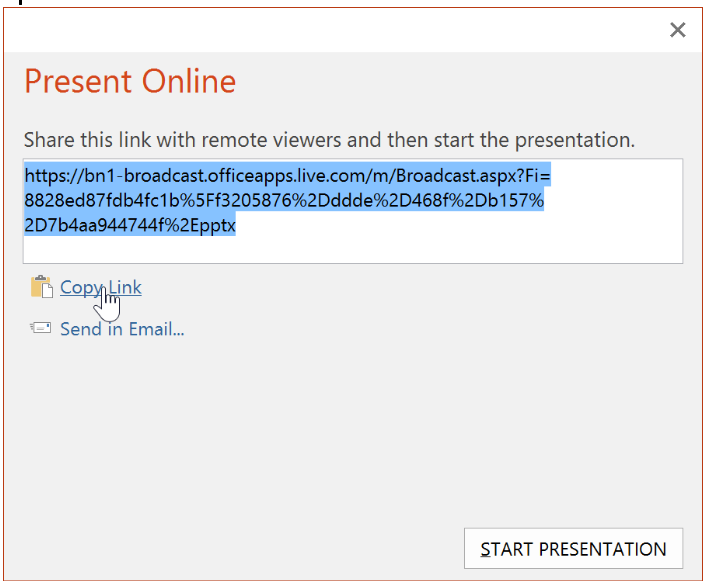
1. Select the **Slide Show** tab, then locate the **Start Slide Show** group.
2. Click the **Present Online** command.



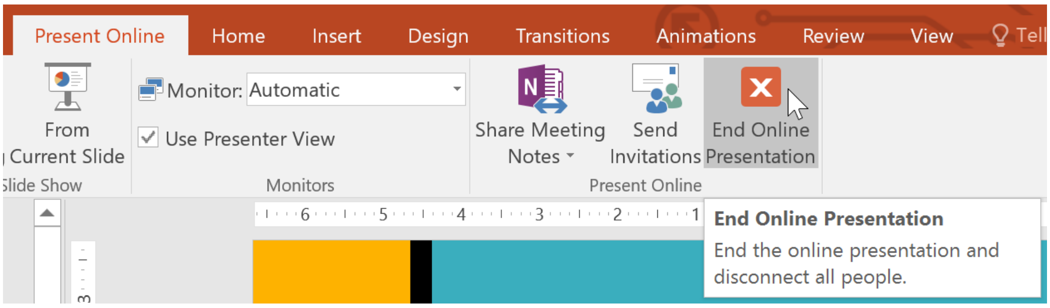
3. A dialog box will appear. Click **Connect**. A status message will appear as PowerPoint prepares your online presentation.



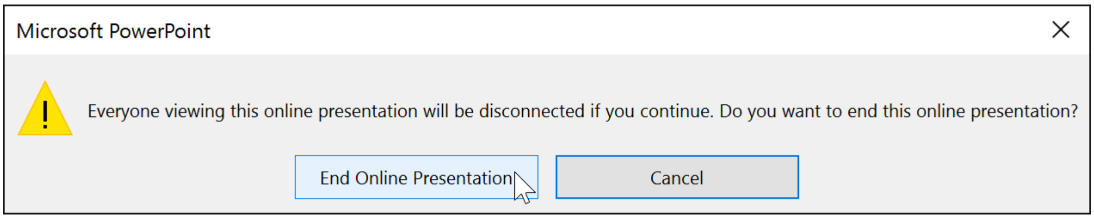

4. A link will appear. If it's not already selected, select the link.
5. Click **Copy Link** to make a copy of the link, which you can paste just about anywhere—including Facebook, a blog, or an email. You'll just want to make sure each of your viewers receives a copy of the link before you begin your presentation.




6. Click **Start Presentation**.
7. Present the slide show as you normally would, using the mouse or keyboard to advance the slides.
8. When you are finished, click **End Online Presentation**.




9. A dialog box will appear to confirm that you want to end the presentation. Click **End Online Presentation**.



# Module 5: Internal office management

The modern guide to office management

Office management is a big job and involves a lot of stakeholders. It's about more than handing out office supplies and handling other administrative tasks—it's actually about making sure that your modern office and everyone in it work harmoniously.

In this guide, we will look at office management, as it is done by modern office managers. We will look at the demands of the job of office management, the skills required to succeed, how the role is changing, and how you can excel in this area.

**What is office management?**

Office management is a job that focuses on improving productivity, efficiency, and working conditions within an office. It may involve a wide range of responsibilities, including managing a modern workplace, handling office equipment, building a warm office environment, managing office budget, welcoming visitors and new employees to the workspace, organizing activities in the office and off-site events for office personnel, planning and booking travel for staff, managing internal communications, acquiring office furniture, and more.

*Office Manager* is a specific job title whose work will vary greatly from company to company, depending on the industry, the size of the company, and the make-up of other departments. Office administration will differ greatly depending on whether you work for a large or small business.

**There are a number of alternative titles for the role such as:**

- Workplace Manager
- Head of Office Operations
- Facility Manager
- Administrative Director

**Office manager skills**

Soft skills are vital for a good office manager, above all else. Office managers often serve as a go-between for different departments, be it communication between upper management and staff, between HR and employees, or between the company and other workers in the building, such as custodial staff. Read our article on how to improve your office management skills and what tools you should master to further your career.

This is not to say that technical competencies are unimportant, these can certainly add value. Especially as the office manager role continues to change over time, technical experience and education, such as a capacity to use software or an understanding of labor laws, grow in importance.

With that said, the main soft skills and duties of an office manager should focus on are:

- **Organizational skills and time management skills**, as the quantity and variety of demands on the role means that only the best-organized office managers will really perform well.

- **Interpersonal and leadership skills**, which will allow them to maintain happy employees, make a good first impression with visitors, and diffuse tense disagreements between teams. You will also need to work with lots of different departments, including administrative staff, secretarial roles, finance teams, human resources, and more.
- **Communication skills**, so team members have a clear idea of what senior management is planning for the future, and what they expect from the staff. This will likely require some PowerPoint skills.
- **Negotiation skills**, to improve any agreements the company may have with outside providers. For example, if you're changing office buildings, you'll need to have negotiation skills and decision-making abilities to get the best deal for your company.

**What are the typical types of office management?**

No matter the industry, there is room for an office manager position in most companies. However, the tasks assigned to this employee can vary greatly and may depend on a number of factors, not least of all the industry in which the company operates.

**The most common types of office manager are:**

- Corporate office managers
- Legal office managers
- Medical and dental office managers
- Virtual office managers

**Corporate office managers**

In a corporation, office managers' chief tasks surround improving the performance of the departments working within the office. The environment in which employees work should be appropriate to the work they are doing, and also to the branding and culture of the company itself.

Within corporate settings, office managers may be involved with the work of other departments, such as human resources (HR & staffing), finance, and even marketing.

For large corporations, it is common for there to be multiple branches spread across the country, or even around the world. In this case, at least one office manager is usually hired to oversee the tasks at each branch, with each reporting to a more senior office manager, generally employed at the head office, who manages the overall operations of office management.

**Legal office managers**

Legal offices employ office managers to manage working environments for staff and clients of the company. Their responsibilities differ between offices, but the legal office managers are often tasked with handling incoming clients and other visitors to the building, dealing with administrative assistants, handling staff payroll, and working on projects in tandem with the HR team.

One of the main responsibilities for a legal office manager is the office space itself. As these are often where current and prospective clients come to speak with their legal council, the working space must give the highest sense of professionalism.

Working as a legal office manager generally requires an understanding of the law, particularly in any field in which the company specializes.

**Medical and dental office managers**

In the healthcare industry, office managers are often employed in hospitals, doctor's offices, and dentist's offices. In this case, office managers are generally required to have a certain level of relevant industry knowledge. This can include education in healthcare or anatomy, lab procedures, and even the law surrounding healthcare.

An office manager working in healthcare is still put in charge of the working space, with a focus on creating an environment that is suitable for patients. Above all, strict cleanliness is vital throughout the facility.

Patients' comfort and feeling of ease is also important, so waiting rooms and operating rooms should have a calming and safe aesthetic, and staff must be encouraged to give a similar presence when dealing with patients.

Additional tasks for office managers in healthcare may include dealing with the confidentiality of patients, ensuring proper practices for disposing of medical waste are followed, and possibly even supervising medical assistants.

**Virtual office managers**

Many companies don't have a need for an office manager working full-time at a single location. The company may be too small and unable to afford someone for the position, or they may only have a few hours of work per week to take care of. It's also becoming more common to run a business with a large portion of employees, or perhaps even the entire staff, working remotely.

For companies like these, the role of a virtual office manager is becoming quickly more common and vital to success. It allows important tasks to be properly handled by an office manager without forcing the company to change to a more traditional setup.

The responsibilities of a virtual office manager will depend highly on the company itself – what the company needs, how many hours the employee is expected to work per week, the company culture, and so on. But, most of the responsibilities of the corporate office manager will still apply.

The biggest difference with a virtual office manager is the lack of physical space to manage. It may seem redundant to have an office manager with no office, but this is a misconception.

With a virtual office, the office manager must still juggle most of the tasks of a traditional office manager – such as organizing travel, planning offsite company events, helping with projects for other teams, implementing videoconferencing tools – but now this requires dealing with teams spread across different locations.

And this may even mean different countries in totally different time zones. It may seem counterintuitive, but employing an office manager may be most important when there is no physical office at all.

**How is the concept of office management changing?**

Office management has evolved considerably in recent years. These employees have transformed from receptionists and secretaries tasked with making photocopies and relaying messages, now to more strategic-level roles in the company.

Many office managers now meet with senior staff regularly as they are charged with important decisions such as office location, productivity improvements, and more.

**Modern office management**

Modern office managers are expected to have a more direct impact on the revenue generation of the company. They are tasked with planning, executing, and analyzing their

own projects just as other departments in the company – all with the aim of bringing real value to the company.
More and more, office managers are becoming involved with the work of other teams – such as helping to craft large marketing and branding campaigns, helping to plan company-run events, and aiding the HR team with projects aimed at improving employee satisfaction and productivity.
The office manager can typically be tasked with finding and establishing suitable employee wellness programs, usually in coordination with HR.
With this extra responsibility and room for career growth comes higher expectations. A successful office manager should have experience and knowledge in the various software used by the company.
Project management skills are a must, as the role becomes more important and self-starting. It’s important they keep updated with industry knowledge, such as trends, regulations, and news.
An office manager may be asked to wear many different hats. Not only may two companies have a very different set of expectations for the position, but the responsibilities for an office manager at a company may change significantly from week to week.
If other departments start projects that need help, or if a large company event draws near, or if sudden change for the industry takes place, then the office manager may be asked to drop their current tasks and help pick up the slack.

**What are the main functions of office management?**

An office manager’s responsibilities within a company will depend on a lot of factors, such as the industry, the size, and the culture of the company. So this list will focus on the typical responsibilities of a modern office manager in a corporate office.

**The typical fields of office management can be broken down into:**

- The office space
- Employee management
- Event planning
- Employee travel
- Facility staff
- Internal communication
- Safety and security

**The office space**

In a standard office management role, this is often the key responsibility. Striking a balance between form and function is important – ensuring a positive atmosphere, while being conducive to high performance.

**Example tasks:**

- Ensuring the aesthetics of the office space matches the brand and the people working there.
- Setting the culture, norms, and organization of in-office working.
- Creating an appropriate working space for employees to improve productivity and morale.
- Replacing broken, used-up, or obsolete equipment.
- Handling the meeting spaces used by different teams.

**Employee management**

Often, although not without some controversy, the office manager will be asked to help HR with the rest of the staff. And in small, up-and-coming companies, there may be no HR team at all, and the entirety of these responsibilities can fall to the office manager.
In these cases, a general office manager should not be considered, but rather someone with extensive knowledge of employment law should be brought in.
In any case, involving the office manager in HR responsibilities may include softer tasks, such as hearing concerns and feedback from staff, as well as tasks related to wages and benefits.

**Example tasks:**

- Managing perks and wellbeing programs.
- Understanding how employees in the office work best, and what their needs and wants are.
- Working with HR on recruitment and hiring.
- Administering the payment and promotions of existing staff
- Helping to create external motivation for employees.

**Managing facility staff**

Company employees are often not the only people working within the office space. External contractors and employees of the rented building will often be present in the office, and their management generally falls within the purview of the office manager.

**Example tasks:**

- Working with people who work in the office space, but who aren't employees of the company, such as maintenance workers, custodial staff, or delivery drivers.
- Communicating with the landlord or property manager.
- Establishing relationships with external supplies.

**Event planning**

Managing the events taking place within the office space falls clearly within the domain of an office manager. This often also extends to events outside the office, be they team-building employee events or ones involving clients and prospects.

**Example tasks:**

- Planning and organizing holiday celebrations at the office.
- Managing off-site trips, like workshops, team-building events, retreat, and so on.
- Dealing with venues, vendors, booths, and itineraries.

**Employee travel**

Managing the travel of employees is a huge part of modern office management. There are a lot of moving parts to consider, and the workload for travel management can be immense and very chaotic at times.
Unforeseen complications with travel can have damaging consequences for a company if not handled right, as it may mean missing out on an important industry event, or losing a big prospective client.

**Example tasks:**

- Managing a travel budget for employees.
- Dealing with flights, transport to and from airports, and accommodation.
- Handling emergencies, such as cancelled or missed flights.

**Internal communication**

Communication between senior management of a company and the working employees is extremely important for the productive work of a company. The management of this is often tasked to the office manager. Even if a company has a communications department, or communication specialists within the marketing team, the office manager may be asked to help with this type of work.

**Example tasks:**

- Communicating the needs and the goals of the company to its employees.
- Updating employees on company changes, such as branding, hirings, and departmental updates.
- Hearing and taking into consideration the concerns and needs of employees

**Safety and security**

The importance of creating a safe work environment cannot be understated. This means the working conditions for employees must be safe, and the company should also be secure from potential external threats.

- Organizing and undertaking drills, e.g. for fires or active shooters
- Ensuring the building is locked up at night
- Managing security teams or CCTV
- Distributing and tracking keys and passes for employees and guests
- Ensuring access to proper safety gear
- Approving tools and materials to be used by the right employees
- (In conjunction with IT) Data security
- (In conjunction with HR) Dealing with inter-employee harassment, discrimination, or threatening behaviour, displays of anger and frustration from staff

The role of the admin professional continues to evolve, with more demands on the position every year. One of the best ways to compare your skills to the market is to look at office manager job descriptions, you will see the high expectations many companies have.

Companies can see the direct impact of office managers on their working environment, and so the role is not likely to disappear any time soon. For office managers, the role is so demanding that it can lead to senior positions in the company from Chief of Staff to even Chief Operations Officer.

**12 tips to become a great office manager**

The Office Manager role is changing. There's no doubt about it. The role was already beginning to shift before the outbreak of the coronavirus pandemic. However, upon returning to the physical office or virtual office, the role of the office manager is evolving.

Office Managers are no longer there to make sure people wash their dishes after lunch, to buy office supplies, or to fix the broken printer. They are now essential for employee happiness, safety, retention, and more.

This article will explore the qualities, skills, and tools that a great office manager needs to excel in their role this year and beyond.

**How to become a Great Office Manager**

Often referred to as office administrators, office coordinators, or office operations managers, these professionals are often the first point of contact for anyone in or out of the company. Their responsibilities vary drastically, from building a great work environment to helping onboard a new hire to acting as executive assistants.

That's why an office manager's workload piles up fast. Along with keeping the office space functional and dynamic, they also need to manage staff movements, travel, expectations, the list goes on. There's a mountain of expectation on an office manager's role, and many employees have their different ideas of what an office manager should actually do.

Becoming an office manager is highly rewarding, not only by fulfilling people's expectations of you but exceeding them. You can hold yourself accountable for, and become a key contributor to, the success of a business and its employees.

**Setting clear expectations to become a good office manager**

**1. Be the most organized person in the company**

Organizational and time management skills are at the top of the list and for a good reason. It's no longer just about creating a new filing system. An office manager needs to know everyone's schedule, as well as their own. The role requires juggling co-workers, 3rd party suppliers, long-term business plans, as well as day-to-day operations. If organizational skills aren't there, work will pile up fast.

**2. Be a great communicator**

You need strong communication skills to thrive in an office management role. It helps to avoid mistakes, resolve conflicts, and give clear directions. An office manager is one of the few roles within a company that has communication with absolutely everyone, from new employees to the C-level executives. Make sure you're an excellent communicator, and it will make the role a whole lot easier.

**3. Be innovative at problem-solving**

The company knowledge that an office manager accumulates over the years is unrivaled. They help a business through its most challenging times, and it all comes down to excellent problem-solving qualities. The longer you're in the position, the more you'll find you are being turned to from all seniority levels for your advice on challenging employee situations.

Problem-solving doesn't stop there though. An office manager will often be tasked with the responsibility to make something happen with little or no budget. The role requires you to be innovative with the resources you have and make things happen regardless of the problems you may face.

**4. Be empathetic**

Every office manager needs to be able to understand and empathize with all team members. As a core part of the team with a good overview of everyone's working situations, an office manager is often the voice for a large majority of employees. You'll need to be able to lead with empathy and charisma to make sure everyone is heard and understood.

An office manager will often find themselves on wellness or positive initiative committees. They'll need to be able to take the reins on empathetic projects, applying a business mind with a kind heart, and managing expectations alongside realities.

**Keep learning to become a better office manager**

**5. Develop your negotiation skills**

An office management position comes with a certain amount of negotiation involved. You'll be responsible for a budget to keep the day-to-day office ticking over; as well as larger budgets for company events, conferences, and more in your daily routine. It's up to the office manager to make the most of a budget and maximize what the business can get for the money it has.

Negotiation skills will also come in the form of peace-keeping. A diverse business comes with diverse personalities and it's not uncommon for people to clash heads from time-to-time. These confrontations often fall on human resources and the office manager to resolve and find a peaceful solution that fits everyone.

**6. Always work on your business knowledge**

Whether it is budgeting skills, financial planning, recruitment strategies, or management theory, these skills will put you in a position to advance quickly. The modern office manager can have a lot of contact with senior management, having some financial or business know-how in your back pocket will help you get your ideas implemented and improve your general efficiency.

**7. A little legal knowledge goes a long way**

Office managers are often responsible for dealing with external suppliers or office contracts solely on their own. It's handy to be able to deal with these contracts with some legal knowledge. You'll be better equipped to understand the small print, when or how the contract can end, and how the business can maximize results with its spend.

**8. Understand emotional intelligence**

Having great interpersonal skills is critical in being able to manage and be managed within a team. Harnessing it massively helps your people skills and ensures that your team or teams have the best chance of success. It also helps to have a positive attitude that makes people feel comfortable to speak to you about anything.

It's been found that companies that harness emotional intelligence tend to have better customer loyalty and higher employee engagement rates, which leads to greater success for the business. By embarking on an emotional intelligence course, you're better equipped to connect with employees and harness emotions for greater productivity.

**Tools to master to be a successful office manager**

**9. Become an excel wizard**

Office managers are responsible for data entry and storage, administrative and managerial support, accounting, budgeting, data analysis, research, reporting, and forecasting. The list is extensive and doesn't end there.

Excel will become an office manager's best friend, but you need to be able to use it to its fullest potential. There's no use having a basic knowledge of excel. Learn how to format and make the most of the tool and, in turn, make the role (and your workday) easier. Being an Excel wizard definitely needs to form part of your skillset.

**10. Learn bookkeeping software**

Office managers often have a budget to look after and can be tasked with supporting other departments in looking after their numbers too. The role can also be responsible for setting up company-wide processes to ensure departments are keeping track of their budgets in a way that is understood by everyone.

The good news is that there's plenty of bookkeeping software available. It will be down to the office manager to find and onboard the software that's the best fit for the company.

**11. Use project management software**

The same can be said for project management software. Whether it's team-building days, town halls, new software integrations, there will always be projects to manage in running a business. These projects often fall into the hands of the office manager.

Master project management software that you can introduce with the role. Keep track of tasks, people, and ensure that any project assigned is completed as efficiently as possible.

**12. Become a travel management guru**

Phoning up a corporate travel agent is now a little old school, and expensive for the company. Also, using Skyscanner or Kayak doesn't give employees the support they need in the journey. Train yourself up on travel management software and impress senior management with your budget control and time efficiency. Most travel software lets you digitize your travel policy to automate your company's rules around spend and travel.

**How to write an office manager job description**

Office Management roles have changed, they are no longer what they used to be. Today, any office manager is expected to be as adaptable and global-minded as some of our world's best businesses.

When you're looking for an office manager you need someone that is not only organized and has excellent people skills, but someone with great know-how for remote work tools, legal knowledge, and has a global business mindset.

In this short article, we'll guide you through the essentials you need to involve in your office manager job description to attract the talent your business needs.

**Specialized office managers**

Before we dive into office manager job descriptions and responsibilities, we need to establish the different kinds of office managers out there. Many businesses can hire a regular office manager and will have success. Modern office management roles require a degree of specialization, and some companies require office managers to be more industry-specific.

**Medical & Dental Office Management**

A healthcare office manager differs slightly. This medical office management position comes with the regular responsibilities of leading business operations, overseeing operational staff- in this case, receptionists and billing technicians- as well as helping with local marketing initiatives. However, healthcare office managers often need to ensure the correct coding is used by staff when designating a diagnosis or results.

There's no degree or qualification required, although there is a nice-to-have certification available: *Professional Association of Health Care Office Management* (PAHCOM).

**Law Office Management**

Law office managers may perform some of the same responsibilities as legal secretaries, paralegals, and legal assistants- depending on their education. As well as the standard office management responsibilities, law office managers also help to recruit attorneys, maintain the library and office records, and perform legal research.

There may be some education or and training required, depending on the responsibilities the law firm is looking to fill.

## Office manager job description example

**Writing an Office manager intro paragraph**

The introduction paragraph to your office manager job description should dive into your company mission and vision. You'll want to find someone as passionate about what your business does as you are.

If you can, try to go into describing your employee culture, life at the office, and the type of qualities you're looking for in a candidate.

**Office manager job responsibilities & requirements**

- Support/manage company day-to-day operations, systems, and staff
- Maintain office services by working with internal or external suppliers
- Payroll support
- Support staff retention and onboarding
- Planning & Implementing internal systems and procedures
- Designing & Implementing office policies
- Staff reporting and trend watching presentations for leadership
- Coaching, counseling and disciplining employees where necessary
- Company event budgeting & management
- Greeting visitors in-office and over the phone
- Coordinating all staff travel including, flights, hotels, car rental, insurance, and budgets
- Working with contractors & vendors
- Support in local marketing initiatives

**Work hours & benefits**

It's important to manage expectations here while keeping the potential candidate excited for the role. Be clear with the office hours the candidate needs to be available. Also, note down any travel required.

Balance this out with your company perks. Do you offer free lunches, gym memberships, company retreats, or other wellness programs?  Put all of that information in this section.

**Office manager skills & qualifications**

Each company will be looking for its own set of skills and qualifications from an office manager, selects those that are specific to your role.

- Microsoft Office: Excel, Word, Powerpoint, Outlook, Teams, etc
- Google Suite: Drive, Docs, Gmail, Sheets, Calendar, etc
- Remote tools: Slack, Zoom, Skype, Google Hangouts, etc
- Desired Bachelor/High school diploma/GED
- Language proficiency

**Desirable but not essential skills & qualities**

Again, these will vary depending on your business and the type of candidate you're looking to hire. If your business tone allows it, feel free to be a little playful towards the end of this list and show that you're human.

- Knowledge of administrator systems, responsibilities & procedures
- Bookkeeping, travel & project management software knowledge
- Analytical minded & results-driven
- Thrives under pressure
- Extra languages
- Travel booking experience

- Can bake a mean carrot cake

**Other titles for an office manager**

We'll wrap things up with other names for an office management position. It's good to get these into your job description and encompass them into your recruitment strategy if you're hoping to attract as many great candidates as possible. Not everyone is searching for "office manager" jobs.

**Some other titles you can consider are:**

- Workspace manager
- Employee wellbeing manager
- Area Manager (Office)
- HQ Manager
- Internal Office Manager
- Workplace manager
- Administrative director
- Business Manager
- Wellbeing manager
- People and Happiness Manager
- Operations Manager

**Employee wellness programs: ideas and implementation**

Employee wellness is now deemed as business-critical if a company wants to attract and retain top talent. Employee Wellness programs have the power to reduce company healthcare costs by 127%.

Plus, 80% of employees with robust wellness programs feel more engaged, and companies with engaged employees can be up to 21% more profitable. With numbers like this, any business owner can't ignore the emphasis their company needs to put on wellness and its importance for employees and business success.

Employee wellness doesn't stop there. If you're hoping to lift global standards around mental and physical health, then it needs to start in the workplace. In this article, we'll explore the whats and whys behind employee wellness programs, where wellness programs fit in for companies of different sizes and types. We'll also explore the various categories of wellness programs available, and how best to implement them.

Employee wellness programs are very different for every business, and they often come down to your mission, vision, and values. Consider what your company is trying to create. How do your employees need to feel to help you get there?

By reading this article, you're already one step closer to creating a healthier workplace and world for your employees and beyond.

**What is an employee wellness program?**

There are **five core pillars of wellness.** Each of these wellness areas encompasses different tactics that can help to lift your company and its workforce.

1. Physical
2. Social
3. Mental

4. Financial
5. Community

| | Physical Health | Social and Emotional Wellness | Financial Fitness | Community Wellbeing |
|---|---|---|---|---|
| | Definition of Physical Health and the ideal outcome | Definition of Social/Emotional Wellness and the ideal outcome | Definition of Financial Fitness and the ideal outcome | Definition of Community Wellbeing and the ideal outcome |
| Health Insurance | X | X | | X |
| Dental Insurance | X | X | | X |
| Vision Insurance | X | X | | X |
| HSA | X | | X | |
| 401k/RSP | | X | X | |
| Lifestyle Savings Account | X | X | X | X |
| Charitable Outreach | | X | | X |
| Parenting Class | | X | | X |

In short, an employee wellness program is a regular effort to encourage a healthier lifestyle for employees. It is the creation of healthy habits within the workplace that are explored through one of the five pillars above. These programs come in many shapes and sizes, and we'll discuss many of them throughout this article.

Any wellness program needs to be driven by key stakeholders within the business, and it's project management often falls into the hands of someone within HR or Office Management positions. However, a successful wellness program is initiated from the top-down and led by example. Leadership needs to be fully on board with any wellness program and should be at the forefront of **every wellness initiative**.

**Why is employee wellness important?**

A successful wellness program can help businesses across the board. Take a look at some statistics for implementing a wellness program within the workplace:

- Double employee engagement rates
- Reduce sick days by up to 6 days per year

- 91% of workers at companies that support wellbeing feel motivated to do their best
- Organizations with higher levels of engagement are 22% more productive
- For every dollar companies spend on wellness, they can save $2.73 in reduced absenteeism (Wellsteps)
- Create 50% higher revenue per employee
- Reduce stress and increase positive communication among employees
- 20% of employees would trade a pay rise for better health coverage

**How to select the right employee wellness program**

There are many wellness programs out there. It can be overwhelming trying to select a program that's right for your business, and more importantly, your employees. Whether you choose one wellness program or decide to invest your time and effort into many, what's important is that you're proactive in creating a healthier working environment. There are a few things you need to consider when selecting the right wellness program.

**A change in culture**

First thing's first, consider that you're changing company culture. You're about to start creating **a culture of wellbeing**. Changes in culture come from changing habits, and we all know that habits can be the hardest of things to break.

When you're considering implementing a wellness program, really take a moment to think about how this will evolve your company culture, and what habits you'll need to break among your workforce along the way. Perhaps it's better to start with an easier habit to break before tackling larger, more inset habits.

**A demand in resources**

Secondly, you need to consider your resources. What do you have available to create a culture of wellbeing? Consider the stakeholders you need to be involved. Also, take into account whether you have a budget for your department's efforts or will need to get one approved. What goals are you trying to reach, and how will your wellness program help you hit them?

These factors that you need to consider when building out any wellness program often comes down to the size or structure of your company.

With that being said, let's dive into some employee wellness program ideas for different size businesses that fall within the social, financial, and community pillars. We'll go on to explore physical and mental wellness ideas later in this article.

**Employee wellness program ideas for small businesses**

If you're working at a startup or a relatively small business, you have a few advantages. Habits are often not hard set, your workforce is agile and adaptable, and people expect your culture to be ever-evolving.

People often know that funding and financial resources are not always on a startup or small company's side. There's no harm in implementing those wellness programs that are low-cost; they can still be high reward. Types of wellness programs you can consider are:

**Social**

Buddy systems, culture onboarding, free staff team building activities, religious rooms, and cultural inspired hangouts.

**Financial**

Company stipends, self-study hours, discounts on courses, financial resources, company shares options.

**Community**

A positive initiative committee, positive impact initiatives.

**Employee wellness program ideas for large corporates**

Corporates are often in a better position to be able to source funding for wellness programs. However, getting buy-in can be tougher. Depending on the size, and often the age of your corporate will determine how easy it is for you to get your initiative pushed forward.

Take into account that you're creating new work lifestyles that are out to break old, *comfortable* habits. Buy-in from employees themselves may be tricky as well. Types of wellness programs for corporates can be:

**Social**

Mentor or buddy programs, cross-department meet & greets, company-wide team-building events.

**Financial**

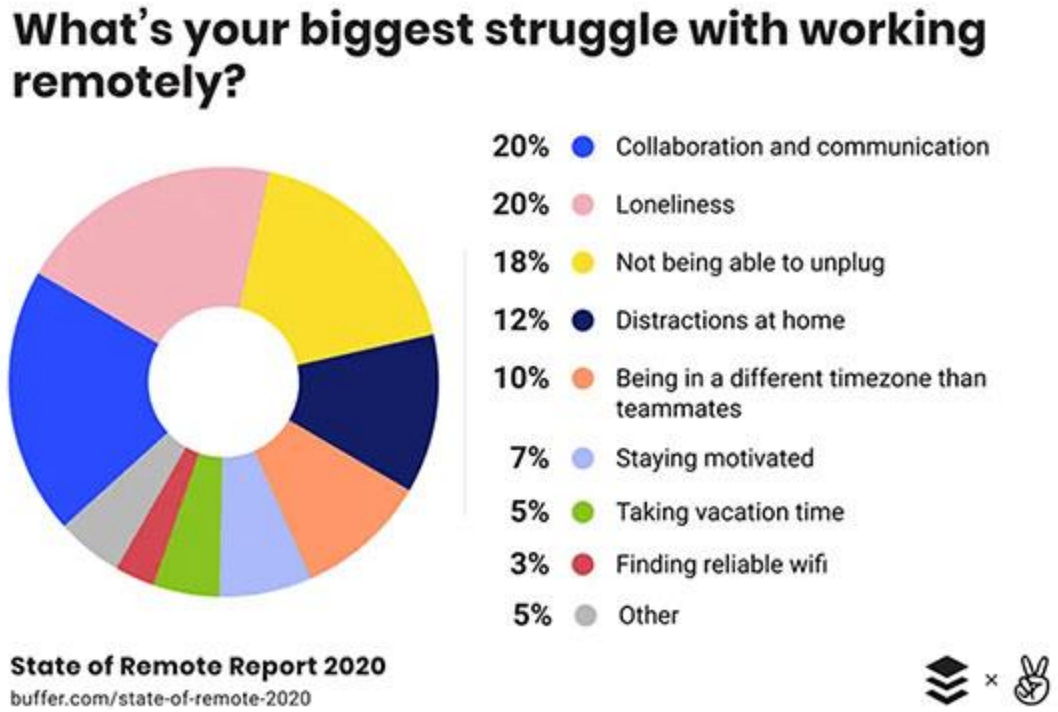
Financial wellness enables other aspects of health management. Annual bonuses, contributions to savings, pension plans, yearly reviews, money management & financial literacy classes, company discounts and perks, student loan support.

**Community**

Company donations in names of best-performing employees, global green initiatives.

**Employee wellness program ideas for remote employees**

Remote companies need wellness programs too. Being remote is a benefit, sure, but there's more to it. Remote options certainly help to attract talent and send your talent casting net global rather than within a certain radius of your office.
However, remote employees also have more options when they're selecting a company to work for. It means you'll need to stand out to attract and retain the talent that will help your remote business thrive, and this can be done through your wellness initiatives.




**Some wellness options for remote companies are:**
**Social**
Social wellness is essential for remote employees. 70% of remote workers feel left out of the traditional workplace.
Provide your employees with opportunities to connect, encourage time online that doesn't revolve around work, and give them reasons to come together through a wellness initiative. Consider book clubs, offline retreats, online coffee & breakfast breaks.
**Financial**
Tech stipends, free-time or holiday stipends, home-office support, self-education time and support.
**Community**
Another big one for remote employees; they tend to be mission-driven and choose their employers as much as their employers choose them. Ensure your company has a wellness program that enables remote employees to be a part of giving back from afar. Pick causes that are global, not location-specific.

**Wellness program ideas for employees who travel**
Business travel may seem glamorous to those members of staff new to the task, but it can be tiring both physically and mentally for the employees who have to do this

consistently. Travel wellness is becoming essential to many companies' travel policies. In fact, the quality and frequency of business travel directly affect the retention rate of employees. Given that many employees who travel are valuable sales or account management staff, it is no wonder that many companies have put additional perks and wellness programs in place for these staff.

**Bleisure travel**

Bleisure travel, i.e. extending a work trip to include vacation days, so to take advantage of the destination. Some companies permit employees to extend their stay and either take vacation days or have one day as a free vacation day. Bleisure has become a new corporate standard and has shown to keep employees motivated for upcoming trips.

**International Gym memberships**

For traveling employees, fitness can be key to their general wellbeing, made difficult by having their routine changed by the demands of travel. Some companies such as AndJoy or TrainAway, offer the perfect solution for international travelers.

**Healthy food subsidy**

Another way to encourage employees to eat right when on the road, is to offer extra budget for meals in the healthy range. Some employers simply ask the employee to tag the meal as a health choice in their expenses in order to receive the extra budget. This nudging effect, promotes more healthy meals and less fast food

Mental health wellness programs for all company types

Mental health is at the forefront of employer branding today. People need to know you're supporting mental health issues and following through with your word. Ensure that your company and its employees are as equipped as they can be to support mental health among each other.

**By actively enforcing mental health programs into your workplace, you will be able to:**

- Reduce employee health care costs
- Reduce sick days
- Achieve greater employee productivity
- Reduce disability and compensation costs
- Improve general morale and employee loyalty

**Some useful resources when considering a mental health wellness program:**

- Workplace Health Assessment with The CDC
- Final Rule on Employer Wellness Programs and the Genetic Information Nondiscrimination Act
- The Health Insurance Portability and Accountability Act

**A few mental health wellness programs you can consider:**

**1. Mental health first aid courses**

This two-day course from MHFA England teaches managers to recognize signs that an employee may need mental health support. The course is designed to give your company a first-aid style response.

**2. Free counseling services**

The Employee Assistance Professionals Association provides various subscription-based services to companies, giving employees access to a wealth of health professionals for free.

**3. Wellness action plans**

*Mind* is a UK based charity devoted to providing help and support to anyone experiencing mental health problems. They have created:

- A wellness action plan for line managers
- A wellness action plan for employees

**4. Book clubs**

Book clubs are a great way of supporting the mental wellbeing of your employees. They are best coupled with a book or kindle stipend and managed by one person. Consider building a book club on slack and hold monthly get-togethers. A book club encourages positive communication between employees and builds a sense of comradery.

**5. The act of being grateful**

An easy win but often overlooked. Encourage the act of being grateful among employees. Make sure this is part of their daily or weekly culture- to be thankful for another employee or external stakeholders. Highlight great work and let leadership sing about success that is not only based on numbers but *kindness*.

**6. Emotional intelligence classes**


Emotional intelligence is an incredible tool in the workplace. It will enable managers to make the most out of their team by giving them the support and resources they can identify are needed. Emotional intelligence dives into the psychology of team-building and people management.

**7. Fight Seasonal Affective Disorder**

We don't all need company retreats to be booked in when the weather is getting us down. Consider other ways you can help your workforce fight SAD. Introduce therapy lamps in offices or find other ways to make sure employees get the daylight they need to live a healthier lifestyle.

**8. Screen-free hours**

Going screen-free is unheard of in many workplaces. A screen-free initiative needs to be introduced by line-managers and is especially crucial for remote companies. We all need offline time. We need time to unwind and to come back to work refreshed.

Let your team know that it's okay to turn off notifications and set strict times that they are not allowed to touch their laptops; they'll thank you for it.

**9. Some useful mental health wellness software companies are:**

- Limeade ONE : Limeade ONE brings together employee wellbeing, engagement, and inclusion in a mobile-first experience.
- Virgin Pulse: Virgin Pulse provides culture-first technology solutions designed to grow with your business and wellbeing needs.
- Training Amigo : Training Amigo gives your team the power to easily manage engagement, wellbeing, and recognition in one HUB.


Fitness wellness programs for all companies

ASICS have hit the nail on the head with their slogan *sound mind, sound body*. One helps the other, and one does not come without the other. By introducing a fitness wellness program to your business, you'll ensure healthier and happier employees.

Some ideas you can consider implementing:

**1. An office sports league**

Find a sport that a few of your employees play – or if they don't play, it will be interesting too. Create a league within that sport with other companies in the area. Create a volleyball, football, or even ultimate frisbee league.

Keep your employees fit, encourage team-building, and provide social networking opportunities while you're at it.

**2. On-site sports facilities**

This largely comes down to the budget and resources you have available. On-site sports facilities like gyms are a huge wellness benefit. However, if you're not in a position to implement these, consider gym discounts, online meditation or yoga classes, or access to other sports facilities near your employee's homes.

**3. Walks and Talks**

An easy one to implement, no matter what type of company you have. If these are part of the company onboarding and training, then your employees will continue to host them without further encouragement. Walking meetings are a great initiative to keep minds fresh and legs young.

**4. Access to healthy ways of travel**

Try to eradicate driving to work where you can. Consider introducing a wellness benefit that includes free or discounted access to other forms of transport like bikes, scooters, skates, or even a good pair of walking shoes.

**5. Workout time**

Everyone works differently. If you can be flexible towards people's preferences, then do so. No one likes the gym rush at 6 pm, and few of us are *actually* morning birds, despite what we say. Give your employees time to workout in the week. Flexible hours or designated gym times are a great way to promote healthy living.

**6. Fitness challenges**

Challenges are an excellent way to combine any fitness wellbeing program with a little competition. It takes out the need to continually remind people of your initiative by putting people in competition with each other.

Smart technology, like apple watches that can track steps, is a great place to start. Or, consider working towards a greater goal with an app like the couch to 5k app.

**7. Healthy Eating**

Healthy eating is easier said than done, especially if someone doesn't feel they have the time or the knowledge to prepare healthy meals. Consider how your company can support this. Can you provide nutritional advice or healthy food workshops? Are you in a financial position to provide free, healthy food? What works best for your employees?

**8. Some useful fitness wellness software:**

- Grokker: Grokker empowers your workforce to take control of their wellbeing — no matter where they are.
- Incentfit: Rewards your employees for living well.
- CoreHealth: Total Well-Being Technology.
- Pacer for Teams: Your team's step challenges made simple.

How to implement an employee wellness program

Deciding to implement an employee wellness program is one thing, but implementing it is something else entirely. Follow these steps to ensure you have the best chance of implementing a successful employee wellness initiative.

1. Perform a company-wide qualitative and quantitative analysis
2. Set KPIs and goals
3. Get Key stakeholders on board
4. Create a wellness committee

5. Get a budget
6. Identify external partners to support your initiatives
7. Create incentives and rewards for employees
8. Form a communication plan and onboarding
9. Evaluate and optimize

How to measure and analyze an employee wellness program

There are different ways to measure the success of your wellness program, both quantitative and qualitative. It’s something you’ll need to decide on when you’re creating KPIs and goals for your initiative.

An employee feedback survey is a great way to get your ear to the ground and find out the effects of your efforts. If you’re using any software, then that software will also come with reporting tools you can utilize.

Going back to the beginning of this article, look at the hard numbers of your business. Have you seen a notable increase in productivity or employee engagement? Have your health care expenses decreased, job application rates increased, or is the business overall more profitable?

Many factors can come into consideration when you’re summing up these numbers, so what’s most important is you track the dates you implement specific actions and consider the lead and effect time it will take to show in your figures. Report smartly, create actionable insights, and keep your employee wellness programs thriving.

**Summing up**

Employee wellness varies dramatically from company to company. The task of evaluating and implementing an employee wellness program is sometimes carried out by office management staff, the Human Resources Department, or professional talent recruitment teams. Even though the employee wellness still has a wide variety of owners and forms, it is still present in almost every business today. Simply put, the few businesses that do not consider employee wellness a priority are setting themselves up to be out-recruited and eventually out-competed by their competition.

**What does an office assistant do?**

Do you enjoy speaking to a variety of people? Would you like to support a range of teams in hitting their goals? Would you like a job where no two days are the same? If the answer to these questions is yes, then the role of office assistant could be a great fit.

According to Indeed, the average salary for an office assistant is $15.42 an hour, which equates to approximately $32,000 per annum.

Depending on the size of the organization, an office assistant role is generally considered an entry-level position. However, in larger companies, the job might come with more responsibility and an hourly wage of up to $30. Plus, as you gain experience, there may be scope to expand your duties and move into an office manager role in some organizations.

But what is an office assistant, and how does their job differ from other positions like executive or administrative assistant? Read on for more details on the duties and responsibilities of this position, plus the pathways to landing your first job as an office assistant!

What does an office assistant do?

The primary function of office assistants is to help businesses to keep their workspace running smoothly. While an office assistant will provide administrative support such as diary management and coordinating travel schedules, their role differs slightly from that of a virtual assistant or executive secretary.

Their role is predominantly an operational one, supporting the company to provide a functioning office setting for their business. It’s safe to say no two days as an office assistant will be the same! However, some typical responsibilities can include;

**Typical office assistant duties:**

- Maintaining office supplies and liaising with vendors.
- Keeping communal spaces in good order throughout the day.
- Greeting visitors and answering phone calls when needed.
- Proofreading and distributing materials like agendas and minutes.
- Note-taking in meetings.
- Managing any general business email inboxes, ensuring communications reach the necessary departments.
- Assisting with travel arrangements.
- Scheduling appointments and managing diaries for executives.
- Coordinating office events when needed.
- Helping with any bookkeeping, data entry, and general administrative tasks required.
- Assisting new starters with getting settled and with any office equipment issues.

**What skills do you need as an office assistant?**

As we have seen, being an office assistant has a wide range of responsibilities. So what competencies and soft skills are needed to be successful in this role? Below you will find a rundown of the most important abilities you will need to possess as an office assistant. Check out our comprehensive list of qualities to cultivate if you want to be the best office assistant.

**To be flexible.**

As an office assistant, your role is relatively flexible and encompasses a variety of different duties. A good OA is a team player with a can-do attitude who is willing to take on tasks as and when they crop up to help the business run smoothly.

As an office assistant, there will be few tasks beyond your remit. So if you prefer to have a more defined list of responsibilities, this might not be the role for you. Time management is another vital skill for office assistants who will need to juggle their varied workload to handle issues in real-time while ensuring they still hit their deadlines for time-sensitive projects.

**To have excellent communication skills.**

Having solid interpersonal skills in both verbal and written contexts is the key to success as an OA. In the office, you are the first face clients or potential hires will encounter. Your interactions will set the tone as they check out whether the company is a good fit for them. The same applies to any communications over email or telephone.

As an office assistant, you are the first port of call and impression of the business. Plus, using communication skills to develop strong relationships with office equipment suppliers can secure your company a better level of service or even a discount or two. Employers need to trust that every time you greet a visitor or answer phones, you will approach each interaction with the utmost professionalism.

**To be able to work independently.**

When hiring an office assistant, executives look for someone who doesn't require lots of supervision and is happy to manage their schedule and workload. Office assistants need to be proactive, spotting any potential issues and tackling them independently. No boss, or fellow employee, is going to appreciate an OA checking in to see if they can order more coffee when the office is almost down to its last cup!

Businesses are searching for a candidate with initiative who is confident about problem-solving within time and budget constraints. This is perhaps one of the most important aspects of being a successful office assistant. Ultimately you are there to remove tasks from other team members' to-do lists, not create more with lots of questions!

**To be detail-oriented.**

As an OA, you will need to have exceptional organizational skills. On top of managing your schedule and to-do list, you will also need to possess excellent attention to detail. You will be handling a range of documents, from important internal memos to correspondences with clients. Having a perfectionist mindset and double-checking your work can help avoid embarrassing and potentially costly mistakes.

**To be technologically savvy.**

As well as general word processing and computer skills, you will need to demonstrate knowledge of the differing office management software for the various clerical tasks you will have to undertake. Technology shifts all the time, and you may find organizations are using replacements for many of the programs in the traditional Microsoft Office suite. For example, you might find companies prefer to use Canva over Powerpoint or have replaced Excel with Google Sheets. While each company might have individual preferences, understanding the different programs and platforms OA's generally use is handy.

**What qualifications are needed to be an office assistant?**

The role of office assistant encompasses many responsibilities and requires a range of skills. While some office assistants will have a bachelor's degree, a college education is not necessarily a prerequisite. As a minimum, businesses will be looking for applicants to have a high school diploma or GED.

When weighing up candidates for an office assistant position, experience and proven administrative skills are more likely to be a determining factor than a formal qualification. However, it can be considered a bonus to have a clean driving license depending on the company you are applying to.

**How do you secure your first office assistant job?**

If being an office assistant sounds like an appealing next step when starting your job search and crafting your cover letter, it's worth reflecting on your previous employment. Has any of your former work experience given you experience that could be relevant to a position as an office assistant?

Maybe you developed customer service skills or have examples of times you had to think on your feet from a previous retail role? Perhaps you have developed strong organizational skills while volunteering at a local nonprofit? Whatever your background, it's worth mentioning any relevant skills you have acquired to set yourself ahead of other applicants.

Another way to stand out is to obtain some certifications. LinkedIn and specific computer software providers offer candidates the opportunity to test their proficiency with particular programs such as excel or skills like data entry. If you pass, you can gain certificates that you can add to your application. Plus, investing in short courses like first aid training or fire marshaling can help your application shine.

When looking through any office assistant job description, try to identify a feature of that business that draws your interest. Showing you are passionate about the company straight off the bat in your cover letter will go a long way to help secure an interview.

Working as an office assistant can be a gratifying role. You get to support a business and its employees in creating a great work environment. You will have the chance to meet new people and will have variety in your work. OA's are respected team members and enjoy benefits like healthcare, and there is lots of room for career development.

After a few years of experience in a smaller organization, you can work your way up to roles with increasing responsibility. Plus, depending on the company, if you need to have more flexibility for childcare, there might also be an opportunity to scale down from a full-time to a part-time position.

**10 tips to be the best office assistant**

Have you already secured your first OA position and want to know the top skills for kick-starting your professional development? A career in office support has lots of room for growth, but you will need to prove your worth within the organization. So what skill set do you need to cultivate to be a genuinely stand-out office assistant?

**1. Do your research**

When trying to secure your first entry-level role, you did your research to impress in your interview. When climbing the ladder and looking for more senior roles, take note of the organizations you feel more drawn to. When eyeing up your dream position, analyze what parts of the business' mission statement you feel most aligned with. Hiring managers are looking for their office assistants to be passionate advocates for their business. Expressing what attracted you to this office assistant job description concisely in your cover letter will help you stand out amongst other applicants. Once they are in the role, great OA's continue to keep abreast of the latest developments within the company so they can answer any questions from visiting clients!

**2. Swot up on your software.**

The role of office assistant encompasses a wide range of administrative tasks and a host of supporting software to master. While individual organizations might have specific programs for you to learn, having a general overview of the types of software you might need to use can help you ace any interview. Technology changes and the best administrative assistants work hard to stay on top of the latest trends. But when you are starting out, begin with tackling the most commonly used tools;

**Word Processing**

- Microsoft Word
- Google Docs

**Email**

- Outlook
- Gmail

**Organization**

- Slack
- Asana
- Trello
- Evernote

- Google Drive
- Dropbox
- Wetransfer
- Google Sheets
- Excel
- Google Forms
- Google Calendar
- Calendly

**Bookkeeping**

- Quickbooks
- Xero

**Communication**

- Zoom
- Google Meet
- Microsoft Teams
- Skype

**Design**

- Photoshop
- Canva
- Powerpoint

3**. Hone your communication skills.**

Strong written and verbal communication skills are perhaps the most vital ingredient to becoming an accomplished office assistant. Whether you are meeting in person or over phone calls, companies trust you to be the first impression their client has of the business. They need the peace of mind that their OA will have the interpersonal skills to handle every interaction professionally. But office assistants are busy people! You will be wearing lots of hats and juggling an extensive to-do list at any given time. To succeed as an OA, you need to hone this soft skill so you can get your point across succinctly and politely in all contexts.

**4. Let your personality shine.**

Being a friendly face is an essential part of being a successful office assistant. Not only are you there to greet visitors and make a great first impression, but you are also there to create a supportive office environment for your colleagues. Team members are more likely to discuss their issues with an OA who adopts a kind and open approach. Don't be afraid to get to know your fellow employees in the break room. You might be able to nip a problem in the bud over a casual coffee! Being an approachable ear for colleagues isn't the only way the relationships you build as an OA can serve the business. Having a friendly attitude with suppliers can reap preferential rates or a speedier level of service!

**5. Prove you are an excellent problem-solver.**

If you enjoy a challenge and love having a job where no two days are the same, you are likely thriving as an office assistant! Problem-solving skills are key for OA's who need to think on their feet to resolve office management issues without being micromanaged. The role of office assistant also requires an element of flexibility. The most successful OA's are team players with a positive attitude who are content taking on new tasks as they arise. Terrific office assistants not only handle problems in real-time, they also try to negate them wherever possible. Whether it's keeping coffee supplies well-stocked or flagging potential scheduling issues, employers appreciate an office assistant with a proactive approach.

**6. Brush up on organization.**

Exceptional organizational skills are a must for any office assistant. In handling your time and responsibilities, you will need to have an organized approach to everything you do. As an OA, you are also responsible for the organization of the physical office and other team members. You will be an administrative assistant for various departments, and each task might require a new process. For example, there might be varying filing systems between teams, or certain executives might have different preferences for their travel arrangements. The best office assistants can rise to these organizational challenges, keep abreast of expectations, and deliver a personalized level of administrative support.

**7. Tackle your time management.**

As an office assistant, your workload will be a constant juggle between day-to-day and longer time-sensitive tasks. It's a fine line to walk. If you get too bogged down in a data entry project, you could overlook ordering office supplies. Miss the data entry deadline, and you anger your boss. Miss out on delivery dates for equipment, and you have to handle frustrated colleagues. Developing top time management skills ensures you meet deadlines while not neglecting your other ongoing responsibilities. The best office assistants learn that saying yes to everyone can do more harm than good. It's better to set realistic deadlines than burn yourself or let people down trying to achieve the impossible. Managing expectations with your co-workers is an important skill and a more sustainable way to cement yourself as a vital team member.

**8. Pay attention to the details.**

A critical part of having top-notch organizational skills is noticing the details. As an office assistant, you will have access to many sensitive aspects of the business. From being the first person potential clients meet to writing up minutes from top-level meetings. The best office assistants take pride in their work and apply a level of perfectionism to everything they do. Even simple steps like proofreading all emails can help avoid any issues and hit the right tone with clients and colleagues alike. But not only can great attention to detail save the company from costly mistakes, it can also help secure new business. Think back to a time when you visited an office. How did it feel when the assistant had to ask three times if you took milk in your coffee or, even worse, almost instantly forgot who you came to see! Paying attention to these details will help you impress your employers and make you stand out as an exceptional OA.

**9. Trust your intuition.**

As an office assistant, you will likely sit outside the typical management silos. You may even report directly to a senior executive. When filling an office assistant position, employers are looking for a candidate who is confident working independently. Executives won't have time to sign off on every decision, so an OA needs to use their initiative to solve as many issues as they can themselves. The role of office assistants also comes with significant responsibility. OA's will often be given a budget for office equipment and will need to manage this themselves throughout the year. As we have seen, employers want an assistant who takes a proactive approach. If your instinct says you need to flag something to management, you need to allow them plenty of time to respond. No boss will be pleased with an OA who is reactive and needs lots of last-minute support with issues they should have seen coming.

**10. Collect solid references.**

When fulfilling your duties as an admin assistant, you will be privy to sensitive information. So when starting your job search for a more senior position, it's crucial to demonstrate that you are a trustworthy employee. Having a couple of solid references from your former employers can show you have been a respected team member in other organizations. Keeping up good relationships with colleagues past and present is a good habit to maintain, as you never know when you might need someone to vouch for your previous work experience. You can even start curating references on social media. Ask current and past co-workers to give you a recommendation on your LinkedIn profile, but be sure to reciprocate the favor!

**8 Must-have office administrator skills**

Office administrators play a key part in holding offices together. On a day-to-day basis, they're the people responsible for supporting team members, helping them to maintain high levels of productivity and efficiency. It's common to see record-keeping, creative thinking, and general administrative tasks on a job description, but what else makes a stand-out office administrator?

Office administrators' skills are incredibly valuable to all team members. So, what does it take to be a great office administrator? Here, we go through the mix of skills, qualities, and characteristics of an office administrator.

8 Must-have skills and qualities of an office administrator

Depending on the industry, some office administrators will need specialized skills or knowledge. However, most office administrators will need several standard skills in order to carry the job out well. Below, we go through eight must-have skills you'll need to be a great office administrator.

**1. Strong organizational skills**

Office administrators are nothing if not organized, with impeccable multi-tasking and time management skills, too. They're able to keep up with and adapt quickly to competing priorities in fast-paced environments, keeping not only themselves organized, but other team members, too.

They keep records, files, and databases incredibly organized, and are a whizz at scheduling appointments, maintaining multiple calendars, writing memos, creating templates, and making travel arrangements.

**2. Communication skills**

Both written and verbal communication skills are highly important in any office administrator role. They're often responsible for managing other office administrative assistants, and so delegating tasks in a clear and understandable way is paramount to the productivity of the office.

They're also who people go to when they need something done, ordered, or arranged, which means communication is a non-negotiable office administration skill.

**3. Interpersonal skills**

Teamwork is an office administrator's middle name. Office administrators are able to easily interact with a large range of employees across all levels of seniority and within many different company departments. They're also responsible for keeping the office manager up-to-speed.

**4. Accounting and bookkeeping skills**

In some cases, office administrators are responsible for accounting and bookkeeping tasks. They're often responsible for collating office receipts and travel expenses, preparing and disbursing payments, and compiling statistical or financial reports and spreadsheets. It's also worth noting that many administrative positions require the use of accounting and expense software such as Quickbooks.

**5. Experience with technology and software**

Office administrators must be proficient in the use of common computer applications and software such as programs within Microsoft Office (Excel, Word, Powerpoint, etc). They're also well-versed in data entry, report compilation, and answering virtual correspondence using different software applications.

**6. Problem-solving skills**

Office administrators are the problem-solvers of the office. If the printer breaks, if someone's keycard stops working, or if the heating breaks down, they're responsible for getting these fixed while also maintaining the office as usual.

They're also skilled in navigating their superiors' competing priorities, schedules, and projects, and are able to quickly switch gear when something needs to be taken care of urgently.

**7. Attention to detail**

Since they're responsible for multiple moving parts, office administrators have a keen eye for the tiniest of details. They know the when, how, why, what, and where of everything office-related, can spot potential mistakes before they happen, and work tirelessly to make sure everyone's needs are accommodated for.

**8. Customer service skills**

Last but not least, office administrators are not just responsible for pleasing the office, but for assisting customers and clients, too. Customer service skills are imperative since office administrators are often the first point of contact with customers both in-person and via phone calls, and may need to deal with customer complaints and refer customers to the correct individual or department in a pleasant, efficient manner.

How to be a great office administrator

If you already have these office administrator skills under your belt, it's well worth learning some extra skills or honing your existing ones to help you stand out from the crowd.

Here are some tips to help you become the best office administrator possible!

**1. Be proactive with tasks**

Office administrators are responsible for multiple tasks that are often competing against one another, too. Although you can't predict every task that will land at your feet, there are often recurring tasks that you can be proactive with, such as ordering office supplies, budgeting, and maintaining filing systems.

For example, if you know your company is going through an extensive hiring period and will be expecting several new staff members, you could begin to look into extra office equipment, order extra office keycards, or purchase extra software licenses. This level of strategic planning will help provide a high level of administrative support for your superiors.

**2. Learn more about your company and industry**

As we mentioned, most office administrators have several standard skills and characteristics in common. However, to become a more valuable office administrator, you could spend time learning more about your company's wider goals and objectives, its growth projections, and engross yourself in what's happening in your specific sector and industry as a whole.

**3. Use tools to automate and streamline tasks**

Office administrators juggle many tasks, many of which are recurring, and could be taken care of with office management software. This also frees up your time for more business-critical priorities. For instance, if managing employee travel expenses for corporate accommodation and transport always falls to you, you could consider using a travel management platform like TravelPerk that can help you create one simple invoice that collects all costs after every trip, eliminating the need to track down invoices from multiple employees.

## Top 30 best office management software tools

**Full disclaimer,** office managers do a lot of different things. Depending on the product or service that your company provides — and how large your company is — all of these tools and tasks might not apply to you. The demands on the office management staff are extensive, so we've done our best to compile a list of the best office management software for you.

Your daily to-dos might include a little client account management, a little travel booking, a little bookkeeping, or not. You might serve as a personal assistant to your CEO or you might handle customer concerns. Whether you work for a large or small business, having a great management system can make your workday more enjoyable and productive. **Disclaimer aside,** there are awesome office and project management tools that can help nearly every office manager to do their job faster and smoother than before. Let's dive into the best software for office managers!

**Amazing project management softwares for office managers**

Office managers can implement project management software for internal company tasks like documentation updates, events planning, and more.

**Asana**

Asana's many task viewing options (including timelines, boards, and task lists) make this tool a fan favorite. For each project, you can choose the organization system that makes the most sense. You can assign tasks to different team members, create interactive calendars and track your progress in real-time.

**Trello**

Trello can help you streamline collaboration with easy-to-follow workflows and task boards. Comment on tasks, upload relevant files and track progress. Not to mention that there's a mobile app available for both iOS and Android!

**TaskWorld**

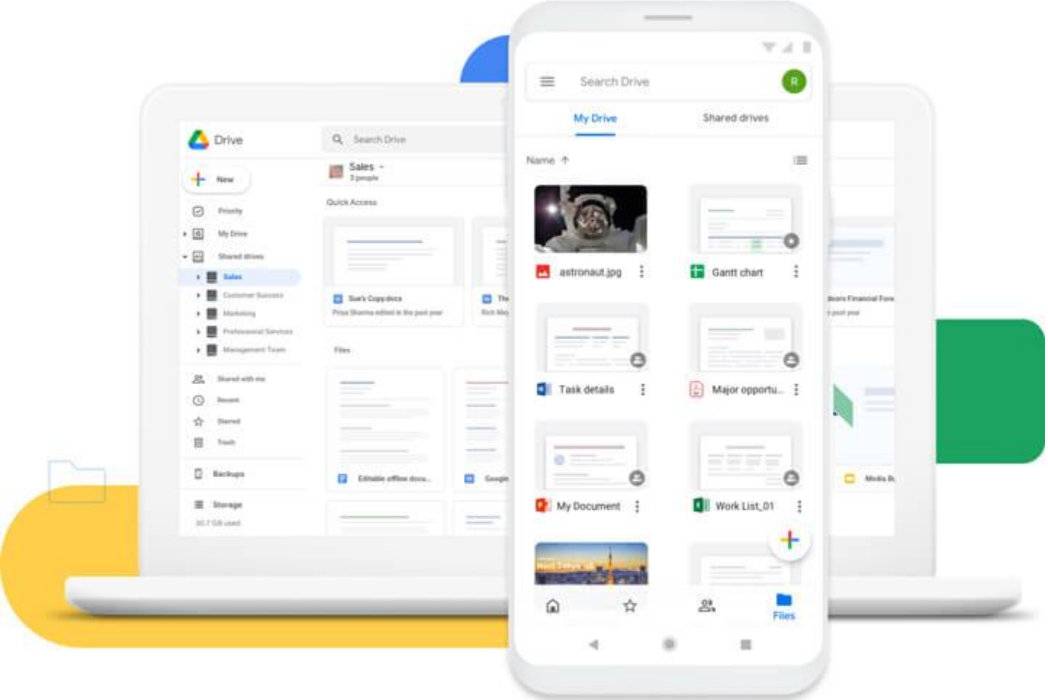
If your team doesn't yet have a communication tool like Slack or Flock (or is open to switching over), then TaskWorld can be a great way to get communication and collaboration all in one place, because this tool offers not only task management and project planning, but public and private channels and chats as well.

**Bitrix24**

Bitrix24 is a robust, powerhouse software that combines document management, calendar management, event scheduling and customer resource management with project management and collaboration.

The importance of document collaboration

Gone are the days of having to download a document or sheet from Box and Dropbox, change it in Microsoft Office, and reupload it. Asset management still has its place, but not for active, living projects.




**Google Drive**

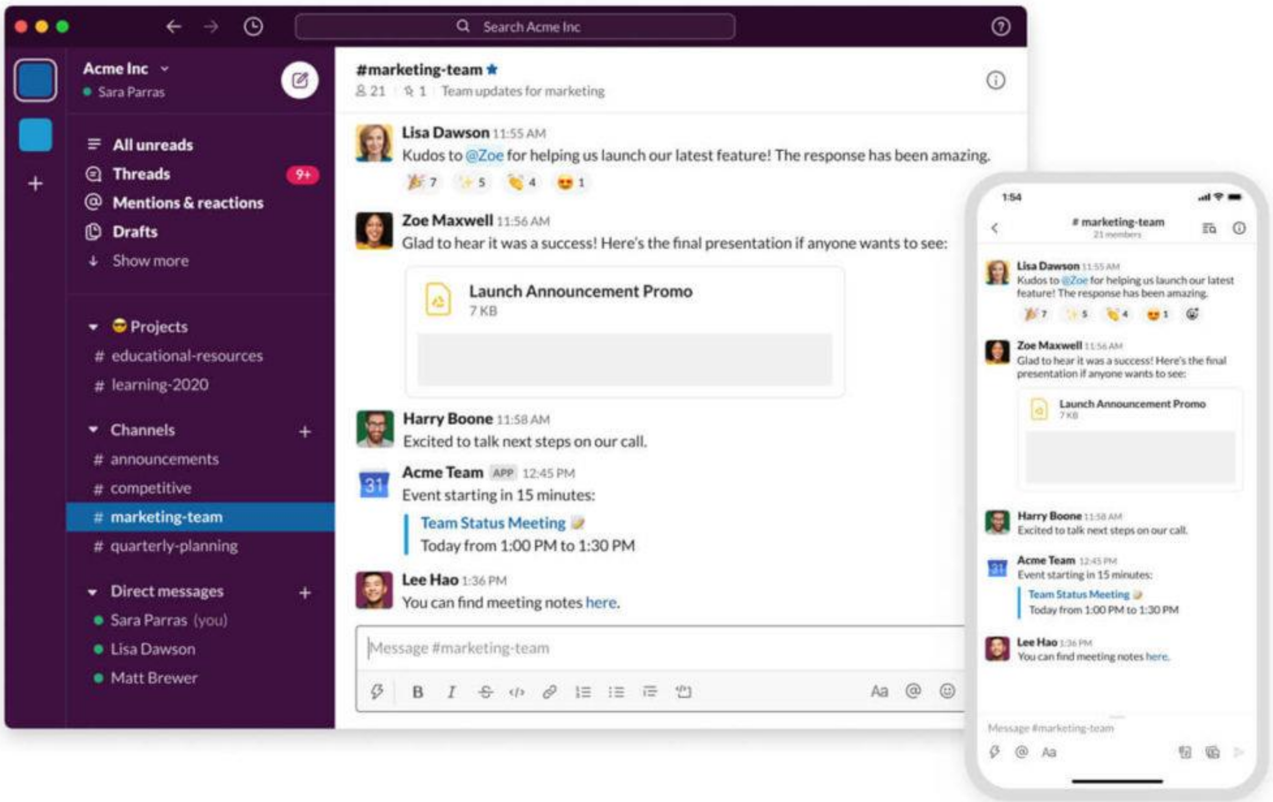
Where would any of us be without Google Drive? If you haven't yet switched your team over to Google Drive, what are you waiting for? Talk them into taking the plunge. For most documentation needs, we suggest you change to this cloud storage system right away.

**LibreOffice**

For teams that can't rely on Google Drive and need a smoother way to collaborate on documents that can more reliably be exported as .docx of .xlsx or .pptx, then LibreOffice is the perfect cloud collaboration solution.

Communication tools for modern teams

Why email when you can chat?




## Slack

King of office chat, Slack is a communication tool that allows you to send direct messages to individual colleagues or to converse informally in groups called channels. Channels can be organized around teams, projects, topics or all three.

## Fleep

While most chat and communication tools are built to reduce email and get people outside of email, that’s not always helpful. For teams that need to communicate with people outside their internal organization (clients for example), then integrating with email is a big plus. Fleep lets everyone choose their preference, whether that’s their inbox or the Fleep app, and integrates all communications.

## Flock

In addition to individual and group chat, file sharing, and chat search, Flock also offers to-do lists, polling, and email list building (for when chatting isn’t the best medium but you still want to contact everyone in that channel). Flock is also the cheapest chat solution.

Video conferencing tools for remote work

## Google Meet

Previously known as Google Hangouts, this is Google’s solution to enterprise conferencing software. It’s offered for free as part of the Google Workspace, or any Google user. It’s a great, hassle-free way to meet with colleagues no matter where you are.

## Microsoft Teams

If you’re more into the office suite, Microsoft Teams is a great option for Office 365 users. It’s completely compatible with all of Microsoft’s other tools like Excel, Word, and

PowerPoint. Use the free browser version as a guest, or check out their pricing options to get the full suite.

*Zoom*

**Zoom**

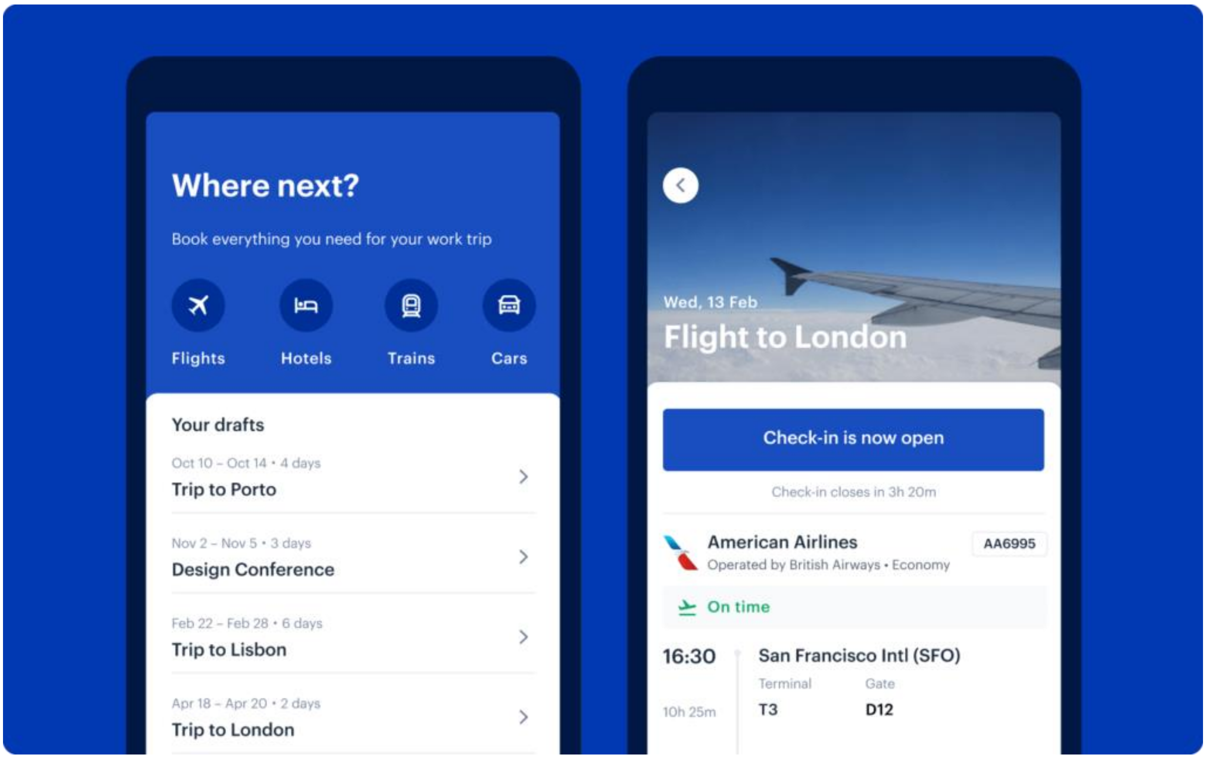
The famous Zoom! The popularity and prevalence of this video conferencing tool have skyrocketed since remote working became the new normal in 2020. It’s a highly reliable tool with some great functionalities that make teamwork and collaboration quick and easy.

Travel & Expense management software

The travel booking management software category is on the come-up and you’ll be happy to be an early adopter.

**TravelPerk**

TravelPerk is built for booking and managing business travel. Aggregating all the flight and hotel options you can find on Google and delivering that inventory alongside business-critical features like travel policy limits for self-booking and spend reporting, TravelPerk is a no brainer. And did we mention the 24/7 trip support? It’s amazing. Business travelers will thank you for it.




Book every aspect of your business trip within the TravelPerk app

**Expensify**

No one likes writing expense reports. Really no one. Expensify automates the whole expense reporting process with receipt scanning and bookkeeping integration and fast reimbursements.

The elements of stellar event planning

When you're planning an event, you need all the help you can get. There are tools and systems that can make everything so much easier.

**Typeform**

As a survey tool, Typeform can be used for so many different things, including getting feedback on a recent event, asking for lunch orders, or discovering what type of furniture your team would like to have in the new lounge. But one of the best uses of Typeform is event planning.

Need to discover when team members will be arriving or what their preferred itinerary is? Typeform is so helpful for grouping people together and tackling trip booking or other event related tasks.

**TravelPerk Group Booking**

Ok, so we know we mentioned TravelPerk but bare with us here. TravelPerk has some awesome services built into the platform and overall experience. Group booking is one of them.

If you've ever organized a retreat or a summit, you know what a headache group events are. The TravelPerk specialists will handle group booking for you and make sure all of the itineraries and travel data is inside your TravelPerk account so that you as an administrator can keep track of everyone and your CFO can see all the spend.

Office management and general organization

**Google Calendar**

Make everyone's lives easier by implementing the use of Google Calendar across the entire team or company. If you have to book group lunches or meetings, it will be so much easier to pick a time (with no back and forth) if you can view the shared calendars for the relevant parties.

And if anyone on your team in charge of client care or customer support uses scheduling tools like Calendly or Acuity Scheduling — tools that integrate with Google Calendar — any event you create in their schedule will then be automatically blocked off. Best of all, Google Calendar sends event notification and reminders so missed meetings are much less common!

**Q**

Q can do a whole lot of things but our personal favorite is powered by a startup called Hivy, which Q recently acquired.

Now baked inside the robust Q platform, this smart tool integrates with the Slack bot so any employee can ask for more forks or more chamomile tea or more staplers, and follow up on that request to make sure that you've ordered it. When other team members are on the lookout for items in low supply (and they remind you), it's a blessing for a busy office manager.

**OneLogin**

You and your team use so many different tools every day! I mean really, you should be using most of the ones on this list. That means so many different login credentials. Say goodbye to needing to remember dozens of passwords, and use OneLogin to login to every other tool that you use. Not only is this more secure, but it also keeps you more productive because you can login once and go about your day.

**Envoy**

For the modern receptionist, Envoy is a must. Here's what you can do with this platform: allow guests to sign in, send notifications to the host, get signatures from visitors on legal documents if needed, and quickly print guest badges. And it's completely optimized for touch screen use on tablets. Hooray!

**Amazon Business**

Amazon, why do you have to make life so easy? The retail giant isn't just for consumers. They've got fast shipping and easy ordering for businesses too. You can even set up approval workflows for ordering supplies, pay in the way that's convenient for your business, and get exclusive savings.

**The best bookkeeping and account management tools**

As an office manager, you may or may not handle bookkeeping, invoicing and the like. If you do, you want something that is easy to use and just works. These tools fit the bill perfectly.

**QuickBooks**

Enter profits and losses, categorize items, run quarterly reports, and be fully prepared come tax season. QuickBooks has been around for a long time as a desktop application, and has successfully made the jump to an easy-to-use web app.

**Xero**

Xero is a bookkeeping and accounting platform known for its reliable mobile experience and quick and easy reconciliations.The 600+ app integrations make it a fan favorite.

**Wave**

Professional, easy-to-create invoices from a free tool? It doesn't get better. If your company uses a robust suite that includes invoicing, you won't need this. But if you're using simple finance tools, then this is the perfect add-on for creating quick invoices.

*PandaDoc*

**PandaDoc**

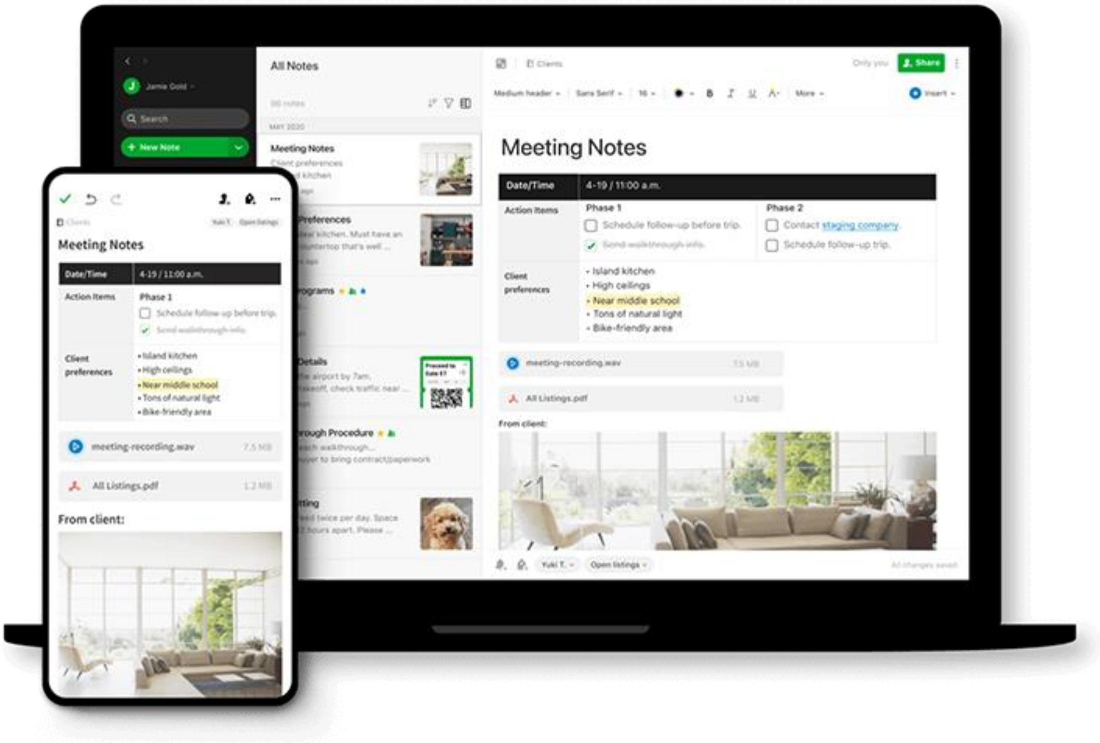
If your company does client work, then as an office manager you probably handle the contracts and proposals. If you're handling this manually with Microsoft Word, it's a real pain. Switch over to a smart system like PandaDoc to handle proposals and contracts and allow clients to esign on any device.

**FreshBooks**

If your team bills for their hours, then having a time tracker integrated into your invoicing system can be a huge time saver for you. FreshBooks allows you to track time, send invoices, manage expense reporting, and collect payments. Perfect fit for law firms, agencies, IT consulting firms and more.

Note taking and list making for admin work

You're in charge of keeping everything on track, and while there's no app for giving you four extra arms, there are some great apps for managing your to-dos.




*Evernote*

**Evernote**

With Evernote, create dynamic notes that include links, checklists, tables, attachments and audio recordings. Best of all, these notes are easy to search and can be shared and collaborated on with others.

**Wunderlist**

This robust app (available on any device) can help you organize your lists and notes into folders, create due dates and push notification reminders, and even help you manage your deluge of incoming email by turning emails into tasks.

**Any.do**

In addition to creating to-dos and organizing your daily calendar, you can set up recurring tasks, collaborate with your team, get location-based reminders, and more. If making phone calls is part of your daily workflow, this is the perfect app for you because it integrates with your phone dialpad.

Types of email management tools

Whether you check email for your CEO or handle customer support issues, you could benefit from one or more of these email management tools.

**Help Scout**

Collaborate with other teammates to reply to customer emails by tagging conversations, triggering auto-responses, marking a conversation as complete, mentioning other colleagues in private comments and more.

**ReplyManager**

Perfect for large ecommerce brands, eBay sellers and Amazon sellers, ReplyManager helps you tackle customer support email with centralized, faster replies.

**FreshDesk**

This affordable is a great tool if you've never used a customer support tool before and you're still doing everything in your inbox. It can even help you if you don't actually handle customer support but you get so much incoming email that you need canned responses and scenario automation. (We won't tell).

**Inbox Pause**

As an office manager, responding to dozens of email everyday is part of your job. But if you don't bulk email management then you won't be able to get anything else done. Inbox Pause literally puts your inbox on pause so you can set aside 15 or 30 minutes to handle other important tasks.

**Yesware**

While many users rely on Yesware for email tracking, it's template feature is even more useful. If you find yourself having to answer the same question over and over, or send the same onboarding email to new clients or customers, then Yesware templates will be a life saver. The follow up and reminders features are amazing too.

**SaneBox**

Designed to help you get to Inbox Zero, SaneBox helps your prioritize important emails, send distractions to a "SaneLater" folder, customize other folder types, and send emails to yourself at a future date.

## Office Management: File Management System

### What Does File Management System Mean?

A file management system is used for file maintenance (or management) operations. It is is a type of software that manages data files in a computer system.

A file management system has limited capabilities and is designed to manage individual or group files, such as special office documents and records. It may display report details, like owner, creation date, state of completion and similar features useful in an office environment.

A file management system is also known as a file manager.

A file management system's tracking component is key to the creation and management of this system, where documents containing various stages of processing are shared and interchanged on an ongoing basis. It consists of a straightforward interface where stored files are displayed. It allows the user to browse, move, and sort them according to different criteria such as date of last modification, date of creation, file type/format, size, etc.

The system may contain features like:

- Assigning queued document numbers for processing.
- Owner and process mapping to track various stages of processing.
- Report generation.
- Notes.
- Status.
- Create, modify, move, copy, delete and other file operations.
- Add or edit basic metadata.

In Microsoft Windows operating systems, the default file management system is Windows Explorer. On Mac computers, instead, this role is taken belongs to a tool called Finder. Although the functionality offered by these file management systems is pretty basic, they are usually enough for most users.

However, some businesses might want more advanced tools that can, for example, understand the differences between files of the same format or sort them according to their content.

More advanced file management systems can provide additional functions, such as document management software (DMS) which can organize important documents. Files are assigned a label or indexed according to their attributes to build a searchable database for faster retrieval.

A file management system should not be confused with a file system, which manages all types of data and files in an operating system (OS), or a database management system (DBMS), which has relational database capabilities and includes a programming language for further data manipulation.

**Why we need file management software and systems?**

A file management system is a cloud-based service that facilitates the storage and managing (and sometimes creation) of all your documents and files from a single point of contact.

In other words, it’s a filing system that operates in the cloud where you can store all your documents and company files and retrieve them whenever you want from anywhere around the world.

Remote working has brutally exposed the old paper-based document storage models that businesses have been using for decades, leaving them in despair. Even when working in a physical office, paper documents bring more chaos to the table than calm. The chances of error and misplacement along with supplementary costs of storing and maintaining file cabinets are a few of the major hurdles businesses tackle every day. Besides, they are difficult to locate and access becomes impossible if your peers are working remotely.

**The challenges are bigger than you think. Take a look at these stats:**

- A staggering 7.5% of all paper documents get lost.
- Document challenges account for 21.3% productivity loss.
- Companies with annual revenues between $500k and $1 million can save as much as $40k per year by switching to digital document management.
- On average, a professional spends 18 minutes searching for a document, which adds up to nearly 50% of their total time on the job.
- Around 20 percent of the business time – the equivalent of one day per working week – is wasted by employees searching for information to do their job efficiently.
- File management system plays a significant role in making the management of files easier, faster, and more efficient.

**The Many Advantages of a File Management System:**

File management software and systems offer a lot of advantages when compared to physical files storage systems, some of which include:

- Simple storage, surveillance, and retrieval of documents irrespective of location

- Superior search abilities mean less time is spent on searching for important files
- Lowered storage costs associated with physical files.
- More security and privacy control over sensitive company data
- Disaster recovery and backups
- Real-time collaboration and improved teamwork
- The version history of each document to see when edits were made
- and much more!

Seeing that over 77% of business owners want to access files remotely, having a file management system in place seems like an obvious decision.

**OFFICE MANAGEMENT: FILES AND RECORDS MANAGEMENT**

**1: The objectives / policies for files and records management shall be to:**

- Standardize the filing system among various Government agencies;
- Improve the documentation and thus facilitate a sound information system for efficient management;
- Ensure proper maintenance, storage and archiving of records;
- Expedite decision making and correspondence;
- Strictly maintain office secrecy and prevent the untimely and unwarranted flow of information outside the agency;
- Promote individual and collective responsibility and accountability within the civil service; and
- Economize the government operation

**2: Organizing Files**

**Overview and General Principles**

Most department offices already have organized file arrangements or file plans in place for hard copy records. This chapter addresses general file organizational principles to employ when the need arises to

- create, revise or overhaul a filing system;
- develop and apply file management techniques and procedures to electronic documents and records;
- develop or revise a file plan index to files; or
- establish procedures to review files in all media for storage and disposition.

The principles apply to files in any medium.

**Organizing for Retrieval**

Organize files for easy and intuitive retrieval of information. Organization is typically hierarchical, moving from broad categories through subcategories to specific contents such as individual folders or documents. The usual need is to retrieve a specific document. In hard copy file systems organization through the folder level is ordinarily sufficient. In an electronic file system organization techniques may extend to specific criteria to identify individual documents.

Proper organization enables both efficient retrieval of individual documents and the efficient management of the record series to which they belong through the record life cycle.

**Basic Arrangements**

The three basic types of file arrangement are

- **alphabetical** - using names, subjects, geographic locations, etc.;
- **numerical** – using numbers in various combinations, such as date, control-section and job, etc.; and
- **alphanumerical** – using a combination of letters and numbers.

**Hierarchical Groupings**

Typical file organization moves from broad groupings of files through progressively more specific groupings to particular files or documents.

- **Major Groups** - A major group is a *broad* grouping of files related to major functions or areas of activity. Major groups vary according to the function of the individual organizational unit maintaining the files.
  - **Minor Groups** - Minor groups consist of different files that relate to similar types of activity or function. For example, the following minor groups may exist as folders under the major group of Office Administration: Budget files, Material Issues and Purchasing files, and Annual Equipment Inventory files.
    - **Component Files or Folders** – Component files or folders consist of assemblies of documents related to a particular subject, event, function or transaction. These may include sub-folders under folders or documents within an individual folder.

**3: File Management on Shared Drives**

**File Location**

Use shared drives to maintain electronic files enhances accessibility and security. Standard procedures should include guidance to employees on routine transfers of electronic files from individual desktops to the shared drive as they are developed in the course of business functions.

While shared drives offer convenience when documents are being developed, the FileNet enterprise document management system (EDMS) is the preferred repository for the retention of completed documents. Until EDMS is fully implemented across the enterprise, however, many offices will continue to maintain electronic records on their shared drives.

This section discusses addresses the following techniques for managing files on the share drive:

- file Naming and Organization
- date-Based File Organization
- event-Based File Organization
- document Naming
- e-mail Guidelines

**File Naming and Organization**

Electronic file naming should support both retrieval and record life cycle management for electronic files that are retained on a shared drive. While document and folder names may suggest content, use of dates or numbers in the names can help to graphically organize them on the display.

**Date-Based File Organization**

Organize and name date-managed files in the following manner:

- Major Group Name
  - CY or FY20## (Minor Group) (NOTE: For voluminous files, the minor group may be further subdivided by month).
    - Constituent file name (May be alphabetical, numerical or alphanumerical).

**Event-Based File Organization**

Employ the same folder structure as the date-based arrangement, above, but create separate folders to contain active and completed files, as in the following example:

- Major Group Name (Project type or component, for example)
  - Active Projects (Minor Group)
    - County
      - CSJ
  - Completed CY or FY 20## (Minor Group)
    - County
      - CSJ

As the status of records changes from active to completed, move the records from the Active minor group to the appropriate folder in the Completed Minor Group.

Since records are typically managed on a periodic basis, organization of completed event-based records by year of completion is ordinarily sufficient to accomplish efficient retention and destruction of records. Folder structures can be organized for a closer adherence to minimum retention requirements for sensitive records by using month folders, or a similar finer level of detail in a date-based minor group.

**Document Naming**

Appropriate document naming is essential to allow accurate identification of content for retrieval. In most functions, using a combination of a date and standard title suggestive of the document content or function is sufficient. Document naming conventions can be established as routine procedures for many documents related to operations. Some examples include the following:

- MM-DD-YY Approval Memo (or E-mail or Letter or Form) (NOTE: It may be helpful for retrieval to include the type of document format, such as e-mail or form, for correspondence.)
- MM-DD-YY Status Report (File suffix (.doc, .xls,) will identify type of document)
- MM-DD-YY (Recipient Name) E-mail
- MM-DD-YY Form Title-Person Name or other Identifier

Use of the date allows for an easy sequential organization of documents related to a process. Numerical suffixes can identify consecutive content related to a document or subject.

Managers or supervisors can establish naming conventions appropriate to the needs of their operations and train employees to use them.

CAUTION: Excessively long folder or document names may result in file corruption that prevents document actions, such as moving or copying document files.

**E-mail Guidelines**

E-mail messages created or received by means of state resources, including employees and facilities, are considered state records. Inadequately managed or controlled e-mail represents a significant legal vulnerability in most organizations. While users may view the medium as a communications utility, much like the telephone, the courts may consider e-mail messages as documentary evidence. Responsibility for appropriate management of e-mail is shared by managers, supervisors and users.

**Basic Guidelines.** Several basic measures can reduce risks related to e-mail, including the following:

- identifying and characterizing e-mail related to routine business functions
- developing e-mail subject/naming conventions to relate the content to a specific record
- developing e-mail text templates for use in routine business communications
- establishing and enforcing procedures to save e-mail to the appropriate record folder immediately upon completion of the transaction
- arranging for frequent and regular automatic emptying of mailboxes
- training employees on e-mail procedures and include appropriate e-mail management in performance planning and evaluation
- copying only those who have a direct stake in the content of the e-mail
- using links to documents posted to the intranet for broadcast e-mail communications

**Record Copy Status.** Identify and retain e-mail according to the requirements for the record to which its content relates. The following guidelines can help in determining the record copy status of e-mail:

- The person authoring an e-mail in connection with a business function may be presumed to have created the original (e-mail) record
- E-mail that contains a string of dialog, (initial message, response(s), and attachments) that represents a completed communication or transaction related to a function for which the office or unit is responsible is normally a record.

Transitory e-mail typically not considered for record copy status includes:

- e-mail received that does not require a response or further documented action;
- e-mail transmitting attachments (unless it is important to retain documentation of the transmittal itself);
- informal conversational e-mail that does not include content that turns the message into a record.

**Saving to the Shared Drive.** Saving e-mail to the appropriate folder on the shared drive as a routine procedure related to the maintenance of an electronic file or record allows the content to remain accessible if the original account should be discontinued. E-mail saved in this manner defaults to a Word document in the form of a memo. The essential basic metadata of sender, recipient and date is preserved in this format.

## 4: File Management in an EDMS

### Active and Passive EDMS Uses

Active EDMS use employs the technology to manage documents involved in the conduct of business processes. Typical actions involve coordination of revisions or document handoffs for reviews or approvals.

Passive use employs EDMS simply as a repository for retaining documents after their active use is completed. Typical actions involve adding the document or a scanned image to the library when the hard copy would ordinarily be filed.

**EDMS and SharePoint Services**

Microsoft's Share Point Services (SPS) is marketed as a document management application, and has become popular as a means of sharing documents and conducting collaborative processes in the department. As documents are developed locally on shared drives, they may be posted to SPS sites for collaborative actions across the enterprise. SPS is a more user-friendly tool than FileNet for collaboration and business process-related document actions.

SPS, however, should not be used as a repository for the retention of completed documents as official records, as the ease with which SPS sites can be developed and accessed by large numbers of users and then removed presents inherent vulnerabilities. The Technology Services Division's procedures governing the use of SPS emphasize that "SPS web sites should be focused primarily on defined projects and organizational infrastructure support issues." Accordingly, completed or final documents managed through SharePoint should be moved to the FileNet EDMS for retention. If necessary, links to documents in the FileNet repository may be established in SPS sites.

Before eliminating SPS sites, SharePoint managers must take care to ensure that official records and documents are preserved and retained. Discussion strings may contain content necessary to preserve as a record, and steps to index and retain that content are also necessary.

**Using Properties to Manage Files in an EDMS**

Library developers coordinate with subject matter experts to develop indexing criteria for retrieving and managing the life cycle of documents related to their individual business processes. Users are typically unconcerned with document life cycle management after they complete their role in the process.

In an EDMS, properties, or index terms, are assigned to documents when they are added to the repository. These properties are fields in a database that is used for building searches to retrieve documents. Documents added to the EDMS require certain properties that furnish essential data for life cycle management. These properties include the following:

- Record Type — Relates the document to a record series in the TxDOT Records Retention Schedule
- Document Type — Identifies specific document components in a record, some of which may require special retention requirements
- Document Date — Used for date-based purposes/document operations
- Document Status — Used to track document handling/life cycle status
- File Code — A numerical identifier used to enable batch document operations

Optional custom properties are available for document indexing to support retrieval. Ordinarily, only a limited number of index terms (or properties) are necessary for the majority of retrieval needs for documents related to a business process. It is important

to establish a balance between the number of properties used and the real retrieval needs related to the document. More properties to keep track of mean greater workload in adding and maintaining documents in the repository.
Optional properties may also be used for active document management. For example, the Process Status can track a document's relationship or use in the management of a process.

**EDMS File Management Procedural Overview**

Managers, supervisors, records custodians or coordinators must include EDMS records in routine file management procedures. The procedures resemble those for hard copy records, but involve more teamwork. The following steps are discussed in the remainder of this section:

- declaring a record to trigger retention
- changing security to preserve document integrity
- including records in the EDMS in periodic records management procedures
- generating a report of destroyed records
- deleting the records from the library

Developing queries and scripts that perform global operations on component documents of records specific to various department functions involves coordination between the OPR and EDMS system administrator. Once developed and stored, however, queries, search templates and scripts may be reused—with adjustments to certain values—to perform the same operations in the future.

NOTE: E-mail all queries or scripts that are based on the standard library design to EDMS_OPR@txdot.gov to ensure system users have access to these resources.

**Declaring a Record**

Declaring a record by an OPR may be event-driven, as in acceptance of a project, or date-driven, as in the turn of a fiscal or calendar year. For example, on notification of a construction or maintenance project's completion, the OPR should perform a global document status property change to "Final" for all documents sharing the CSJ of the completed project. It is generally sufficient to batch records with an "AC" (After Completion) retention trigger in date-based groupings. For example, a declaration operation may specify all records with a document status of "Final" and document date equal to or before a specified trigger date, for example 0901YYYY.
The nature of the record determines its handling. If an OPR determines that a record should be destroyed as soon as it becomes eligible, it may be necessary to perform declaration and reporting on a more frequent basis.
Business process experts may collaborate with system administrators to explore developing scripts that would base global document property changes when a capstone document, such as a project acceptance letter, for example, is added to the library.
External resources may help this process. For example, the Construction Division periodically disseminates an Excel spreadsheet listing completed construction and maintenance projects by CSJ and completion dates among other categories. This data could be incorporated in scripts that run against the repository and update status properties for the affected documents.

**Securing the Record**

Security settings for declared records are imposed to preserve their integrity and limit access during their retention, reducing risks of inadvertent changes to, or loss of documents. It may be possible to accomplish this at the same time the record is declared.

Optimally, access to a record during retention is restricted to the EDMS system administrator. If business processes require retrieval of documents from storage, read-only access should be limited to specific individuals. To support legal inquiries concerning the integrity of records retained in the EDMS, OPRs should maintain a list of these persons, the specific record types they are authorized to access, and their rights to the documents.

**Including EDMS in Periodic Records Management Procedures**

Most routine procedures used to identify records eligible for destruction are managed on a date basis, typically at the turn of the fiscal year. Part of this procedure should include performing queries to report records eligible for destruction on the basis of their document status and date properties. Responsible persons then review the reports and authorize destruction of records or request withholding of destruction for specific records or documents.

In the case of reference files or documents retained indefinitely or “AV” (as long as they have administrative value) annual reviews afford owners the opportunity to reevaluate the need to retain the document.

OPRs can define the parameters of the reports. In some cases it may be sufficient to simply identify the record type and list specific identifying information, for example, denoting purchasing records for a specific fiscal year with a list of PO numbers.

Other queries may require specifying a listing that includes specific component documents.

Procedures used to report the records should include a global revision of the document status property to “Delete” and a review of documents against the EDMS file plan to identify any documents to be withheld for state archives review. Owners choosing to retain specific documents should revise the document status property to “Reference File” and enter an explanation for withholding the document from destruction in the “Document Comment” property.

In cases where certain selected documents are routinely retained for a longer period than other documents in the record type, the longer retention value may be established in the file plan, which can permit the use of the file code to exclude the document from the global document status property change, and report of documents eligible for destruction. See the following discussion on the EDMS file plan.

**Reporting Records to be Destroyed**

Once the eligible records have been reviewed and approved for destruction, a report should be generated and attached to Form 1420, Records Destruction Log, for submission to Records Management. The report can make use of properties in the EDMS database and fields in the EDMS file Plan, and should include the record type, record date, the retention code (Trigger Date and Years field from the EDMS file plan), and a reference to the agency item number on the records retention schedule (also in the file plan).

**Deleting the Records**

On completion of the report of records authorized for destruction, the EDMS system administrator may proceed with deletion of the records with the document status property "Delete."

**Using the File Code Property**

When users select a record type and a document type when adding documents to the library, the selections associate the document with a file code—a unique numerical identifier that relates the document to a retention rule. The Excel EDMS File Plan spreadsheet also includes the retention trigger event, the number of years the retention is required, archival requirements (if any), and a citation to the TxDOT records retention schedule. System administrators can select fields from the file plan for developing stored queries or scripts to accomplish operations on documents and collections of documents (records) in the library.

The file plan is posted on the EDMS intranet page and available via links from the ECM SharePoint site as well.

To employ the file plan, replace the "##" in the field(s) with your D/D/O's functional account number (for example, "14" for the Austin district). Agency Item Number citations with a functional account number present refer to a division or office OPR for documents which may have a different retention requirement. In situations where a document exists in both district and division libraries, two separate entries in the file plan exist.

Assigning the functional account number relates the document contents to your specific D/D/O when citing the department's records retention schedule in reports of records eligible for destruction or for attaching to Form 1420 upon completion of destruction. Multiple RRS Item references relate to records retention requirements for specific office operations. Records management can assist in selecting the appropriate reference for the particular library application being developed.

**Controlling EDMS Costs**

EDMS employs server-based technology which, in the current environment, represents a considerable cost to the department. While conscientious observance of file management/records retention and destruction procedures offers the possibility of establishing some equilibrium in storage requirements over time, the trend will be toward increasing storage needs as reference files of indefinite retention ("archival" files) are added.

Not all documents belong in an EDMS, and careful planning before implementing the technology can help to manage costs associated with the system. More detailed information on planning for EDMS is available in an EDMS Planning Handbook.

Alternative approaches toward the management of archival files can reduce costs and improve security. Mass storage drives are inexpensive and can be duplicated with backups maintained in a separate location. Immediate online access is probably not that important for records stored in these devices, and the drives may be accessed "nearline"quickly enough for the majority of business processes that may need to call upon their contents.

## 5: Using a File Plan

### Definition and Content

All TxDOT office or work units are required to develop and maintain a file plan. Records custodians must certify the currency and accuracy of their file plans to the DDO Records Administrator, who, in turn must certify the currency and accuracy of their organization's file plan to TxDOT Records Management.

The file plan discussed in this section is distinct from the EDMS file plan. A file plan is an index and a location guide to the information in files. It identifies record copy files to manage in accordance with the records retention schedule, retention requirements, and includes records being retained.

File plans must be reviewed and revised as necessary to maintain their utility for locating files. They can serve as a running inventory of an office's records.

The standard department file plan is an Excel spread sheet that includes the following file plan information.

**Table 4-1: File Plan Content**

| Block | Description |
|---|---|
| Record Type | The record type may be a general description or a specific file name. |
| File Title/Description | File titles or descriptions identify major groups, minor groups and individual file fold may also appear on file guides in file cabinet drawers. Include instructions for stand as applicable. |
| Location | Files may be located in a variety of places. The file plan should guide users to the rig statement may suffice. Larger offices may need to develop a numbering system for layout of the file cabinets with the file plan. File plans for electronic files may includ Document Class and Record Type properties in the EDMS.<br>The following procedure is an easy way to copy and paste files in a shared drive:<br>1. Open a blank worksheet in Excel with a wide column A.<br>2. Open the shared drive and select List View.<br>3. Highlight all folders.<br>4. Right click and select Copy as Path.<br>5. Paste to the first column and row in the spreadsheet. Note: The folders may no Highlight the column and select Sort A to Z.<br>6. Create enough rows in the file plan template to accept the folder list.<br>7. Copy and paste the folder list to the file plan. |
| File Organization Description | Describe how files are organized. The description may include records and date ran currency review and certification. |
| Status | Identify record copy files to help file management procedures related to retention a |
| Retention | Enter retention periods for record copy files. Although information and convenienc needed, some offices include retention periods for them on the file plan if it is impo |
| RSS Item | For record copy files, the agency item number from the TxDOT records retention sc destruction log after purging files. Having it on the file plan is a convenient referenc |

The following figure illustrates the file plan formats.

FY 20YY
FILE PLAN
DDO. Section Office/Unit
Effective Date mm-dd-yy

| ELECTRONIC FILES | | | | |
|---|---|---|---|---|
| **LOCATION** | **DESCRIPTION/REMARKS** | **Rec Copy?** | **RETAIN** | **RRS ITEM #** |
| **T:\Main Folder Name (i.e., "XYZ Program Files")** | Drive location and general description of contents. In this example, files related to program management. | | Retention Requirement | Records Retention Schedule citation. |
| Folder Name | Description of contents. (Users can access the folder to view file contents). | R | AV (Min. 3 yrs.) | |
| Folder Name<br>Sub folder name<br>Further sub division | It may be desirable to describe the file structure in greater detail. | R | US/AV | |
| Next folder name | | | | |
| **T:\Additional Main Folder Name(s) (i.e. "XYZ Operations Files")** | | | | |
| IAC and Service Cost Monitoring | Interagency contract and services cost tracking spreadsheets | R | AC+4 | ##ACF09 |
| Reports | Fiscal and Production reports. | R | FE+1 | ##ADM08 |
| **EDMS** | General description of record content maintained in the EDMS. Description may include primary indexing/retrieval criteria. | | | |
| Record Type | General content description may be taken from the EDMS record type glossary and may include primary indexing/retrieval criteria for the specific record type. | R | Code | Citation |

| HARD COPY FILES | | | | | | |
|---|---|---|---|---|---|---|
| **CODE/ Folders** | **FILE DESCRIPTION** | **LOCATION** | **REC COPY ?** | **RETAIN** | **RRS ITEM #** | **REMARKS** |
| **1. ABC** | **FILE GROUP NAME (i.e., "OFFICE ADMINISTRATION")** | Office bay cabinet # or individual office. | | Retention Requirement | Records Retention Schedule citation. | Folder numbers with an asterisk do not need to be changed annually. Contents may be reviewed for purging on a periodic basis. |
| **Folder** | **Title** | | | | | |
| 1 | File Plan | | R | US/AV | ##ADM37 | |
| 2* | Folder Title | | | | | |
| **2. DEF** | **FILE GROUP NAME** | | | | | |
| 1* | Folder Title | | | | | |
| 2 Etc. | Folder Title | | | | | |
| **3. GHI** | | | | | | |
| 1 | Folder Title | | | | | |
| 2 Etc. | Folder Title | | | | | |

NOTES:

Page 1 of 1

Coordinating review and acceptance of the plan during its development among those who are responsible for and/or use the files helps to ensure filing accuracy. The file plan is a dynamic document that should be revised as needed.

**Certification**

The Records Custodian shall certify the accuracy and currency of the file plan and forward a copy to the DDO Records Administrator. TxDOT Records Management sends an annual reminder to DDO Records Administrators to have their respective Records coordinators review and certify the currency and accuracy of their file plans. When local review is completed, the Records Administrator shall send an email to TxDOT Records Management certifying the currency and accuracy of the file plans within their organization.

**Distributing the File Plan**

Keep a copy of the file plan available at a central location for reference by employees. Making the plan available in an office's shared drive or on an intranet site is an efficient method of dissemination. In hard-copy files, it may be helpful to insert a copy of the file plan at the front of each file drawer.

NOTE: It can also be helpful to maintain a file of previous file plans to use when records need to be retrieved from storage.

**Support for Discovery and Open Records**

DDO records administrators should maintain a file of current and recent file plans for their organizations to aid compliance efforts related to legal discovery and open records.

Electronic Records

**Definition of Electronic Record**

An electronic record is any information created, used and retained in a form that only a computer can process. Electronic records include email, text messages, disaster recovery backup tape, and records that exist on portable media, such as memory sticks, BlackBerry devices, or PDAs. Records related to department work that may be produced or kept on personal devices away from the office are considered **state** records, and are not the employee's personal property.

Any state record may be created or stored electronically. Certified output from electronically digitized images or other electronic data compilations is accepted as original state records by any court or administrative agency of this state unless barred by a federal law, regulation, or rule of court.

The definition of a record can range from a single document to entire files of different types of applications and media related to the conduct of official business. In this chapter, the term record and file may be used interchangeably to describe official records, as distinguished from the use of these terms to describe specific data sets in the computing environment.

- defines electronic records,
- summarizes requirements for managing electronic records,
- discusses practical procedures and best practices for managing electronic records during the inactive portion of their life cycle,
- discusses management of email records,
- discusses records management planning in the development of electronic document management systems, and
- Discusses risk management and electronic records.

Vital Records

**Vital Records**

Vital (essential) records, as defined in the Preservation of Essential Records Act Texas Government Code, §441.056, are records that, following a disaster, are necessary for the department to

- resume or continue operations;
- reaffirm authority and activity, including legal and financial positions; and
- protect the rights and interests of the department and its customers.

Although all state records serve a purpose, only about 5 percent of an agency's records are truly vital as defined above.
The Act requires each state agency to identify vital records, and to be able to rapidly reconstruct vital records from backup copies after a disaster. This chapter contains information on identifying and protecting vital records.

**Identifying Vital Records**

Vital records are **only** those records that are essential for TxDOT offices to carry out their responsibilities following a disaster. Vital records are identified in the TxDOT records retention schedule.
Vital records may consist of

- **operational** records necessary to resume or continue operations;
- **legal** records for proof of authority or activity;
- **fiscal/financial** records, especially those related to receivables; and/or
- **governmental** records necessary to protect the rights and interests of the department, its employees and the public.

**Responsibility for Vital Records**

**Offices that maintain vital records are responsible for**

- identifying vital records and making sure they are listed as vital on the TxDOT Records retention schedule,
- implementing vital records protection procedures to back up vital records, and
- advising the TxDOT records management officer on backup records locations, contacts and sources for records retrieval and reconstruction.

**Common Vital Records**

Vital records are not necessarily permanent records or records with archival value. Vital records may be vital for only a part of their total retention.
Common vital records include the following:

- active contracts and agreements, with all amendments and supporting documentation
- financial records
  - accounts receivable (vendors will provide copies of lost or damaged accounts payable)
  - loans or money transactions
  - general ledgers
  - records proving payment
- employee records
  - payroll
  - benefits
- operations and manufacturing records
  - engineering drawings
  - in-process project records
  - research and development notes, reports, plans, formulae
  - production/design specifications
  - equipment inventory
- negotiable instruments
  - checks
  - bonds

  - notes
- ownership records
  - deeds
  - titles
  - leases
  - patents and trademarks
  - licenses
- insurance policy information

If a record you consider vital is not identified as vital on the records retention schedule, annotate your file plan or record copy responsibility list to make employees aware of the need for special handling for the records. You may also include the following:

- **Special instructions.** For example, the record may be vital only for a specific period of time within a longer retention period.
- **Backup protection.** If the backup protection method is dispersal through **routine** distribution, indicate the department offices that are the primary and secondary contacts. For districts, this may include both a building within the district and an area office or Austin headquarters division which may have a copy as part of routine operations. If the record is dispersed through **planned** distribution, indicate the location of the backup copy. Additionally, note any special storage equipment used and its specifications.
- **Persons authorized to access the records.** If the records are kept in secured storage, include information on contact persons for access.

Disaster Recovery Planning

**General -- Steps in Disaster Recovery Planning**

Disaster recovery planning includes the following steps:

- disaster prevention measures
- development of a disaster recovery plan
- development of disaster recovery and records salvage procedures, as part of the plan

**Definitions**

A **disaster** is generally defined as an event that causes widespread destruction and distress.

When a disaster causes the irreparable loss of information, it may be called a **catastrophe**. This chapter contains information that can help prevent disasters and help to keep any that may occur from becoming catastrophes.

Disaster Prevention

## Recognizing Threats to Records

Recognizing potential threats to records can help prevent disasters. The four most common threats to records include the following:

- fire
- water
- theft and sabotage
- adverse environmental conditions
  - flood
  - tornado or hurricane

- earthquake

Other threats include the following:

- civil disaster
- accidental destruction
- neglect
- misplacement
- deterioration by age

## Methods of Protection

The table below lists the four most common threats to records and ways to protect records from damage.

**Record Threats and Methods of Protection**

| Threat | Protection |
|---|---|
| Fire | To minimize chances that a fire will start and maximize chances for quickly extinguishing any fires that do start:<br>• Do not store records near a heater, radiator or other heat source.<br>• Prohibit smoking in record storage areas.<br>• Do not store records with chemicals, cleaning supplies, etc.<br>• Remove paper clutter from storage areas.<br>• Observe approved records retention periods to ensure the timely destruction and removal of records,<br>• thereby reducing the amount of potential fuel.<br>• Make sure electrical wiring is safe. When possible, avoid the extended use of lighting or equipment with cords around<br>• storage areas. After using such appliances, unplug them before leaving the area.<br>• Comply with all local fire, electrical, plumbing, heating and construction codes.<br>• Have fire extinguishers available near the records. Have them inspected regularly, and train staff to know where they are located and how to use them.<br>• Clearly mark escape routes and exits. Hold regular fire drills to practice emergency procedures.<br>• Periodically evaluate fire prevention systems in use, such as smoke detectors and/or sprinkler systems.<br>• Try to store records against an outside wall. In fires, structures tend to collapse toward the center where fire burns hottest and longest. |
| Water | Water damage may occur as a result of other forms of disaster. Water damage and flooding often occur as a result of efforts to put out a fire. Winds and wind-driven rain can break windows and damage records. Also, routine structural failures such as backed-up drains and sewers, or broken pipes, can cause water damage. |

| | |
|---|---|
| | To reduce the likelihood of water damage to records, do the following:<br>• Avoid storing records in basements, under water pipes, or directly on the floor.<br>• Locate all drains and have them checked regularly.<br>• Regularly inspect the sprinkler system, and check the general condition of the records storage site for susceptibility to flooding.<br>• Look for any potential water hazards during routine inspections of plumbing.<br>• Do not install carpet in storage areas. It retains moisture, prevents drainage and, if wet, will create humidity and temperature problems.<br>• Try to store records in an area without windows. |
| Theft and Sabotage | Security is the key to protecting records from theft and sabotage. Consider the following when determining who will have access to individual record series:<br>• whether the records are classified as open or confidential<br>• characteristics of the record medium<br>• whether the records include vital records<br>• physical features of the building where the records are used or stored<br>Conduct an initial security analysis and periodic evaluations of security in records storage areas and active files areas. The following basic protective measures will improve security:<br>• Determine who needs access to specific record series and limit the number of employees who handle these records.<br>• Limit access to record storage areas.<br>• Be aware that terminated employees may pose security risks. Be sure they turn in all relevant identification and keys before leaving.<br>• Ensure that all access control systems, intrusion detection systems and alarm systems receive regular maintenance.<br>• Make security checks at closing time to ensure all exits and windows are locked, all equipment has been turned off or unplugged, all lights and water faucets are off, no cigarettes are smoldering in ashtrays and no unauthorized persons are in the building.<br>• Keep the exterior of the facility well lit at night.<br>• Establish procedures to follow in the event of theft or vandalism. |

| | |
|---|---|
| Environmental Conditions | The most important factor in protection from environmental conditions is avoidance of extremes. Avoid storing records in attics, basements or warehouses that are not in some way climatically controlled. To help retard natural deterioration, provide at least the following:<br>• air-conditioning<br>• air circulation<br>• temperature stabilized within a range of 60-75 degrees Fahrenheit<br>Most modern paper deteriorates continuously due to high levels of paper acidity. Atmospheric pollution intensifies this problem. Microforms and magnetic media may deteriorate unless there are controls for temperature, humidity, pollution and light. Some protective measures in addition to the above are to<br>• avoid storing records in areas where there is smoke, dust or chemical fumes produced by paints or copying devices,<br>• protect all records from direct sunlight and bright lights,<br>• keep the storage area free of food, beverages and plants to avoid soiling the records or attracting insects or rodents. |

Developing a Disaster Recovery Plan

**General -- What the Plan Involves**

Districts, divisions, and offices should develop a written disaster recovery plan appropriate to their own operations. Even minimal preparation can have a significant impact on the success of efforts to recover TxDOT records.

The following pages contain information to use in developing a disaster recovery plan.

<u>Developing a disaster recovery plan involves</u>

- stockpiling emergency supplies and arranging services,
- establishing a disaster recovery team,
- developing disaster recovery and records salvage procedures,
- Contingency planning.

**Emergency Supplies and Services**

In an emergency, self-reliance is critical. In any major disaster, TxDOT is likely to have to assist with recovery efforts for other agencies and the public while managing its own recovery.

Initial disaster recovery plan development should include:

- stockpiling emergency supplies,
- Arranging necessary services to aid in disaster recovery.

Check supplies and re-confirm service agreements periodically. After a wide-scale disaster, these resources may not be readily available. Suppliers or service organizations may have their own damages to deal with, or they may be helping someone else.

**Disaster Recovery Team**

Department offices should establish in-house disaster recovery teams to resume or sustain operations after a disaster, including handling recovery of their records. The teams should develop and practice disaster recovery and records salvage procedures. Teams may also want to train office employees in disaster recovery.

Each team member should have two copies of the office's disaster recovery plan, one at the office and another at home.

**Recovery Team Responsibilities**

Ideally, a disaster recovery team should consist of at least four members, including a team leader. Each team member should have an alternate.

Responsibilities of team members are as follows:

- Team leader: Acts as point of contact for local emergency service agencies; performs overall management of the team's disaster recovery and records salvage procedures; coordinates with other offices; authorizes expenditures for wages, supplies, transportation and services; and is liaison with TxDOT customers and/or the public.
- Recovery and salvage supervisor: Assembles, trains, and directs work crews for recovery and salvage procedures. Controls the flow of work and materials.
- Coordinator of Enterprise Content and Records Management, (ECRM): Assembles supplies and equipment and may arrange such things as food for work crews.
- Record keeper: Inventories damaged records. Assesses damage and salvage required. Performs or supervises recovery and salvage procedures.

**Disaster Recovery and Records Salvage Procedures**

Each district, division and office is responsible for developing emergency procedures to follow in a disaster and making sure employees are familiar with them.

Include these essential procedures in any disaster recovery plan:

**1. Activate Recovery Team -** Once the building has been declared safe to enter, the team leader should contact the team and brief them on procedures and priorities to be met. The recovery team should then

- assign specific responsibilities to members;
- set up a communications center and obtain services, supplies and equipment;
- make arrangements to take care of physical needs (food, water, hygiene) of personnel involved in the recovery.

**2. Establish Security and Safety -** For security and safety, restrict access to damaged area(s), allowing only essential personnel to enter. This minimizes opportunities for further damage to records and injuries to personnel. Use security guards, sign-in/out registers, and/or identification badges to restrict access.

Basic safety precautions include the following:

- Inspect disaster areas for hidden hazards, such as shorted motors or broken electrical wires.

- Avoid standing water and wet carpets, which make it dangerous to use electrical equipment.
- Install and use temporary wiring properly.
- Handle fire- or water-damaged files carefully. Wet records are heavy and fragile. Use care lifting record boxes or opening file cabinets.
- Use face masks and protective gloves. Wash or clean clothing as soon as possible to reduce health hazards from fungi and bacteria.

**3. Assess Damage** - Inspect damaged areas as quickly as possible. Avoid handling records, if possible. Take photos to document record damage. Keep the following questions in mind:

- How much damage has occurred?
- What kind (fire, smoke, soot, clean or dirty water, heat, humidity)?
- Is it confined to one area or is the entire building damaged?
- How much of the records holdings are affected?
- What type(s) of records media have been damaged (paper, microforms, photographs, magnetic tapes, diskettes)?
- Are the damaged records easily replaced? (Are backup copies stored off-site? Are the damaged records convenience copies? Can they be replaced with copies from other offices?)
- If the damaged records are irreplaceable, what is their value? (How important are these records to the business of TxDOT?)
- What is the order of priority to recover damaged essential records?
- Can the in-house recovery team salvage records or is outside help needed?

NOTE: Take steps to stabilize the environment while assessing the damage (see below).

**4. Stabilize Environment** - Take steps to stabilize the environment while the damage assessment is taking place. Mold can appear on records in 48 hours and is encouraged by high humidity and temperatures. Quickly reducing the humidity and temperature can reduce the risk of mold and buy time for recovery.

The following procedures will help stabilize the environment:

- Keep the air constantly circulating.
- Arrange fans to expel humid air outside.
- Use dehumidifiers if they are helpful. (Dehumidifiers may help in small, enclosed areas. Operating them may raise the temperature, however, and they tend to freeze up in colder temperatures.)

Immediately pump standing water from the area. Use caution -- standing water can conceal hazards. Remove wet debris and carpeting. The following equipment should be readily accessible:

- portable generators, in case of power failure
- shop vacuums capable of handling water (pumps may be needed to remove large quantities of standing water)
- fans to circulate the air
- thermometers, hygrometers or other tools to measure temperature and humidity

**5. Treat Water-Damaged Records** - Water-damaged records are the records most likely to be salvaged. See the next table for methods of treating water-damaged records.

**6. Perform Post-Disaster Assessment** - Assessing the disaster recovery plan is essential. Share the results with districts, divisions and offices and revise the plan if needed. Assess the following:

- effectiveness of recovery procedures
- areas for improvement
- sources and supplies
- any off-site facilities used

**Salvaging Water-Damaged Records**

The records most likely to be salvaged after a disaster are those that have water damage. A number of options are available for treating water-damaged records. The steps to follow vary according to the record medium and are described below.

**Paper -** When paper records are slightly damp, air-drying (natural drying) may suffice. If records are soaked, they should be freeze-dried, regardless of quantity.

- Air-drying: To air-dry paper records, hang the paper on lines. You may want to interleave pages with special blotter paper as a preliminary step before hanging the paper.
- Rooms used for drying areas should have good air circulation and low humidity. Use fans, dehumidifiers and/or air conditioning. Handheld hair dryers (set on cool) may be used to speed drying.
- Freeze-drying: The most effective procedure for stabilizing water-damaged records and archival materials is to blast-freeze them to a temperature of -20 degrees F, and then dry them using a thermal vacuum process.
  Freezing allows time to estimate recovery costs, prepare and coordinate subsequent steps in the drying and recovery operation, and clean up the disaster site. In addition, freezing stabilizes water-soluble materials (inks, dyes, etc.), that may disperse during air drying.
  Thermal vacuum drying causes water to pass from a frozen state to a vapor without returning to a liquid form. It reduces stains and removes the odor caused by smoke. Determining a source for thermal-vacuum drying services should be part of disaster planning. The Blackmon-Mooring Steamatic company (in Austin) has special vehicles that can travel to remote sites to perform this service. (Many carpet cleaning/water removal services can perform the service or suggest vendors who can.)

**Microfilm** - In recovering microfilm or microfiche, speed is essential to avoid the breakdown of film emulsions and the onset of bacterial growth which destroys images.

Immerse the film in clean, cold, preferably distilled water. Send the film to a professional laboratory for cleaning. Generally, film should not be frozen because ice crystals may harm it.

**Electronic Media -** Off-site storage of backups is the best possible disaster recovery strategy for electronic records. If electronic records on portable media are water-damaged, do not use them until they are thoroughly clean and dry and their housing or containers have been replaced. This reduces the possibility of damage to equipment, especially for disk drives.

**Diskettes** require the following steps:

- To clean and dry, do the following:
  - Drain.
  - Remove from jackets.
  - Rinse in distilled water.
  - Blot with lint-free cloth.
  - Air-dry approximately eight hours.
- When diskettes are dry, do the following:
  - Insert into a new jacket.
  - Copy information on damaged diskettes onto new diskettes.
  - If information copies correctly, discard damaged diskettes.
  - Clean copy equipment drive heads to prevent permanent damage to the heads.

**Magnetic Tape** that has become wet has a good chance for recovery through these steps:

- Hand dry all external surfaces with a soft, lint-free cloth.
- Air-dry the tape using a tape cleaner or winder to run the tape from reel to reel.
- Consult a company that does magnetic tape restoration.

**Compact Disk or other Optical Media** require these steps:

- Clean any dirt or debris from the disk using a disk cleaning solution.
- Hand dry all external surfaces with a soft, lint-free cloth.

**Contingency Planning**

Contingency planning combines emergency preparation with routine office procedures to help the office continue operations with as little interruption as possible after a disaster.

The real disaster is failure to prevent avoidable situations.

<u>For effective contingency planning, do the following:</u>

- Keep your office file plan up-to-date. Know which records your office has record copy responsibility for, and be ready to carry out disaster recovery and salvage procedures for those records.
- Be aware of alternate locations for records. You may use this information to replace records quickly after a disaster. District and division offices that are related by function are often alternate locations for the same record, even though only one office may be designated as the office of record. Part of a disaster preparedness plan could include:
  - notation of alternate locations on the file plan, or
  - securing a copy of any procedures manual or internal office procedural material that may include information on alternate locations for records.
- Keep a current list of contact persons for various types of records.
- Keep identification and protections for vital records current. Carry out vital records protection as described in Chapter 6, "Vital Records" in a disciplined manner.

- Back up electronic records routinely and frequently. Dispersal of a second backup copy at another, off-site location is a good protective measure.

Inactive Record Storage

Generally, only active records need to be maintained in office space. A common measure for identifying active records is one reference per month per file or file drawer. Records kept for a specific period of time during which they are most likely to be referenced, (for example, the current fiscal year) may also be considered as active. Proper implementation of the TxDOT records retention schedule and use of inactive records storage

- reduces the volume of records and the equipment and space needed to accommodate them,
- increases the filing and retrieval efficiency in the office,
- minimizes the cost of storing official department records for the required retention period,
- preserves accessibility to records during their required retention periods, and
- ensures proper coordination and documentation of the destruction of official state records.

**Records Eligible for Storage at a Records Center**

Only official record copy records or files of Austin headquarters divisions and offices listed on the TxDOT records retention schedule are eligible for storage at a the records center. Districts should maintain a similar policy for storing records to conserve resources.

Information or convenience records or files are ineligible for storage, since they can be disposed of without formality once their administrative value has been met.

A record series with a retention code of AV (as long as administratively valuable) is not eligible for records center storage unless a specific retention period and destruction date is assigned to it.

For assistance contact TxDOT Records Management by e-mail from the link on the records management intranet site or at the phone number on the site.

**Storage Locations**

Eligible records from headquarters divisions or offices are stored at the TxDOT records center at 2000-A Centimeter Circle in north Austin.

Districts may store inactive records locally or at off-site storage facilities.

**Selecting Records for Storage**

Points to consider when evaluating whether to transfer records to storage include:

- volume of records and required minimum retention period
- how frequently the records are needed or used
- the urgency of need when they are required
- time required for retrieval
- availability, cost and use of office space and filing equipment vs. the lower cost of storage
- viability of imaging (in Chapter 9, Section 1, Storing, Scanning or Microfilming?) as an alternative to hard copy storage.

Microfilming Records

**Introduction and General Guidelines**

Sections 441.188 and 441.189 of the Government Code authorize agencies to retain records on microfilm or electronically. Document imaging involves the conversion of hard copy original documents or records to an alternative medium. Records with permanent or long term (more than 20 years) retention periods or archival requirements may be retained on microfilm. Offices choosing to microfilm records may obtain those services through a purchase of services. This chapter contains guidelines for microfilming. See Chapter 5, "Electronic Records," for information on electronic imaging.

**Storing, Scanning or Microfilming?**

The majority of department records require retention for fewer than five years. For all but permanent or archival records, storage in the original format is the easiest and cheapest way to retain hard copy inactive records until their destruction date.

Scanning records to an electronic system has replaced microfilming of hard copy files that require lengthy retention as a standard department practice. Scanning is most efficient when done at the time a record would ordinarily be filed. Batch scanning of files for electronic storage is almost as labor-intensive as microfilming.

The space-saving and distribution advantages of microfilm can be achieved by electronic imaging without incurring the limitations of film. Microfilming is labor-intensive and expensive. Managers should carefully evaluate the actual need to use microfilm. Considerations include the manpower to prepare and index the records for microfilming, to inspect the microfilm product after filming and the cost, availability and maintenance of equipment to store and read or print copies from the microfilm.

The following table describes the advantages and limitations of microfilm.

| Advantages | Limitations |
|---|---|
| • **Space savings.** Microfilm concentrates a large volume of information in a small package. One 250-foot roll of 16 mm microfilm can hold the equivalent of a document storage box of records (up to 4,200 8-1/2-by-11-inch pages or images). Nine 100-foot rolls can store the equivalent of one five-drawer file cabinet (25,000 8-1/2-by-11-inch pages or images).<br>• **Low cost distribution.** Microfilm is inexpensive to duplicate.<br>• **File integrity.** Once filmed, all records in a file are together, and individual records cannot be physically removed, lost or misfiled. Any alterations are apparent.<br>• **Security.** Duplicate security copies can be stored in a separate place<br>• **Archival preservation.** Microfilm may be used for reference in place of original documents and can offer an increased life span. | • **Expense.** Microfilm is expensive and labor intensive to create.<br>• **Unclear copy.** The quality of the original record affects the quality of the filmed image. Old, faded or damaged documents may not reproduce clearly. Colors do not appear, and it may be difficult to tell whether a filmed record is the original. Official certifications and explanatory notes filmed with the records on target sheets can address these limitations to some extent.<br>• **Equipment requirements.** Microfilm requires equipment ranging from simple readers that cost as little as $150 to highly advanced reader/printers that can cost up to $30,000. Continuing availability of equipment and service support over time may present difficulties in using microfilm for archival preservation.<br>• **Environmental storage considerations.** Microfilm will deteriorate if it |

| | |
|---|---|
| • **Convertability.** Microfilm images may be converted to paper or, with proper equipment, digitized. | is stored in an environment that does not have temperature and humidity controls. See "Storage Environment" in this chapter. The product of deterioration, acetic acid, may present a workplace hazard to employees.<br>• **User resistance.** Using microfilm and microfilm equipment for any length of time can be tedious. |

**Microfilm Formats**

The most commonly used microfilm formats include:

**Roll film:** The most economical microform, 16 mm width is typically used for documents, and 35 mm widths are used for larger format documents such as drawings or maps. Roll film ensures file integrity and is best used for long-term storage of inactive records.

**Microfiche:** A sheet of 105mm film (usually 4 inches by 6 inches) that can contain at least 98 images (depending on the size of the originals), microfiche is best used for frequently referenced files. An eye-readable label makes retrieval easier. Because a microfiche is a single unit, it provides reasonable file integrity. It is moderately expensive to produce, although a microfiche reader is the least expensive type of microfilm reader. Microfiche, jackets (transparent cards 4 inches by 6 inches with chambers for the insertion of individual frames or strips of microfilm) are typically produced and the customer is furnished a microfiche duplicate for active use. Microfiche, jackets (transparent cards 4 inches by 6 inches with chambers for the insertion of individual frames or strips of microfilm) are typically produced and the customer is furnished a microfiche duplicate for active use.

## 11: Records Destruction

**Authorization for Destruction**

Texas Government Code §441.187 authorizes TxDOT to dispose of any record listed on the approved TxDOT records retention schedule once the required retention period has been met.

NOTE: Records involved in an audit, investigation, litigation or open records request cannot be destroyed until conclusion of the action involving those records.

**Advantages of Timely Disposal**

Destroying records as soon as they become eligible after having met their retention requirement benefits the department by:

- reducing exposure to legal discovery and open records demands,. There is no requirement to produce records that were destroyed in the normal course of business, **as long as there was no anticipated or actual legal action in place at the time of their destruction that would have required us to withhold them from destruction**, and
- reducing the cost of storage (physical space and equipment, virtual space, system performance), since the department now pays an external vendor for server storage

and network bandwidth services. Benefit will also accrue as enterprise FileNet libraries accumulate content over time.

**Records Eligible for Destruction**

Official (record copy) records are eligible for destruction when they have been retained for the total retention period in the TxDOT records retention schedule. Non-record convenience or information copies and e-mail of a transitory nature may be destroyed without formality once their purpose has been served.

**Withholding Records from Destruction**

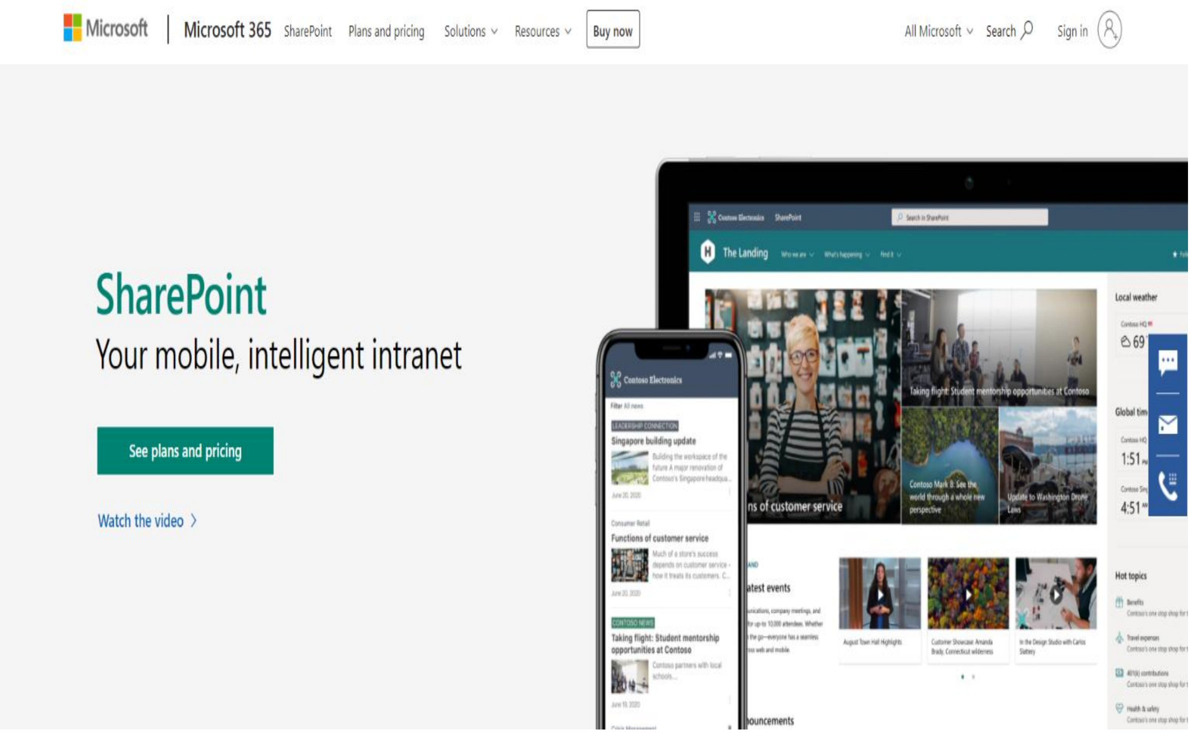
Records involved in an audit, investigation, litigation or an open records request shall not become eligible for destruction until the final conclusion of the action and satisfaction of the retention requirements pertaining to records related to the action. Take steps to identify and preserve records involved in such actions as soon as you become aware of the possibility of the action, and include steps to verify conclusion of any actions during review of eligibility for destruction. Coordinate with the Office of General Counsel (OGC) to determine the status of any records subject to a litigation hold before authorizing their destruction.

List of Best File Management Software and Systems:

Below is a list of our picks for the best file management software and systems available today.

- Microsoft Sharepoint
- DocuWare
- ProofHub
- Google Drive
- Alfresco
- M-Files
- OnlyOffice
- LogicalDoc
- Dokmee
- Hightail

**#1. <u>Microsoft Sharepoint</u>**




Next up is Sharepoint, a file management system by Microsoft. SharePoint empowers teams to store all company knowledge- documents, files, content, etc and find anything they need quickly. SharePoint allows team members to create dynamic team sites for projects, departments, as well as division. Inside these sites, employees can share data, news, files, and other important resources and collaborate inside and outside the organization.

With a tool like SharePoint, your employees can become more organized, and productive by having their files centrally located in team sites. Apart from being an amazing file manager, Sharepoint also combines many aspects of a calendar tool, messaging tools, project management tools, a company's intranet, cloud storage service, and even a content management system.

The platform is a part of the Microsoft 365 suite of apps and integrates with MS Office, Onedrive, Microsoft Teams, and more to bring all your collaboration in one place.

**Some Key Features of Sharepoint**

- Share files from Teams, Onedrive, and more
- Mobile apps to access files anywhere, anytime.
- Annotate, highlight, and comment on files.

**Pricing:**

- Free with limited functionality
- Paid plans start from $5 per user per month

**#2. <u>DocuWare</u>**


DocuWare says that employees spend 50% of their time searching for documents. If that's the case, we are in big trouble! Don't worry though, Docurware handles all our search worries easily by allowing users to store all documents and files on its cloud-based platform. Document management and workflow automation service, Docuware reduces time wastage significantly and help employees be more productive.

Docuware has advanced document indexing and storage abilities, making it easy to get a hold of your files, no matter where you are. With over 25 years of experience in the industry, Docuware has evolved into a robust file management system and continues to provide a great service.

Along with file management, Docuware automates business processes such as onboarding of new employees, invoice processing, or contract management. Furthermore, Docuware protects your files from unauthorized access by providing regulatory compliance safety features and disaster recovery benefits.

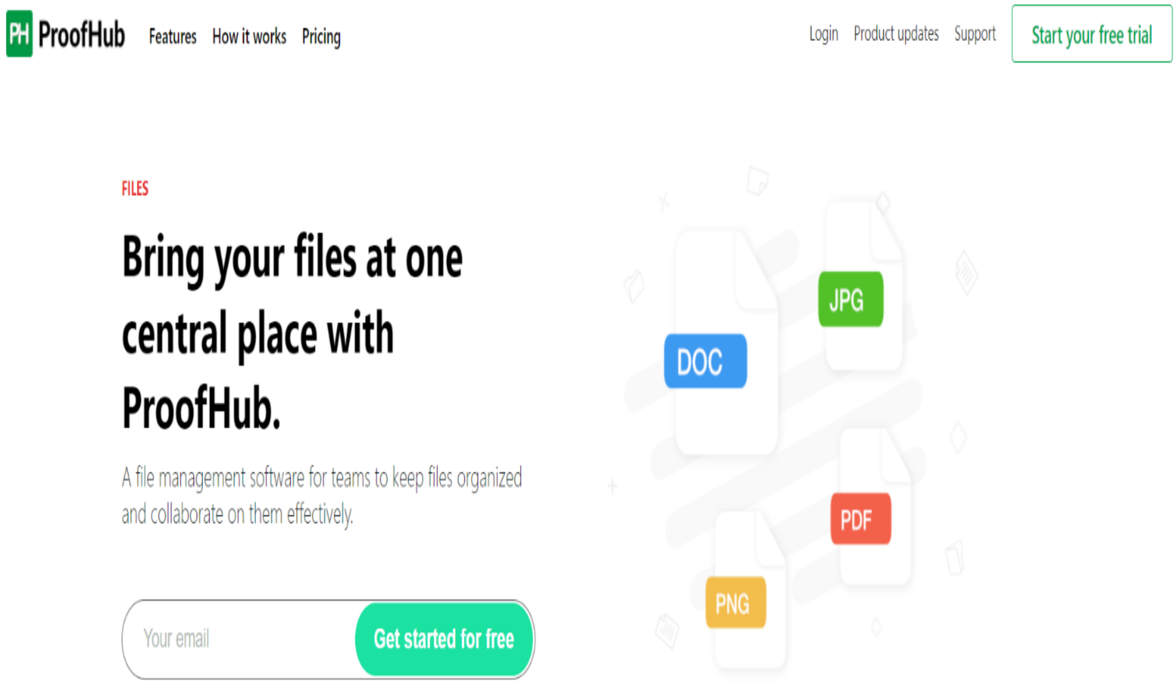
**Some Key Features of Docuware**

- Process planner to plan out business processes
- Barcode scanning and invoice processing
- Integration with other cloud applications like Google Drive

**Pricing:**

- Paid plans start from Cloud Base (Includes 4 named client users with 20 GB storage), Cloud Professional (Includes 15 named client users with 50 GB storage), Cloud Enterprise (Includes 40 named client users with 100 GB storage), Cloud Large Enterprise (Includes 100 named client users with 250 GB storage)

**#3. <u>ProofHub</u>**




When it comes to enhanced team collaboration and simplified project management, ProofHub is a cloud-based SaaS tool that needs no introduction. ProofHub offers a wide range of advanced features under one virtual roof, including efficient ***"File Management Software"***. Project teams also spend a considerable amount of time sorting and organizing their digital files and documents, but ProofHub's File Management system simplifies the whole process.

The software enables project teams to upload, store, and organize all their documents in one place. You can easily access your files, share links and collaborate on them with widely distributed team members. ***"File versioning"*** allows you to store multiple versions of the same file, and ***"Advanced search"*** makes it easy to locate your documents by using relevant keywords and phrases.

You can also use ProofHub's File Management system on your mobile phone.

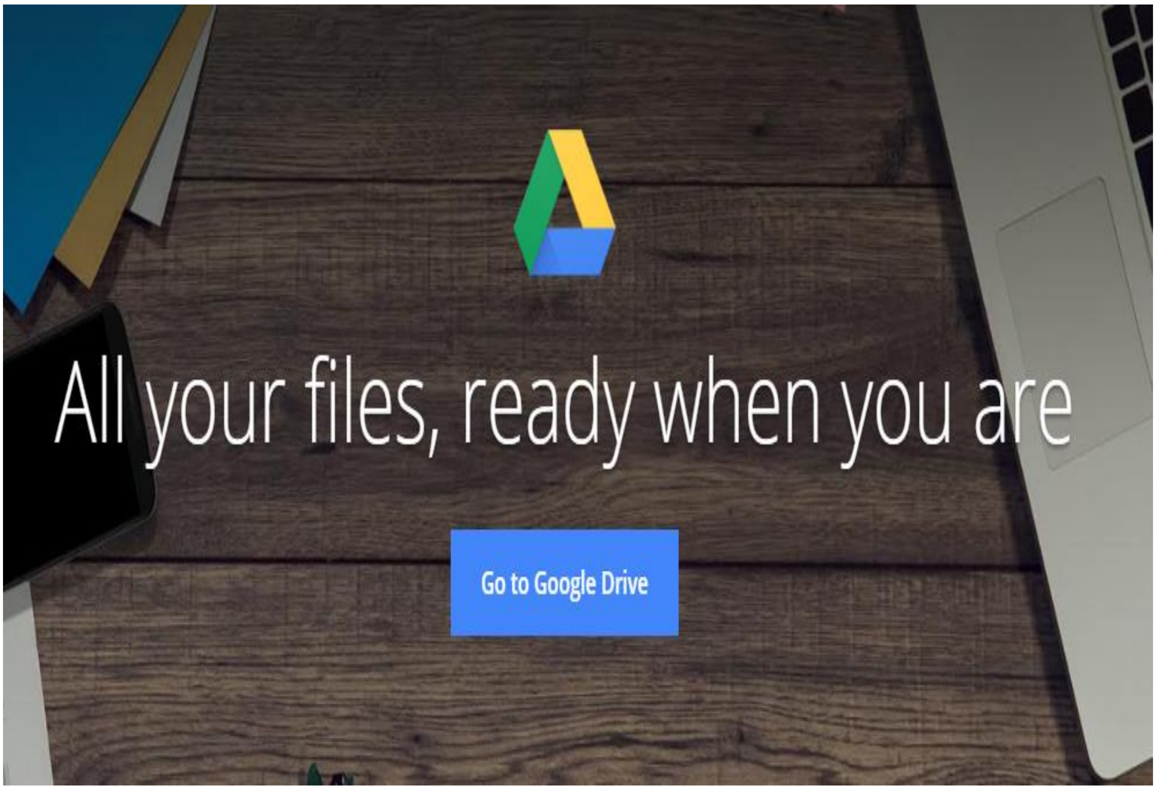
**Some Key Features of ProofHub's File Management Software:**

- Online proofing allows you to review, proof, and annotate files with markup tools
- Attach files and documents to tasks, discussions, chats, and notes
- Real-time collaboration and feedback sharing on files

**Pricing:**

- ProofHub offers two pricing plans – The Essential plan with all basic features at $45/month, billed annually, and the Ultimate Control plan with all basic plus premium features is priced at $89/month, billed annually.

**#4. <u>Google Drive</u>**




Need something casual? Check out Google Drive, a file management system by Goole. Even though not as powerful or robust as other file management software on this list, it still gets the job done and is a great tool for the average user. A free collaboration platform by Google, Drive integrates with Google Docs and Google sheets, allowing you to store all your documents and files inside Drive with one click.

Google Drive offers free 15GB of cloud storage to store all your files and you can upgrade to a pro version in case you need more. The platform is simple and intuitive to use, however it doesn't really scale when you have a large company. Drive also has smartphone apps for both iOS and Android so you can access your files on the go.

**Some Key Features of Google Drive**

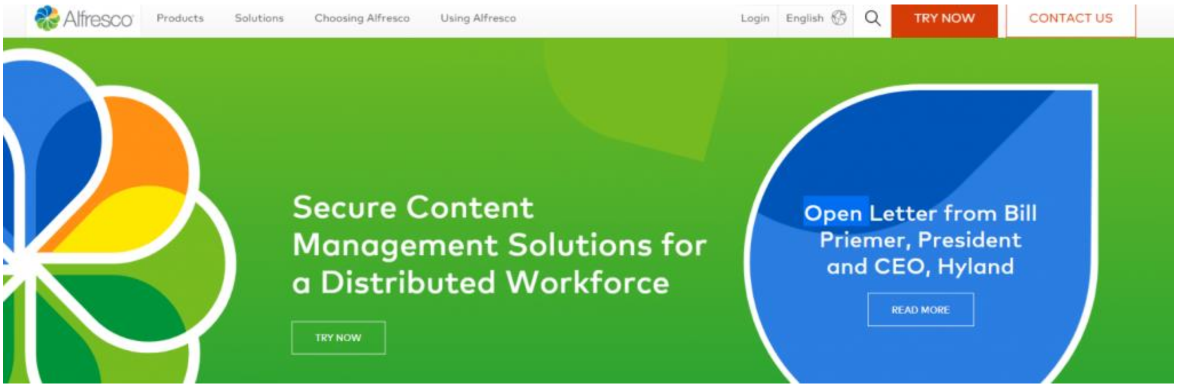
- User-friendly, simple design
- Integrates with Google Docs and Google Sheets
- Perfect for individual users

**Pricing:**

- Free 15 GB storage
- Paid plans start from: 100GB for $1.99, 200GB for $2.99, and 2TB for $9.99 per month.

**Read more: What is Knowledge Management and Why Your Organization's Success Depends on It?**

**#5. Alfresco**




Next up is Alfresco, an Enterprise Content Management Tool aimed to streamline your organization's knowledge. Alfresco removes content silos by providing users a single source of truth for all their data and files. No more searching emails and hard drives for content and documents!

Want to improve your workflow? Alfresco's document management lets employees find, share, and store all important files including legal contracts, marketing assets, customer files, and more. With document scanning and capture, get more out of your documents, and unlock business intelligence like never before. Alfresco's AI and machine learning capabilities can also extract information from AWS. Alfresco is available on the web, on desktop, and via mobile apps.

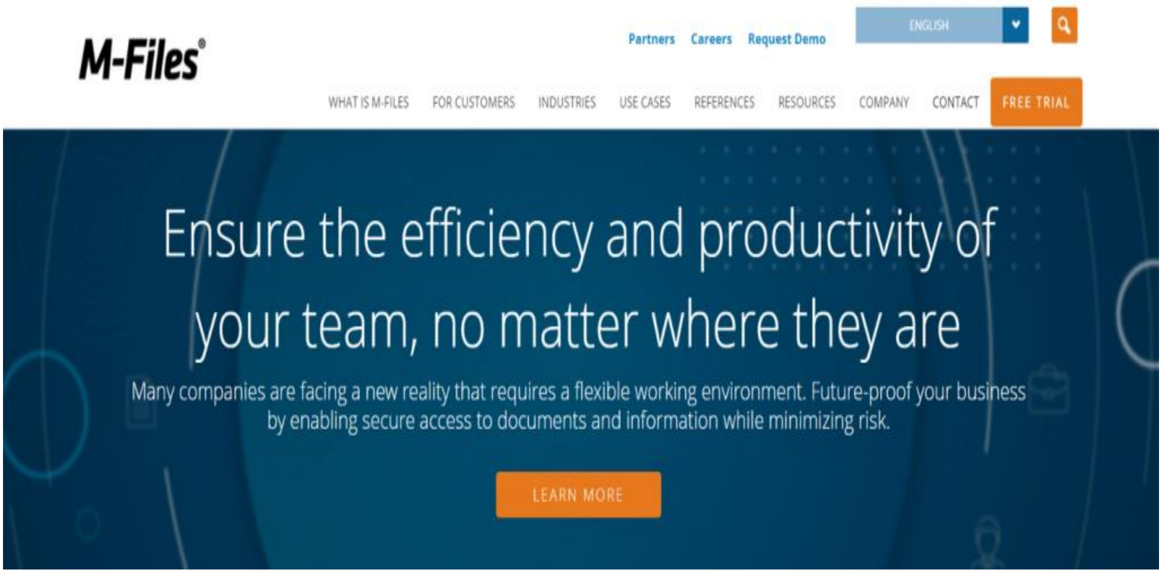
**Some Key Features of Alfresco**

- Smart folders to find information quickly
- Built-in workflows to simplify document review and approval process
- Multiple layers of access permissions for added security

**Pricing:**

- Free trial
- Paid plans start from Starter (supports 100 users), Business (supports 300 users), Enterprise (supports 1000 users)- customized pricing. Contact sales.

**#6. M-Files**




An intelligent information management system, M-Files is next up on our list. The platform organizes company files based on what the file is about and not where it's stored. By creating a central location for all files, M-files allows users to quickly find the file they are looking for, no matter where (desktop, cloud storage services, etc) the file is stored.

Simply tag the file, fill in the metadata, and click save and M-files will easily locate your data and would also notify you of any sort of duplication. M-Files is a platform and device-independent, meaning that users can choose between on-premises, cloud, or hybrid deployment of M-files and simplify their workflow. With enterprise-grade security, you would never have to worry about losing your data with M-Files.

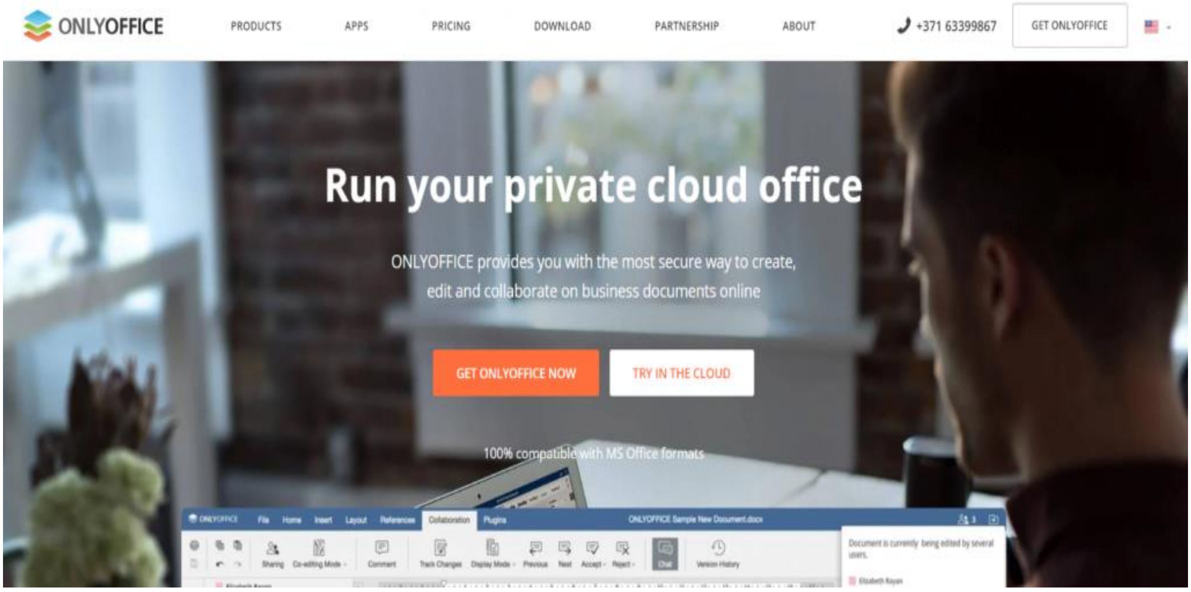
**Some Key Features of M-Files**

- Search across devices, services, and locations
- Cloud-based, on-premise, or hybrid deployment
- Integrates with Salesforce, Sharepoint, Google Gsuite, and more

**Pricing:**

- Contact sales

**#7. OnlyOffice**




OnlyOffice wants your entire office files to be deployed on their platform for easy storage and retrieval. Employees can upload files, documents, presentations, spreadsheets, and other workplace data to Onlyoffice's web app and manage it online. OnlyOffice was awarded as the best document management software of 2018 by PCmag and we aren't complaining!

Apart from storing your files, OnlyOffice allows users to track changes, collaborate in real-time, leave suggestions, and access version history. Supporting all major file formats including PDF, DOC, CSV, TXT, and HTML, OnlyOffice makes sure all your files are secured on their platform.

Users can also connect their cloud storage services like Dropbox or Google Drive to bring all of their data under one roof.

**Some Key Features Onlyoffice**

- Store and play videos in multi-format
- Share files as read-only, review, comment, form filling, or full access.
- Version and revision control system

**Pricing:**

- Free trial
- Paid plans start from Enterprise Edition Start ($1200/server, lifetime access), Enterprise Edition Standard ($2400/server, lifetime access), Enterprise Edition Standard+ ($4800/server, lifetime access).

**#8. LogicalDoc**


Looking for an open-source solution to your file management worries? Try LogicalDoc, an open-source file management system with the bells and whistles of an enterprise document management. LogicalDoc is perfect for those organizations that already have a ton of paper documents lying around and what to convert those into digital documents. The platform is available for deploying as both a cloud-based web app and as on-premise software.

The tool is really easy to use- simply drag and drop files to your dashboard and create your digital file library. With collaboration features in-built, users can create and edit documents together and keep a record of version history. The platform also has an internal messaging system as well as barcode management capabilities.

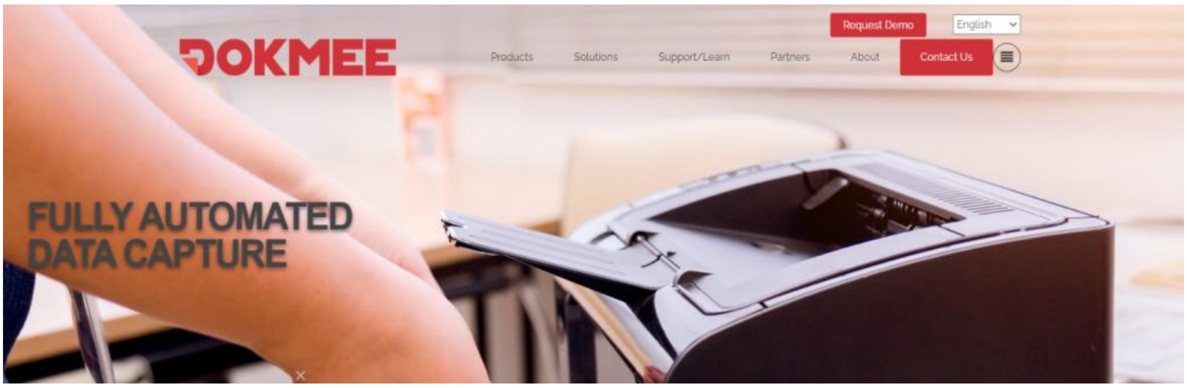
**Some Key Features of LogicalDoc**

- Auto-naming and auto-filing of documents
- Syncs across devices, be it Windows, Mac, iOS, or Android
- Barcode scanning, bulk upload, auto-import from email, and more

**Pricing:**

- Book demo for pricing quote

**#9. Dokmee**




Next up is Dokmee, another great file management system that wants to help you get rid of your paper documents. The platform works by the user uploading their electronic files to the Dokmee cloud and let Dokmee do the rest. Users can organize their files in separate folders and spaces, making them easy to find and retrieve. With powerful production level-imaging and data capture, users can scan and index files onto the Dokmee cloud with ease.

With collaboration features like multi-user access, document audit, restrictions, version control, and more, Dokmee ensures teamwork and compliance in the workplace. Dokmee’s scanning technology can also extract data from documents like page size, page count, and compression type. With enterprise-grade-security data centers and 24×7 monitoring and power supply, your files are safe with Dokmee.

**Some Key Features of Dokmee**

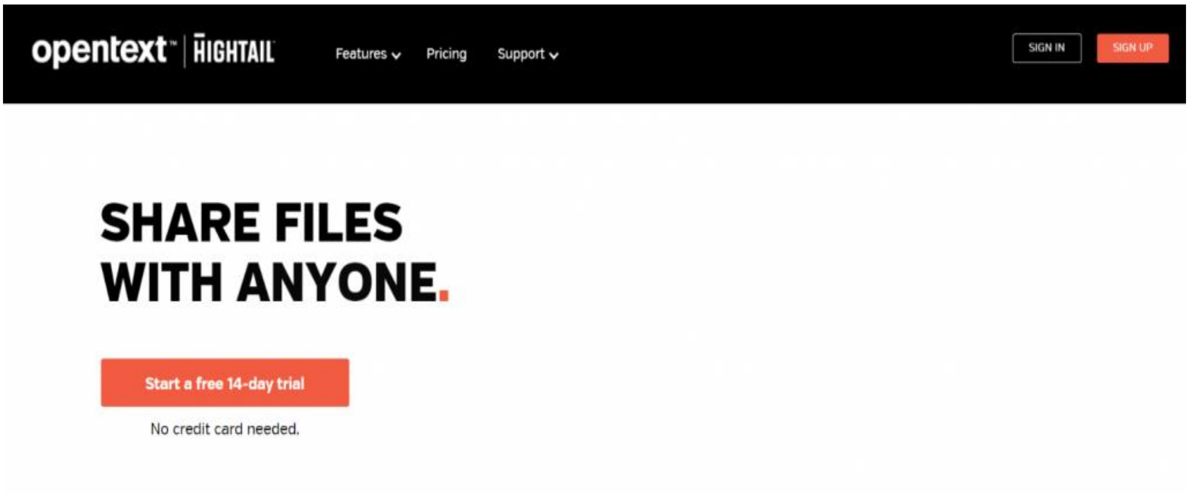
- Automated data capture and annotations
- Rules-based document indexing and routing
- File sharing and collaboration

**Pricing:**

- Free trial
- Paid plans start from $29/month

**Read more: Best Cloud Document Management Systems in 2022**

**#10. Hightail**




Formerly known as YouSendIt, Hightail is the last tool on our list. A file sharing and collaboration platform, Hightail works around “spaces” which are nothing but groups where employees can share files with another and collaborate on work. Hightail makes it extremely convenient to add files to their platform- whether you prefer to drag and drop them to the Hightail dashboard or import them from other services like Dropbox or Google Drive.

Apart from file sharing, Hightail also promotes creative collaboration, and employees can annotate content, collect different versions, and chat in real-time to get work done. You can also track files sent and received and be on top of your work. With password protection and expiration limits, users can share their files in a safe and secure way.

**Some Key Features of Hightail**

- Integrates with Google Drive, Dropbox, and OneDrive
- Share files without needing a Hightail account
- Receive email notification once your files are delivered.

**Pricing:**

- Free with limited functionality
- Paid plans start from Pro ($12/month per user), Teams($24/month per user), Business ($36/month per user)

**Conclusion**

These are our top picks for the best of the best file management system on the market today. Every business creates and shares a ton of files and documents, making them an indispensable part of our workflow.

# Best File Management Systems and Software

## Microsoft Sharepoint

SharePoint empowers teams to store all company knowledge- documents, files, content, etc and find anything they need quickly. It also allows team members to create dynamic team sites for projects, departments, as well as division.

## DocuWare

DocuWare handles all our search worries by allowing users to store all documents and files on its cloud-based platform. It has advanced document indexing and storage abilities, making it easy to get a hold of your files, no matter where you are.

## Google Drive

A free collaboration platform by Google, Google Drive allows you to store all your documents and files inside Drive with one click. It offers free 15GB of cloud storage to store all your files and you can upgrade to a pro version in case you need more.

## Alfresco

Alfresco is aimed to streamline your organization's knowledge. It removes content silos by providing users a single place for all their data and files. Yes! You don't need to search your emails and hard drives for content and documents anymore!

## M-Files

The platform organizes company files based on what the file is about and not where it's stored. By creating a central location for all files, M-files allows users to quickly find the file they are looking for, no matter where the file is stored.

## OnlyOffice

OnlyOffice wants your entire office files to be deployed on their platform for easy storage and retrieval. Employees can upload files, documents, presentations, spreadsheets, and other workplace data to Onlyoffice's web app and manage it online.

## LogicalDoc

LogicalDoc is perfect for those organizations that already have a ton of paper documents lying around and what to convert them into digital documents. The platform is available for deploying as both a cloud-based web app and as on-premise software.

## Dokmee

With powerful production level-imaging and data capture, users can scan and index files onto the Dokmee cloud with ease. They can also organize their files in separate folders and spaces, making them easy to find and retrieve.

## Hightail

Hightail works around "spaces" which are groups where employees can share files and collaborate with each other. You can also track files sent and received and be on top of your work. With password protection and expiration limits, users can share their files in a safe and secure way.

Streamlining this process can do wonders for employee productivity, efficiency, and stress management. A file management system helps you do just that and thus, gives you an advantage over your competitors.

# Module 6: Digital Communication (email and others)

## Lesson 1: Email Basics

### Introduction

Do you ever feel like the only person who doesn't use email? You don't have to feel left out. If you're just getting started, you'll see that with a little bit of practice, email is easy to understand and use.

In this lesson, you will learn what email is, how it compares to traditional mail, and how email addresses are written. We'll also discuss various types of email providers and the features and tools they include with an email account.

### Getting to know email

Email (electronic mail) is a way to send and receive messages across the Internet. It's similar to traditional mail, but it also has some key differences. To get a better idea of what email is all about, take a look at the infographic below and consider how you might benefit from its use.

# Traditional Mail vs Email

## Address

Traditional mail is addressed with the recipient's name, street address, city, state or province, and zip code.

For example, it will usually look something like this:

Elena M. Casarosa
202 Cedar Lane
Raleigh, NC 27601

Email addresses are always written in a standard format, but they look quite different from traditional mail.

An email address includes a username, the @ (at) symbol, and the email provider's domain. Usernames often include numbers and shortened versions of a name to create a unique email address, and will usually look something like this:

emcasarosa82@gmail.com

## Delivery

Traditional mail in a sealed envelope or package is delivered to a home or post office box by a mail carrier.

Email is delivered electronically across the Internet. It is received by the inbox of an email service provider like Gmail, Yahoo, or Outlook.

## Time

Traditional mail delivery could take anywhere between a couple of days, to a couple of weeks, depending on where it's being sent.

Email is delivered instantly, or usually within a few minutes.

## Email advantages

- **Productivity tools**: Email is usually packaged with a calendar, address book, instant messaging, and more for convenience and productivity.
- **Access to web services**: If you want to sign up for an account like Facebook or order products from services like Amazon, you will need an email address so you can be safely identified and contacted.
- **Easy mail management**: Email service providers have tools that allow you to file, label, prioritize, find, group, and filter your emails for easy management. You can even easily control spam, or junk email.
- **Privacy**: Your email is delivered to your own personal and private account with a password required to access and view emails.
- **Communication with multiple people**: You can send an email to multiple people at once, giving you the option to include as few as or as many people as you want in a conversation.
- **Accessible anywhere at any time**: You don’t have to be at home to get your mail. You can access it from any computer or mobile device that has an Internet connection.

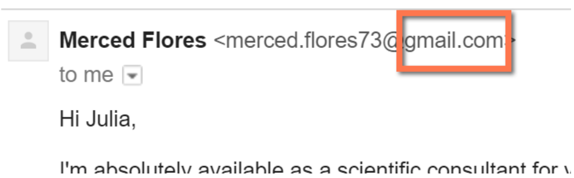
## Understanding email addresses

To receive emails, you will need an **email account** and an **email address**. Also, if you want to send emails to other people, you will need to obtain their email addresses. It's important to learn how to write email addresses correctly because if you do not enter them exactly right, your emails will not be delivered or might be delivered to the wrong person.

Email addresses are always written in a standard format that includes a **user name**, the **@** (at) symbol, and the **email provider's domain**.

The **user name** is the name you choose to identify yourself.


The **email provider** is the website that hosts your email account.




Some businesses and organizations use email addresses with their own website domain.


**About email providers**

In the past, people usually received an email account from the same companies that provided their Internet access. For example, if AOL provided your Internet connection, you'd have an AOL email address. While this is still true for some people, today it's increasingly common to use a **free web-based email service**, also known as **webmail**. Anyone can use these services, no matter who provides their Internet access.

**Webmail providers**

Today, the top three webmail providers are **Yahoo!**, Microsoft's **Outlook.com** (previously Hotmail), and Google's **Gmail**. These providers are popular because they allow you to access your email account from anywhere with an Internet connection. You can also access webmail on your **mobile device**.

Visit the links below to compare the features of the three top webmail providers:

- **Yahoo! Features**
- **Outlook.com Features**
- **Gmail Features**

**Other email providers**

Many people also have an email address **hosted by their company**, **school**, **or organization**. These email addresses are usually for professional purposes. For example, the people who work for this website have email addresses that end with **@gcflearnfree.org**. If you are part of an organization that hosts your email, they'll show you how to access it.

Many hosted web domains end with a suffix other than **.com**. Depending on the organization, your provider's domain might end with a suffix like **.gov** (for government websites), **.edu** (for schools), **.mil** (for military branches), or **.org** (for nonprofit organizations).

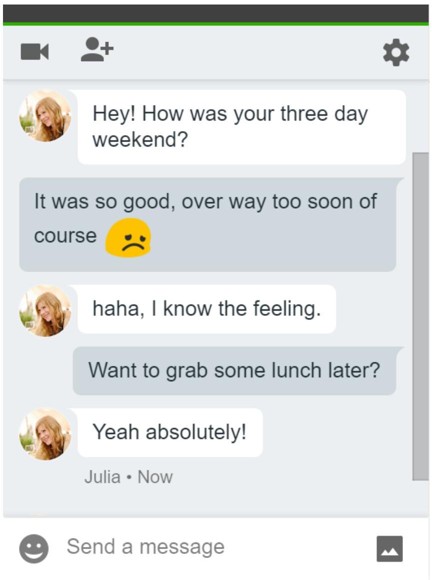
**Email applications**

Many companies and organizations use an email application, like **Microsoft Outlook**, for communicating and managing their email. This software can be used with any email provider but is most commonly used by organizations that host their own email.

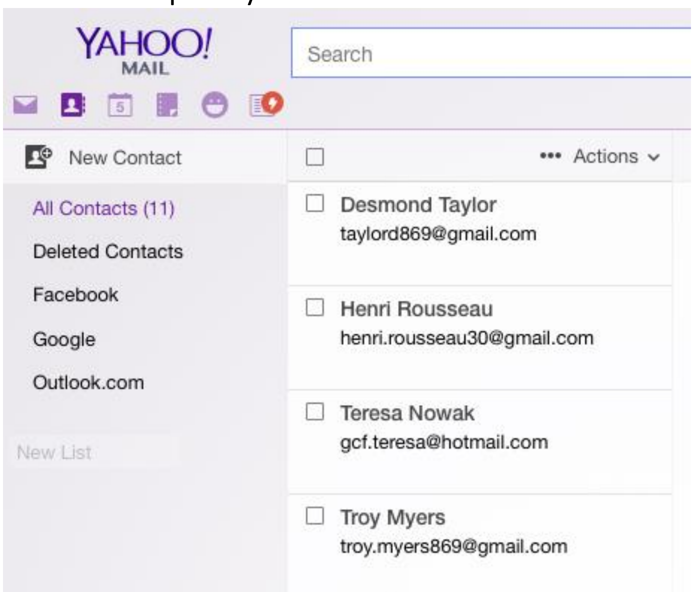
**Email productivity features**

In addition to email access, webmail providers offer **various tools and features**. These features are part of a **productivity suite**—a set of applications that help you work, communicate, and stay organized. The tools offered will vary by provider, but all major webmail services offer the following features:

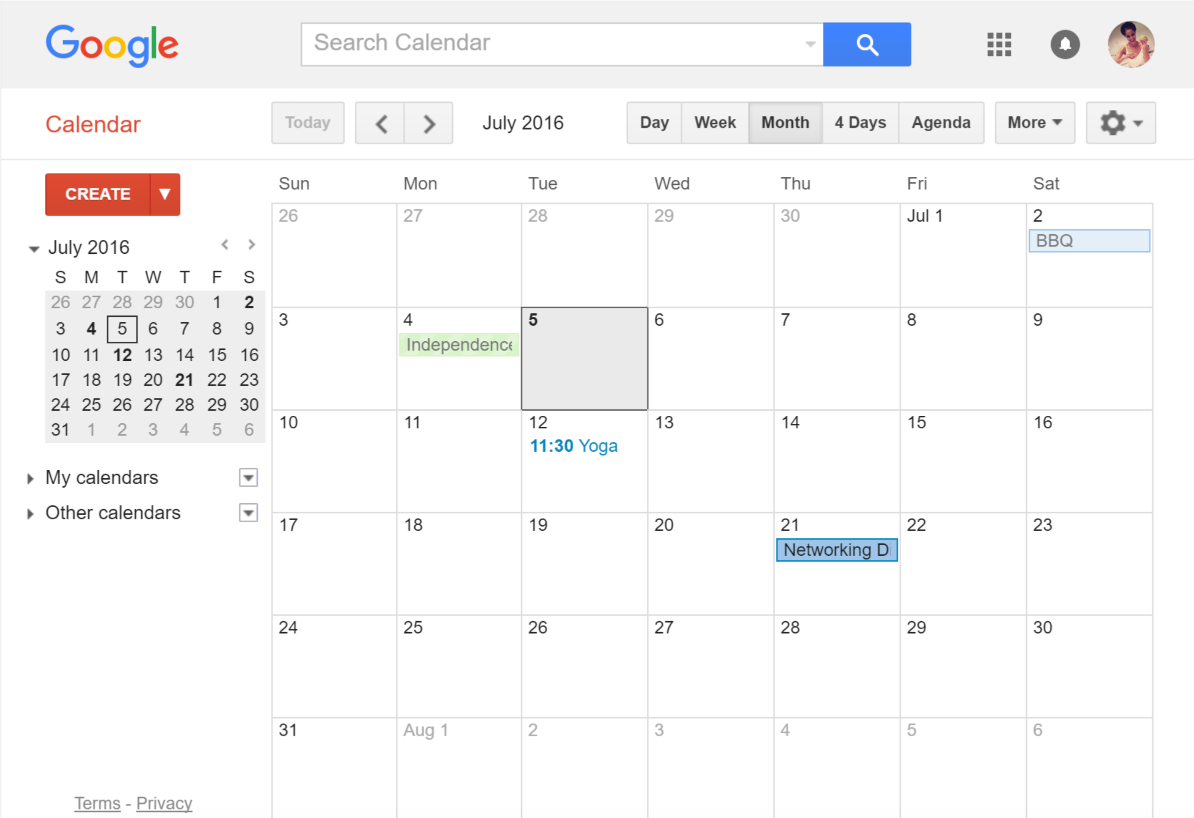
- **Instant messaging**, or **chat**, which lets you have **text-based conversations** with other users .



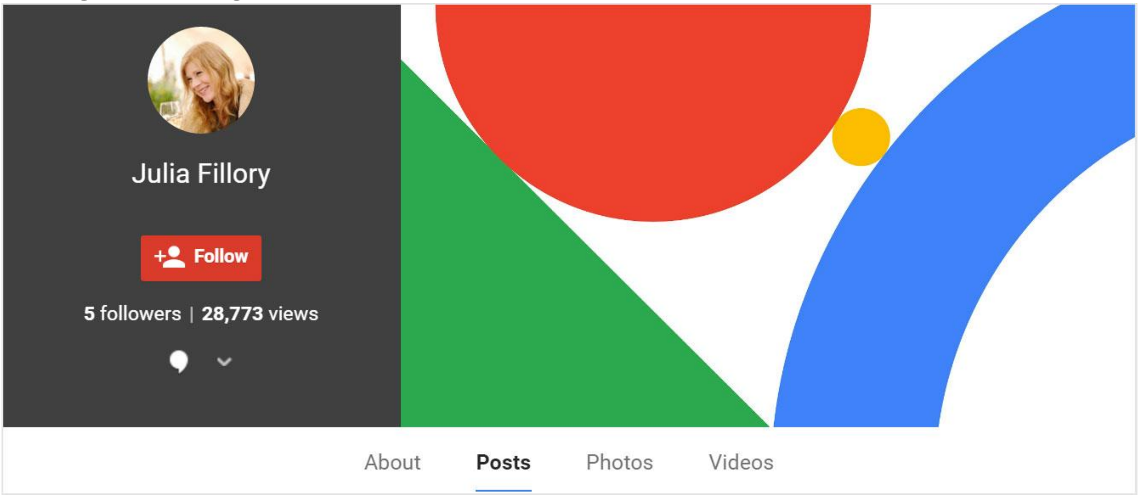

- An **online address book**, where you can store **contact information** for the people you contact frequently




- An **online calendar** to help **organize your schedule** and **share it** with others




- A **public profile** that you can use for basic social networking purposes, like sharing photos, previous work or school history, and status updates, among other things




In addition, each provider offers some unique features. For instance, when you sign up for Gmail you gain access to a full range of Google services, including **Google Drive**, **Google Docs**, and more. Outlook, on the other hand, offers connectivity with **OneDrive** and **Microsoft Office Web Apps.** You can visit our tutorials on **Google Drive**, **Google Docs** and **OneDrive and Office Online** to learn more.

**Lesson 2: Getting started with email**

You should now have a good understanding of what email is all about. Over the next few lessons, we will continue to cover essential **email basics**, **etiquette**, and **safety tips**.

**Setting up your own email account**

If you want to sign up for your **own email account**, we suggest choosing from one of the three major webmail providers.

- **Yahoo! Mail**: Click **Create Account**
- **Outlook.com**: Click **Sign up**
- **Gmail**: Click **Create an account** (review our lesson on **Setting Up a Gmail Account** for help)

## Lesson 2: Common Email Features

**Introduction**

No matter which email service you choose, you'll need to learn how to interact with an **email interface**, including the **inbox**, the **Message pane**, and the **Compose pane**. Depending on the email provider, the interfaces may look and feel different, but they all function in essentially the same way.

In this lesson, we'll talk about using an **email interface** to send and receive messages. We'll also discuss various **terms**, **actions**, and **features** that are commonly used when working with email.

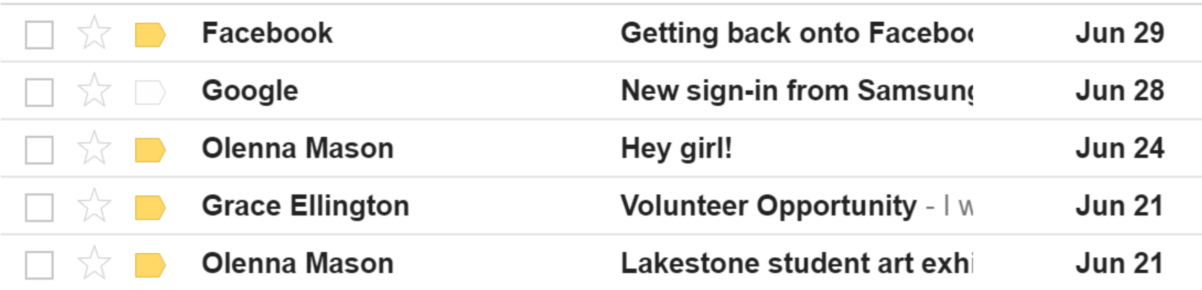
**Understanding the email interface**

Below are some examples of different **email interfaces** from **Gmail**. Review the images below to become familiar with various email interfaces.

Keep in mind that these examples will only provide a general overview. You can visit our **Gmail** tutorial to learn how to use an email application in detail.

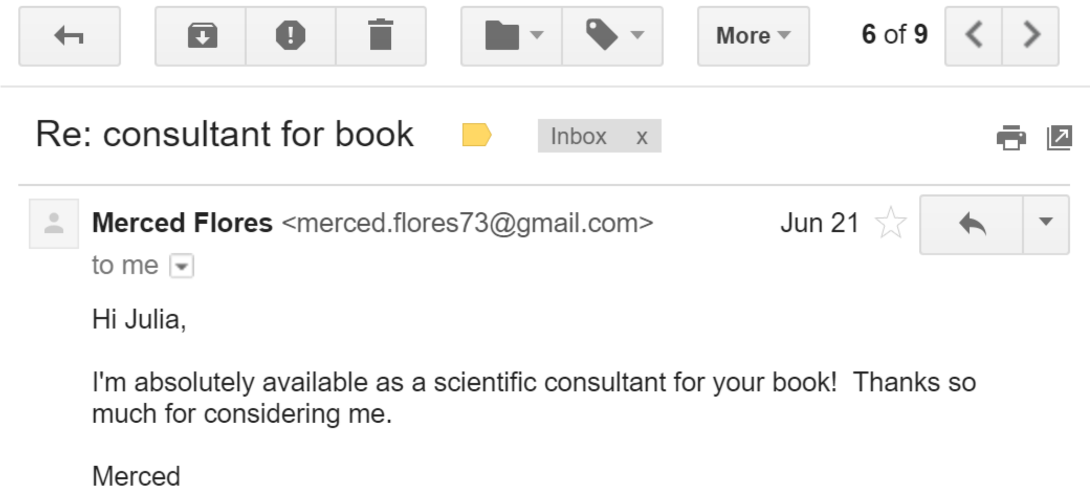
**Inbox**

The **inbox** is where you'll view and manage **emails** you receive. Emails are listed with the name of the **sender**, the **subject** of the message, and the **date received**.



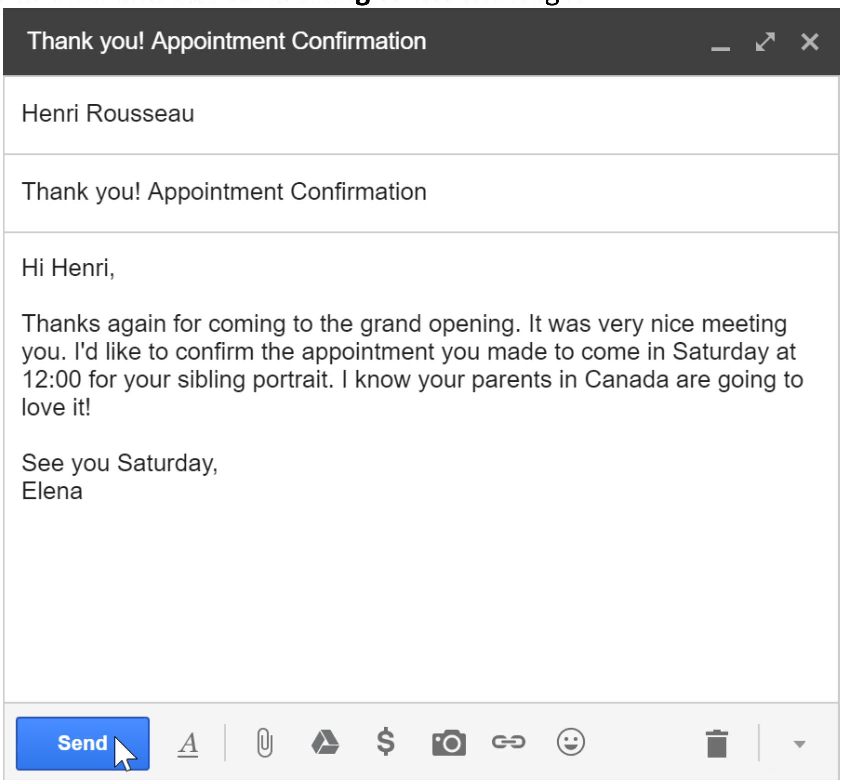

**Message pane**

When you select an email in the inbox, it will open in the **Message pane**. From here, you can **read the message** and choose **how to respond** with a variety of commands.




**Compose pane**

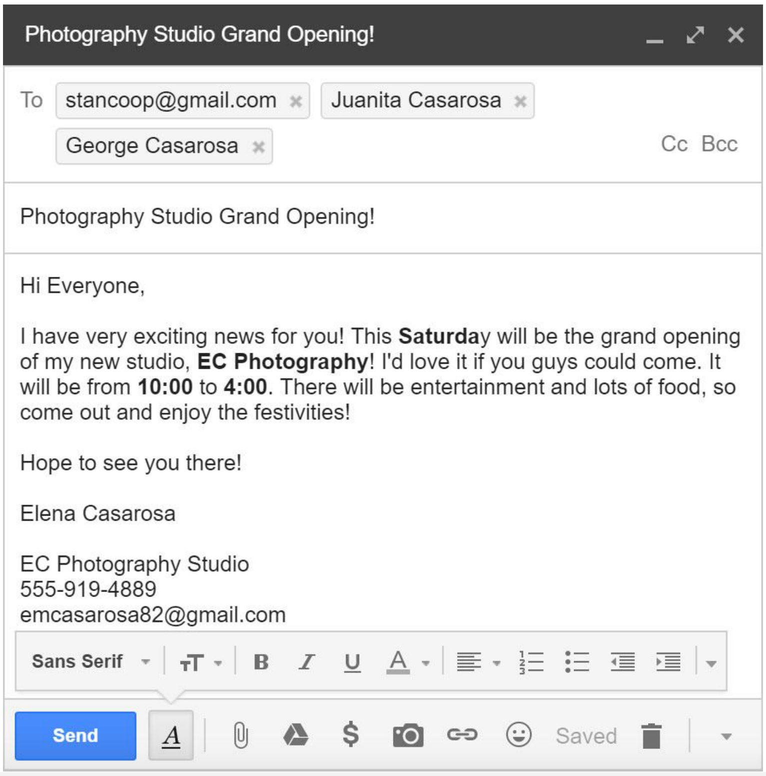
You can click the **Compose** or **New button** from your inbox to open the **Compose pane** to create your own email message. From here, you'll need to enter the **recipient's email address** and a **subject**. You'll also have the option to upload files (photos, documents, etc.) as **attachments** and **add formatting** to the message.

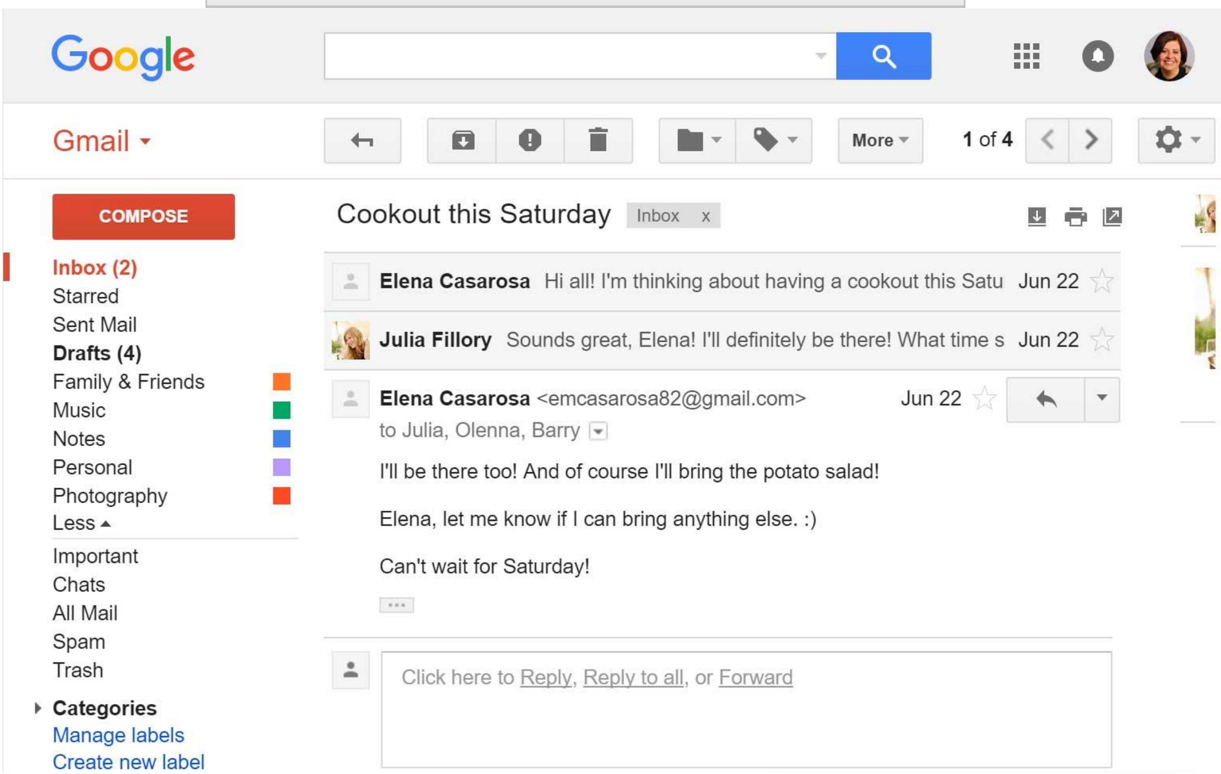



A Compose pane will also appear when you select **Reply** or **Forward**. The text from the original message will be copied into the Compose pane.

**Common email terms and actions**

All email applications use certain **terms** and commands you will need to understand before using email. The examples below use **Gmail's Compose pane** and **Message pane** to introduce basic email terms, but these will still be applicable for Yahoo! and Outlook.



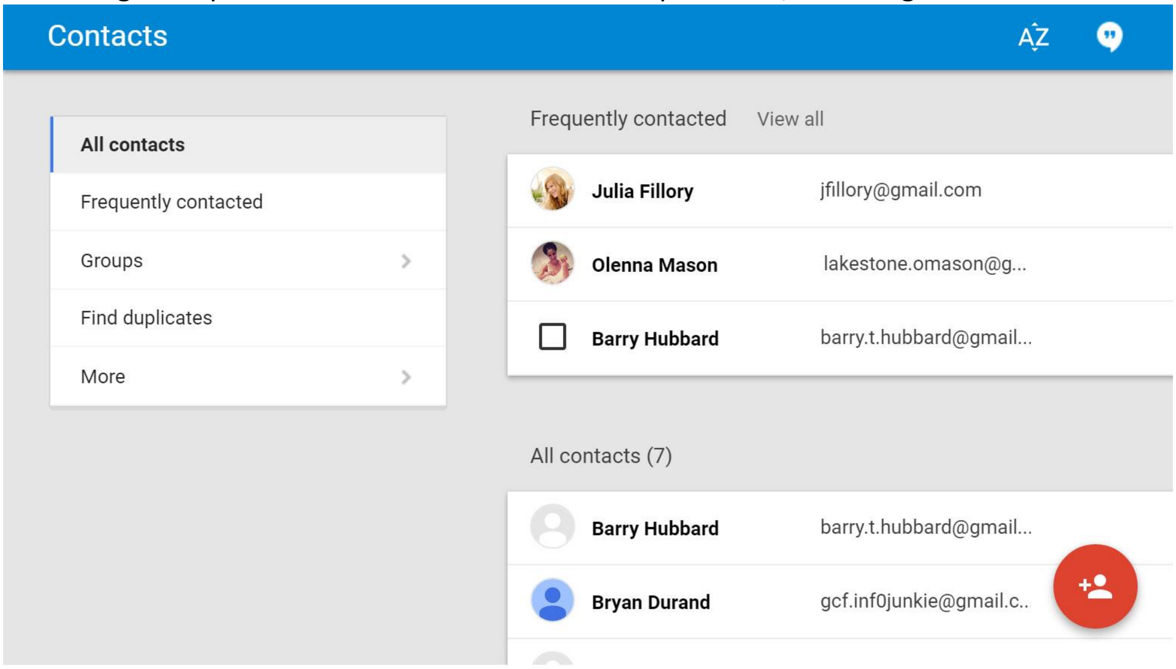




## Lesson 3: Contacts and Calendars

**Introduction**

In addition to email services, most webmail providers offer an **online calendar** and **address book**. These features make it easy to **stay organized** and access your **important information** from anywhere.

In this lesson, you'll learn more about the basics of **online calendars** and **contacts lists** using examples from a few common webmail providers, including Yahoo! and Gmail.



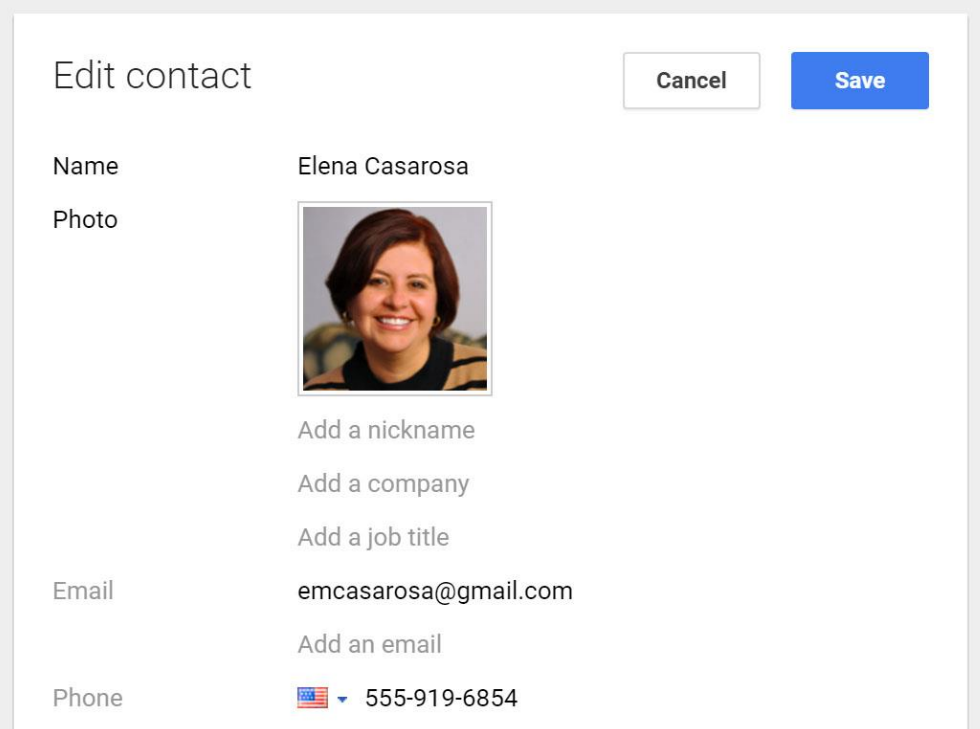

**Contacts basics**

**Online contacts lists** help you **organize contact information** for your friends, family, and coworkers, just like an **address book**. Once people are added to your contacts list, it's easy to access their information **anytime and anywhere**.

Review the examples below to become familiar with the basic features and advantages of online contacts lists.

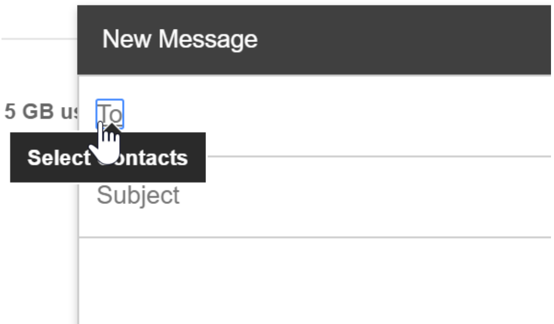
**Adding contacts**

It's easy to **add people** to your contacts list. When you create a new contact, you should (at the very least) enter a **first** and **last name**, as well as an **email address**. However, you can also enter other information, like a **phone number**, **home address**, and more. In most email accounts, the **name and email** of anyone you correspond with will be added to your contacts list **automatically**.

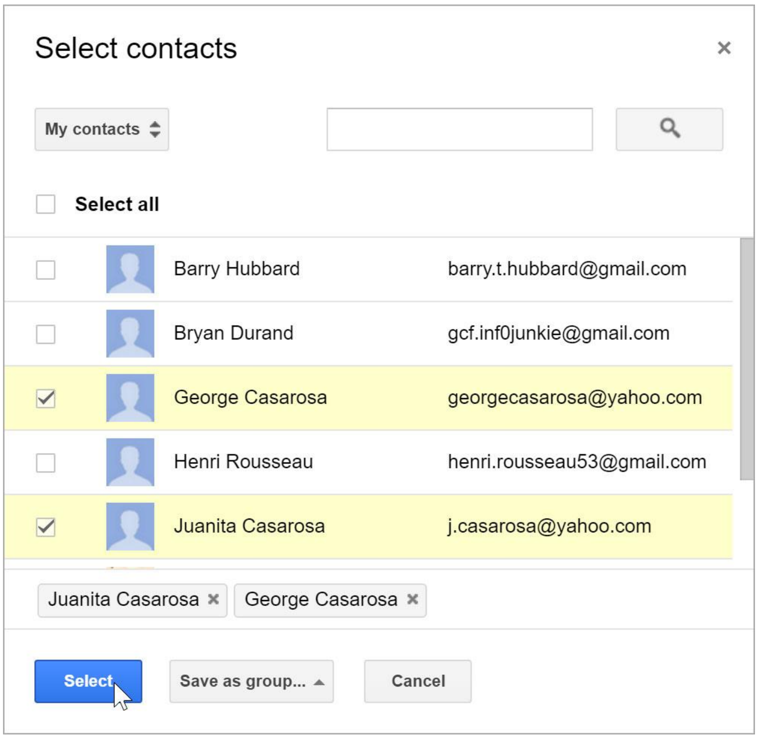



**Selecting contacts**

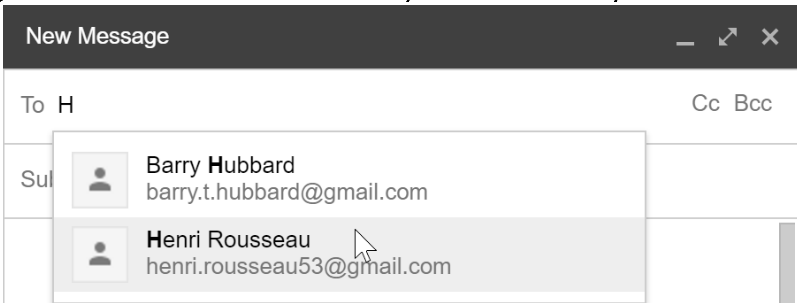
Once you've added people to your contacts list, you'll never have to worry about remembering an email address. Whenever you create a new email, you can select the **To** or **Add Recipients** button.




Then **choose recipients** from your **contacts list**. The contacts' email addresses will be added **automatically** to the message. You'll even be able to use the same contact information for other webmail services, like **instant messaging** and **calendar sharing**.

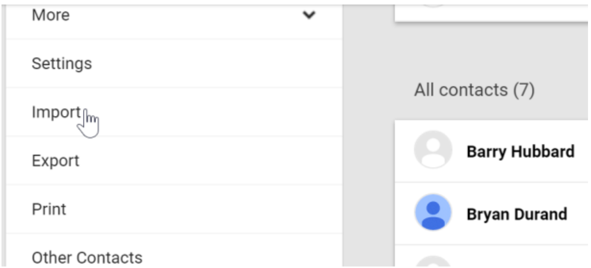



Most email services will also autocomplete or suggest an email address when you start typing, as long as it's an address that's already been saved in your contacts.



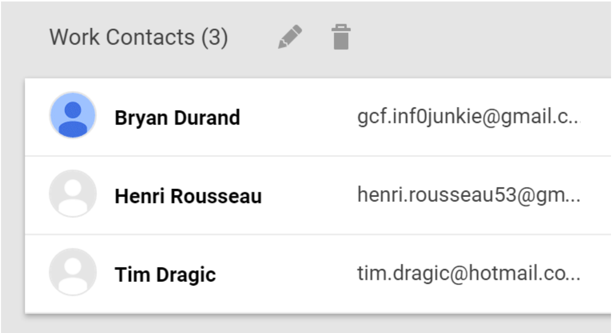

**Linking contacts**

If you already have a lot of contacts saved in another **web-based service**, such as Facebook or LinkedIn, it's easy to **link them** between accounts, which can save you a lot of time. For example, you could **import** your Facebook contacts to your webmail service or use your existing contacts list to search for friends on Facebook.




**Contact groups**

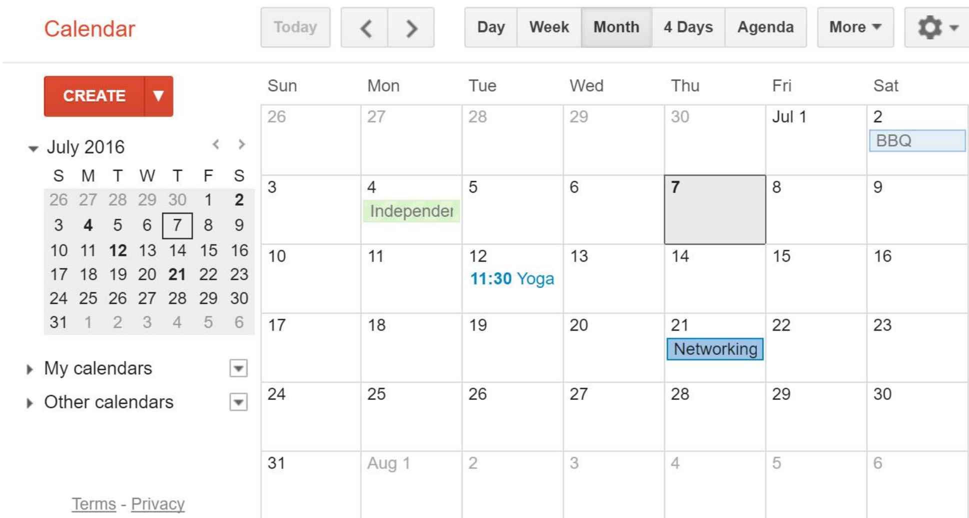
If you frequently connect with the same group of people, you can create **contact groups** for quick access. This allows you to quickly sort your contacts by type. For example, you might use one group to organize your **personal contacts** and another for **professional contacts**.




**Calendar basics**

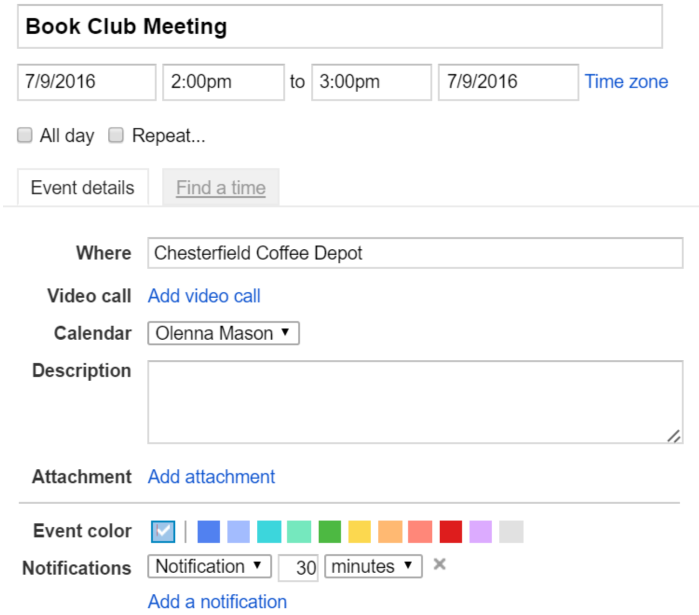
**Online calendars** make it easy to **schedule appointments**, **organize tasks**, and **manage your time**, just like a **desk calendar**. But unlike a physical calendar, online calendars give you the freedom to quickly **edit and rearrange** your schedule whenever you want. You'll even be able to access your calendar **on the go** and **sync it across multiple devices**, like your mobile phone and personal computer.

Review the examples below to become familiar with the basic features and advantages of online calendars.



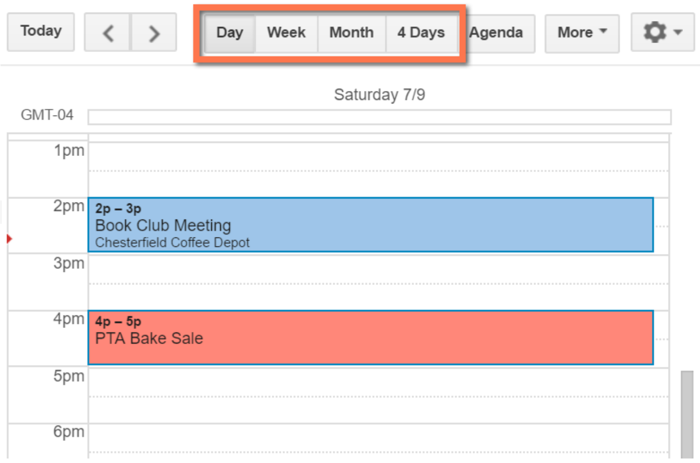

**Creating appointments**

It's easy to **schedule**, **track**, and **edit** upcoming appointments or events. When you create a **new appointment**, you should (at the very least) include a **title**, **start** and **end time**, and **location**, but you can also include other information, such as **reminder preferences**, **detailed notes, and more**.



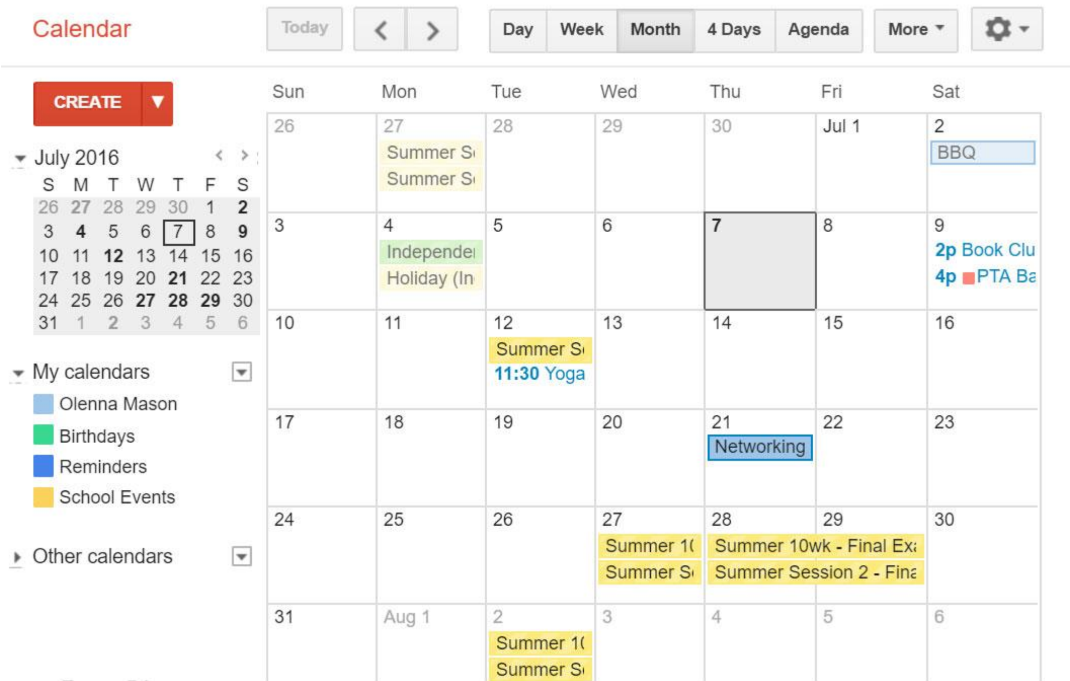

### Switching views

You can choose a variety of view options for your calendar, including a **daily**, **weekly**, and **monthly summary** of your upcoming appointments.



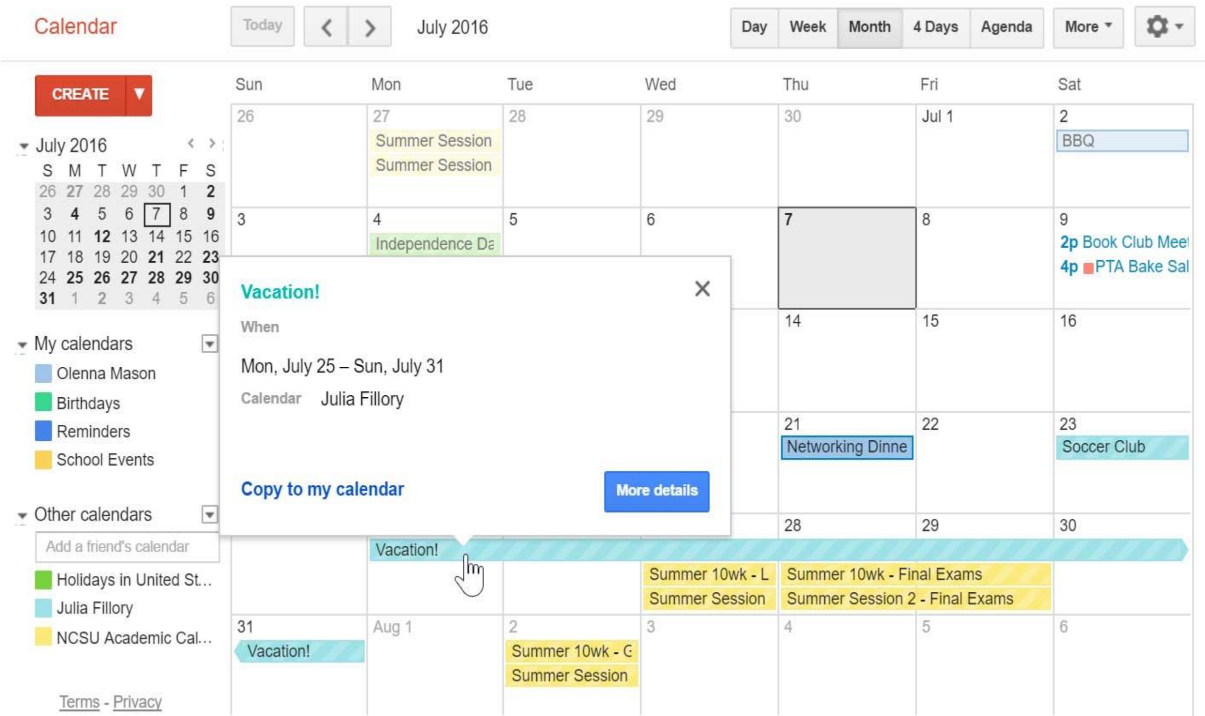

### Using multiple calendars

If you keep a lot of **different appointments**, you can create **multiple calendars** to help organize your schedules. For example, you might use one calendar to keep track of your personal tasks and another to manage your family's schedule. Each calendar is assigned its own **color**, so it's easy to organize lots of different appointments. You can even **toggle** calendars **on and off** to easily sort your appointments.




## Sharing calendars

You can **share your calendar** with anyone who uses the same webmail provider. Once you've shared a calendar, you'll be able to **view** and even **edit** a friend's calendar, depending on your sharing preferences.



## Lesson 4: Email Etiquette and Safety

**Introduction**

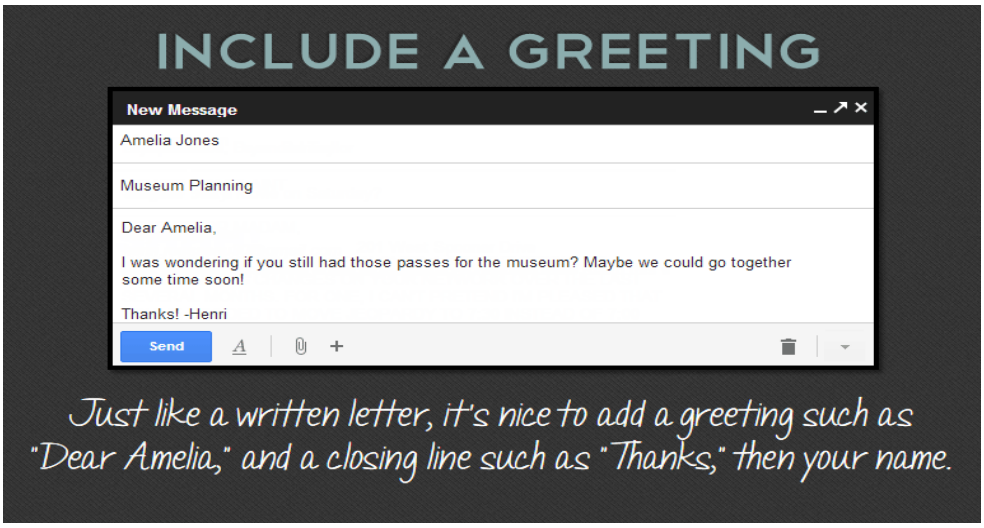
Like any form of online communication, it's important to practice good etiquette and safety when using email. Etiquette is a set of rules and guidelines that people use to communicate more effectively. You should also know how to protect yourself from certain risks, like malware and phishing.

In this lesson, we'll discuss writing more effective emails using good email etiquette, both for personal use and in the workplace. We'll also talk about different strategies for using email safely.

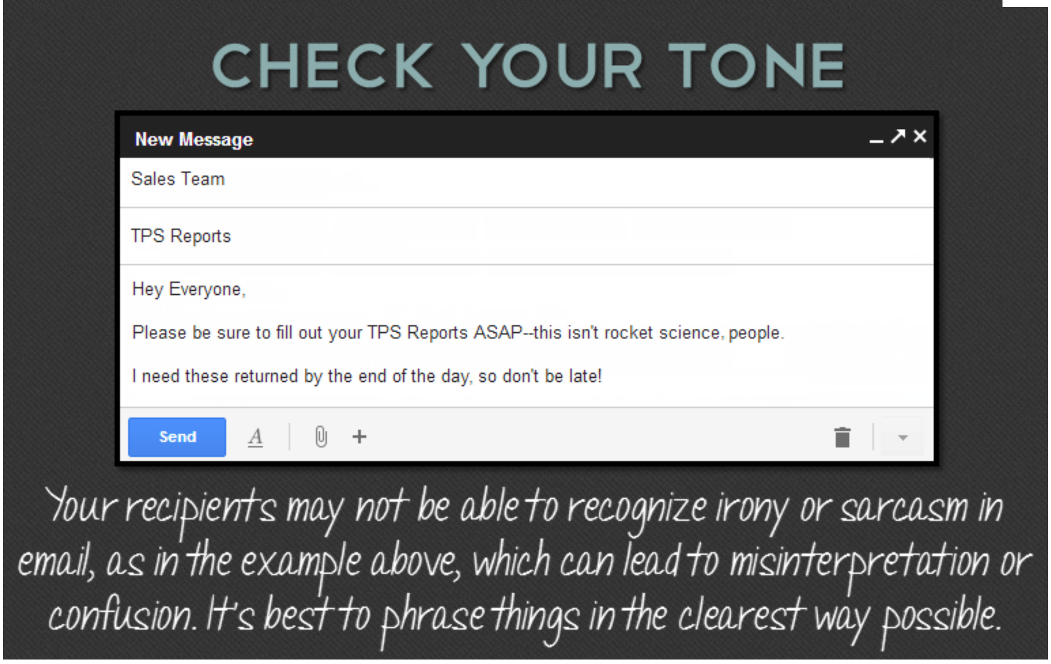
**Tips for email success**

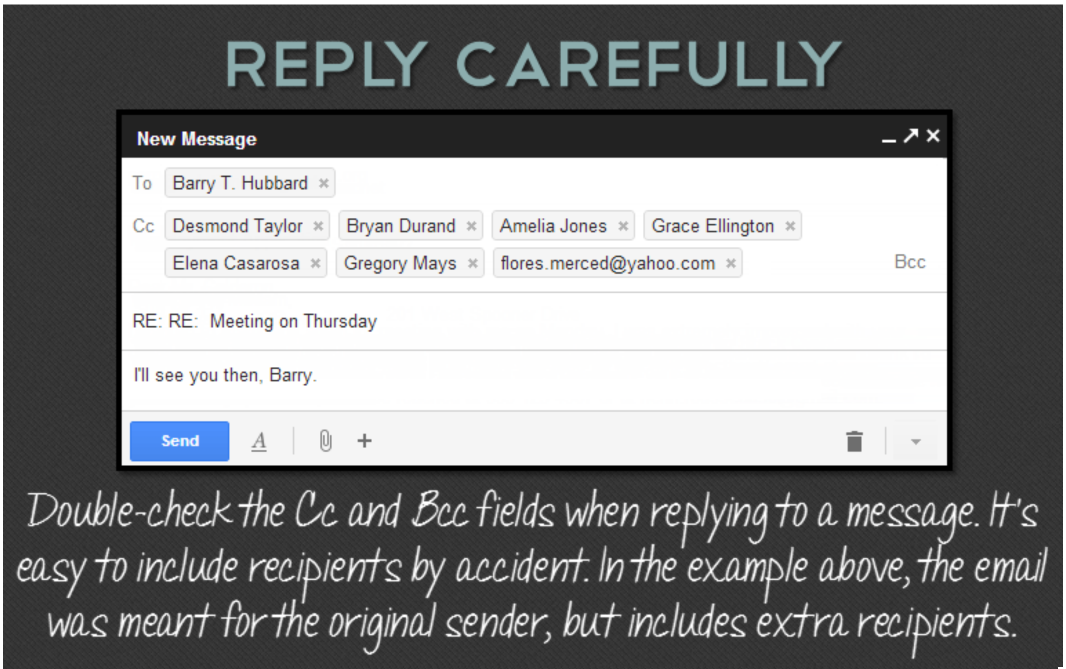
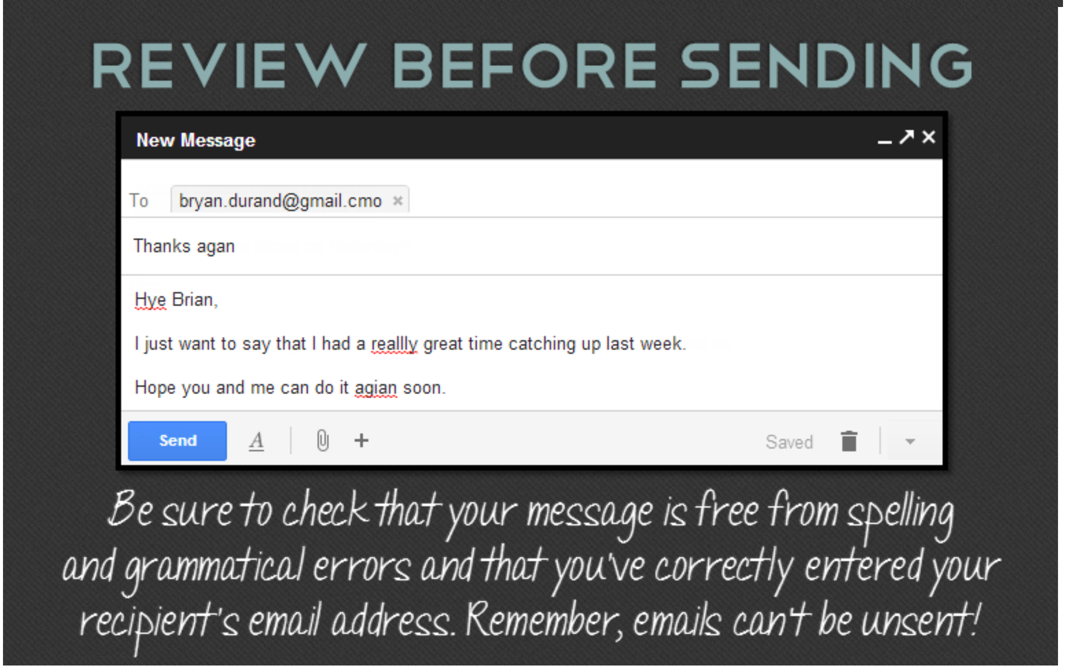
Here are some **basic rules** you can follow to write better emails, no matter who you're emailing. In some cases, it's OK to break these rules. Use these rules as a starting point, then tailor each email you send based on the situation.

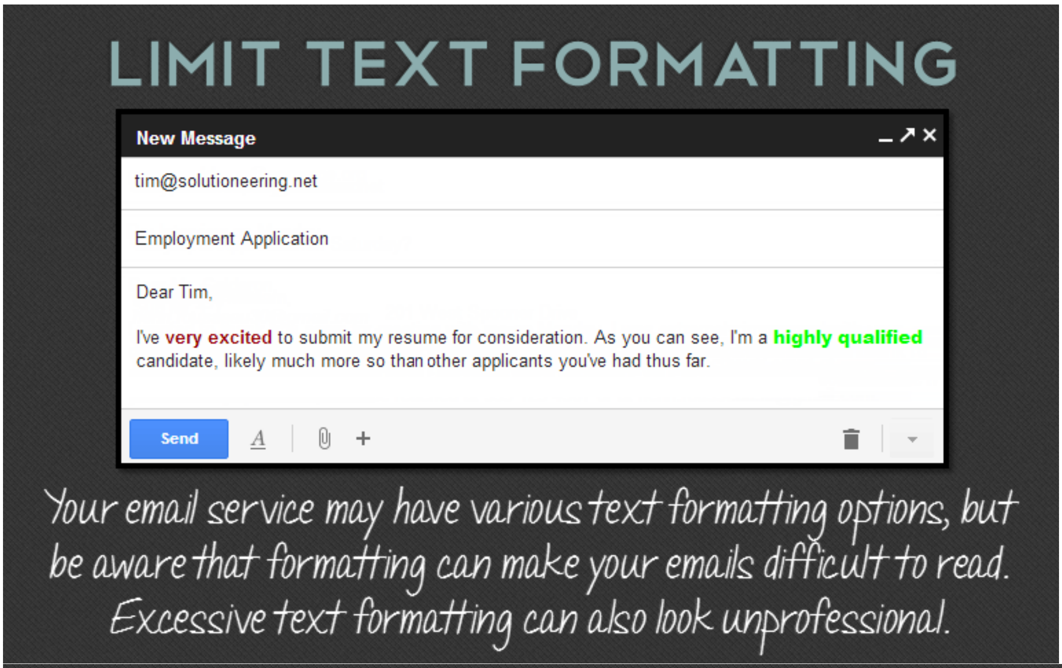
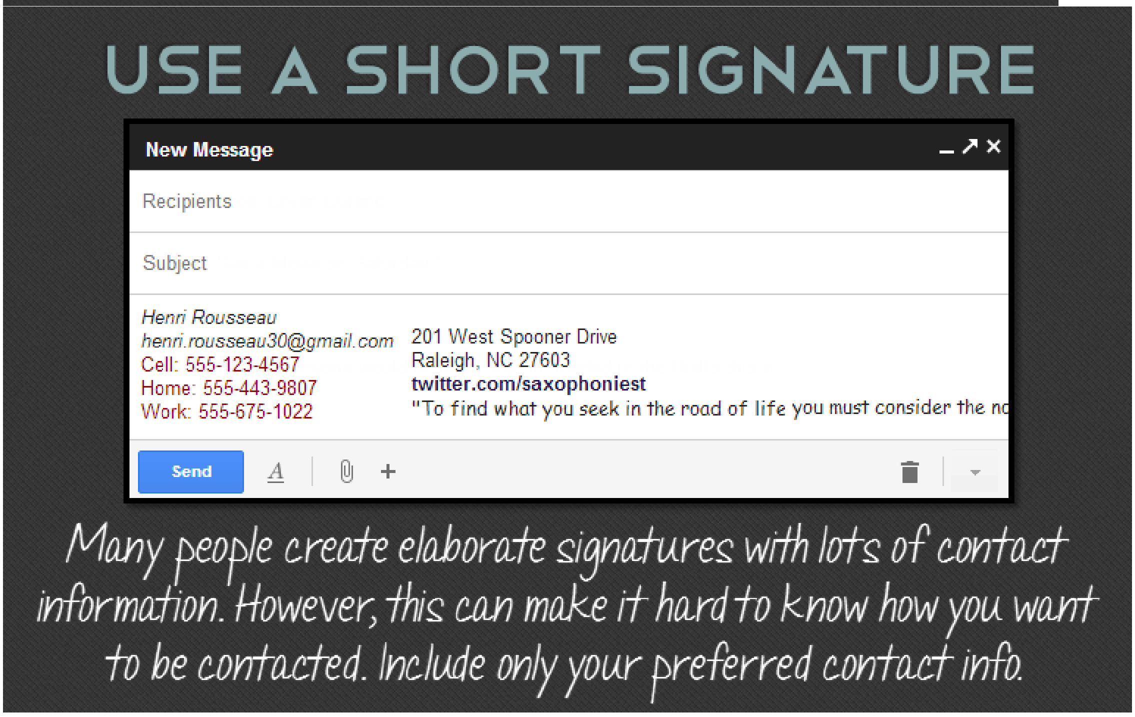
- 

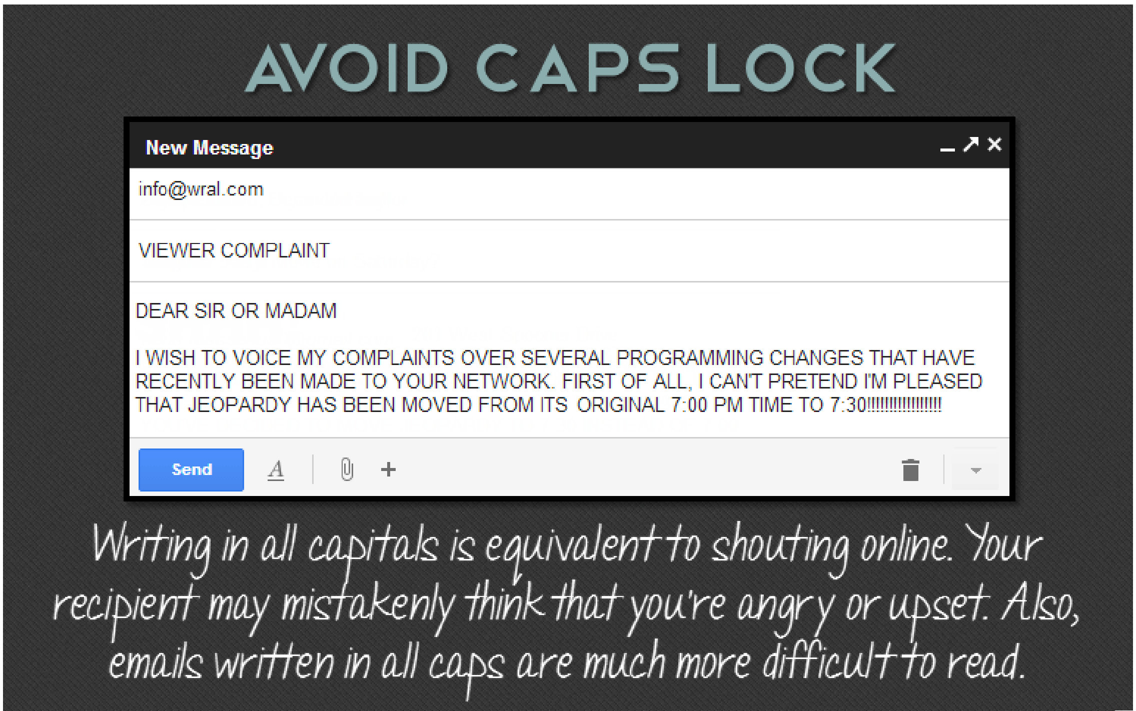

- 

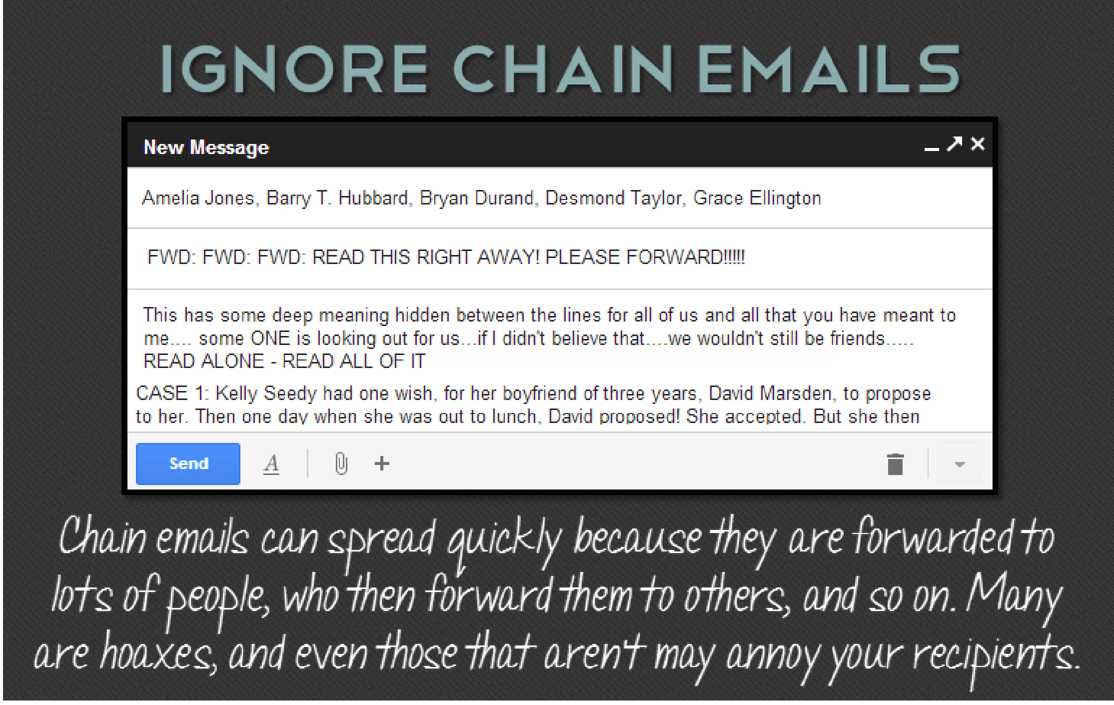
-

- 
BE CLEAR AND CONCISE
New Message
Amelia Jones, Bryan Durand
Want to See a Movie on Saturday?
Hey Guys,
Just wondering if anyone would be interested in headed to the Rialto this weekend?
-Henri
Send
People are more likely to read an email if they know what it's about, so be sure to include a relevant subject line. Avoid long or rambling messages, but provide enough detail to make the email clear.
- 
CHECK YOUR TONE
New Message
Sales Team
TPS Reports
Hey Everyone,
Please be sure to fill out your TPS Reports ASAP--this isn't rocket science, people.
I need these returned by the end of the day, so don't be late!
Send
Your recipients may not be able to recognize irony or sarcasm in email, as in the example above, which can lead to misinterpretation or confusion. It's best to phrase things in the clearest way possible.
-

- 
REPLY CAREFULLY
New Message
To Barry T. Hubbard
Cc Desmond Taylor Bryan Durand Amelia Jones Grace Ellington
Elena Casarosa Gregory Mays flores.merced@yahoo.com
Bcc
RE: RE: Meeting on Thursday
I'll see you then, Barry.
Send
Double-check the Cc and Bcc fields when replying to a message. It's easy to include recipients by accident. In the example above, the email was meant for the original sender, but includes extra recipients.
- 
REVIEW BEFORE SENDING
New Message
To bryan.durand@gmail.cmo
Thanks agan
Hye Brian,
I just want to say that I had a reallly great time catching up last week.
Hope you and me can do it agian soon.
Send
Saved
Be sure to check that your message is free from spelling and grammatical errors and that you've correctly entered your recipient's email address. Remember, emails can't be unsent!
- 

- 
LIMIT TEXT FORMATTING
New Message
tim@solutioneering.net
Employment Application
Dear Tim,
I've very excited to submit my resume for consideration. As you can see, I'm a highly qualified candidate, likely much more so than other applicants you've had thus far.
Send
Your email service may have various text formatting options, but be aware that formatting can make your emails difficult to read. Excessive text formatting can also look unprofessional.
- 
USE A SHORT SIGNATURE
New Message
Recipients
Subject
Henri Rousseau
henri.rousseau30@gmail.com
Cell: 555-123-4567
Home: 555-443-9807
Work: 555-675-1022
201 West Spooner Drive
Raleigh, NC 27603
twitter.com/saxophoniest
"To find what you seek in the road of life you must consider the no
Send
Many people create elaborate signatures with lots of contact information. However, this can make it hard to know how you want to be contacted. Include only your preferred contact info.
- 

- 

- 

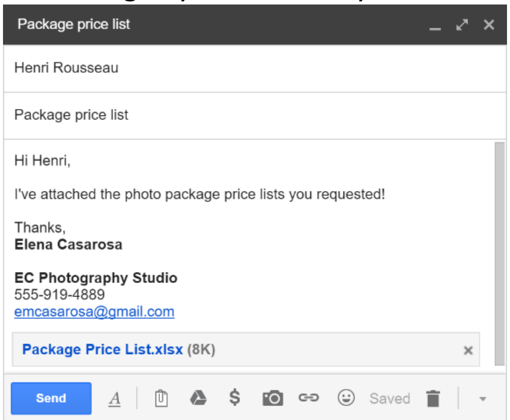

**Lesson 4: Email attachment etiquette**

**Attachments** are an easy way to share **files**, **photos**, **and more**, but many people aren't aware of some of the most common **attachment mistakes**. Be sure to follow these basic rules when including attachments in your emails.

**Mention included attachments**

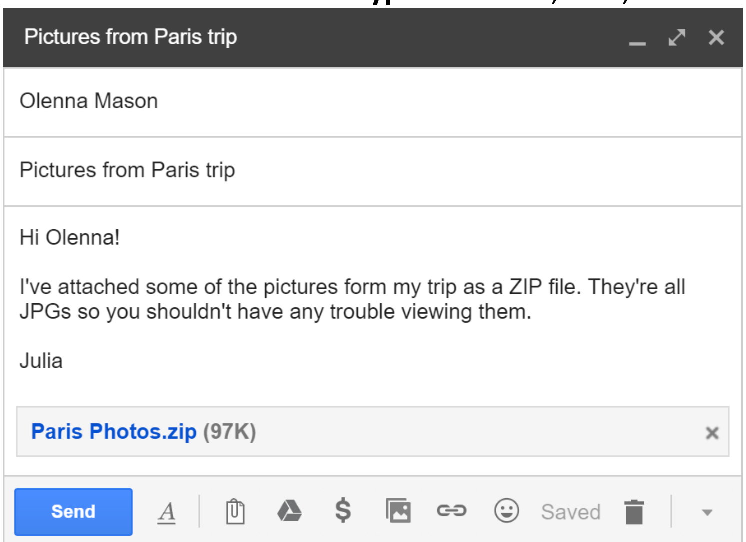
Never attach a file without **mentioning it** in the body of your email. Something as simple as **I've attached a few photos to this email** will help your recipients **know what to expect**. On the other hand, make sure the attachments you mention **are actually**

**included** with the message—it's easy to focus on your message and forget to include the file itself. We recommend attaching any files **before** you start writing.



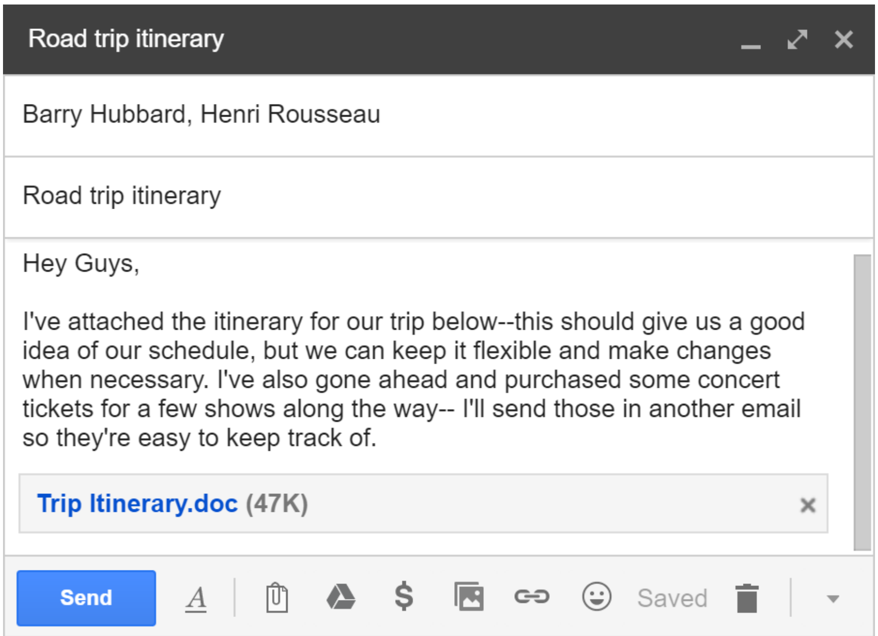

**Consider file size and format**

Avoid sending excessively **large attachments** or **uncompressed photos**, which can take a long time for your recipients to download. You can always **ZIP** or **compress** files to make them easier to send. Additionally, make sure your attachments don't need to be viewed in a **specific application**—use **universal file types like** .PDF, .RTF, and .JPG.




**Only include related files**

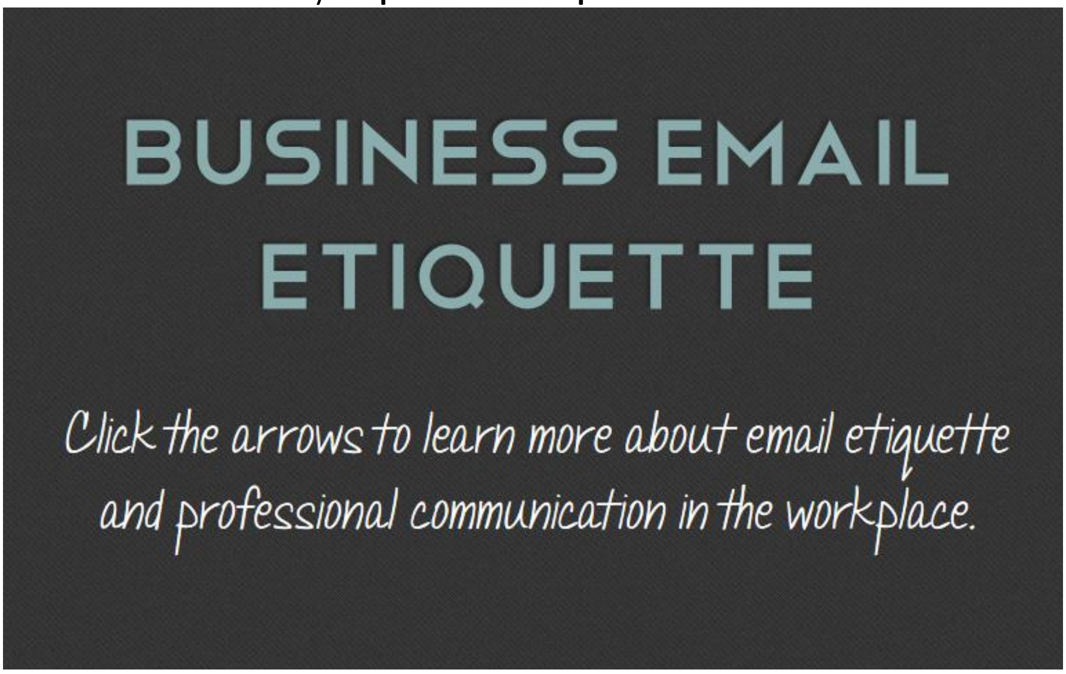
If you need to send a lot of **different files** to the same person, consider sending the attachments through multiple emails. If you include several **unrelated files** in the same email, it can be difficult for your recipients to find the exact file they need.

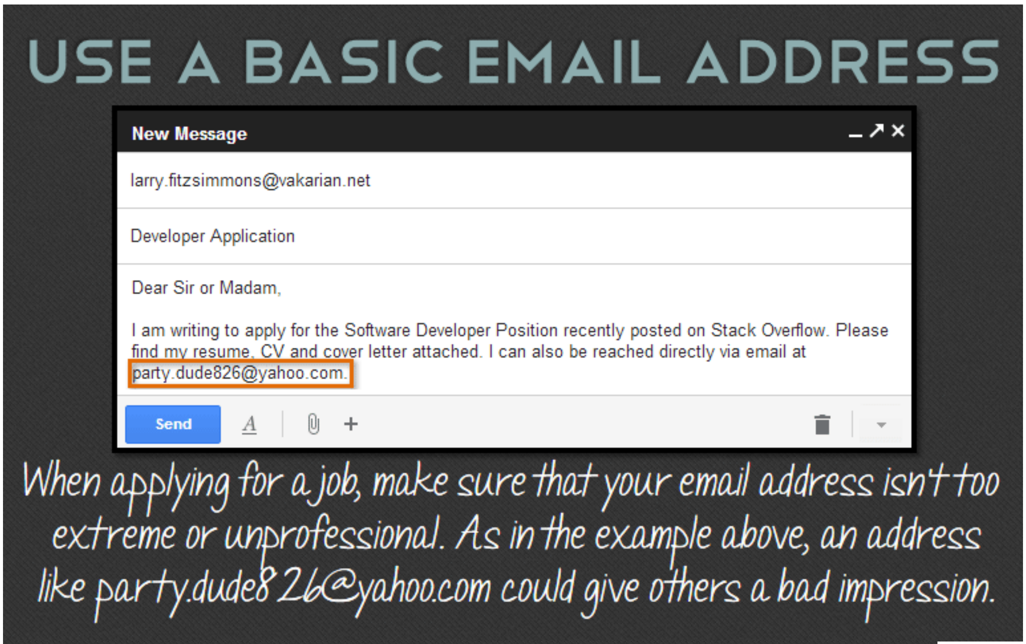


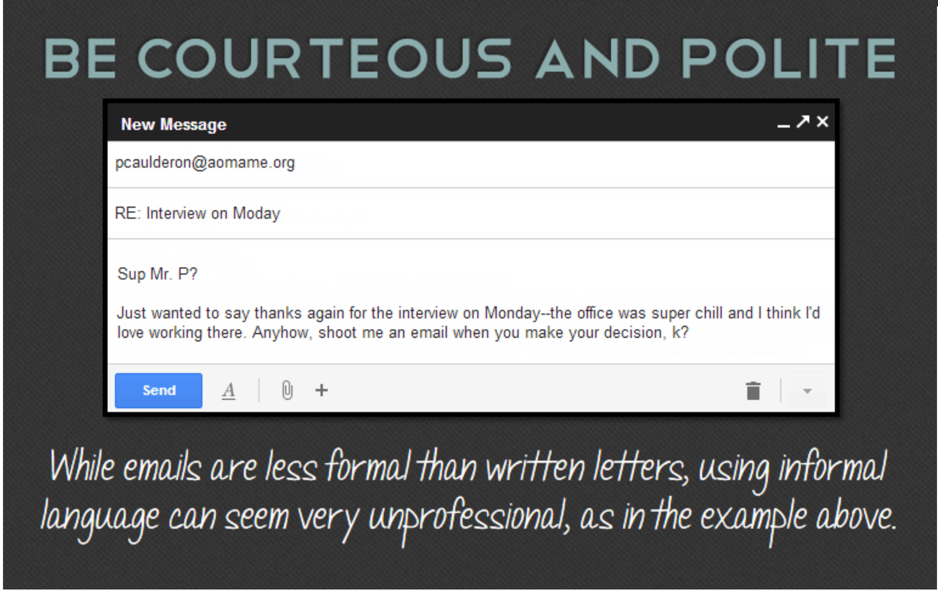

While attachments are still an easy way to share files quickly over email, many people have begun using cloud-based storage services like **Google Drive** and **Microsoft OneDrive** to **share large files**. Rather than sharing the file itself, you can **share a link**, allowing others to access the file remotely.

**Using email in business**

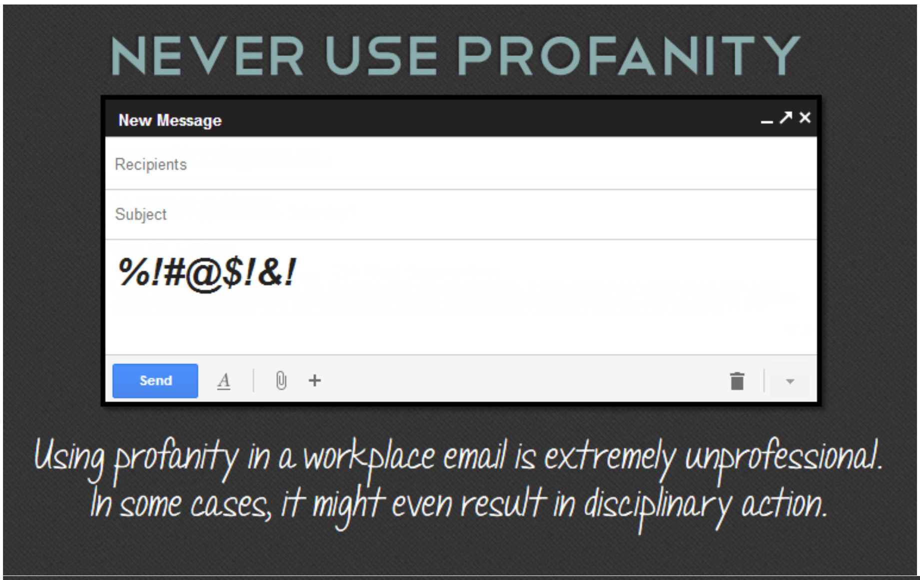
Whether you're using email at work or applying for a job, the normal rules of email etiquette still apply. However, there are a few additional considerations to keep in mind, as **business emails** can affect your **professional reputation**.

- 

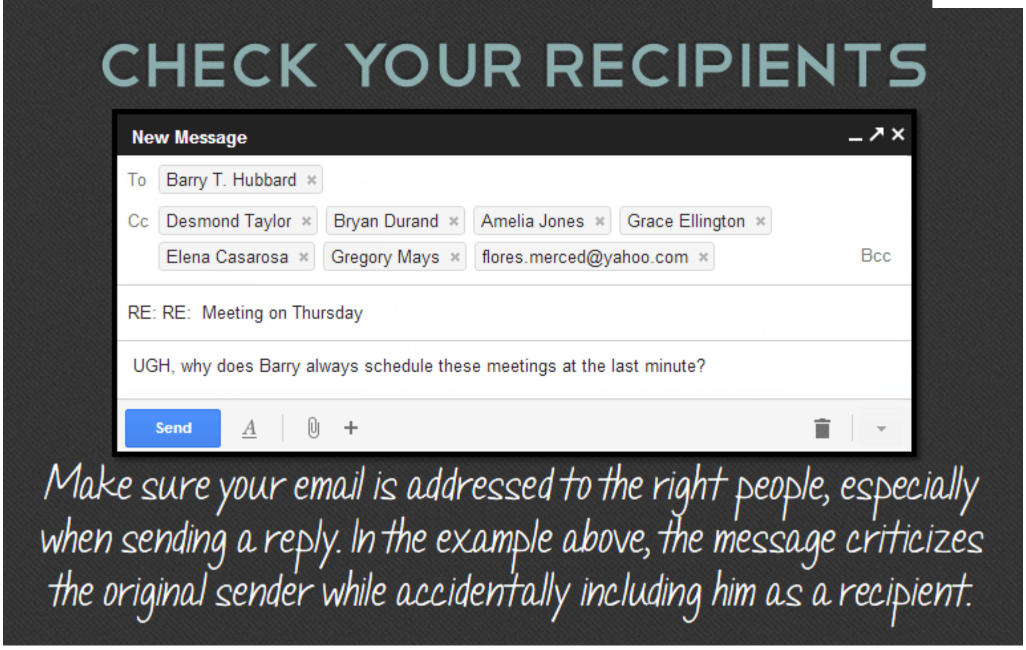
- 
USE A BASIC EMAIL ADDRESS
New Message
larry.fitzsimmons@vakarian.net
Developer Application
Dear Sir or Madam,
I am writing to apply for the Software Developer Position recently posted on Stack Overflow. Please find my resume, CV and cover letter attached. I can also be reached directly via email at party.dude826@yahoo.com.
Send
When applying for a job, make sure that your email address isn't too extreme or unprofessional. As in the example above, an address like party.dude826@yahoo.com could give others a bad impression.


BE COURTEOUS AND POLITE
New Message
pcaulderon@aomame.org
RE: Interview on Moday
Sup Mr. P?
Just wanted to say thanks again for the interview on Monday--the office was super chill and I think I'd love working there. Anyhow, shoot me an email when you make your decision, k?
Send
While emails are less formal than written letters, using informal language can seem very unprofessional, as in the example above.

-
-

- 
NEVER USE PROFANITY
New Message
Recipients
Subject
%!#@$!&!
Send
Using profanity in a workplace email is extremely unprofessional. In some cases, it might even result in disciplinary action.

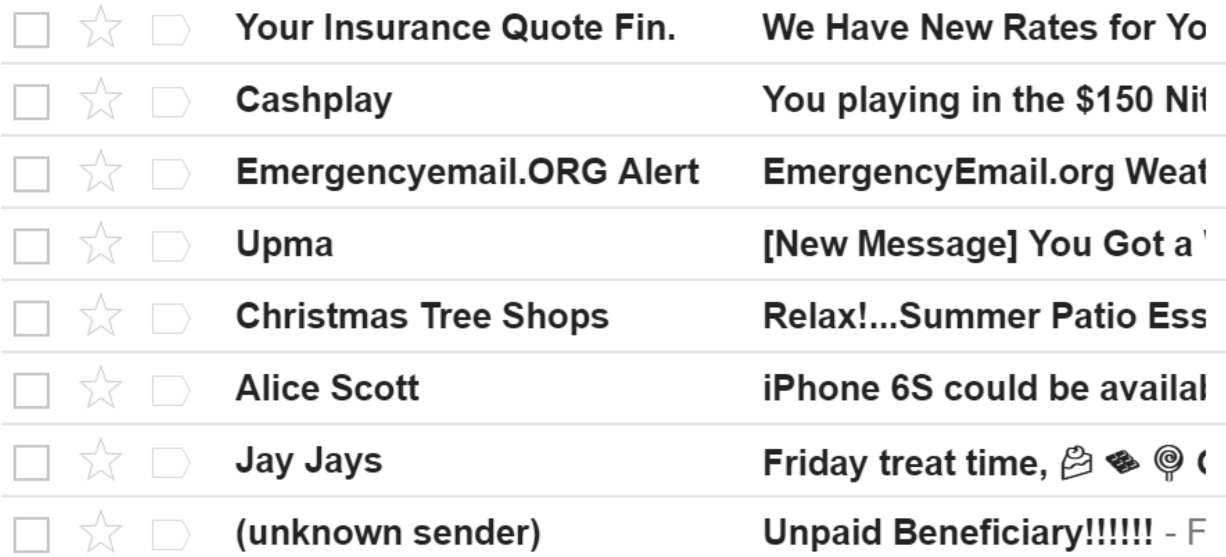
- 
BE CAUTIOUS AND DISCREET
New Message
kate@lakestone.edu
Today's Meeting
Hey Kate,
Didn't you think that today's meeting was pointless? I don't know why we even have to bother with this material anymore. If it were up to me, I'd prefer just to call in "sick" rather than deal with this again. LOL
Send
Keep in mind that your company may read your email. As in the example above, you should never send anything derogatory or offensive about your coworkers or your workplace.

- 
CHECK YOUR RECIPIENTS
New Message
To Barry T. Hubbard
Cc Desmond Taylor Bryan Durand Amelia Jones Grace Ellington
Elena Casarosa Gregory Mays flores.merced@yahoo.com
Bcc
RE: RE: Meeting on Thursday
UGH, why does Barry always schedule these meetings at the last minute?
Send
Make sure your email is addressed to the right people, especially when sending a reply. In the example above, the message criticizes the original sender while accidentally including him as a recipient.

Remember, you should never use your work email account for personal communication. It's best to get your own personal account from a webmail service like Gmail, Yahoo!, or Outlook.com.

**Email safety**

Email is not totally secure, so you should avoid sending sensitive information like **credit card numbers**, **passwords**, and your **Social Security Number**. In addition, you may receive emails from **scammers** and **cybercriminals**. The first step in dealing with email safety concerns is understanding them so you know what to look for.




**Spam**

Spam is another term for **junk email** or **unwanted email advertisements**. It's best to **ignore** or **delete** these messages. Luckily, most email services offer some protection, including **spam filtering**.

**Phishing**

Certain emails pretend to be from a **bank** or **trusted source** in order to steal your personal information. It's easy for someone to create an email that looks like it's from a specific business. Be **especially cautious** of any emails requesting an urgent response.

**Attachments**

Some email attachments can contain **viruses** and other **malware**. It's generally safest not to open any attachment you weren't expecting. If a friend sends you an attachment, you may want to ask if he or she meant to send it before downloading.

**Setting up your own email account**

Now that you've finished exploring Email Basics, you may feel ready to set up your own email account. You can get a free email account from any major webmail provider, including **Yahoo!**, **Outlook.com**, and **Gmail**.

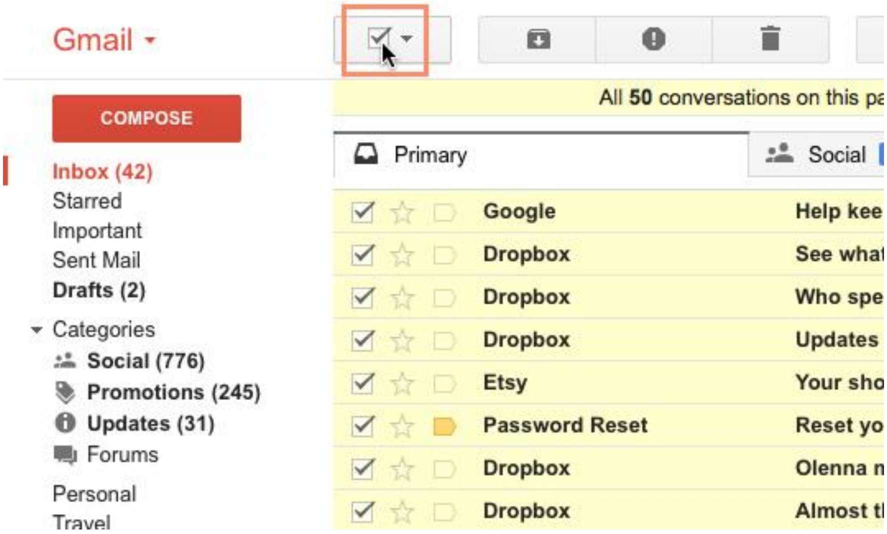
**Lesson 5: Extras**

**Time-saving email tips**

Many **email** clients have a variety of helpful features you might not know about. These features are pretty easy to use, and they can save you time and help you to better organize your emails. In this lesson, we'll go over some of these tips and tricks to help you optimize your email experience.

**Selecting multiple emails**

Let's say you have a large number of emails you'd like to delete. It would be fairly time consuming to go through and individually delete each email. Luckily, most clients have a feature that allows you to **select multiple emails**. These are usually in the form of check boxes next to each of your emails. Many clients also have a **Select All** button, which will select every email on the page, as seen below.




Once the emails are selected, you can then perform any action you want, including deleting, sorting, and archiving.

**Keyboard shortcuts**

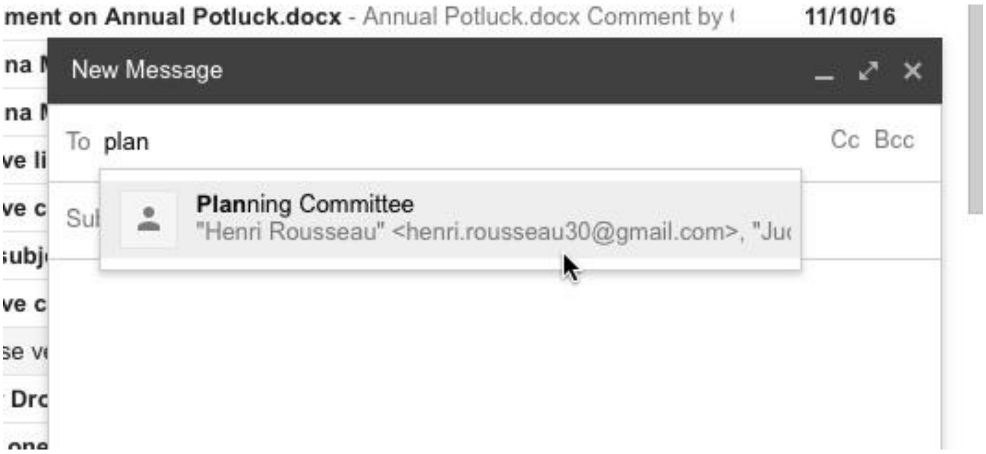
Most email clients have some set of **keyboard shortcuts** that can help you navigate your emails more quickly. An example that's fairly universal is using the **arrow keys** to scroll through email messages instead of having to click specific buttons. Other keyboard shortcuts (like replying and deleting) will vary from client to client. Below are a few support pages listing shortcuts for some popular clients:

- **Gmail**
- **Outlook**
- **Yahoo! Mail**

If you use an email service other than those listed above, you should be able to find its corresponding keyboard shortcuts via its help page or a quick Internet search.

**Creating groups**

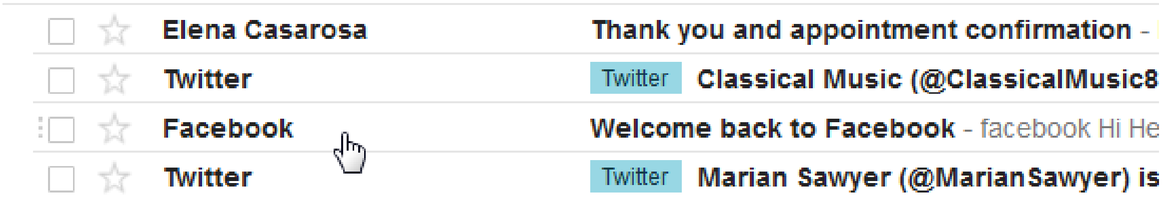
If you find yourself sending emails to the same people on a regular basis, it might be a good idea to **create a group**. Many clients allow you to select various email addresses and save them as a single group. This way, you can simply select the group as the recipient instead of having to select each individual address. This feature can usually be accessed from the **Contacts** page of your email client.




**Email filters**

When you're receiving a lot of emails on a daily basis, it can be difficult to keep them organized. Luckily, various email clients offer a feature called **filters**, which basically sort your emails into folders as you receive them.

You can create filters that sort your email by various characteristics, including specific **senders** or **recipients**, **keywords** in the subject or body, and **attachments**. For example, let's say you want to make sure emails from Twitter don't get lost among the rest of your messages. You could create a filter that sorts every email received from Twitter, as shown below.




**Lesson 6: Email violations can jeopardize your job**

Embarrassing or inappropriate communications sent via company email can damage professional credibility, reputations, and careers. Employees who violate their companies' email policies can face penalties ranging from disciplinary action to termination.

Many employers monitor email, and some employees have even been fired for violating their companies' email policies. Violation of company email policy and messages containing inappropriate or offensive language are the two most common causes for email-related firing. While workers may be disciplined or fired because of inappropriate email messages, companies can face the risk of lawsuits.

It's important to find out what your company’s email policies are, and make sure you comply. But in general, there are a few guidelines to keep in mind when it comes to handling email at work.

**Keep it professional**

Never convey anger, use profanity, or make racist or sexist remarks. Remember, inappropriate words or images sent via email can come back to haunt you. Don't send or forward emails containing libelous, defamatory, offensive, racist, or obscene remarks—even if they are meant to be a joke.

Keep in mind that while email is a convenient way of sending information, it's not always the best way to communicate. Things like tone, facial expression, and body language can completely change the meaning of a word or phrase. But because these things are lost in email communication, it's possible for people to interpret messages the wrong way.

**Don't discuss confidential information**

Most email is insecure unless it has been encoded or encrypted. Because of this, sending an email is like sending a postcard for many eyes to see. Never send confidential information to someone through email.

**Think before you send**

Don't treat email casually. Play it safe. In general, don't write anything in email that you wouldn't feel comfortable saying in a crowded elevator. Whenever you're writing an email, take a moment to think before you send.

**Lesson 7: Avoiding Spam and Phishing**

**Avoiding spam and phishing**

From email to instant messaging to social media, the Internet is an essential communication tool. Unfortunately, it's also popular among scammers and cybercriminals. To protect yourself from email scams, malicious software, and identity theft, you'll need to understand how to identify and avoid potentially dangerous content in your inbox, including spam and phishing attempts.

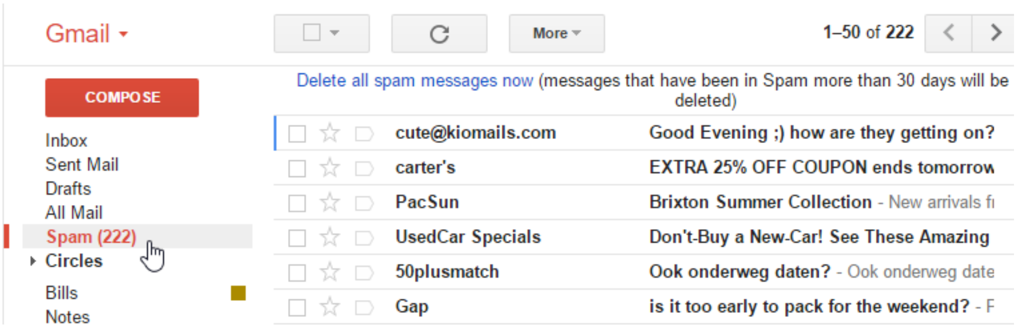
**Dealing with spam**

If you've ever received unwanted email advertisements, you may already be familiar with **spam**, also known as **junk email**. Spam messages can clutter your inbox and make it more difficult to find the emails you actually want to read. Even worse, spam often includes **phishing scams** and **malware**, which can pose a serious risk to your computer. Fortunately, most email services now include several features to help you protect your inbox from spam.

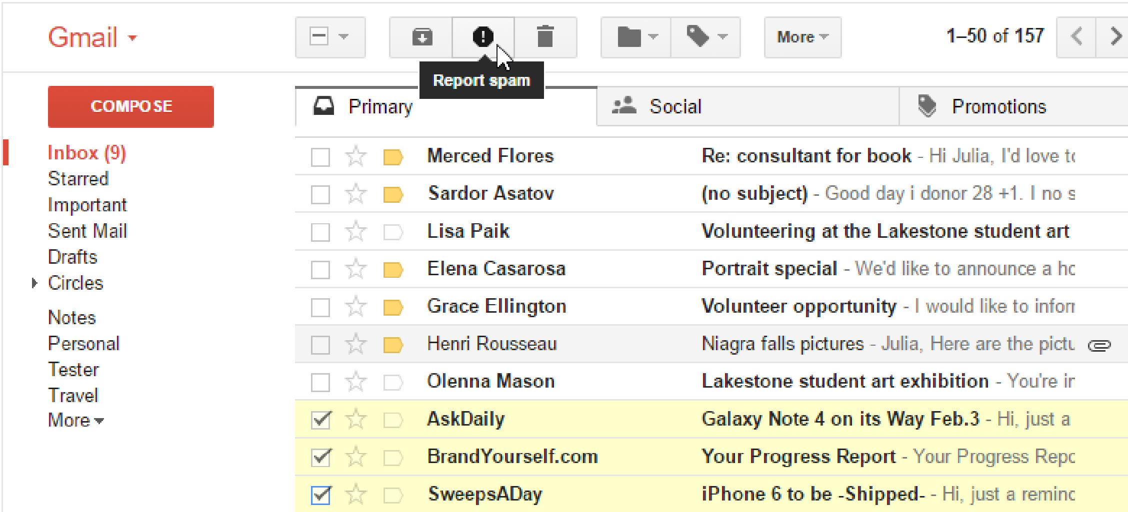
**Spam filters**

Whenever you receive an email, most email providers will check to see if it's a real message or spam. Any likely spam messages will be placed in the **spam folder** so you don't accidentally open them when checking your email.

Spam-blocking systems aren't perfect, though, and there may be times when legitimate emails end up in your spam folder. We recommend checking your spam folder regularly to make sure you aren't missing any important emails.



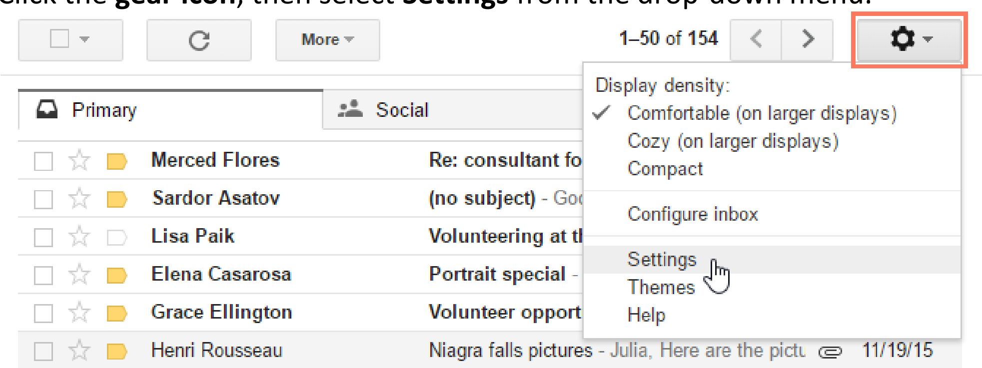

Many email services also have a feature you can use to **mark emails as spam**. In Gmail, for example, you can select the message and click the **Mark as Spam** button. This helps your email provider filter out these types of messages in the future.



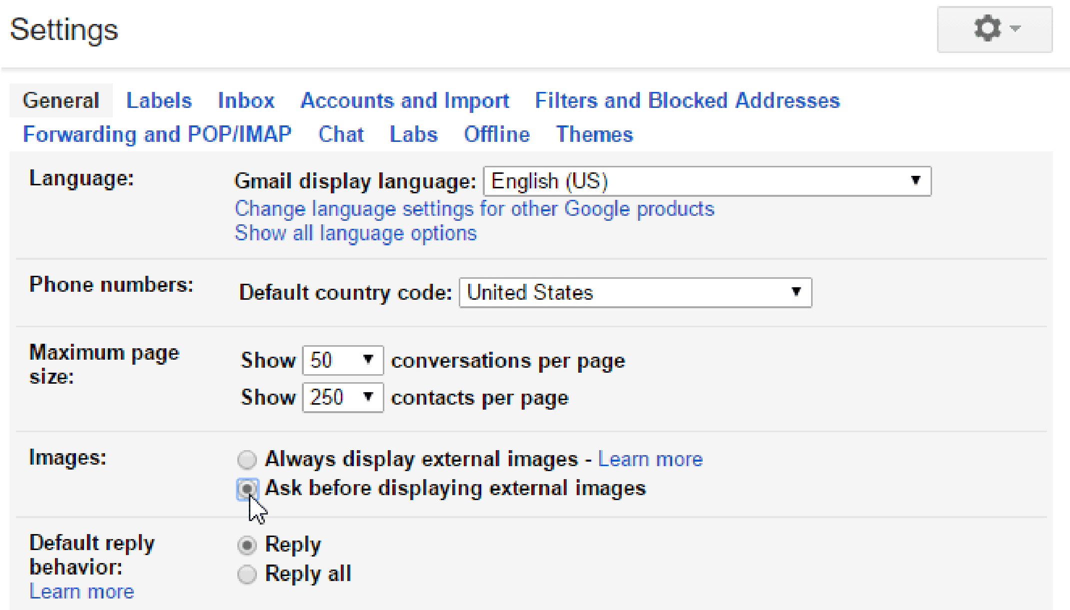

**Turning off email images**

Spam messages often contain **images** that the sender can track. When you open the email, the images will load and the spammer will be able to tell if your email works, which could result in even more spam. You can avoid this by **turning off email images**. Let's look at how to do this in Gmail, but remember that the process will vary depending on your email service.

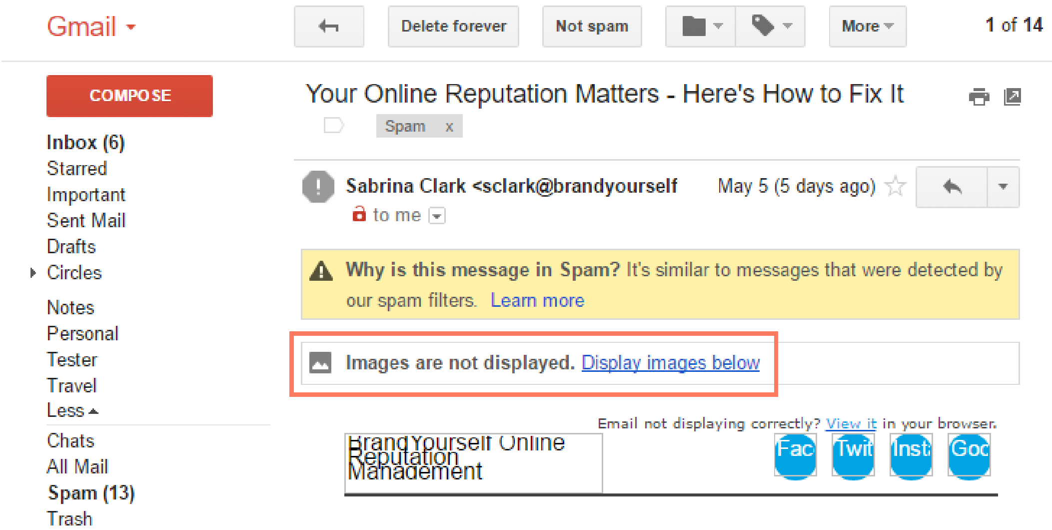
1. Click the **gear icon**, then select **Settings** from the drop-down menu.




2. Select **Ask before displaying external images**, then click **Save** at the bottom.

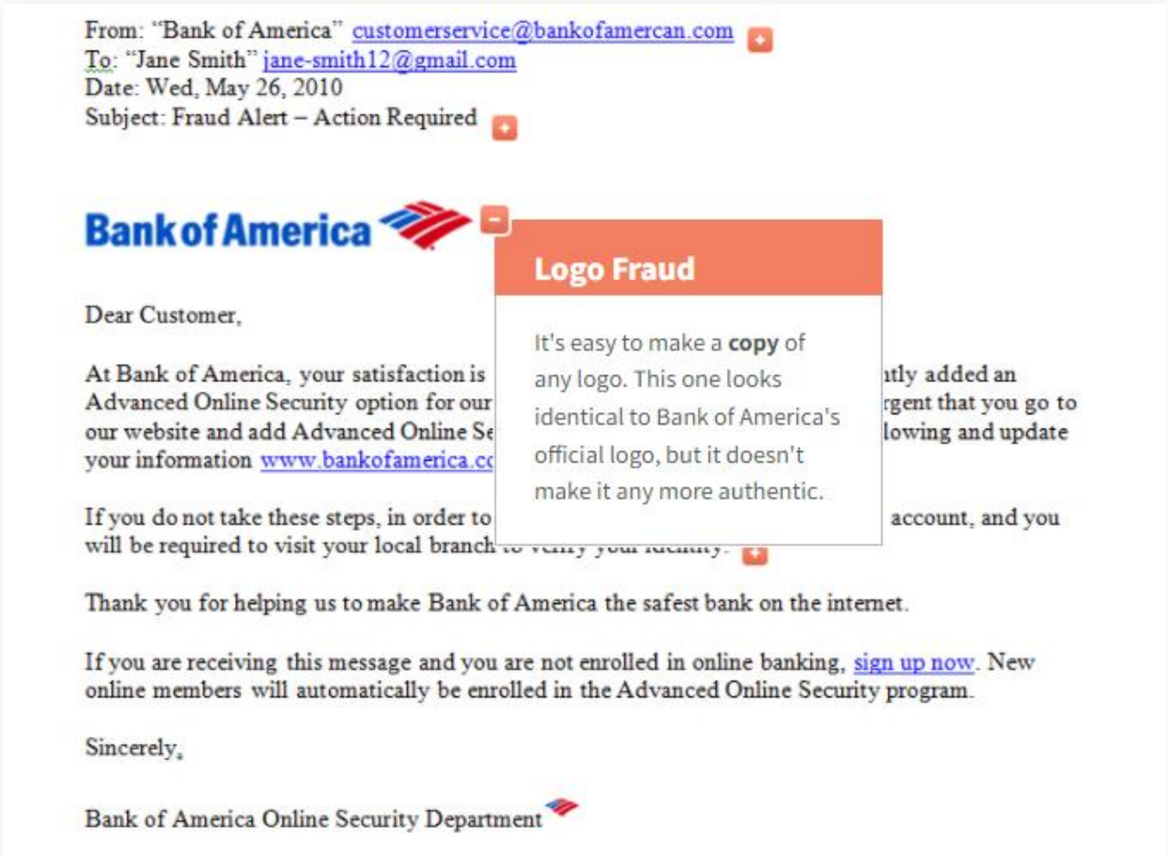



3. Whenever you open a message with images, Gmail will prevent them from loading by default.




## Phishing

**Phishing scams** are messages that try to **trick you into providing sensitive information**. These often appear to come from a bank or another trusted source, and they'll usually want you to re-enter a password, verify a birth date, or confirm a credit card number. Phishing messages may look real enough at first glance, but it's surprisingly easy for scammers to create convincing details.




**Other common email scams**

Spam and phishing are common problems, but there are many other types of **email scams** you may encounter. Some will promise to give you a lot of money if you advance a small amount upfront. Others may pretend to be from people you know in real life, and they'll often ask you to send money or download an attached file.

As with spam and phishing scams, remember to **trust your best judgement**. You should **never send someone money** just because you've received an email request. You should also **never download email attachments you weren't expecting** because they might contain malware that could damage your computer and steal your personal information.

Spam, scams, and phishing schemes will continue to evolve and change. But now that you know what to look for—and what to avoid—you can keep your inbox and computer that much safer.

**Lesson 8: How Formal Should an Email Be?**

**Finding the right tone for an email can be tricky**.


Sometimes it may feel like an email must be formal in order to be correct. The truth is, a formal tone isn't always automatically better than a casual tone. But how do you know which one to use, and when? There are several things you can look for to help you decide how formal or casual the tone of your email should be.

**When should an email sound more formal?**


Consider the person you're writing to. How do you know this person? What, if any, contact have you had in the past? These factors are going to be the best guide in deciding the tone of your email. If you're initiating first contact with someone such as a potential employer—or anyone in a position superior to you—generally you want to default to a formal tone.

Whenever you're writing to someone you've never met in person, the tone of your email is especially important. Because this email will be your way of making a first impression, you want to make sure it's a good one. Stick to greetings that use either a full name or a title and last name if you have that information. If you don't have the name of the person you're emailing, using **Dear Sir or Madam** is fine.

Using more professional language and avoiding contractions will also give your email a more formal tone. For example, instead of **I won't be able to make it**, saying **Regretfully, I will not be able to attend** gives your email an overall more professional tone. Also keep in mind that avoiding abbreviations and using correct spelling and grammar are just as important when it comes to setting the tone of your email.

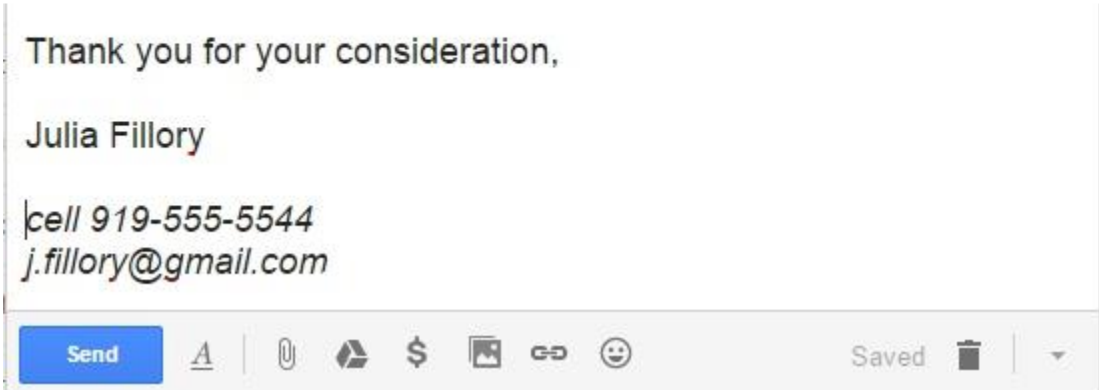
**In the example below:**

An applicant is emailing a recruiter she's never met. The formal greeting and language she uses give her email a more professional tone.


Similarly, you want to make sure you're closing your email in a way that matches the greeting of your email. Ending an email with simply **Thanks!** may sound friendly, but it can come off as too familiar and casual. For more formal emails, your best bet is to close with something like **Thank you very much** or **Best regards** to maintain a professional tone.

**Be sure to provide contact information.**

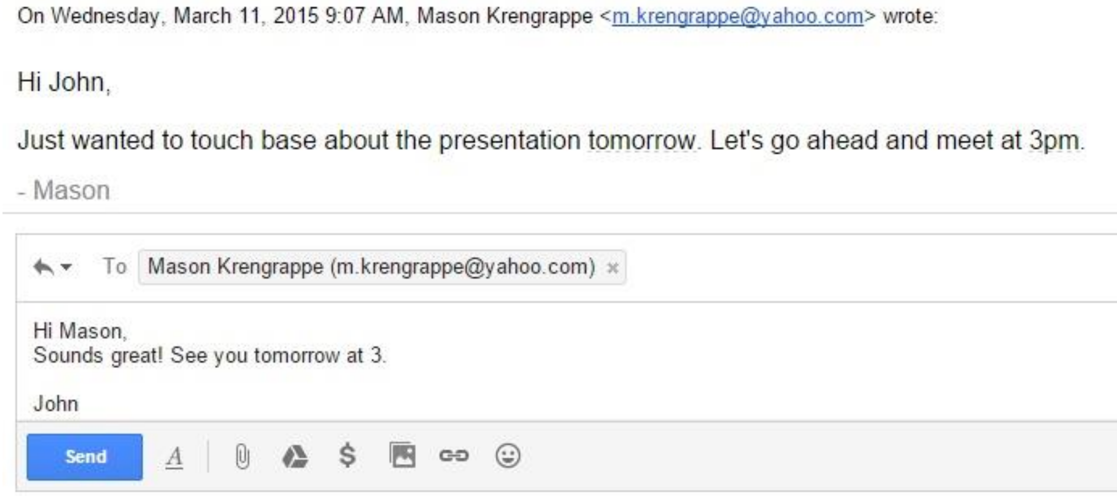
This is particularly important when initiating contact with someone—especially potential employers. You want to make sure they have all the information they need to contact you in the future.




**However, the rules of formality may not always apply.**

For instance, if you're writing a response to an email you have received, make note of the tone and language used by the sender. This can help take a lot of the guesswork out of deciding the tone of your email.

If you notice that the tone sounds less than perfectly formal, it's OK to mirror this in your reply. For example, if in the greeting someone uses **Hi** and your first name, it would be acceptable to use the same tone in your response. Look at the other person's use of abbreviations, contractions, and general word choice as a guide. In most situations, mirroring the tone set is perfectly acceptable for your response.



On Wednesday, March 11, 2015 9:07 AM, Mason Krengrappe <m.krengrappe@yahoo.com> wrote:

Hi John,

Just wanted to touch base about the presentation tomorrow. Let's go ahead and meet at 3pm.

- Mason

To Mason Krengrappe (m.krengrappe@yahoo.com)

Hi Mason,
Sounds great! See you tomorrow at 3.

John

Send

**When is it OK for an email to sound more casual?**


Situations in which it is acceptable to send a more casual, friendly email tend to be more obvious. For example, if you're writing to a friend or family member, it is of course appropriate to use a casual tone.

When it comes to people like your colleagues or peers, take two things into consideration when deciding on tone:

1. How long have you known this person?
2. In what context have you known this person?

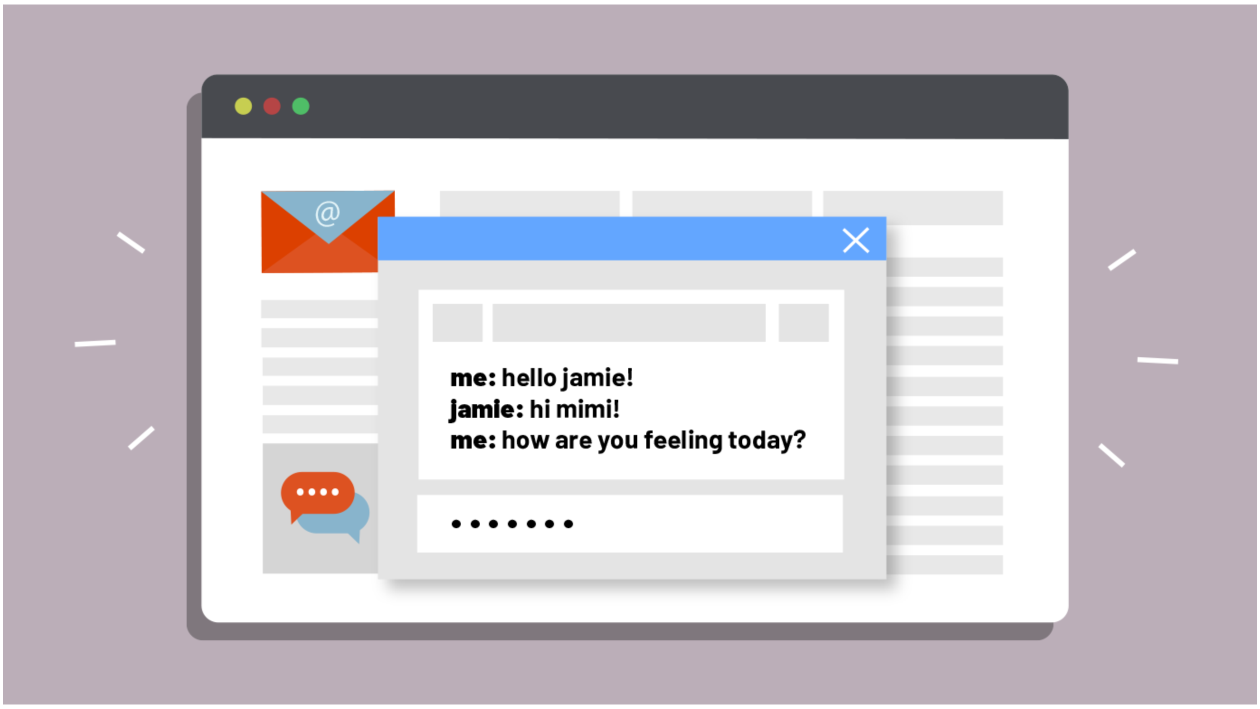
Generally, the longer you've known someone—or if you interact with a person outside of work with some frequency—the more acceptable it is to use a casual tone. An email with a very casual tone may read more like a text message than a letter, and it could include things like abbreviations or emoticons—it all depends on the culture of your workplace. Think about the environment you work in, and look for examples set by your peers and superiors when deciding whether to use things like these.

**One very important thing to keep in mind:**


Professional isn't always the same as formal. In a work environment, it's important to always remain professional, even when the tone is casual. It's never a good idea to gossip or say anything bad about other people you work with, no matter how well you know the colleague or coworker you're emailing. It's the sort of thing that could very easily come back to haunt you, but fortunately it's also easy to avoid.

**Lesson 9: All About Online Communication**

**Introduction**




In the past, email was the best way to communicate with people online. But today, there are many different ways to talk online, allowing you to do things like:

- Make phone calls from your computer and even see the person you're talking with
- Share with lots of friends at the same time without sending an email to each of them individually
- Engage with different websites by making comments or posting your own content

Over the next several lessons, we'll take a look at some different methods of online communication, including **chat**, **video calling**, **text messages**, and **status updates**.

**How people communicate online**

When people are not online, they use a variety of communication methods, including **phone calls**, **written letters**, and **face-to-face conversation**. We use these different methods depending on the situation. Online communication is very similar: People may use **instant messaging**, **video chat**, or **social networking** depending on the situation. You can choose whichever methods best fit your needs.

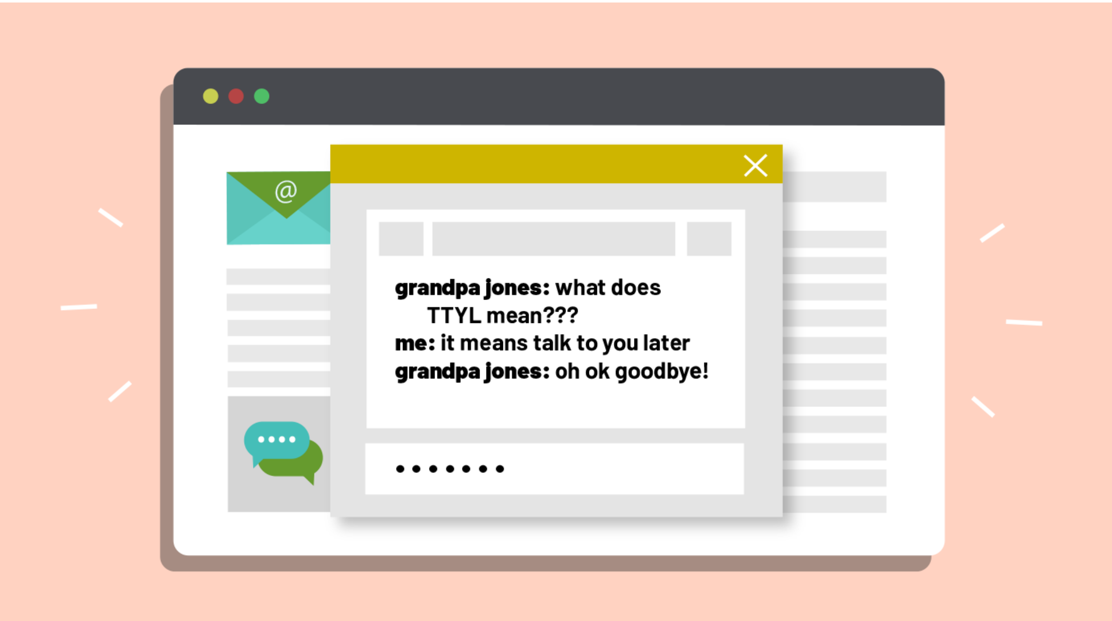
Review the graphic below to get an idea of how a few different people communicate online.


**Staying safe online**

No matter how you communicate online, you'll need to think about **privacy** and **safety**. Each service that we'll discuss has its own privacy settings. It's helpful to review these settings before using any service to avoid revealing your conversations and personal information to a broader audience.

Act as if you were communicating offline: Remember, everything you write online is relatively **permanent**, so even passing comments could have negative consequences for you or someone else in the future.

**Lesson 10: Chat and Instant Messaging**



**Chat** and **instant messaging (IM)** are short messages sent and read **in real time**, allowing you to converse more quickly and easily than email.

**Chat** and **IM** are generally used when both (or all) people are online, so your message can be read immediately. By comparison, an **email message** won't be seen until the recipient checks his email, meaning that chat and IM are better for quick messages and conversations.

**Chat vs. IM**

The terms **chat** and **IM** are sometimes used interchangeably. However, they can have slightly different meanings:

- **Chat** often occurs in a virtual **chat room**, which can include many different people who may or may not know each other. Many chat rooms focus on a particular **topic** or **interest**.
- **IM** usually includes a list of your contacts, called a **Buddy List** or **Friend List**, which allows you to see who is online. IM is especially suited for **one-on-one communication**, but it's possible to send messages to multiple people at once. IM is technically a kind of chat, and some IM services use the term "chat" instead.

**Pros and cons of instant messaging**

Will chat or IM work for your needs? Review some of the pros and cons to help decide:

**Pros:**

- It's **instant**; you don't need to wait for the other person to check his email.
- It's great for **quick messages**, questions, or notifications.
- Compared to email, it's easier to carry on a **conversation** (or even multiple conversations).
- You can stay logged in while doing other things on your computer, which makes it easy to **multi-task**.

**Cons:**

- If someone is not online, you may have to contact him **another way**.
- It's **not as convenient** as email for lengthy or complicated messages.
- It's **not always instantaneous**: If your friends are busy or away from the computer, it may take a while for them to respond.
- Since people may type quickly or use **abbreviations**, messages could be difficult to understand. Also, as with email, it's possible to misinterpret someone's tone.

**Lesson 11: Online Phone Calls**


It's easy to make free or inexpensive **phone calls** to almost anywhere in the world using your computer. You don't even necessarily need a super-fast Internet connection. Many IM and chat services include **voice chat**, which lets you talk to your friends who are online.

Some services go a step further, allowing you to **call any phone number** and even providing you with a **phone number** for others to call. As these services are often very inexpensive, some people use them to replace their traditional, or **landline**, phone service entirely.

You may have heard the term **VoIP** (pronounced "voyp"), which stands for **Voice over Internet Protocol**. VoIP can be used to describe any kind of online phone service.

**Hardware and software requirements**

In order to make phone calls from your computer, you'll need a **microphone** and **speakers**, or better yet, a **headset** with a microphone. If your computer has a built-in microphone and speakers, you may be able to use those instead. There are also **adapters** that will let you connect a regular phone to your computer or your router.

Different services will have their own **hardware** and **software** requirements, but most computers from the last few years will have more than enough processing power. In addition, a **broadband Internet connection** is recommended but not necessarily required.

**Pros and cons of online phone services**

Will an online phone service work for your needs? Review some of the pros and cons to help decide:

**Pros:**

- Some services are **free** or **very inexpensive**.
- Unlike chat or email, you can actually **talk** to someone.

- You can use it as a **replacement** for your landline, or just to save minutes on your mobile phone.
- It's possible to set up a **conference call** (or **group chat**) with multiple people.

**Cons:**

- Compared to IM or chat, it's more difficult to carry on several conversations at once.
- Unlike a traditional phone, it **won't work if the power goes out**.
- Some features, like the ability to **call phones**, may cost extra.
- You may need to purchase a **microphone**, **speakers**, or **headset** if you don't already own these.
- On slower Internet connections, it **may not work** at all or could be unreliable.
- Most online phone services cannot be used to make **emergency calls**.

**Lesson 12: Video Chat and Group Calls**


**Video chat** allows you to **see and hear** the people you're communicating with **in real time**. Whether you're talking with a family member or collaborating at work, video chat can add a personal touch to your conversations. Just like **voice chat**, it's included in many **IM** and **chat** services, and it's often free.

**Hardware and software requirements**

Like **voice chat**, you'll need a **microphone** and **speakers**, or a **headset** that contains both. You'll also need a **webcam** so the other person can see you. Many computers have a **built-in webcam**, usually located just above the screen. There are also inexpensive webcams that connect to your computer's USB port, which can be purchased at any store that sells computer hardware and electronics.

Generally, video chat will require a **broadband Internet connection**. The **faster** your Internet connection, the **better** the video quality. With slower connections, the video can become choppy or may not work at all.

**Group video chat**

With some services, it's possible to video chat with **multiple people**. This is often called **group video chat** or **video conferencing**, while the meeting itself is often called a **webinar** (short for **web seminar**). It's often used in the workplace, but you can use it anytime you want to collaborate with a group. However, you should be aware that some services **charge extra** for this feature, and it may require a **faster Internet connection**.
If you're giving a presentation, you can even **share your screen** with the people you're talking to. That means they'll see exactly what you're seeing on the screen, whether it's a **PowerPoint presentation**, a **photo**, or a **spreadsheet**. Screen sharing is also useful if you're having a **problem with your computer**, as it can help others see and identify the issue.

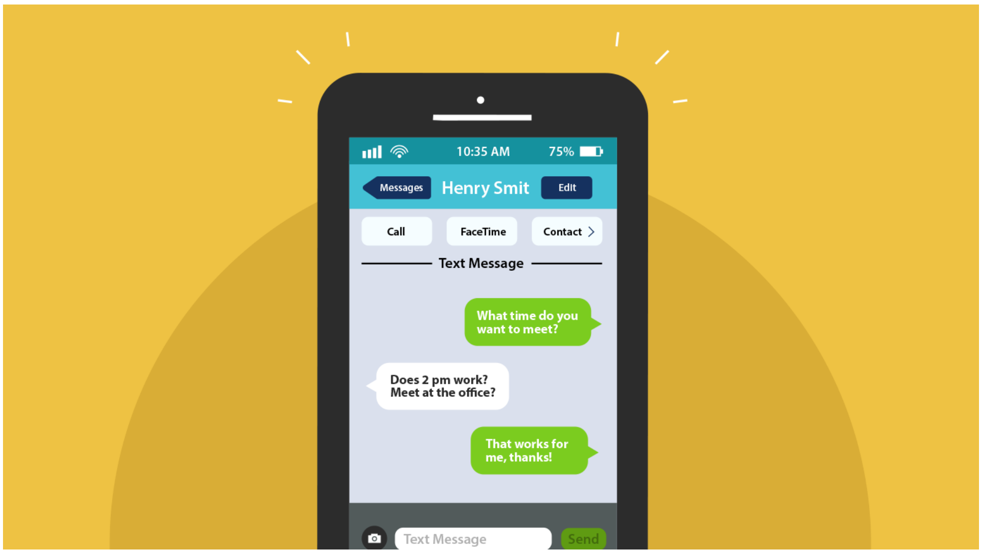
**Pros:**

- You can **see** the person you're talking with.
- Many voice chat services are **free** and may be included with your IM or chat program.
- It's possible to chat with **multiple people** at once.

**Cons:**

- You may need to buy a **webcam** and **headset** if you don't already own them.
- It may not work with **slower Internet connections**.
- Even though you can see the person, it's not the same as talking face to face. Due to the camera angle and picture quality, you may find it a bit **awkward** or **unflattering**.

**Lesson 13: Text Messages**




You've probably heard people talk about **text messaging**, or **texting**. **Text messages** are short messages (usually **160 characters or fewer**) sent from one **mobile phone** to another. It's similar to instant messaging, except that you won't need to **log in**—you'll just send messages directly from your phone.
Typically, texting is **not free**, although your mobile carrier probably offers service packages that include a certain number of texts per month (or even **unlimited texts**). If

you don't have a texting plan, you'll generally be charged whenever you **send** or **receive** a text message.
Text messaging is also known as **SMS**, which stands for **Short Message Service**.
**Why text?**
Many people ask the same question: **"Why would I send a text message when I could just call the person?"** One of the main reasons is that it's faster, at least for short messages. It can easily take several minutes to "send" your message with a phone call. With a text message, the same message could be sent with a text in just a few seconds.
There are also times when it's not really possible to call someone, like if you're at a **meeting**, or in **class**, or any other place where you're not able to talk easily. Texting is often the best alternative in these situations.
Do note that typing on a mobile phone tends to be **slower** than typing on a computer. To speed things up, people often use **abbreviations** and **acronyms**. If you're not familiar with these abbreviations, it can be difficult to understand some text messages. To see some of the most common acronyms, check out the **Top 50 Popular Text & Chat Acronyms**.
**Texting without a mobile phone**
Text messages are designed to be sent from **one mobile phone to another**. However, there are some websites, such as **textem.net**, which allow you to send a text message from a **computer** to a **mobile phone**.
This can be especially helpful if you don't use texting on your phone but need to contact someone who does.
**Pros and cons of text messaging**
Will text messages work for your needs? Review some of the pros and cons to help decide:
**Pros:**

- Texts can be sent and received with **almost any mobile phone**—not just smartphones.
- They are great for **quick messages**, especially if you are away from a computer.
- People you text will see your message either **immediately** or the **next time they look at their phones**.
- It's possible to send text messages from a **computer** to a **mobile phone**.

**Cons:**

- Text messages generally **cost money**, unless they are included in your mobile phone plan. Also, **recipients may also be charged** when they read the message.
- The **160-character limit** makes text messages unsuitable for longer messages.
- Unless your mobile phone has a full keyboard, it **may take a long time to type** your message.

**Lesson 14: Direct Messages**


Many websites allow you to send **direct messages**: private messages sent from one person to another. In many ways, direct messaging is **very similar to email**, but with a few important distinctions:

- It has **fewer features** than email.
- It's only used to communicate with other people who use the **same website**.
- You don't get your own **email address**, which means that you can't really use direct messages as a replacement for email.

**When are direct messages used?**

Direct messages are often used when **email is not an option**. For example, eBay sellers may keep their email address private, but you can always contact them through eBay's direct message feature. Direct messages allow both parties to communicate **without sharing their email addresses**. For convenience, you can usually have direct messages forwarded to your email address.

There are **two main types of websites** where you might use direct messages:

- **Online stores:** If you have a question about an item, you might send the **seller** a direct message. This is especially common on websites like eBay and Etsy where items are sold by **regular people**, not retailers.
- **Social networking sites:** Websites like Twitter, Facebook, and LinkedIn let you send direct messages to other users. This allows you to send a **private message** without posting it to a public profile.

**Pros and cons of direct messaging**

Will direct messages work for your needs? Review some of the pros and cons to help decide:

**Pros:**

- Your contact info stays **private**. Neither person has to reveal an email address.
- You can send **private messages** that are visible only to the recipient.

- It gives you an **alternate way to contact friends** if you lose their email addresses.
- It's included with **sites you may already use**, such as eBay, Facebook, and Twitter.

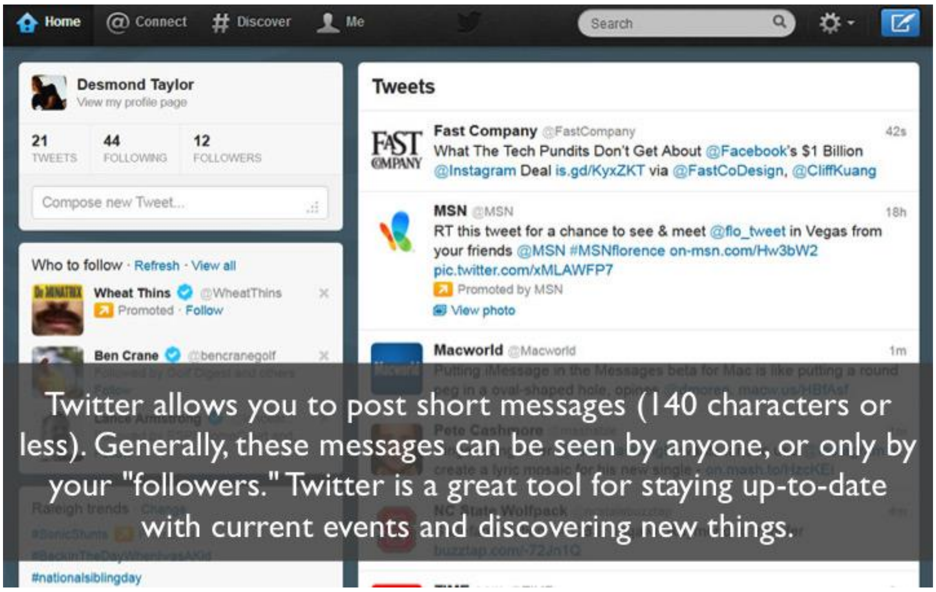
**Cons:**

- Like email, it **may take a long time** for the other person to see your message.
- It can't really be used as a **replacement** for email, and its usage is more limited.

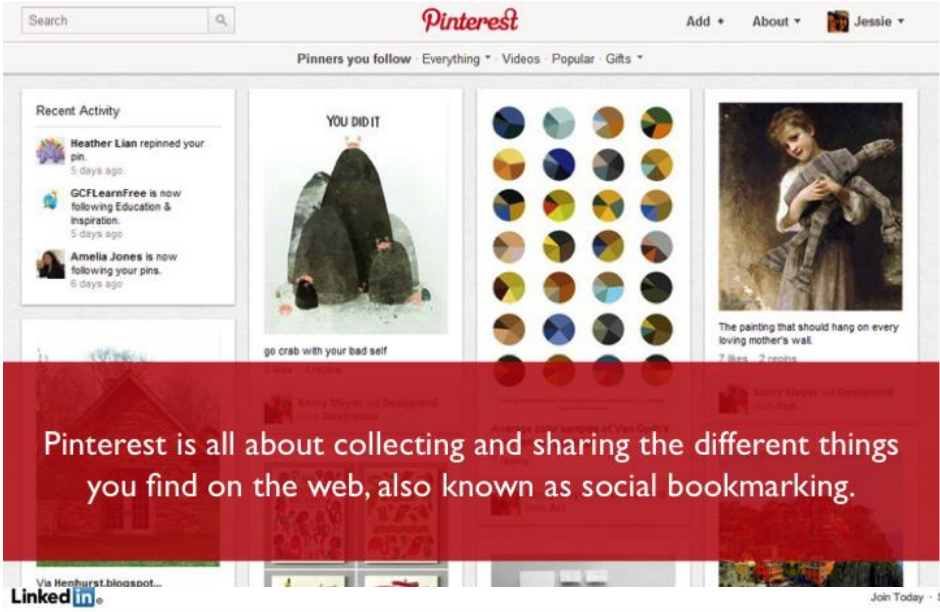
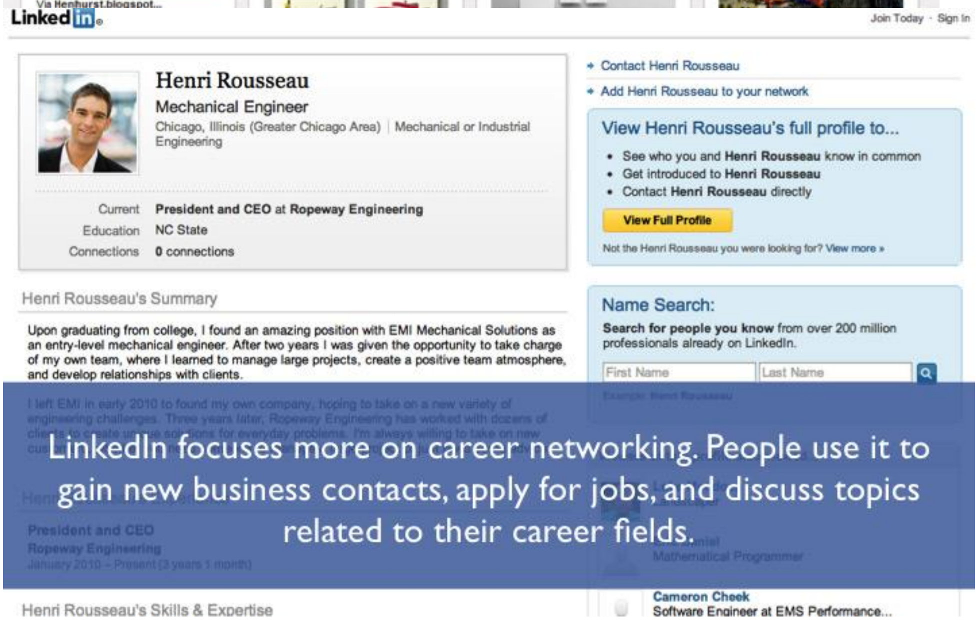
**Lesson 15: Social Posts, Status Updates, and Tweets**

Imagine you're at a party. You might be talking to one person, or a small group of people, but other people can **join the conversation**. This is basically how **social networking** sites work. Conversations are more **open** and **public**, which can provide a **richer social experience** than other forms of online communication.


-
-




-

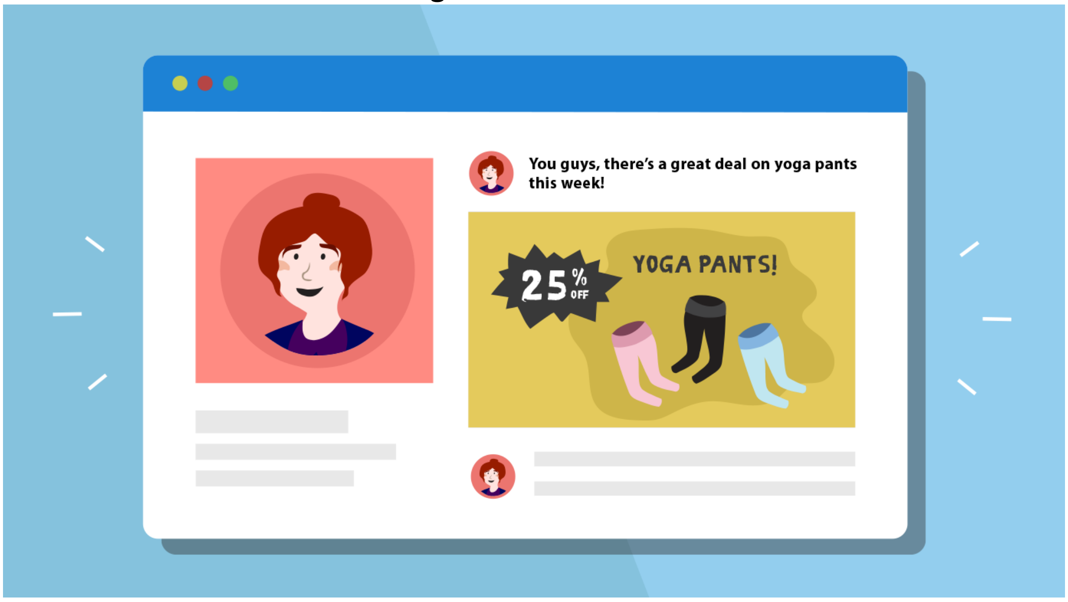
- 
Pinterest
Search
Add
About
Jessie
Pinners you follow · Everything · Videos · Popular · Gifts
Recent Activity
Heather Lian repinned your pin.
5 days ago
GCFLearnFree is now following Education & Inspiration.
5 days ago
Amelia Jones is now following your pins.
6 days ago
YOU DID IT
go crab with your bad self
The painting that should hang on every loving mother's wall.
Via Henhurst.blogspot...
Pinterest is all about collecting and sharing the different things you find on the web, also known as social bookmarking.

LinkedIn
Join Today · Sign In
Henri Rousseau
Mechanical Engineer
Chicago, Illinois (Greater Chicago Area) | Mechanical or Industrial Engineering
Current President and CEO at Ropeway Engineering
Education NC State
Connections 0 connections
Contact Henri Rousseau
Add Henri Rousseau to your network
View Henri Rousseau's full profile to...
See who you and Henri Rousseau know in common
Get introduced to Henri Rousseau
Contact Henri Rousseau directly
View Full Profile
Not the Henri Rousseau you were looking for? View more »
Henri Rousseau's Summary
Upon graduating from college, I found an amazing position with EMI Mechanical Solutions as an entry-level mechanical engineer. After two years I was given the opportunity to take charge of my own team, where I learned to manage large projects, create a positive team atmosphere, and develop relationships with clients.
Name Search:
Search for people you know from over 200 million professionals already on LinkedIn.
First Name
Last Name
LinkedIn focuses more on career networking. People use it to gain new business contacts, apply for jobs, and discuss topics related to their career fields.
Henri Rousseau's Skills & Expertise
Cameron Cheek
Software Engineer at EMS Performance...
- 
- 


**Communicating in a social network**

Once you've joined a social network, you can start posting your thoughts, questions, pictures, links, videos, or anything else you'd like to share. These are called social posts because they are visible to other people, unlike direct messages or email. Posts will appear on your activity feed, which is visible to your friends on the site.

Social posts are known by many different names, but they are most commonly called **status updates**. You can use status updates to let your friends know **what you're doing** or to say **what's on your mind**. Some social networking sites have unique names for their social posts. For example, on **Twitter** a post is called a **tweet**, while a post on **Pinterest** is known as a **pin**.

**Pros and cons of social networking**




**Pros:**

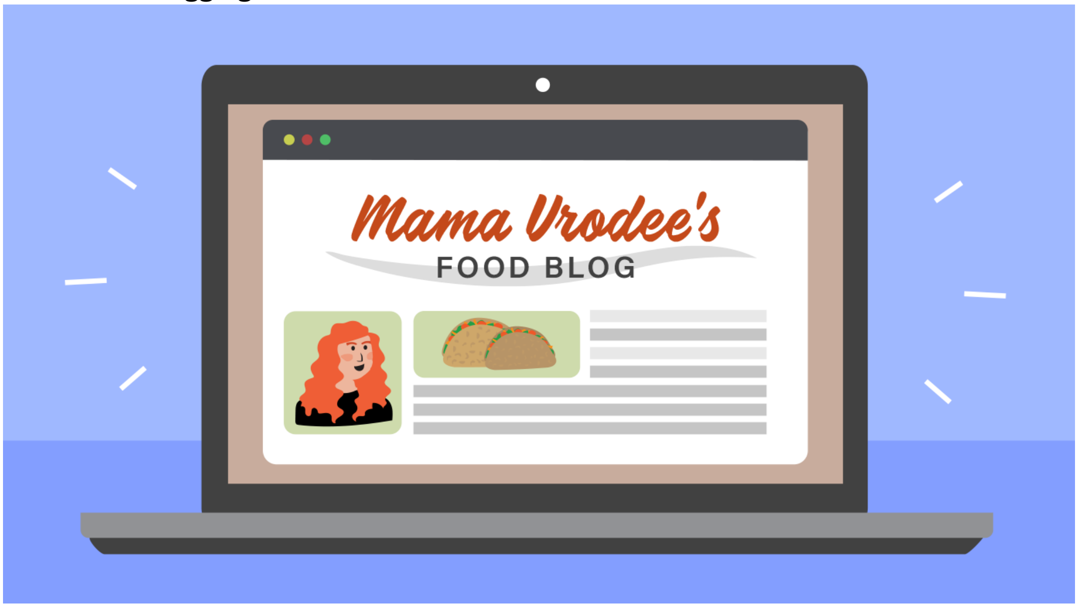
- You can communicate with **a lot of people** at the same time.
- It's easy to post your **thoughts**, **pictures**, **links**, and more.
- It provides a **richer social experience** than email or instant messaging.

- You can stay in touch with people who **live far away** or who you **don't see often**.

**Cons:**

- If you have friends who use a **different social networking site** (or don't use any at all), they **won't see your social posts**.
- You can accidentally post **sensitive information** that will be seen by many different people.
- Things that you post may be **permanent**, so you have to be careful not to post things that could harm your reputation in the future.
- Some sites have **complex privacy options**, which may be a bit confusing to set.

**Lesson 16: Blogging**




Have you ever wanted to create your own magazine or newsletter? Would you like to promote your home-based business or build your personal brand? Have you always wanted to create your own website, but didn't know how? Today it's possible to do these things by creating a **blog** (short for **weblog**). Best of all, it's free and relatively easy. Many blogs focus on a particular topic or interest, like **music**, **cooking**, **technology**, or **parenting**. Others are less structured and cover a variety of topics. It's easy to find a professional **design** for your blog, even if you don't know much about building a webpage.

**Different types of blogs**

You don't necessarily have to be a writer to create a blog. Some blogs focus on a particular type of media, such as **video** or **photos**, instead of having full-fledged articles. Others have **shorter posts**, which won't require as much writing and which may be less time consuming. Below are some common types of blogs:

- **Video blog:** Also known as a **vlog**, this is a type of blog composed mainly of videos. Many YouTube channels are classified as video blogs.
- **Photoblog:** This is a blog that is mostly **photos**, with or without descriptions.

- **Microblog:** A microblog consists of **very short** posts. **Status updates** are a form of microblogging. **Twitter** and **Tumblr** are two of the most popular microblogging services.


**Blogging privacy**

It's important to remember that **blogging** is a **public form** of online communication. Generally, anyone in the world can view your posts and your profile. This means you should be extra careful not to post **sensitive information**. Additionally, posting things that reflect negatively on you (such as **derogatory** or **offensive** content) could seriously affect your personal and professional **reputation**.

**Pros and cons of blogging**

**Pros:**

- It gives you an opportunity to write about **things that matter to you**.
- Your blog can be read by people all **over the world**.
- A blog is much **easier to set up** than a regular website.
- You can choose a **design** and **layout** that you like.

**Cons:**

- It can be **time consuming**, especially if you post frequently.
- You'll need to avoid posting **sensitive information** because it can be viewed by anyone.
- Writing **derogatory** or **offensive** content could harm your reputation.

**Lesson 17: 5 free instant messenger services**

If you're looking for a way to keep in touch, we've collected five instant messenger services that allow you to chat with friends online:

**Google Hangouts:** Once you've downloaded Google Hangouts, you can chat from your computer's desktop, make video calls, and participate in group chats with other Google Hangouts and Gmail users.

**Facebook Messenger:** If you already have a Facebook account, this can be a convenient option. All of your Facebook friends will be easy to find through Messenger, so you won't have to spend time adding people to your list of contacts.

**Skype:** Although Skype is probably best known for offering voice and video calling, it also has instant messaging features. One advantage of Skype is its language-translation feature: It can translate instant messages, voice calls, and video calls automatically.

**Pidgin:** Pidgin is a basic instant messaging service for Windows that allows you to chat with users of other instant messaging services like Google Talk, ICQ, and many more.

**Adium:** Similar to Pidgin, Adium is a basic instant messaging service that allows you to chat with users of other instant messaging services like Google Talk and ICQ. The service, designed for macOS users, also lets you combine contacts if a contact has more than one instant messaging name.

# Module 7: Data Security

## Introduced to Data Security:

Data Security is the means of ensuring that data is kept safe from corruption and that access to it is suitably controlled. Data Security helps to ensure privacy. It also helps to protect personal data.
Data security is the process of maintaining the confidentiality, integrity, and availability of an organization's data in a manner consistent with the organization's risk strategy. Before an incident happens, companies must have a security architecture and response plan in place. Once an incident occurs, they must be able to detect the event and respond accordingly. After the incident, the company must be able to recover effectively and efficiently.

## What You Should Know about Data Security:

Data security is not just about protecting company and customer data from threats. Your network is made up of multiple layers that have unique attack surfaces. Compromise at one layer can propagate through the operating system and applications. To help protect data, reduce risk, and assure compliance standards, your security and integrity capabilities should be rooted in hardware.

Meeting industry standards for healthcare, finance, government, and retail can help you stay in compliance when handling sensitive customer data.

While compliance is important, best practices recommend putting additional protections in place—from the hardware and firmware up through the operating system and applications and to the cloud.

The most commonly used security technologies include data encryption in transit and at rest, authentication and authorization, hardware-based security (or physical-based security), and data backup.

## What are the Main Elements of Data Security?

The core elements of data security are confidentiality, integrity, and availability. Also known as the CIA triad, this is a security model and guide for organizations to keep their sensitive data protected from unauthorized access and data exfiltration.

- **Confidentiality** ensures that data is accessed only by authorized individuals;
- **Integrity** ensures that information is reliable as well as accurate; and
- **Availability** ensures that data is both available and accessible to satisfy business needs.

## What are Data Security Considerations?

There are a few data security considerations you should have on your radar:

- **Where is your sensitive data located?** You won't know how to protect your data if you don't know where your sensitive data is stored.

- **Who has access to your data?** When users have unchecked access or infrequent permission reviews, it leaves organizations at risk of data abuse, theft or misuse. Knowing who has access to your company's data at all times is one of the most vital data security considerations to have.
- **Have you implemented continuous monitoring and real-time alerting on your data?** Continuous monitoring and real-time alerting are important not just to meet compliance regulations, but can detect unusual file activity, suspicious accounts, and computer behavior before it's too late.

## What are Data Security Technologies?

The following are data security technologies used to prevent breaches, reduce risk and sustain protections.

**Data Auditing**

The question isn't if a security breach occurs, but *when* a security breach will occur. When forensics gets involved in investigating the root cause of a breach, having a data auditing solution in place to capture and report on access control changes to data, who had access to sensitive data, when it was accessed, file path, etc. are vital to the investigation process.

Alternatively, with proper data auditing solutions, IT administrators can gain the visibility necessary to *prevent* unauthorized changes and potential breaches.

**Data Real-Time Alerts**

Typically it takes companies several months (or 206 days) to discover a breach. Companies often find out about breaches through their customers or third parties instead of their own IT departments.

By monitoring data activity and suspicious behavior in real-time, you can discover more quickly security breaches that lead to accidental destruction, loss, alteration, unauthorized disclosure of, or access to personal data.

**Data Risk Assessment**

Data risk assessments help companies identify their most overexposed sensitive data and offer reliable and repeatable steps to prioritize and fix serious security risks. The process starts with identifying sensitive data accessed via global groups, stale data, and/or inconsistent permissions. Risk assessments summarize important findings, expose data vulnerabilities, provide a detailed explanation of each vulnerability, and include prioritized remediation recommendations.

**Data Minimization**

The last decade of IT management has seen a shift in the perception of data. Previously, having more data was almost always better than less. You could never be sure ahead of time what you might want to do with it.

Today, data is a liability. The threat of a reputation-destroying data breach, loss in the millions or stiff regulatory fines all reinforce the thought that collecting anything beyond the minimum amount of sensitive data is extremely dangerous.

To that end: follow data minimization best practices and review all data collection needs and procedures from a business standpoint.

**Purge Stale Data**

Data that is not on your network is data that can't be compromised. Put in systems that can track file access and automatically archive unused files. In the modern age of yearly acquisitions, reorganizations and "synergistic relocations," it's quite likely that networks of any significant size have multiple forgotten servers that are kept around for no good reason.

## How Do You Ensure Data Security?

While data security isn't a panacea, you can take several steps to ensure data security. Here are a few that we recommend.

**Quarantine Sensitive Files**

A rookie data management error is placing a sensitive file on a share open to the entire company. Quickly get control of your data with data security software that continually classifies sensitive data and moves data to a secure location.

**Track User Behavior against Data Groups**

The general term plaguing rights management within an organization is "overpermissioning'. That temporary project or rights granted on the network rapidly becomes a convoluted web of interdependencies that result in users collectively having access to far more data on the network than they need for their role. Limit a user's damage with data security software that profiles user behavior and automatically puts in place permissions to match that behavior.

## Respect Data Privacy

Data Privacy is a distinct aspect of cybersecurity dealing with the rights of individuals and the proper handling of data under your control.

## Data Security Regulations

Regulations such as HIPAA (healthcare), SOX (public companies) and GDPR (anyone who knows that the EU exists) are best considered from a data security perspective. From a data security perspective, regulations such as HIPAA, SOX, and GDPR require that organizations:

- Track what kinds of sensitive data they possess
- Be able to produce that data on demand
- Prove to auditors that they are taking appropriate steps to safeguard the data

These regulations are all in different domains but require a strong data security mindset. Let's take a closer look to see how data security applies under these compliance requirements:

**Health Insurance Portability and Accountability Act (HIPAA)**

The Health Insurance Portability and Accountability Act was legislation passed to regulate health insurance. Section 1173d—calls for the Department of Health and Human Services "to adopt security standards that take into account the technical capabilities of record systems used to maintain health information, the costs of security measures, and the value of audit trails in computerized record system."

From a data security point of view, here are a few areas you can focus on to meet HIPAA compliance:

- **Continually Monitor File and Perimeter Activity –** Continually monitor activity and access to sensitive data – not only to achieve HIPAA compliance, but as a general best practice.
- **Access Control** – Re-compute and revoke permissions to file share data by automatically permissioning access to individuals who only have a need-to-know business right.

- **Maintain a Written Record** – Ensure you keep detailed activity records for all user objects including administrators within active directory and all data objects within file systems. Generate changes automatically and send to relevant parties who need to receive the reports.

**Sarbanes-Oxley (SOX)**

The Sarbanes-Oxley Act of 2002, commonly called "SOX" or "Sarbox," is a United States federal law requiring publicly traded companies to submit an annual assessment of the effectiveness of their internal financial auditing controls.

From a data security point of view, here are your focus points to meet SOX compliance:

- **Auditing and Continuous Monitoring** – SOX's Section 404 is the starting point for connecting auditing controls with data protection: it asks public companies to include in their annual reports an assessment of their internal controls for reliable financial reporting, and an auditor's attestation.
- **Access Control –**Controlling access, especially administrative access, to critical computer systems is one of the most vital aspects of SOX compliance. You'll need to know which administrators changed security settings and access permissions to file servers and their contents. The same level of detail is prudent for users of data, displaying access history and any changes made to access controls of files and folders.
- **Reporting –** To provide evidence of compliance, you'll need detailed reports including:
    - data use, and every user's every file-touch
    - user activity on sensitive data
    - changes including permissions changes which affect the access privileges to a given file or folder
    - revoked permissions for data sets, including the names of users

**General Data Protection Regulation (GDPR)**

The EU's General Data Protection Regulation covers the protection of EU citizen personal data, such as social security numbers, date of birth, emails, IP addresses, phone numbers, and account numbers. From a data security point of view, here's what you should focus on to meet GDPR compliance:

- **Data Classification** – Know where sensitive personal data is stored. It's critical to both protecting the data and also fulfilling requests to correct and erase personal data, a requirement known as the right to be forgotten.
- **Continuous Monitoring** –The breach notification requirement enlists data controllers to report the discovery of a breach within 72 hours. You'll need to spot unusual access patterns against files containing personal data. Expect hefty fines if you fail to do so.
- **Metadata** – With the GDPR requirement to set a limit on data retention, you'll need to know the purpose of your data collection. Personal data residing on company systems should be regularly reviewed to see whether it needs to be archived and moved to cheaper storage or saved for the future.
- **Data Governance** – Organizations need a plan for data governance. With data security by design as the law, organizations need to understand who is accessing

personal data in the corporate file system, who should be authorized to access it and limit file permission based on employees' actual roles and business need.

**How Varonis Helps with Data Security**

For companies that have a hold on data and have security obligations due to GDPR or other regulatory requirements, understanding our mission at Varonis will help you manage and meet data protection and privacy regulations requirements.

The mission at Varonis is simple: your data is our primary focus, and our data security platform protects your file and email systems from cyberattacks and insider threats. We're fighting a different battle – so your data is protected first. Not last.

We continuously collect and analyze activity on your enterprise data, both on-premises and in the cloud. We then leverage five metadata streams to ensure that your organization's data has confidentiality, integrity, and availability:

- **Users and Groups** – Varonis collects user and group information and maps their relationships for a complete picture of user account organization.
- **Permissions** – We add the file system structure and permissions from the platforms that we monitor, and combine everything into a single framework for analysis, automation, and access visualization.
- **Access Activity** – Varonis continually audits all access activity, and records & analyzes every touch by every user. Varonis automatically identifies administrators, service accounts and executives and creates a baseline of all activity. Now you can detect suspicious behavior: whether it's an insider accessing sensitive content, an administrator abusing their privileges, or ransomware like CryptoLocker.
- **Perimeter Telemetry** – Varonis Edge analyzes data from perimeter devices such as VPN, proxy servers, and DNS – and combines this information with data access activity to detect and stop malware apt intrusions and data exfiltration.
- **Content Classification** – Varonis scans for sensitive and critical data, and can absorb classification from other tools like DLP or e-Discovery. Now we know where sensitive data lives and where it's overexposed.

These five metadata streams are critical to achieving data security nirvana. When you combine them, you can get reports on sensitive data open to global group access, stale data, data ownership, permissions changes and more. Then, prioritize your custom reports and act to remediate your risk. Meanwhile, you'll know that your data is continuously monitored and that you'll receive real-time alerts when suspicious behavior is taking place.

## Information Security:

Information Security is not only about securing information from unauthorized access. Information Security is basically the practice of preventing unauthorized access, use, disclosure, disruption, modification, inspection, recording or destruction of information. Information can be physical or electronic one. Information can be anything like your details or we can say your profile on social media, your data in mobile phone, your biometrics etc. Thus Information Security spans so many research areas like Cryptography, Mobile Computing, Cyber Forensics, Online Social Media etc.

Information Security programs are build around 3 objectives, commonly known as CIA – Confidentiality, Integrity, and Availability.

**Confidentiality** – means information is not disclosed to unauthorized individuals, entities and process. For example if we say I have a password for my Gmail account but someone saw while I was doing a login into Gmail account. In that case my password has been compromised and Confidentiality has been breached.

**Integrity** – means maintaining accuracy and completeness of data. This means data cannot be edited in an unauthorized way. For example if an employee leaves an organisation then in that case data for that employee in all departments like accounts, should be updated to reflect status to JOB LEFT so that data is complete and accurate and in addition to this only authorized person should be allowed to edit employee data.

**Availability** – means information must be available when needed. For example if one needs to access information of a particular employee to check whether employee has outstanded the number of leaves, in that case it requires collaboration from different organizational teams like network operations, development operations, incident response and policy/change management.

Denial of service attack is one of the factor that can hamper the availability of information.

Apart from this there is one more principle that governs information security programs. This is Non repudiation.

**Non repudiation** – means one party cannot deny receiving a message or a transaction nor can the other party deny sending a message or a transaction. For example in cryptography it is sufficient to show that message matches the digital signature signed with sender’s private key and that sender could have a sent a message and nobody else could have altered it in transit. Data Integrity and Authenticity are pre-requisites for Non repudiation.

**Authenticity** – means verifying that users are who they say they are and that each input arriving at destination is from a trusted source.This principle if followed guarantees the valid and genuine message received from a trusted source through a valid transmission. For example if take above example sender sends the message along with digital signature which was generated using the hash value of message and private key. Now at the receiver side this digital signature is decrypted using the public key generating a hash value and message is again hashed to generate the hash value. If the 2 value matches then it is known as valid transmission with the authentic or we say genuine message received at the recipient side

**Accountability** – means that it should be possible to trace actions of an entity uniquely to that entity. For example as we discussed in Integrity section Not every employee should be allowed to do changes in other employees data. For this there is a separate department in an organization that is responsible for making such changes and when they receive request for a change then that letter must be signed by higher authority for example Director of college and person that is allotted that change will be able to do change after verifying his bio metrics, thus timestamp with the user(doing changes) details get recorded. Thus we can say if a change goes like this then it will be possible to trace the actions uniquely to an entity.

At the core of Information Security is Information Assurance, which means the act of maintaining CIA of information, ensuring that information is not compromised in any way when critical issues arise. These issues are not limited to natural disasters, computer/server malfunctions etc.

Thus, the field of information security has grown and evolved significantly in recent years. It offers many areas for specialization, including securing networks and allied infrastructure, securing applications and databases, security testing, information systems auditing, business continuity planning etc.

## Difference between Cyber Security and Information Security

The terms **Cyber Security** and Information Security are often used interchangeably. As they both are responsible for security and protecting the computer system from threats and information breaches and often Cybersecurity and information security are so closely linked that they may seem synonymous and unfortunately, they are used synonymously. If we talk about data security it's all about securing the data from malicious user and threats.

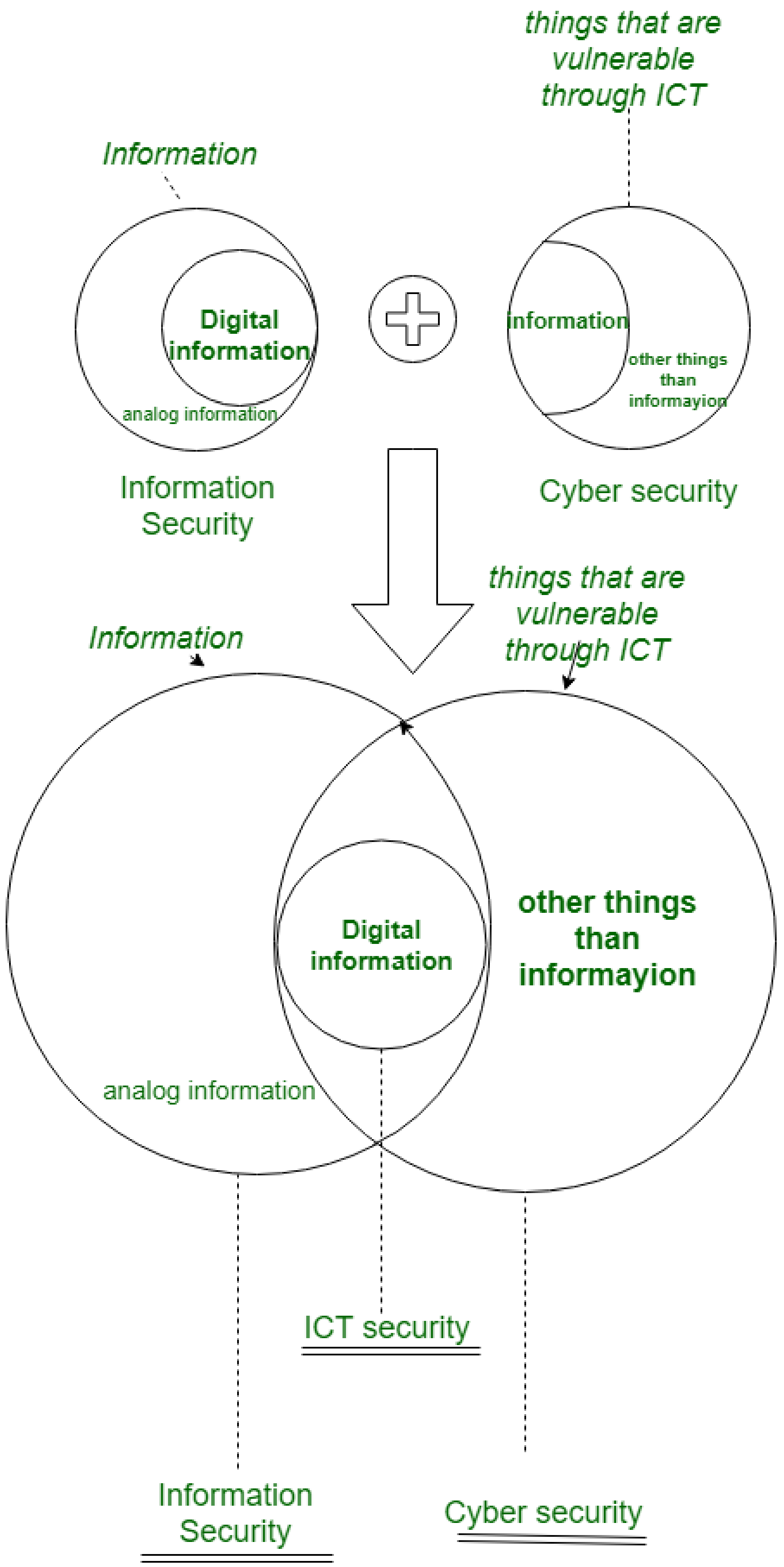
**Now another question is that what is the difference between Data and Information?** So one important point is that "not every data can be an information" data can be informed if it is interpreted in a context and given meaning. for example **"100798"** is data and if we know that it's the date of birth of a person then it is information because it has some meaning.

**so information means data which has some meaning.**

| CYBER SECURITY | INFORMATION SECURITY |
|---|---|
| It is the practice of protecting the data from outside the resource on the internet. | It is all about protecting information from unauthorized user, access and data modification or removal in order to provide confidentiality, integrity, and availability. |
| It is about the ability to protect the use of cyberspace from cyber attacks. | It deals with protection of data from any form of threat. |
| Cybersecurity to protect anything in the cyber realm. | Information security is for information irrespective of the realm. |
| Cybersecurity deals with danger against cyberspace. | Information security deals with the protection of data from any form of threat. |

| CYBER SECURITY | INFORMATION SECURITY |
|---|---|
| Cybersecurity strikes against Cyber crimes, cyber frauds and law enforcement. | Information security strives against unauthorised access, disclosure modification and disruption. |
| On the other hand cyber security professionals with cyber security deals with advanced persistent threat. | Information security professionals is the foundation of data security and security professionals associated with it prioritize resources first before dealing with threats. |
| It deals with threats that may or may not exist in the cyber realm such as a protecting your social media account, personal information, etc. | It deals with information Assets and integrity confidentiality and availability. |

Diagram are given below to represent the difference between *Information Security* and *Cybersecurity*.


things that are vulnerable through ICT
Information
Digital information
analog information
information
other things than informayion
Information Security
Cyber security
things that are vulnerable through ICT
Information
Digital information
other things than informayion
analog information
ICT security
Information Security
Cyber security

In above diagram **ICT** refers for Information and communications technology (ICT) which is an extensional term for information technology (IT) that define the role of unified communications and the integration of telecommunications (basically digital communication security).

**Need of Information Security**

Information system means to consider available countermeasures or controls stimulated through uncovered vulnerabilities and identify an area where more work is needed. The purpose of data security management is to make sure business continuity and scale back business injury by preventing and minimizing the impact of security incidents. The basic principle of Information Security is:

- Confidentially
- Authentication
- Non-Repudiation
- Integrity

## The need for Information security:

**Protecting the functionality of the organization:**

The decision maker in organizations must set policy and operates their organization in compliance with the complex, shifting legislation, efficient and capable applications.

Enabling the safe operation of applications:

The organization is under immense pressure to acquire and operates integrated, efficient and capable applications. The modern organization needs to create an environment that safeguards application using the organizations IT systems, particularly those application that serves as important elements of the infrastructure of the organization.

**Protecting the data that the organization collect and use:**

Data in the organization can be in two forms are either in rest or in motion, the motion of data signifies that data is currently used or processed by the system. The values of the data motivated the attackers to seal or corrupts the data. This is essential for the integrity and the values of the organization’s data. Information security ensures the protection of both data in motion as well as data in rest.

**Safeguarding technology assets in organizations:**

The organization must add intrastate services based on the size and scope of the organization. Organizational growth could lead to the need for public key infrastructure, PKI an integrated system of the software, encryption methodologies. The information security mechanism used by large organizations is complex in comparison to a small organization. The small organization generally prefers symmetric key encryption of data.

## Basic principles of Information Security

What are the 3 Principles of Information Security?

The basic tenets of information security are confidentiality, integrity and availability. Every element of the information security program must be designed to implement one or more of these principles. Together they are called the CIA Triad.

**Confidentiality**

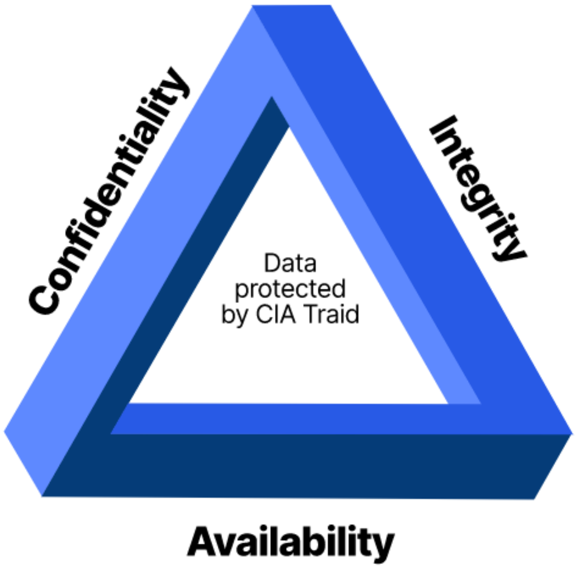
Confidentiality measures are designed to prevent unauthorized disclosure of information. The purpose of the confidentiality principle is to keep personal information private and to ensure that it is visible and accessible only to those individuals who own it or need it to perform their organizational functions.

**Integrity**

Consistency includes protection against unauthorized changes (additions, deletions, alterations, etc.) to data. The principle of integrity ensures that data is accurate and reliable and is not modified incorrectly, whether accidentally or maliciously.

**Availability**

Availability is the protection of a system's ability to make software systems and data fully available when a user needs it (or at a specified time). The purpose of availability is to make the technology infrastructure, the applications and the data available when they are needed for an organizational process or for an organization's customers.




## Threats to Information Security

Information Security threats can be many like Software attacks, theft of intellectual property, identity theft, theft of equipment or information, sabotage, and information extortion.

**Threat** can be anything that can take advantage of a vulnerability to breach security and negatively alter, erase, harm object or objects of interest.

**Software attacks** means attack by Viruses, Worms, Trojan Horses etc. Many users believe that malware, virus, worms, bots are all same things. But they are not same, only similarity is that they all are malicious software that behaves differently.

**Security Misconfiguration**

Modern organizations use a huge number of technological platforms and tools, in particular web applications, databases, and Software as a Service (SaaS) applications, or Infrastructure as a Service (IaaS) from providers like Amazon Web Services.

Enterprise grade platforms and cloud services have security features, but these must be configured by the organization. Security misconfiguration due to negligence or human error can result in a security breach. Another problem is “configuration drift”, where correct security configuration can quickly become out of date and make a system vulnerable, unbeknownst to IT or security staff.

Organizations can mitigate security misconfiguration using technological platforms that continuously monitor systems, identify configuration gaps, and alert or even automatically remediate configuration issues that make systems vulnerable.

**Unsecure or Poorly Secured Systems**

The speed and technological development often leads to compromises in security measures. In other cases, systems are developed without security in mind, and remain in operation at an organization as legacy systems. Organizations must identify these poorly secured systems, and mitigate the threat by securing or patching them, decommissioning them, or isolating them.

**Malware** is a combination of 2 terms- Malicious and Software. So Malware basically means malicious software that can be an intrusive program code or anything that is designed to perform malicious operations on system. Malware can be divided in 2 categories:

1. Infection Methods
2. Malware Actions

**Malware on the basis of Infection Method are following:**

1. **Virus –** They have the ability to replicate themselves by hooking them to the program on the host computer like songs, videos etc and then they travel all over the Internet. The Creeper Virus was first detected on ARPANET. Examples include File Virus, Macro Virus, Boot Sector Virus, Stealth Virus etc.
2. **Worms –** Worms are also self-replicating in nature but they don’t hook themselves to the program on host computer. Biggest difference between virus and worms is that worms are network-aware. They can easily travel from one computer to another if network is available and on the target machine they will not do much harm, they will, for example, consume hard disk space thus slowing down the computer.
3. **Trojan –** The Concept of Trojan is completely different from the viruses and worms. The name Trojan is derived from the ‘Trojan Horse’ tale in Greek mythology, which explains how the Greeks were able to enter the fortified city of Troy by hiding their soldiers in a big wooden horse given to the Trojans as a gift. The Trojans were very fond of horses and trusted the gift blindly. In the night, the soldiers emerged and attacked the city from the inside.
   Their purpose is to conceal themselves inside the software that seem legitimate and when that software is executed they will do their task of either stealing information or any other purpose for which they are designed.
   They often provide backdoor gateway for malicious programs or malevolent users to enter your system and steal your valuable data without your knowledge and permission. Examples include FTP Trojans, Proxy Trojans, Remote Access Trojans etc.

4. **Bots –**: can be seen as advanced form of worms. They are automated processes that are designed to interact over the internet without the need for human interaction. They can be good or bad. Malicious bot can infect one host and after infecting will create connection to the central server which will provide commands to all infected hosts attached to that network called **Botnet.**

**Malware on the basis of Actions:**

1. **Adware –** Adware is not exactly malicious but they do breach privacy of the users. They display ads on a computer's desktop or inside individual programs. They come attached with free-to-use software, thus main source of revenue for such developers. They monitor your interests and display relevant ads. An attacker can embed malicious code inside the software and adware can monitor your system activities and can even compromise your machine.
2. **Spyware –** It is a program or we can say software that monitors your activities on computer and reveal collected information to an interested party. Spyware are generally dropped by Trojans, viruses or worms. Once dropped they install themselves and sits silently to avoid detection.
   One of the most common example of spyware is KEYLOGGER. The basic job of keylogger is to record user keystrokes with timestamp. Thus capturing interesting information like username, passwords, credit card details etc.
3. **Ransomware –** It is type of malware that will either encrypt your files or will lock your computer making it inaccessible either partially or wholly. Then a screen will be displayed asking for money i.e. ransom in exchange.
4. **Scareware –** It masquerades as a tool to help fix your system but when the software is executed it will infect your system or completely destroy it. The software will display a message to frighten you and force to take some action like pay them to fix your system.
5. **Rootkits –** are designed to gain root access or we can say administrative privileges in the user system. Once gained the root access, the exploiter can do anything from stealing private files to private data.
6. **Zombies –** They work similar to Spyware. Infection mechanism is same but they don't spy and steal information rather they wait for the command from hackers.

- **Theft of intellectual property** means violation of intellectual property rights like copyrights, patents etc.
- **Identity theft** means to act someone else to obtain person's personal information or to access vital information they have like accessing the computer or social media account of a person by login into the account by using their login credentials.
- **Theft of equipment and information** is increasing these days due to the mobile nature of devices and increasing information capacity.
- **Sabotage** means destroying company's website to cause loss of confidence on part of its customer.
- **Information extortion** means theft of company's property or information to receive payment in exchange. For example ransomware may lock victims file making them inaccessible thus forcing victim to make payment in exchange. Only after payment victim's files will be unlocked.

These are the old generation attacks that continue these days also with advancement every year. Apart from these there are many other threats. Below is the brief description of these new generation threats.

- **Technology with weak security –** With the advancement in technology, with every passing day a new gadget is being released in the market. But very few are fully secured and follows Information Security principles. Since the market is very competitive Security factor is compromised to make device more up to date. This leads to theft of data/ information from the devices
- **Social media attacks –** In this cyber criminals identify and infect a cluster of websites that persons of a particular organization visit, to steal information.
- **Mobile Malware –**There is a saying when there is a connectivity to Internet there will be danger to Security. Same goes for Mobile phones where gaming applications are designed to lure customer to download the game and unintentionally they will install malware or virus on the device.
- **Outdated Security Software –** With new threats emerging everyday, updation in security software is a prerequisite to have a fully secured environment.
- **Corporate data on personal devices –** These days every organization follows a rule BYOD. BYOD means Bring your own device like Laptops, Tablets to the workplace. Clearly BYOD pose a serious threat to security of data but due to productivity issues organizations are arguing to adopt this.
- **Social Engineering –** is the art of manipulating people so that they give up their confidential information like bank account details, password etc. These criminals can trick you into giving your private and confidential information or they will gain your trust to get access to your computer to install a malicious software- that will give them control of your computer. For example email or message from your friend, that was probably not sent by your friend. Criminal can access your friends device and then by accessing the contact list, he can send infected email and message to all contacts. Since the message/ email is from a known person recipient will definitely check the link or attachment in the message, thus unintentionally infecting the computer.

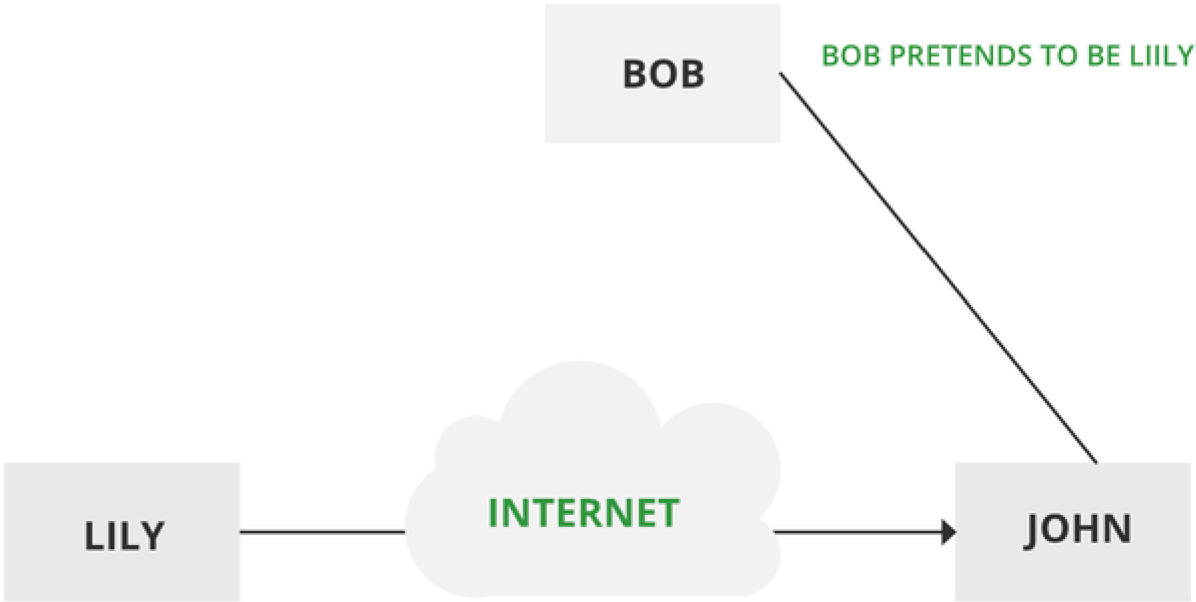
## Active and Passive attacks in Information Security

**Active attacks:** An Active attack attempts to alter system resources or affect their operations. Active attacks involve some modification of the data stream or the creation of false statements. Types of active attacks are as follows:

- Masquerade
- Modification of messages
- Repudiation
- Replay
- Denial of Service

**Masquerade –**

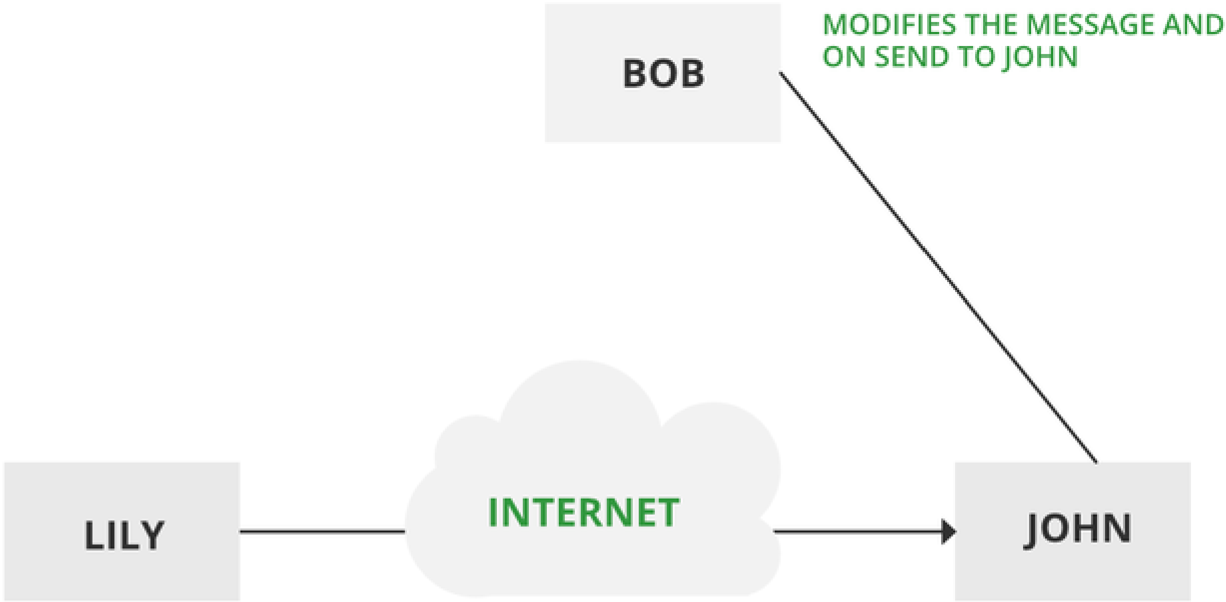
A masquerade attack takes place when one entity pretends to be a different entity. A Masquerade attack involves one of the other forms of active attacks. If an authorization procedure isn't always absolutely protected, it is able to grow to be extraordinarily liable to a masquerade assault. Masquerade assaults may be performed using the stolen passwords and logins, with the aid of using finding gaps in programs, or with the aid of using locating a manner across the authentication process.




*Masquerade Attack*

**Modification of messages –**

It means that some portion of a message is altered or that message is delayed or reordered to produce an unauthorized effect. Modification is an attack on the integrity of the original data. It basically means that unauthorized parties not only gain access to data but also spoof the data by triggering denial-of-service attacks, such as altering transmitted data packets or flooding the network with fake data. Manufacturing is an attack on authentication. For example, a message meaning “Allow JOHN to read confidential file X” is modified as “Allow Smith to read confidential file X”.



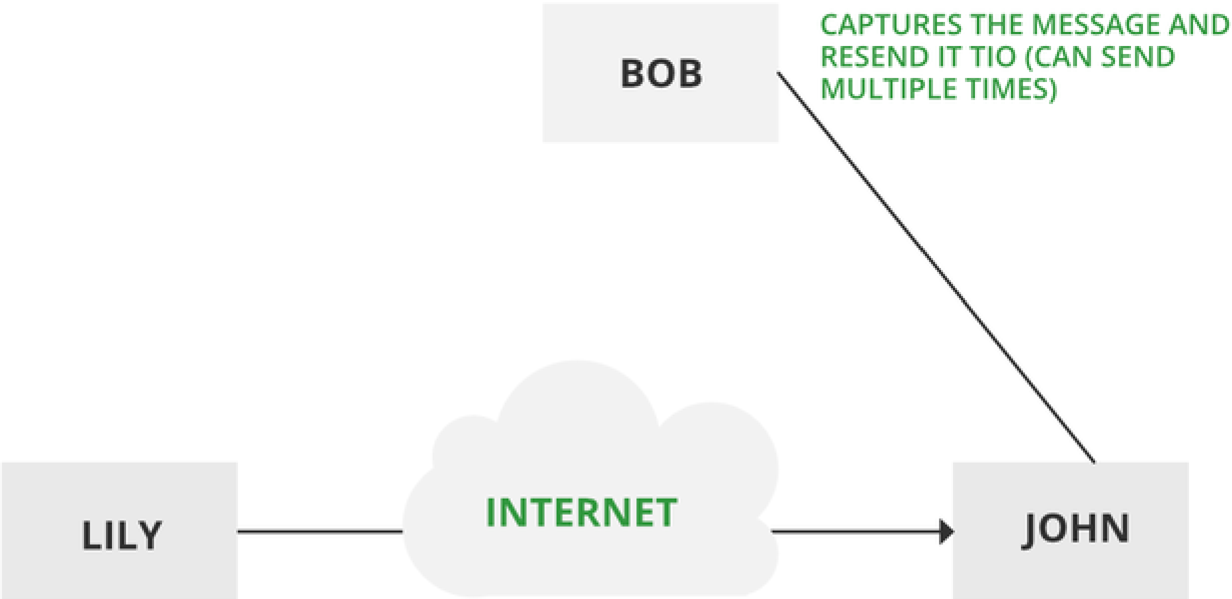

***Modification of messages***

**Repudiation –**

This attack occurs when the network is not completely secured or the login control has been tampered with. With this attack, the author's information can be changed by actions of a malicious user in order to save false data in log files, up to the general manipulation of data on behalf of others, similar to the spoofing of e-mail messages.

**Replay –**

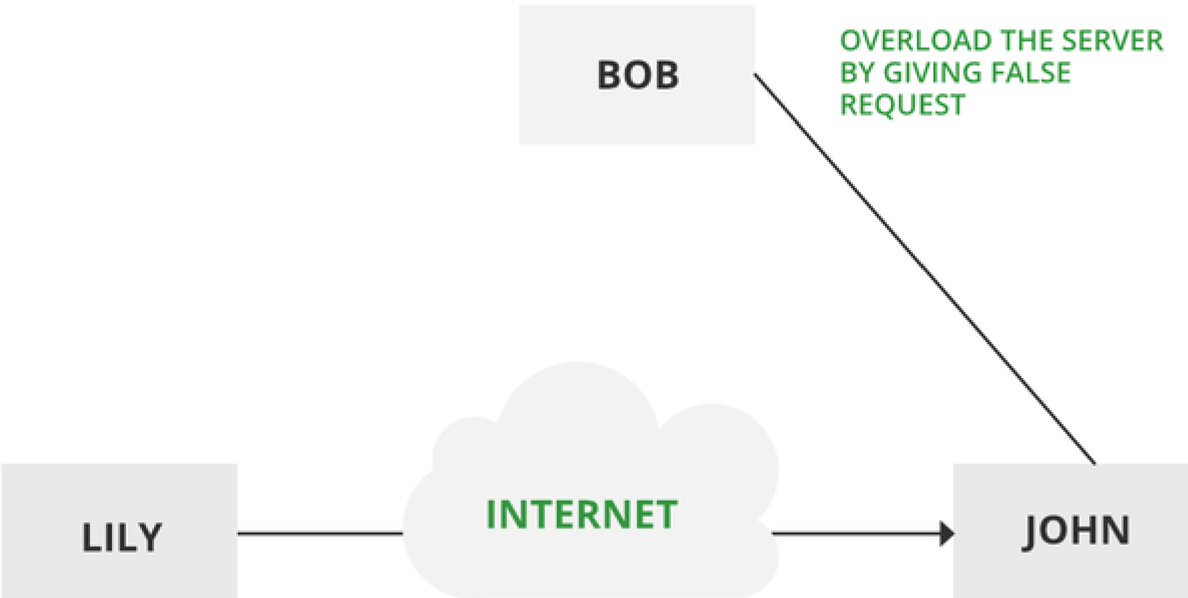
It involves the passive capture of a message and its subsequent transmission to produce an authorized effect. In this attack, the basic aim of the attacker is to save a copy of the data originally present on that particular network and later on use this data for personal uses. Once the data is corrupted or leaked it is insecure and unsafe for the users.




***Replay***

**Denial of Service –**

It prevents the normal use of communication facilities. This attack may have a specific target. For example, an entity may suppress all messages directed to a particular destination. Another form of service denial is the disruption of an entire network either by disabling the network or by overloading it with messages so as to degrade performance.



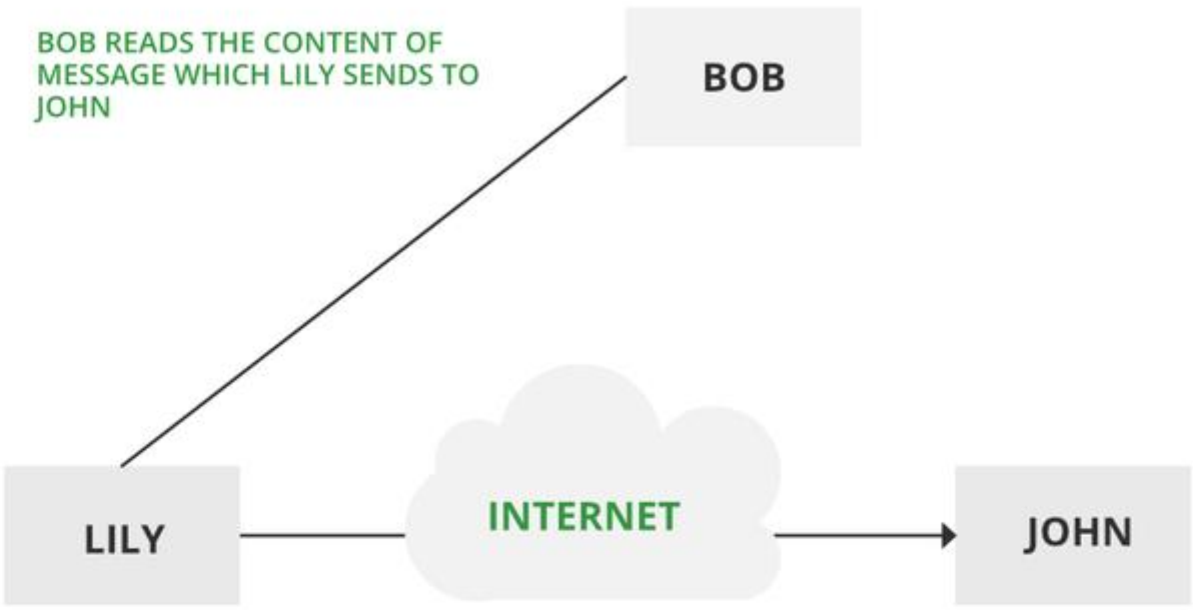

***Denial of Service***

**Passive attacks:** A Passive attack attempts to learn or make use of information from the system but does not affect system resources. Passive Attacks are in the nature of eavesdropping on or monitoring transmission. The goal of the opponent is to obtain information that is being transmitted. Types of Passive attacks are as follows:

- The release of message content
- Traffic analysis

**The release of message content –**

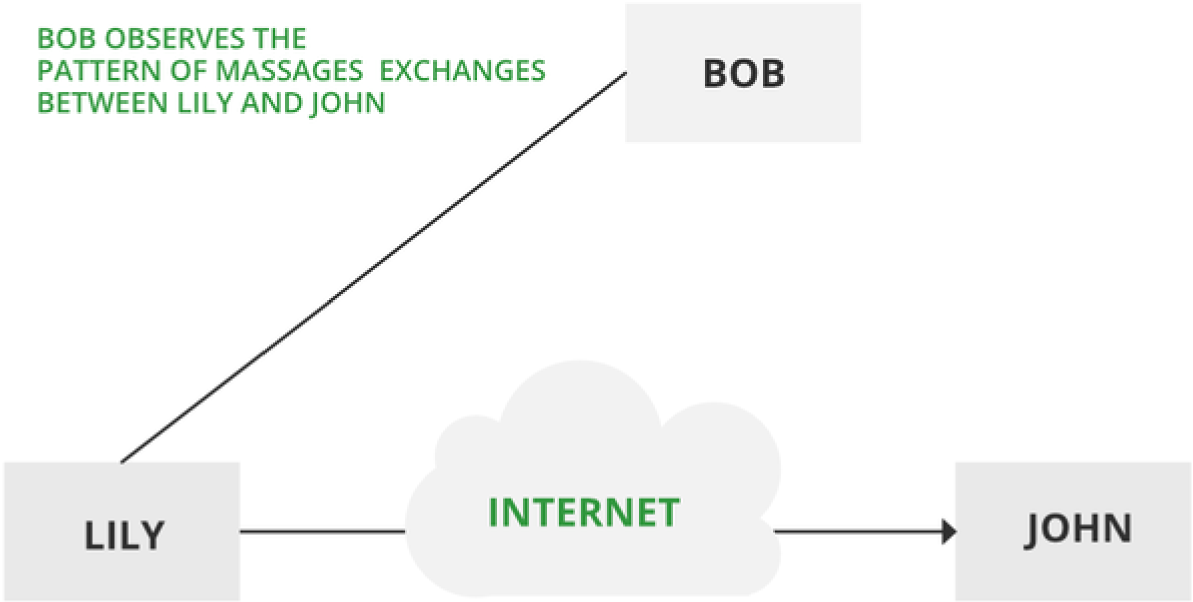
Telephonic conversation, an electronic mail message, or a transferred file may contain sensitive or confidential information. We would like to prevent an opponent from learning the contents of these transmissions.




*Passive attack*

**Traffic analysis –**

Suppose that we had a way of masking (encryption) information, so that the attacker even if captured the message could not extract any information from the message. The opponent could determine the location and identity of communicating host and could observe the frequency and length of messages being exchanged. This information might be useful in guessing the nature of the communication that was taking place. The most useful protection against traffic analysis is encryption of SIP traffic. To do this, an attacker would have to access the SIP proxy (or its call log) to determine who made the call.




*Traffic analysis*

## At a glance

| Active Attacks | Passive Attacks |
|---|---|
| Modify messages, communications or data | Do not make any change to data or systems |
| Poses a threat to the availability and integrity of sensitive data | Poses a threat to the confidentiality of sensitive data. |
| May result in damage to organizational systems. | Does not directly cause damage to organizational systems. |

| | |
|---|---|
| Victims typically know about the attack | Victims typically do not know about the attack. |
| Main security focus is on detection and mitigation. | Main security focus is on prevention. |

Information Security and Data Protection Laws

Information security is in constant interaction with the laws and regulations of the places where an organization does business. Data protection regulations around the world focus on enhancing the privacy of personal data, and place restrictions on the way organizations can collect, store, and make use of customer data.

Data privacy focuses on personally identifiable information (PII), and is primarily concerned with how the data is stored and used. PII includes any data that can be linked directly to the user, such as name, ID number, date of birth, physical address, or phone number. It may also include artifacts like social media posts, profile pictures and IP addresses.

**Data Protection Laws in the European Union (EU): the GDPR**

The most known privacy law in the EU is the General Data Protection Regulation (GDPR). This regulation covers the collection, use, storage, security and transmission of data related to EU residents.

The GDPR applies to any organization doing business with EU citizens, regardless of whether the company itself is based inside or outside the European Union. Violation of the guidelines may result in fines of up to 4% of global sales or 20 million Euro.

**The main goals of the GDPR are:**

- Setting the privacy of personal data as a basic human right
- Implementing privacy criteria requirements
- Standardization of how privacy rules are applied

**GDPR includes protection of the following data types:**

- Personal information such as name, ID number, date of birth, or address
- Web data such as IP address, cookies, location, etc.
- Health information including diagnosis and prognosis
- Biometric data including voice data, DNA, and fingerprints
- Private communications
- Photos and videos
- Cultural, social or economic data

**Data Protection Laws in the USA**

Despite the introduction of some regulations, there are currently no federal laws governing data privacy in general in the United States. However, some regulations protect certain types or use of data. These include:

- **Federal Trade Commission Act**—prohibits organizations from deceiving consumers with regard to privacy policies, failure to adequately protect customer privacy, and misleading advertising.

- **Children's Online Privacy Protection Act**—regulates the collection of data related to minors.
- **Health Insurance Portability and Accounting Act (HIPAA)**—regulates the storage, privacy and use of health information.
- **Gramm Leach Bliley Act (GLBA)**—regulates personal information collected and stored by financial institutions and banks.
- **Fair Credit Reporting Act**—regulates the collection, use, and accessibility of credit records and information.

Additionally, the Federal Trade Commission (FTC) is responsible for protecting users from fraudulent or unfair transactions such as data security and privacy. The FTC can enact regulations, enforce laws, punish violations, and investigate organizational fraud or suspected violations.

In addition to federal guidelines, 25 US states have enacted various laws to regulate data. The most famous example is the California Consumer Privacy Act (CCPA). The law went into effect in January 2020 and provides protection to California residents, including the right to access private information, request deletion of private information, and opt out of data collection or resale.

**There also other regional regulations such as:**

- Australian Prudential Regulatory Authority (APRA) CPS 234
- Canada Personal Information Protection and Electronic Documents Act (PIPEDA)
- Singapore Personal Data Protection Act (PDPA)

## Data Security Solutions

Micro Focus drives leadership in data security solutions with over 80 patents and 51 years of expertise. With advanced data encryption, tokenization, and key management to protect data across applications, transactions, storage, and big data platforms, big data solutions, Micro Focus simplifies the protection of sensitive data in even the most complex use cases.

**Data Discovery and Classification**

Modern IT environments store data on servers, endpoints, and cloud systems. Visibility over data flows is an important first step in understanding what data is at risk of being stolen or misused. To properly protect your data, you need to know the type of data, where it is, and what it is used for. Data discovery and classification tools can help.

Data detection is the basis for knowing what data you have. Data classification allows you to create scalable security solutions, by identifying which data is sensitive and needs to be secured. Data detection and classification solutions enable tagging files on endpoints, file servers, and cloud storage systems, letting you visualize data across the enterprise, to apply the appropriate security policies.

**Data Masking**

Data masking lets you create a synthetic version of your organizational data, which you can use for software testing, training, and other purposes that don't require the real data. The goal is to protect data while providing a functional alternative when needed.

Data masking retains the data type, but changes the values. Data can be modified in a number of ways, including encryption, character shuffling, and character or word substitution. Whichever method you choose, you must change the values in a way that cannot be reverse-engineered.


**Identity Access Management**

Identity and Access Management (IAM) is a business process, strategy, and technical framework that enables organizations to manage digital identities. IAM solutions allow IT administrators to control user access to sensitive information within an organization.

Systems used for IAM include single sign-on systems, two-factor authentication, multi-factor authentication, and privileged access management. These technologies enable the organization to securely store identity and profile data, and support governance, ensuring that the appropriate access policies are applied to each part of the infrastructure.

**Cloud data security** – Protection platform that allows you to move to the cloud securely while protecting data in cloud applications.

**Data encryption** – Data-centric and tokenization security solutions that protect data across enterprise, cloud, mobile and big data environments.

Encryption is viewed as one of the most reliable ways to keep your data confidential at rest, in transit, or when processing real-time analytics. Data encryption uses algorithms to encode data into an unreadable format that needs an authorized key for decryption. But cryptographic processing can be vulnerable to side channel attacks and can affect performance.

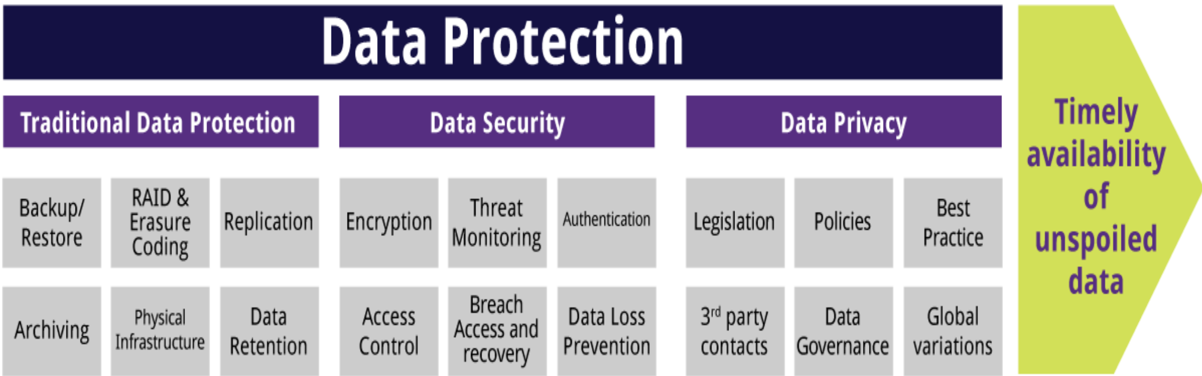
The latest technologies can speed up encryption and boost security without affecting performance.

**Hardware-Based Security**- Hardware security that guards financial data and meets industry security and compliance requirements.

As hackers have become more sophisticated, they've made their way down the stack, increasing attacks at the hardware level. That's why you need to protect your data at every layer of the IT infrastructure—not just the software. Intel's hardware-enabled security capabilities include protections built right into the silicon, creating Trusted Infrastructure, which helps secure hardware, firmware, operating system, applications, networks, and the cloud.

**Key management** -- Solution that protects data and enables industry regulation compliance.

**Enterprise Data Protection** – Solution that provides an end-to-end data-centric approach to enterprise data protection.




**Payments Security** – Solution provides complete point-to-point encryption and tokenization for retail payment transactions, enabling PCI scope reduction.

**Big Data, Hadoop and IofT data protection** – Solution that protects sensitive data in the Data Lake – including Hadoop, Teradata, Micro Focus Vertica, and other Big Data platforms.

**Mobile App Security** - Protecting sensitive data in native mobile apps while safeguarding the data end-to-end.

**Web Browser Security** - Protects sensitive data captured at the browser, from the point the customer enters cardholder or personal data, and keeps it protected through the ecosystem to the trusted host destination.

**eMail Security** – Solution that provides end-to-end encryption for email and mobile messaging, keeping Personally Identifiable Information and Personal Health Information secure and private.

**Data Loss Prevention (DLP)**

To prevent data loss, organizations can use a number of safeguards, including backing up data to another location. Physical redundancy can help protect data from natural disasters, outages, or attacks on local servers. Redundancy can be performed within a local data center, or by replicating data to a remote site or cloud environment.

Beyond basic measures like backup, DLP software solutions can help protect organizational data. DLP software automatically analyzes content to identify sensitive data, enabling central control and enforcement of data protection policies, and alerting in real-time when it detects anomalous use of sensitive data, for example, large quantities of data copied outside the corporate network.

**Governance, Risk, and Compliance (GRC)**

GRC is a methodology that can help improve data security and compliance:

Governance creates controls and policies enforced throughout an organization to ensure compliance and data protection.

Risk involves assessing potential cybersecurity threats and ensuring the organization is prepared for them.

Compliance ensures organizational practices are in line with regulatory and industry standards when processing, accessing, and using data.

**Password Hygiene**

One of the simplest best practices for data security is ensuring users have unique, strong passwords. Without central management and enforcement, many users will use easily guessable passwords or use the same password for many different services. Password spraying and other brute force attacks can easily compromise accounts with weak passwords.

A simple measure is enforcing longer passwords and asking users to change passwords frequently. However, these measures are not enough, and organizations should consider multi-factor authentication (MFA) solutions that require users to identify themselves with a token or device they own, or via biometric means.

Another complementary solution is an enterprise password manager that stores employee passwords in encrypted form, reducing the burden of remembering passwords for multiple corporate systems, and making it easier to use stronger passwords. However, the password manager itself becomes a security vulnerability for the organization.

**Authentication and Authorization**

To help keep unauthorized users from accessing sensitive data, you'll need to have the right user authentication methods in place. But strong passwords aren't enough. The most-secure methods use hardware security features such as biometrics, built-in two-factor authentication, and secure enclave technology built into the processor itself. Organizations must put in place strong authentication methods, such as OAuth for web-based systems. It is highly recommended to enforce multi-factor authentication when any user, whether internal or external, requests sensitive or personal data.

In addition, organizations must have a clear authorization framework in place, which ensures that each user has exactly the access rights they need to perform a function or consume a service, and no more. Periodic reviews and automated tools should be used to clean up permissions and remove authorization for users who no longer need them.

**Data Security Audits**

The organization should perform security audits at least every few months. This identifies gaps and vulnerabilities across the organizations' security posture. It is a good idea to perform the audit via a third-party expert, for example in a penetration testing model. However, it is also possible to perform a security audit in house. Most importantly, when the audit exposes security issues, the organization must devote time and resources to address and remediate them.

**Anti-Malware, Antivirus, and Endpoint Protection**
Malware is the most common vector of modern cyberattacks, so organizations must ensure that endpoints like employee workstations, mobile devices, servers, and cloud systems, have appropriate protection. The basic measure is antivirus software, but this is no longer enough to address new threats like file-less attacks and unknown zero-day malware.

Endpoint protection platforms (EPP) take a more comprehensive approach to endpoint security. They combine antivirus with a machine-learning-based analysis of anomalous behavior on the device, which can help detect unknown attacks. Most platforms also provide endpoint detection and response (EDR) capabilities, which help security teams identify breaches on endpoints as they happen, investigate them, and respond by locking down and reimaging affected endpoints.

**Data Backup**
Data backup solutions can help you restore your company and customer data in the event of a storage failure, breach, or disaster. By creating an exact copy of your data and storing it in a secure location that can be accessed by authorized administrators, you can minimize the risk of a primary data failure. However, for better data integrity and security, you'll need protections for that backup, both while that data is being sent to its backup location as well as when it's stored to assist in spotting anomalies or threats early. A documented data backup policy can help you comply with various security regulations as well as establish a consistent, reliable data recovery process.

**Different ways of backing up data and information:**
There are plenty of options available for people looking to backup up their data, all with their own pros and cons. In this article we have listed some of your options, but remember: it's best to have more than one backup to be safe. This is particularly true in the case of ransomware. For example, if you back up your computer to an external hard drive, but leave that drive connected when you are not doing backup, some ransomware will try to encrypt those backup filed as well: always disconnect backup drives when the backup has finished.

**1. USB stick**

Small, cheap and convenient, USB sticks are everywhere, and their portability means that they're easy to store safely, but also pretty easy to lose. There are questions about the number of read/write cycles they can take, so should be considered alongside other backup methods.

Pros:

- Extremely portable
- Very cheap
- Can easily transfer data to other sources

Cons:

- Portability means they're small and easy to lose
- Questions over read/write cycle longevity

**2. External hard drive**

External hard drives are just what they sound like – hard drives that live outside your computer, meaning they can be plugged in to other sources. If using them for backup, it's best not to use them as an 'extra every day hard drive'.

Pros:

- Relatively cheap
- Plenty of storage space for larger files

Cons:

- Potentially open to problems which lost files in the first place (a power surge or malware)

**3. Time Machine**

For the Mac users out there, Time Machine is an option that backs up to external hard drives automatically. Apple sells its own brand of dedicated wireless Time Capsules, but you can use any hard disk for it. Using this method, you'll automatically keep backups hourly for the last 24 hours, daily for the last month and then weekly backups until the machine is full.

Pros:

- Automated, meaning you shouldn't forget to stay up to date
- Frequency of backups means you should never be too out of date
- Backs up whole drive, not just the key files

Cons:

- Dedicated wireless machine is expensive
- Mac only

**4. Network Attached Storage**


Businesses tend to backup their files to network attached storage, but with more and more homes having multiple computers, the idea has a certain appeal, especially for those looking to save files from more than one source. With prices coming down, a dedicated wireless storage solution is a convenient option which requires less thought.
Pros:

- Automatic backups mean you don’t risk forgetting
- Wireless solutions also work with phones and tablets

Cons:

- Can be expensive
- Can be awkward to set up and maintain

**5. Cloud Storage**


While network attached storage is essentially your own Cloud Server, there are plenty of third party cloud storage options around: free, paid, or free with paid extras. iCloud, Dropbox, Google Drive and OneDrive are big names, but others are available.

Pros:

- Can be done automatically
- A certain amount of space is usually free
- Device agnostic

Cons:

- Requires an internet connection to work
- You can’t account for their security breaches
- Companies aren’t obliged to keep these services around forever

**6. Printing**

At a first glance, this might sound a facetious inclusion. But while considerably less technically advanced, printing offers you a hard copy of your most important documents that will survive power outages, and are easy to store and access even if your computer is out of action for a few days. Of course it's hard to keep documents up to date this way, and it won't work for video or audio files, but for that novel you'd be devastated to lose, it's certainly worth considering.

Pros:

- A backup that won't be affected by hardware outages or tech headaches
- Impossible for hackers to access

Cons:

- Impossible for certain file types
- Awkward to manage
- Less practical for longer documents
- Not great for the environment

However you choose to backup your data (and it's smart to consider using more than one solution, at least for your life-or-death files), make sure that you do it. Often people don't think about what were to happen if their valuable files were to be lost, until it's too late. Don't make that mistake, and use World Backup Day to make sure your files are all safe and accounted for.

## Modern Best Data Security technologies:

**1. Data classification**

Classification is the foundation of data security. It helps in prioritizing the assets the company needs to protect. Many tools support both user-driven and automated classification capabilities. A well-planned data classification system makes essential data easy to find. This can be essential for risk management, and compliance.

**2. Data access policies**

Providing the right amount of data access to individual users is crucial for data protection. Authorising only key members of the teams to handle secure data makes sure that the possible data breaches are remaining at a very low state. The tools are helping in sensitive data discovery and cleaning up data access permissions to enforce least privilege.

**3. Cloud data protection**

Encrypting sensitive data and storing it in the cloud makes system backups safer as well, and also it makes accessing data much easier for involved parties. Online document management systems come in handy for every company, as they make accessing files easy, safe and available for all the involved parties. Always use trustworthy cloud-based document management system, make sure the server parks are located inside the EU where strict data policy regulations apply, also, read their contract to see if they have backdoor channels for your files.

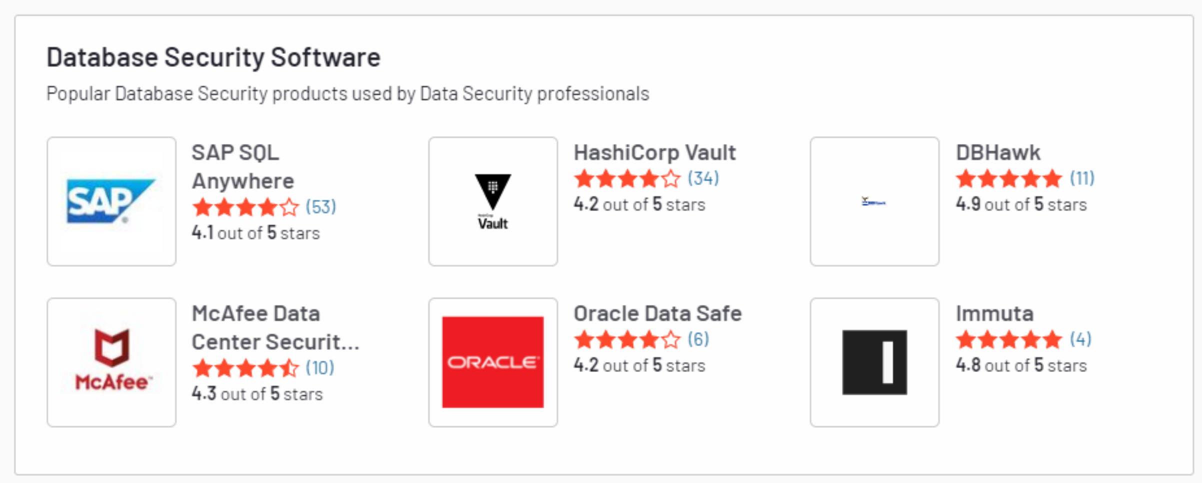
**4. Two-factor authentication**

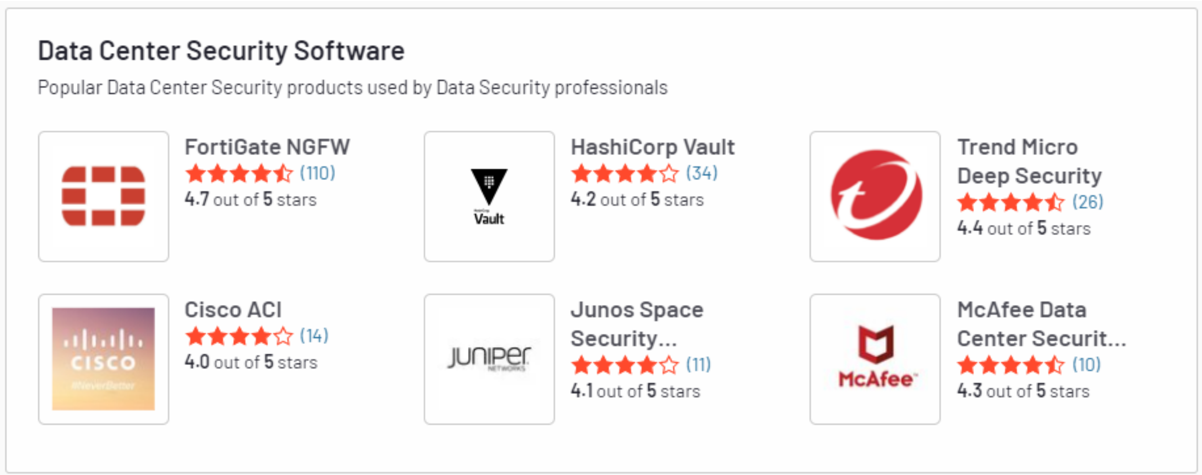
Two-factor authentications are very useful for preventing attackers from getting access to one's account. Even if your password was guessed correctly by hackers, the 2nd step will stop them from entering the account. With the use of a 2nd factor it is guaranteed that even if the password is stolen, attackers cannot get into the account.

**5. Tokenization**

Substituting a randomly generated value, or a token, for sensitive data like credit card numbers, bank account numbers, and social security numbers makes it safer to store sensitive information. Unlike encryption, there is no mathematical relationship between the token and its original data; to reverse the tokenization, a hacker must have access to the mapping database, and this makes it much more difficult to read the data.

## Popular Data Security Software Categories



# Module 8: Email Merge

### Introductions:

Mail Merge is a handy feature that incorporates data from both Microsoft Word and Microsoft Excel and allows you to create multiple documents at once, such as letters, saving you the time and effort of retyping the same letter over and over. Here is an example of how to use it to create a letter thanking people who donated to a particular fund.

## EMAIL MERGE IN OUTLOOK

### Mail Merge from Outlook

Outlook

Starting a Mail Merge from within Outlook is the easiest method if all the people who you want to include are already in a Contacts folder in Outlook.

In this mail merge example we will send a select amount of contacts an email and ask them whether their contact information is correct.

As the whole process involves quite a few clicks, we're going to break it down in 4 easy to follow steps.

**Important!**

Before continuing, please verify with your ISP or mail admin first if there are any restrictions in how many emails you may send within an hour or in total on a day. Some have put a restriction on that but as long as you stay under a 100 it's very likely you won't run into any issues and there is probably no need to contact your ISP.

If there is a limit set, then you can use a Mail Merge tool with scheduling functionality to work around these limits and send out the mail merge is smaller batches.

**Step 1: Select or filter your contacts**

We start the Mail Merge process by specifying which of our contacts we want to send an email to.

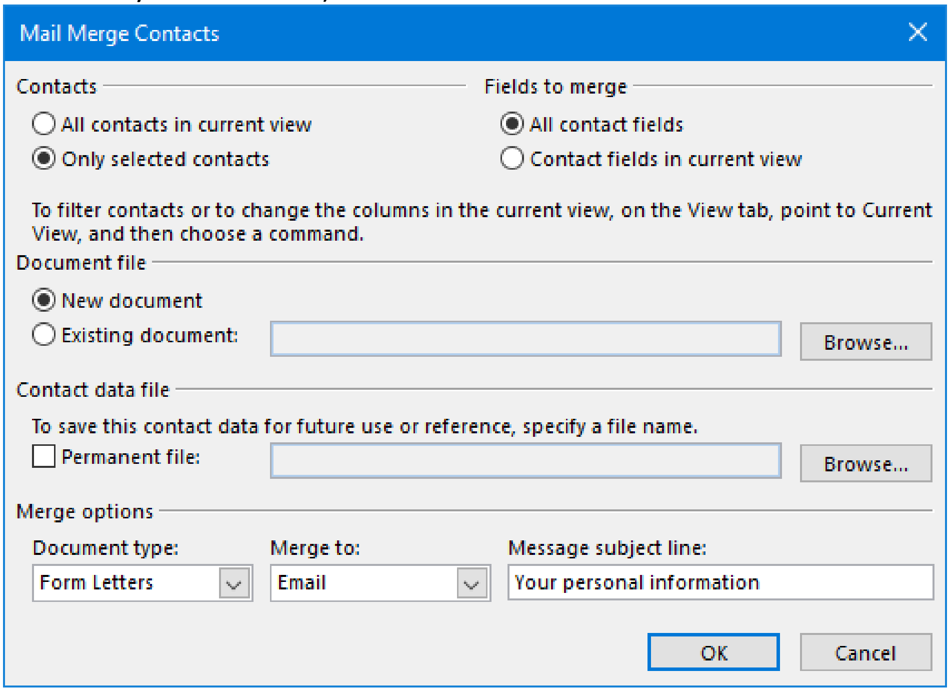
1. Select the Contacts folder containing the contacts that you want to send an email to (press CTRL+3 to quickly switch to your Contacts folders).
2. Select the contacts that you want to email to or apply a filter to your view so that only the contacts that you want to address are visible. Quick methods to apply a filter are;
   - Perform a search.
     For instance, based on the Company or a Category (provided that you have assigned the same category to similar contacts). You can do some quite advanced Search queries as well.
   - Sort or group your Contacts folder by Category or another field in 2 easy steps.
     a. Set your View to the "List" or "Phone" view.
        View-> Change View

b. Change your Arrangement.
   - Simplified Ribbon (Microsoft 365)
     View-> Arrange By-> Categories
   - Classic Ribbon
     View-> option group: Arrangement-> Categories

**Step 2: Start the Mail Merge**

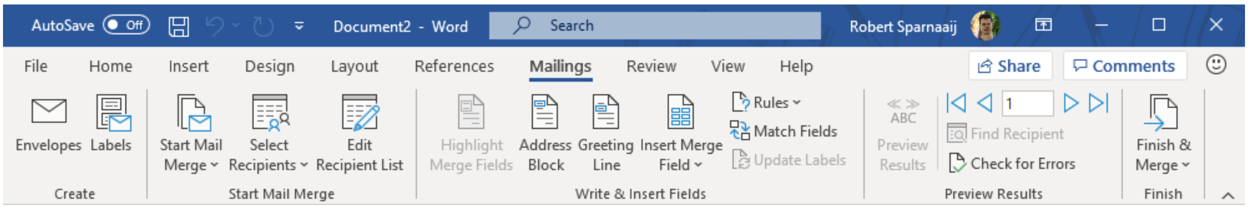
Now that we've selected the contacts, it is time to start the Mail Merge.

1. Open the Mail Merge dialog in Outlook:
   - Simplified Ribbon (Microsoft 365)
     Home-> press the ellipsis (…) button on the right-> button Mail Merge…
   - Classic Ribbon
     Home-> option group: Actions-> button Mail Merge
2. Verify if the correct options are set for contacts;
   - "All contacts in current view" if you filtered your view so that only the contacts that you want to address are visible.
   - "Only selected contacts" if you manually selected the contacts from the Contacts folder that you want to address.
3. At the bottom of the dialog set the "Merge options" to;
   - Document Type: Form Letters
   - Merge to: E-mail
   - Message subject line: <*whatever you want as a subject for your message*> (you can modify this later too)




*Your screen should now look something like this.*

4. Press OK and wait for Word to start.
5. A new document will open. Select the Mailings tab on the Ribbon.

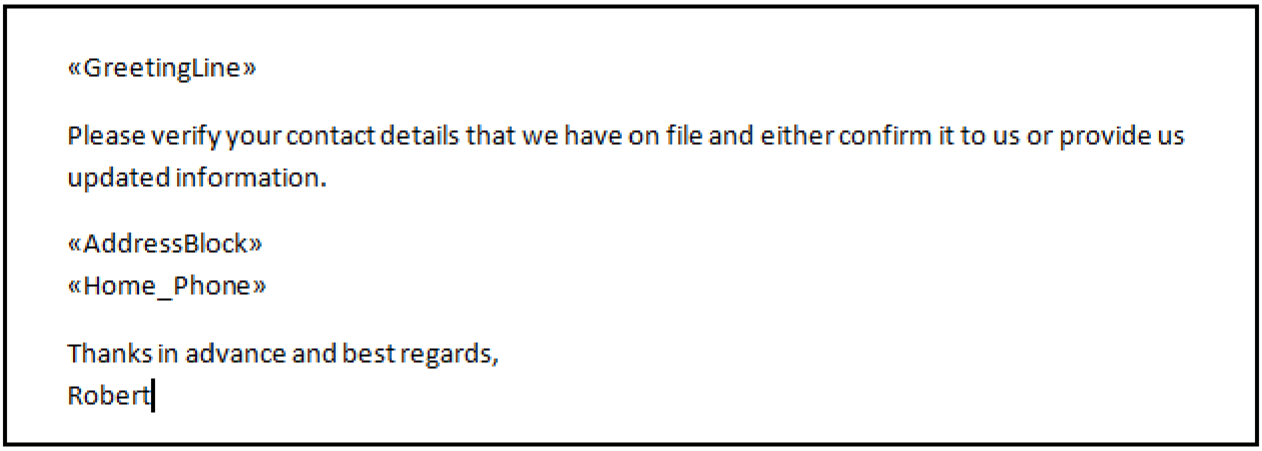



*The Mail Merge tab in the Ribbon of Word as part of a Microsoft 365 subscription.*

**Step 3: Create the message with Contact fields**

Now it is time to start writing your message with variables. This sounds more difficult than it is.

1. Insert a greeting line by pressing the “Greeting Line” button
2. Select the greeting line that you want and which greeting line to use when no proper information is found from the contact information.
   - Note that you can type freely in the format fields. So instead of selecting “Dear ” you can also type “Hello ”.
   - Please be aware that you need to type a space at the end of the word in order not to have it “stick” to the name of the addressee.
3. Press OK to close the dialog and then press ENTER to start a new line in the document.
4. Here type the following;
   “Please verify your contact details that we have on file and either confirm it to us or provide us updated information.”
5. Press ENTER again to start a new line and insert the address by pressing the “Address Block” button.
6. As we’ve already addressed the person, we remove their name from the address block by disabling the option “Insert recipient’s name in this format:”
   As we only address individuals in our example we also disable the option “Insert company name”.
7. Press OK to close the dialog and press ENTER to start a new line.
8. Now we’re going to include the home telephone number by pressing the “Insert Merge Field” button.
9. From the dialog that pops up select Home_Phone and then press Insert.
10. Press Close to close the dialog and press ENTER to start another new line.
11. Now type the following;
    “Thanks in advance and best regards, *<your name here>*“



«GreetingLine»

Please verify your contact details that we have on file and either confirm it to us or provide us updated information.

«AddressBlock»
«Home_Phone»

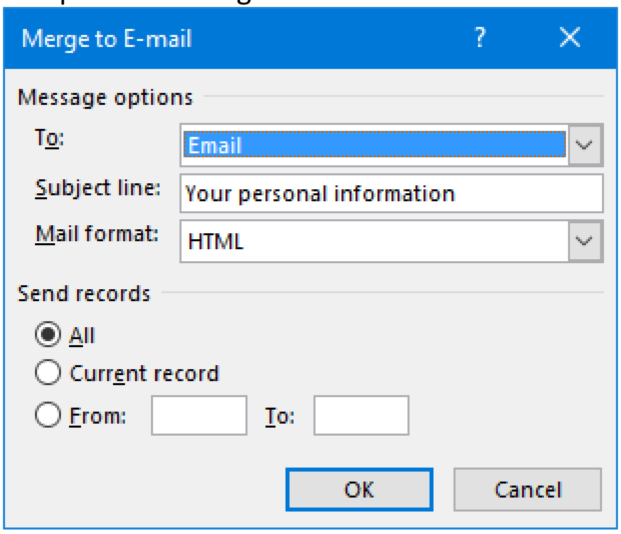
Thanks in advance and best regards,
Robert

*Your document should now look something like this.*

**Step 4: Send out the personalized mass mailing**

Only a few more clicks and checks, and and the messages will be on their way.

1. Before sending, it is best to preview your results first by pressing the “Preview Results” button.
2. You can use the arrow buttons in the toolbar to browse through all the personalized emails.
3. Now it is time to send the messages; Press the Finish & Merge button and select “Send E-mail Messages…”.
4. A new dialog will now pop-up. As we had already set the subject and selected all the correct contacts we don’t need to change anything in this dialog. Click OK to complete the merge.




*Pressing OK will directly start sending the emails.*

**Tool Tip!**

If you need to send along an attachment with your mail merge or also want to address people via the CC or BCC address line, then you can use the Mail Merge Toolkit add-in from MAPILab.

*If you decide to order use **4PM76A8** to get a discount.*

Mail Merge from Word with Outlook as source

Starting your mail merge from Word is also possible. The end-result is the same as starting it in Outlook. The main difference is the dialog box that you use to select the correct contacts but more about that later.

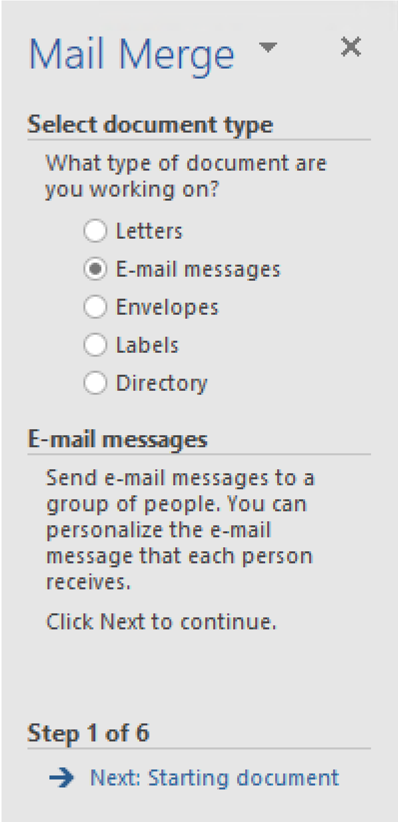
**Document types**

Word provides tools for incorporating your data into the following kinds of documents.

- **Letters** that include a personalized greeting. Each letter prints on a separate sheet of paper.
- **Email** where each recipient's address is the only address on the To line. You'll be sending the email directly from Word.
- **Envelopes** or **Labels** where names and addresses come from your data source.
- **Directory** that lists a batch of information for each item in your data source. Use it to print out your contact list, or to list groups of information, like all of the students in each class. This type of document is also called a catalog merge.

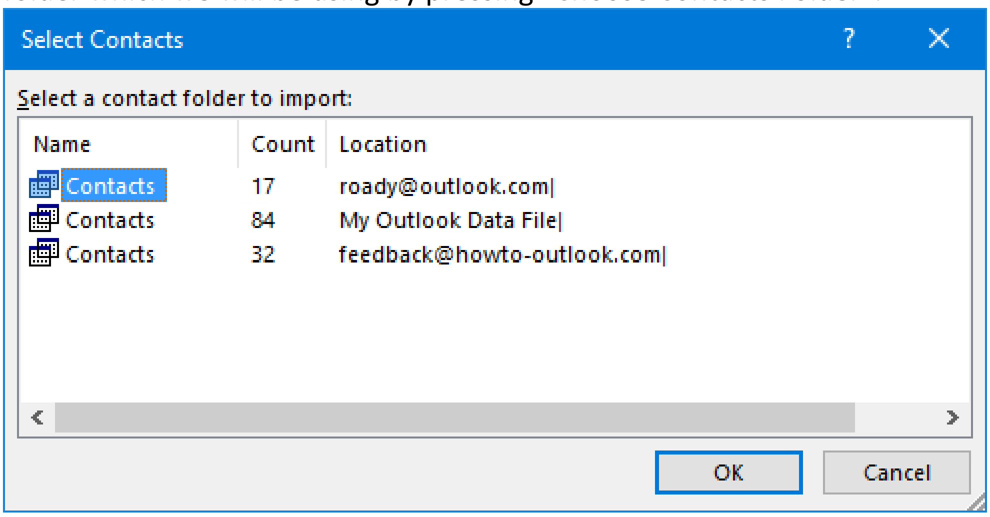
In this example we again send a selected amount of contacts an email but we'll skip the letter writing as it is similar to the example above section.

1. Start the Mail Merge Wizard;
   Select the tab Mailings-> click the Start Mail Merge button-> Step by Step Mail Merge Wizard…
2. The Task Pane panel will open on the right side of the document to choose the document type.
   Here select "E-mail messages".




*Using the Mail Merge Wizard in Word to create a mail merge.*

3. Pressing Next will brings us to step 2 where you can choose the document to start from. As we will be typing our own contents we just click Next.
4. In this example we will be using Outlook as the source again so click “Select from Outlook contacts”.
5. As you can have multiple Contacts folders in Outlook we need to select the actual folder which we will be using by pressing “Choose Contacts Folder”.

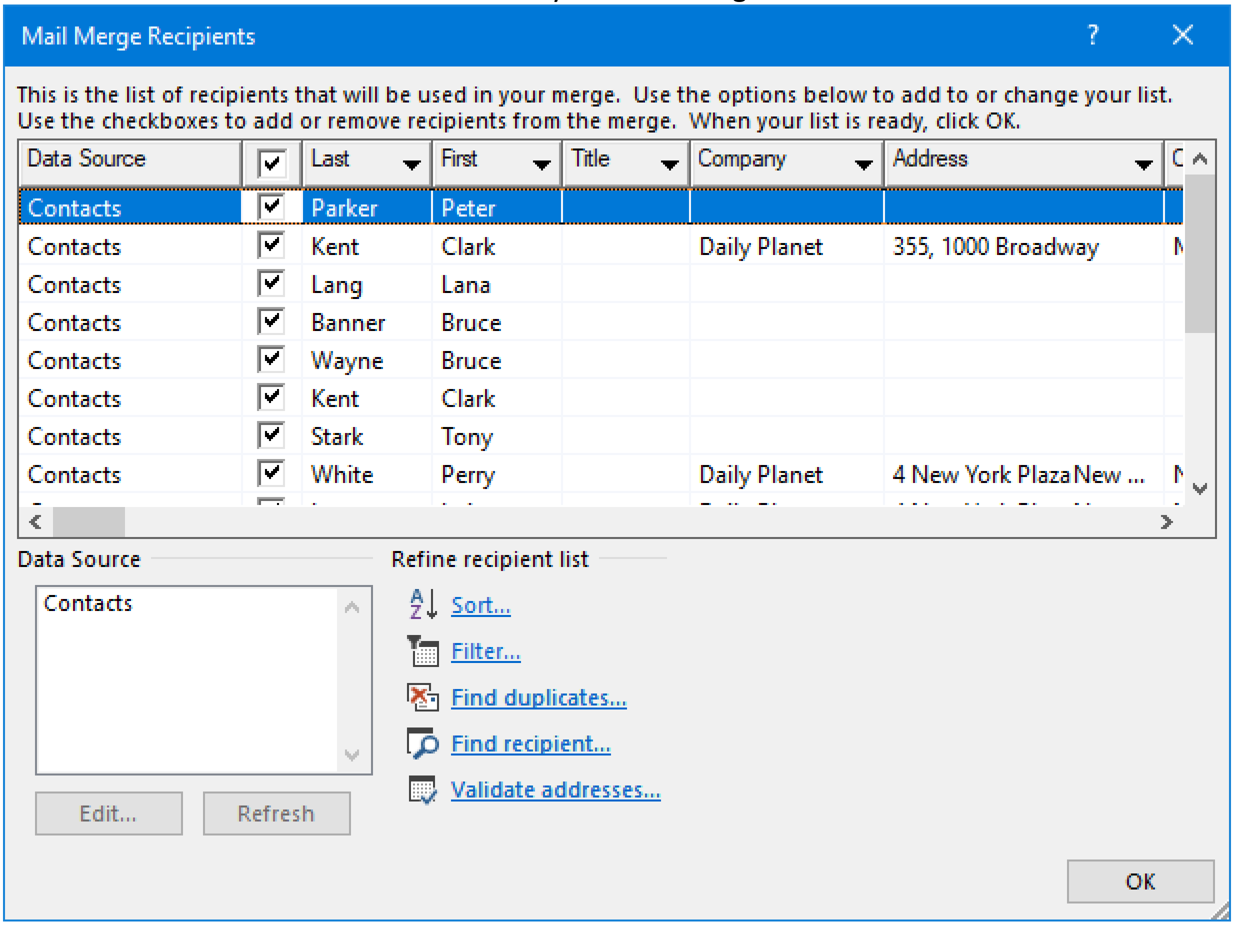



*Bringing up this dialog could take a while and could also cause a mail profile prompt from Outlook.*

6. After selecting the Contact folder of your choice you could be presented with the “Choose Profile” dialog from Outlook. If you don’t know this dialog, there is

probably one selection in the drop down list anyway or set to the correct default so simply press OK.

7. Word now opens the “Mail Merge Recipients” dialog where you can specify which contacts to send to.
   This dialog offers various selecting and filtering options. This dialog can be a bit slow when you have a lot of contacts as it refreshes the screen after pretty much every action. However, the “Find duplicates…” feature is quite handy especially, when you want to use the entire Contacts folder for your mail merge.




*The Mail Merge Recipients allows you to refine your selection of Contacts.*

8. After selecting the recipients, the next step is to write your message. The Mail Merge Wizard already shows you some variables you can use. Writing of the message can be done in the same way as in the example indicated above.
9. The next step allows you to preview all the emails you’ll eventually be sending.
10. In Step 6 you can press “Electronic Mail…” to set the final options before mailing your message
    - Note that it is the same dialog as we had in our previous example but now you still need to fill in some details;
        - To: Email_Address
        - Subject line: Your personal information
11. After setting the options, pressing OK will direct start sending the emails.

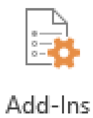
Mail Merge from Word with another source


When you want to send out personal emails via Outlook but the information itself isn't in Outlook, but for instance in Excel, Access, a SQL query, a csv-file, etc., then you can start your mail merge from within Word as well.

The process is similar as doing a mail merge from within Word with Outlook as the source, with an additional step to match the merge fields.

1. Start the mail merge from Word again as indicated above until you reach the screen with Step 3 in the Mail Merge Wizard.
2. In Step 3 select "Use an existing list".
3. Click the Browse… button.
4. Select the location of the document containing the information. This can be Excel sheets, Access Databases, Database Queries, Text Documents and many other sources as long as it is in a structured format Word can work with.
   - Depending on the file type you selected you might need to put in the delimiters; the characters that are used to separate the columns and rules.
5. After you have selected the file and optionally filtered your contacts to address, continue to Step 4.
6. When you reach Step 4, it is a good time to match the fields from your source to Mail Merge fields to be able to use the predefined blocks such as "Greeting Line". For instance, when you have an Excel sheet that contains the columns Name, Email Address, Usernames and Passwords, you'd want to match the Name field to the "Last Name" merge field.
   1. Press the Match Fields button.
   2. You'll now get a dialog with standard Merge Fields in Word which can be used in standardized templates.
   3. Expand the drop down list next to "Last Name" and set it to the column in your source document (in our case an Excel sheet) containing that information (in our case the column "Name").
   4. Match up other fields if you need and press OK to close the dialog.
7. You can now continue with the mail merge as indicated in the process above.
8. When you get to the dialog to send the messages, you must set the "To:" field to the column that contains the list of email addresses to send to.

Mail Merge with 3rd party tools




Below is a list of 3rd party mail merge tools which you can use in addition to the Word Mail Merge or as a replacement of it. I won't discuss their start to finish processes but will highlight their unique features.

Mail Merge Toolkit by MAPILab

- Fully integrates with the Mail Merge Wizard providing you with more sending options.

- Mail merge with attachments or even a different attachment for each recipient.
- Optionally set CC and BCC recipients.
- Allows customization of the Subject too.
- *Discount code: **4PM76A8***

**Send Individually by Sperry Software**

- Easy to use.
- Automatically creates individual emails from addresses you have put in the To field.
- Has its own merge fields already mapped to contact details which can be used in a message.
- Supports a simple txt-file as the source for the mail merge with an email address on each individual line.
- *Discount code: **BH93RF24***

**Send Personally by MAPILab**

- Easy to use.
- Automatically creates individual emails from addresses you have put in the To field.
- Has its own merge fields already mapped to contact details which can be used in a message.
- Allows for an exclusion list.
- *Discount code: **4PM76A8***

**Merge Tools by Doug Robbins (Word MVP)**

- Installation via a Word Startup template (dotm-file).
- Merge to e-mail messages either with or without attachments, with the documents created by the merge being sent as either Word or PDF attachments or as the body of the e-mail message.
- Many to One type merges, which can be used for creating documents such as invoices where there are multiple records in the data source that have common data in one of the fields.
- Merging to a document that will include a chart that is unique to each record in the data source.
- Video tutorial by Kevin Stratvert (ex-Microsoft employee).

# Module 9: Digital Marketing and Social Media management

## Lesson 1: Digital Marketing

### 1.1 What is Digital Marketing?

Digital marketing is the practice of promoting products or services with the help of digital devices and technology.

In simple words, digital marketing is any form of marketing that occurs online with the help of mobile, laptop, internet, etc. In addition to digital signage and technology that may not be connected to the internet. It can range from anything as complex as automated email marketing initiatives all the way down to the content choices on your website's blog.

Now, you know what digital marketing is, so let's proceed and know the types of digital marketing.

### 1.2 Types of Digital Marketing

If you have a computer or a smartphone, as many of us do, you've experienced digital marketing. It could be an email in your inbox, a search result when using Google, an ad on Facebook, a text message sent to your phone, or a post by an influencer on Instagram. As you can see, internet marketing is an expansive field with many areas of specialization. The core forms of digital marketing, however, are:

**a. Search Engine Optimization (SEO)**

Put, SEO consists of carefully structuring and optimizing your website's pages to achieve the best position possible on search engine result pages (SERPs) when internet users perform a search on an engine like Google that's related to your business.

**b. Paid Social and Paid Search Advertising**

Ads that appear on social media are paid social ads, and all that seems on SERPs when you enter a query are paid search ads. Advertisers create these paid ads and compete with others for positions on their chosen social platform or the SERP for their selected search engine.

**c. Email Marketing**

Any marketing that occurs through email is known as email marketing, and it's not just for newsletters and coupons. All marketing-related interaction over email fits into this category.

**d. Content Marketing**

Every effort to market through online content is considered content marketing (and often employs SEO, paid search, and paid social advertising). For example, all these content types (and more) are grouped under the content marketing category:

- Blog posts
- Infographics
- Videos
- eBooks
- White papers

Other types of digital marketing include marketing automation, design, apps, mobile marketing and SMS, web analytics, and growth hacking.

## 1.3 Benefits of Digital Marketing

Digital marketing has become hugely popular in such a short period, and for a good reason. Today's customers and clients spend an increasing amount of time online, and they expect their favorite companies to be online, too.

The internet landscape might seem intimidating, but effective digital marketing can be an enormous boon for business. With careful strategy and implementation, the benefits of digital marketing on business include the expansion of the audience, meeting target customers where they're spending their time, and achieving this for a far more affordable price than traditional marketing methods allow.

For these reasons and more, more than 60 percent of marketers have moved their focus from traditional to digital marketing.

## 1.4 How Digital Marketing Works?

While the benefits of digital marketing are plentiful, understand that each form of internet marketing functions in its way. Companies would be wise to assess the bigger picture before determining which forms of digital marketing in which to invest and which platforms to use. It's generally recommended to crawl before you walk–start small with your online marketing strategy and grow as the company becomes accustomed to different areas.

Digital marketing is hugely helpful to firms in that it allows them to grow their audience as far as their budget allows. On the other side of the coin, internet marketing offers companies the chance to focus clearly on marketing to the right audience. In other words, a firm may reach the perfect target clientele on a local, national, or international stage, all while staying on budget.

## 1.5 How does Digital Marketing work?

There are two ways in which Digital Marketing is implemented by brands and businesses:

- B2C (Business to Customer)
- B2B (Business to Business)

B2C (Business to Customer)

As the name suggests, this sort of Digital Marketing is conducted when a brand or a company has to sell a product or service to individual customers. Infact, 95 percent of the time, the ads and marketing that you see online are examples of B2C campaigns, e.g., an ad for a candy bar, a promotional video for a safety razor, or a movie trailer. All of these marketing efforts are targeting individual consumers and not organizations. Since most traditional means of B2C marketing are far too redundant in the digital era, Digital Marketing is easily the best way to go about in this area.

Let's get into the B2C Digital Marketing:

- Analyze and profile your customers
- Create activities for attracting customers and engage with them. Games and contests are generally a great idea to promote your brand. By giving the customers something of value or challenge and via the means of entertaining them, you are ensuring to stand out from the usual direct marketing crowd, which people are annoyed by.

- Use Search Engine Optimization or SEO to optimize your content on which you are basing your marketing.
- Time-limited offers like discount codes or free store credit can help boost your sales. By providing discounts to an Internet user, you may be swaying them from where they usually would have bought that product and turning them into your own customer.
- After segmenting the crowd and singling out your target audience, tailor your marketing campaign completely around their needs and desires through emails, videos, and social media posts.
- Once you have narrowed down your customer segment, try to find out which social media influencers or the category of influencers they tend to follow. Then, you can contact that influencer and offer them a sum of money, a free sample, or your product, or some other forms of incentives, to promote your product. Keep in mind that this sort of marketing is on the expensive side, and you really need to be wise about your budget and target case to hire influencers.

B2B (Business to Business)

B2B is conducted for very specific products. You wouldn't generally see B2B products being advertised on platforms with traffic from the everyday crowd. These marketing campaigns are low profile, professional, and in most cases, marketed directly (or pitched) to the client. This client can be a small business or a corporate giant. We can take heavy-duty cooking machinery used in big fast-food restaurants as an example. What would be the point of running a TV ad for an industry-level chimney? None. This sort of marketing is done through B2B-specialized salesmen who use custom-made marketing material, PowerPoint presentations, and word of mouth to pitch their product.

B2B campaigns are highly custom-made and catered to a very small group of people and their needs. A lot of times, an entire marketing campaign and presentation will be created for a single client organization. Let's look at the process:

- Study the marketspace and analyze your competitors' offerings, price points, and marketing material
- Identify and study the businesses that you are going to target. For example, imagine your analysis finds out that the biggest complaint about industrial chimneys is blockage. Then, you need to advertise your product in a way that offers a solution to that particular problem or conveys how your product deals with that particular issue better than your competitors
- Have a professional-looking website or landing page
- Perform SEO
- Whenever you successfully transact with a business, make it a point to request them to refer other potential clients to your organization.
- Use paid Ads
- Make and use custom-made video ads (pitches)
- Share your professional brand identity through social media

## 1.6 Digital Marketing Roles and Responsibilities

Job responsibilities for digital marketers will vary depending on experience and specialization.

For example, an SEO specialist will understand all aspects of SEO, including the know-how to drive organic traffic, identify and evaluate high-quality content, and make competitor analyses.
On the other hand, a social media manager will devise a social media strategy in line with the identity of the brand, define a communication style and a content strategy, create and adapt the content for each social media network, and stay up-to-date on the latest digital marketing trends.

Now, as you are well versed with the understanding of what is digital marketing, its type, benefits, roles, and responsibilities let's have a look at the difference between inbound marketing and digital marketing.

## 1.7 What's the Difference between Inbound Marketing and Digital Marketing?

**Inbound Marketing**

Inbound marketing is a form of marketing that can apply to digital or traditional marketing. Inbound functions like a magnet. The marketer provides content that is attractive to the intended audience, and the audience finds it of their own accord. In other words, it's a form of marketing that isn't forced upon its target.

**Digital Marketing**

Digital marketing can be inbound or not. If you create incredible content on your website that draws in readers and turns them into customers, you're using an inbound marketing strategy. If, however, you run ads on social media or search engines, you're forcing your marketing onto the viewer, which is not an inbound method.

## 1.8 Email Marketing: A Complete Step-by-Step Guide to Start On

### *1.8.1 What is Email Marketing?*

It is a way of delivering effective messages to convert leads into sales by sending personalized emails to targeted customers. It also helps us to educate our target customers on the value of our product.

### *1.8.2 Importance of Email Marketing*

- Costs lesser as compared to other marketing channels
- Shows a higher ROI (return on investment)
- Helps in attracting new customers
- Easier Integration with other communication channels
- Assists in creating targeted and personalized messages
- Helps higher-intent client to engage with your business
- Helps reaching larger audiences and even smaller targeted lists

### *1.8.3 How to Practice Email Marketing?*

#### Define Your Audience

Identify the target audience and create segments based on their geography, demographics, firmographics, past purchases, email engagement, etc.

#### Choose Suitable Email Marketing Platform

Next, choose a suitable email marketing service for your company. Then create campaigns and set an appropriate call to action.

### Test Your Emails before Sending

A/B test you emails with the following steps:

- **Optimize Basic Elements of Email**

### Emails elements - Email marketing

- Attract the audience with a compelling subject line
- Ensure to choose the preview text wisely
- Offer relevant content to your audience
- Place CTA in a visible place for your visitors
- Add relevant images and ensure of creating visually appealing emails
- Design mobile-friendly emails

### Gain Your Audience’s Trust

Audience

- Build and segment an email list based on user behavior
- Send campaigns immediately or schedule a time
- Ensure to follow a consistent schedule to build trust with your audience

### Measure the Results

Measure Results

- Optimize your subject lines, preheader text, email content, CTA, and landing pages through A/B tests
- Measure performance (open rate, CTR rate, response, and rate)
- A soft bounce means the email has reached the recipient's mail server but is bounced back undelivered
- A hard bounce email occurs when the email has been permanently rejected
- Open Rate: It is the percentage of the total number of recipients who opened an email campaign
- Click-through Rate: It is the percentage of recipients that have clicked the CTA in your email message

- Response Rate: It is the percentage of the number of people who completed the survey of your email by selecting the link of your email campaign and completed an action
- Forward Rate: The forward rate refers to the rate at which your subscribers share your email campaigns with others
- Bounce Rate - There are two types of bounces -- hard and soft.

Below is an example of an optimized email that can help you bring a high open rate:


Optimized email

## Types of Email Campaigns

There are a variety of email campaigns that can be used to interact with your target audience. And here's how you can optimize each type of email campaign:

- Welcome emails
- Newsletter
- Promotional emails
- Abandonment cart emails
- Re-engagement campaign
- Sponsorship Emails

## 1. Welcome Emails

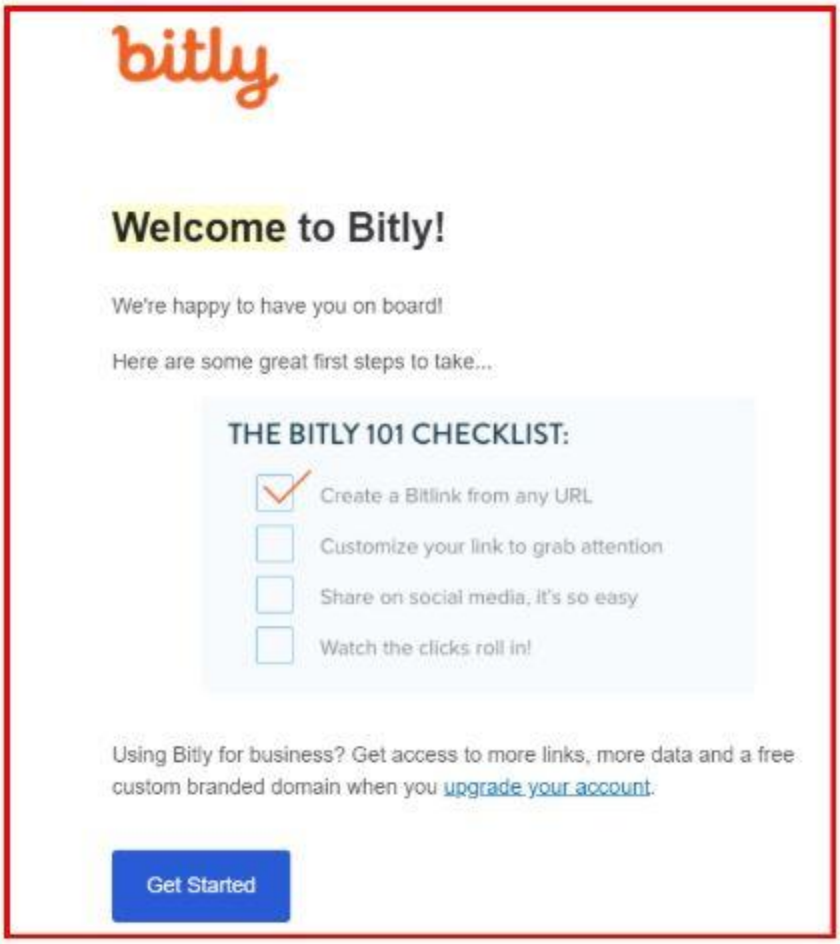
- According to Campaign Monitor, a lot of recent studies have shown that welcome emails have an average read rate of 34%
- Welcome mails encourage new subscribers to engage with your products and services

### How to Optimize?

- Send your welcome email immediately after the sign-up process of the user
- It should be informative, clear and actionable
- Optimize subject lines and email content
- Keep messages short and clear

- Use relevant CTA

An example of an optimized welcome email is shown below:




Welcome email - Email Marketing

## 2. Newsletters

- With email newsletters, the audience are connected and informed about the product updates
- This is a very significant way of educating your audience and prospects about your business

## How to Optimize?

- Try to reduce text and provide visually interesting campaigns
- Stack your email content and optimize CTA
- Create an interesting header
- Share a variety of content (like videos, articles, eBooks, podcasts, webinars) with your readers
- Follow a consistent schedule for sending emails

Below is an example of a newsletter:


Newsletter - email marketing

### 3. Promotional Emails

According to convince and convert, 68% of Millennials have confirmed that Promotional Emails have influenced their purchase decisions.

- These emails drive revenue by sending special offers
- Its objective is to make a conversion

### How to Optimize?

- Ensure to personalize your campaigns
- Engage your customers by including limited time offers
- Send offer emails on holidays for high engagement rate

Below is an example of a promotional email:


source: Pinterest

Promotional email

### 4. Abandonment Cart Emails

- Abandonment emails are shared with clients who have kept products on their cart but did not complete the checkout process
- It is an effective way to improve sales

### How to Optimize?

- Use a simple abandoned cart email template
- Personalize your abandoned-cart recovery emails
- Adding a product image in your email remainder can result in high click-through rate
- Send a series of email reminders to your clients.

Below is an example of abandonment cart email:

```java
public class Car1{
    int id; //for model number
    String name; //for model name
    //creating a constructor
    Car1(int i, String n){
        id = i;
        name = n;
    }
    //constructor for initializing another object
    Car1(Car1 c){
        id = c.id;
        name = c.name;
    }
    //using display method for printing results
    void display(){
        System.out.println(id+" "+name);
    }
    public static void main(String args[]){
        Car1 c1 = new Car1(1,"Mercedes-Benz"); //passing values along with creating objects
        Car1 c2 = new Car1(c1);
        c1.display(); //printing outputs
        c2.display();
    }
}
```

Result

```
1 Mercedes-Benz
1 Mercedes-Benz
```

abandonment cart email - email marketing

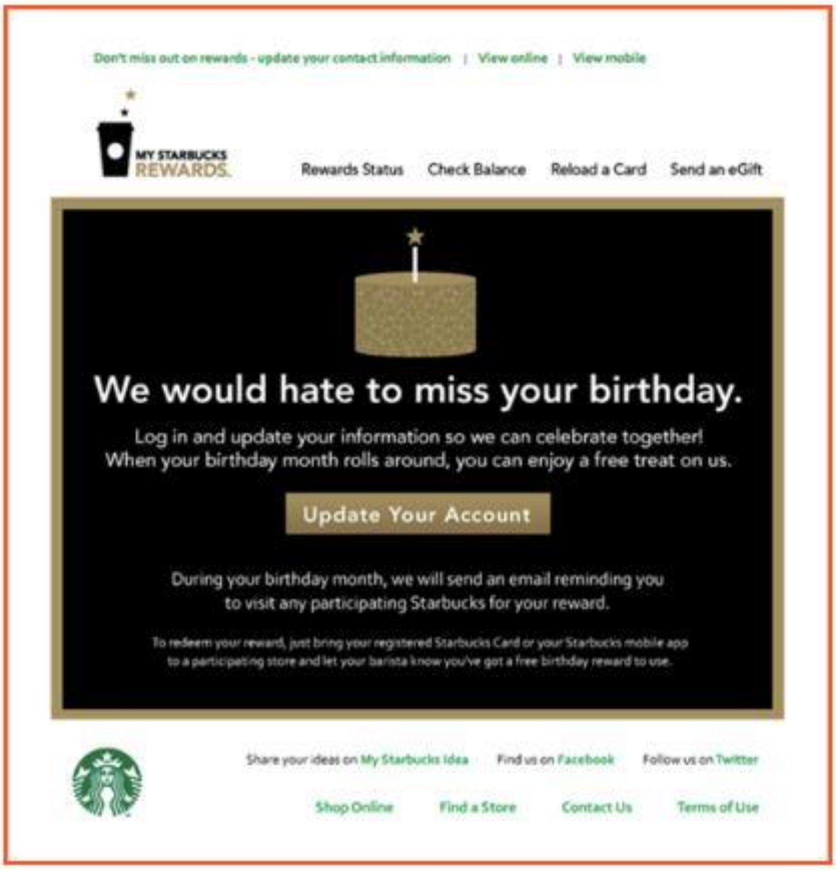
### 5. Re-Engagement Campaign

- It is a practice of sending series of emails to inactive email subscribers
- It leads to high user engagement rate and maintains a high IPR (Inbox Placement Ratio)

### How to Optimize?

- Opt for gamification to win back inactive subscribers
- Prefer subject lines like "We have been waiting for your response" or "We have got a special offer for you."
- Conduct a poll or quiz to re-engage with your subscribers

Below is an example of a re-engagement campaign:



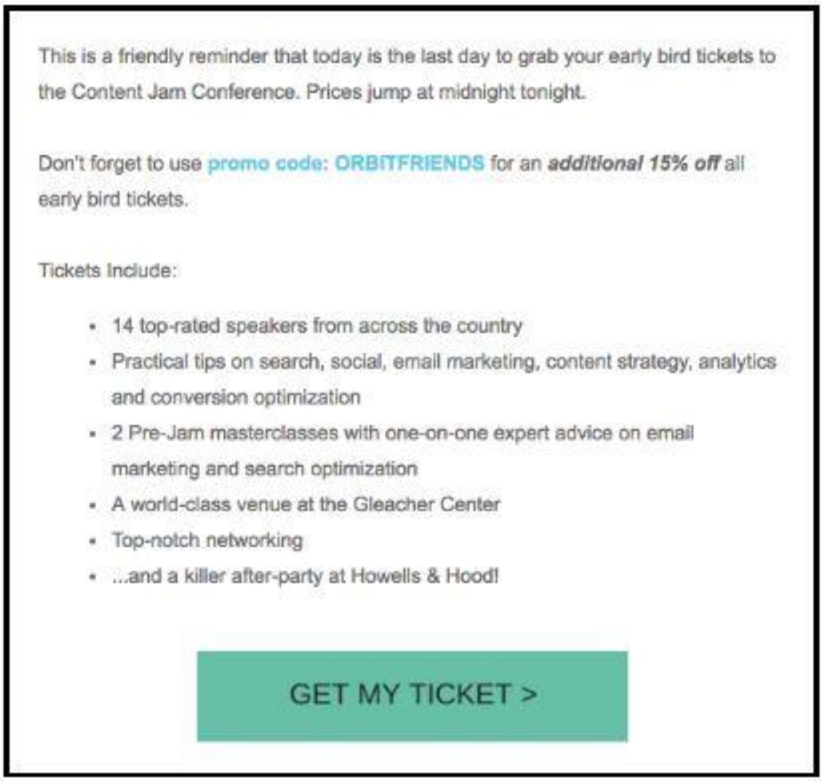

Re-engagement campaign

### 6. Sponsorship Emails

- These emails let you advertise your copy in another vendor's newsletter
- In simple terms, it is a way to reach a different audience and gain new leads through display ads via emails

### How to Optimize?

- Choose the right promotional partner
- Use only one primary CTA whereas offering multiple deals to the audience can be confusing
- Always clearly define your objectives
- Leverage social media platforms in order to maximize the reach of your campaign




Sponsorship email

## What is A/B testing?

A/B testing or split testing is a way to analyze which of the two email campaign strategies can result in high open rates and click rates.

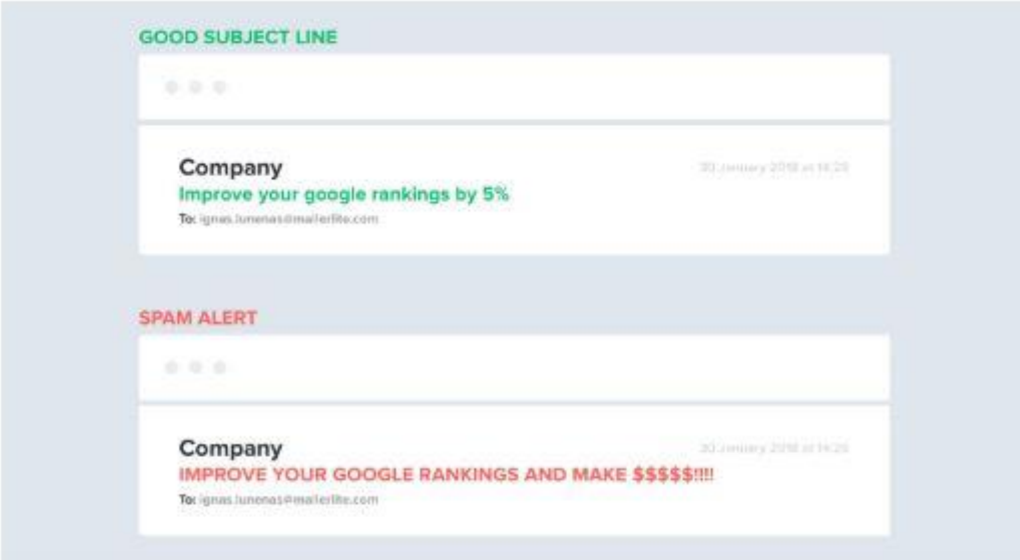
### 1. Subject Line

- It is the message that the recipient sees when the emails reach his/her inbox
- An interesting subject line can convince a reader to open your email and read further

### How to Optimize?

- Your chosen subject line should be relevant to your audience
- Include a number in your subject line
- Make sure the subject line isn’t too lengthy (17-24 characters)
- Prefer using actionable language, like "Final Hour," "download," "get your free," etc.
- Opt for title case in subject lines

Below is an example of an optimized subject line:




subject line

Based on research, Convince and Convert have confirmed that 82% of marketers opt for subject lines shorter than 60 characters.


The following email marketing statistics prove how you can use email to reach your marketing goals in 2019 and beyond.

1. 82% of Marketers Send Emails With Subject Lines of 60 Characters or Less

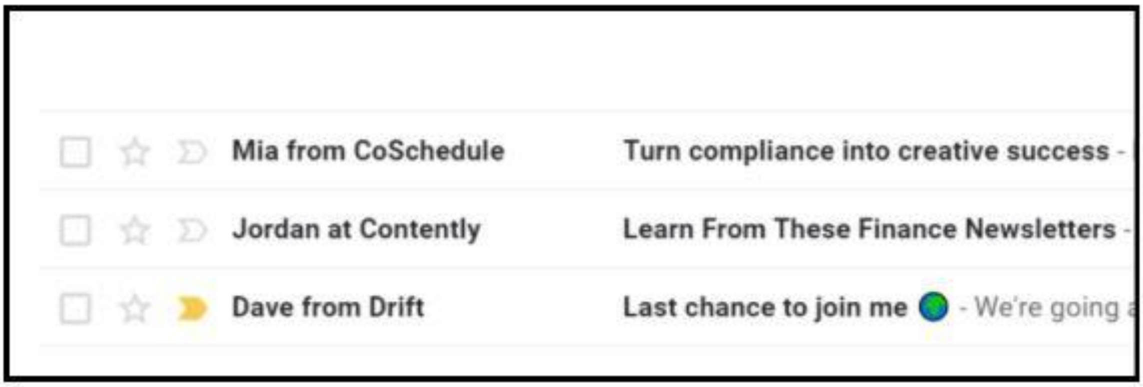
Source: Convinceandconvert

## 2. Sender Name

- It is a key element of your email message displayed in your recipient's' inboxes
- An optimized sender name will boost your open rates and build trust with your target audience

### How to Optimize?

- Always have a clear sender name as it results in a high open-rate
- It's always better to use an organization or brand name over an individual person's name
- Consistency and familiarity of your sender name helps in building trust with your audience
- Avoid no-reply address and always prefer using a valid email address
- Below is an example of a Gmail account full of emails, where the first column contains the sender name, or "from" name




## 3. Personalization

It is a strategy of creating more engagement by targeting an email campaign to a specific audience

### How to Optimize?

- Address the email to the person's first name
- Leverage the demographic and behavioral data you have about your readers
- Set up automated behavioral trigger emails for converting your readers to subscribers

Based on research, the campaign monitor says, studies show that personalized emails have 2.5 times higher click-through rates, and are six times more likely to drive a conversion.

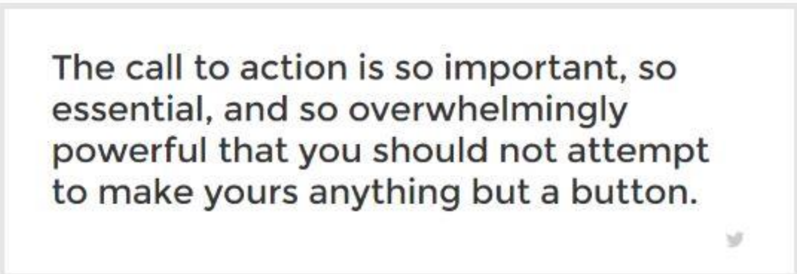
## 4. CTA

It is an action incorporated in emails to encourage the audience for engagement

### How to Optimize?

- Keep your CTAs not more than three words (such as, "sign up now" or "Download now"
- Personalize Your CTAs
- Always use responsive designs
- Opt for button format, as its more clickable

According to Crazy Egg, CTA with button designs have high converting rate:




Below are the top five A/B testing tools that can help in optimizing your email for high open rate:

- HubSpot’s A/B testing kit
- Crazy egg
- Omniconvert
- Optimizely

- VWO

## How to Grow an Email Subscriber List?

If you're noticing an increase in unsubscribes or if you want to grow your subscriber number, opt for the following techniques:

- Create remarkable email content for high engagement
- Encourage your subscribers to forward the email as it can be a great way to find a target audience
- Do not opt for longer-form content as it results in low conversion rate
- Send content that meets your customer expectation
- Prefer using bullet points to make the content readable and follow a logical structure in your email
- Use compelling images for high open rates
- Prefer to draft emails with responsive designs
- Quick Response code is an easier way to encourage readers to sign up for an email list even when they're offline
- Reach out to the audience through the social network to increase your email sign up list at a quicker pace
- Use recipient names and personalize emails for your readers
- Add a clear CTA at the end
- Test your subject lines, preheader, CTA, and email content
- Segment your emails and provide an option for social sharing

## How To Segment Email List For High Open and Click-Through-Rate?

Email list segmentation can be a very simple process if done in the right way. In case you're willing to put some effort, here's what you need to know:

- Geographic segmentation - With this segmentation, you can target your audience based on geographical areas, such as by city, state, country, or continent
- Demographic - Segment your audience by age, education, income, gender, occupation, nationality, and more
- Behavioral segmentation - It segments target audience by their behaviors and decision-making patterns such as purchase, online activity, search history, and more

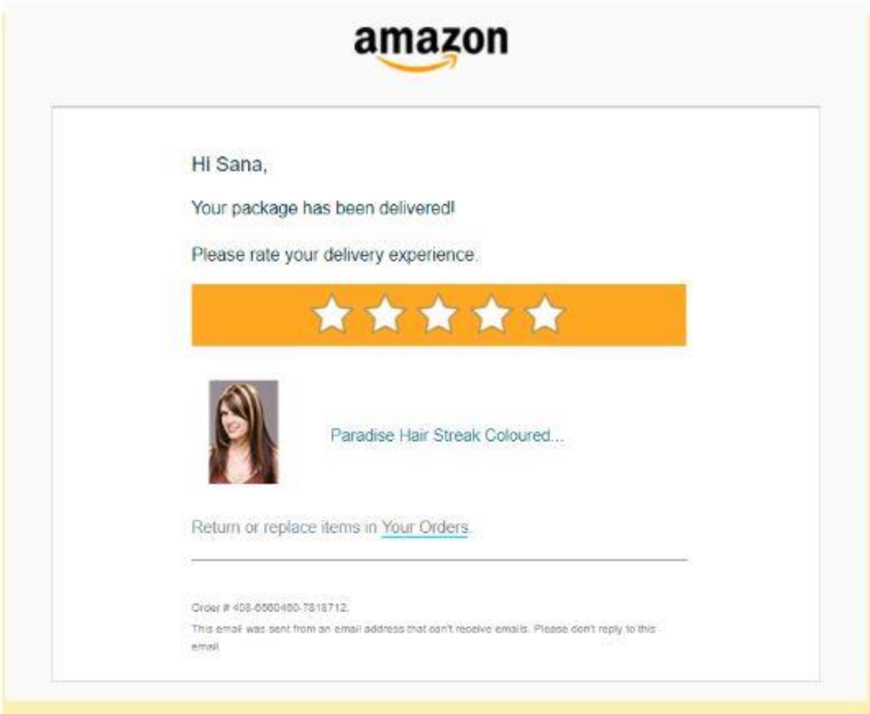
## How To Automate Email Marketing With An Auto Responder?

There are basically two types of emails you can send to your readers:

- Broadcasts
- Autoresponders

Broadcast emails are one-time email campaigns which are delivered to a group of audience in your contact list and Auto Responder is a programming script where emails are sent at frequent intervals based on the behavior of subscribers.

A suitable example of Auto Responder is below:




AutoResponder

**To create an AutoResponder:**

1. In the mail section, go to Menu>> AutoResponders
2. Click Create AutoResponder and write a message in the internal name.
3. Choose the list linked to the autoresponder
4. Assign the AutoResponder to a particular day
5. Select delay time, days of the week, you'd like for the message to go out on
6. Choose the from and reply-to addresses.
7. Write a compelling subject line
8. Choose Google Analytics as the source before sending the email
9. Finally, save and publish if you want the message to go live right away

## Email Marketing Tools

Selecting the right tool for your email campaign is essential, as it will help grow your businesses. With the tool, it's easier to identify the right templates for your emails. Selecting the right tool can help to share engaging emails such as welcoming a new subscriber, notifying clients of a sale, etc. These are some of the most widely used tools to ensure you hit the mark every time:

- Mailchimp
- Marketo
- ConvertKit
- Sendinblue

**Mailchimp**

- It is a reliable and feature-packed tool that helps grow businesses
- Offers basic analytics that are helpful for inbound campaigns
- It helps in boosting lead tracking and conversions
- It is a cost-efficient tool for businesses having less than 2,000 subscribers

**Marketo**

- It has various pricing options that can fit into different companies' budgets
- It is suitable for medium-sized organizations and provides services which can be focused on lead management, email marketing, and mobile marketing
- It's easy to learn and set up. And you pay only for the options that you use

**Convertkit**

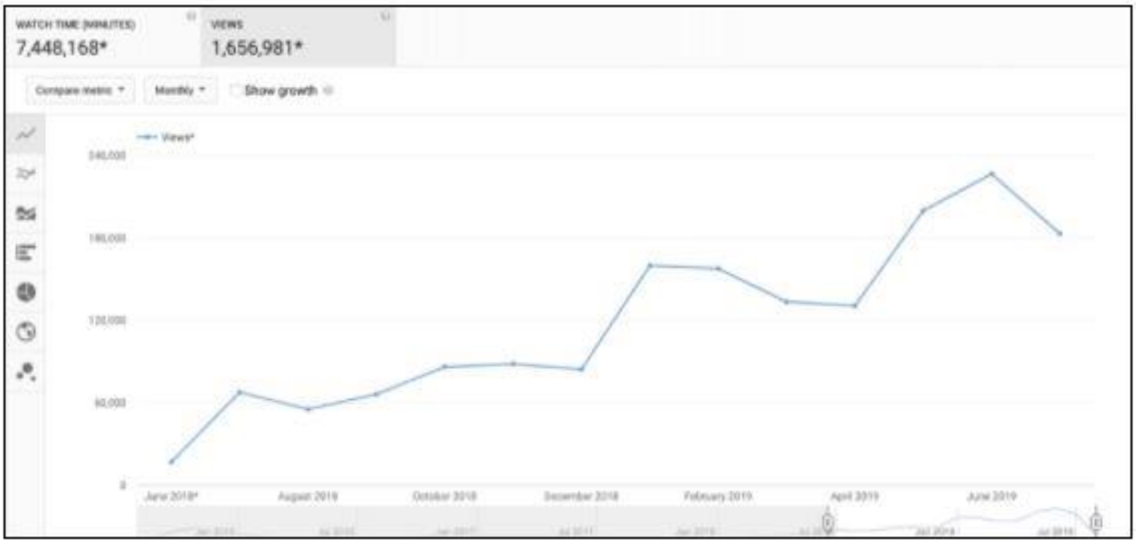
- Easy understanding of autoresponder sequence and enables us to create segments of the target audience
- Helps to grow businesses through attractive forms, dynamic emails, trackable data, and simple automation feature
- New features are regularly updated for better usage

**SendinBlue**

- Automation workflow speeds ups the task and enhances the user experience
- Optimizes open and click-through rates by scheduling time and date for delivering emails
- Easy to create a professional newsletter with its advanced features

**YouTube Keyword Research: All You Need to Know About It**


JumpShot confirms that after Google, YouTube is the most popular search engine. If you have a YouTube channel and are seeking to get more views for it, your main target is to focus on the keywords with search demand. This YouTube keyword research technique helped Ahref grow their YouTube channel from 10,000 to over 200,000 monthly views in a year.




Source: Ahref

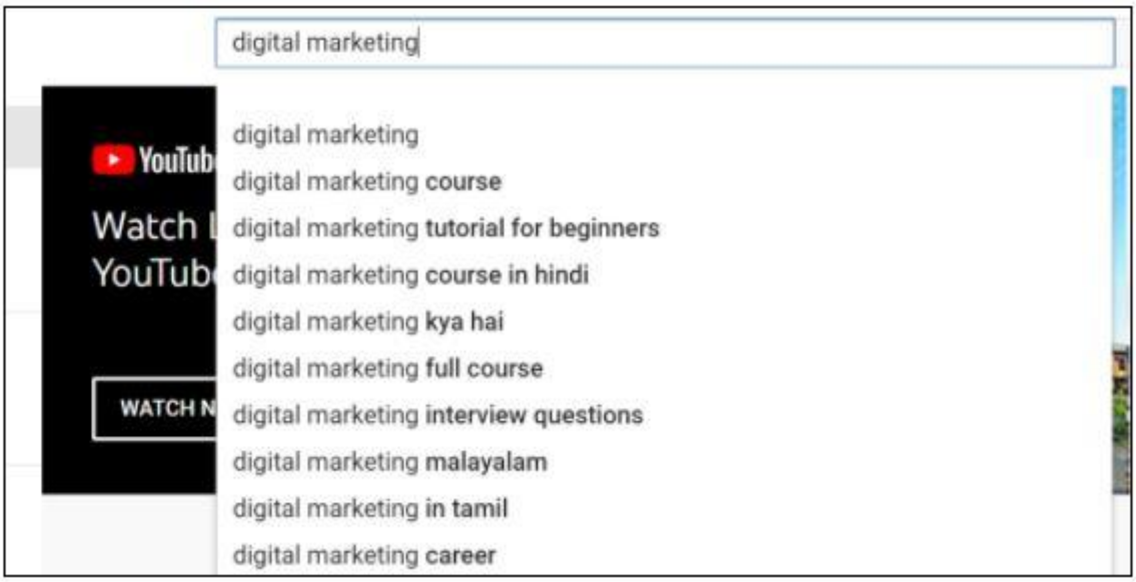
Note: Ahref also earned approximately 50,000 new subscribers in that same period.

Let us discuss a few simple YouTube keyword research techniques that will help us find relevant and high search volume keywords.

YouTube Auto Suggest

- YouTube has a feature called autocomplete.
- This feature suggests only popular keywords.
- With the suggestion, when you type a keyword relevant to your niche, you will receive a list of suggestions related to the term.

For example, if you type "digital marketing," then you get suggestions like "digital marketing," and "digital marketing for beginners."

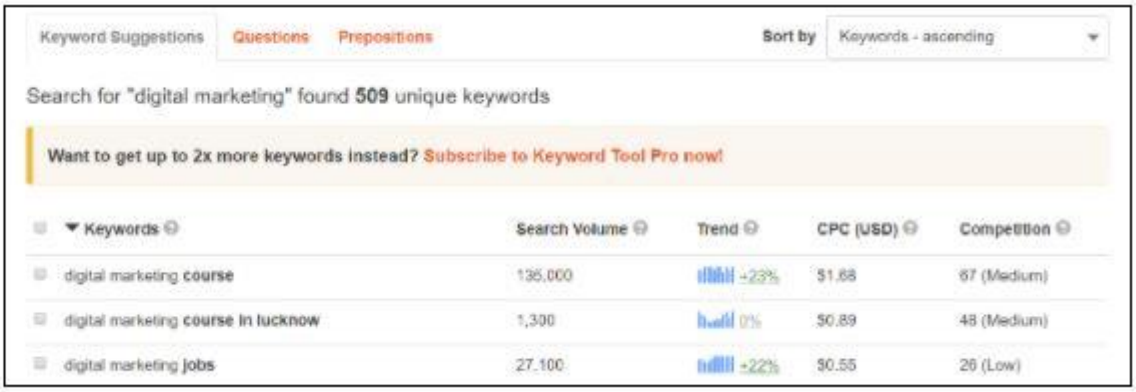



Note: According to WordStream, YouTube autocomplete is useful to find long-tail keywords

**Use Keyword Tool.io**

Instead of manually if you want to search keywords with the help of a tool, we suggest you check out KeywordTool.io.


This tool helps marketers identify hundreds of autocomplete suggestions for YouTube, Google, and other search engines.

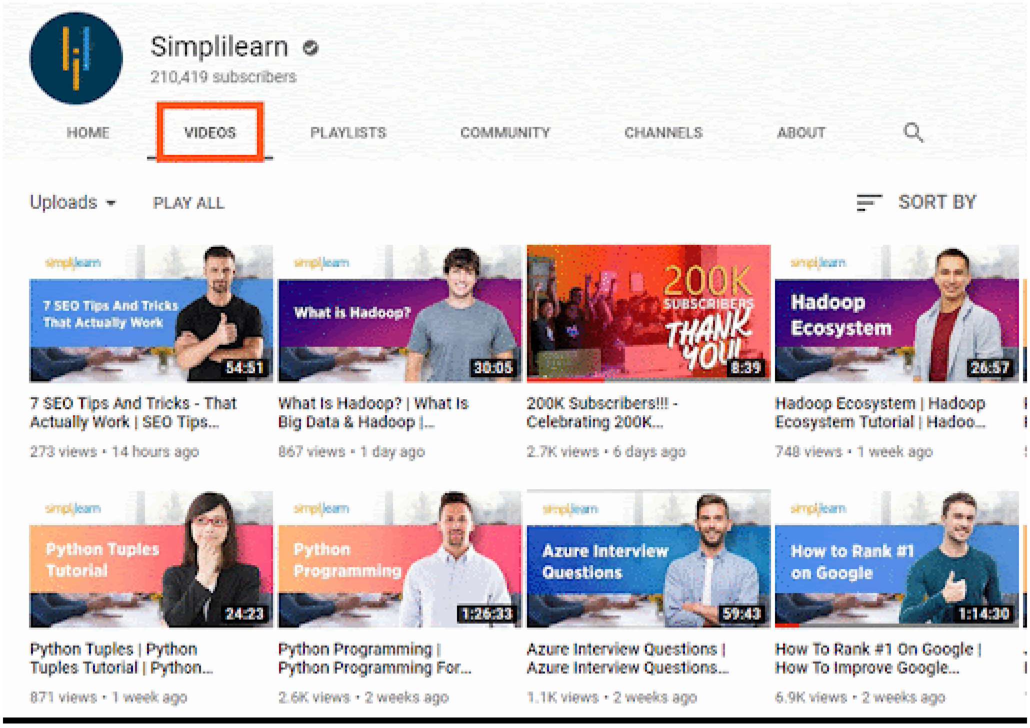


## *Keep a Track of Your Competitors*

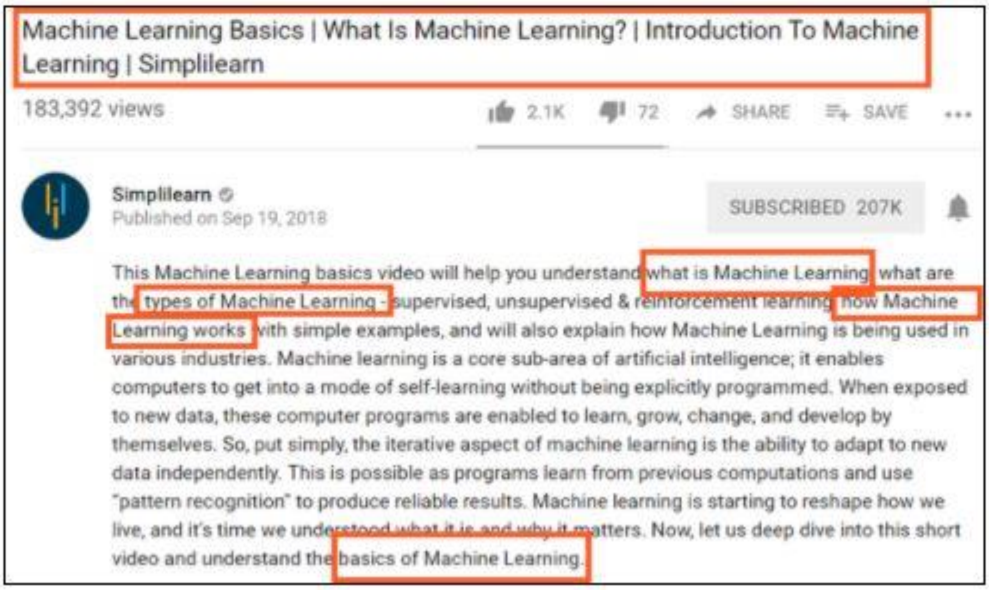
- Study your competitors' campaigns by finding new profitable keywords.
- Search for phrases or keywords that are used by your competitors in their video title and description.

Here comes the important question: How to spy on the keyword?

- Go to your competitor's channel and click on the videos tab, then sort by the "most popular" option. This way, you will find a list of top videos.
- Now, choose a video and take a look at the keywords used in the title and description of the video.

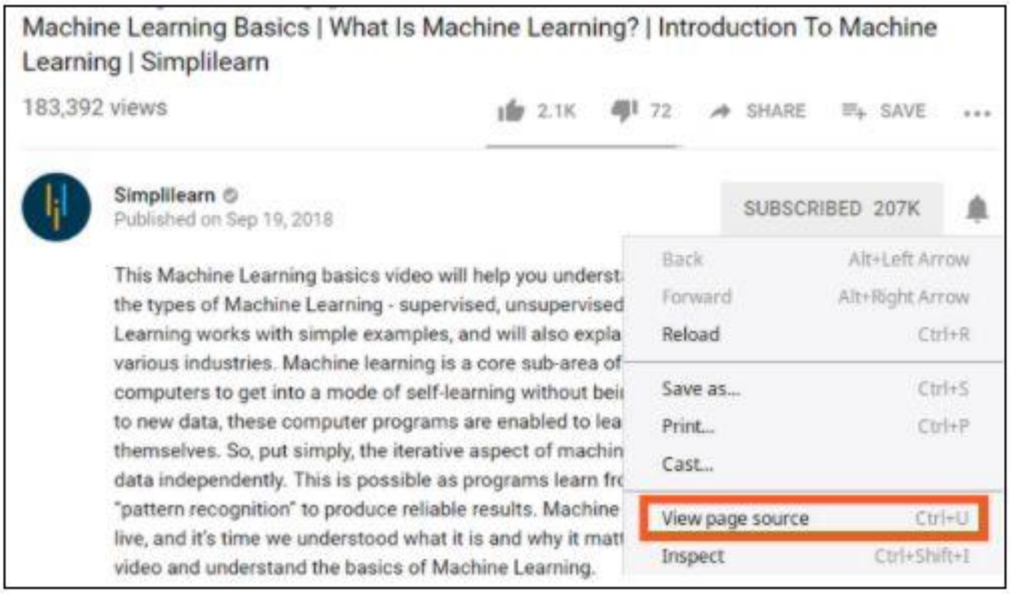



- As a result, you have a list of keywords that you can optimize your videos around.

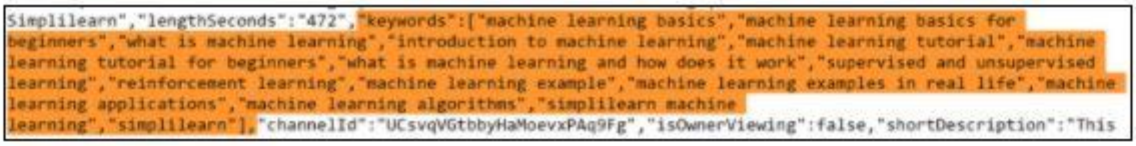



- Now, let us have a look at video tags. Video tags of YouTube can be viewed on the HTML page.

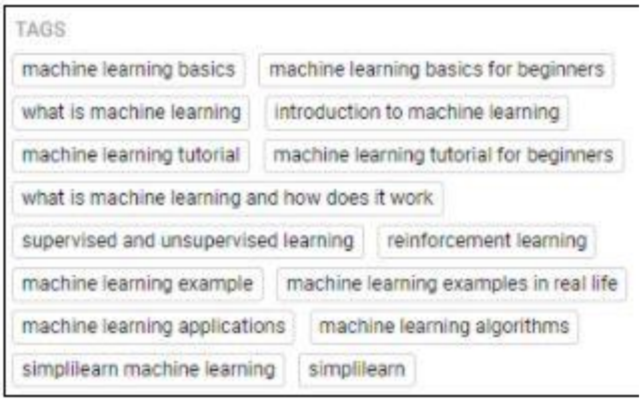
- To check video tags, right-click on the web page and select view page source.




- Search for "keywords" (using CTRL+F shortcut). The terms that appear next to the "keywords" are the video tags used by your competitor.

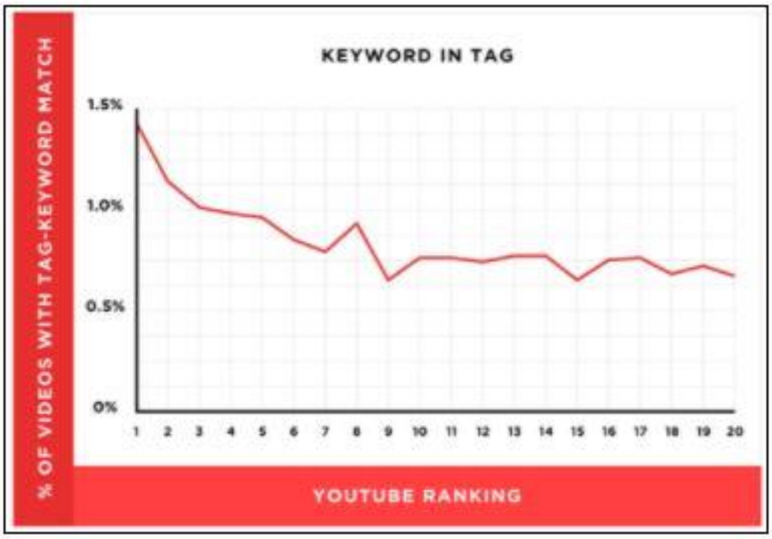



- Also, there is another way to find your competitor's video tags.
- Install Chrome Plugins–Using this, an individual can see video tags on the web page itself.




- For example, VidIQ and TubeBuddy's extension give you the exact tags that your competitors use for their videos.

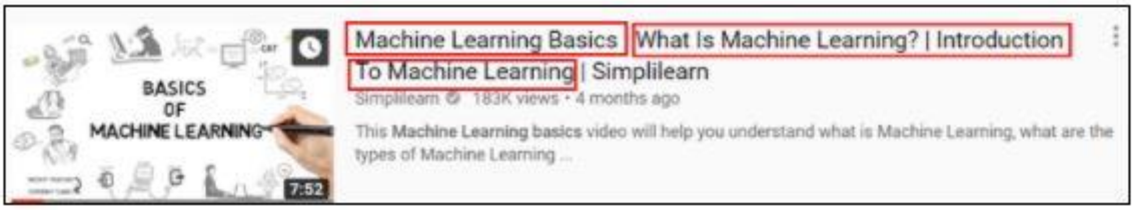
According to an industry study, using keywords in video tags helps you to rank well on YouTube.




**Important Factors of YouTube Keyword Research**

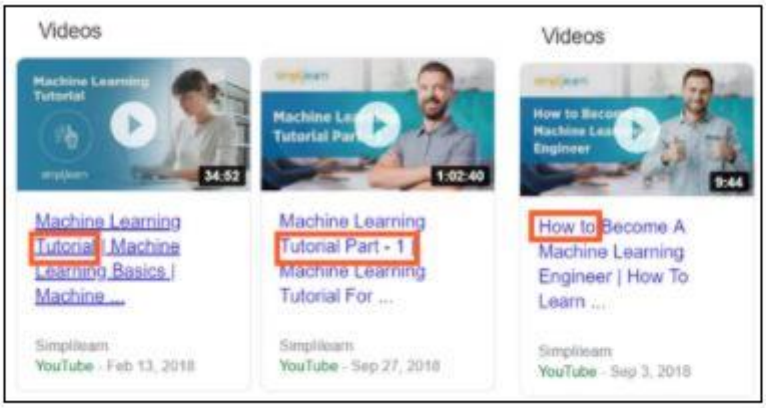
- Well-chosen keywords (primary and secondary) help your video to rank well on YouTube.
- We should do keyword research based on:
- Search volume - Choose keywords with high search volume as they drive more traffic to your video.
- Competition–Keywords with low difficulty rank well on YouTube.
- Relevancy–Always prefer keywords that are relevant to your content.
- Primary keyword–Choose a keyword that defines the nature of your business.
- Secondary keyword - Prefer keywords that are highly relevant to your primary keyword.

For example, if you have a machine learning video, you can choose your primary keyword as and secondary keyword as the following:



### Check Out Google Search Results

- When doing YouTube keyword research, opt for keywords that Google shows on the video results page (as they have high search volume), which means your video can get more views if you rank on Google as well.
- According to Backlinko, Google ranks videos with keywords like, "how-to" and "Tutorials".
- For example, On Google, when you search for a machine learning tutorial or how to become a machine learning engineer, you get results for the following.




### Ahref Site Explorer Using Scraper Extension

- Identify high traffic YouTube videos using Ahref site explorer.
- Identify your competitor channel on YouTube and select the "Videos" tab to check their uploads.
- Now, Copy and paste the video URLs into Ahrefs Site Explorer.


Source: Ahref

- If you want the process to be done quickly, we suggest you use the Scraper extension. Right-click anywhere on the page and hit "Scrape similar," then add this code in the "Selector" field:

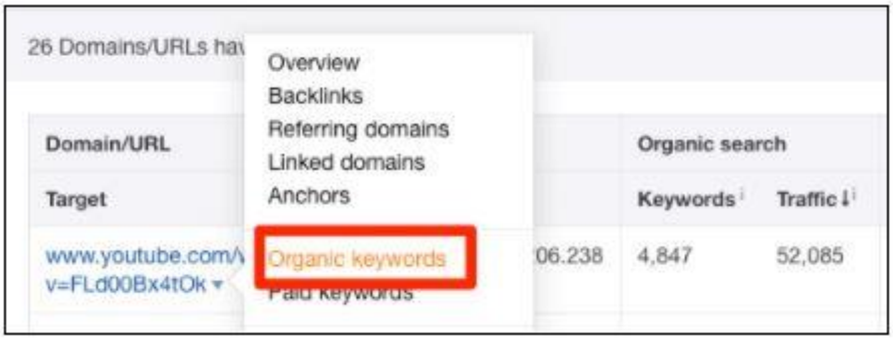
```
//h3/a
```

- Now, under the columns section -> XPath name, type:

```
concat ('https://www.youtube.com', @href)
```

- On the right-hand side, you will get a list of videos that have high traffic. So, select "Scrape" and "Copy to clipboard."
- Now, paste the results into the Ahrefs Batch Analysis tool, select the URL mode -> run the search -> sort by the "Traffic" column from high to low.

- To see the keywords for the list of videos, select the down arrow (from target domain), and hit "Organic keywords."




Source: Ahref

### *What is Affiliate Marketing and How to Start it?*

Affiliate Marketing is a term that's synonymous with giving individuals a secure method to earn money online. And although its 'ease' is debatable, they're not half-wrong. Once appropriately understood, affiliate marketing can be easy. We've all heard about how it's useful for individuals, but did you know that it can be helpful for organizations as well?

### Affiliate Marketing Stats in 2020

Affiliate marketing is a domain within marketing that's seen significant growth in the last few years. And if you're on the fence about getting into it, here are a few stats that are sure to push you over to its side:


- The annual affiliate marketing spend is estimated to be 12 billion US dollars (SoftwareFindr)
- It accounts for 15 percent of the entire digital marketing revenue (SoftwareFindr)
- More than 80 percent of advertisers and 84 percent of publishers capitalize on an affiliate marketing program (Rakuten Marketing)
- It is possible to make over $1000 in a single sale. Some affiliate programs even offer their affiliates with more than 8000 dollars per conversion.

Quite powerful numbers! Next: let’s get a deeper understanding of what exactly affiliate marketing is.

## What is Affiliate Marketing?

Affiliate Marketing is a form of digital marketing in which merchants pay commissions to a particular website or other third parties to advertise their products. These are advertised in the form of referrals. There are four major components involved in affiliate marketing. These are the same, regardless of whether you look at it from the affiliate or merchant's perspective.

**Merchant**

The merchant refers to the component of affiliate marketing that creates the product. It's the merchant's product that the affiliates need to advertise. The term 'merchant' can refer to anyone, from startups to large multinational corporations. They can also be referred to as the brand, the seller, the creator, etc.

**Affiliate**

The affiliate is the third party website or entity, which advertises the merchant's products. The affiliate's objective is to show his audience the value of the product or service the merchant is offering, and then convince them to buy it. Some of the ways that affiliates are incentivized are based on:

- Registrations
- Email sign-ups
- Sales and
- Subscriptions

There are various components that make the relationship between an affiliate and the merchant possible: the affiliate network.

**The Affiliate Network**

The affiliate network acts as the middle-man between the merchants and the affiliates. It allows merchants to find an affiliate they want to collaborate with (who are in-sync with the merchant's brand values) and, likewise, enables affiliates to find merchants they want to work with.

The affiliate network provides merchants with tools to track and process payments for affiliates.

**Consumer**

Consumer: the most crucial component of affiliate marketing. The merchant would not get any revenue without customers to buy these products, and the affiliates wouldn't get any commission either.

## What is the Process of Affiliate Marketing?

**Step 1**

Use a tool or platform to look up affiliates who might be interested in advertising your products or services. Initially, it might be difficult to decide which affiliate network to choose from. Here are some tips to help you with that.

- Targeting the Right Affiliates

You need to understand what kinds of affiliates you want to advertise your brand. If your brand belongs to a particular niche, it's highly likely that an affiliate network that caters to your specific needs already exists. You just need to find it.

- Competitive Analysis

Find out which affiliate networks your competitors are using. Analyze out how successful these networks are for them, and how large their affiliate programs are.

- Tracking Solutions

You need to determine what kind of tracking solutions you require. Although most merchants are okay with basic tracking abilities, some others may require advanced tracking, which could be a deciding factor.

- Affordability

Some networks might require a monthly membership, and some others take a cut from your profits.

Some of the most popular affiliate networks in the market right now are:


Fig: Popular Affiliate Networks - Affiliate Marketing

**Step 2**

Set up rules, guidelines, image specifications, commission values, etc. that need to be adhered to by the affiliates. Some of the specifications can be:

- The types of creatives (images) that can be used
- The kind of text that's present in the advertisement
- Image specifications
- Referral links
- Commission percentage, and so on

The commissions that the affiliate is entitled to be mentioned. Let's look at an example of when an affiliate gets a 15% commission for each time the referral code is used.


Fig: An Affiliate's Commission

**Step 3**

The affiliates apply to advertise on behalf of your brand/ organization. Affiliates can get in touch with you through the affiliate network, or through a link on your website, set up for this specific purpose.

Did you know that Amazon gives you the option to become their affiliate?


Fig: Amazon's Affiliate Program

**Step 4**

You need to select an affiliate that's best suited for your brand. This can be done by choosing applicants for your affiliate program (on your website or the affiliate network). Affiliates can be selected based on:

- The amount of traffic the affiliate's website receives
- The success of their previous affiliate campaigns
- Their acceptance of the commission that you are offering

**Step 5**

The affiliate advertises the merchant's product in his blog, website, YouTube channel, etc. Most of these have a referral link or an advertisement incorporated into them. The customer clicks on this and is transferred to the merchant's website.

**Now, let's take a look at some of the marketing channels used by affiliates.**

- Influencers: This is an individual with a sizable audience in social media. With social media posts, blogs, and other forms of interaction, the influencer can guide his/ her audience to the merchant's website.
- Bloggers: Most bloggers can rank in search engine queries organically. Taking advantage of this, bloggers sample your products/ services and then review them comprehensively, which compels the audience to go to the merchant's website.
- Paid Search Focused Micro-sites: These are sites that are websites, different from the merchant's main site that focuses on content tailored to a particular type of audience. They are usually successful thanks to their straightforward and simple call-to-action.
- Email Lists: Some affiliates still use email marketing with the help of email lists they have built over a while. Others also take advantage of email newsletters that hyperlink to the merchant's product
- Large Media Websites
- These are websites that advertise to millions of people. With this comes great exposure and similarly huge conversion rates, providing sizable revenues to the merchant and the affiliate.

**Step 6**

The customer purchases on the merchant's website, and the affiliate network takes note of the transaction details.

**Step 7**

The validity of the transaction is verified, and the amount is credited to the affiliate.

**Step 8**

The affiliate network may take a cut of the profit, and then pay the affiliate his/ her commission, and the process repeats itself.

## How to Succeed in Affiliate Marketing (Merchant)?

- Attract successful and profitable affiliates by offering competitive rates.
- Gamify your compensations into different tiers. Rewards are given to the affiliates that are performing well.
- Ensure you communicate regularly, and a good relationship is maintained with your affiliates.
- Set up strong guidelines and focus on the liberties that can be taken by the affiliates.
- Be flexible with your budget, as long it is bringing in profits.
- Nurture new affiliates by providing them with appropriate talking points and promotional ideas.
- Create a buzz around your product by having affiliates promote your products along with additional details about them.

**Below listed are some of the benefits a merchant has in affiliate marketing.**

## Benefits of Affiliate Marketing for a Merchant

- You get to choose an affiliate that represents your brand and products the best
- You're only paying the affiliates their commission if conversions take place
- The affiliate's audience would be highly likely to be interested in your product
- The process works in a semi-automatic fashion

## How to Become an Affiliate Marketer?

**1. Choose a Niche**

The first thing you need to figure out is the niche you want to cater to. To decide on a particular niche, you need to ask yourself questions like:

- What are some topics I'm passionate about?
- Are people interested in my niche?
- Will there be constant demand?
- What's the competition like?
- What are the other affiliate programs that work within my niche?

Tools like Google Trends, Ubersuggest, and Clickbank would determine how successful your chosen niche is.

**2. Research Programs**

The next step is to find an affiliate marketing program that's suitable for you. You can make an informed decision by keeping in mind the following questions:

- Which merchants are working with the program of your choice?

- How much commission will you make?
- Are you ready to commit to the program and the brands that work with it?
- What support does the program provide you?

**3. Build Your Platform**

Next, you need to build a platform that can make your content work. You have two options to choose from:

- Make a website (a blog or a marketplace)
- Run paid ads

It's on these platforms that you can present your content for the audience to see.

**4. Create and Publish Quality Content**

One of the most important steps here is to create content that helps you stand out as a valuable, bankable, and trustworthy affiliate marketer. Some types of content you can start with are:

- Product Reviews: You can write reviews of products and services within your niche.
- Blog Posts: With a consistent post schedule, and by posting unique, high-quality content relating to your niche, you will be able to establish yourself as a leader in that niche. Your audience will significantly value your recommendations, and by extension, help you in your efforts.
- Guides: You can create informational content that can get people interested in what you have to say. In time, you can develop your audience's interest in the product you're trying to sell.

**5. Create an Ad Account**

Although creating a website is a great option to become an affiliate marketer, advertising is also a great way to perform affiliate marketing. With the latter method, you don't even need a website! Some of the most popular advertising platforms on the internet are:

- Google Ads
- Facebook Ads
- Bing Ads

You can choose an appropriate platform depending on your requirements.
Next up, let's have a look at how affiliates can make money off affiliate programs.

**How is an Affiliate Marketer Paid?**

There are three different methods based on which an affiliate can be paid. Let's have a look at each of them:

1. Pay Per Sale

In this program, the affiliate is paid a percentage of the sale by the merchant, after the purchase of the product by a customer.

2. Pay Per Lead

In this case, the affiliate is provided compensation based on the number of leads that have been converted. The affiliate's objective is to drive his/ her audience to the merchant's website and have them perform a particular action like - sign up for a trial, subscribing to a newsletter, etc.

3. Pay Per Click

In this case, the affiliate needs to redirect customers to the merchant's website. The affiliate is paid depending on the increase in web traffic that they bring to the site.

**Now, let's take a look at the benefits of becoming an affiliate marketer.**

## Benefits of Becoming an Affiliate Marketer

- A Constant Flow of Income

Once you've invested time and resources into your campaign, you can relax as your audience purchases your products in the following days. This flow of income could likely continue for a long time. And even if you're not in front of your computer, the pay remains continuous.

- No Customer Support

Once your customers have bought your product, you won't have to worry about customer support or satisfaction. Those become issues that the merchant needs to handle.

- Work from Home

You'll be able to receive revenue for campaigns created by the merchants from the comfort of your home. You could do this work in your pajamas.

- Cost-effective

You can get started quickly and with ease and low cost. You don't have to worry about any affiliate program fees, and neither do you need to create a product.

- Convenient and Flexible

You have the freedom to set your own goals, determine your hours, not get bogged down by restriction or regulations.

- Performance-Based Rewards

Affiliate marketing is entirely based on your performance. The more effort you put into it, the better outcome you get.

## *What is Google Data Studio and How to Create Report on It?*

**What is Google Data Studio?**

Google Data Studio is a web-based data visualization tool that helps users build customized dashboards and easy-to-understand reports. It helps in tracking key KPI's for customers, visualizing trends, and comparing performances over time.

**What Are the Benefits of Using Google Data Studio?**

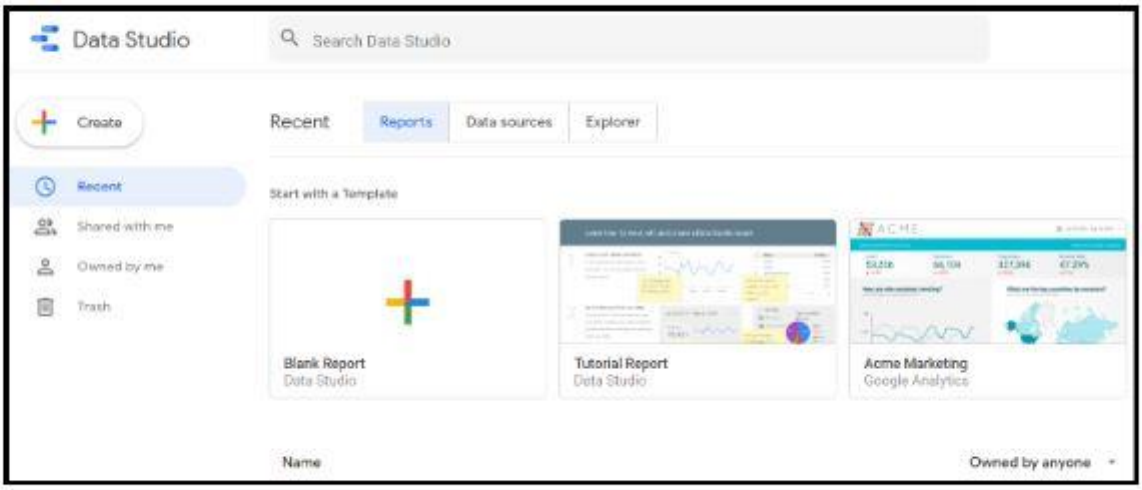
- Easier set up with simple reporting.
- Creates customized and engaging reports.
- Pulls multiple data sources into a single report.
- Makes sharing and collaboration simple.
- Creates up to five customized reports that are free of cost.
- Helps the user connect to 150+ data sources.
- Monitors campaigns effectively.
- Reduces turnaround time on reporting.

## How Do I Use Google Data Studio?

1. Log In

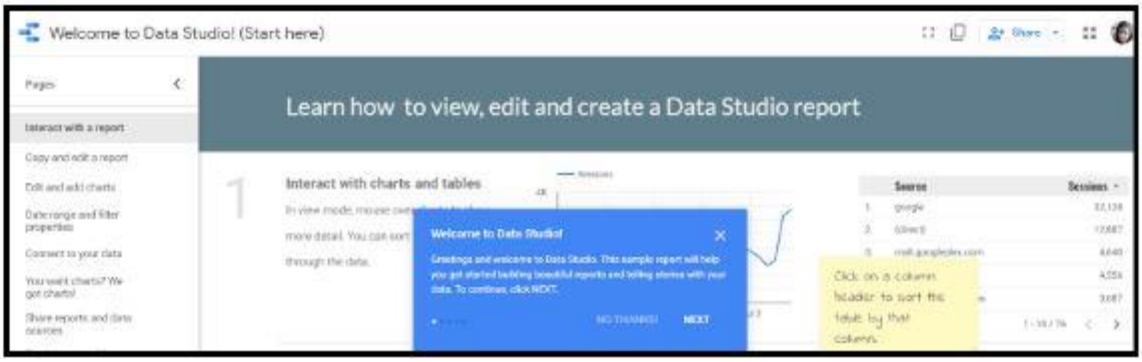
Go to Data Studio by visiting https://www.google.com/analytics/data-studio, and log in using your Google Analytics, Google Ads, or Search Console login information.
Now, you'll be taken to the Google Data Studio overview page. To view the dashboard, click the "Home" tab.
2. Explore the Data Studio Dashboard

The image below gives you an idea of how sample reports look, and the type of information you can fetch from your custom reports.



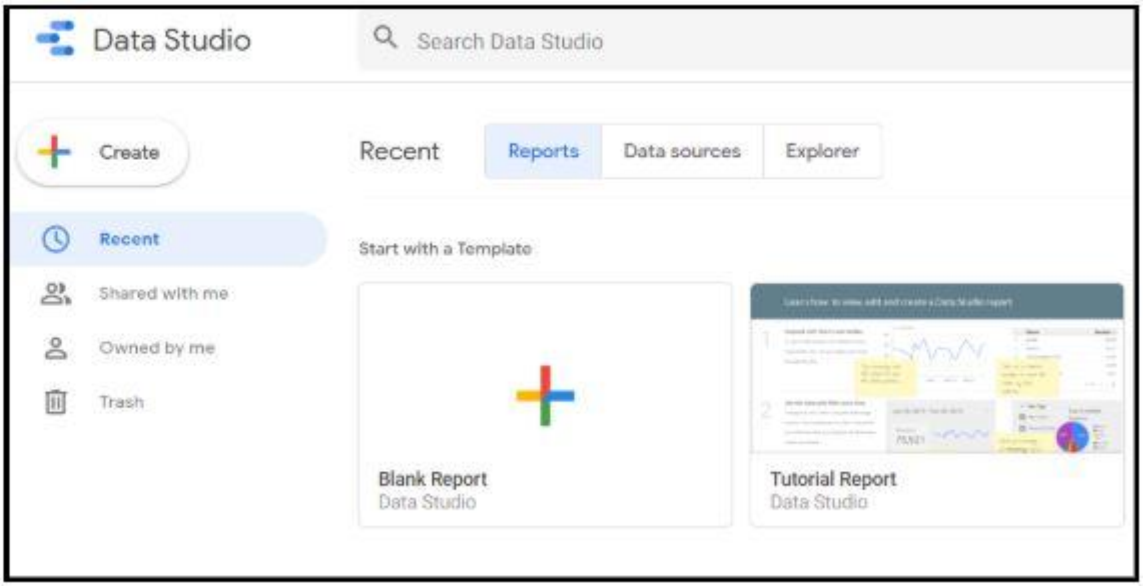

Data studio dashboard

The following image of "Welcome to Data Studio!" provides an interactive tutorial that will help you understand how to get started with Data Studio. Be sure not to miss out on this.




Welcome Page

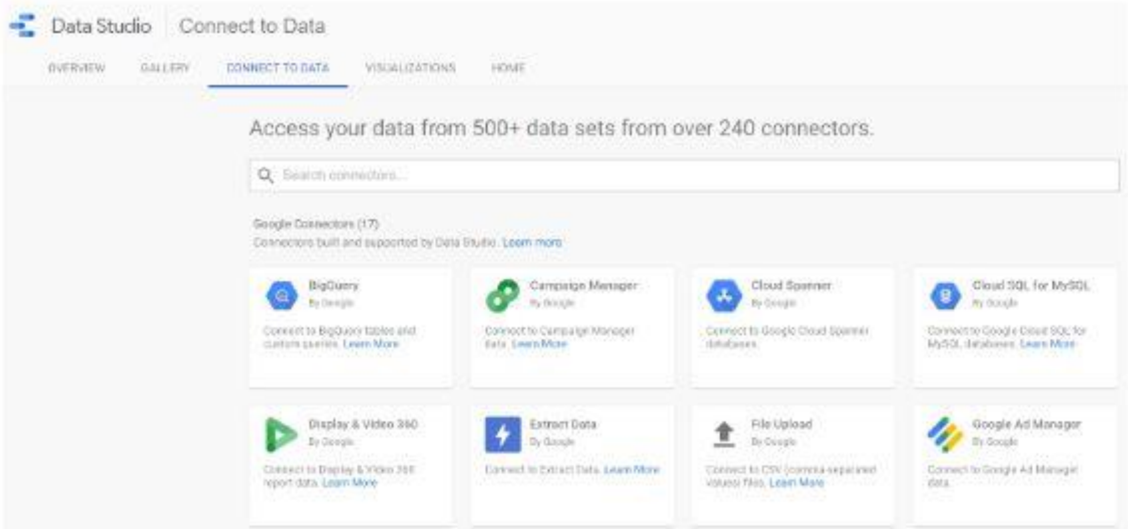
3. Reports and Data Sources




Reports and data sources - Data Studio

As shown in the above image, reports, and data sources are displayed on the dashboard of Data Studio. Reports let you create data visualizations. Data sources are the instance of a connector, which links your report to your external data, such as Google Analytics, Google AdWords, etc.

4. Connect Your First Source




Connect Source - Data Studio

- Data sources act as a link to connect a Data Studio report to a collection of underlying data.
- Each data source has unique features and pre-built connectors that help users access and connect efficiently with the Data Studio.
- Data Studio supports 500+ data sources; some of the most popular sources are:
  - Google Analytics
  - Google Ads
  - Google Search Console
  - BigQuery
  - YouTube Analytics
  - PostgreSQL
  - Search Ads 360

## How to Create a Report on Google Data Studio?

To create a new report, click on the blue plus (+) button at the bottom right-hand corner of the screen.

**The two basic parts of any data report are:**

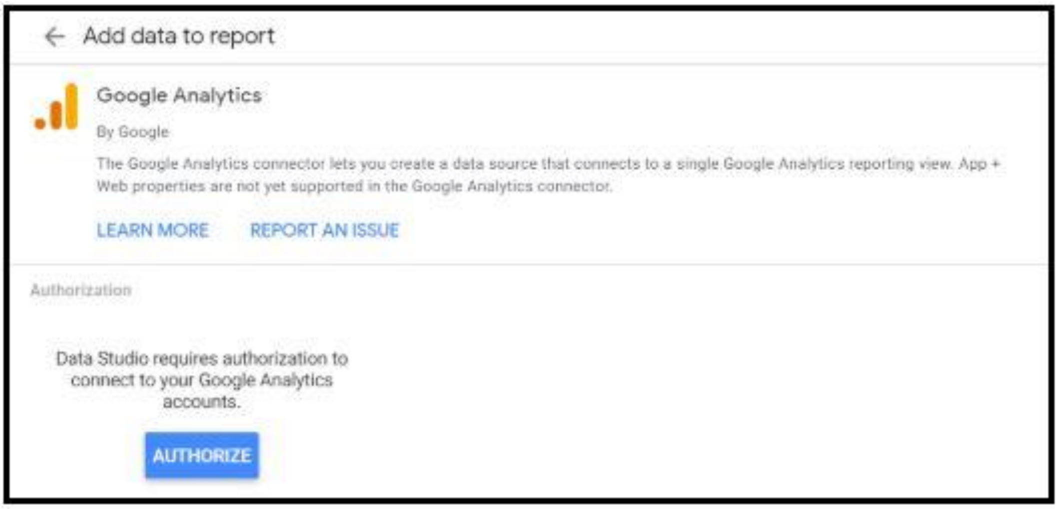
- Data sources
- Widgets

## Now, let’s set up a data source first and then build a widget.

**Step 1: Add a Data Source**

Data sources can be added using a data connector. Create a new blank report and add a data source (for example, Google Analytics) in the panel.
In this example, we will add a Google Analytics data source.

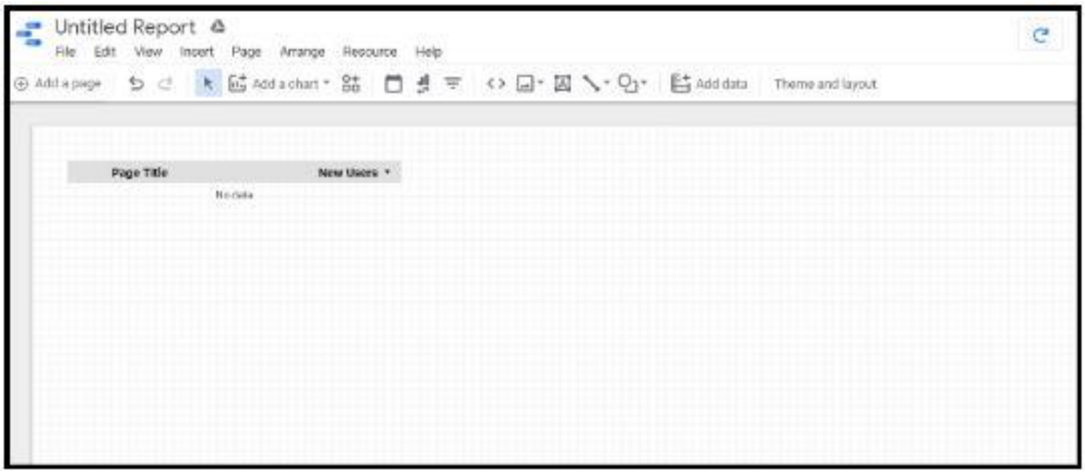
- First, add a ‘New Data Source’ button in the panel and select Google Analytics.
- Then, create a ‘New Report’ in the panel.
- Now, select a Connector for creating a new data source, and create a ‘New Data Source’ in the panel and add that to your report.
- Now, click the ‘Authorize’ option to authorize the connection between Data Studio and Google Analytics




Authorization To Connect - Data Studio

Once it's authorized, go to the "Google Analytics Account" -> "Property" -> (the view you want to get data from) -> "Connect" (on the right corner of the page).

- As a result, the data source is now connected to your Google Studio. Now, a full list of metrics and dimensions are displayed in the new data source. If you want to add these metrics and dimensions to your report, click the 'Add to Report' button on the page.




Add Dimensions and Metrics

**Step 2: Add a Widget**

Now, let's focus on creating visualizations that can be added to your report. Some of the visualization include:

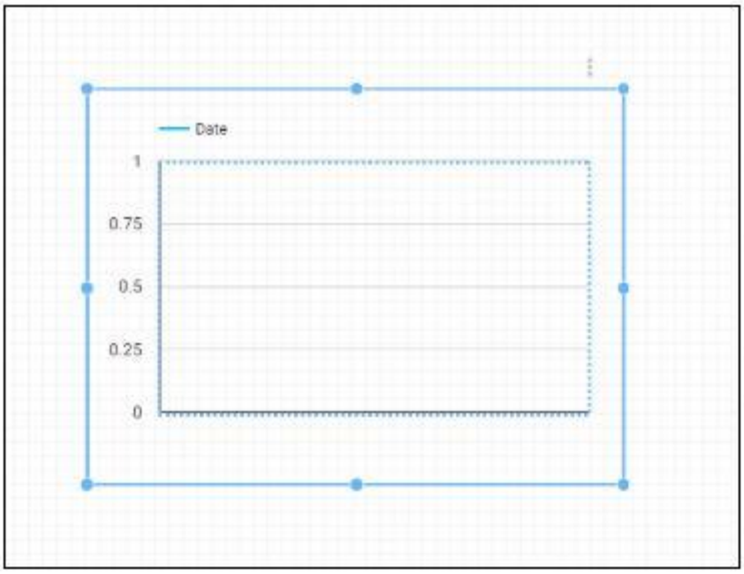
- Pie Charts
- Bar Charts
- Time Series Graphs
- Tables
- Maps
- Scorecards

Additionally, you can also include design elements like text boxes that will make you understand your reports in an easier manner.

Some of the other important controller elements in the widgets are Date Selector (changes the date range of the data), Filter Controller (allows to modify the entire data in the report), and Data Control (an easier way to share reports with peers who are willing to use that report with their data).

Consider this example where you will create a simple time-series graph that shows the number of sessions that Google Analytics recorded.

- In the toolbar, select the “Insert” -> “Time Series” option.
- With the cursor, draw a graph on the report.
- As a result, the graph will be added to your report.



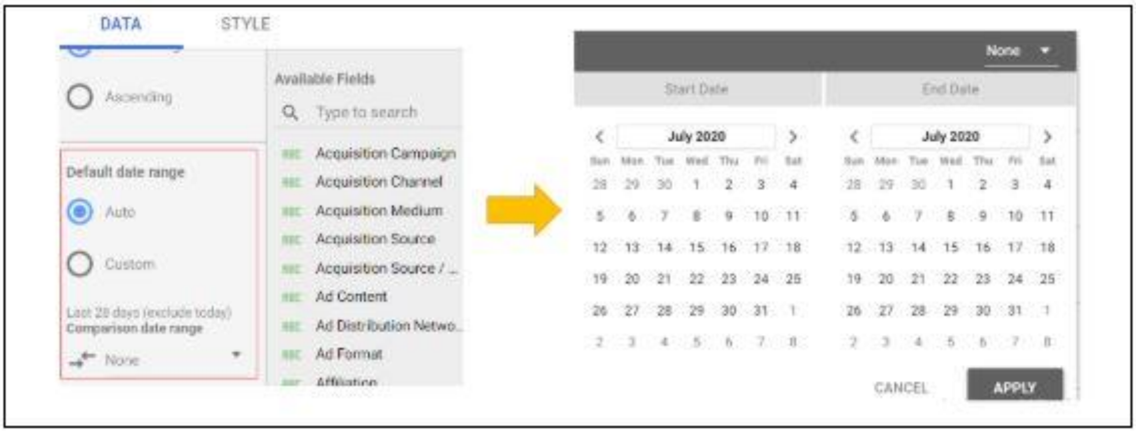

Time Series

By default, the graph will have ‘Session’ as the metric, and ‘Date’ as the dimension.

**Step 3: Customize the Widget**

The metric and dimension can be modified the way you want.

For example, you can add a comparison period, which allows you to compare your present data to the previous one. In the Date Range section, select ‘Auto’ and click on the dropdown menu below it and choose the ‘Start Date’ and ‘End Date’.




Dates

**Step 4. Create Your Report Theme**

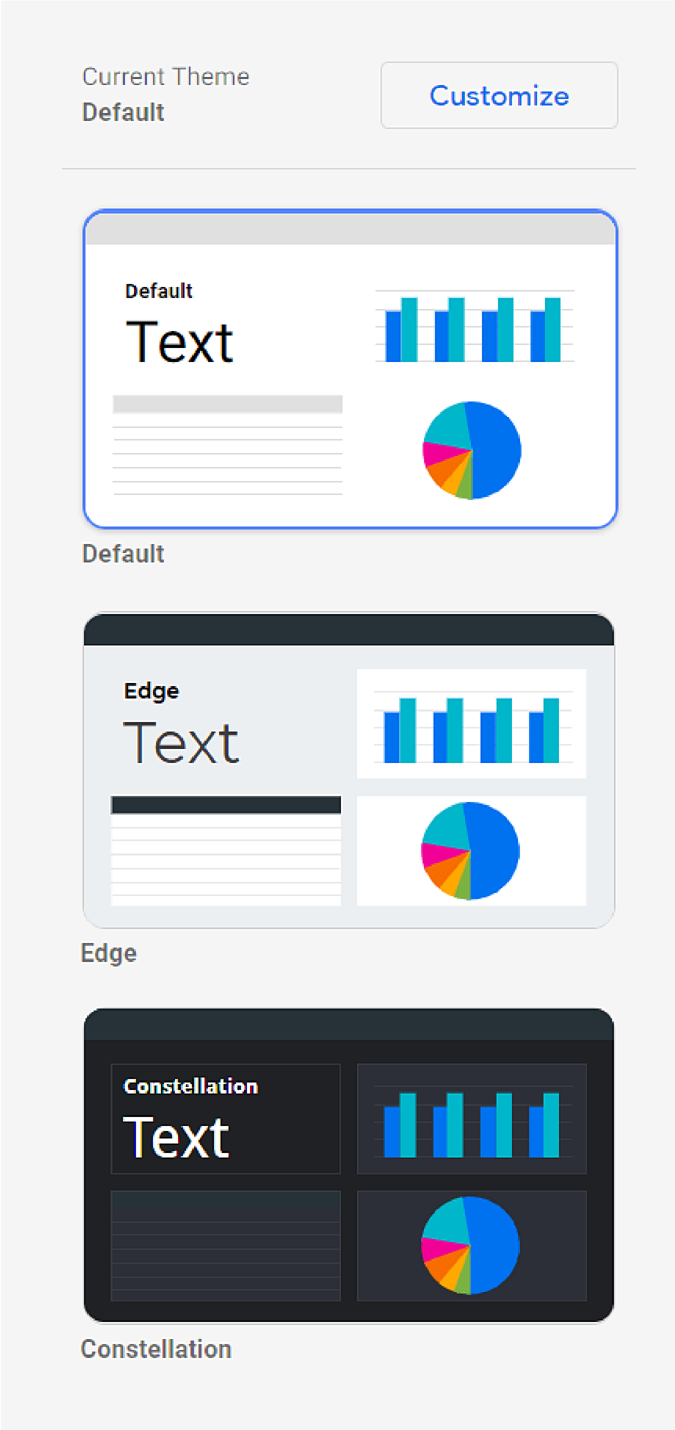
Whether your report is for clients, teams, or managers, it'll be effective only if presented in the right way. To create your report style and formatting, click the 'Theme and layout' option in the toolbar.


Theme and layout

Any changes made here will reflect upon your report.

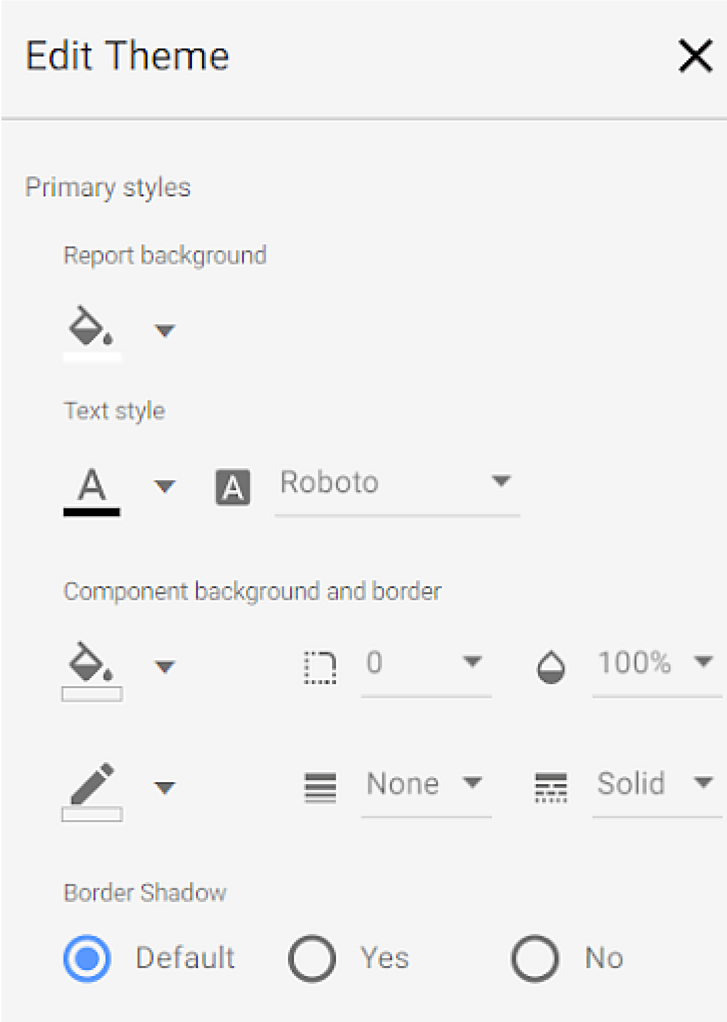
This tool has many in-built themes such as simple, simple dark, constellation, groovy, etc. But, here it's simpler to design your style.

**Some of the brightly colored themes available are displayed below:**




Current Theme

In the toolbar, go to “Theme and layout” -> “Theme” -> “Customize”



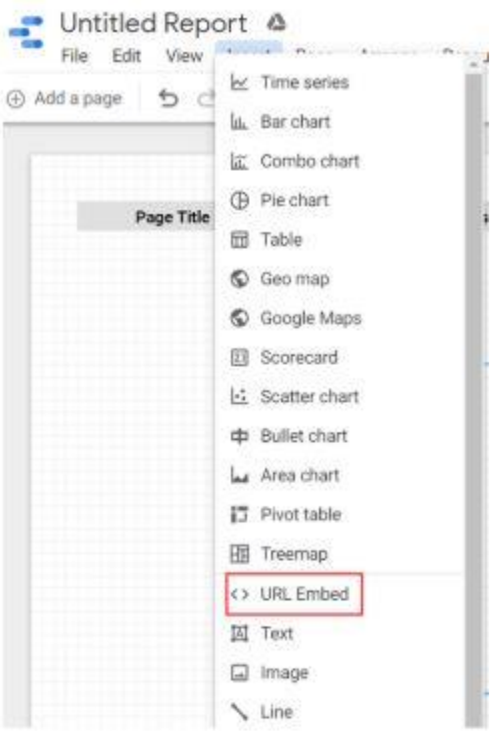

Edit Theme

Here, you can choose primary and secondary colors (from the color palette), fonts, and the text of your choice. This tab also lets you create a custom chart palette with more options for background settings.

**Step 5: Embed External Content in Reports**

With this feature, you can embed external files like Google Docs, Google Sheets, and even online videos to create the best experience for your clients.

- To add content, click “Insert” -> “URL embed”




URL embed

- Now, a  transparent frame appears on the screen. Resize and place the frame as required.
- On the properties panel, go to the ‘Data’ tab, enter the desired URL in the external content URL field.
- Now, configure the chosen content's frame border properties in the ‘Style’ tab.

**Step 6: Share the Report**

Here, you can share or invite others to view or access reports and data sources. Also, by turning on link sharing, anyone in your organization can view your Data Studio assets, despite not having a Google account. So, you just have to select the ‘Share’ button to let your customers or peers view or edit the reports.

## *Digital Marketing Skills to Master in 2022*

Digital marketing is a lucrative and cost-effective form of marketing. Thanks to a majority of the world's audience having access to the internet, digital marketing enables marketers to engage with their target audiences. It helps users with personalized experiences to target them based on their preferences and build awareness and reputation of the brand.

### Mobile Marketing

**First off, let's have a look at some statistics.**

"Mobile is responsible for an average of more than 40% of revenue in leading B2B organizations" - BCG

"Marketers and advertisers put 51% of their budget into mobile ads" - Impact BNG

"Mobile devices are used for over 40% of online transactions" - Think With Google

Now that we know how important it is to focus on mobile marketing, let's take a look at exactly what it is.

Mobile marketing is a form of digital marketing that involves advertising products/services through channels like smartphones, tablets, and other mobile devices via websites, SMS, social media, in-app notifications, etc.

**Some of the critical areas to be focused on for successful mobile marketing are:**

1. Focus on the Customer and Personalized Marketing

You need to give users a personalized experience and personalized ads based on their location and purchase history. With this, the users feel like they're directly interacting with the brand; and hence their loyalty to the brand also dramatically increases.

2. Identifying Trends With Data

With the help of data, different trends can be easily identified. With this, customer profiles can be created, along with predictive and behavioral analysis that can help with understanding users, and how to grab their attention better.

3. Testing

Testing helps you understand what works and what doesn't in your campaigns. It gives you insights and learnings that you can use to ensure the success of future marketing campaigns.

4. Mobile Analytics

By focusing on metrics like engagement ratio, cost per install, average revenue per user, and so on, you get a clear understanding of what's going well and what isn't. It helps provide insights that would drive future campaigns and experiments.

Now, moving on to our next top digital marketing skill - Customer Relationship Management.

5. Customer Relationship Management


“Businesses that leverage CRM software, see sales increase by 29%, sales productivity increase by 34%, and sales forecast accuracy increase by 42%” - Salesforce
“CRM marketing will be worth $73 billion in 2020” - Impact BND
“Towards the end of 2019, 86% of customers are willing to pay 25% more for better customer experience” - Small Biz Genius
Now, let’s have a detailed look at CRM.
CRM (Customer Relationship Management) refers to a collection of strategies, tools, and technologies through which your relationship and interaction with potential or existing customers can be managed. It also enables you to develop new customer relationships or retain them. It also helps with sales, marketing, and service management. It may also store data like purchase history, personal information, and so on.
**Some of the key areas to be focused on customer relationship management are:**
1. Data Analytics

Thanks to data analyzed from different metrics, you can perform optimizations that can be incorporated into upcoming campaigns. Although your requirements may vary, some of the most popular metrics you can focus on are customer churn, NPS(Net Promoter Score), customer retention rate, customer churn, first contact resolution rate, etc.
2. To Understand How Different Tools Work

When it comes to CRMs, there's a huge number of options available. From Salesforce, Hubspot CRM, Zoho CRM to Microsoft Dynamics, there is plenty of choices. It's essential to be experienced in at least some popular CRMs considering how each of them has its nuances, advantages, and disadvantages.

6. Designing

**Now, let's have a look at some stats related to designing.**

"70% of companies invest in content marketing, which could include visual marketing strategies" - HubSpot

"32% of marketers say visual images are the most important form of content for their business, with blogging in second (27%)" - Social Media Examiner

Now that we know how vital designing is, let's have a look at what exactly designing is. Designing involves the process of advertising products and services in a visually appealing manner. Designing consists of a combination of high-quality creative and copy. A basic understanding of designing concepts can be greatly helpful in scenarios where you can provide insights for the kinds of creatives you can create for an advertisement.

**Some of the key areas to be focused on for proper designing are:**

1. Having a Basic Understanding of Design Philosophies

You need to have a basic understanding of adding attention-grabbing and relevant images, and other design philosophies to create high-quality designs.

2. Knowing How to Work With Tools Like Adobe Photoshop and AfterEffects

You need to understand the working of tools like Adobe Photoshop and AfterEffects to churn out good quality creatives. Having even a basic understanding of this software would be greatly useful in the long run.

7. Social Listening

**Let's have a look at what exactly social listening is.**
Social listening refers to how a brand can learn about what customers are saying about them and the industry on the internet, by monitoring digital channels. With this, you can track, analyze, and respond to conversations and feedback on the brand's social media channels. This can improve your relationship with your users, increase their brand loyalty, and convert them into potential customers.
**Some of the critical areas for social listening are:**
1. Understanding Different Social Media Platforms
You need to understand how different social media platforms work, how each of these platforms is different from each other, what type of content works best for a particular platform, and so on.

2. You Need Experience With Popular Tools
Experience with tools like HubSpot and HootSuite will help you handle issues like PR crises, customer complaints, user-generated content, competitive intelligence, suggestions from users, and much more. Next, at number 8, we have copywriting.

8. Copywriting

Let's have a look at some stats related to copywriting.
"A compelling copy draws 7.8 times more site traffic and produces brand recall which brings higher engagement rates" – CMI

"64% of B2B marketers outsource their demanding copy needs" – CMI

Now, let's have a look at what exactly copywriting is.

Copywriting involves creating promotional texts that can be used in brochures, notifications, billboards, emails, and so on. High quality written content can increase brand awareness and encourage users to perform a particular action like signing up to a website, buying a specific product, and so on.
**Some of the critical areas of copywriting are:**
1. Understanding Customers and Competition
Customers can give you vital information that can help you understand your competition. You'll understand what content your audience enjoys the most, what they dislike, what content gets maximum engagement, and so on. For this, having grammatical skills and excellent writing skills that can be hugely beneficial for you.

## Email Marketing

Let's have a look at some stats related to email marketing.

"49% of consumers would like to receive promotional emails from their favorite brands" - Statista

"81% SMBs rely on email as their primary customer acquisition channel, and 80% for retention" - Impact BND

"In 2019, global email users amounted to 3.9 million. By 2023, this is set to grow to 4.3 billion" - Statista

Now, let's have a look at what exactly email marketing is.

Email marketing is a method that uses emails to promote products and services to a highly targeted audience. It can be used to improve brand relationships or ultimately drive them away.

Customers can directly interact with personalized emails. This helps them stay updated with new products and services.

**Next, let's have a look at the key concepts of email marketing.**

1. Focusing on Personalization and Automation

Email marketing can be used to keep in touch with your users, to inform them about the latest products/services, and to perform other forms of engagement.

2. Complying With Data Privacy Rules

Privacy rules like GDPR specify a large number of restrictions that need to be followed. If these rules aren't followed, your brand could face huge fines.

3. Experimenting With Different Kinds of Content

Your emails can have images, gifs, or videos attached to them. Each of these can impact your customers

4. Understanding Popular Tools and Metrics

Having an understanding of popular tools like Mailchimp and Hootsuite can help you become successful at email marketing. These platforms also come with several features like contact segmenting, autoresponders, service and app integration, A/B testing, and much more.

Now,  Social Media Marketing.

## Social Media Marketing

Let’s have a look at some statistics related to social media marketing.
“90.4% of Millennials, 77.5% of Generation X, and 48.2% of Baby Boomers are active social media users” - E-marketer
“73% of marketers believe social media marketing has been “somewhat effective” or “very effective” for their business” - Buffer
“Nearly 50% of the world’s population uses social media” - Statista
Now, let’s have a look at what exactly social media marketing is.
Social media marketing enables marketers to drive traffic to their website, build their brand, increase sales, and achieve their marketing goals by creating and sharing content through social media platforms like text, images, videos, and other forms of content that can drive engagement. You can also perform paid advertising on these platforms.
**Next, let’s have a look at some key concepts of social media marketing.**
1. Understanding Different Social Media Platforms
Each of these social media platforms has its nuances, audiences, advantages, and disadvantages. An understanding of these platforms can help you choose a platform based on your requirements.
2. Monetization
Social media platforms like YouTube enable you to monetize your videos. Events, affiliate marketing, and influencer marketing are some other options that can be used.
3. Analytics
Experience with marketing tools like Buffer and Buzz sumo can help you track and analyze competitors’ content to determine what works best.
You need to know your user base, understand what content they enjoy, and then optimize it.
Now, let’s have a look at number 3, PPC.

## PPC (Pay-Per-Click)

Let's have a look at some stats related to PPC. '
"Businesses make an average of 2 dollars in income for every 1 dollar they spend in Google Ads" - Google
"Paid ads have an 11.38% CTR on Google" - Sparktoro
"33% of people click on a paid search ad because it directly answers their search query" - Clutch.co
Let's have a look at what exactly PPC is.
Pay-per-click lets marketers advertise their content by spending a certain amount of content each time their ads are clicked. One of the most successful types of PPC is search engine marketing.
**Let's have a look at the key concepts of PPC.**
1. Google Ads

One of the most popular platforms in the market, Google ads, enables marketers to advertise to a broad audience. You need to understand how the platform works, its different features and functionalities to be used more efficiently.
2. Analytics

Metrics like cost-per-click, clickthrough rates, quality scores, etc. need to be understood to make optimal and well-informed decisions.
Having skills with copywriting and visual design can be hugely beneficial to the marketer and the organization.
Now, for number 2 on our list - SEO.

## *Must-Have Digital Marketing Tools in 2020*

Digital Marketing Tools You Should Consider.

## Email Marketing

1. MailChimp: is a web-based email marketing service. In addition to sending marketing emails like newsletters, you can create targeted campaigns and automated messages. It offers templates that can be customized as well as a number of options for sending emails.

Features

- Customizable forms and templates
- A/B testing
- Social media plug-ins
- Automation workflows
- Multiple campaigns
- Real-time reports
- Tutorials

Pricing

The basic plan is free and includes up to 2,000 subscribers and up to 12,000 emails per month. Other plans are available for $10 to $199 per month.

2. HubSpot Sales

Focused on the sales process as a whole, HubSpot Sales allows you to create and share email templates. Every lead’s contact info, email leads, and clicks get logged automatically.

Features

- Automated emails, including follow-up emails
- Works with Gmail, G Suite, and Outlook or Office 365 for Windows
- Email tracking, including open, click and reply data
- Customizable templates

Pricing

Subscriptions are $200 to $2,400 month, billed annually.

Social Media Management

3. Buffer

Buffer makes managing your social media easy. Nicknames like “The Siri of Social Media” and “Social Media Assistant” have been applied to Buffer. It allows you to optimize your posts on Facebook, LinkedIn, App.net, and Twitter, by scheduling them in advance; Buffer posts them at the best time based on time zone.

Features

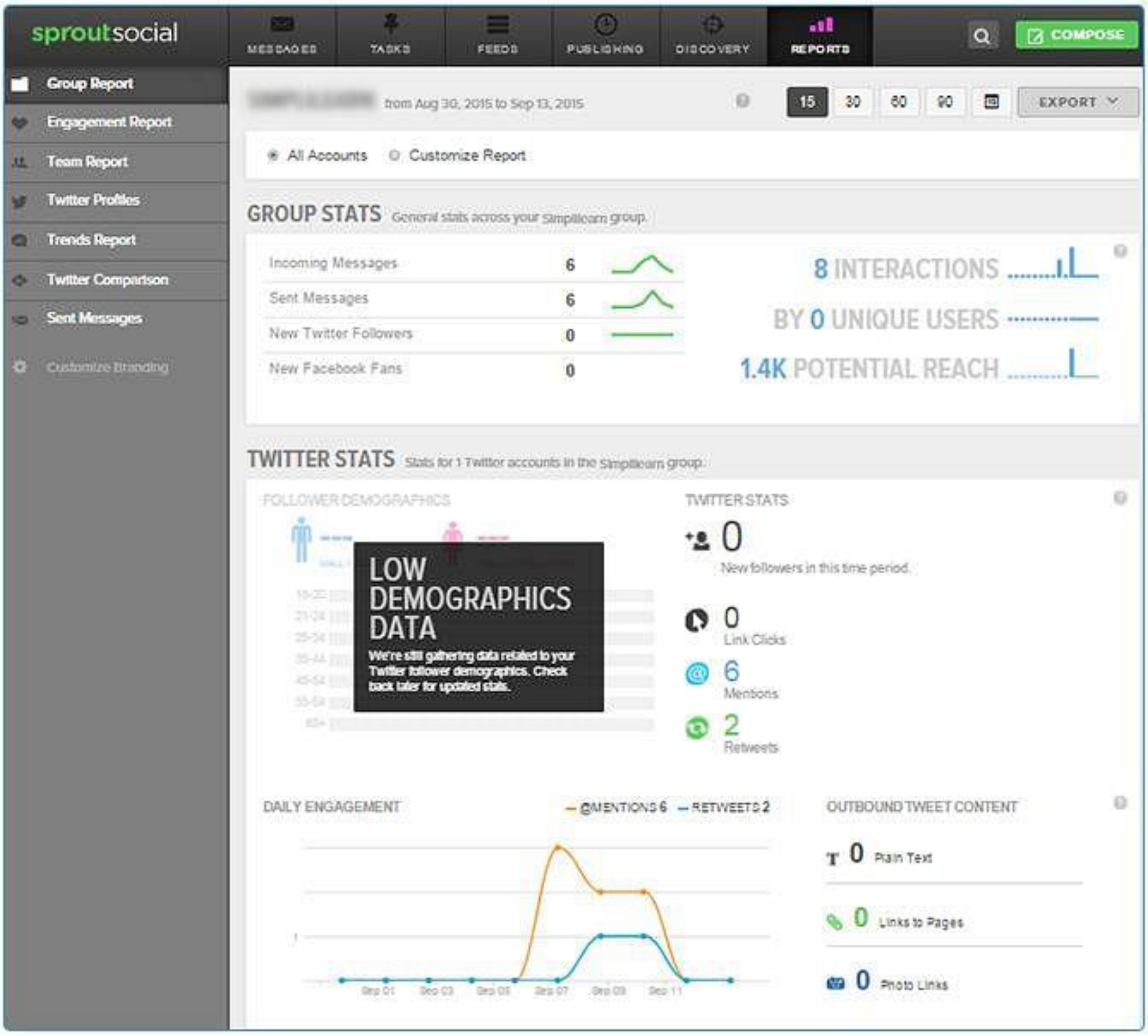
- The free trial period for paid plans
- Detailed analytics
- Multiple social networks
- High security with two-step login
- Posts the same message to all platforms or customizes for each

Pricing

Two plans are available for individuals: Individual, which is free, and Awesome, which is $10 per month. Three plans are available for teams and agencies: Small, which is $99 per month; Medium, $199 per month; and Large, $399 per month.

4. Sprout Social

Sprout Social provides solutions for social media management, marketing, analytics and customer service. It's integrated with Facebook, LinkedIn, Twitter, Google+ and more. You'll get excellent statistics across all of your interlinked social networking sites. Sprout Social has become an incredible force in the social media world in a short time.



*Search Engine Optimization*

First, let's have a look at some statistics.

- "57% of B2B marketers stated that SEO generates more leads than any other marketing initiative" - HubSpot
- "Where to buy" + "near me" mobile queries have grown by over 200% in the past two years" – Google.
- "On the first page alone, the first five organic results account for 67.60% of all the clicks" - Zero Limits Web
- Let's have a look at what exactly the search engine organization is.
- SEO enables marketers to improve the quality and quantity of the traffic coming to your website by making it more visible to users who have searched for a particular keyword. SEO improves unpaid results and doesn't count as traffic obtained from paid ads.

**1. Technical SEO**

Understanding the technical concepts of SEO like sitemaps, server-side settings, rewrites, etc. enables marketers to perform server level and page level optimizations.
This ensures users find the website's content and help generate traffic and improve conversions.

**2. Content Marketing**

With content marketing, marketers can create high-quality content; SEO can provide appropriate keywords that enable the material to be identified by search engines.

**3. Link Building**

SEO involves a combination of external and internal link building. One builds links with credible websites, and the other optimizes links within the website and social media platforms.

**4. Site Usability**

Placing objects and information appropriately on the website will make it easy to use and navigate.

**5. Google Analytics & Webmaster**

Google Analytics will help with tracking and reporting website traffic. Google Webmaster will help track your website's search performance with the help of the google search console and additional resources.

Next, number 1 on our list is Data Analytics.

**1. Data Analytics**

Data analytics involves the combination of collecting and organizing data, to draw conclusions that can be incorporated into upcoming campaigns.

**Here are some key concepts of Data analytics.**

1. Google Analytics

Google Analytics is a popular tool that enables marketers to analyze their website. It records information like the number of visitors coming to the site, the demographics of the visiting audience, their interests, etc. This information can be used to drive future marketing campaigns.

2. Data Visualization

Data visualization enables data to be translated into a chart, graph, or other visual components.
Understanding data visualization would help with understanding data quickly and cleanly.
It enables brands to identify upcoming trends and to respond to them quickly. The brand's story can also be shared with others, thanks to being able to create a narrative with graphics and diagrams. And finally, a clear understanding of data structures fundamentals and basic statistics can significantly ease the process of data analysis.

Features

- Social media dashboard
- Link performance analysis
- Can view Twitter follower demographics and contact details
- Discover customers by interest or by location
- Monitor competitor activity
- Customer relationship management tools
- Integrated analytics
- Free trial

Pricing

Offers three plans: Premium, $99 per month; Corporate, $149 per month, and Enterprise, $249 per month.
5. Wyng (formerly Offerpop)

Wyng lets you configure and personalize digital, mobile, and social campaigns. It also lets you view and manage user-generated content and much more.
Features

- Integrate with other enterprise platforms, such as Experian and Sprout Social
- Build custom configurations using open-source technology
- Auto-response in real-time
- Customizable templates
- Preview rendering for mobile, tablet and desktop devices
- Real-time reports

Pricing

Contact Wyng to get a breakdown of plans and prices.
6. Nanigans

Nanigans offers “profit-driven advertising automation” designed for in-house advertisers. Founded in 2010, the company helps marketers achieve social and mobile performance marketing goals using workflow automation, predictive optimization, and more.
Features

- Official partner of Facebook, Instagram, and Twitter
- Industry-leading advertising automation software
- 100-plus reporting attributes

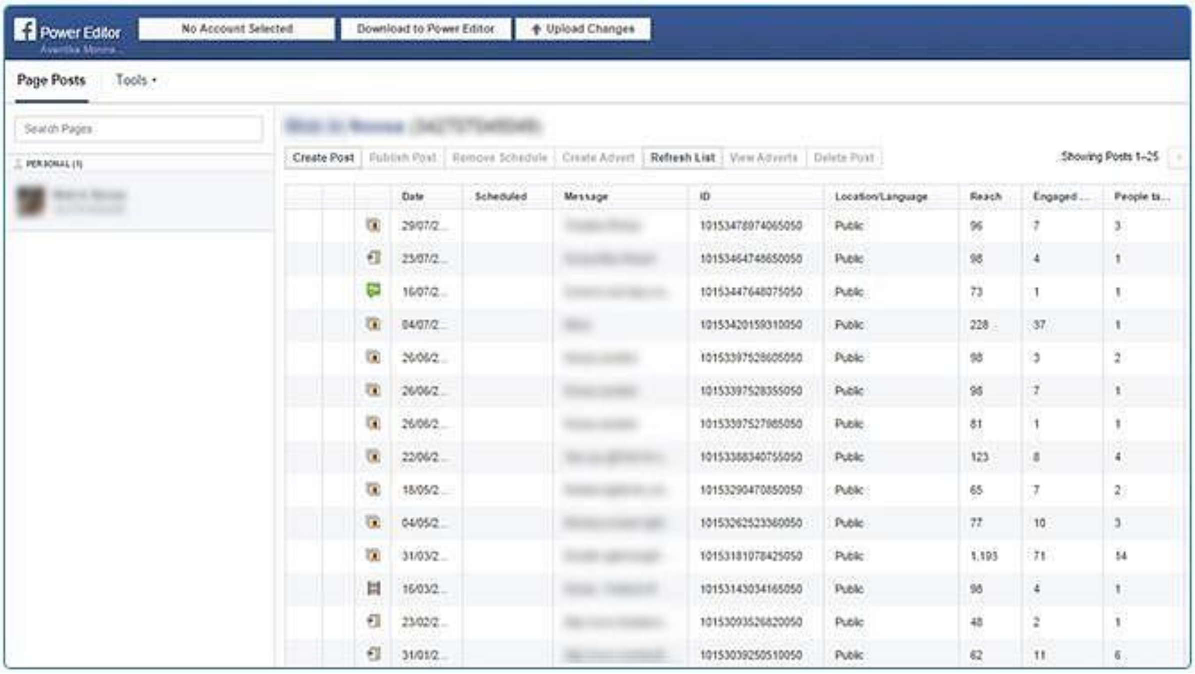
- Cross-channel ROI (return on investment) automation

Pricing

Nanigans is one of the most expensive advertising tools on the market, but it's also one of the best. Contact the company for a demo and pricing.

7. Facebook's Power Editor

A powerful tool designed for bigger Facebook advertisers, Power Editor lets you create, edit and publish multiple ads at once. Facebook's Ad Manager is for beginners; Power Editor is a more advanced and effective way of managing ads.




Features

- Manage many ads simultaneously
- Import ads using Excel
- Find what you want quickly using search filters
- Works with Chrome, Firefox, Internet Explorer, and Edge

Pricing

Varies based on the campaign.

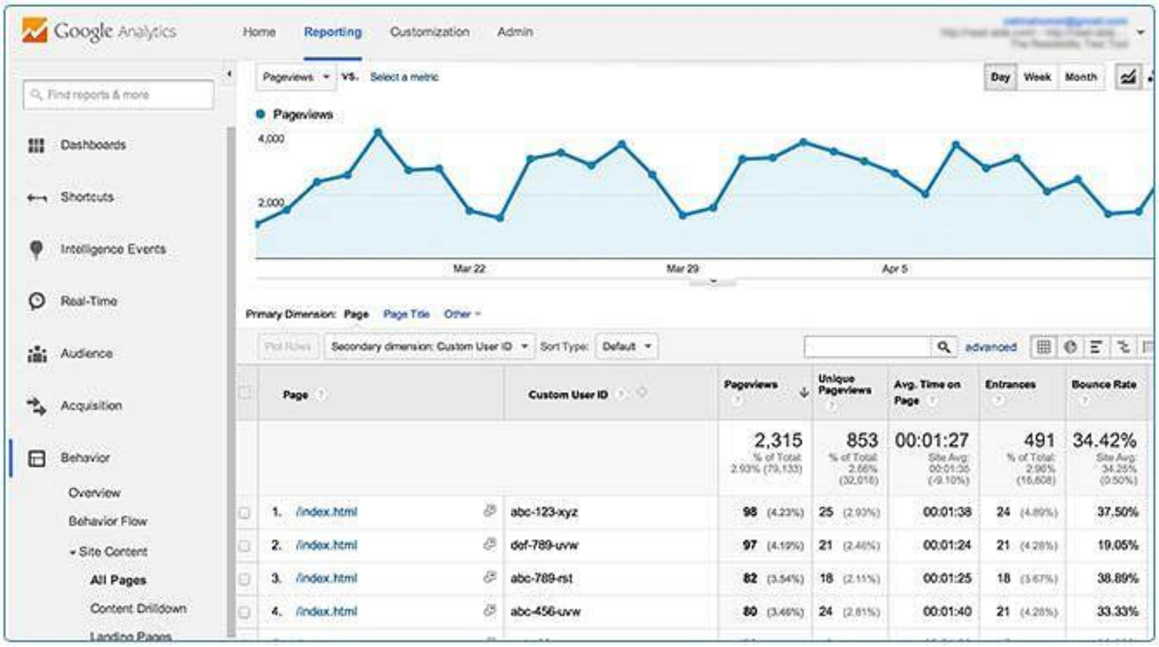
**Analytics**

8. Google Analytics

Google Analytics is a comprehensive freemium web analytics service available to anyone with a Google account. It helps you understand your site users and figure out which digital campaigns are working and which aren't.

Features

- Custom reports
- Cross-device data
- Segmentation for analysis of subsets
- Built to work with Google's other media and publisher products




Pricing

The standard version of Google Analytics is free. The premium version is $150,000 per year.

9. Kissmetrics

A web-based solution, Kissmetrics helps in analyzing, recognizing, understanding, and enhancing the metrics that drive online business. The biggest difference between it and Google Analytics is that user behavior is more accessible on a multisession basis.

Features

- Real-time tracking
- A/B testing
- Funnel and cohort reports
- Design editor
- Behavior campaigns and behavioral comparisons
- Software integration
- Revenue reports

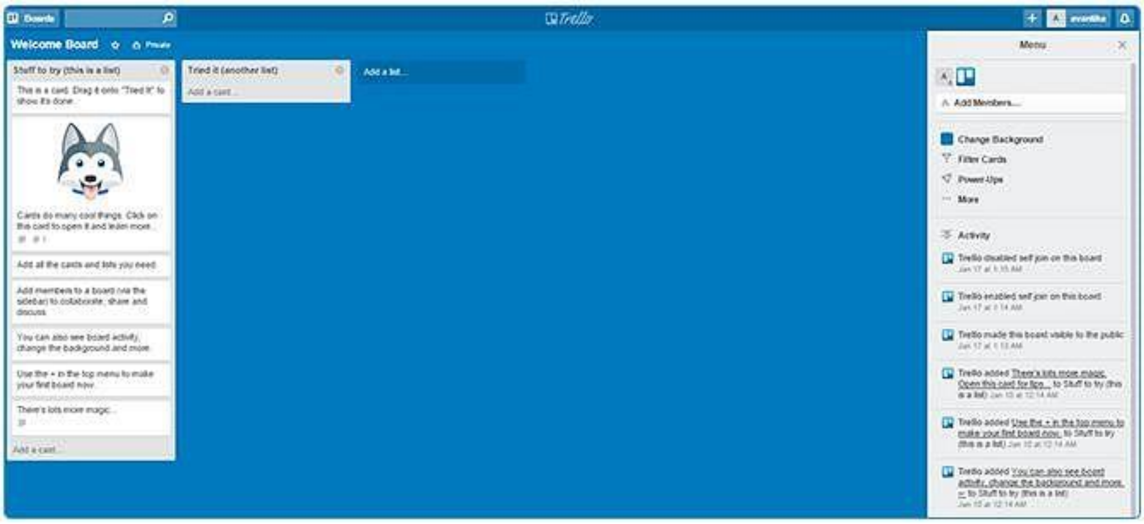
Pricing

Subscription plans start at $500 per month. You can request a demo.

**Task and File Management**

10. Trello

All marketers can benefit from Trello, which is a software developed for managing projects. It has cards that are like sticky notes that you can arrange on aboard. An individual card has deadlines, checklists, images, colored labels, attachments, and notes from any others sharing the board with you. There is no limit to the number of boards you can have.




Features

- Collaborate with others in real-time
- For companies of all sizes
- Integrate apps into the workflow
- Offers email notifications and an activity log
- Attach photos and drawings

Pricing

In addition to a free basic version, there's a Business Class option for $9.99 per month when paid annually, and an Enterprise option for $20.83 or less.

11. Dropbox

Dropbox is a tool for sharing, saving, and syncing files. Files saved on Dropbox can be accessed from anywhere around the world, including on mobile devices, and can be shared with people who don't have a Dropbox account.

Most e-mail services limit the size of attachments, meaning large files generally can't be sent over e-mail. Photos, videos, Word documents, presentations, and spreadsheets can all be backed up and shared using Dropbox.

Features

- File storage and sharing
- Accessible from any device
- Preview ability
- Automatic updates
- Simple link sharing via email, chat or text message
- Online backup and file recovery
- Offline access

Pricing

The basic version is free; the upgraded option costs $9.99 per month when billed monthly or $99 billed annually.

12. Evernote

Evernote didn’t take long to carve out a niche for itself in the world of digital marketing. The application is designed for note-taking and archiving. You can also put together web articles and save images, and share everything with your team. The app is available on a range of devices. Once you make a note, you can access it from anywhere.

Features

- Web clipping support
- Edit rich text and sketches
- For mobile and desktop devices
- Store notes, web clips, files, and images
- Record audio
- Share notes and collaborate on files

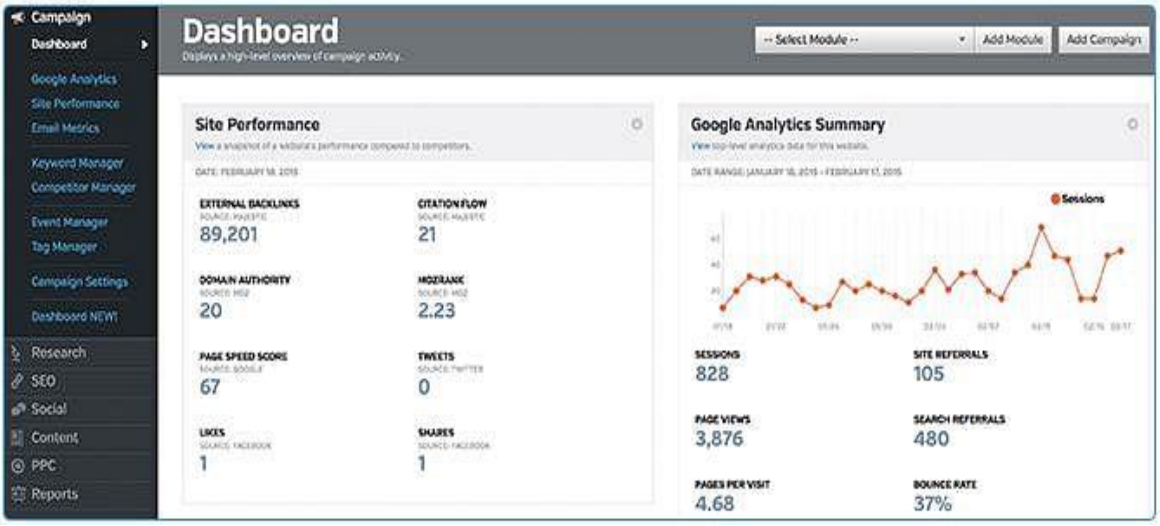
Pricing

The basic plan with up to 60 MB of new uploads per month is free. The Plus plan, with 1 GB of uploads per month, is $34.99 per year; the Premium plan gets you 10 GB and costs $69.99 per year.

**SEO**

13. Raven

Reports are what tell you if a campaign is working and if targets are being met —report generation and presentation take up a considerable amount of a marketer’s time. Raven is an SEO toolkit that makes creating marketing reports easier. It also helps you research, monitor, and manage your social media, content, pay-per-click (PPC), and search engine optimization (SEO) campaigns.



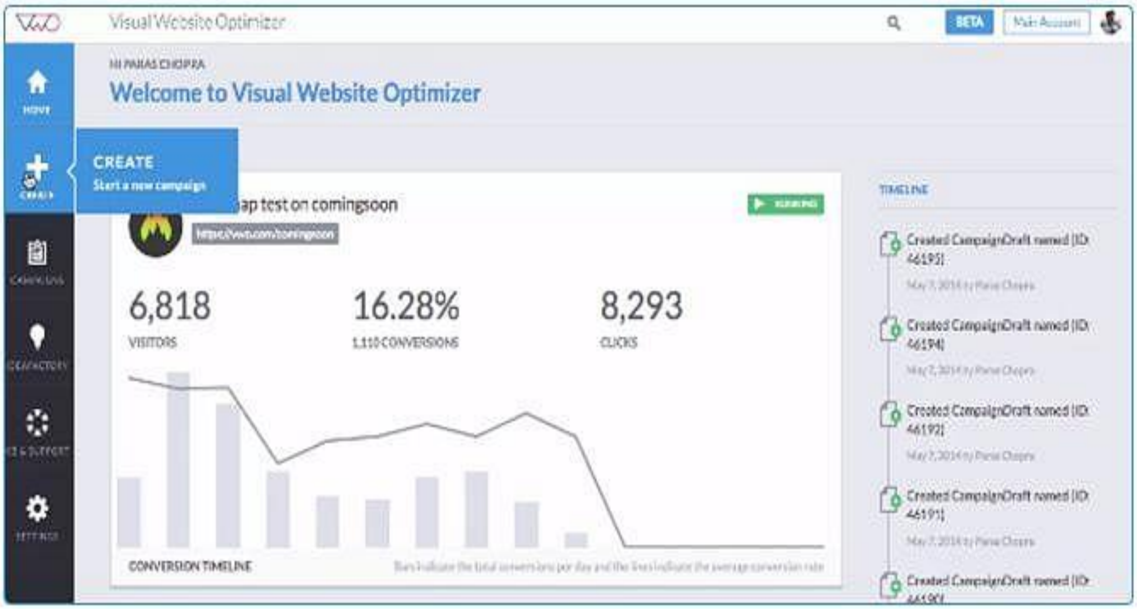

Features

- Automated marketing reports
- More than 20 data connectors, including Google Analytics and Facebook Ads
- Site auditor tool automatically crawls sites to gather data
- Create unlimited campaigns

- Very user-friendly
- Free trial

14. Visual Website Optimizer

Visual Website Optimizer lets you create various versions of your website and landing pages to see which would generate maximum sales. You can request a demo.




Features

- A/B testing
- Split URL and usability testing
- Behavioral and geographical targeting
- Revenue tracking
- Plug-ins and integration
- Real-time reports

Pricing

Three plans: Startup, $49 per month billed annually (or $59 per month billed monthly); Business, $129 per month billed annually (or $155 per month billed monthly); and Enterprise, $999 per month billed annually.

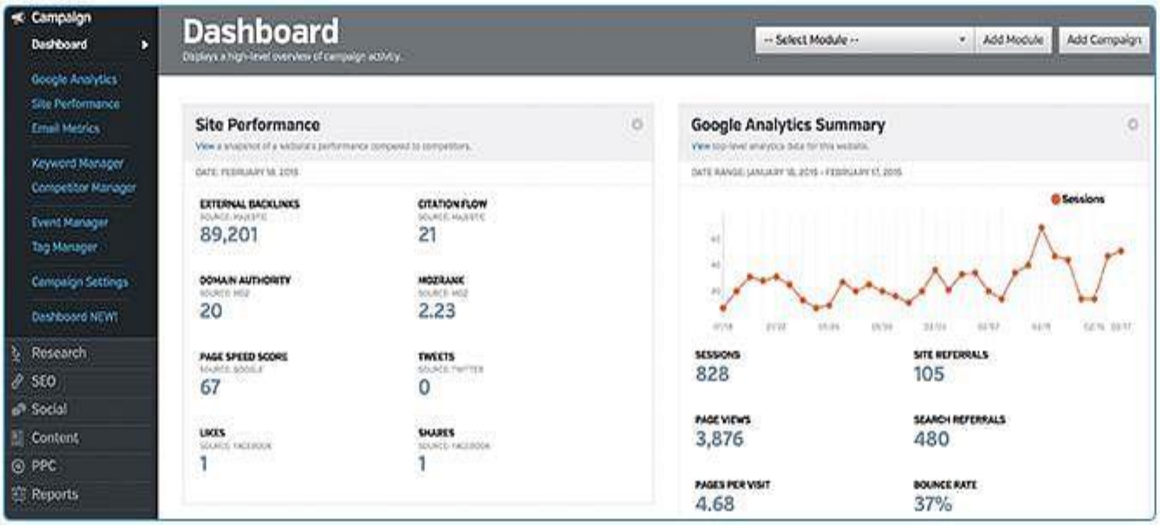
15. Moz

Moz began as an SEO consulting company in 2004. It offers Moz Pro and Moz Local to help you improve search rankings to get more views and customers. Moz Pro is “the SEO toolset that’s got it all: keyword research, link building, site audits, and page optimization,” according to the website, while Moz Local helps with SEO-integrated business listings.

Moz Pro Features

- Industry-leading SEO metrics
- Many ranking tools
- Site audit tool identifies errors

- User-friendly analytics
- Free trial




Pricing

Four plans, from $79 to $479 per month, both paid annually.
16. SEMrush

SEMrush helps you maximize your efforts in the areas of SEO, PPC, social media, content, and public relations. It offers info on things like best-performing posts, performance versus the competition, and strategy analysis, and trending topics.


Features

- Analytics cover organic, advertising and keyword research and more
- Data visualizations for fast competitive analysis
- Site audit
- Brand monitoring

- Position tracking

Pricing

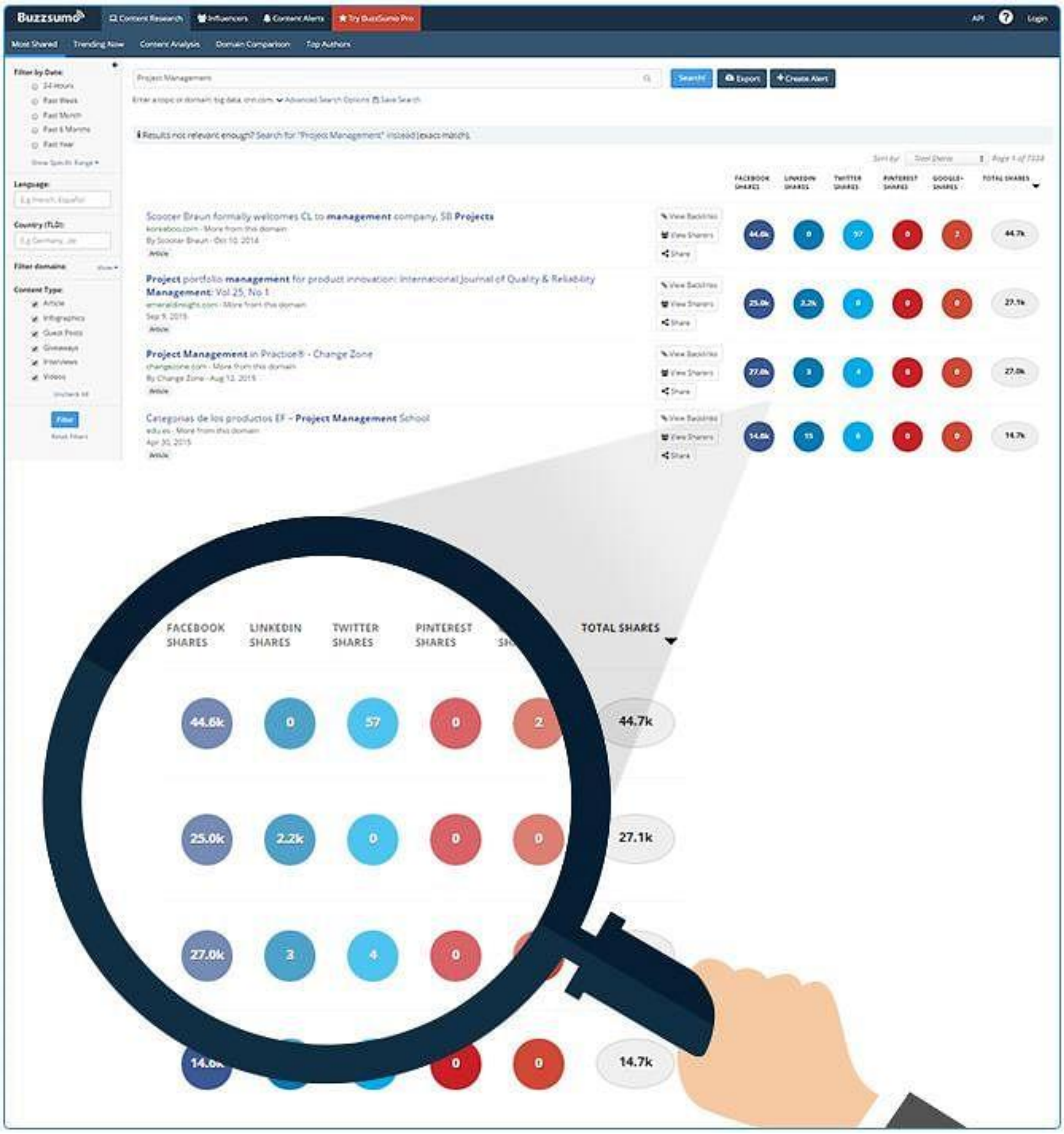
Three monthly plans (lower prices for annual billing): Pro, $99.95 per month; Guru, $199.95 per month; and Business, $399.95 per month.

**Content Marketing**

17. BuzzSumo

When you're creating your marketing strategy, you'll need to look for what is trending on sites and what is clicking with your audience. BuzzSumo is a tool that ranks content shared on social media sites based on the number of hits it gets. You can easily find who the most influential content curators or aggregators are within any niche.

BuzzSumo also gathers statistics on the industry's influencers along with their associated websites. When used wisely and paired with some of the other tools on this list, the possibilities are endless.




Features

- Content insights, alerts, curation, discovery, and analysis
- Influencer amplification available
- Competitor analysis and comparisons
- Social backlinks and advertising filters
- Open API

Pricing

Three plans (prices are for monthly billing): Pro, $79 per month; Agency, $239 per month; and Enterprise, $559 per month.

18. Kapost

Content marketing is big. And Kapost is a tool that combines world-class software and expert service to help you deliver content that gets results. It's designed to help you manage the whole content marketing process, from planning to ideation to production and finally to distribution and analytics.

Features

- More than 60 out-of-the-box integrations
- Open API
- Plenty of support through consulting services and more
- Customizable content dashboard and workflow
- Cross-channel content performance metrics
- Automated email notifications
- Can manage videos, blog posts, e-books, white papers, presentations, emails, landing pages, and webinars

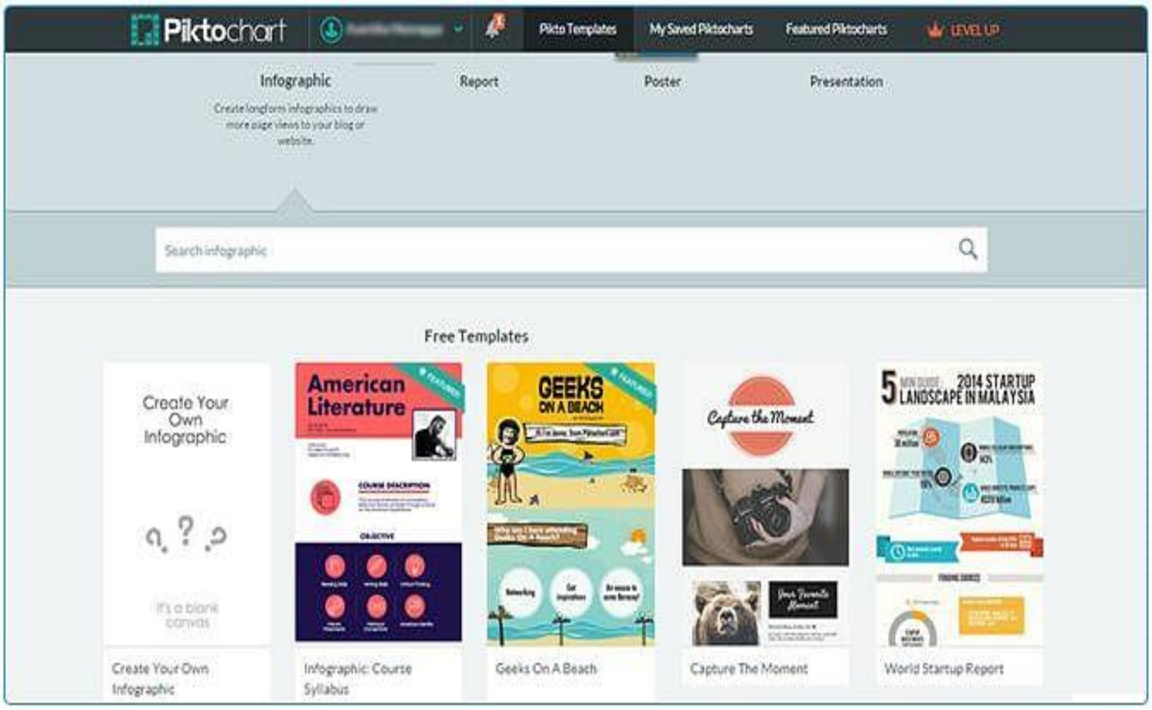
Pricing

A subscription starts at $3,500 per month.

**Visual Marketing (Images and Videos)**

19. Piktochart

Piktochart helps you create professional-looking infographics even if you have no design experience. The tool provides over 100 templates that you can customize or just fill out.




Features

- More than 600 professionally designed templates
- Very user-friendly interface
- Library of more than 4,000 images to use
- Import data from Excel or Google spreadsheet or Survey Monkey

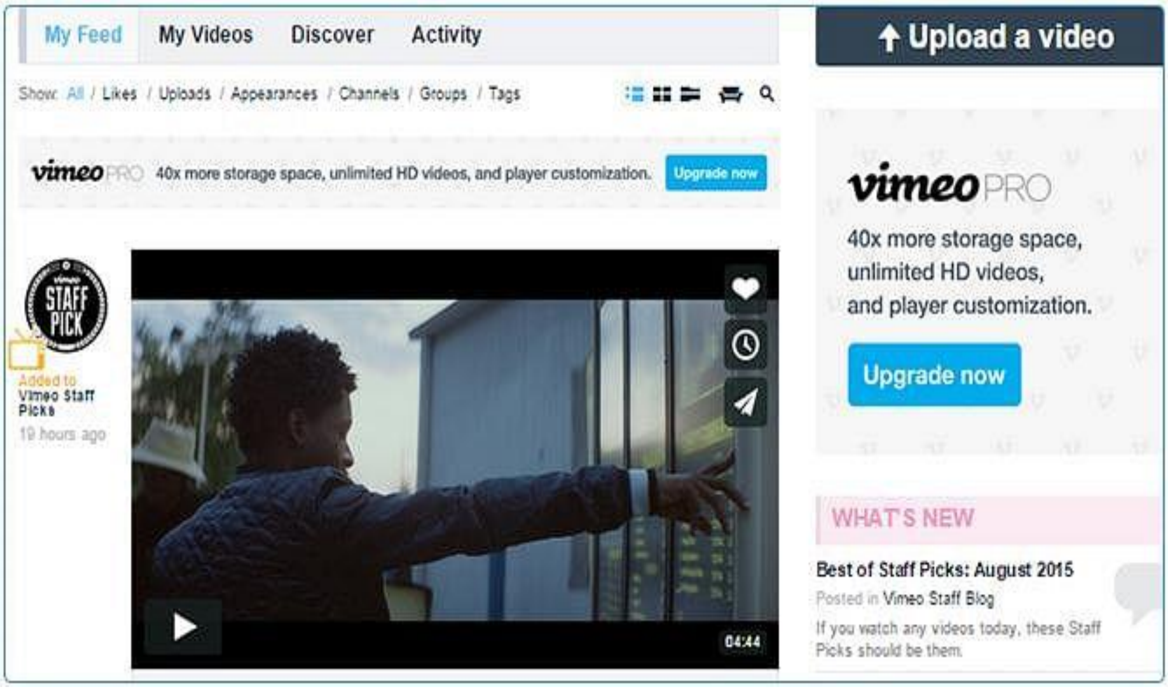
Pricing

The basic plan is free. There are two upgraded versions: Lite, $15 per month; and Pro, $29 per month.
20. Vimeo

The highly popular Vimeo site is a platform that lets you view, upload, and share videos. It has mostly original content instead of TV shows and movies.

Features

- Can embed your own logo into the video (Pro version)
- No ads before the video, unlike YouTube
- Supportive community
- Fewer videos than YouTube, so less competition for viewers




Pricing

The basic plan is free; upgraded plans range from $5 to $50 per month.
21. Unbounce

Unbounce helps you build, publish, and test landing pages. The site provides an easy-to-use editor to create high-conversion landing pages.

Features

- Landing page and overlay templates
- Real-time stats
- A/B testing
- Lead generation tools
- Multiuser and client management
- Integrations
- Text replacement automatically changes selected keywords to match those used in search queries

- Free trial

Pricing

Three plans (based on annual billing): Essential, $79 per month; Premium, $159 per month; and Enterprise, $399-plus per month.

22. GoToMeeting

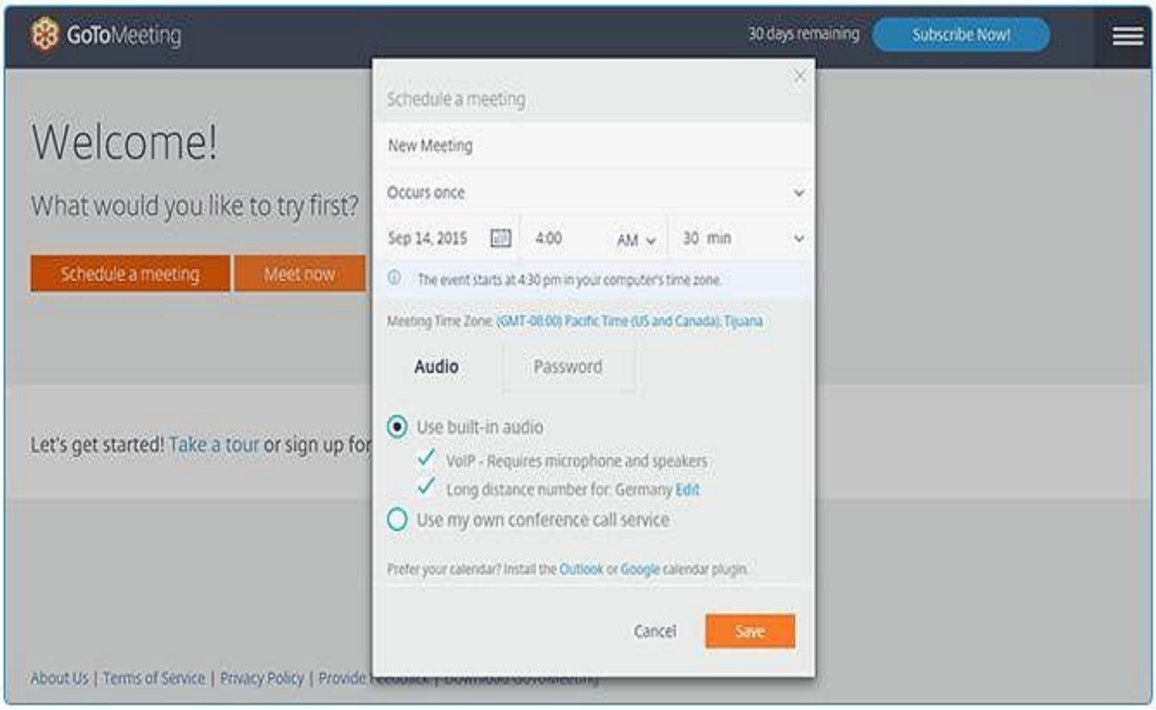
Meetings and calls with clients are a given, but you don't have to be there in person. Video-conferencing software GoToMeeting lets you have meetings online, making it easy and cost-effective to collaborate with colleagues and interact with customers.

Features

- Access to instant meetings with a single click
- One-time scheduled and recurring meetings
- Seamless audio
- Recording option
- Integrated scheduling with Microsoft Outlook
- Use on Mac, PC, iPad, iPhone or Android
- Free trial

Pricing

Three plans (based on annual billing): Starter, $19 per month; Pro, $29 per month; and Plus, $49 per month.




**Automation Software**

23. Pardot

Pardot is a web-based marketing software that helps you streamline lead management and create and track online campaigns. It offers modules for building and managing elements like forms and landing pages.

Features

- Customizable templates
- Email testing with automated CAN-SPAM compliance
- Lead scoring, grading, and management
- Tracking and analytics
- Top-notch customer support
- Real-time sales alerts

Pricing

Three plans: Standard, $1,000 per month; Pro, $2,000 per month; and Ultimate, $3,000 per month.

24. Marketo

Marketo bills itself as a “world leader in marketing automation for companies of any size.” It’s a pioneer in innovation and offers a range of products; it also lets you tap into the insight of expert marketers through its Marketing Nation.

Features

- Easily build and scale automated marketing campaigns
- Explains search marketing, landing pages, web personalization, more
- Integrations
- Analytics
- A/B testing
- Ad targeting and mobile engagement

Pricing

Varies based on the bundle chosen.

## What is Social Media Marketing?

Social media marketing is the practice of using various social media channels to connect with customers and lead them to your product or service, a compelling option in the marketing toolkit. But don't feel bad if you don't fully understand the concept as the term often gets thrown around without a whole lot of thought about a clear definition. Social media marketing is simple on the surface, but it includes multiple layers that impact the best practices for different types of organizations. While social media marketing may seem easy, jumping in without a solid understanding will hurt your chances of getting the right results.

Social media management is the process of creating, publishing, and analyzing content you post on social media platforms like Facebook, Instagram, and Twitter, as well as engaging with users on those platforms. You can streamline social media management with free and paid tools, as well as professional social media management services.

**A Quick History of Social Media**

Social media began in 1997 with a website called Six Degrees, growing to around 1 million members who could create profiles and connect with one another by "friending." Then, in the next couple of years, with the rollout of a site called LiveJournal, blogging took off to keep friends updated with each other's personal lives.

The first decade of the 2000s saw expansive social media growth with the addition of Friendster, LinkedIn, Facebook, YouTube, MySpace, and Twitter. Not all of them survived as we all know, but they changed the internet landscape and marketing forever.

**What is a social media manager?**

A social media manager, whether working as a consultant, in-house employee, or team member at a social media agency, is a skilled professional at social media marketing, advertising, and management. They help achieve your goals for social media, like growing your following or social media revenue.

**Social Media Marketing Defined**

Before building a social media marketing plan, you need to start with the fundamentals; a definition of the concept will provide a foundation on which to develop your understanding. At the simplest level, social media marketing involves the use of various social media channels to connect with more customers and lead them to your product or service. That is an excellent place to start, but it doesn't tell the whole story.

Neil Patel, one of the most successful entrepreneurs in the social media realm, defines social media marketing as the process of "creating content that you have tailored to the context of each social media platform to drive user engagement and sharing." This definition expands our view to see the need to understand the differences between the various platforms and to be clear about our goals.

**The Benefits of Social Media Marketing**

Many organizations jump into social media marketing or develop a social media marketing plan without thinking much about the outcomes. It doesn't make sense to invest time, energy, or money in social media without understanding the benefits.

A clear view of potential outcomes can help you evaluate the cost-benefit and fine-tune your strategy for the best results. Here are just some of the possible benefits:

- Better awareness of your business and brand
- High website traffic

- More sales leads
- Increased sales
- Good customer engagement
- The chance to better understand customers

## Lesson 2: Why is social media management important?

Social media management offers several benefits, including:

**Cost**: No matter your marketing budget, social media is a cost-effective initiative. It's free to join social media networks, post content, respond to user comments, and more. Even social media advertising offers a profitable channel for reaching your audience and building an online following.

**Reach**: Social media networks, from Facebook to LinkedIn, can connect you with users across the world. You can also use social media platforms, like Pinterest, to reach niche audiences. Traditional marketing and advertising can't match the reach — or price — or social. That's why social media management is a must for businesses.

**Users**: Incorporating social media into your marketing strategy allows you to align your marketing initiatives with user behavior. For example, 74% of people now use social media when making purchase decisions. Not to mention, 80% of people get advice about purchases through social media.

**Performance**: Marketers and business owners alike agree on the performance of social media marketing and advertising. Via social, companies can build their brand and even generate leads and sales. Almost 45% of business-to-business (B2B) marketers, for instance, have earned a client through Facebook.

With social media's multiple advantages, it's worth considering for your marketing strategy.

## Lesson 3: How Does Social Media Marketing Work?

A well-developed social media marketing plan includes several steps, all of which are required to get the most bang for your buck.

It starts with an effective strategy. Determine your business goals and choose a path to achieve them. Then come planning and publishing. At some point, you need to jump in and start sharing content on the platforms with which you've chosen to engage. But, unlike other marketing methods, the next steps are just as important—listening and engaging.

The benefits of social media become apparent when people begin to comment, tag, share, and message you (or your business). It's important not just to watch and listen, but also to respond and continue the conversation.

Finally, part of a great social media marketing plan is reviewing analytics. You can track views, likes, shares, comments, and other aspects of engagement to see what parts of your plan have the most impact.

**Here are some of the most common platforms for social media management:**

## Lesson 4: Social Platforms

1. Facebook
2. Twitter
3. Instagram
4. LinkedIn
5. YouTube
6. Pinterest

**Facebook**

With nearly two billion daily users, Facebook is a massive social media network. That's why agencies that offer social media management services will not only specialize in Facebook but also recommend it due to its audience variety.

**Learn more about Facebook for social media marketing:**

- **Demographics:** Facebook offers access to several different demographics, from seniors and youth to men and women. Plus, more than 50% of adults in the U.S. use Facebook multiple times a day, which lets you connect with varying segments of your target audience.
- **Uses:** From a social media management perspective, Facebook is useful for building relationships with existing and future customers. It can also help build brand loyalty, which can encourage future purchases.
- **Perks:** A massive perk about Facebook is that it features a wide variety of ads and content formats, from photos to videos to text. Even better, for more than 40% of business-to-business (B2B) marketers, it's led to new clients.

No matter your industry or goals, expect to use Facebook in your social media strategy.

**Twitter**

With 330 million monthly users, Twitter doesn't offer the same reach as Facebook. It does, however, provide your business access to a group of users that engage with brands daily. Depending on your target audience, that's an advantage.

**Learn more about Twitter for social media marketing:**

- **Demographics:** Less than 25% of U.S. adults use Twitter, but the social media platform provides competitive access to users between the ages of 18 to 29 — more than 40% of Twitter users are from this age group. They're also more likely to be active on the platform multiple times a day.
- **Uses:** Unlike Facebook, Twitter focuses more on news. It also emphasizes two-way conversations between users, whether they're a brand or consumer. If you're looking to engage with your target audience, Twitter is a good option.
- **Perks:** One advantage of Twitter is its users — they're active and happy to engage with other users. Twitter also features a specific audience, which is helpful if people between the ages of 18 to 29 are in your target market.

Twitter isn't for every company, but it does offer value to those in certain sectors.

**Instagram**

With around one billion monthly users, Instagram is becoming a new standard for social media management services. Its focus on images, as well as videos, encourages companies to come up with creative ways to capture and engage their audiences.

**Learn more about Instagram for social media marketing:**

- **Demographics:** Instagram is a prime platform for connecting with users between the ages of 18 to 29, as well as 30 to 49. Over 70% of Americans between 18 to 29 use Instagram — for users between 30 to 49, the number is nearly 50%.
- **Uses:** Like Facebook, Instagram is useful for establishing a relationship with consumers, as well as engaging them. Depending on your industry, you can also use Instagram to generate new leads. That's why retail, entertainment, and beauty businesses often use the platform.
- **Perks:** A benefit of Instagram is that users love to use the platform. That's why nearly 60% check in multiple times a day, which increases the chances that users will not only see your posts but also interact with them.

For certain markets, Instagram is a must-have platform in your social media strategy.

**LinkedIn**

As the biggest professional social network in the world, LinkedIn offers access to more than 774 million users. That's why it's an ideal platform for businesses looking to recruit candidates, as well as establish themselves as an industry leader.

**Learn more about LinkedIn for social media marketing:**

- **Demographics:** LinkedIn is a popular platform among college graduates — more than half use the network. Even better, 90% of LinkedIn users are also on Facebook, which is helpful if your strategy focuses on both platforms.
- **Uses:** Like Twitter, LinkedIn is useful for sharing news-related materials, such as company announcements or industry-specific news. It can also assist in developing relationships with other companies, plus building your reputation via content marketing.
- **Perks:** LinkedIn offers a few benefits for businesses, especially B2B operations. For B2B leads from social media, 80% come from LinkedIn. That's why more than 60% of marketers find it's the most effective platform for their business.

Depending on your goals, market, and operations, LinkedIn could offer several advantages.

**YouTube**

With more than two billion users, YouTube offers access to more than 80% of adults in the U.S. In response, businesses are doing more with their YouTube accounts, from creating how-to videos to showcasing behind-the-scenes material.

Learn more about YouTube for social media marketing:

- **Demographics:** Like Facebook, YouTube features a wide range of users, from 18 to 65 and older. Even 49% of people 65 and older watch YouTube, while almost 83% of 50-to-64-year-olds visit the platform.
- **Uses:** With YouTube, your company can provide users with informational content. A few examples include how-to videos on your products, as well as explainer videos related to your industry or services. These can increase user brand awareness, as well as lead to conversions.
- **Perks:** A notable benefit of YouTube is that it converts more than any other social media platform — even Facebook. That can lead to big gains for your company, especially if you're offering a high-priced product.

While more time-intensive than other social media outlets, YouTube is worth the investment.

**Pinterest**

Pinterest has more than 450 million monthly active users, providing companies with a strong visual focus, such as cabinet manufacturers, clothing stores, and flower shops, the chance to connect with people in their target audience.

**Learn more about Pinterest for social media marketing:**

- **Demographics:** This social media platform features a strong female audience, with more than 40% of women — and only 16% of men — using Pinterest. For the age groups from 18 to 64, between thirty and 40% of U.S. adults use the platform, while usage for those 65 and older is 18%.
- **Uses:** Pinterest is excellent for showcasing your product in a non-promotional way. For example, you can highlight the uses and features of your goods. You can even connect with influencers to promote your products further.
- **Perks:** One perk of Pinterest is that users rely on it to plan for future purchases, with one study discovering that more than 85% of millennials use it for that purpose. As a result, you're connecting with consumers already planning to buy.

Depending on your audience, Pinterest is an asset to your social media management services.

While agencies will vary in the platforms they specialize in, WebFX focuses on several social media platforms. Our social media management services are available for Facebook, Twitter, Instagram, LinkedIn, and Pinterest.

**Best social media management tools**

If you're excited about getting started with social media, you can make the experience (and your productivity) even better with social media management tools. These paid and unpaid tools can help you schedule content, respond to comments, and more.

**A few of the best social media management tools include:**

- **Buffer:** A paid tool, Buffer can help you manage social accounts, establish a posting schedule, schedule social media posts, and more. Plus, it's available as a mobile app to make social media management hassle-free.
- **Hootsuite:** Another paid social media management tool, Hootsuite helps you manage all your social media platforms, reply to user questions and comments across channels, and monitor your social media strategy's performance via analytics.
- **CoSchedule:** A paid tool, CoSchedule focuses on more than managing your social media. Schedule your social media posts, as well as build content calendars, publish blog posts, and more.

For more help finding the perfect toolkit, check out:

- 6 Best Social Media Tools for Scheduling
- 4 Best Social Media Tools for Management
- 7 Best Social Media Tools for Monitoring
- 4 Best Social Media Tools for Automation

**Is a Career in Social Media Marketing for You?**

As an increasing number of businesses discover the benefits of social media marketing, there's a corresponding need for social media experts. Fortunately, for those who are interested in this field, the necessary skills are easily attainable as it just takes a willingness to learn and succeed.

Social media marketing as a career field was virtually unheard of a decade ago. Now, however, it's an established, growing field with a positive outlook for the foreseeable future.

But don't feel like you need to be an expert to start your career in social media marketing. If you know how to communicate, tell compelling stories, and enjoy analyzing trends, you might be a perfect fit as a professional in this industry. What's more, it helps if you have the drive to continue learning as social media is evolving and needs professionals who can keep up.

### Lesson 5: How to Get Started in Social Media Marketing?

Social media is undoubtedly an exciting and ever-changing industry. Psychology is as much a part of the job as creativity and data—it utilizes both the right and left sides of the brain, and each day brings about new challenges. There are a couple of things you can do right away to prepare yourself for a career in social media marketing, helping transform you into an industry-ready marketer.

**Play in the Sandbox**

The first thing to do when considering a career in social media marketing is to get your feet wet in the social media world. Start building your presence on major platforms like Facebook, Twitter, YouTube, and Instagram. Also, follow other thought leaders in the industry. See what type of plans they're working on and get a better understanding of the benefits of social media marketing from their standpoint.

## Digital Marketing - Social Media

Social media today is essentially **word-of-mouth marketing**. Getting people to connect with you online in the social arena helps spread the word about what your company is and what are your products and services.

### Lesson 6: SEO and Social Media

For many teams, there are different sets of people who work on SEO and social media separately; however, this scenario is changing lately.

- The two may still officially belong to separate teams, but social media marketers will need to be more informed on the SEO strategist's agenda, so that the SEO strategy can go hand-in-hand with content promotion.
- SEO strategists too need to know how to work with social media marketers in order to receive the social signals it needs to make sure their company ranks high in search.

**There are two functions of social media for business −**

- Are you participating in the conversation and sharing?
- Are you listening and monitoring what is being said about you?

**Start Social Media Marketing**

If you're starting from scratch with your social media strategy, here are the basic steps to get you started −

- **Step 1** − Choose your social networks
- **Step 2** − Fill your profiles completely, remembering to load in your keywords
- **Step 3** − Find your voice and tone
- **Step 4** − Pick your posting strategy - how often, when, and what type of content
- **Step 5** − Analyze and test
- **Step 6** − Automate and engage

Although we'll be getting into the specifics in the latter half of the tutorial, here are a few things to consider in your general **social media strategy**.

**Facebook tops the list of social media strategy**

For many, social media starts with Facebook. Just having a page, however, does not suffice. Sophisticated content marketing is now the way to foster engagement on Facebook. If your business doesn't have a content marketing strategy or a blog, but wants to maintain a strong Facebook presence, it may be time to create a content marketing strategy for Facebook. We'll get to know more on this in a subsequent chapter.

**Optimize for mobile**

All social media efforts need to be optimized for mobile. You've probably heard, but everyone needs to make sure their websites are optimized for mobile. Social media managers need to be aware of this to ensure that the format of any promotions they do (especially those that include driving people to their company websites) are optimized for mobile. Any images used on social media should also be viewable on mobile for optimized user experience.

## Lesson 7: Emphasize on human experience

It may be digital, but you need to consider the "human experience." Google and Facebook have made changes to their platforms to push businesses to focus more on the "human experience." For social media marketers, your social media posts need to be more relevant, provide more value to your audience, and the engagement needs to be more "human."

**What does social media management include?**

**Generally, social media management focuses on the following:**

- Auditing your existing social media strategy
- Researching your target audience
- Choosing your social media platforms
- Creating your social media strategy
- Designing your social media profiles
- Developing your social media ads
- Building your social media content calendar
- Creating platform-specific social media content
- Responding to your social media followers
- Growing your social reach
- Monitoring your social media performance
- Keep reading to learn more about these social media management practices for businesses!

**How to get started with social media management for businesses**

You know the definition of social media management and what social media management for businesses typically focuses on — now, learn how to bring those practices to life in your social media campaigns with this breakdown of the 11 most critical processes:

**1. Auditing your existing social media strategy**

Are you already marketing and advertising your business on social media? Then, you'll want to set aside some time to audit your existing strategy. With a social media audit, you look at what's working and what isn't within your social media campaigns.

Typical steps within a social media audit include:

- Reviewing your social media goals
- Ensuring your branding across social media networks matches
- Compiling your social media metrics, like followers, engagement rate, and more
- Analyzing your social media metrics to find trends, like content preferences
- Reviewing your competitor's social media presence
- And more

Your audit will provide immediate insight into your social media strategy. Plus, it'll offer a foundation for improving your campaigns so you can achieve the results your business wants to see from social media, from more followers to better client satisfaction.

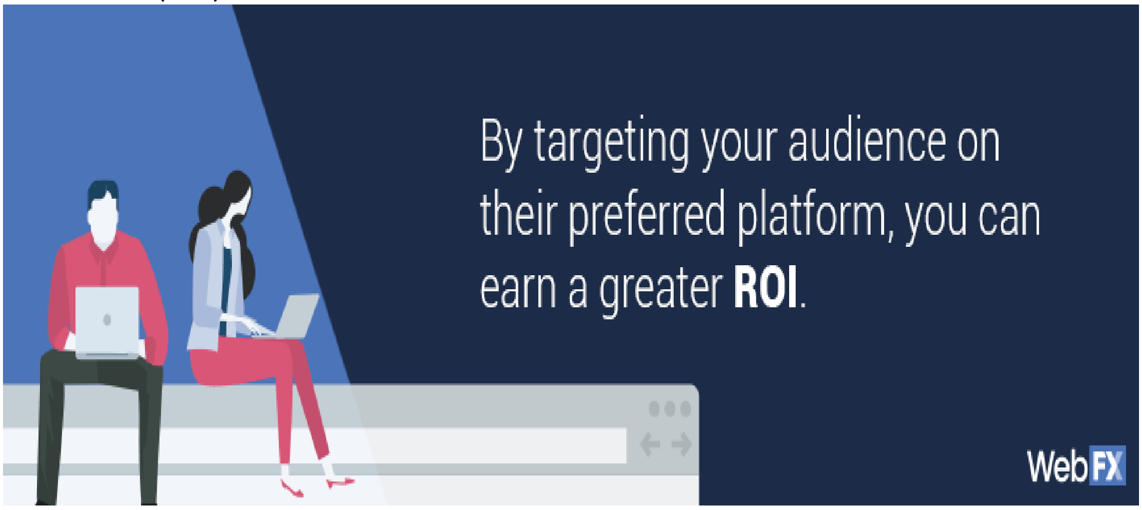
If you partner with a social media manager, they'll take care of this step for you.

**2. Researching your target audience**

Investigating your audience is a core part of social media management. If your agency — or your company — doesn't know who your audience is, it makes developing a social media strategy challenging.

Know who your audience is, and you'll know where to find them online.

That's critical, as you want to maximize your investment in social media management. By targeting your audience on their preferred platform, you can earn a bigger return on investment (ROI).




As an example, imagine social media marketing for dentists. While one dentist provides pediatric care, another offers implant services. They each operate in the health and medical sector, but they have completely different audiences.

When their social media management services include audience research, these practices ensure they invest their marketing budget and ad spend creating content and advertisements that target the right users, versus anyone that needs dental care.

Invest in social media management services, and you can expect your account manager to ask about your target audience at the start. In some cases, an agency may take the initiative to ask about your target audience when you call to discuss their services.

**3. Choosing your social media platforms**

Next, you'll decide which social media platforms to use. Time is one of the most valuable resources when it comes to social media management for businesses, so it's essential to focus your efforts on the networks that matter most to your audience.

While you should have a profile on the top social media networks, like Facebook, Twitter, and LinkedIn, you shouldn't divide your time between them evenly. Instead, prioritize social media platforms by how much your audience uses them.

You can find which networks matter most to your target market by reviewing demographic data. If you conducted a social media audit, you could also reference your engagement rates to see which networks performed best. Check competitor activity, too.

If you use social media management services, don't worry. Your account manager will provide platform recommendations based on their research of your industry, audience, and goals.

**4. Creating your social media strategy**

Before your account manager (or your internal team) can launch your social media campaign, they need to develop your strategy. In most cases, they'll focus on building a strategy for each platform due to the different roles and uses of Twitter, LinkedIn, Facebook, and other social media platforms.

In addition to considering your audience, they'll also look at the following factors:

- **Your goals:** What does your business want to accomplish with social media? Do you want to build more brand awareness among consumers or establish brand loyalty among existing clients? Or, is there another goal you want to accomplish?
- **Your industry:** What do audiences in your industry want to know? Are there content gaps that your company can fill, such as with blog posts or guides that you can then share on social media? Or, are there industry leaders you can connect with on different platforms?
- **Your brand:** What is your brand voice? Do you have a set of standards or processes when engaging with clients in a public forum? Or, how does your branding influence the colors and media that you use?

Some of these questions, such as your branding standards and goals, will require your direct input. At WebFX, we're always curious to learn about your company — it's that curiosity that lets us create powerful and personalized social media strategies.

**5. Designing your social media profiles**

When you create or update your social media profiles, making sure they fit with your brand is essential.


That's why social media management services can also include social media design. This service focuses on creating professional images that capture your brand and make a great first impression on users.

In most cases, social media design will focus on your account's static images, such as the following:

- Your Twitter header and background
- Your Facebook header, icon, and profile picture
- Your Instagram profile picture

Once they've designed your social media accounts — and you've approved of the designs — your social media specialist can start working towards your marketing goals, such as increasing post engagement or driving conversions.

**6. Developing your social media ads**

Depending on your business' goals and service plan, your social media manager may develop an advertising strategy for your company. If you want to earn more genuine followers, as well as encourage user engagement, social media ads are essential.

Platforms, from Snapchat to Facebook, vary in their approach to ads. They feature different ad types, as well as different goals. Facebook, for example, offers the option to create ads for increasing brand awareness, generating leads, earning store visits, and more.

Some other ad features that your social media manager will look at include:

- Audience
- Media
- Content
- Calls-to-action (CTA)
- Cost-per-click (CPC)
- And more

These are all critical factors that influence the success of your advertisements. You may create an ad with a compelling CTA, but if you target it to the wrong audience, you won't see the results you expected.

Before launching an ad campaign, you should have the chance to review and sign off on your ads.

**7. Building your social media content calendar**

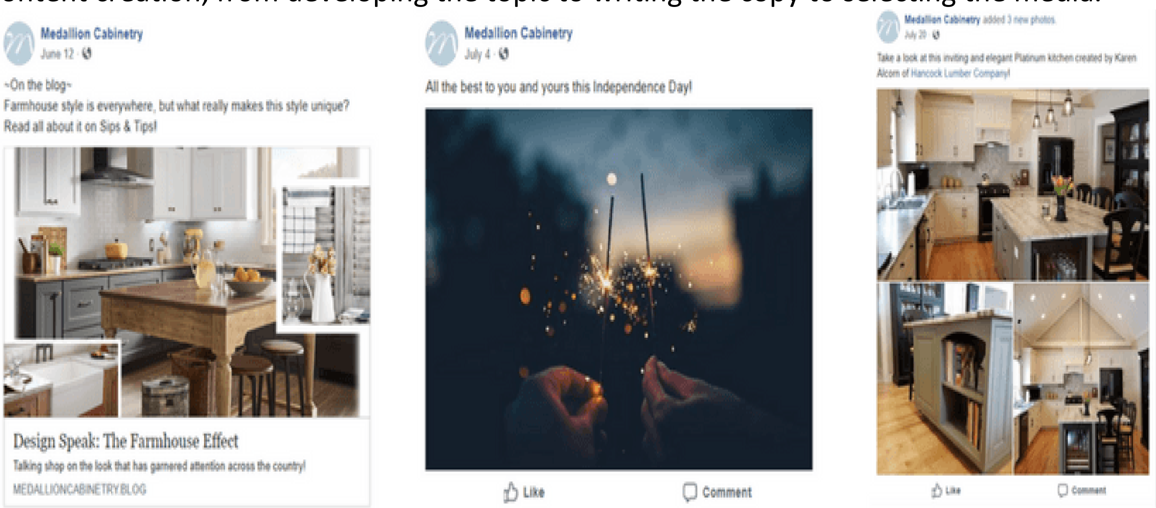
Another deliverable included in most social media management services is a content calendar for each of your social media accounts. This calendar serves as a reference point for you and your professional social media management team.

In your content calendar, which will include the current month, you can view scheduled posts for your social media accounts. These posts may include company announcements and holiday tidings, as well as shared content, such as a blog post from your website or an image from a client.

Before publishing these posts, your social media manager will likely request that you review and approve all the content. While this requires some effort on your part, it guarantees that the only content that goes live is the content you want.

**8. Creating platform-specific content**

A social media specialist does more than build a content calendar for your company — they also create the content in it. In some cases, they may oversee every aspect of content creation, from developing the topic to writing the copy to selecting the media.

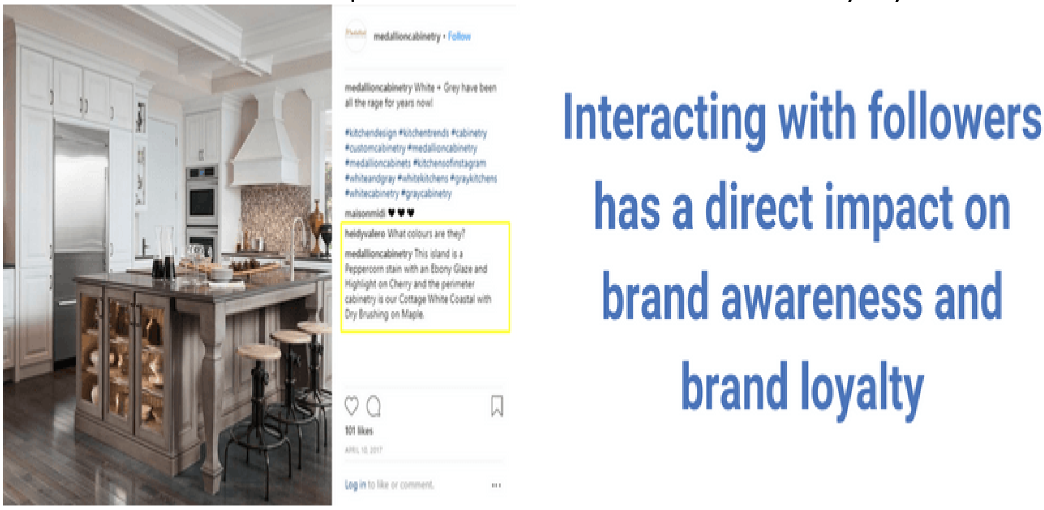



To create the best possible content, however, many social media specialists will work with graphic designers and copywriters. The result is a piece of content that resonates with users and accomplishes your company's goals.

If your calendar includes content from a third party — maybe you're sharing an influencer's blog post that mentions your product — your social media manager will ensure they have the appropriate link and caption to share on your social media accounts.

**9. Responding to your social media followers**

A day-to-day responsibility included with many social media management services is interacting with your followers and commenters. For many businesses, this service is invaluable as it has a direct impact on brand awareness and brand loyalty.




As a part of this service, your social media manager will adhere to your brand and company standards when engaging with your followers. They'll also respond to users that leave negative comments, such as about a bad experience.

For social media users, your company's interaction with them demonstrates that you care. In many industries, that will set your business apart from your competitors. It can even become a selling point for consumers, especially since more than 65% of people use social media for customer service.

**10. Growing your social reach**

Ads are not the only way that your social media specialist will increase your followers and social media presence. As a part of your social media management services, your provider may reach out to influencers and trusted organizations in your industry.

That can lead to coverage of your company by those individuals, which can connect you with their followers. The result is more exposure for your brand, as well as the chance to earn more followers and clients.


If you sell kitchen cabinets, for example, an influencer could highlight your product as a purchase for their renovated kitchen. They'll create a post highlighting the experience on their social media account, which you can then share to yours.

It's a chance for you, as well as another organization, to gain coverage.

**11. Monitoring your social media performance**

A critical part of social media management is monitoring the performance of your efforts. That's why your team of social media specialists will track the performance of your ads, as well as creative content, and share those results with you.

With MarketingCloudFX from WebFX, we make sure you can see the performance, as well as the returns of your investment. This proprietary application, which IBM's artificial intelligence software powers, also offers numerous other useful tools for your digital marketing efforts outside of social media.

When you invest in social media management services — or any digital marketing service — it's essential that you partner with an agency that not only monitors the performance of your social media accounts but also reacts when that performance drops.

You want a partner that develops an action plan for improving low performance too — not someone that excuses it. Adopt this mindset, and you'll find the best agency for your business. That kind of partnership leads to better results and a better ROI.

# Module 10: Online Research and Market Research

## What is market research?

Market research is the process of gathering information about your business's buyers personas, target audience, and customers to determine how viable and successful your product or service would be, and/or is, among these people.

## What is Online Market Research?

Online Market Research is a research method in which the data collection process is carried out over the Internet.

Online Market Research can be either Qualitative or Quantitative. Qualitative Online Tools include Video Ethnography and Market Research Online Communities (MROCs). Quantitative Online Methods include mobile and app surveys.

This research can evaluate the performance of a product or service and may allow companies to glean insight into consumer purchasing behavior. With the rising use of the Internet, online research has become a popular tool among market research firms.

Online research can provide additional information about a buyer, such as her prior purchasing history. Online research projects can be carried out by a company itself or by a hired research firm.

## Why do market research? What is the Purpose of Online Market Research?

Market research allows you to meet your buyer where they are. As our world (both digital and analog) becomes louder and demands more and more of our attention, this proves invaluable. By understanding your buyer's problems, pain points, and desired solutions, you can aptly craft your product or service to naturally appeal to them.

Market research also provides insight into a *wide* variety of things that impact your bottom line including:

- Where your target audience and current customers conduct their product or service research
- Which of your competitors your target audience looks to for information, options, or purchases
- What's trending in your industry and in the eyes of your buyer
- Who makes up your market and what their challenges are
- What influences purchases and conversions among your target audience

Conducting proper online market research requires time and money. But investing those resources into ecommerce research makes sense for the following reasons:

### 1. Get a deeper understanding of your target audience.

Knowing your target audience is critical for coming up with new product ideas, developing a winning marketing strategy and creating copy that converts.

Ecommerce personas also help ensure that you are speaking directly to the customer’s needs and satisfy all of their expectations.

Keep in mind that while knowing the demographics of your target market is important, it's not enough in and of itself.

In addition to knowing who your target customers are, you should also understand what they think, feel and value.

Online market research, especially **qualitative research**, can help you delve into the internal motivators that prompt a purchase.

### 2. Learn customer behaviors.

Understanding how your target customers shop online can help you improve the usability of your website and provide a better customer experience. Every point of friction in the buyer's journey reduces customer satisfaction and increases the likelihood of cart abandonment, lost up-sale or missed retention opportunity.

Online market research can help you identify those points of friction and common deal-breakers. Then, use this know-how to simplify navigation, facilitate product discovery and improve conversion rates.

### 3. Find new business opportunities.

Lots of ecommerce business opportunities are out there that can make your company more successful:

- New product development
- Cross-border sales
- Subscription offerings
- Or new business models

Doing online business research and looking at the market data can help you uncover those opportunities that lie hidden in plain sight.

As you begin honing in on your market research, you'll likely hear about primary and secondary market research. The easiest way to think about primary and secondary research is to envision to umbrellas sitting beneath market research: one for primary market research and one for secondary market research.

Beneath these two umbrellas sits a number of different types of market research, which we'll highlight below. Defining which of the two umbrellas your market research fits beneath isn't necessarily crucial, although some marketers prefer to make the distinction.

So, in case you encounter a marketer who wants to define your types of market research as primary or secondary — or if you're one of them — let's cover the definitions of the two categories next.

## 2 Types of Market Research

### Primary vs. Secondary Research

There are two main types of market research that your business can conduct to collect actionable information on your products including primary research and secondary research.

**Primary Research**

Primary research is the pursuit of first-hand information about your market and the customers within your market. It's useful when segmenting your market and establishing your buyer personas.

Primary research is data collection, done by you, using your internal resources.

**Here are a few examples:**

- Online surveys and questionnaires.
- In-person, in-depth interviews.
- Online focus groups.

In other words, with primary research, you are the one doing the data collection, then analyzing that data to extract actionable business insights.

Primary market research tends to fall into one of two buckets: exploratory and specific research.

Exploratory Primary Research

This kind of primary market research is less concerned with measurable customer trends and more about potential problems that would be worth tackling as a team. It normally takes place as a first step — before any specific research has been performed — and may involve open-ended interviews or surveys with small numbers of people.

Specific Primary Research

Specific primary market research often follows exploratory research and is used to dive into issues or opportunities the business has already identified as important. In specific research, the business can take a smaller or more precise segment of their audience and ask questions aimed at solving a suspected problem.

Secondary Research

Secondary research is all the data and public records you have at your disposal to draw conclusions from(e.g. trend reports, market statistics, industry content, and sales data you already have on your business). Secondary research is particularly useful for analyzing your competitors.

Secondary research is using data and insights, produced by someone else.

Here are a few examples:

- **Government statistics:** For example, if you are in the healthcare industry, then the National Center for Health Statistics can be a valuable source of data.
- **Industry statistics:** Statista is a great website for learning more about a particular market. The Big-4 accounting firms also conduct a ton of original industry research.
- **Industry reports:** For example, HubSpot publishes an annual “State of Marketing Report” in which they share their online marketing research and provide an overview of the latest industry trends.

The main buckets your secondary market research will fall into include:

Public Sources

These sources are your first and most-accessible layer of material when conducting secondary market research. They're often free to find and review — lots of bang for your buck here.

Government statistics are one of the most common types of public sources according to Entrepreneur. Two U.S. examples of public market data are the U.S. Census Bureau and the Bureau of Labor & Statistics, both of which offer helpful information on the state of various industries nationwide.

Commercial Sources
These sources often come in the form of market reports, consisting of industry insight compiled by a research agency like Pew, Gartner, or Forrester. Because this info is so portable and distributable, it typically costs money to download and obtain.
Internal Sources
Internal sources deserve more credit for supporting market research than they generally get. Why? This is the market data your organization already has!
Average revenue per sale, customer retention rates, and other historical data on the health of old and new accounts can all help you draw conclusions on what your buyers might want right now.
Now that we've covered these overarching market research categories, let's get more specific and look at the various types of market research you might choose to conduct.

## Types of Market Research

1. **Interviews**
2. **Focus Groups**
3. **Product/ Service Use Research**
4. **Qualitative research**
5. **Quantitative research**
6. **Observation-Based Research**
7. **Buyer Persona Research**
8. **Market Segmentation Research**
9. **Pricing Research**
10. **Competitive Analysis Research**
11. **Customer Satisfaction and Loyalty Research**
12. **Brand Awareness Research**
13. **Campaign Research**

1. Interviews
Interviews allow for face-to-face discussions (in-person and virtual) so you can allow for a natural flow or conversation and watch your interviewee's body language while doing so.
2. Focus Groups
Focus groups provide you with a handful of carefully-selected people that you can have test out your product, watch a demo, provide feedback, and/or answer specific questions.

**How It Works**
A focus group usually consists of 5-12 individuals who all possess certain characteristics pertaining to the topic of the group. A moderator or interviewer facilitates the discussion and creates an environment that promotes the communication of different perceptions and points of view. They usually last for about one to two hours, during which group members are usually asked five or six questions.

The discussion is then carefully analyzed to provide insights as to how a product, service, or opportunity might be perceived by the group. The qualitative data is used to develop products, services, or opportunities that will meet customer requirementsDemand CurveThe demand curve is a line graph utilized in economics, that shows how many units of a good or service will be purchased at various prices.

Types of Focus Groups

**1. Two-Way**

One group watches another group answer the questions posed by the moderator. By listening to what the other group thinks and says, the group that listens is able to facilitate more discussion and potentially draw different conclusions.

**2. Dual-Moderator**

Two moderators are present – one which ensures the group session progresses smoothly and one that makes sure that the topics in question are all covered. Dual-moderator focus groups typically result in a more productive session.

**3. Dueling-Moderator**

There are two moderators who play devil's advocate. The purpose of the dueling-moderator focus group is to facilitate new ideas by introducing new ways of thinking and varying viewpoints.

**4. Respondent-Moderator**

One or more of the participants in the group takes the lead as moderator. This is done to change the dynamics of the group and generate more varied responses.

**5. Mini Focus Group**

A focus group that consists of fewer participants – usually four or five – which creates a more intimate group.

**6. Online Focus Group**

Participants respond and share information through online means. Online focus groups are created to reach a broader range of participants.

Advantages of a Focus Group

- Focus groups are a cheaper means of obtaining information, as compared to individual interviews.
- Participants are able to listen to the responses of other participants and “feed off each other.”
- The groups generally result in more data being gathered, as participants are given the opportunity to rebut each other.
- Compared to a quantitative survey, these groups are able to gather more information about perceptions, attitudes, and experiences.

Disadvantages of a Focus Group

- Group dynamics, such as group is a term developed by social psychologist Irving Janis in 1972 to describe faulty decisions made by a group due to group pressures. Groupthink is a phenomenon in which the ways of approaching problems or matters are dealt by the consensus of a group rather than by individuals acting independently. may inhibit discussion.
- The group may be difficult to manage and control, due to the number of participants.
- Shy participants or introverts may feel overpowered and intimidated by assertive participants. This can introduce bias and affect the end result.
- Analysis of data may be time-consuming and challenging.
- The group culture may intimidate or fail to energize participants, resulting in weaker data collection.

3. Product/Service Use Research

Product or service use research offers insight into how and why your audience uses your product or service, and specific features of that item. This type of market research also gives you an idea of the product or service's usability for your target audience.

This research will help you answer several questions:

- What do customers need?
- Which customer needs aren’t currently being met?
- How do we improve the existing product or introduce a new product?
- What type of customer will be interested in a new or modified product?
- Are people aware of the products currently available in the market?
- Are people satisfied with existing products?

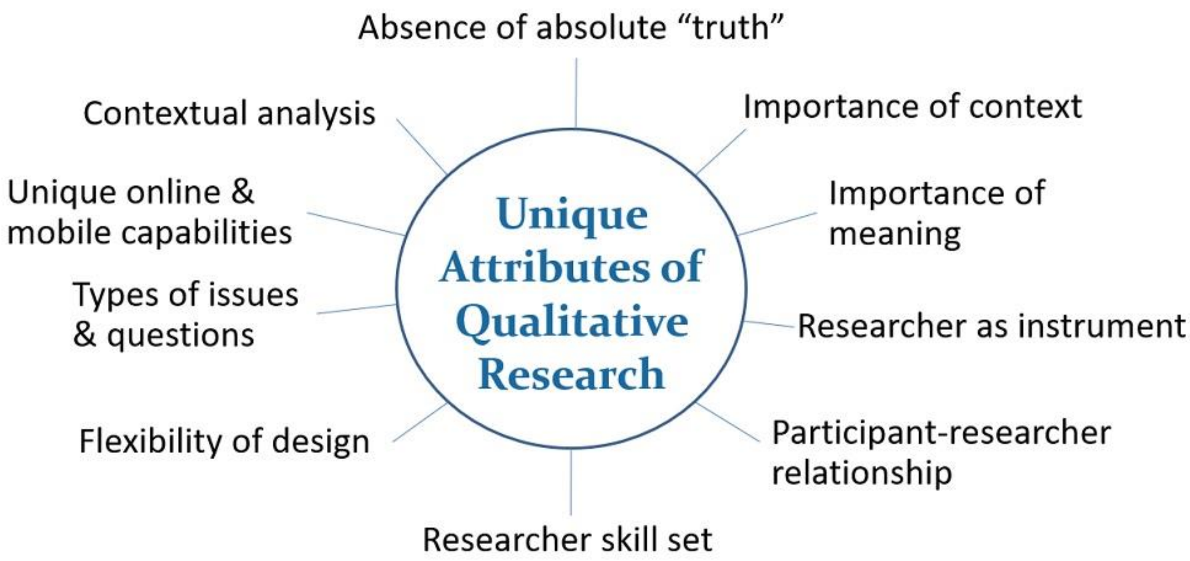
Qualitative research

Qualitative market research is the collection of primary or secondary data that is non-numerical in nature, and therefore hard to measure.

Qualitative research collects and analyzes unstructured data through techniques which include observations, interviews, and focus groups. Qualitative research enables researchers to develop research hypotheses and uncover context-rich insights for a wide variety of different concepts.

Research methods that would gather qualitative data include:

- Interviews (face to face / telephone)
- Focus groups
- Open-ended survey questions




Strengths and Weaknesses of Qualitative Research

Qualitative methodologies have certain strengths and weaknesses that researchers should consider when designing their market research strategy. The strengths of qualitative research include:

Nuance: Qualitative techniques enable researchers to understand complex ideas and concepts in great detail and offer a window into the decision making process of research participants.

Cost Effectiveness: Researchers typically conduct qualitative research with a small number of participants, meaning that many types of qualitative research can be relatively affordable to conduct.

Flexibility: Techniques are flexible and, when new concepts or ideas emerge, it's straightforward for researchers to adapt their approach and explore new topics without redesigning the whole market research process.

There are also some limitations to qualitative research, which is why it's important that qualitative techniques are not the only ones used in the research process. These include:

Labor Intensive: Designing and administering qualitative research can be time-consuming. Researchers need to find appropriate participants, design the research agenda, and determine the best way to interpret responses.

Difficult to Analyze Data: Qualitative research does not produce numerical results, meaning that analysis of the results can be subjective. Sometimes, market researchers may come away with entirely different conclusions from the same focus group or set of interviews.

Challenging to Control for Variables: Because research is conducted with few participants, it can be difficult to control for variables and ensure that the sample is representative. One example: focus groups can easily be derailed by a particularly vociferous participant.

Researchers collect this market research type because it can add more depth to the data.

This kind of market research is used to summarise and infer, rather than pin-points an exact truth held by a target market. For example, qualitative market research can be done to find out a new target market's reaction to a new product to translate the reaction into a clear explanation for the company.

## Quantitative research

Quantitative Market Research is a technique to ask questions to the target audience in an organized manner using surveys, polls or questionnaires. Received responses can be analyzed to make well-thought decisions for improving products and services, that will in turn help increase respondent satisfaction levels. Well-founded results can be achieved in case a large sample size that represents a population is surveyed.
The age of Information has transformed both selling as well as purchasing habits and norms. "Information" or "data" is now more valuable than gold. Companies rise and fall on the basis of how well they are able to collect and analyze data and make informed decisions based on the gathered insights.

Any evolved customer who makes a purchase online can tell how quickly businesses have become "customer-centric". And the first step towards becoming a customer-centric business is through customer feedback and research.
Quantitative research methods include:

- Polls
- Questionnaires
- Surveys


### Reasons to conduct Quantitative Market Research

Research is the first step for a successful marketing campaign, be it a new product launch, sales pitch positioning or conducting a data-oriented statistical analysis.

By conducting an online quantitative market research, insights about marketing activities like updating the website, social media page management or newsletters can also be received.

By implementing Quantitative Market Research, questions like “Who are currently buying my products/services?”, “Why are the others not buying my product?”, “How to reach out to my potential clientele?” are answered.

Quantitative research starts with survey creation, designing, and distribution. After the survey is sent out to the right people, data collection and analysis has to be done to get desired insights.

Steps of quantitative market research

**Significance of Quantitative Market Research**

As the name implies, Quantitative market research focuses on the quantity and structured collection of data. It began with face-to-face techniques and now has evolved into online surveys like those provided by QuestionPro. It is often used to capture data like customer behavior, size of the market, identifying reasons for product repurchase. This type of market research is usually based on a large number of samples.

Characteristics of Quantitative Market Research

**The basic characteristics of quantitative market research are:**

- The premise that quantitative market research operates on is to confirm the hypothesis of the phenomena of how many.
- The data collected is solely in the form of numbers and statistical formula can be applied to this data to come up quantified actionable insights.
- Data collected and the mode of collection is very structured. It is a mix of questionnaires, surveys etc.
- The research study is designed in a way that the questions are structured and the possible responses to these questions are also structured. This is laid out well in advance before the study.
- Since the questions are not open ended, they point towards certain answers so the scope for uncertainty is limited.

What is the methodology for creating a successful quantitative market research survey?

Quantitative market research is a highly scientific method of market research. It uses deductive reasoning to come to a conclusion and create actionable insights from the data collected. This research method works on the principle of developing a hypothesis, collecting data and then analyzing that data to further prove or disprove the hypothesis.

The milestone based procedure of the quantitative design is:

Make an observation of something that is unknown to you. Investigate the theory that is related to your issue or the field that requires validation.

Create an in-depth hypothesis to validate your research and findings and end objective.

Plan for how to prove or disprove this hypothesis and create a structure to achieve this objective.

Collect and analyze your data. If your data validates your hypothesis, prepare for final validations and to present findings. If the data disproves your hypothesis, you can either start afresh with a new hypothesis or drop your current research.

The milestones mentioned above fall under 5 quantitative design types namely; survey research, descriptive research, correlational research, causal-comparative/quasi-experimental research and experimental research.

What are the common techniques to conduct a quantitative market research?

Quantitative market research can be conducted by primary and secondary research types. Some of the Some of the most common ways to conduct a quantitative market research are:

Primary quantitative market research techniques

Primary techniques are the most common forms of conducting quantitative market research. Some of the most common and widely used forms are:

Surveys: Traditionally, surveys were conducted using paper-based methods and have gradually evolved into online mediums. Closed-ended questions form a major part of these surveys as they are more effective in collecting quantitative data. The survey makes include answer options which they think are the most appropriate for a particular question. Surveys are integral in collecting feedback from an audience which is larger than the conventional size. A critical factor about surveys is that the responses collected should be such that they can be generalized to the entire population without significant discrepancies. Quantitative market research is conducted under two broad buckets of the frequency they are administered at:

Cross-sectional research survey: Cross-sectional market research is a quantitative market research method that analyzes data of variables collected at one given point of time across a sample population. population or a pre-defined subset. This research method has people who are similar in all demographics but the one that is under research.

Longitudinal research survey: Longitudinal market research is a quantitative market research method where research is conducted over years or decades on a target demographic markets or certain individuals to collect statistical data.

One-on-one Interviews: This quantitative data collection method was also traditionally conducted face-to-face but has shifted to telephonic and online platforms. Interviews offer a marketer the opportunity to gather extensive data from the participants. Quantitative interviews are immensely structured and play a key role in collecting information. There are two major sections of these online interviews:

Face-to-Face Interviews: An interviewer can prepare a list of important questions in addition to the already asked survey questions. This way, interviewees provide exhaustive details about the topic under discussion. An interviewer can manage to bond with the interviewee on a personal level which will help him/her to collect more details about the topic due to which the responses also improve. Interviewers can also ask for an explanation from the interviewees about unclear answers.

Online/Telephonic Interviews: Telephone-based interviews are no more a novelty but these quantitative interviews have also moved to online mediums such as Skype or Zoom. Irrespective of the distance between the interviewer and the interviewee and their corresponding time zones, communication becomes one-click away with online interviews. In case of telephone interviews, the interview is merely a phone call away.

Computer Assisted Personal Interview: This is a one-on-one interview technique where the interviewer enters all the collected data directly into a laptop or any other similar device. The processing time is reduced and also the interviewers don't have to carry physical questionnaires and merely enter the answers in the laptop.

Secondary quantitative market research techniques

Secondary techniques to conduct quantitative market research are a means to validating a hypothesis or drawing conclusions from empirical data and primary data. This research method is a form of observational market research where historical data helps validate the statistical observations of the primary data. For example: mapping the purchase of snowblowers to the months where sales spike with historical data of inclement weather helps manage supply and demand as well as trained personnel during those months.


5 steps needed for creating a successful quantitative market research survey:

a. Specify the Goal: Why do you want to conduct this market research? There should be a clear answer to this question so that the steps that follow are smoothly executed.
b. Have a Plan Sketched Out: Every step that needs to be achieved has to be put to paper like the tools that are required to carry out the research, survey templates, the target audience etc. This may vary from project to project.
c. Collect Data: This is the most crucial step in this market research. Data is collected through 3 main mediums: online surveys, telephone interviews or email surveys.
d. Analysis of Collected Data: Once the data is gathered, it needs to be analyzed. Various methods of analysis like SWOT Analysis, Conjoint Analysis, TURF Analysis can be carried out to get best results.Quantitative Market Research Analysis
e. Compile Reports: A report consisting of graphs, charts, and tables should be created so that the person in-charge of the report can incorporate the observed changes.

Observation-Based Research

Observation-based research allows you to sit back and watch the ways in which your target audience members go about using your product or service, what works well in terms of UX, what roadblocks they hit, and which aspects of it could be easier for them to use and apply.

Depending on the type of observation research and the goal of the study, the market researcher will have varying levels of participation in the study. Sometimes the researcher will insert themselves into the environment, and other times, the researcher will not intervene in the setting and observe from a distance or in a laboratory setting.

The purpose of this type of research is to gather more reliable insights. In other words, researchers can capture data on what participants do as opposed to what they say they do.

When should a market researcher use observational research?

As a market researcher, you have several different research methodologies at your disposal, including surveys, interviews, observations, etc.

Using observational data is best when one of the following situations apply:

- You need to gather sensitive information, and you don't trust your participants will be honest with their self-reporting.
- You need to understand the how or what of a research question.
- The topic is new, and you need robust data to explain consumer behavior.
- When behavior in a natural setting is vital to your research question.
- When behavior in a controlled setting is critical to your research question.
- If you are concerned that self-reported data about behaviors will differ from actual actions, even if it's unintentional.
- When you need more information about a specific research question to formulate a more complete and accurate survey.

If any of these situations describe you or your current research state, then an observational study may be just what you need.

What are the three types of observational research?

When it comes to observational research, you have three different types of methodologies: controlled observations, naturalistic observations, and participant observations.

Let's quickly look at what each type of observation includes, how they differ, and the strengths and weaknesses of each type of observation.

1. Controlled observation

Controlled observations are typically a structured observation that takes place in a psych lab. The researcher has a question in mind and controls many of the variables, including participants, observation location, time of the study, circumstances surrounding the research, and more.

During this type of study, the researcher will often create codes that represent different types of behaviors. That way, instead of writing a detailed report, they can classify behavior into different categories and analyze the data with more ease.

Advantages and limitations of controlled observation

The advantages of controlled observation include:

- You can make an observation schedule for your sampling, and have other market researchers use the same codes if they replicate the study. This helps test for reliability.
- The coded data is easy to analyze and quantify.
- Controlled studies aren't as time-consuming.

Limitations of a controlled observation include:

- It may be challenging to determine the validity of the study if participants know they are being watched.

2. Naturalistic observation

Naturalistic observation is another type of observation research method used by market researchers. This type of observation is when market researchers study the behaviors of participants in a natural surrounding. There are typically no predetermined behavioral codes. Instead, the researcher will take rigorous notes and code the data later.

Advantages and limitations of naturalistic observation

Some advantages of naturalistic observation include:

- The study ensures validity when participants are in their natural setting.
- This type of study can generate new ideas and research questions.
- It opens researchers' minds to possibilities they might not have considered before.
- Researchers can collect authentic data and avoid any potential problems with self-reported data.

Some limitations include:

- You can't control different variables, making it difficult to replicate the study and test for reliability.
- It may be challenging to conduct this type of study on a wide scale.
- You have to use skilled researchers, so you don't risk missing critical behavioral data.
- You aren't able to manipulate any variables.

3. Participant observation

The last type of observation method is participant observation. This is a type of naturalistic observation in the fact that market researchers will observe participants in their natural habitat. The difference is market researchers will insert themselves into the environment.

Advantages and limitations of participant observation

Some advantages of this type of observation include:

- You can control some of the variables by being part of the natural environment.
- You can still observe participants in their natural habitat, even if they know you are part of the study.
- You can avoid incorrect self-reported data through this method of observation as well.

Here are some limitations to this type of study to consider:

- It can be challenging to take notes openly without blowing your cover as the market researcher.
- If you can't take notes openly, you'll have to rely on memory for note-taking, and memory can be faulty.
- If a researcher becomes too involved in the study, they could become less objective. This could threaten the validity of the study.

Each type of study will help you gather insight into how customers and participants behave, but they also come with their own set of limitations.

Buyer Persona Research

Buyer persona research gives you a realistic look at who makes up your target audience, what their challenges are, why they want your product or service, what they need from your business and brand, and more.

Market Segmentation Research

Market segmentation research allows you to categorize your target audience into different groups (or segments) based on specific and defining characteristics — this way, you can determine effective ways to meet their needs, understand their pain points and expectations, learn about their goals, and more.

It provides valuable data on customer demographics, needs, values, attitudes, and behaviors. As you better define target groups, you're able to further develop your marketing strategy. "You can then tailor your message and positioning for the different segments you've identified."

Pricing Research

Pricing research gives you an idea of what similar products or services in your market sell for, what your target audience expects to pay — and is willing to pay — for whatever it is you sell, and what's a fair price for you to list your product or service at. All of this information will help you define your pricing strategy.

Whether you're deciding on a price for a new product or optimizing the price for an existing product, pricing research helps determine the price elasticity of a product based on a given customer segment and set of features.

You can get to know which features and capabilities a customer is willing to pay a premium for and which types of customers are more price sensitive. "You can then create different pricing plans based on who a customer is (e.g., student or professional), and what features you're including (e.g., unlimited use vs limited use)."

Competitive Analysis

Competitive analyses are valuable because they give you a deep understanding of the competition in your market and industry. You can learn about what's doing well in your industry, what your target audience is already going for in terms of products like yours, which of your competitors should you work to keep up with and surpass, and how you can clearly separate yourself from the competition.

1. **Customer Satisfaction and Loyalty Research**

Customer satisfaction and loyalty research give you a look into how you can get current customers to return for more business and what will motivate them to do so (e.g. loyalty programs, rewards, remarkable customer service). This research will help you discover the most-effective ways to promote delight among your customers.

2. **Brand Awareness Research**

Brand awareness research tells you about what your target audience knows about and recognizes from your brand. It tells you about the associations your audience members make when they think about your business and what they believe you're all about.

Campaign Research

Campaign research entails looking into your past campaigns and analyzing their success among your target audience and current customers. It requires experimentation and then a deep dive into what reached and resonated with your audience so you can keep those elements in mind for your future campaigns and hone in on the aspects of what you do that matters most to those people.

Now that you know about the categories and types of market research, let's review how you can conduct your market research.

**Here's how to do market research step-by-step.**

## How to Do Market Research

1. **Conduct keyword research.**
2. **Define your buyer persona.**
3. **Identify a persona group to engage.**
4. **Prepare research questions for your market research participants.**
5. **List your primary competitors.**
6. **Summarize your findings.**

<u>Conduct keyword research.</u>

Keyword research can help you figure out whether there's a demand for the product that you want to sell online.

Even though high search volumes don't mean the product's idea is profitable, they do indicate genuine interest among consumers.

Moreover, keyword research is also useful when you are working on your inbound marketing strategy since it allows you to pinpoint opportunities for generating organic traffic with search engine optimization (SEO).

<u>Some of the popular free keyword research tools are:</u>

- Google Keyword Planner.
- Keyword Tool.
- Ubersuggest.

However, a premium tool such as Ahrefs or SEMRush provides business owners with deeper level insights.

While Ahrefs is a sophisticated tool that might take time to master, you can learn how to do basic keyword research with it in just 10 minutes.

Simply watch the "Keyword Research Tutorial: From Start to Finish" video in which Sam Oh explains everything you need to know to get started.

This tutorial is particularly helpful for ecommerce entrepreneurs because Sam uses a new ecommerce store that sells computers, computer parts, computer accessories and software to show the ropes of research.

**Here's a quick summary:**

- Generate keyword ideas. Start by typing in a few broad keywords related to your business (e.g., "computer"), then go to "*Having same terms*" report to expand your list of ideas. Then filter those keyword ideas down, group them by search intent (informational, navigational, commercial, transactional) and evaluate their business potential.
- Analyze Google's top ten search results. See which websites already rank for the target keyword. Pay attention to the content format. Consider using a similar type of content, but look for opportunities to improve upon the published posts.
- Assess how hard it will be to rank on Google for that keyword. Take a look at the number of referring domains and the domain ratings for the top ten search

results. Competing with websites that have a similar domain rating (DR) to yours is the best strategy.
- Analyze topical relevance. See how your website compares to those in the top ten search results. Are you in the same industry? Is it a commercial domain? Is it a niche publisher, covering the topic exclusively? Doing so will give you more insights into the difficulty of ranking for that particular keyword.
- Reverse-engineer the topics that are driving traffic to your competitors' websites. Go to Ahrefs Site Explorer, enter a competitor's domain name and go to the top pages report. Then look at the traffic, the top keywords and the referring domains.

Sam Oh also emphasizes that keyword research isn't about search volume alone. Your goal is to find topics that potential customers are searching for, create educational content around them and soft-pitch your offers.

At the end of the day, traffic quality beats traffic quantity. When you are considering a particular keyword, ask yourself whether ranking for it will lead to more sales, not just extra **traffic.**

<u>Research current trends.</u>
When you are doing product research for ecommerce, you should always look into the latest consumer trends. Use Google Trends to uncover those.
Here are the two questions that can help with online product research:
- Is the interest in this product declining, stable or growing?
- Is the interest in this product seasonal or does it remain the same all year?

Simply type in a relevant keyword and pick a time period.
For example, if you type in “artificial plants” and pick “Past 5 Years” as your timeframe, you will see that the interest in this keyword has been stable, with a noticeable increase in the last year.
A moderate but stable level of interest like that may indicate an opportunity for building a sustainable, long-lasting business.
Check your assumption with a quick google search for such businesses. And yes, we have Autograph Foliages — a company that has been selling artificial plants for over 40 years!
Also, when you see an upcoming trend, analyze it from different angles. For example, CBD is a promising new market with a diverse range of business opportunities. So rather than doing CBD-everything, consider niching down.
Lab to Beauty, for instance, saw great success with selling CBD-infused beauty products.
Also, be wary when a trend has a crazy upward trajectory at the moment. Because a real-time spike in interest might turn out to be a short-lived fad.
While it's okay to capitalize on hot trends, you shouldn't build your entire business around them. Make sure that your foundation is stable.
<u>Define your buyer persona.</u>
Before you dive into how customers in your industry make buying decisions, you must first understand who they are.

This is where your buyer personas come in handy. Buyer personas — sometimes referred to as marketing personas — are fictional, generalized representations of your ideal customers.

*Use a free tool to create a buyer persona that your entire company can use to market, sell, and serve better.*

They help you visualize your audience, streamline your communications, and inform your strategy. Some key characteristics you should be keen on including in your buyer persona are:

- Age
- Gender
- Location
- Job title(s)
- Job titles
- Family size
- Income
- Major challenges

The idea is to use your persona as a guideline for how to effectively reach and learn about the real audience members in your industry. Also, you may find that your business lends itself to more than one persona — that's fine! You just need to be thoughtful about each specific persona when you're optimizing and planning your content and campaigns.

Identify a persona group to engage.

Now that you know who your buyer personas are, use that information to help you identify a group to engage to conduct your market research with — this should be a representative sample of your target customers so you can better understand their actual characteristics, challenges, and buying habits.

The group you identify to engage should also be made of people who recently made a purchase or purposefully decided not to make one. Here are some more guidelines and tips to help you get the right participants for your research.

How to Identify the Right People to Engage for Market Research

When choosing who to engage for your market research, start by focusing on people who have the characteristics that apply to your buyer persona. You should also:

Aim for 10 participants per buyer persona.

We recommend focusing on one persona, but if you feel it's necessary to research multiple personas, be sure to recruit a separate sample group for each one.

Select people who have recently interacted with you.

You may want to focus on people that have completed an evaluation within the past six months — or up to a year if you have a longer sales cycle or niche market. You'll be asking very detailed questions so it's important that their experience is fresh.

Gather a mix of participants.

You want to recruit people who have purchased your product, purchased a competitor's product, and decided not to purchase anything at all. While your customers will be the easiest to find and recruit, sourcing information from those who aren't customers (yet!) will help you develop a balanced view of your market.

Here are some more details on how to select this mix of participants:

- **Pull a list of customers who made a recent purchase.** As we mentioned before, this is usually the easiest set of buyers to recruit. If you're using a CRM system, you can run a report of deals that closed within the past six months and filter it for the characteristics you're looking for. Otherwise, you can work with your sales team to get a list of appropriate accounts from them.
- **Pull a list of customers who were in an active evaluation, but didn't make a purchase.** You should get a mix of buyers who either purchased from a competitor or decided not to make a purchase. Again, you can get this list from your CRM or from whatever system your Sales team uses to track deals.
- **Call for participants on social media.** Try reaching out to the folks that follow you on social media, but decided not to buy from you. There's a chance that some of them will be willing to talk to you and tell you why they ultimately decided not to buy your product.
- **Leverage your own network.** Get the word out to your coworkers, former colleagues, and LinkedIn connections that you're conducting a study. Even if your direct connections don't qualify, some of them will likely have a coworker, friend, or family member who does.
- **Choose an incentive.** Time is precious, so you'll need to think about how you will motivate someone to spend 30-45 minutes on you and your study. On a tight budget? You can reward participants for free by giving them exclusive access to content. Another option? Send a simple handwritten 'thank you' note once the study is complete.

Prepare research questions for your market research participants.

The best way to make sure you get the most out of your conversations is to be prepared. You should always create a discussion guide — whether it's for a focus group, online survey, or a phone interview — to make sure you cover all of the top-of-mind questions and use your time wisely.

(Note: This is not intended to be a script. The discussions should be natural and conversational, so we encourage you to go out of order or probe into certain areas as you see fit.)

Your discussion guide should be in an outline format, with a time allotment and open-ended questions for each section.

*Wait, all open-ended questions?*

Yes — this is a golden rule of market research. You never want to "lead the witness" by asking yes and no questions, as that puts you at risk of unintentionally swaying their thoughts by leading with your own hypothesis. Asking open-ended questions also helps you avoid one-word answers (which aren't very helpful for you).

**Example Outline of a 30-Minute Survey**

Here's a general outline for a 30-minute survey for one B2B buyer. You can use these as talking points for an in-person interview, or as questions posed on a digital form to administer as a survey to your target customers.

**Background Information (5 Minutes)**

Ask the buyer to give you a little background information (their title, how long they've been with the company, and so on). Then, ask a fun/easy question to warm things up (first concert attended, favorite restaurant in town, last vacation, etc.).

Remember, you want to get to know your buyers in pretty specific ways. You might be able to capture basic information such as age, location, and job title from your contact list, there are some personal and professional challenges you can really only learn by asking.

Here are some other key background questions to ask your target audience:

- Describe how your team is structured.
- Tell me about your personal job responsibilities.
- What are the team's goals and how do you measure them?
- What has been your biggest challenge in the past year?

Now, make a transition to acknowledge the specific purchase or interaction they made that led to you including them in the study. The next three **stages of the buyer's journey** will focus specifically on that purchase.

**Awareness (5 Minutes)**

Here, you want to understand how they first realized they had a problem that needed to be solved without getting into whether or not they knew about your brand yet.

- Think back to when you first realized you needed a [name the product/service category, but not yours specifically]. What challenges were you facing at the time?
- How did you know that something in this category could help you?
- How familiar were you with different options on the market?

**Consideration (10 Minutes)**

Now you want to get very specific about how and where the buyer researched potential solutions. Plan to interject to ask for more details.

- What was the first thing you did to research potential solutions? How helpful was this source?
- Where did you go to find more information?

If they don't come up organically, ask about search engines, websites visited, people consulted, and so on. Probe, as appropriate, with some of the following questions:

- How did you find that source?
- How did you use vendor websites?
- What words specifically did you search on Google?
- How helpful was it? How could it be better?
- Who provided the most (and least) helpful information? What did that look like?
- Tell me about your experiences with the sales people from each vendor.

**Decision (10 Minutes)**

- Which of the sources you described above was the most influential in driving your decision?
- What, if any, criteria did you establish to compare the alternatives?
- What vendors made it to the short list and what were the pros/cons of each?
- Who else was involved in the final decision? What role did each of these people play?
- What factors ultimately influenced your final purchasing decision?

**Closing**

Here, you want to wrap up and understand what could have been better for the buyer.

- Ask them what their ideal buying process would look like. How would it differ from what they experienced?

- Allow time for further questions on their end.
- Don't forget to thank them for their time and confirm their address to send a thank-you note or incentive.

List your primary competitors.

List your primary competitors — keep in mind listing the competition isn't always as simple as Company X versus Company Y.

Sometimes, a *division* of a company might compete with your main product or service, even though that company's brand might put more effort in another area.

For example. Apple is known for its laptops and mobile devices but Apple Music competes with Spotify over its music streaming service.

From a content standpoint, you might compete with a blog, YouTube channel, or similar publication for inbound website visitors — even though their products don't overlap with yours at all.

And a toothpaste company might compete with magazines like Health.com or Prevention on certain **blog topics** related to health and hygiene even though the magazines don't actually sell oral care products.

Identifying Industry Competitors

To identify competitors whose products or services overlap with yours, determine which industry or industries you're pursuing. Start high-level, using terms like education, construction, media & entertainment, food service, healthcare, retail, financial services, telecommunications, and agriculture.

The list goes on, but find an industry term that you identify with, and use it to create a list of companies that also belong to this industry. You can build your list the following ways:

- **Review your industry quadrant on G2 Crowd:** In certain industries, this is your best first step in secondary market research. G2 Crowd aggregates user ratings and social data to create "quadrants," where you can see companies plotted as contenders, leaders, niche, and high performers in their respective industries. G2 Crowd specializes in digital content, IT services, HR, ecommerce, and related business services.
- **Download a market report:** Companies like Forrester and Gartner offer both free and gated market forecasts every year on the vendors who are leading their industry. On Forrester's website, for example, you can select "Latest Research" from the navigation bar and browse Forrester's latest material using a variety of criteria to narrow your search. These reports are good assets to save on your computer.
- **Search using social media:** Believe it or not, social networks make great company directories if you use the search bar correctly. On LinkedIn, for example, select the search bar and enter the name of the industry you're pursuing. Then, under "More," select "Companies" to narrow your results to just the businesses that include this or a similar industry term on their LinkedIn profile.

Identifying Content Competitors

Search engines are your best friends in this area of secondary market research. To find the online publications with which you compete, take the overarching industry term you identified in the section above, and come up with a handful of more specific industry terms your company identifies with.

A catering business, for example, might generally be a "food service" company, but also consider itself a vendor in "event catering," "cake catering," "baked goods," and more.
Once you have this list, do the following:

- **Google it:** Don't underestimate the value in seeing which websites come up when you run a search on Google for the industry terms that describe your company. You might find a mix of product developers, blogs, magazines, and more.
- **Compare your search results against your buyer persona:** Remember the buyer persona you created during the *primary research* stage, earlier in this article? Use it to examine how likely a publication you found through Google could steal website traffic from you. If the content the website publishes seems like the stuff your buyer persona would want to see, it's a potential competitor, and should be added to your list of competitors.

After a series of similar Google searches for the industry terms you identify with, look for repetition in the website domains that have come up.
Examine the first two or three results pages for each search you conducted. These websites are clearly respected for the content they create in your industry, and should be watched carefully as you build your own library of videos, reports, web pages, and blog posts.

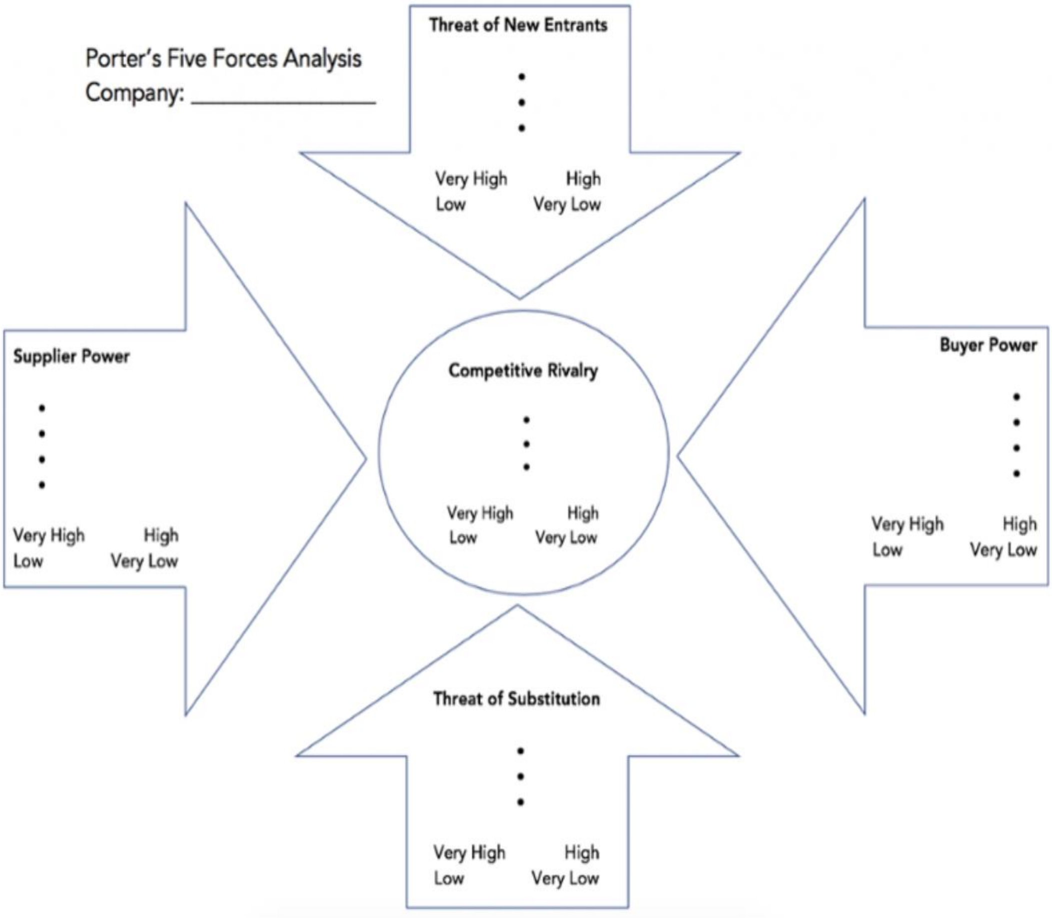
1. **Summarize your findings.**

Feeling overwhelmed by the notes you took? We suggest looking for common themes that will help you tell a story and create a list of action items.
To make the process easier, try using your favorite presentation software to make a report, as it will make it easy to add in quotes, diagrams, or call clips.
Feel free to add your own flair, but the following outline should help you craft a clear summary:

- **Background:** Your goals and why you conducted this study.
- **Participants:** Who you talked to. A table works well so you can break groups down by persona and customer/prospect.
- **Executive Summary:** What were the most interesting things you learned? What do you plan to do about it?
- **Awareness:** Describe the common triggers that lead someone to enter into an evaluation. (Quotes can be very powerful.)
- **Consideration:** Provide the main themes you uncovered, as well as the detailed sources buyers use when conducting their evaluation.
- **Decision:** Paint the picture of how a decision is *really* made by including the people at the center of influence and any product features or information that can make or break a deal.
- **Action Plan:** Your analysis probably uncovered a few campaigns you can run to get your brand in front of buyers earlier and/or more effectively. Provide your list of priorities, a timeline, and the impact it will have on your business.
- **Less is more** – Preface your report with executive summaries that highlight your key discoveries and their implications
- **Work with experts** – Make sure you've access to a dedicated team of experts ready to help you design and launch successful projects

Lastly, let's review a resource that can help you compile everything we just discussed in a simple yet effective way (plus, it's free!).

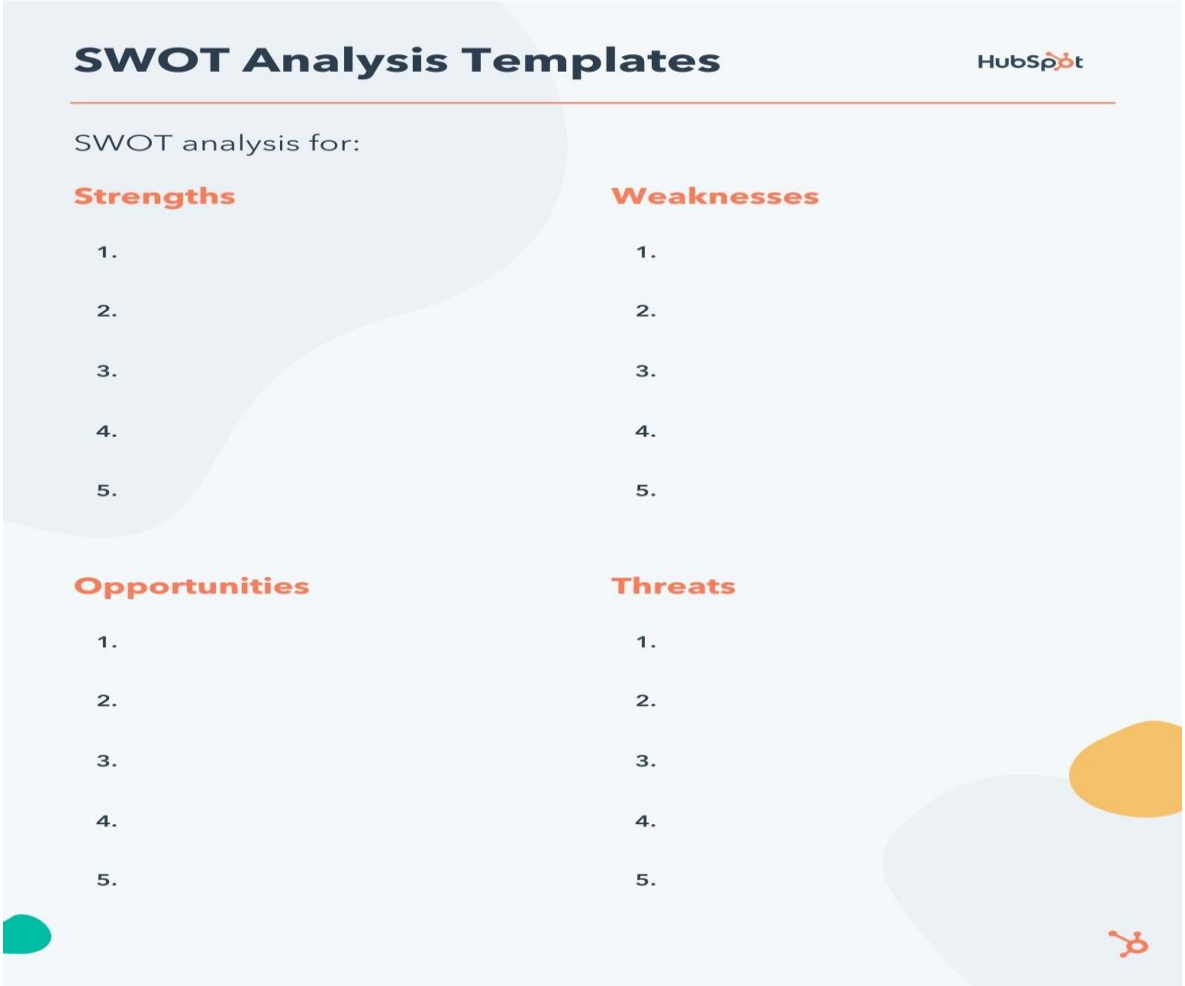
Utilize social media.
Social media is a treasure trove of consumer insights. It's the place where people broadcast their complaints, wishes, preferences and aspirations. But to find those golden nuggets of wisdom, you need to go on a deep dive.
To avoid getting too deep down the internet rabbit hole, keep your online business research focused on:
Following influencers in your industry. Analyze their opinions, conversations and past partnerships with brands.
Monitor relevant hashtags. Identify the most relevant hashtags for your products and then make it a habit to monitor them regularly.
Analyze competitor sentiment. Keep an ear on what people are saying about your competitors. This is a great way to figure out what their strengths and weaknesses are.
Note that the most valuable information often lies in posts that mention a competing company or their products but don't tag them.
Text analysis can come in handy here. This machine learning technique helps analyze massive quantities of textual data and extract relevant information from it.
For example, text analytics software could analyze all tweets with a specific hashtag. Then let you know whether the overall sentiment was positive or negative, which words appeared most frequently, etc. Investing in text analytics software would give you a much more accurate picture of the market and analyze a wider range of ideas shared online.
Picking out the language your customers use — words, slang, metaphors — to express their preferences is a short-cut to writing better copy. By infusing the voice of customer data into your messaging, you make your pitches feel more personal and relevant.
Market Research Report Template
Within a market research kit, there are a number of critical pieces of information for your business's success. Let's take a look at what those different kit elements are next.
**1. Five Forces Analysis Template**




Use **Porter's Five Forces Model** to understand an industry by analyzing five different criteria and how high the power, threat, or rivalry in each area is — here are the five criteria:

- Competitive rivalry
- Threat of new entrants
- Threat of substitution
- Buyer power
- Supplier power

SWOT Analysis Template




A **SWOT (Strengths, Weaknesses, Opportunities, Threats)** analysis looks at your internal strengths and weaknesses, and your external opportunities and threats within the market.

A SWOT analysis highlights direct areas of opportunity your company can continue, build, focus on, and work to overcome.

Market Survey Template

Both market surveys and focus groups help you uncover important information about your **buyer personas**, target audience, current customers, market, competition, and more (e.g. demand for your product or service, potential pricing, impressions of your branding, etc.).

**Surveys** should contain a variety of question types, like multiple choice, rankings, and open-ended responses. Ask quantitative and short-answer questions to save you time and to more easily draw conclusions. (Save longer questions that will warrant more detailed responses for your focus groups.)

Here are some categories of questions you should ask via survey:

- Demographic questions
- Business questions
- Competitor questions

- Industry questions
- Brand questions
- Product questions

## Focus Group Template

**Focus groups** are an opportunity to collect in-depth, qualitative data from your real customers or members of your target audience. You should ask your focus group participants open-ended questions. While doing so, keep these tips top of mind:

- Set a limit for the number of questions you're asking (after all, they're open-ended).
- Provide participants with a prototype or demonstration.
- Ask participants how they feel about your price.
- Ask participants about your competition.
- Offer participants time at the end of the session for final comments, questions, or concerns.

## Conduct Market Research to Grow Better

Conducting market research can be a very eye-opening experience. Even if you think you know your buyers pretty well, completing the study will likely uncover new channels and messaging tips to help improve your interactions.

## What's a Competitive Analysis & How Do You Conduct One?

**What is a competitive market analysis?**

A competitive analysis is a strategy that involves researching major competitors to gain insight into their products, sales, and marketing tactics. Implementing stronger business strategies, warding off competitors, and capturing market share are just a few benefits of conducting a competitive market analysis.

A competitive analysis can help you learn the ins and outs of how your competition works, and identify potential opportunities where you can out-perform them.

It also enables you to stay atop of industry trends and ensure your product is consistently meeting — and exceeding — industry standards.

Let's dive into a few more benefits of conducting competitive analyses:

- Helps you identify your product's unique value proposition and what makes your product different from the competitors', which can inform future marketing efforts.
- Enables you to identify what your competitor is doing right. This information is critical for staying relevant and ensuring both your product and your marketing campaigns are outperforming industry standards.
- Tells you where your competitors are falling short — which helps you identify areas of opportunities in the marketplace, and test out new, unique marketing strategies they haven't taken advantage of.
- Learn through customer reviews what's missing in a competitor's product, and consider how you might add features to your own product to meet those needs.
- Provides you with a benchmark against which you can measure your growth.

## What is competitive market research?

Competitive market research focuses on finding and comparing key market metrics that help identify differences between your products and services and those of your

competitors. Comprehensive market research helps establish the foundation for an effective sales and marketing strategy that helps your company stand out from the crowd.
Next, let's dive into how you can conduct a competitive analysis for your own company.

## 3 Types of Competitors to Watch (+ How to Find Them)

**1. Direct competitors.**
A **direct competitor** probably comes to mind when you think of your competition. These are businesses offering similar (or identical) products or services in the same market. They also vye for the same customer base.
Some famous examples of direct competitors include Apple versus Android, Pepsi versus Coca-Cola, and Netflix versus Hulu. But direct competition isn't exclusive to well-known national or international brands. Two shoe stores in a rural town are direct competitors. So are a handful of realtors servicing one area.
Digital companies also see direct competition. For example, after the success of Twitter’s Periscope app, Facebook pivoted its focus to live video to keep up.
Since direct competitors sell similar products in a similar manner, this type of competition is often a zero-sum game — meaning, a customer that buys a competitor's product won't buy yours. For example, if you buy a hamburger at McDonald's, it's not likely you'll swing by Burger King to buy another one.
**2. Indirect competitors.**
Indirect competitors are businesses in the same category that sell different products or services to solve the same problem.
For example, Taco Bell and Subway fall under the same category — fast-food — but they offer entirely different menu options. While they both seek to solve the same problem (feed hungry people), they provide different products to solve it.
Here's another example — residential painters experience indirect competition with home improvement chains like Home Depot or Lowes. Again, the category is the same but the product offerings differ.
Indirect competition isn't necessarily a zero-sum game. Consider someone buying supplies from Lowe's to re-paint their home —only to do a sloppy job. They may call a local painter to fix the mistakes.
**3. Replacement competitors.**
A replacement competitor offers an alternative to the product or service that you offer. You both seek to solve the same pain points, but the means are different.
For example, a restaurant and coffee shop in the same neighborhood could be replacement competitors. Walking down the street, some customers may choose to grab a to-go lunch from the coffee shop, while others prefer the restaurant.
The idea here is that customers are using the same resources to purchase the replacement that they could've used to buy your offerings.
These competitors are potentially dangerous if there's more than one way to solve the same problem you seek to resolve. Additionally, these are the most challenging competitors to identify. After all, we can't read people's minds and understand all the choices that led them to us.

But we can find other ways to uncover this information — such as requesting feedback from customers or keeping an eye on their social media mentions. With this insight, you can better understand your audience and identify your replacement competitors.
As you work to identify your competitors, you may discover more than you anticipated. Don't get overwhelmed. Remember that not all competitors are built the same — some are less of a threat than others.
Now let's discuss ways to identify the players above, below, and next to you.

## 5 Ways to Identify the Competition

**1. Check the first page of Google.**
An easy starting point is doing a quick Google search. Think of a few keywords someone might search to find you, such as [service or product] + [location]. For example, *general contractor Sacramento*.
Then, note the top companies on the first page of your search results. You may notice your keywords return thousands of results, but you shouldn't stress. The most relevant section is the first page and the competition directly above and below you on it. Those tend to be your direct competitors.
**2. Research targeted keywords.**
Check **the keywords** you are currently targeting to identify other businesses targeting the same ones.
This is a solid strategy for finding your indirect competition since they likely target the same keywords. For example, the keyword "fast-food" may reveal Subway and Taco Bell — both indirect competitors —as the top two results.
**3. Monitor social media conversations.**
Opinions are aplenty on social media — so it's relatively easy **to find what your customers are saying**. To find relevant conversations, enter your businesses' name in the search bar and check the results.
For instance, someone may post a question to Twitter asking what hair salon they should visit in your city. A follower may respond with the name of your business, along with a handful of others.
You can expand your search beyond social media to include community forums, such as Reddit or Quora — along with review sites like Yelp. Both of these resources can reveal helpful insight into your customers and why they chose your business over the competition.
**4. Perform market research.**
Check the market for your product or service and note any companies with a competing offer. **Market research** can be done a number of ways — whether that be with a Google search, by browsing through trade journals, or by talking with your sales team to see what other companies are commonly brought up by customers (to name a few).
**5. Ask your customers.**
Customers are crucial to identifying your competition — after all, they likely sifted through most of them before landing on you. There are many ways to solicit feedback from customers — both online and in-person. That could mean striking up conversations while cashing them out or sending an email survey after each sale. One way or another, try to find the best approach and regularly check the feedback for any trends.

Every business has competition, and it pays to know the top players. But remember, as your business grows and evolves, so too will the competition. A direct competitor may go out of business, or an indirect competitor may become a direct one. All this to say, make a habit of routinely checking those above, below, and next to you.

## How to Conduct a Market Opportunity Analysis

**What is market opportunity analysis?**

Market opportunity analysis is the process of researching where and how you can reach more potential clients or grow your revenue share. It involves identifying competitions, understanding your audience, and uncovering potential risks. By doing a market opportunity analysis, you'll be able to prioritize new business ideas based on how potentially profitable and risky they are.

Who should conduct a market opportunity analysis?

That answer is, "*everyone.*" All sizes of organizations will benefit from better understanding the industry in which they're operating or approaching. Whether you work in B2B, B2C, government, or non-profit organizations, defining and analyzing the market will help you make better decisions.

This kind of analysis can help you grow your existing business, pivot into new markets and opportunities, or expand into the periphery of your current market.

### 5 Benefits of a Market Opportunity Analysis

1. **Make better long-term strategic decisions.**
2. **Evaluate product or service demand.**
3. **Identify potential marketing strategies.**
4. **Uncover areas for further research.**
5. **Identify and navigate potential roadblocks.**

There are many reasons to take the time and examine the full range of options before forging ahead. Here are five important benefits you'll get from market analysis.

**1. Make better long-term strategic decisions.**

Your business is impacted by many external factors. Without taking the time to examine the current market trends, you'll be flying blind.

A market opportunity analysis can provide the insight you need to see into the future. What will the market look like in a year? Five years? 10 years? What forces are acting on the market today? How is the demographic of your target audience shifting?

**2. Evaluate product or service demand.**

You may have invented the next **Google Glass**: a great product with tough, niche demand. A market assessment will show the potential for selling your product or service. This analysis will help you evaluate if expanding into a potential new market is worthwhile for your company.

You may find that there is no existing market for your idea, leading to a "**Blue Ocean Strategy.**" "Blue oceans," **explain authors W. Chan Kim and Renee Mauborgne**, "denote all the industries not in existence today — the unknown market space, untainted by competition. In blue oceans, demand is created rather than fought over. There is ample opportunity for growth that is both profitable and rapid."

While that might be the case, you might also fail to create the market, or need to spend time and energy educating customers on the value of your new idea.

**3. Identify potential marketing strategies.**

The four P's of your marketing mix are price, place, product, and promotion. Through the process of a market opportunity analysis, organizations can gain a deeper understanding of who their target customers are, what they want, and how they make their decisions. After assessing the current market, you'll be able to price your product effectively and know which promotion strategies will work best. Are there partnerships you should pursue? Will direct sales or **inbound marketing work best**?

**4. Uncover areas for further research.**

When you start to better understand the market, you may identify even more new opportunities to explore. As the saying goes, "You don't know what you don't know." You may discover a new government initiative that encourages sustainable businesses.

A customer research project may identify a new pain point that you didn't realize existed. The benefit of knowing your marketplace really deeply is that you'll be ready to leverage any new opportunities that pop up.

**5. Identify and navigate potential roadblocks.**

A **SWOT analysis** looks at the strengths, weaknesses, opportunities, and threats of a potential strategy. Identifying the weaknesses and the threats to your market opportunity is key to your success. No business idea is perfect. But knowing where you might run into trouble before you even begin can help you plan ahead and mitigate those risks.

Examples of Market Opportunity Analysis

Before we get into the step-by-step instructions of how to do your own analysis, let's look at the results of two very different case studies. The purpose of both of these research projects was to identify new opportunities, however, they were done in two different industries: elderly care options and the automotive industry.

**1. Say Yeah! ElderCare Case Study**

Consulting agency Say Yeah! **conducted a market opportunity analysis** for a company looking to expand its business model into the elderly care industry. They started by mapping the customer journey for an adult child caring for their elderly parent, along with all the decision points they encounter.

By examining market forces — such as government subsidies, the changing demographics, and all the options older adults have — Say Yeah! was able to uncover several different options by which ElderCare could increase their profits.

Notably, they recommended ElderCare expand its referral business to include retirement homes, in-home care, and other social services.

"Their initial business premise is validated: by shifting the industry to a subscription-based model, led by an online marketplace, this business could carve out a significant piece of profit in the elder care industry by providing far more value to retirement homes at less cost."

**Comparison of Options**

| Choose Retirement Living | Choose Other |
|---|---|
| Select homes to short-list (~4)<br>Compare options (rental price, care type, location)<br>Share information with stakeholders<br>Complete needs analysis of homes based on parent needs/wants | Select from:<br>Home care<br>Renovations<br>Social supports<br>Family support |
| Family<br>Service providers (retirment home sales staff, **Our Business**)<br>Resource providers | Service providers (banks and institutions, **Our Business**)<br>Trusted advisors (lawyers, financial advisors)<br>Resource providers<br>Social Workers<br>Family |

**2. Ipsos Business Consulting Automotive Case Study**

A global automotive conglomerate was interested in the growing electronic vehicle (EV) market, specifically three-wheelers in India. **Ipsos conducted a study of the EV market** through customer interviews, business model analysis, and government research. At the end of the study, they provided recommendations around charging station locations, leasing vs purchasing options, and other infrastructure requirements.



How to Conduct a Market Opportunity Assessment

**1. Identify potential opportunities.**

Your first step is to lay out the potential opportunities you want to investigate. What segment are you hoping to expand into? What type of customer are you hoping to attract? Are you looking to acquire or partner with another business? Have current events created a potential opportunity?

Knowing whether you want to expand, pivot, invest, create, or reposition your offerings will inform the next steps of your market research.

Once you've identified market opportunities, you're ready to start researching their potential.

**2. Understand the customer.**

In every opportunity, the customer will inform your success. Does this product meet their needs? Do they have the purchasing power to make this idea profitable? How do they make their purchasing decisions? The second step in the analysis is to really, deeply understand your potential customers and their needs. This research may include any of the following tools:

- Customer interviews
- Customer journey map
- Surveys
- Demographic data

**3. Research competitors.**

Next, you'll want to understand who all the players in the existing market are. **Competitor research** can help you understand how big the market share is, how existing products are positioned in the market, and how crowded the market is. Here are some questions you might want to ask:

- What is their value proposition?
- How is their product offering different from ours?
- Who are their partners?
- What do their reviews say about their product or service?
- Are there any gaps we could fill?
- How likely are new competitors?

**4. Consider external factors.**

External factors are always shaping and changing the marketplace. The acronym "STEEP" can help us dive into the five main forces we need to be aware of.

**Social**

How is culture changing the market? For example, more employees working from home during the pandemic has opened up an entire sector of the market that didn't exist before. Jumping on trends can be a lucrative strategy unless the trends disappear too quickly.

**Technical**

What new innovations have influenced the market? Can you apply this technology in other ways or in new industries?

**Economic**

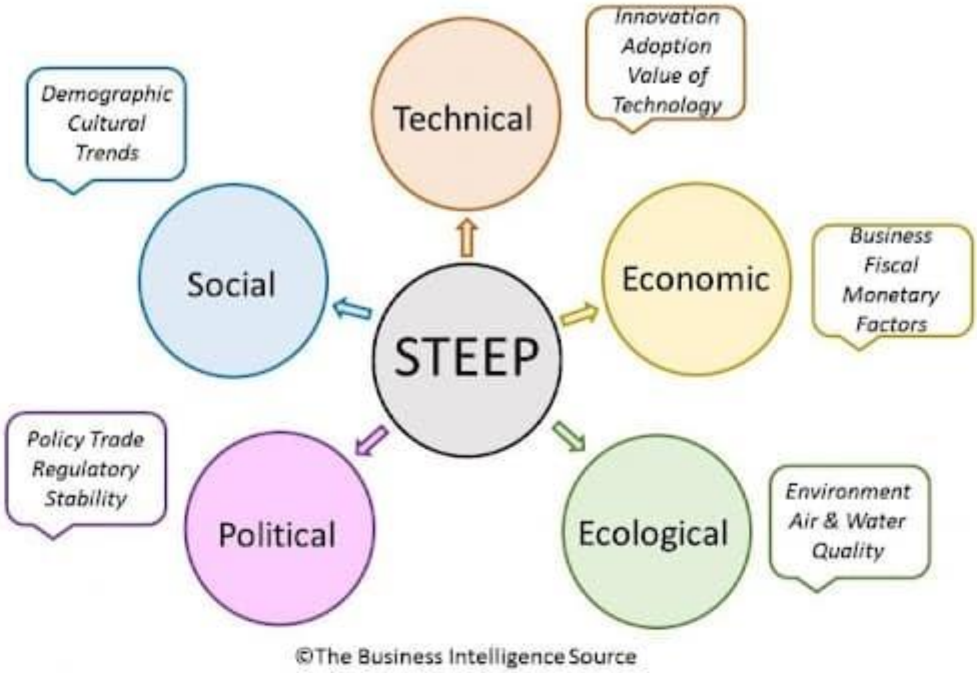
What is the current economic climate like? Will you be able to get a loan if needed? Do your customers have disposable income? How does the market forecast look for the next year? Five years?

**Ecological**

What impact does this idea have on the environment? Can you improve the sustainability of the product or service?

**Political**

You may be pleasantly surprised to learn that your local government is offering grants, tax breaks, or other incentives for businesses in your industry. Alternatively, you may find that there are regulatory roadblocks in your way that you'll need to account for in your analysis.




**5. Be aware of internal forces.**

Finally, dive into your own business' capabilities. Do you have the skills, workforce, technology, and financial resources to invest in a new product? If you're launching a very innovative product, are you going to be able to hire people with the necessary skills? What new departments or teams will you need to create to manage this new opportunity?

Make better decisions with market opportunity analysis.

Not every idea is worth pursuing — but many are. With market opportunity analysis, you'll learn which business strategies will help you grow, along with their potential risks. Don't launch your next product or service without doing your homework.

## How to Run a Focus Group for Your Business

### How to Run a Focus Group

1. Choose your topic of discussion
2. Choose your questions or discussion prompts
3. Prepare your focus group questionnaire
4. Appoint a notetaker
5. Recruit and schedule participants
6. Get consent and start the discussion
7. Have everyone introduce themselves
8. Ask your questions
9. Seek equal representation from the group

10. End the meeting in a reasonable amount of time
11. Analyze and incorporate feedback

**Follow Along With a Free Focus Group Questionnaire Template**

**Question 2: How much would you pay for a product like this?**

Notes:

Most people's responses were in line with our intended price point. Reconsider follow up meeting with marketing team on pricing strategy update, as it may not be needed.

Common Responses:

The majority of respondents answered with a range between $20 and $40.

Noteworthy Individual Responses & Ideas:

The responses were $20, $20, $50, $45, $40, $35, $25, and $0 (the last person did not think the product was a good fit for him).

**How to Run a Focus Group**

**1. Choose your topic of discussion.**

Going into a focus group, your discussion should be narrowed down to one or a few topics. Keep in mind that you won't be able to thoroughly address *every* area you want to discuss in one short focus group session.

Because of this, it's not uncommon for companies to run multiple rounds of focus groups around different topics. For example, if you're launching a new product, you could center one focus group around the product's marketing and brand positioning, and another one around the usability and functionality of the product itself.

**2. Choose your questions or discussion prompts.**

Once you determine the topic of discussion for your focus group, create a list of questions and discussion prompts that will help you gather the data you need.

Let's return to the product launch example from above. If you're running the product marketing focus groups, you could ask questions like:

- What do you think of the packaging design?
- How much money would you spend on a product like this?
- What other companies do you think of when you see a product like this?

Meanwhile, for a focus group about the product itself, you'll want to ask about the product's functionality, ease of use, and perceived favorability.

Also, remember to ask open-ended questions — "Do you like the product?" and "What do you think of the product?" may seem similar in nature, but the latter will produce more detailed results.

**3. Prepare your focus group questionnaire.**

After you've chosen your questions and discussion prompts, organize them on a **focus group questionnaire**. Be sure to leave enough space on the questionnaire for overall notes, a list of common responses, and one or two noteworthy responses that really stood out.

Focus Group Template

Company: ___________

| Question 3: |
|---|
| Notes: |
| Common Responses: |
| Noteworthy Individual Responses & Ideas: |

**4. Appoint a notetaker.**

Your focus group discussion should be facilitated by at least one person, while another person on your team should be a designated notetaker.

Why? The facilitator's job is to *facilitate* — to guide the discussion and foster new ideas from participants. This task can get easily derailed if the facilitator also needs to pause the discussion to write down big, bold ideas and reactions from participants.

To avoid this possibility of disruption, appoint a notetaker before going into the focus group who can focus solely on jotting down the general consensus from the group, unique and noteworthy individual responses, and the key takeaways for the business.

**5. Recruit and schedule participants.**

One of the most challenging parts of running a focus group is getting people to actually show up. After you select a time and a place, you'll want to start spreading the word to participants.

Here are a few ways to find them:

**Reach out to existing customers.**

If you're doing market research for an existing company, reach out to your customers through account managers or an email database. Since current customers will likely be the first to use what you're launching, this will be the perfect opportunity to gauge early reactions for the official launch.

For incentives, you could offer free or discounted services or reward them on a customer advocacy program like **Influitive**.

**Advertise on social media.**

Looking for middle-aged males or senior citizens in the greater Ann Arbor area? No problem! Social media advertising offers advanced targeting options for you to reach your target market.

You should also think about which sites are most used by the people you want in your focus group. If you're interested in surveying middle-aged working professionals, you'll probably have better luck on LinkedIn than you would on TikTok.

**Try location-based promotion.**

If you're hyper-targeting a location, supplement your recruiting efforts with advertisements that will only be seen by those in your area. A few examples include:

- Billboard Ads
- Public Transit-Based Ads (Trains, Busses, Taxis, etc.)
- Ads in Local Publications and Newspapers

**Be prepared to offer incentives.**

People rarely do anything for free. In your advertisements and promotional assets, highlight the incentive you're prepared to offer — which could be cash, a gift card, or a discount on whatever you're selling.

If you're strapped for cash, consider hosting a **raffle or giveaway** for participants. That way, if you host a focus group of eight people, you could offer a *chance* at a $100 gift card (rather than a guaranteed $25 per participant) to save you $100.

**6. Get consent and start the discussion.**

Before you start your focus group discussion, remind participants of the purpose of the group and hand out a consent form. The consent form should reiterate the purpose of the event, outline the participants' rights, identify the compensation, list the facilitators' contact information, and prompt participants to sign.

After everyone signs off, it's time to run the focus group.

**7. Have everyone introduce themselves.**

To break the ice and get people talking, start the discussion off by introducing yourself and inviting the participants to do the same.

This is another chance for you to learn more about your target market. In addition to having participants say their names, consider asking them to share their industry or interests to get a more personal understanding of how your product, service, or business could play a role in their everyday lives.

**8. Ask your questions.**

Remember, this is not an interview! Before the focus group begins, you should prepare a **list of five to 10 questions**.

That being said, it can be easy to tie yourself to your list of questions or discussion points, but sticking too closely to this can hamper natural and effective conversations. If the group takes a slightly different turn than you were expecting, don't be afraid to allow the conversation to veer off-course if it seems productive.

running a focus group to solicit multiple ideas, so only hearing from one or two people defeats the purpose of the exercise. Be ready to jump in when someone has been quiet for too long and say something along the lines of "Isabella, what's your input here?" or "Raheem, what do you think about what Isabella said?"

The point of a focus group is not just to confirm information you think is true, but also to uncover what you don't know.

So long as it's not too far off-topic, allow the conversation to happen naturally and use an agenda as a guide rather than a point-by-point checklist of topics to cover.
Additionally, you may not ask every question on your list, depending on the direction of the conversation. Make sure you ask the most important questions first, and follow-up on certain discussion points to keep things flowing rather than hosting a pure question-and-answer forum.

**9. Seek equal representation from the group.**

Remember, this is not an interview! You're running a focus group to solicit multiple ideas, so only hearing from one or two people defeats the purpose of the exercise. Be ready to jump in when someone has been quiet for too long and say something along the lines of "Isabella, what's your input here?" or "Raheem, what do you think about what Isabella said?"

**10. End the meeting in a reasonable amount of time.**

Exhaustion and the **law of diminishing** returns are real, so keep them in mind when planning the time frame for your focus group.
At the start of the session, in your advertisements, and/or on your consent form, you should specify how long the focus group will last. It's your responsibility to moderate the discussion in a way that ensures the time frame is not exceeded.
Now, if the exercise lasts for an hour and five minutes and you promised an hour focus group, that's totally acceptable. However, if you promised a 45-minute session and it goes well over an hour, your attendees could be resentful and less likely to offer valuable feedback.
When the discussion is over, thank your attendees for their time and deliver the promised incentive, if applicable. Additionally, remind them of your contact information if they decide they have more feedback or comments they'd like to provide.

**11. Analyze and incorporate feedback.**

Ideally, your focus group has provided you with plenty of responses, unique angles, and actionable ideas to help your business thrive. After all of your focus groups have taken place, have your team compile and analyze the commonalities of the ideas presented and what changes, if any, are applicable to the product, service, or business in question.

**Focus Group Agenda**

To get started with your focus group, you'll need an agenda to stay on task during the meeting. First, you'll want to welcome the participants in the focus group and introduce yourself and other researchers who may be present. This step is important as it establishes rapport with the group and builds trust.
Next, ask participants to introduce themselves. This does a few things: it continues building rapport among the group members and it confirms the pronunciation of everyone's names — you don't want to spend the next hour or more together saying everyone's names incorrectly!
Before asking questions, establish some ground rules for the group. If a topic could become controversial, let that be known and set boundaries for how far a discussion can go. If you'll be asking for information that isn't normally shared in a group setting, assure the cohort that the findings won't have names or identifying data attached to the responses. Finally, if your company is reimbursing expenses or providing payment to the focus group participants, let them know how and when they'll receive their disbursements.

Now, here's the fun part. Although you may have one broad topic to discuss during the focus group, it's very likely that you'll have several subtopics that need to be addressed separately. Structure your questions in such a way that the flow of the conversation makes sense. This could be by theme, chronological order, or the current-future state of your business.

Once you've reached a stopping point during the conversation, wrap up any lingering questions and ideas within the group. Finally, thank everyone for their time and end the session.

If you need those steps organized in a handy agenda, we've got you covered. Download the PDF below and save it for your next focus group.

**Focus Group Example**

Now that you have a step-by-step guide for conducting a focus group, it's time to see one in action. Using the steps above, I've identified a recent focus group example that follows most of the guidelines we've recommended.

Georgetown University Institute of Politics and Public Service conducted a focus group with first-time voters after the 2020 election. It could have been very easy for this focus group to get off track and into political affiliations; However, you'll notice in this example that the researcher had a topic in mind — the first-time-voter experience — and didn't deviate from that topic. She asked probing questions and sought out a variety of perspectives from the group.

Watch this focus group to get a better understanding of how to start these conversations and keep them going to get the insights you need.

**Running a Better Focus Group**

Taking this methodical approach to running a focus group can produce better and more insightful feedback from your participants. To keep your questions, thoughts, and responses organized, we developed a focus group template, which you can use to run a better focus group.

**18 Tools & Resources for Conducting Market Research**

**Market Research Tools**

1. Think With Google Research Tools
2. Census Bureau
3. Make My Persona
4. Tableau
5. Statista
6. Claritas MyBestSegment
7. SurveyMonkey
8. Typeform
9. Upwave Instant Insights
10. Loop11
11. Userlytics
12. Temper
13. NielsenIQ
14. Ubersuggest
15. Pew Research Center
16. BrandMentions
17. Qualtrics Market Research Panels

18. Qualaroo

We are creatures of habit, especially when it comes to buying behavior. We know the location of our favorite products in the store, and we trust that they'll work year after year. According to **McKinsey**, nearly 3 out of 4 Americans stick with the same brand — and 8 out of 10 stay with the same retailer.

People don't like change. It's a battle to get someone to switch to an unknown brand, especially during times of crisis.

When a client wants to launch a new product, get into a different market, or open a new store location, the odds are stacked against them. It’s commonly known that most product launches are destined to fail — and that’s because they do.

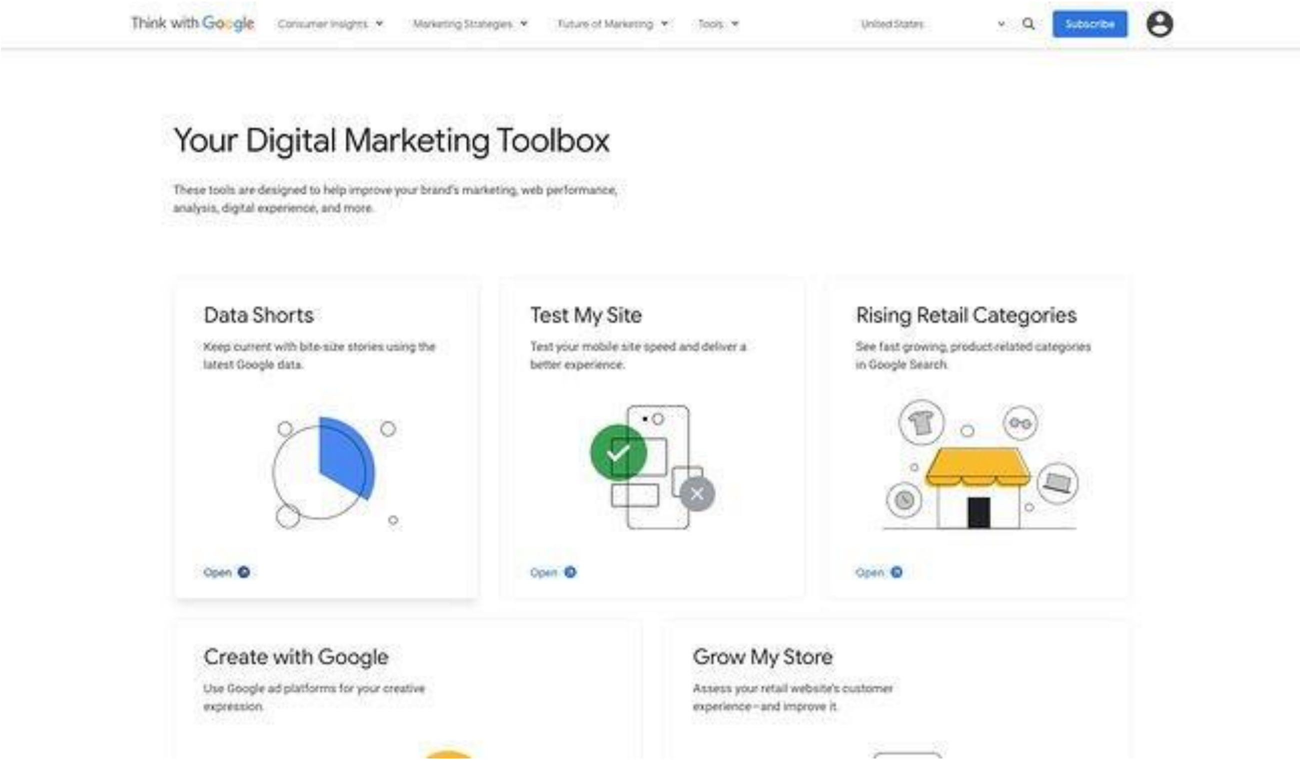
In part, we can blame lack of research for why there are so many unsuccessful product launches and ill-conceived new feature additions. Founders and brand managers "know" it will be successful — they run on their instincts, not the facts. (It was this instinct that led Clairol to release Touch of Yogurt Shampoo, which some people thought was a breakfast food option.)

Finding out if a product will be successful beyond the initial curiosity is just good business. With market research, you determine whether the opportunity exists, how to position the product or service, or what consumers' opinions are after the launch.

If you're sensitive to the high costs of failure and need to gather facts and opinions to predict whether your new product, feature, or location will be successful, start by investing in market research using these tools and resources.

## Helpful Market Research Tools & Resources

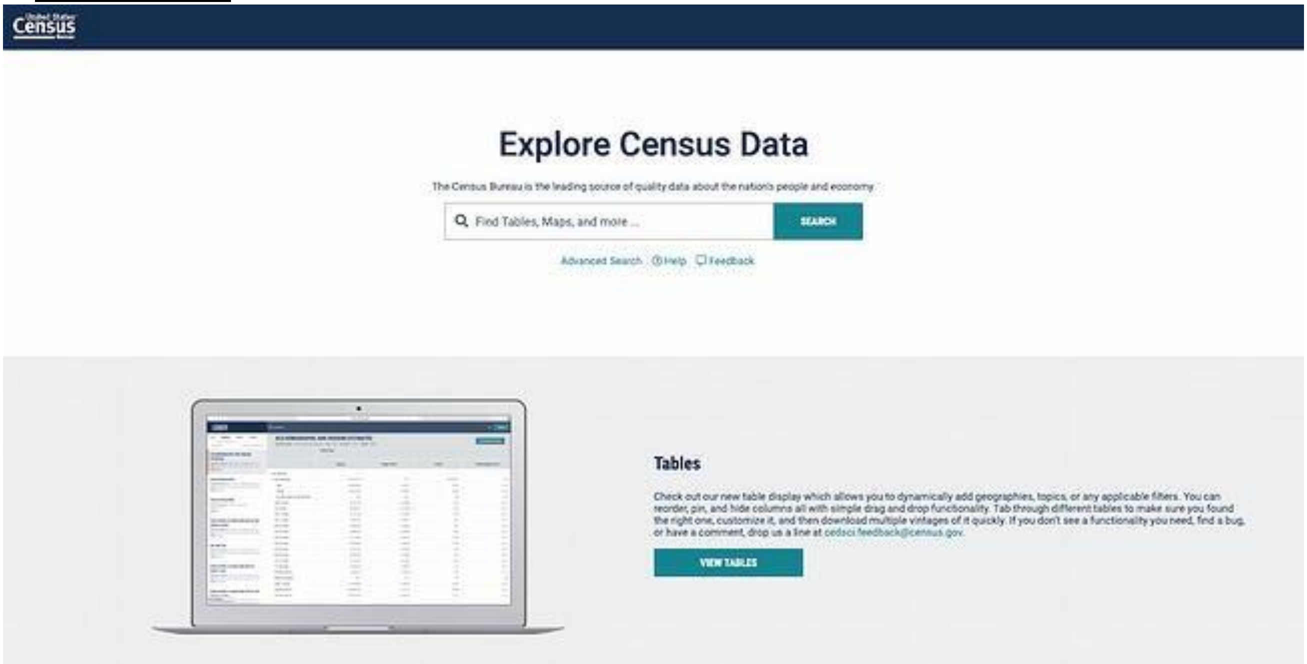
1. **<u>Think with Google Research Tools</u>**




Wish you had information on your product’s likelihood of success? Think With Google's marketing research tools offer interesting insights on whether anyone is looking for your

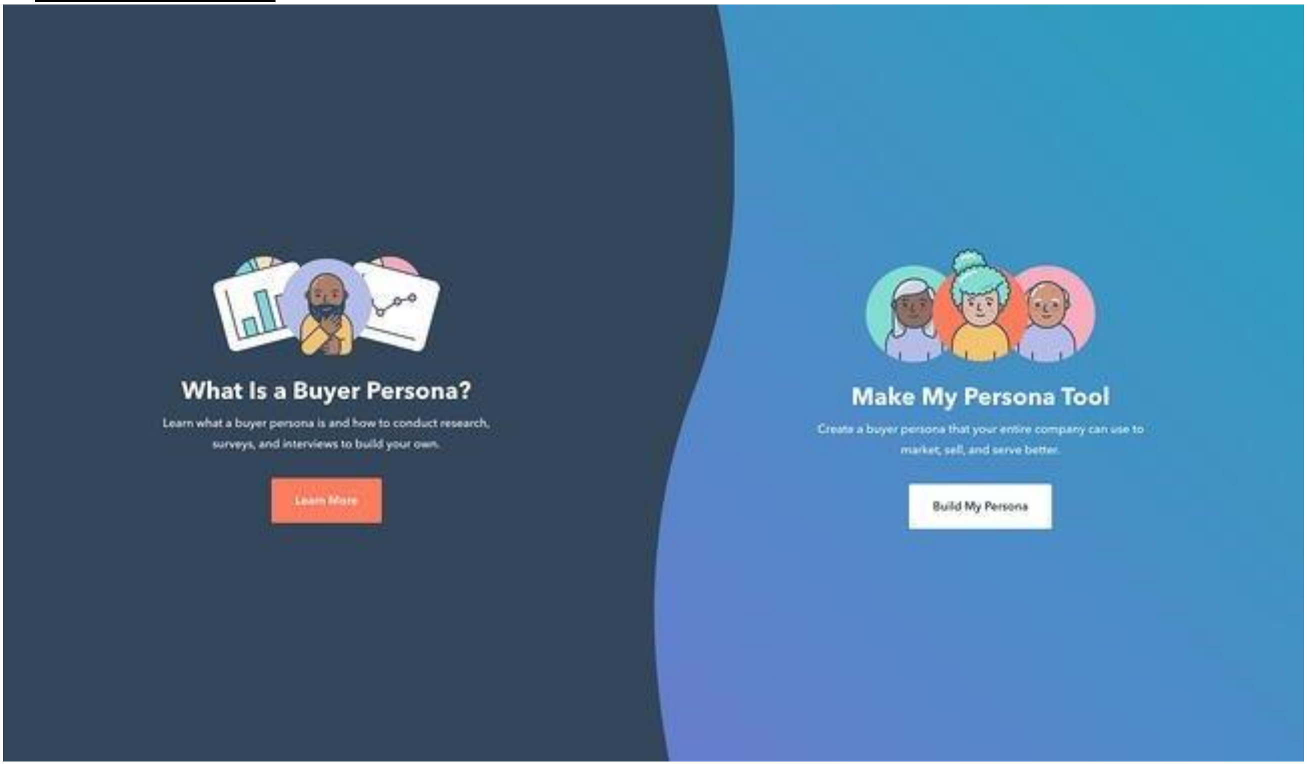
product (**Google Trends**), which markets to launch to (**Market Finder**), and what retail categories rise as the months and seasons pass (**Rising Retail Categories**).
If you'd like to market your product through YouTube, the **Find My Audience** tool allows you to investigate what your potential viewers are interested in and what you should discuss in your brand's YouTube channel.
**Pricing**: Free

2. **Census Bureau**




The Census Bureau offers a free resource for searching U.S. census data. You can filter by age, income, year, and location. You can also use some of its shortcuts to access visualizations of the data, allowing you to see potential target markets across the country.
One of the best ways to use this tool is by finding the **NAICS** code for your business, then accessing the **Tables** tool, then clicking Filter on the sidebar and searching for your industry. Easily find out where your target industry is most popular — or where the market has been oversaturated. Another helpful tool is the **Census Bureau Business and Economy data**, where you can also target premade tables depending on your industry.
**Pricing**: Free

3. **Make My Persona**




Make My Persona is a proprietary tool that allows you to create a **buyer persona** for your potential new product. Defining who might benefit from your product is key to marketing it in an effective way. In this tool, you pick a name for the persona, choose their age, identify their career characteristics, and identify their challenges, allowing you to pinpoint both demographic and psychographic information.

This tool is most suited for B2B product launches, because you'll be prompted to document your buyer persona's career objectives and role-specific challenges. As such, your product would ideally solve a problem for them in the workplace or help their company achieve revenue goals.

**Pricing**: Free

4. **Tableau**

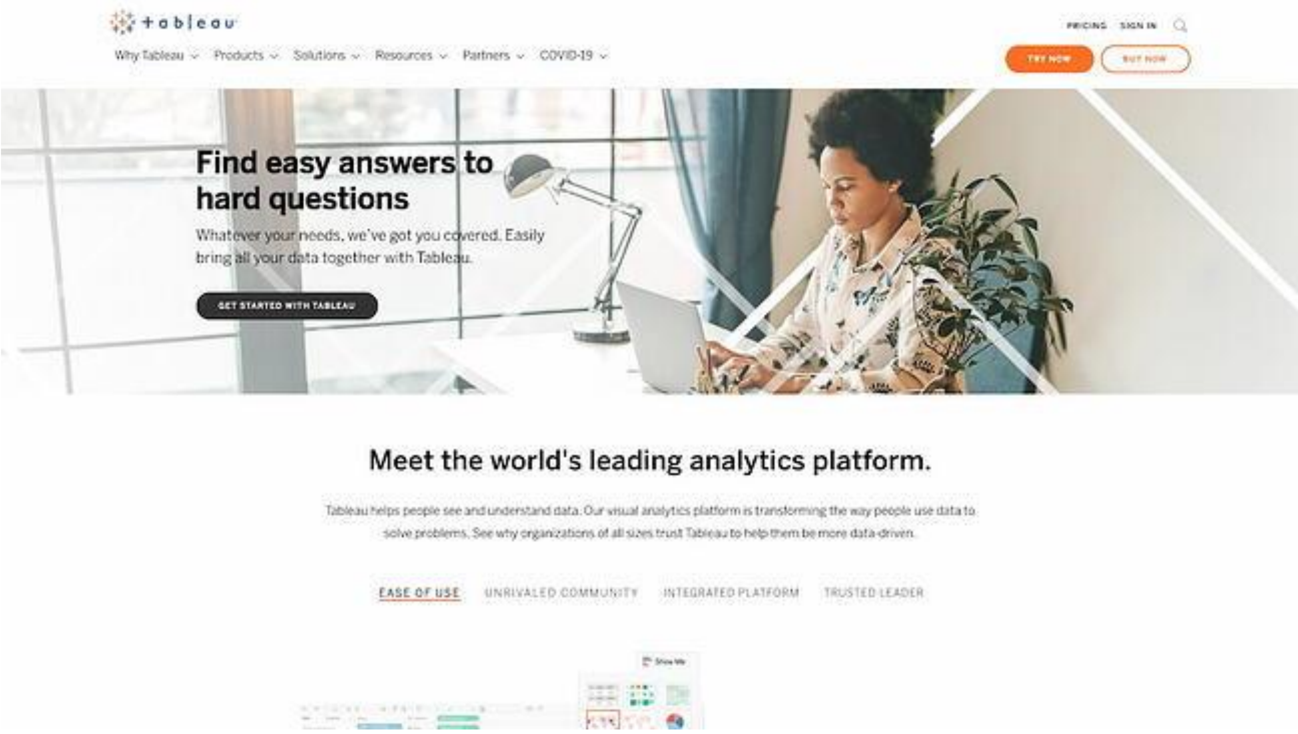



Tableau is a business intelligence suite of products that allows you to “connect to virtually any data source.” But the data isn’t presented in unreadable tables. Rather, Tableau helps you visualize this data in a way that helps you glean insights, appeal to external stakeholders, and communicate the feasibility of your product to potential investors.

You can visualize data on anything from corn production in tropical climate zones to office product sales in North America. With Tableau’s tools, you can take as granular or as general a look you’d like into potential marketplaces and supplier regions.

**Pricing**: $12/user/month (Tableau Viewer); $35/user/month (Tableau Explorer); $70/user/month (Tableau Creator)

5. **Statista**


Statista is a data visualization website that takes data from reputable reports across the web and makes them easy and digestible for researchers, marketers, and product creators just like you.

It helps you find even the most specific data relating to your industry. Are you planning on launching a new video game and want to know how many hours people spend playing video games? There's a **chart** for that.

One neat aspect of using Statista is that the same chart is updated as the years pass. Say that you want to allude to the **value of the beauty market** in your proposal. If your investor accesses that same graph a year from now, it will reflect updated numbers, as Statista always finds the most recent research to update their visualizations. (Note that Statista doesn't carry out original research.)

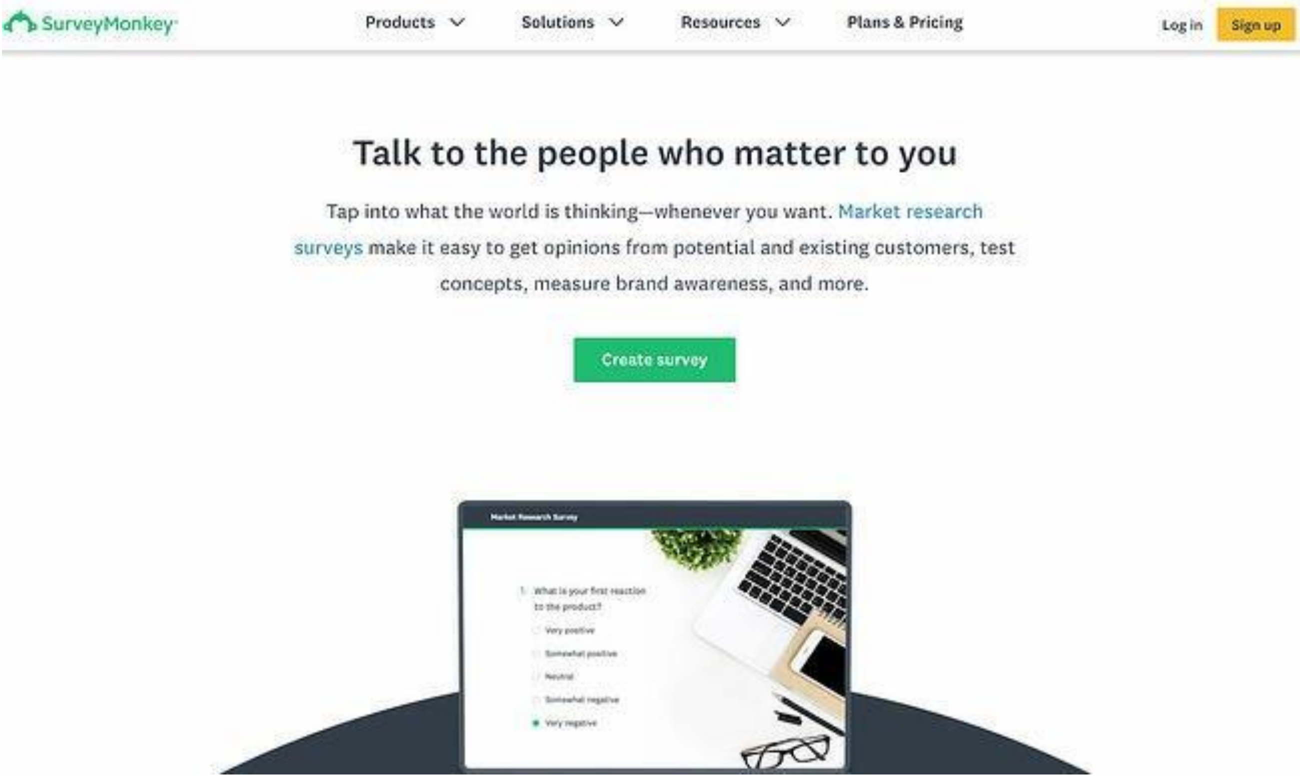
**Pricing**: Free; $39/month (billed yearly); $1,950 (one-time 30-day access)

6. **Claritas MyBestSegment**


Claritas MyBestSegment provides product researchers with tools to understand an area's demographic information and the area's inhabitants' lifestyle habits. By finding out what a segment of the population does — without having to go out and survey them — you can find out which areas would be most receptive to a campaign or launch, which competitors are located nearby, and which lifestyle trends have shifted or are on the rise. A snapshot of an audience segment gives you basic information on their household income, lifestyle traits, employment levels, and education levels. If you want more specific data relating to these topics, you'll have to **contact Claritas' sales team** to become a customer.

**Pricing**: Free; Pricing available on request

7. **SurveyMonkey**



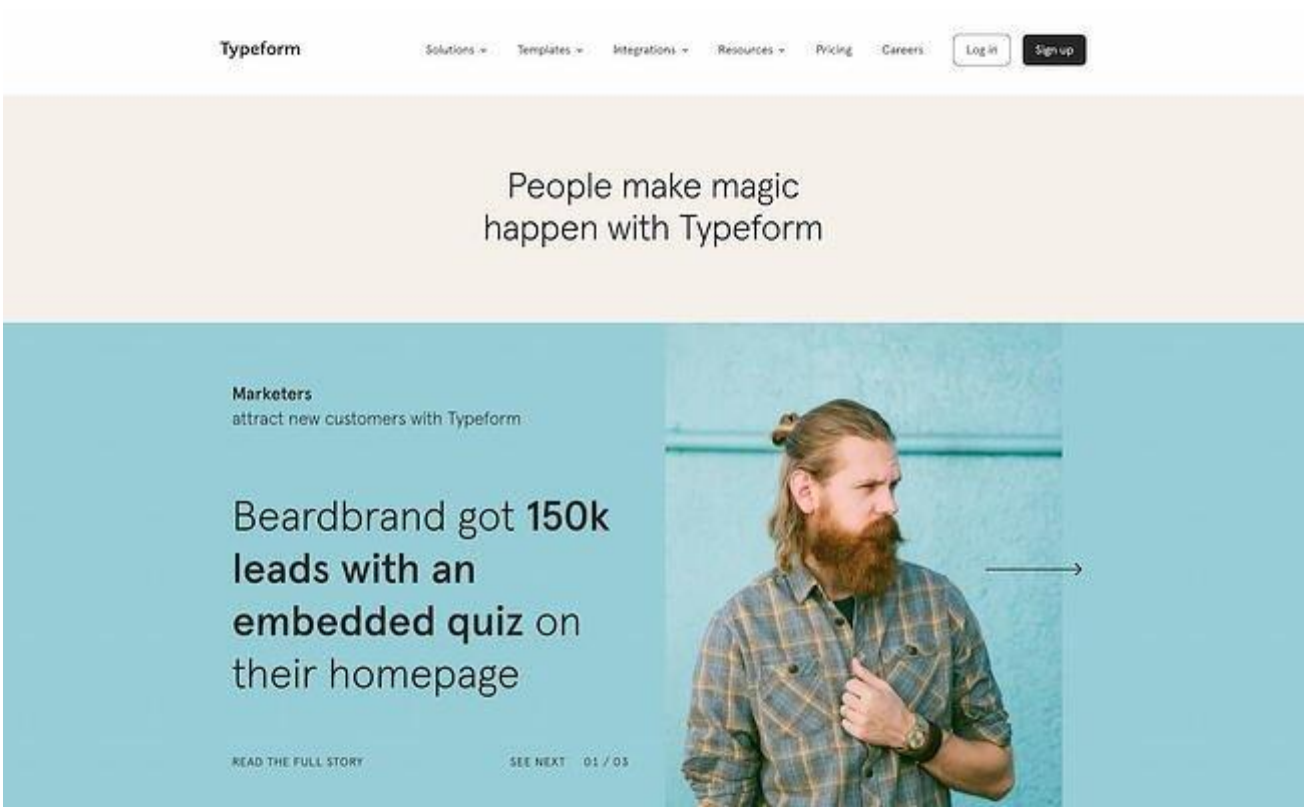

SurveyMonkey is a powerful tool for creating in-depth **market research surveys** that will help you understand your market and consumer preferences.

With this tool, you can create targeted, uber-specific surveys that help you collect answers that pertain specifically to your product. While using a data source can give you a general overview of your target audience and market, SurveyMonkey can help you get more granular insights from real consumers.

SurveyMonkey offers dedicated **market research solutions and services**, including a global survey panel, a survey translation service for international research, and a reporting dashboard option that allows you to easily parse through the results.

**Pricing**: Free, $32/month (Advantage Annual), $99/month (Premier Annual), $99/month (Standard Monthly); $25/user/month (Team Advantage, minimum 3 users), $75/user/month (Team Premier, minimum 3 users), Enterprise (Contact for pricing)

8. **Typeform**




Like SurveyMonkey, Typeform allows you to run research surveys to get direct answers from your target consumers. It's an easy-to-use, mobile-optimized form-builder that's great for market research.

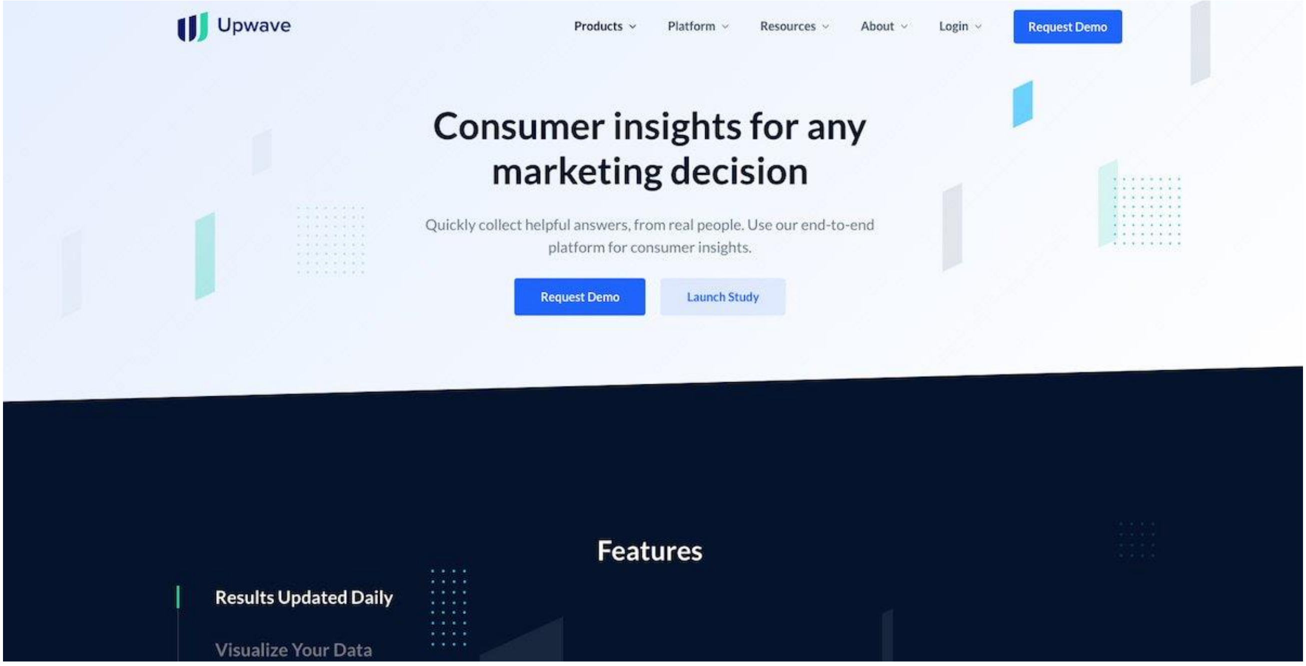
Typeform's distinguishing factor is that it shows viewers one form field at a time. In its templates, it encourages a more conversational, casual approach (like in its market research survey template). This makes it a better fit for product launches that target a younger demographic. If you're targeting C-suite executives at established firms, consider a more formal option such as SurveyMonkey or keeping your tone more formal in your questions.

You can create a wide range of question types, including multiple choice questions, short-form questions, and rating scale questions. Other features include the ability to recall answers from previous questions and create logic jumps.

In a survey, you'd want to collect both demographic and **psychographic information** on your customer, seeking to understand their purchasing behaviors and the problems they encounter. The goal is to find out if your product is the solution to one of those problems — and whether, before launching, you should add more features or rethink your **product positioning strategy**.

**Pricing**: Free; $35/month (Essentials); $50/month (Professional); $70/month (Premium)

9. **Upwave Instant Insights**

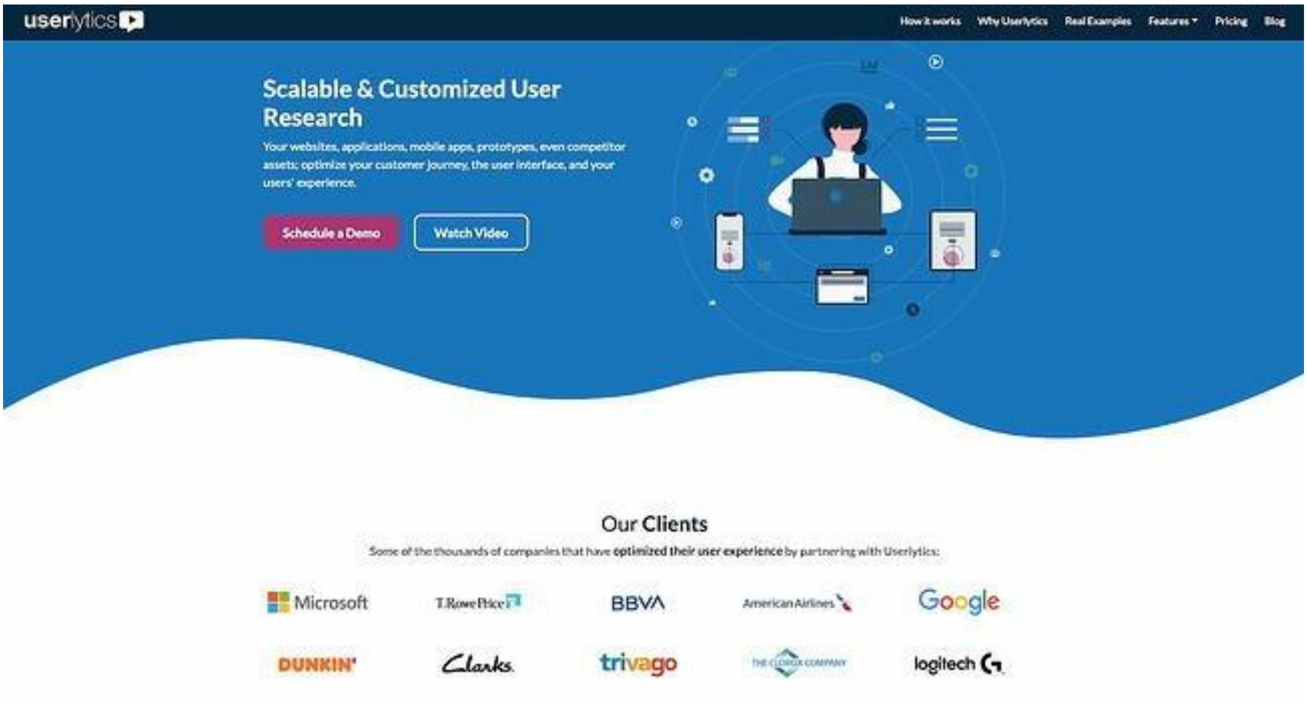



Upwave Instant Insights is a consumer research tool that's part of the Upwave brand marketing platform. While it isn't advertised as a survey creation tool, it allows you to launch market research surveys specifically to get consumer insights.
Instant Insights allows you to target audiences on Upwave's **partner ecosystem** and visualize the data for easy scanning by key stakeholders and investors. One pro of using this platform is that Upwave distributes your survey to real people — not just people taking surveys for the money, which could skew the results.
To create a survey, you **sign up on the Upwave platform**, click your name in the upper right-hand corner, and click "My Surveys," where you can create as many surveys as you want. For the Basic option, you have a 6-question limit, while the Advanced option allows you to include unlimited questions.
**Pricing**: $2/study participant (Basic); $3/study participant (Extended); $4/study participant (Advanced)

10. **Loop11**


Loop11 is a user experience testing platform that allows you to test the usability of your website, study user intent, test the information architecture of your site, and examine how the user experience changes based on the device they're using.
This tool is useful for market research because you can find out whether your target consumers find your site easy to navigate. You can also identify snags that prevent conversions.
Loop11 tests your site by making users perform tasks. They then complete a short question about how easy or difficult the task was to complete. Your product may be phenomenal, but unless consumers can buy it through your site, you won't launch it successfully.
You can use Loop11's participants or bring in your own.
**Pricing**: $63/month (Rapid Insights), $239/month (Pro), $399/month (Enterprise)

11. **Userlytics**



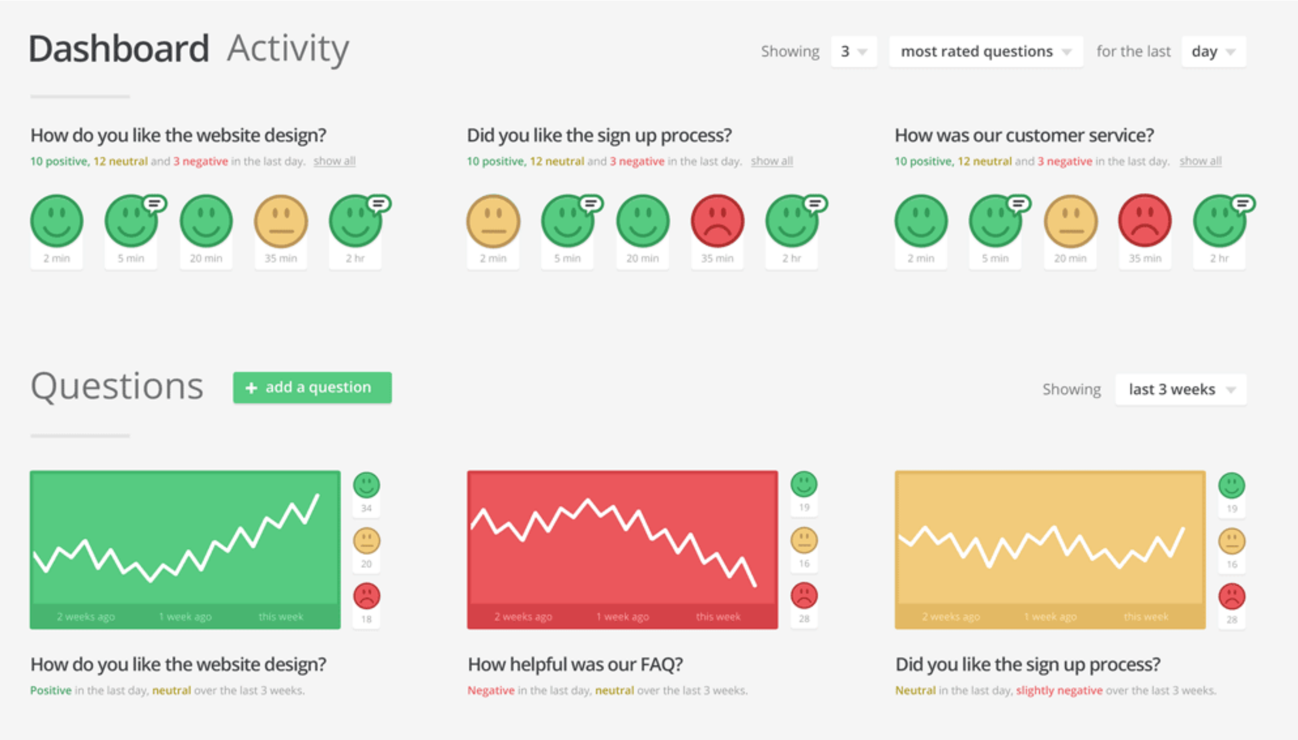

Like Loop11, Userlytics allows you to test the usability of your website, mobile app, and site prototype. You can target different devices, define a buyer persona, and disqualify participants based on screening questions.

Testing is based on tasks that your test-takers carry out. They then answer a simple question about the difficulty of the task. You can structure the question in various ways; you can leave it open-ended, provide multiple choices, or ask for a rating. Other formats you can use include System Usability Scale (SUS) questions, Net Promoter Score (NPS) questions, and Single Ease Questions (SEQ).

Userlytics performs both a webcam and a screen recording. You can compare the user's answers with their reactions on video to understand how they feel when they're interacting with your assets.

**Pricing**: $49/participant (Quick & Easy); $69/participant (Annual Enterprise); Custom pricing available on request

12. **Temper**



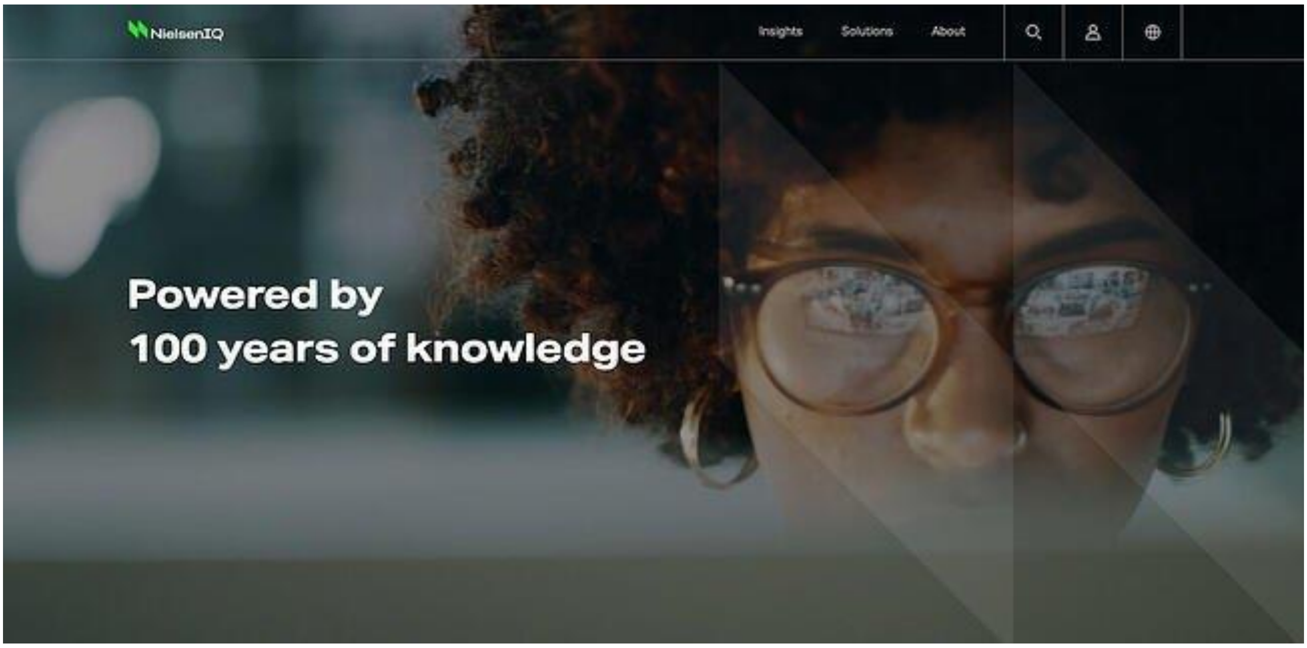

Sometimes you need a no-frills test to take the pulse of consumers. Temper allows you to create a question, grab a snippet of code, and pop it onto your website. The smiley face, "meh" face, and frown face make it easy for viewers to make a snap judgment.

One great way to use this tool is by adding the widget on a blog post announcing the launch of your new product. That way, you can find out general sentiment on the product before launching it. You can also add it to a product page, an email, or a landing page.

When you include the widget, you can change the question to something that's tailored to your offerings.

**Pricing**: $12/month (Hobby), $49/month (Pro), $89/month (Business), $199/month (White Label)

13. **NielsenIQ**

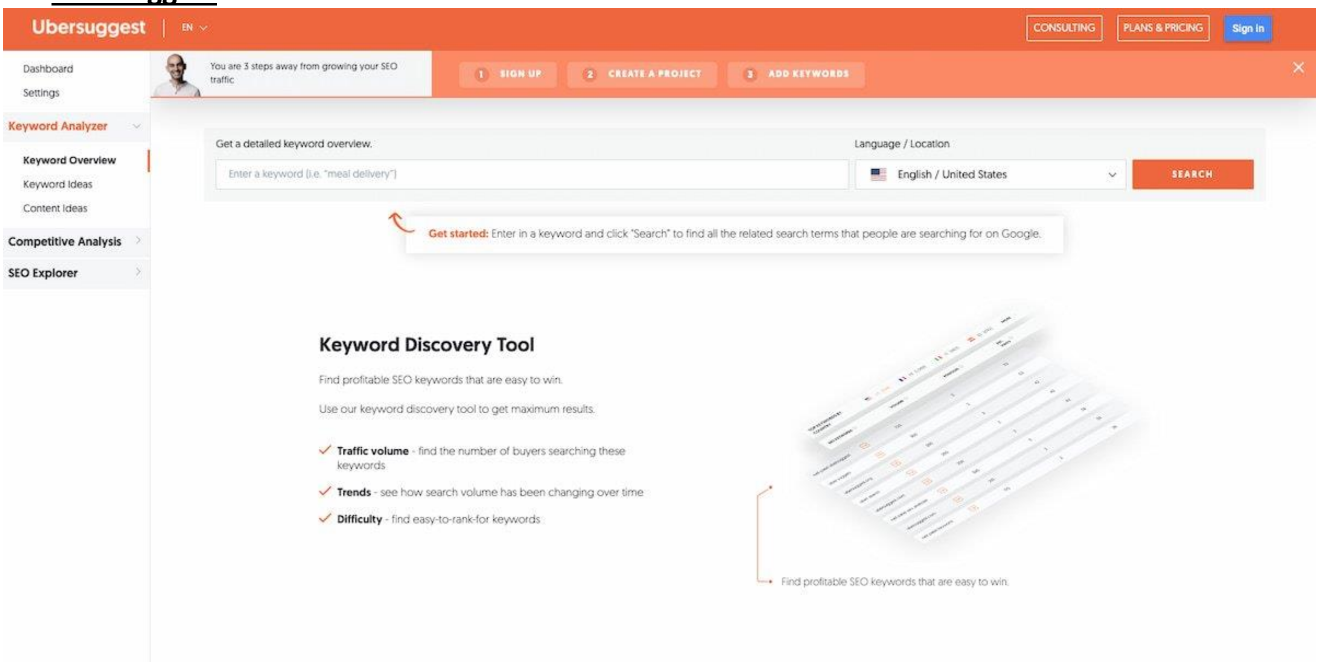



NielsenIQ is a retail and consumer intelligence consultant that works with you to collect consumer insights, identify the best distribution channels for your product, and create a range of products that addresses the needs of your target buyers.

This service helps you look at your product launch from all angles and delivers forecasting data that predicts how your sales will perform upon launch. NielsenIQ can also run **consumer insights surveys** on their list of panelists and partners.

Because it operates like a consultant and not as a self-service software, NielsenIQ is a better option for established firms with a bigger product launch budget.

14. **Ubersuggest**



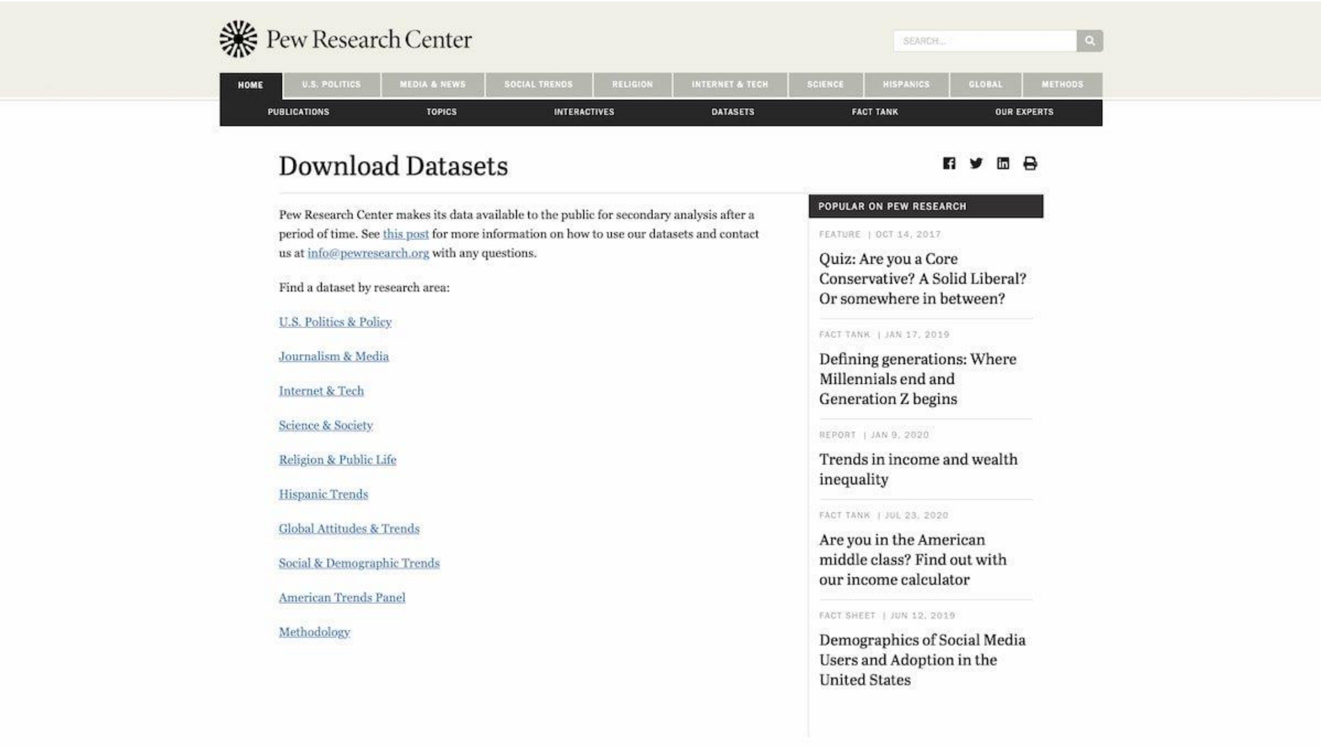

Ubersuggest is a simple tool for doing keyword and content research. You can input a phrase, and it'll create a list of keyword suggestions. You can also see top performing articles and pages so that you get an initial understanding of the type of content that ranks for the keywords.

This tool is useful for market research because you can see who your top competitors are, how often your product is searched for, and whether there's enough space in the market for the type of product you're launching. You can also find out the questions your target audience asks in relation to the product. Each of these questions can be turned into a blog post that can inform your audience, increasing your brand authority and driving conversions.

Alternatives to Ubersuggest include **Moz**, **Ahrefs**, and **SEMRush**.

**Pricing**: Free; $29/month (Individual); $49/month (Business); $99/month (Enterprise / Agency)

15. **Pew Research Center**




From economic conditions, to political attitudes, to social media usage, the Pew Research Center website has a ton of free research that you can use to better understand your target market. Best of all, the site has **interactive articles** that allow you to filter and sift through the data for more granular, targeted insights.

Topics include U.S. politics, digital media, social trends, religion, science, and technology.

**Pricing**: Free

16. **BrandMentions**

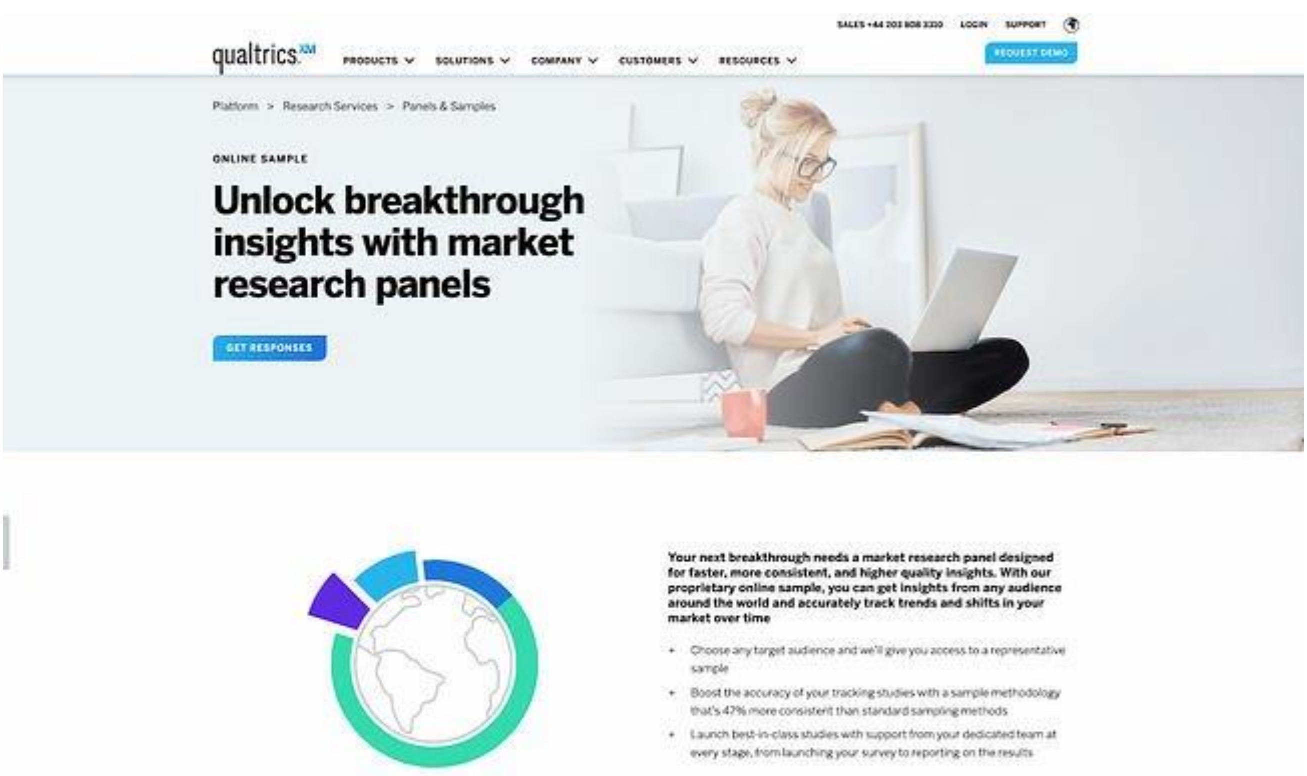

BrandMentions is a social media monitoring platform that can help you understand what your prospective customers are buzzing about online. Search for a keyword, and BrandMentions will show you recent social posts that contain that keyword, along with the context of its usage. After subscribing to the platform, you can also get sentiment analysis on the keyword.

You'll also get other metrics such as Reach (how many people view the keyword per day), Performance (how many people engage with the keyword per day), and Mentions by Weekday (when people are mentioning the keyword).

You can use this tool for market research by finding out when people are looking for your product on social media sites. When you start announcing the new product, you can use insights from this tool to post about the launch at exactly the right time. It also allows you to find out how people are generally feeling about the type of product you're launching. That way, you can better refine the tone of your campaigns.

**Pricing**: $99/month (Growing Business); $ 299/month (Company); $ 499/month (Enterprise/Agency)

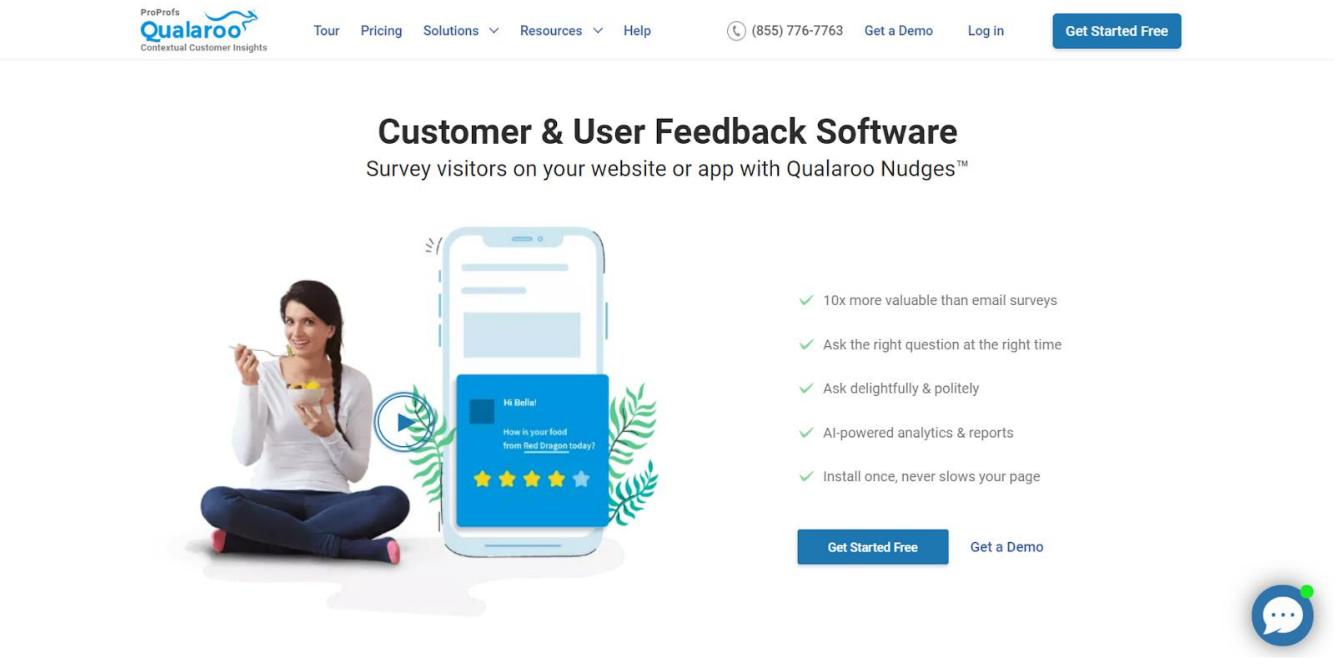
17. **Qualtrics Market Research Panels**




Qualtrics takes the pain of finding respondents for your market research surveys through an online sample service. After identifying your target audience, you can go to Qualtrics for access to a representative sample. You can either use your chosen survey software or use Qualtrics' built-in platform for insights and feedback.

**Pricing**: Pricing available on request

18. **Qualaroo**




Qualaroo is an advanced user and market research tool that helps you understand your target market with targeted surveys. You can run surveys on over six channels at once (such as website, app, product, social media, and mail,) to get a 360-degree view of your existing and potential customers.

It comes packed with features like question branching, 12+ answer types, automatic survey language translation, in-depth audience targeting, pre-built survey templates, and an extensive repository of professionally designed questions.

You can create various market research surveys in minutes to collect data on the demographic, psychographic, and behavioral traits of your target audience. It can help you map customers' expectations and preferences, create customer personas, and perform audience segmentation.

Qualaroo also promotes quick feedback analysis. Its in-built AI-based sentiment analysis and text analytics engine automatically categorizes the responses based on user moods. It also highlights the key phrases and words in real-time, saving hours of manual work.

**Pricing**: $80/month billed annually (Essentials); $160/month billed annually (Premium)

Conducting market research is essential to successfully launch a product to market.

In order to become an online market research PRO, need to understand:

- What are the different types of market research, and how is quant online research different
- How to unpack your research objective
- Questionnaire design
- Survey programming
- Conducting fieldwork
- Data cleaning and processing
- Data analysis and interpretation

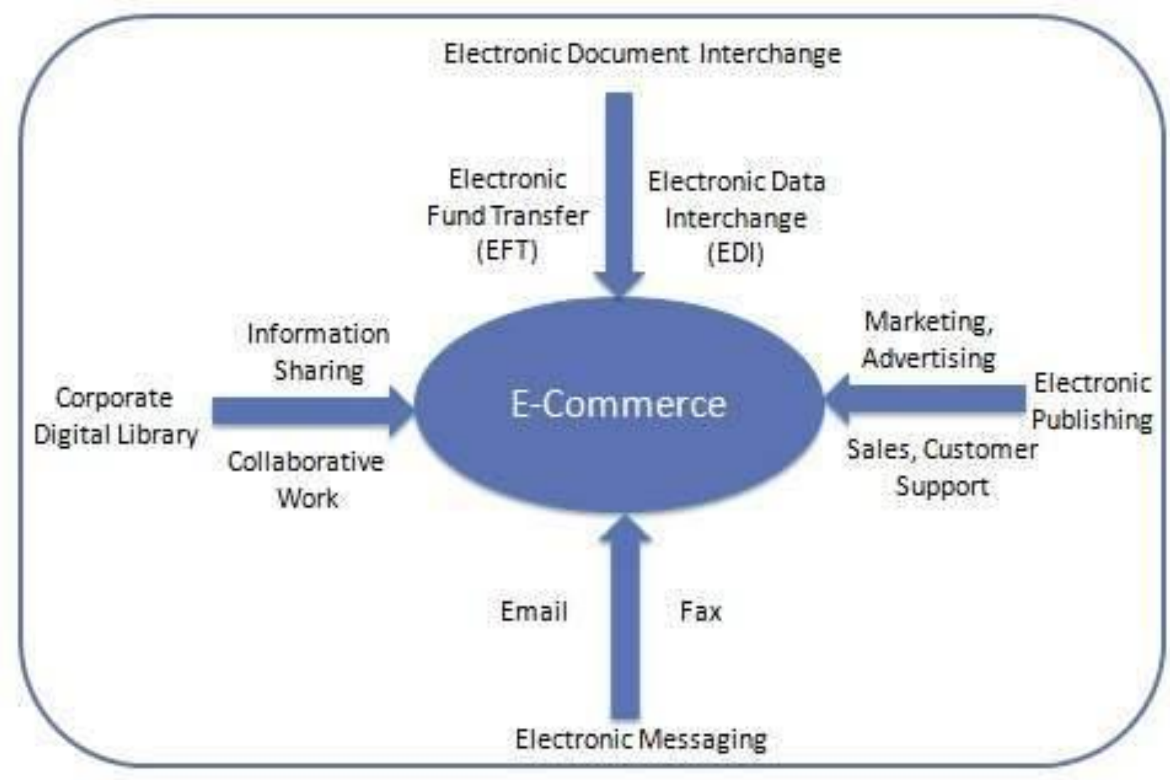
# Module 11: E-commerce

## What is E-Commerce?

E-Commerce or Electronics Commerce is a methodology of modern business, which addresses the requirements of business organizations. It can be broadly defined as the process of buying or selling of goods or services using an electronic medium such as the Internet.

E-Commerce or Electronics Commerce is a methodology of modern business, which addresses the need of business organizations, vendors and customers to reduce cost and improve the quality of goods and services while increasing the speed of delivery. Ecommerce refers to the paperless exchange of business information using the following ways –

- Electronic Data Interchange (EDI)
- Electronic Mail (e-mail)
- Electronic Bulletin Boards
- Electronic Fund Transfer (EFT)
- Other Network-based technologies




## Features

**E-Commerce provides the following features –**

- **Non-Cash Payment** − E-Commerce enables the use of credit cards, debit cards, smart cards, electronic fund transfer via bank's website, and other modes of electronics payment.
- **24x7 Service availability** – E-commerce automates the business of enterprises and the way they provide services to their customers. It is available anytime, anywhere.
- **Advertising / Marketing** − E-commerce increases the reach of advertising of products and services of businesses. It helps in better marketing management of products/services.
- **Improved Sales** − Using e-commerce, orders for the products can be generated anytime, anywhere without any human intervention. It gives a big boost to existing sales volumes.
- **Support** − E-commerce provides various ways to provide pre-sales and post-sales assistance to provide better services to customers.
- **Inventory Management** − E-commerce automates inventory management. Reports get generated instantly when required. Product inventory management becomes very efficient and easy to maintain.
- **Communication improvement** − E-commerce provides ways for faster, efficient, reliable communication with customers and partners.


## Traditional Commerce v/s E-Commerce

| Sr. No. | Traditional Commerce | E-Commerce |
|---|---|---|
| 1 | Heavy dependency on information exchange from person to person. | Information sharing is made easy via electronic communication channels making little dependency on person to person information exchange. |
| 2 | Communication/ transaction are done in synchronous way. Manual | Communication or transaction can be done in asynchronous way. Electronics system |

| | | |
|---|---|---|
| | intervention is required for each communication or transaction. | automatically handles when to pass communication to required person or do the transactions. |
| 3 | It is difficult to establish and maintain standard practices in traditional commerce. | A uniform strategy can be easily established and maintain in e-commerce. |
| 4 | Communications of business depends upon individual skills. | In e-Commerce or Electronic Market, there is no human intervention. |
| 5 | Unavailability of a uniform platform as traditional commerce depends heavily on personal communication. | E-Commerce website provides user a platform where al l information is available at one place. |
| 6 | No uniform platform for information sharing as it depends heavily on personal communication. | E-Commerce provides a universal platform to support commercial / business activities across the globe. |

## E-Commerce advantages can be broadly classified in three major categories –

- Advantages to Organizations
- Advantages to Consumers
- Advantages to Society
- e-commerce advantages

**Advantages to Organizations**

- Using e-commerce, organizations can expand their market to national and international markets with minimum capital investment. An organization can easily locate more customers, best suppliers, and suitable business partners across the globe.
- E-commerce helps organizations to reduce the cost to create process, distribute, retrieve and manage the paper based information by digitizing the information.
- E-commerce improves the brand image of the company.
- E-commerce helps organization to provide better customer services.
- E-commerce helps to simplify the business processes and makes them faster and efficient.
- E-commerce reduces the paper work.
- E-commerce increases the productivity of organizations. It supports "pull" type supply management. In "pull" type supply management, a business process starts when a request comes from a customer and it uses just-in-time manufacturing way.

## Advantages to Customers

- It provides 24x7 support. Customers can enquire about a product or service and place orders anytime, anywhere from any location.

- E-commerce application provides users with more options and quicker delivery of products.
- E-commerce application provides users with more options to compare and select the cheaper and better options.
- A customer can put review comments about a product and can see what others are buying, or see the review comments of other customers before making a final purchase.
- E-commerce provides options of virtual auctions.
- It provides readily available information. A customer can see the relevant detailed information within seconds, rather than waiting for days or weeks.
- E-Commerce increases the competition among organizations and as a result, organizations provides substantial discounts to customers.

## Advantages to Society

- Customers need not travel to shop a product, thus less traffic on road and low air pollution.
- E-commerce helps in reducing the cost of products, so less affluent people can also afford the products.
- E-commerce has enabled rural areas to access services and products, which are otherwise not available to them.
- E-commerce helps the government to deliver public services such as healthcare, education, social services at a reduced cost and in an improved manner.

## E-commerce disadvantages

**The disadvantages of e-commerce can be broadly classified into two major categories** –

- Technical disadvantages
- Non-Technical disadvantages

### Technical Disadvantages

- There can be lack of system security, reliability or standards owing to poor implementation of e-commerce.
- The software development industry is still evolving and keeps changing rapidly.
- In many countries, network bandwidth might cause an issue.
- Special types of web servers or other software might be required by the vendor, setting the e-commerce environment apart from network servers.
- Sometimes, it becomes difficult to integrate an e-commerce software or website with existing applications or databases.
- There could be software/hardware compatibility issues, as some e-commerce software may be incompatible with some operating system or any other component.

### Non-Technical Disadvantages

- Initial cost – The cost of creating/building an e-commerce application in-house may be very high. There could be delays in launching an e-Commerce application due to mistakes, and lack of experience.

- User resistance – Users may not trust the site being an unknown faceless seller. Such mistrust makes it difficult to convince traditional users to switch from physical stores to online/virtual stores.
- Security/ Privacy – It is difficult to ensure the security or privacy on online transactions.
- Lack of touch or feel of products during online shopping is a drawback.
- E-commerce applications are still evolving and changing rapidly.
- Internet access is still not cheaper and is inconvenient to use for many potential customers, for example, those living in remote villages.

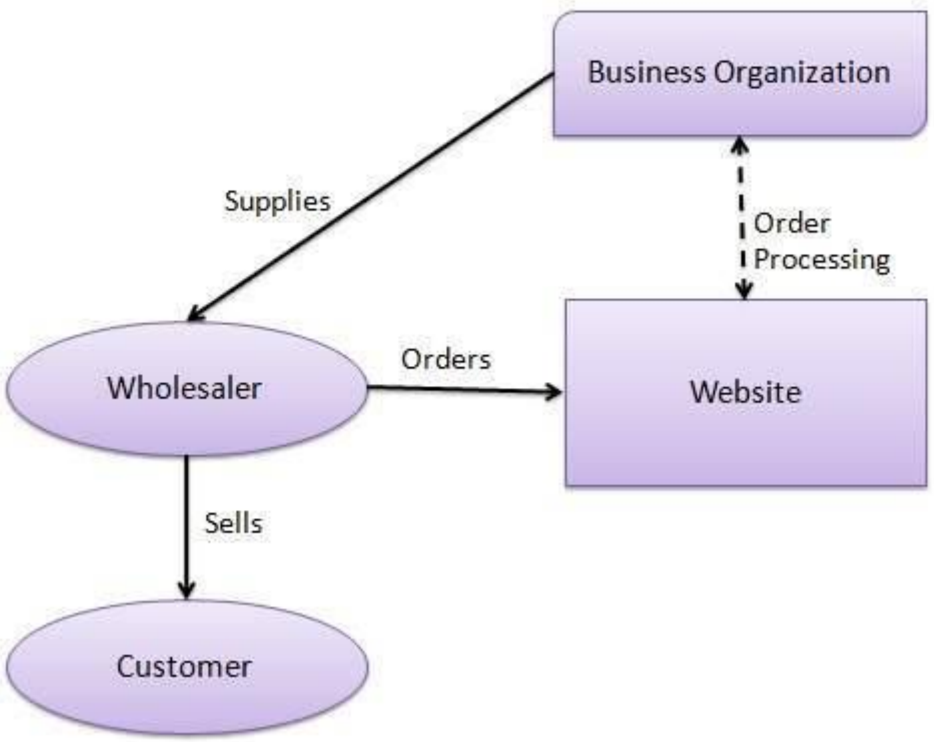
## E-Commerce - Business Models

E-commerce business models can generally be categorized into the following categories.

1. Business - to - Business (B2B)
2. Business - to - Consumer (B2C)
3. Consumer - to - Consumer (C2C)
4. Consumer - to - Business (C2B)
5. Business - to - Government (B2G)
6. Government - to - Business (G2B)
7. Government - to - Citizen (G2C)

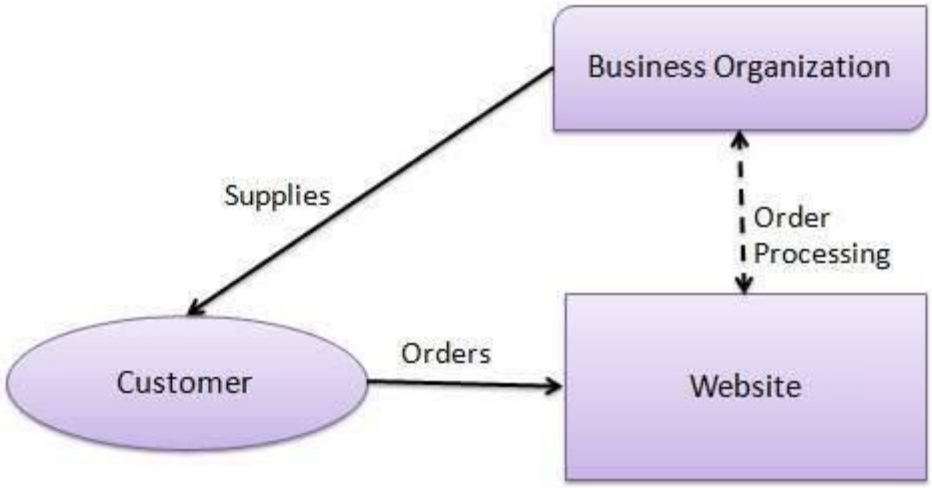
### Business - to - Business

A website following the B2B business model sells its products to an intermediate buyer who then sells the product to the final customer. As an example, a wholesaler places an order from a company's website and after receiving the consignment, sells the endproduct to the final customer who comes to buy the product at one of its retail outlets.



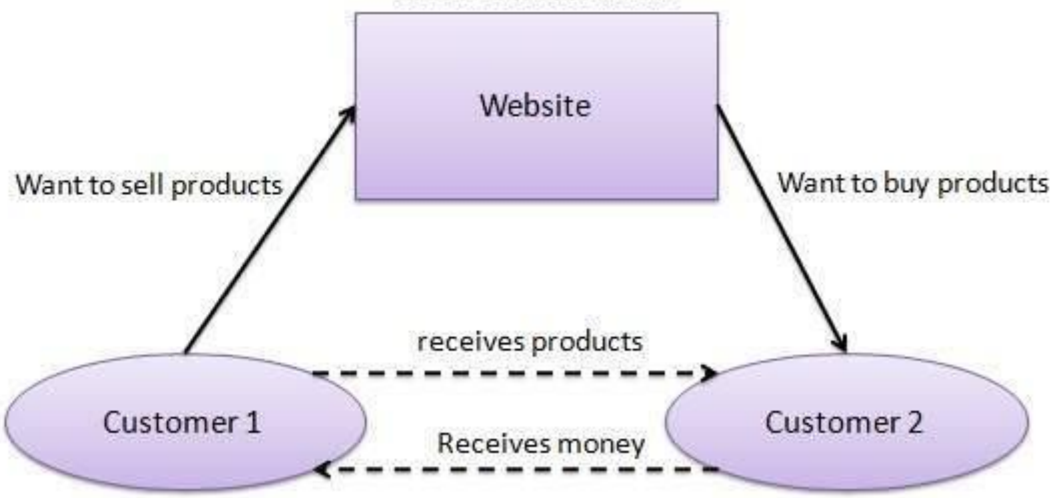
Business - to - Consumer

A website following the B2C business model sells its products directly to a customer. A customer can view the products shown on the website. The customer can choose a product and order the same. The website will then send a notification to the business organization via email and the organization will dispatch the product/goods to the customer.



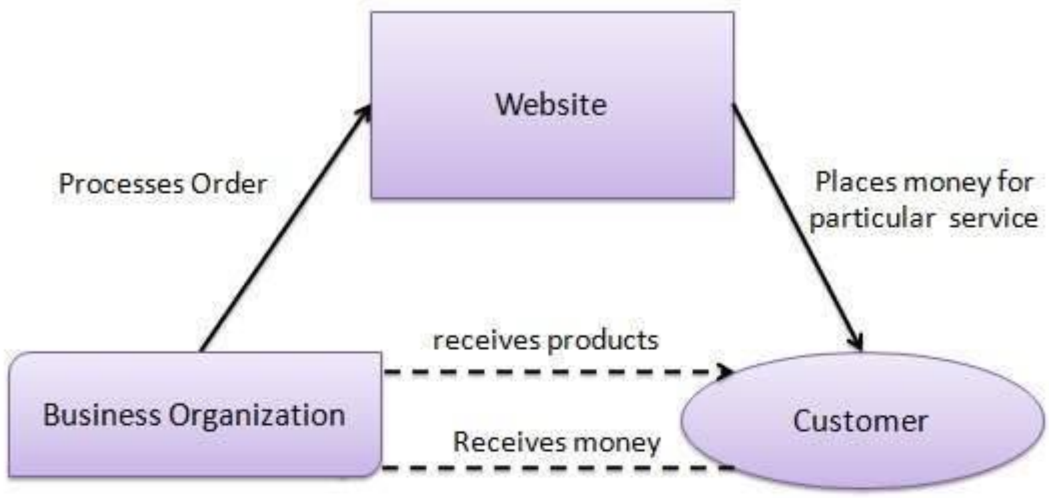

Consumer - to - Consumer

A website following the C2C business model helps consumers to sell their assets like residential property, cars, motorcycles, etc., or rent a room by publishing their information on the website. Website may or may not charge the consumer for its services. Another consumer may opt to buy the product of the first customer by viewing the post/advertisement on the website.




Consumer - to - Business

In this model, a consumer approaches a website showing multiple business organizations for a particular service. The consumer places an estimate of amount he/she wants to spend for a particular service. For example, the comparison of interest rates of personal loan/car loan provided by various banks via websites. A business organization who fulfills the consumer's requirement within the specified budget, approaches the customer and provides its services.

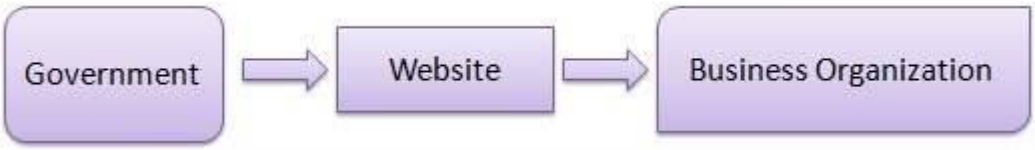



Business - to - Government

B2G model is a variant of B2B model. Such websites are used by governments to trade and exchange information with various business organizations. Such websites are accredited by the government and provide a medium to businesses to submit application forms to the government.


Government - to - Business

Governments use B2G model websites to approach business organizations. Such websites support auctions, tenders, and application submission functionalities.




Government - to - Citizen

Governments use G2C model websites to approach citizen in general. Such websites support auctions of vehicles, machinery, or any other material. Such website also provides services like registration for birth, marriage or death certificates. The main objective of G2C websites is to reduce the average time for fulfilling citizen’s requests for various government services.

## E-Commerce - Payment Systems

E-commerce sites use electronic payment, where electronic payment refers to paperless monetary transactions. Electronic payment has revolutionized the business processing by reducing the paperwork, transaction costs, and labor cost. Being user friendly and less time-consuming than manual processing, it helps business organization to expand its market reach/expansion. Listed below are some of the modes of electronic payments –

1. Credit Card
2. Debit Card
3. Smart Card
4. E-Money
5. Electronic Fund Transfer (EFT)

## 1. Credit Card

Payment using credit card is one of most common mode of electronic payment. Credit card is small plastic card with a unique number attached with an account. It has also a magnetic strip embedded in it which is used to read credit card via card readers. When a customer purchases a product via credit card, credit card issuer bank pays on behalf of the customer and customer has a certain time period after which he/she can pay the credit card bill. It is usually credit card monthly payment cycle. Following are the actors in the credit card system.

- The card holder – Customer
- The merchant – seller of product who can accept credit card payments.
- The card issuer bank – card holder's bank
- The acquirer bank – the merchant's bank
- The card brand – for example , visa or Mastercard.

**Credit Card Payment Process**

| Step | Description |
|---|---|
| Step 1 | Bank issues and activates a credit card to the customer on his/her request. |
| Step 2 | The customer presents the credit card information to the merchant site or to the merchant from whom he/she wants to purchase a product/service. |
| Step 3 | Merchant validates the customer's identity by asking for approval from the card brand company. |
| Step 4 | Card brand company authenticates the credit card and pays the transaction by credit. Merchant keeps the sales slip. |
| Step 5 | Merchant submits the sales slip to acquirer banks and gets the service charges paid to him/her. |
| Step 6 | Acquirer bank requests the card brand company to clear the credit amount and gets the payment. |

| | |
|---|---|
| Step 6 | Now the card brand company asks to clear the amount from the issuer bank and the amount gets transferred to the card brand company. |

## 2.Debit Card

Debit card, like credit card, is a small plastic card with a unique number mapped with the bank account number. It is required to have a bank account before getting a debit card from the bank. The major difference between a debit card and a credit card is that in case of payment through debit card, the amount gets deducted from the card's bank account immediately and there should be sufficient balance in the bank account for the transaction to get completed; whereas in case of a credit card transaction, there is no such compulsion.

Debit cards free the customer to carry cash and cheques. Even merchants accept a debit card readily. Having a restriction on the amount that can be withdrawn in a day using a debit card helps the customer to keep a check on his/her spending.

## 3.Smart Card

Smart card is again similar to a credit card or a debit card in appearance, but it has a small microprocessor chip embedded in it. It has the capacity to store a customer’s work-related and/or personal information. Smart cards are also used to store money and the amount gets deducted after every transaction.

Smart cards can only be accessed using a PIN that every customer is assigned with. Smart cards are secure, as they store information in encrypted format and are less expensive/provides faster processing. Mondex and Visa Cash cards are examples of smart cards.

## E-Money

E-Money transactions refer to situation where payment is done over the network and the amount gets transferred from one financial body to another financial body without any involvement of a middleman. E-money transactions are faster, convenient, and saves a lot of time.

Online payments done via credit cards, debit cards, or smart cards are examples of emoney transactions. Another popular example is e-cash. In case of e-cash, both customer and merchant have to sign up with the bank or company issuing e-cash.

## Electronic Fund Transfer

It is a very popular electronic payment method to transfer money from one bank account to another bank account. Accounts can be in the same bank or different banks. Fund transfer can be done using ATM (Automated Teller Machine) or using a computer.

Nowadays, internet-based EFT is getting popular. In this case, a customer uses the website provided by the bank, logs in to the bank's website and registers another bank account. He/she then places a request to transfer certain amount to that account. Customer's bank transfers the amount to other account if it is in the same bank, otherwise the transfer request is forwarded to an ACH (Automated Clearing House) to transfer the amount to other account and the amount is deducted from the customer's account. Once the amount is transferred to other account, the customer is notified of the fund transfer by the bank.

## E-Commerce - Security Systems

Security is an essential part of any transaction that takes place over the internet. Customers will lose his/her faith in e-business if its security is compromised. Following are the essential requirements for safe e-payments/transactions −

- **Confidentiality** − Information should not be accessible to an unauthorized person. It should not be intercepted during the transmission.
- **Integrity** − Information should not be altered during its transmission over the network.
- **Availability** − Information should be available wherever and whenever required within a time limit specified.
- **Authenticity** − There should be a mechanism to authenticate a user before giving him/her an access to the required information.
- **Non-Repudiability** − It is the protection against the denial of order or denial of payment. Once a sender sends a message, the sender should not be able to deny sending the message. Similarly, the recipient of message should not be able to deny the receipt.
- **Encryption** − Information should be encrypted and decrypted only by an authorized user.
- **Auditability** − Data should be recorded in such a way that it can be audited for integrity requirements.

## Measures to ensure Security

Major security measures are following −

- **Encryption** − It is a very effective and practical way to safeguard the data being transmitted over the network. Sender of the information encrypts the data using a secret code and only the specified receiver can decrypt the data using the same or a different secret code.
- **Digital Signature** − Digital signature ensures the authenticity of the information. A digital signature is an e-signature authenticated through encryption and password.
- **Security Certificates** − Security certificate is a unique digital id used to verify the identity of an individual website or user.

## Security Protocols in Internet

We will discuss here some of the popular protocols used over the internet to ensure secured online transactions.

## Secure Socket Layer (SSL)

It is the most commonly used protocol and is widely used across the industry. It meets following security requirements −

- Authentication
- Encryption

- Integrity
- Non-reputability

"https://" is to be used for HTTP urls with SSL, where as "http:/" is to be used for HTTP urls without SSL.

## Secure Hypertext Transfer Protocol (SHTTP)

SHTTP extends the HTTP internet protocol with public key encryption, authentication, and digital signature over the internet. Secure HTTP supports multiple security mechanism, providing security to the end-users. SHTTP works by negotiating encryption scheme types used between the client and the server.

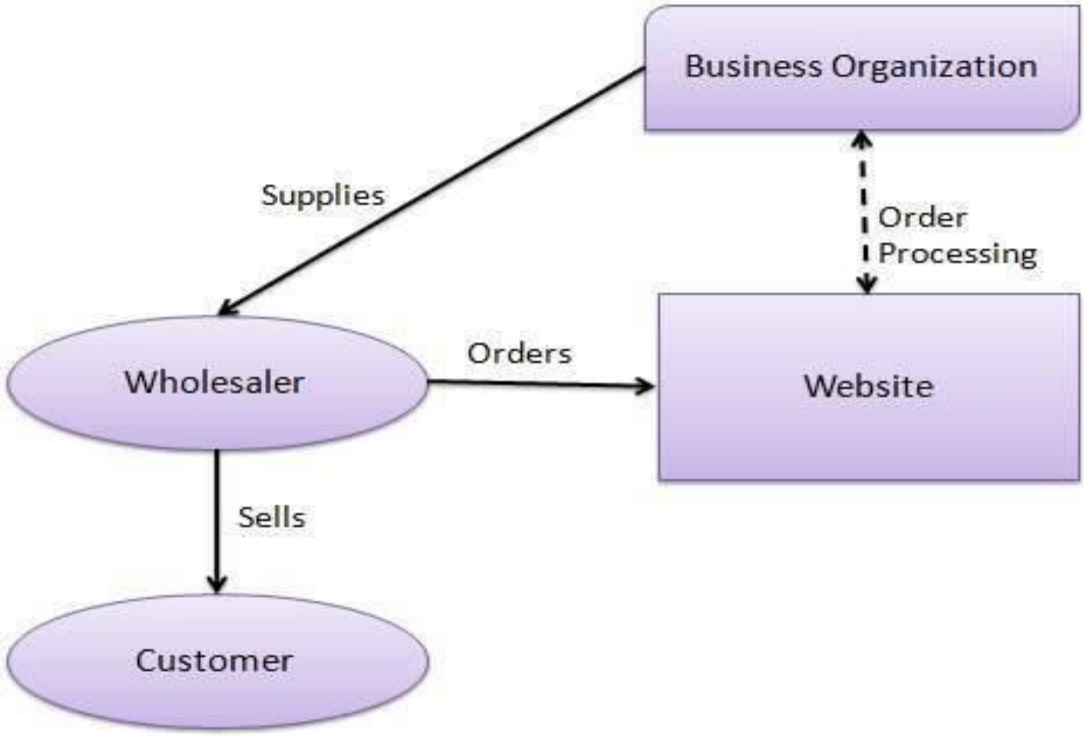
## Secure Electronic Transaction

It is a secure protocol developed by MasterCard and Visa in collaboration. Theoretically, it is the best security protocol. It has the following components −

- **Card Holder's Digital Wallet Software** − Digital Wallet allows the card holder to make secure purchases online via point and click interface.
- **Merchant Software** − This software helps merchants to communicate with potential customers and financial institutions in a secure manner.
- **Payment Gateway Server Software** − Payment gateway provides automatic and standard payment process. It supports the process for merchant's certificate request.
- **Certificate Authority Software** − This software is used by financial institutions to issue digital certificates to card holders and merchants, and to enable them to register their account agreements for secure electronic commerce.

## E-Commerce - B2B Model

A website following the B2B business model sells its products to an intermediate buyer who then sells the products to the final customer. As an example, a wholesaler places an order from a company's website and after receiving the consignment, it sells the endproduct to the final customer who comes to buy the product at the wholesaler's retail outlet.




B2B identifies both the seller as well as the buyer as business entities. B2B covers a large number of applications, which enables business to form relationships with their distributors, re-sellers, suppliers, etc. Following are the leading items in B2B eCommerce.

- Electronics
- Shipping and Warehousing
- Motor Vehicles
- Petrochemicals
- Paper
- Office products
- Food
- Agriculture

### Key Technologies

Following are the key technologies used in B2B e-commerce −

- **Electronic Data Interchange (EDI)** − EDI is an inter-organizational exchange of business documents in a structured and machine processable format.
- **Internet** − Internet represents the World Wide Web or the network of networks connecting computers across the world.
- **Intranet** − Intranet represents a dedicated network of computers within a single organization.
- **Extranet** − Extranet represents a network where the outside business partners, suppliers, or customers can have a limited access to a portion of enterprise intranet/network.
- **Back-End Information System Integration** − Back-end information systems are database management systems used to manage the business data.

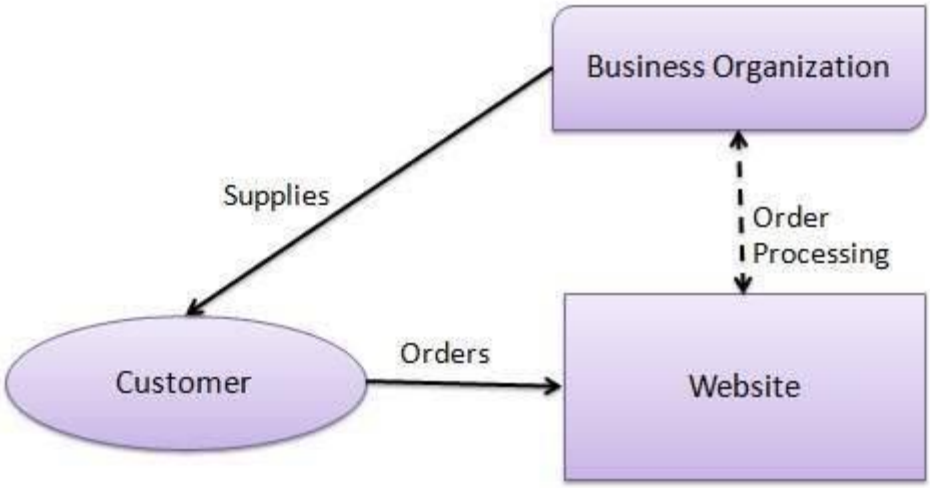
## Architectural Models

Following are the architectural models in B2B e-commerce −

- **Supplier Oriented marketplace** − In this type of model, a common marketplace provided by supplier is used by both individual customers as well as business users. A supplier offers an e-stores for sales promotion.
- **Buyer Oriented marketplace** − In this type of model, buyer has his/her own market place or e-market. He invites suppliers to bid on product's catalog. A Buyer company opens a bidding site.
- **Intermediary Oriented marketplace** − In this type of model, an intermediary company runs a market place where business buyers and sellers can transact with each other.

## E-Commerce - B2C Model

In B2C model, a business website is a place where all the transactions take place directly between a business organization and a consumer.




In the B2C model, a consumer goes to the website, selects a catalog, orders the catalog, and an email is sent to the business organization. After receiving the order, goods are dispatched to the customer. Following are the key features of the B2C model −

- Heavy advertising required to attract customers.
- High investments in terms of hardware/software.
- Support or good customer care service.

## Consumer Shopping Procedure

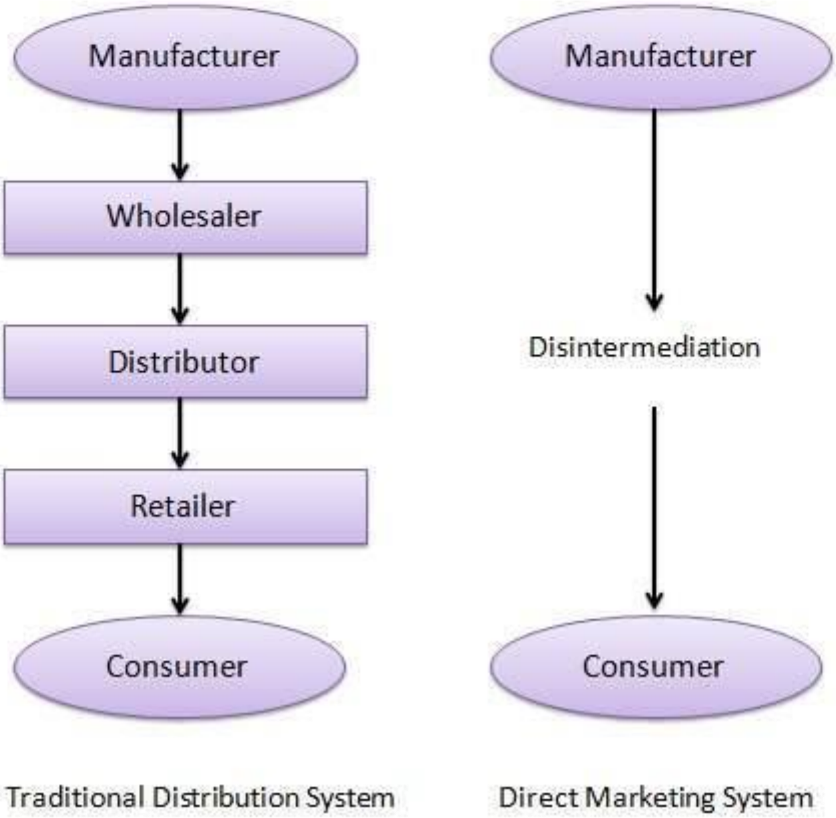
Following are the steps used in B2C e-commerce −

A consumer −

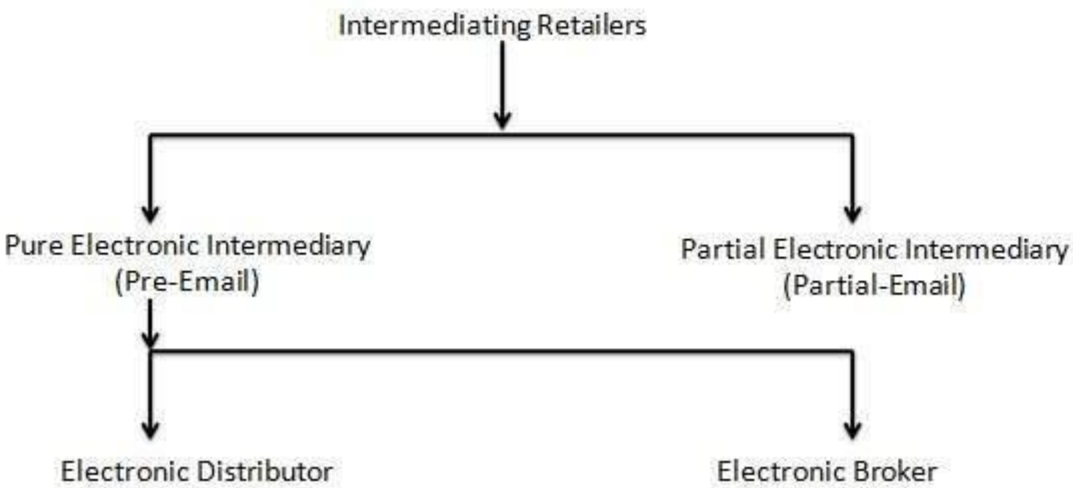
- determines the requirement.
- searches available items on the website meeting the requirment.
- compares similar items for price, delivery date or any other terms.
- places the order.
- pays the bill.
- receives the delivered item and review/inspect them.
- consults the vendor to get after service support or returns the product if not satisfied with the delivered product.

## Disintermediation and Re-intermediation

In traditional commerce, there are intermediating agents like wholesalers, distributors, and retailers between the manufacturer and the consumer. In B2C websites, a manufacturer can sell its products directly to potential consumers. This process of removal of business layers responsible for intermediary functions is called **disintermediation**.




Nowadays, new electronic intermediary breeds such as e-mall and product selection agents are emerging. This process of shifting of business layers responsible for intermediary functions from traditional to electronic mediums is called **re-intermediation**.



# Module 12: Graphics Design

## Lesson 1: Intro to Graphic Design

### 1.1 Typography

Typography is everywhere we look. It's in the books we read, on the websites we visit, even in everyday life—on street signs, bumper stickers, and product packaging.


But what exactly is typography? Simply put, **typography is the style or appearance of text**. It can also refer to the art of working with text—something you probably do all the time if you create documents or other projects for work, school, or yourself.

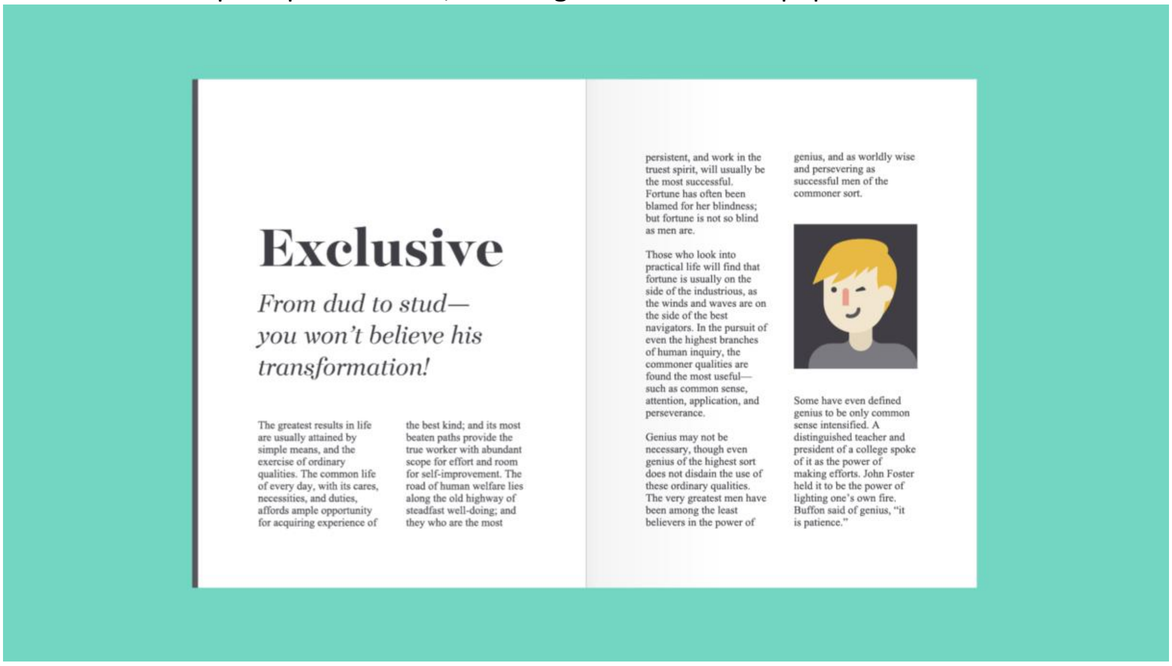
Common types of fonts

Typography can be an intimidating subject, but it doesn't have to be. You only need to know a little to make a big difference in the stuff you do every day. So let's get started. First, some **common types of fonts** and what you need to know about them.

Serif fonts

Serif fonts have little strokes called **serifs** attached to the main part of the letter.

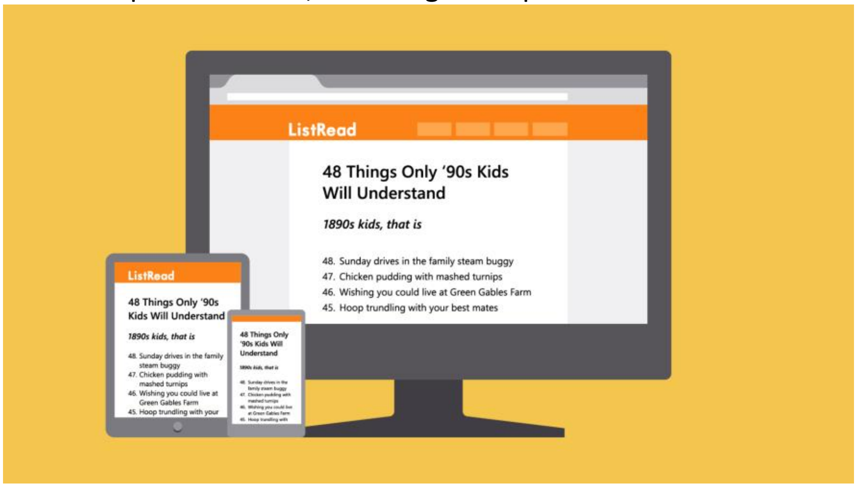

Because of their classic look, they're a good choice for more **traditional projects**. They're also common in print publications, like magazines and newspapers.




## Sans serif fonts

Sans serif fonts don't have that extra stroke—hence the name, which is French for **without serif**.


This style is considered more **clean and modern** than serif fonts. Also, it tends to be easier to read on computer screens, including smartphones and tablets.




Display fonts

Display fonts come in many **different styles**, like script, blackletter, all caps, and just plain fancy.

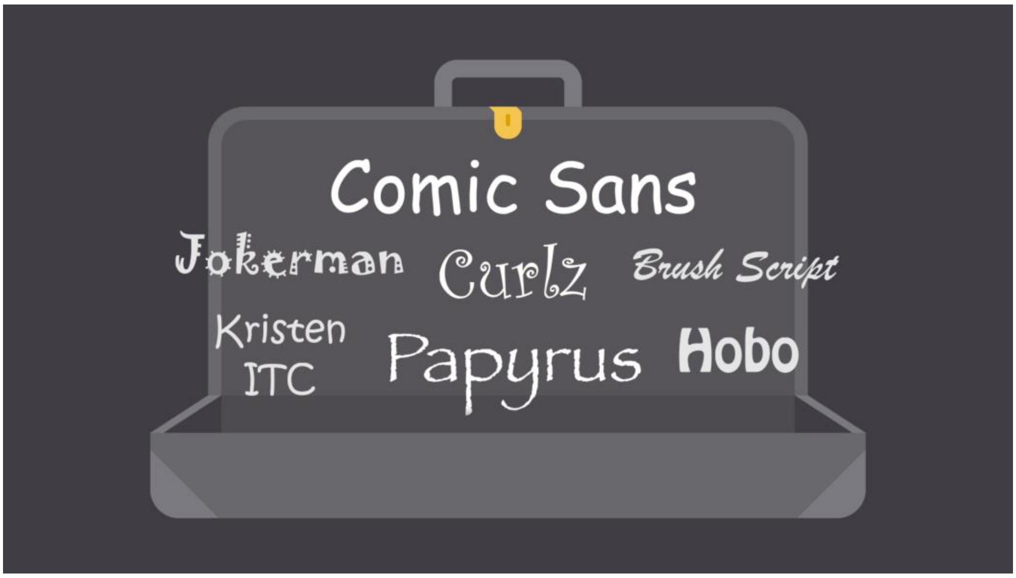

Because of their decorative nature, display fonts are best for **small amounts of text**, like titles and headers and more graphic-heavy designs.


Choosing a font

In a way, fonts have their own language. They all have something to say beyond the words on the page. They can come across as casual or neutral, exotic or graphic. That's why it's important to **think about your message**, then choose a font that fits.


Fonts to avoid

Some fonts come with **extra baggage**, including Comic Sans, Curlz, and Papyrus. There's nothing particularly wrong with these fonts—they just have a certain reputation for being **outdated** and **overused**.




If you find yourself tempted by them, think twice and consider using something else. There are many fonts with a similar look and feel that are less likely to detract from your message.

Combining fonts

When deciding which fonts to use, **less is more**. It's best to **limit yourself to one or two per project**. If you need more contrast, try repeating one of your fonts in a different size, weight, or style. This trick is practically foolproof for creating interesting combinations that work.


You've probably heard that **opposites attract**. The same is true for fonts. Don't be afraid to **combine font styles** that are **different but complementary**, like sans serif with serif, short with tall, or decorative with simple. This can be challenging at first, but don't despair. Look to other designs for inspiration, and soon you'll get the hang of it.

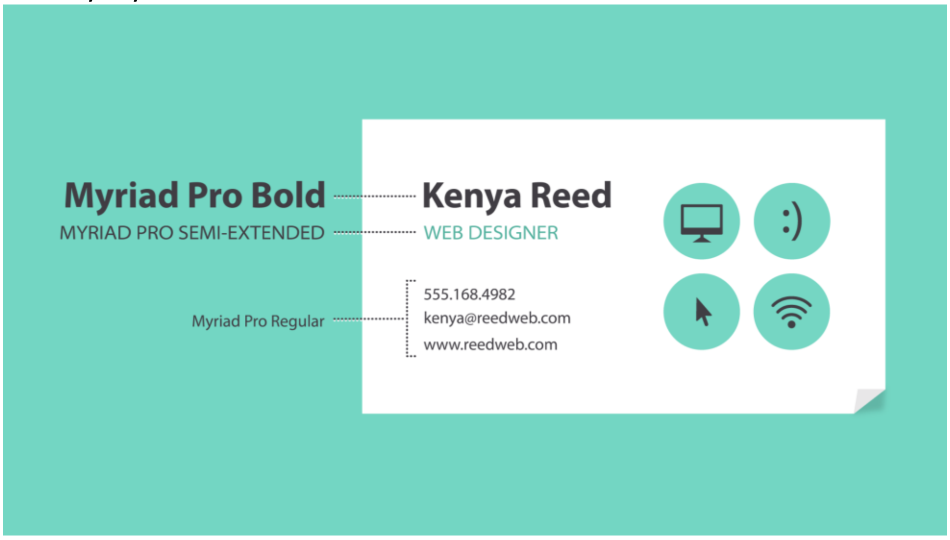

Other important terms

Maybe you've heard terms like **kerning**, **leading**, **tracking**, and **hierarchy**. For those with more experience, these concepts are essential for creating professional-looking designs. As a beginner, you don't need to know *everything* about these terms—just enough to inform your work and help you talk about design with more confidence.


Hierarchy

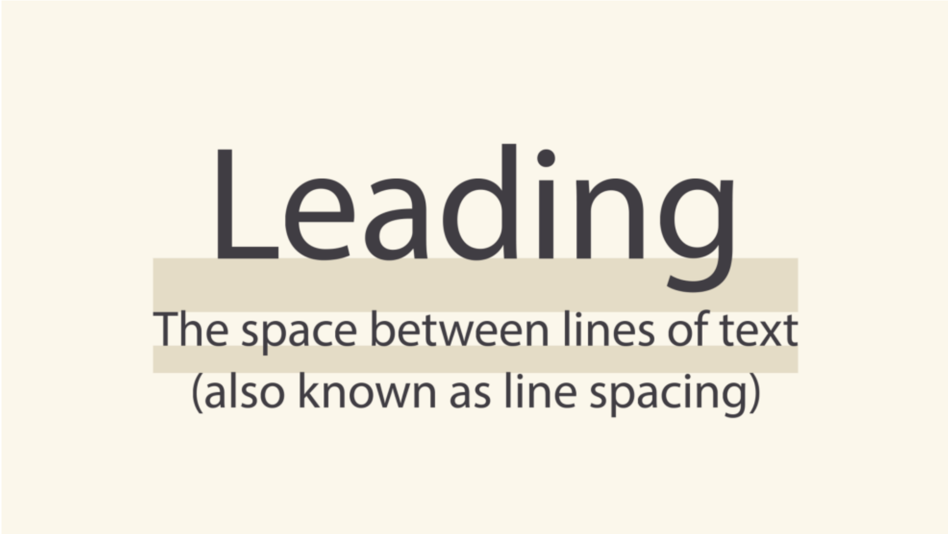
Hierarchy is used to **guide the reader's eye** to whatever is most important. In other words, it shows them where to begin and where to go next using **different levels of emphasis**.


Establishing hierarchy is simple: Just decide which elements you want the reader to notice first, then make them **stand out**. High-level items are usually larger, bolder, or different in some way. Remember to keep it simple and stick to just a few complementary styles.




Leading

Leading (rhymes with wedding) is **the space between lines of text**, also known as **line spacing**.

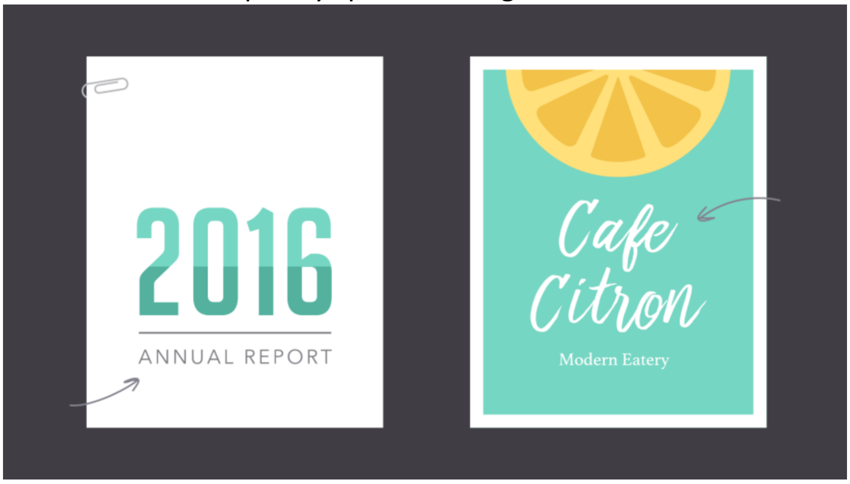



If you're not sure how much line spacing to use, don't fret—the default is usually fine. The goal is to **make your text as comfortable to read as possible**. Too much or too little spacing, as in the example below, can make things unpleasant for the reader.


Tracking

Tracking is the **overall space between characters**, sometimes called **character spacing**. Most programs let you condense or expand this depending on your needs.

In some designs, you might **adjust your tracking** to create a certain artistic effect. It can also help you fix fonts that are poorly spaced to begin with.




Kerning

Kerning is the **space between specific characters**. Unlike tracking, it varies over the course of the word because each letter fits together differently.


Some fonts have what we call **bad kerning**, making certain letters look improperly spaced. If a font you're using has bad kerning, it's best to cut your losses and choose something else.

Putting it all together

Well-crafted text can mean the difference between something ordinary and something extraordinary—even if you're just getting started with design. All it takes is an interest in typography and you'll start to notice more, see more, and be able to do more in your own work.


## Lesson 2: Color

The power of color

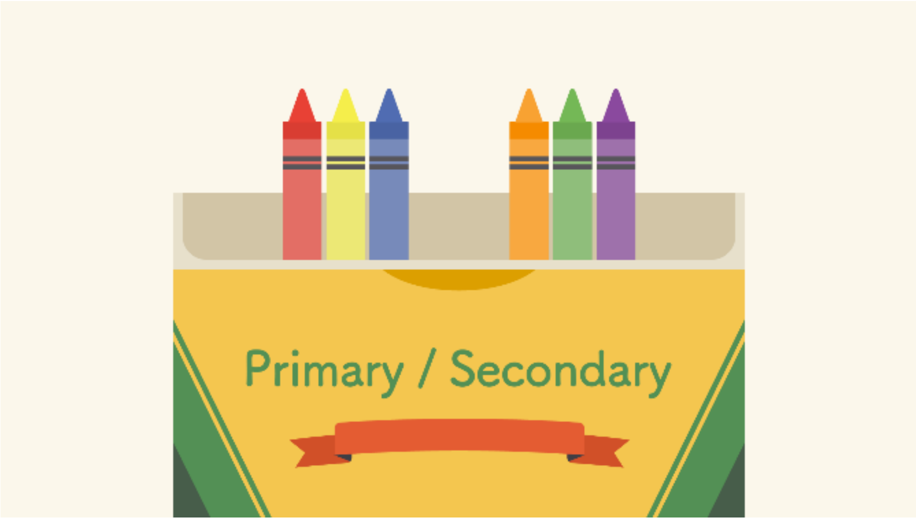
Color plays a vital role in **design** and **everyday life**. It can draw your eye to an image. Sometimes it can trigger an emotional response. It can even communicate something important without using words at all.

So how do we know which colors look good together and which ones don't? The answer is simple: **Color theory**.

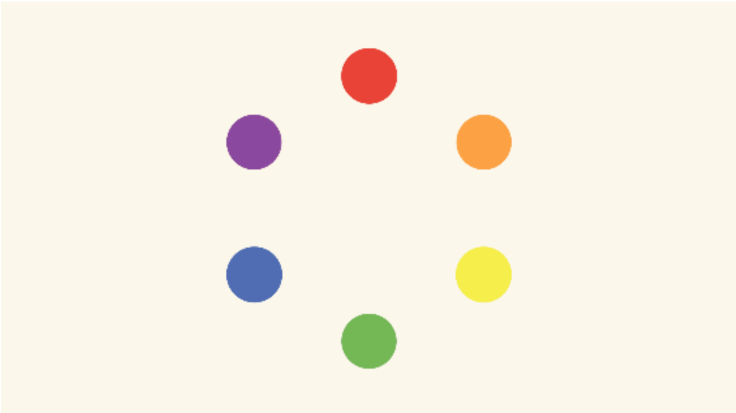
Artists and designers have followed **color theory** for centuries, but anyone can learn more about it. It can help you feel confident in many different situations, whether it's **choosing colors for a design** or **putting together the perfect outfit**. With a little insight, you'll be looking at color in a whole new way.

Color basics

Let's start at the beginning with a refresher on the basics. Remember learning about **primary and secondary colors** in school? Then you already have some knowledge of color theory.




**Secondary colors** are created by combining two **primary colors**. Red and yellow make orange; yellow and blue make green; and blue and red make purple.



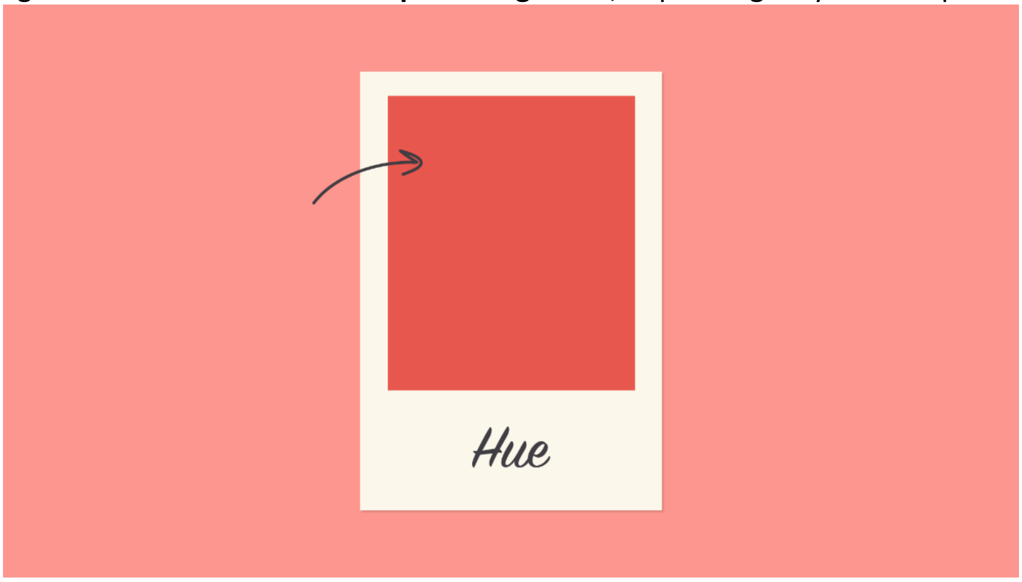
If we mix *these* colors together, we get even more **in-between shades**, like red-orange and yellow-green. All together, they form what's called a **color wheel**. (You can probably see where it gets its name.)

A closer look

Now that you know about the color wheel, let's take it one step further with **hue**, **saturation**, and **value**. These are terms you might not encounter in daily life, but they're the key to understanding more nuanced colors—like all those little paint chips at the home improvement store.

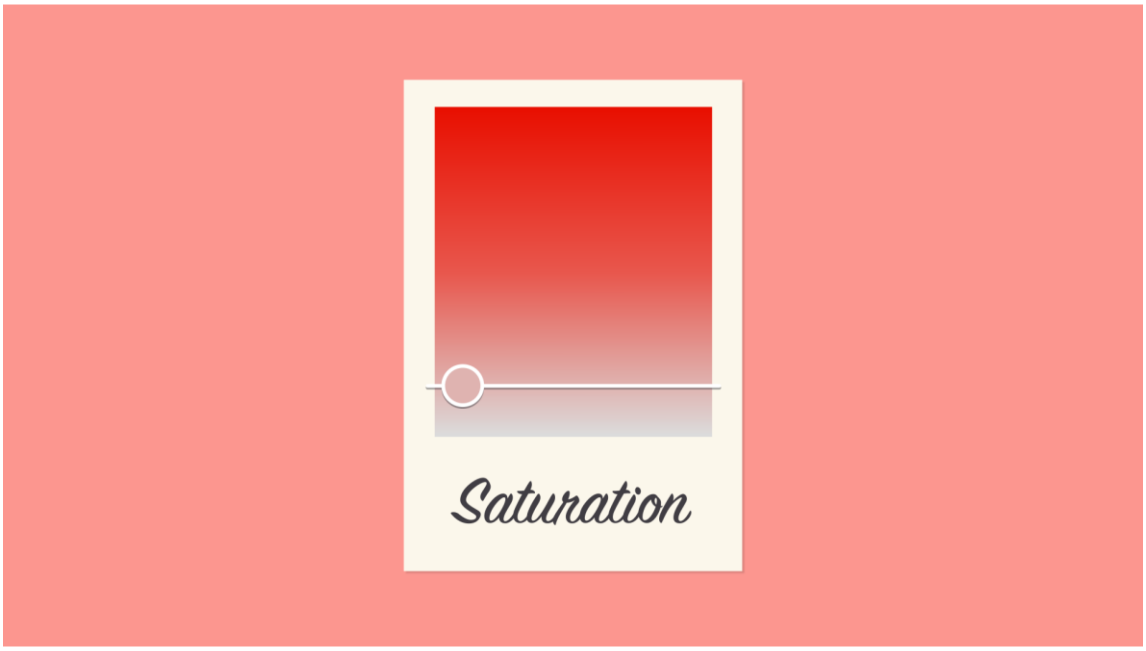
Hue

**Hue** is the easiest one; it's basically just another word for **color**. In the example below, you might describe the hue as **coral pink** or **light red**, depending on your interpretation.



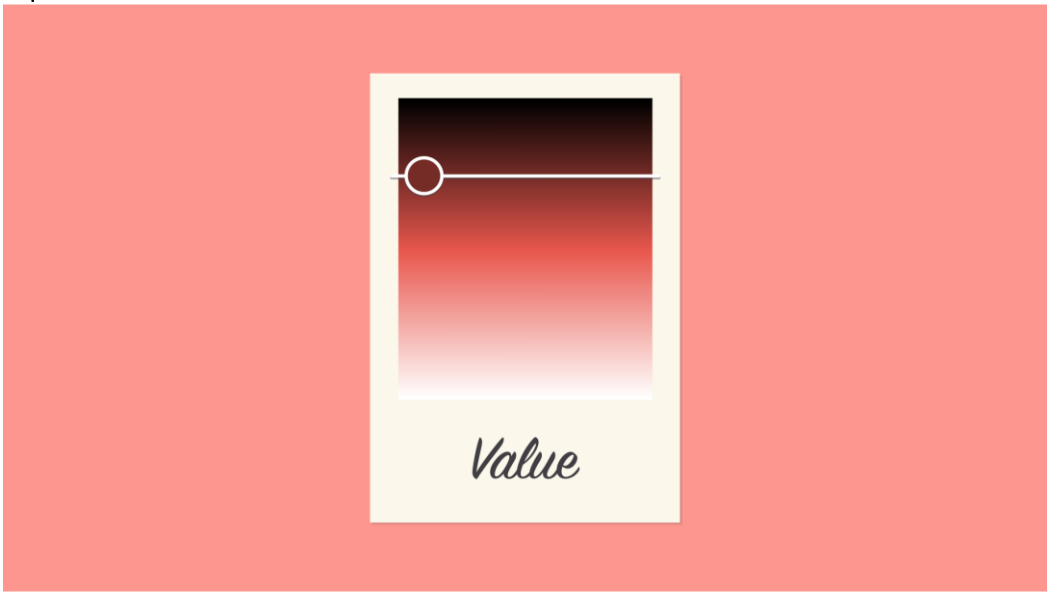

Saturation

**Saturation** refers to intensity—in other words, whether the color appears more **subtle** or more **vibrant**. Highly saturated colors are brighter or richer. Desaturated colors have less pigment and therefore less **oomph**.




Value

**Value** has to do with how **dark** or **light** the color is, ranging from black to white. As you can see below, this gives us many different shades, from a deep reddish brown to a light pastel pink.



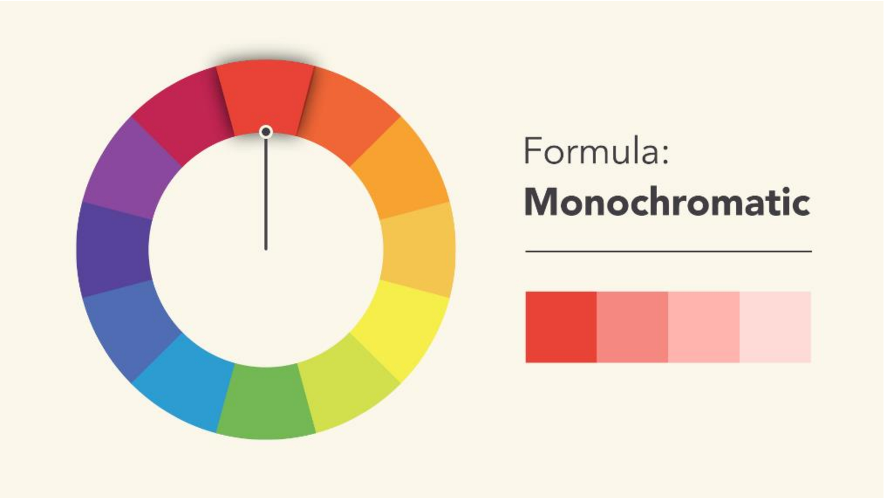

Creating color schemes

So how do we put this all together to create professional-looking color schemes? There are actually tried-and-true formulas based on something called **color harmony** that can help.

Color harmony uses the **color wheel** to illustrate time-tested color combinations. We'll explore some of the most common types of harmony below.

Monochromatic

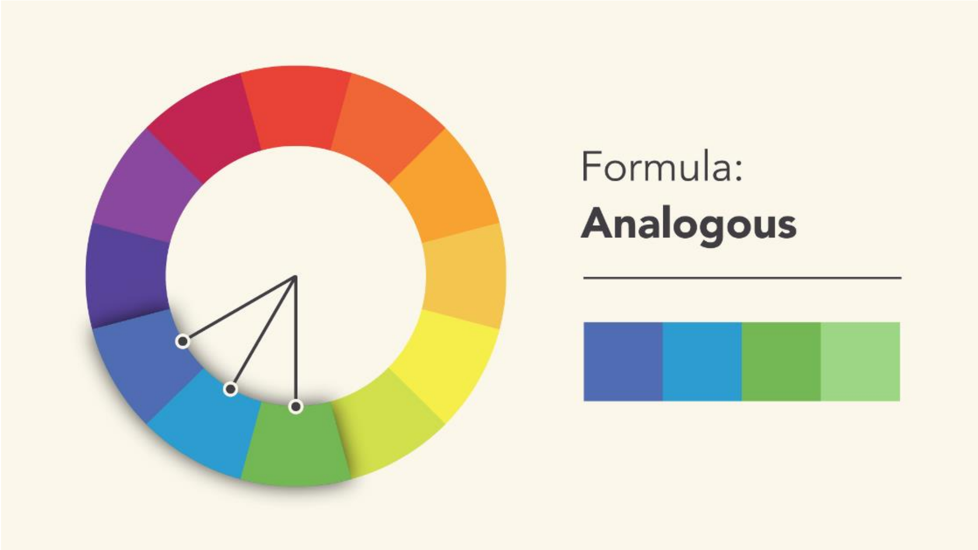
The easiest formula for harmony is **monochromatic** because it only uses **one color** or **hue**. To create a monochromatic color scheme, pick a spot on the color wheel, then use your knowledge of **saturation** and **value** to create variations.



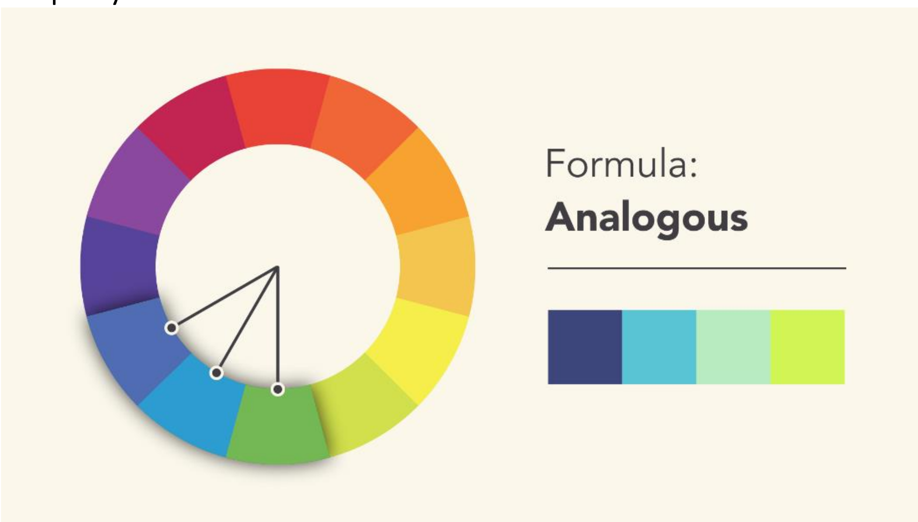

The best thing about monochromatic color schemes is that they're **guaranteed to match**. The colors suit each other perfectly because they're all from the same family.

Analogous

An **analogous** color scheme uses colors that are **next to each other** on the wheel, like reds and oranges or blues and greens.

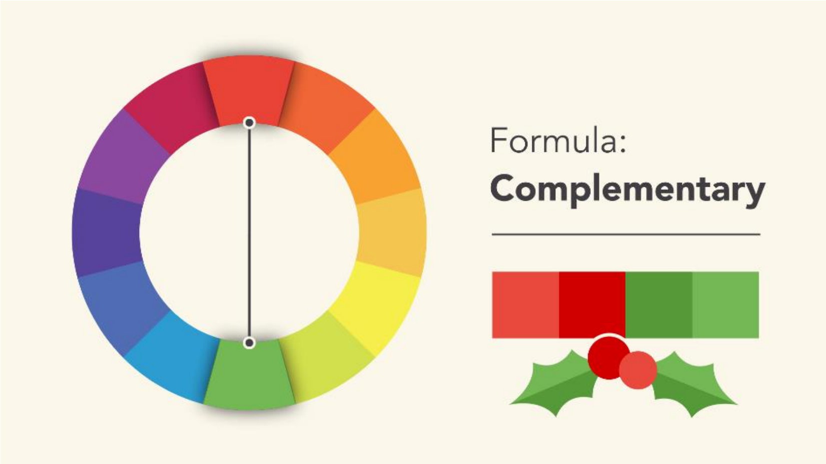



Don't be afraid to play with the palette and **create your own unique interpretation**. That's what color harmony is all about; the formulas are merely starting points to help guide and inspire you.

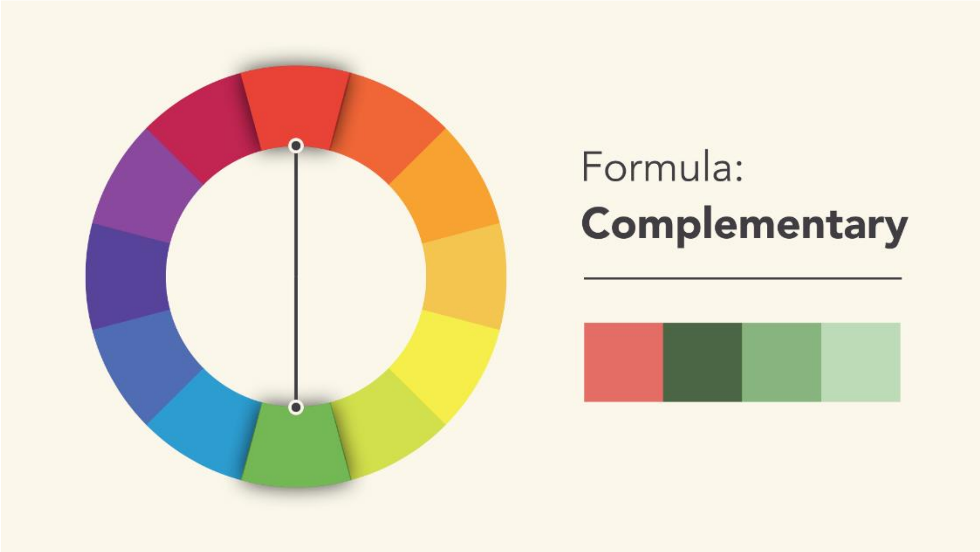



Complementary

**Complementary** colors are **opposite each other** on the wheel; for instance, blue and orange or the classic red and green.

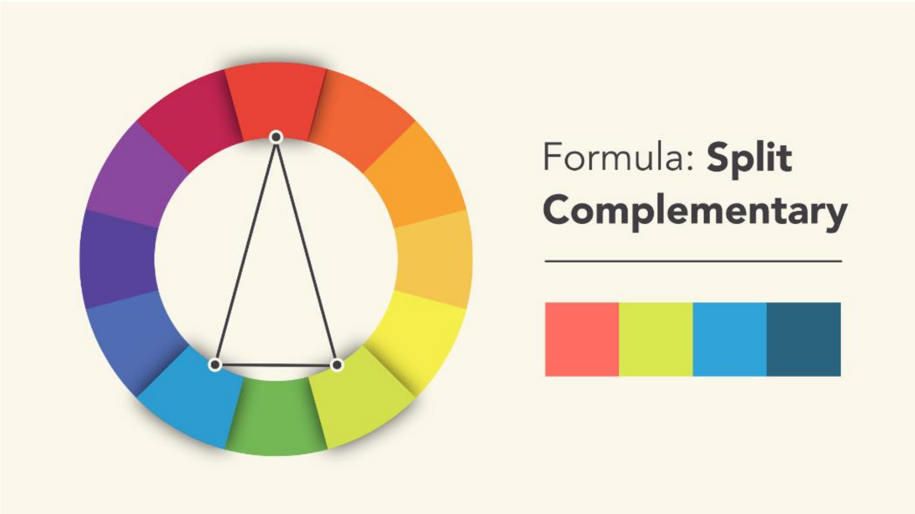



To avoid complementary color schemes that are too simplistic, **add some variety** by introducing lighter, darker, or desaturated tones.




Split-complementary

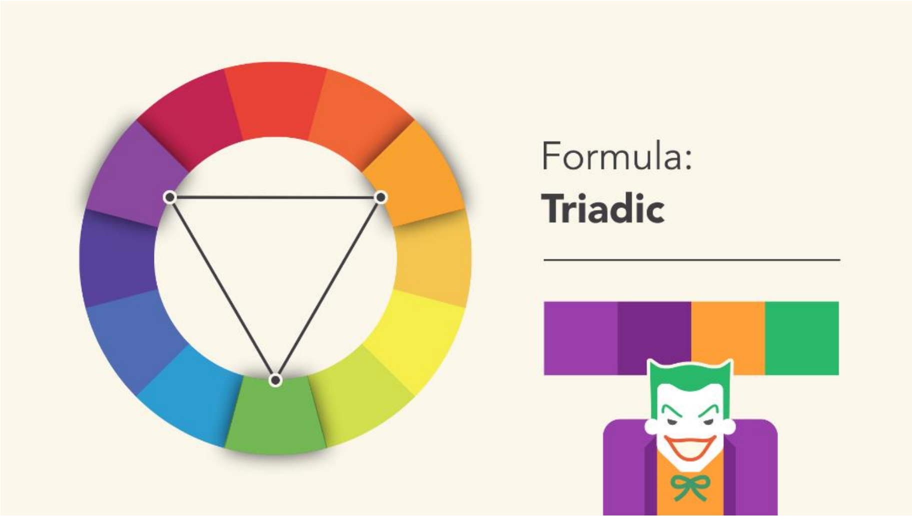
A **split-complementary** color scheme uses the colors on **either side of the complement**.




This gives you the same level of **contrast** as a complementary color scheme but more colors to work with (and potentially more interesting results).

Triadic

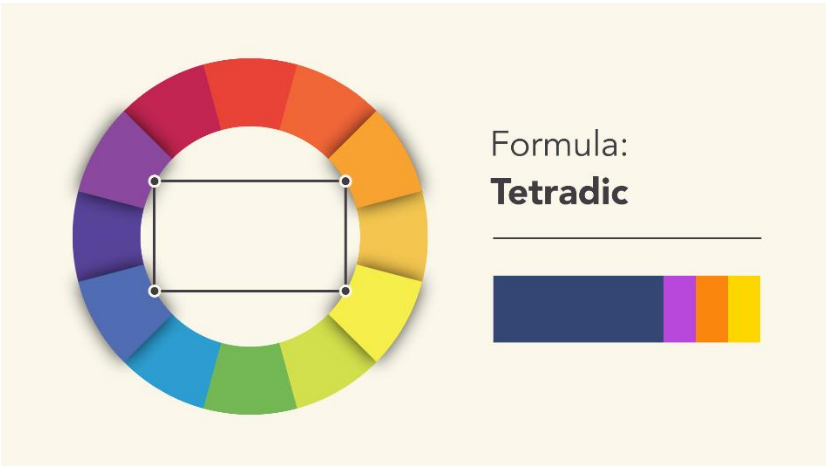
A **triadic** color scheme uses **three colors that are evenly spaced**, forming a perfect **triangle** on the wheel.




These combinations tend to be pretty striking—especially when they include **primary** or **secondary** colors—so be mindful when using them in your work.

Tetradic

**Tetradic** color schemes form a **rectangle** on the wheel, using not one but **two complementary color pairs**. This formula works best if you let one color dominate while the others serve as an accent.

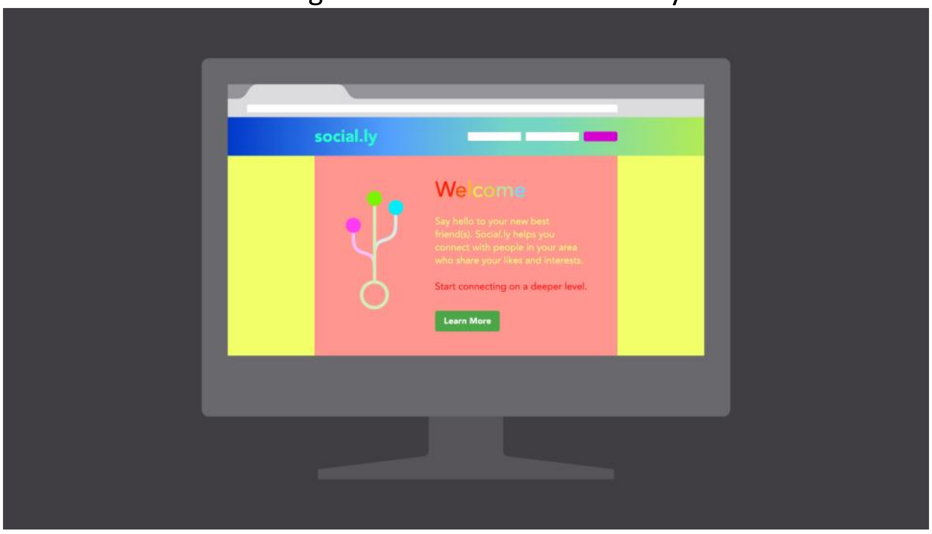



Avoiding common mistakes

There are a few classic dos and don'ts when it comes to color. For instance, have you ever seen colors that seem to **vibrate** when they're placed next to each other?


The solution is to **tone it down**—literally—and there's a simple way do it. Start with one color, and try adjusting its **lightness**, **darkness**, or **saturation**. Sometimes a little contrast is all your color palette needs.


Readability is an important factor in any design. Your colors should be **legible** and **easy on the eyes**, especially when working with text.
Sometimes that means NOT using color—at least not in every little detail.

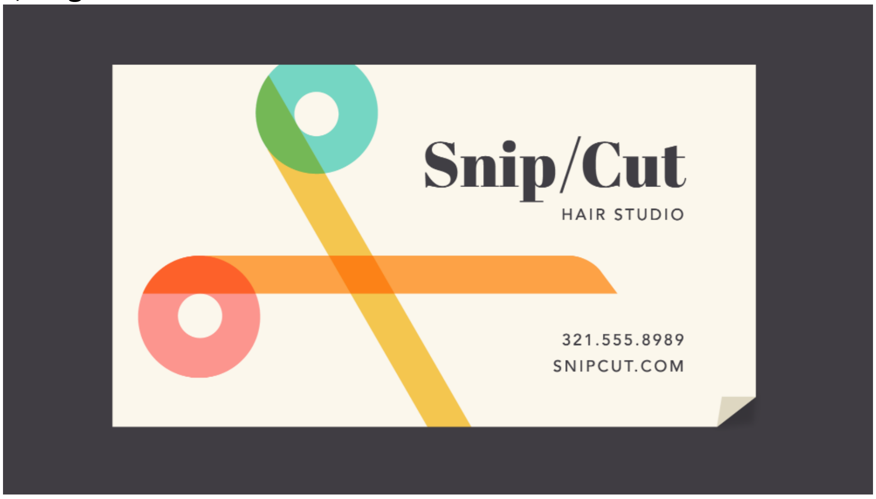



Neutral colors like black, white, and gray can help you **balance** your design, so when you *do* use color, it really stands out.


Choosing the right colors

Every color sends a message. It's important to consider the **tone** of your project, and choose a color palette that fits.

For example, **bright colors** tend to have a fun or modern vibe.




**Desaturated** colors often appear more serious or businesslike.


Sometimes it just depends on the **context**. With practice and creativity, there's no limit to what you can do.


Finding inspiration

You can find **ideas** for color schemes in all kinds of interesting places, from advertising and branding to famous works of art.

You can even use a **web resource** to browse color palettes or generate your own. Experienced designers often take inspiration from the world around them. There's nothing wrong with finding something you like and **making it your own**.

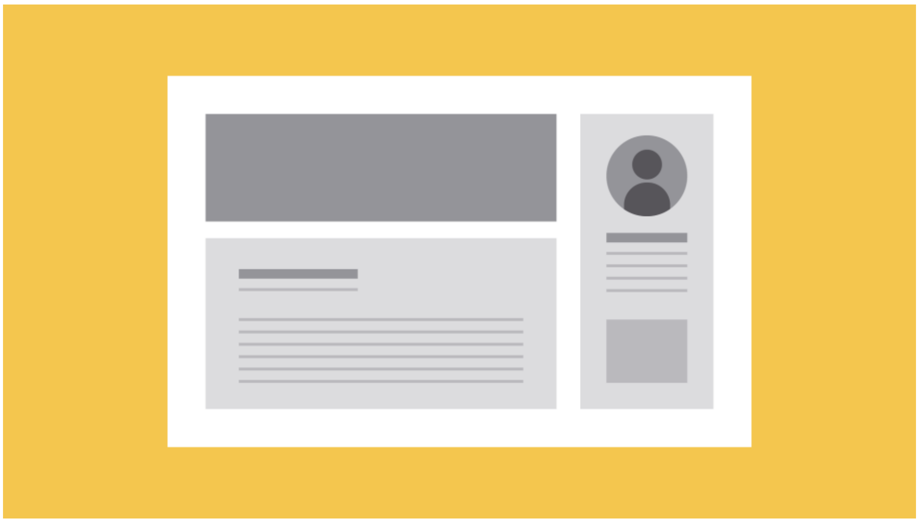
Putting it all together

Everywhere you look, there's color, color, and more color. It can be intimidating to use it in your work, but it doesn't have to be. Just keep **experimenting**, and remember what you've learned about **color theory**. Soon, choosing great-looking colors will feel like second nature.

## Lesson 3: Layout and Composition

### What is composition?

In many ways, layout and composition are the **building blocks** of design. They give your work structure and make it easier to navigate, from the margins on the sides to the content in between.



Why is composition so important? In short, it's the **way your content is arranged**. It doesn't matter if you're working with text, images, or elements in a graphic; without a thoughtful, well-composed layout, your work would basically fall apart.

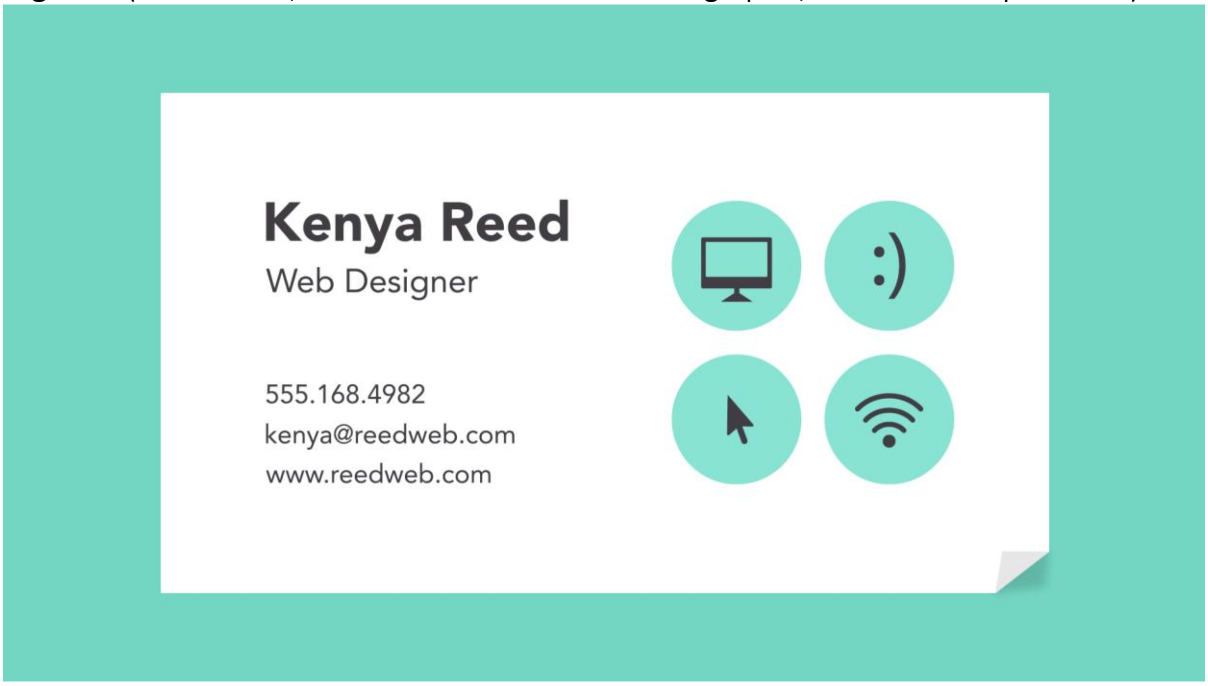
Watch the video below to learn more about layout and composition.

### Five basic principles

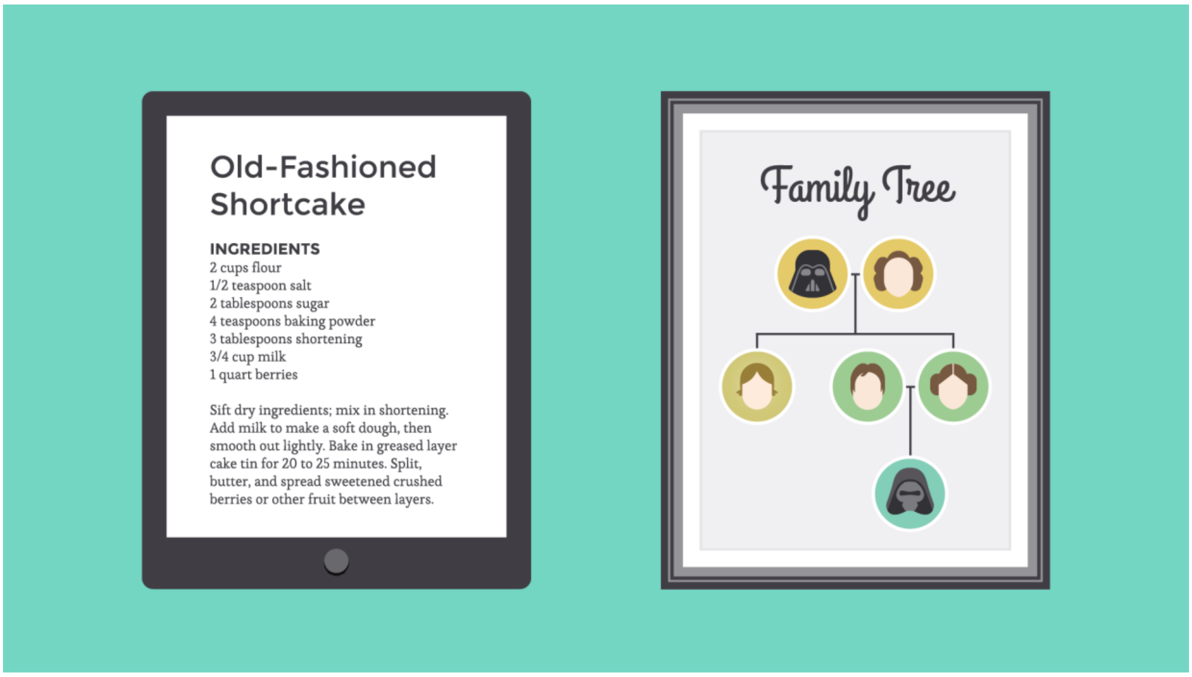
The key to mastering layout and composition is to **think like a designer**. Luckily, it's easier than it sounds. There are **five basic principles** that can help you transform your work and sharpen your eye for design. Keep them in mind during your next project, and look for ways to apply them.


## Proximity

Proximity is all about using **visual space** to show **relationships** in your content. In practice, it's pretty simple—all you have to do is make sure related items are **grouped together** (for instance, blocks of text or elements in a graphic, as in the example below).

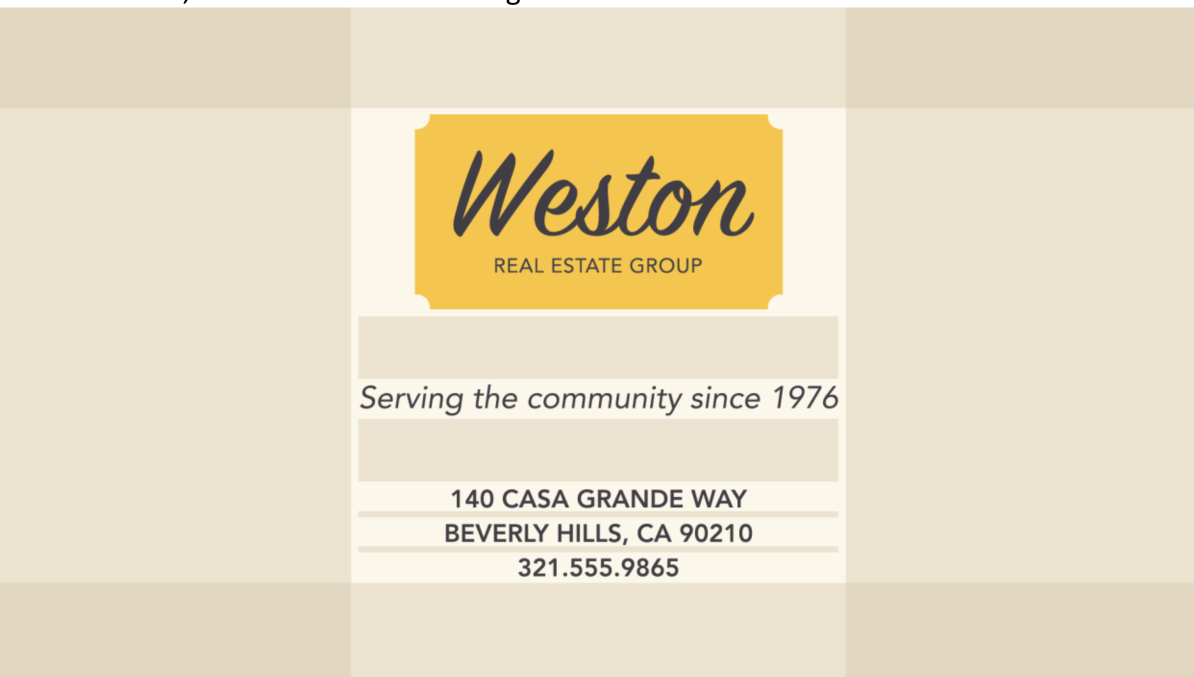



Groups that are NOT related to each other should be **separated** to visually emphasize their lack of a relationship. All in all, this makes your work easier to understand **at a glance**, whether it's purely text or something more visual.




## White space

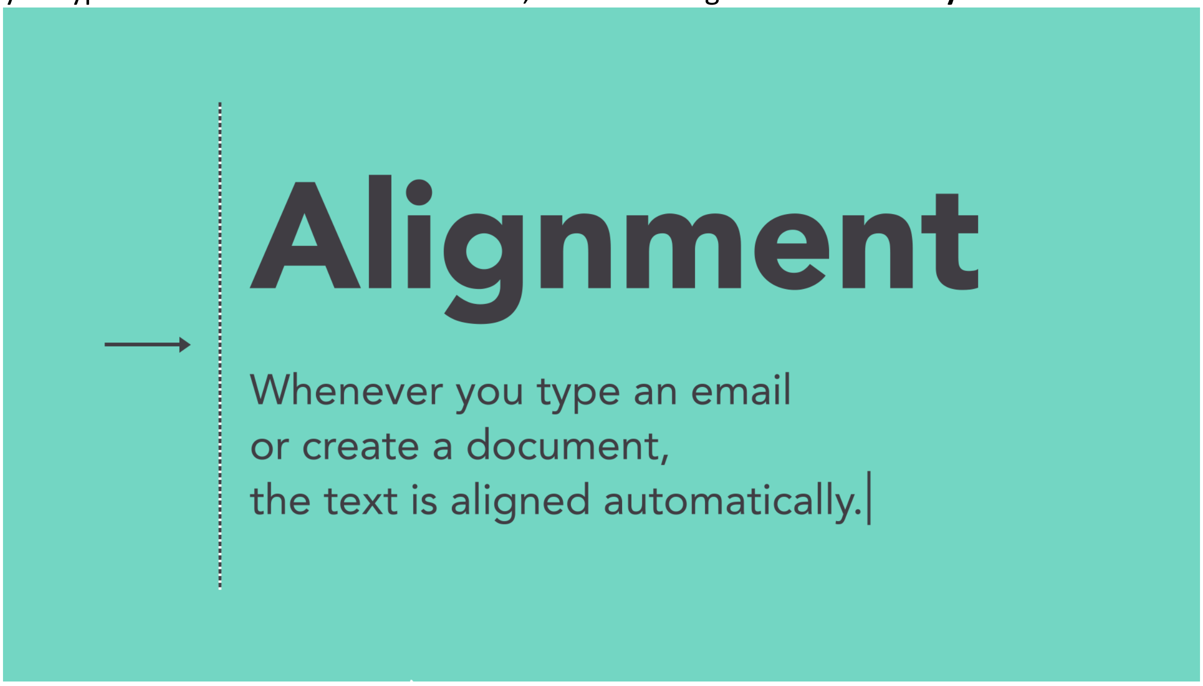
White space is an important part of every composition. Now, this doesn't mean literal **white space**; it just means **negative space**, like the spaces between your content, between lines, and even the outer margins.




There's no one way to use white space correctly, but it's good to understand its purpose. White space helps you **define and separate** different sections; it gives your content **room to breathe**. If your work ever starts to feel cluttered or uncomfortable, a little white space might be just what the doctor ordered.

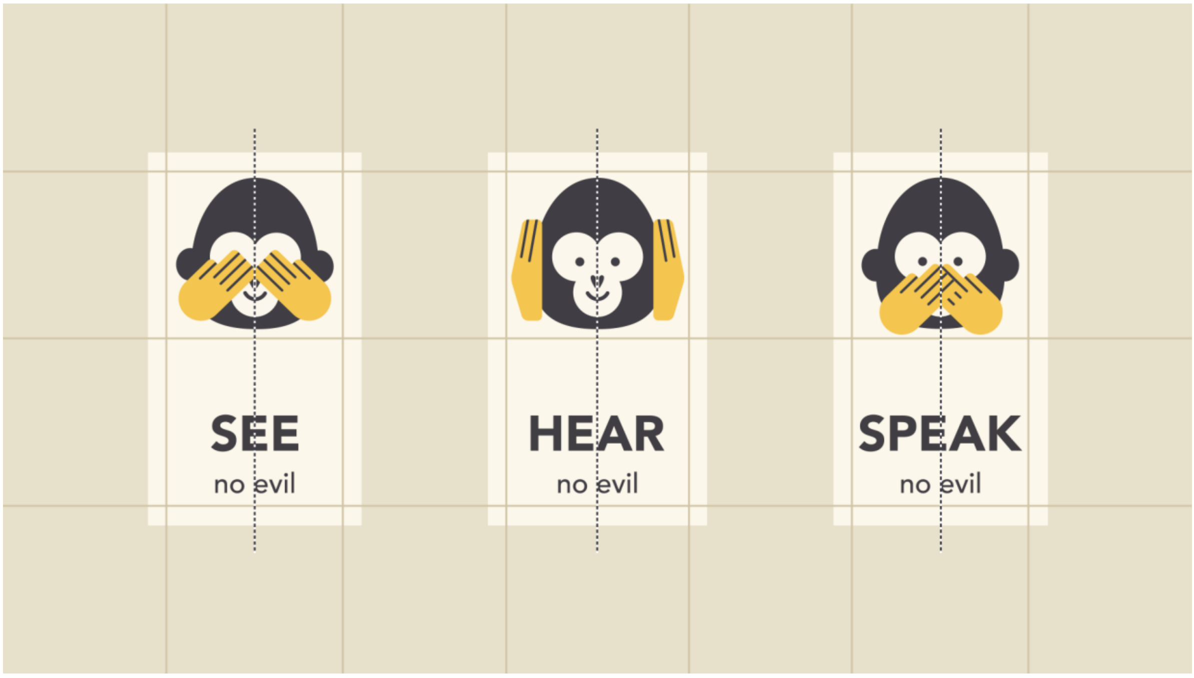

## Alignment

Alignment is something you deal with all the time, even if you don't realize it. Whenever you type an email or create a document, the text is aligned **automatically**.




When aligning objects **by yourself** (for instance, images or separate text boxes), getting it right can be tricky. The most important thing is to be **consistent**.

It might help to imagine your content arranged inside of a **grid**, just like the example below. Notice how there's an **invisible line** centering each image to the text? Each grouping is also **evenly spaced and aligned**, with **equal-sized margins**.

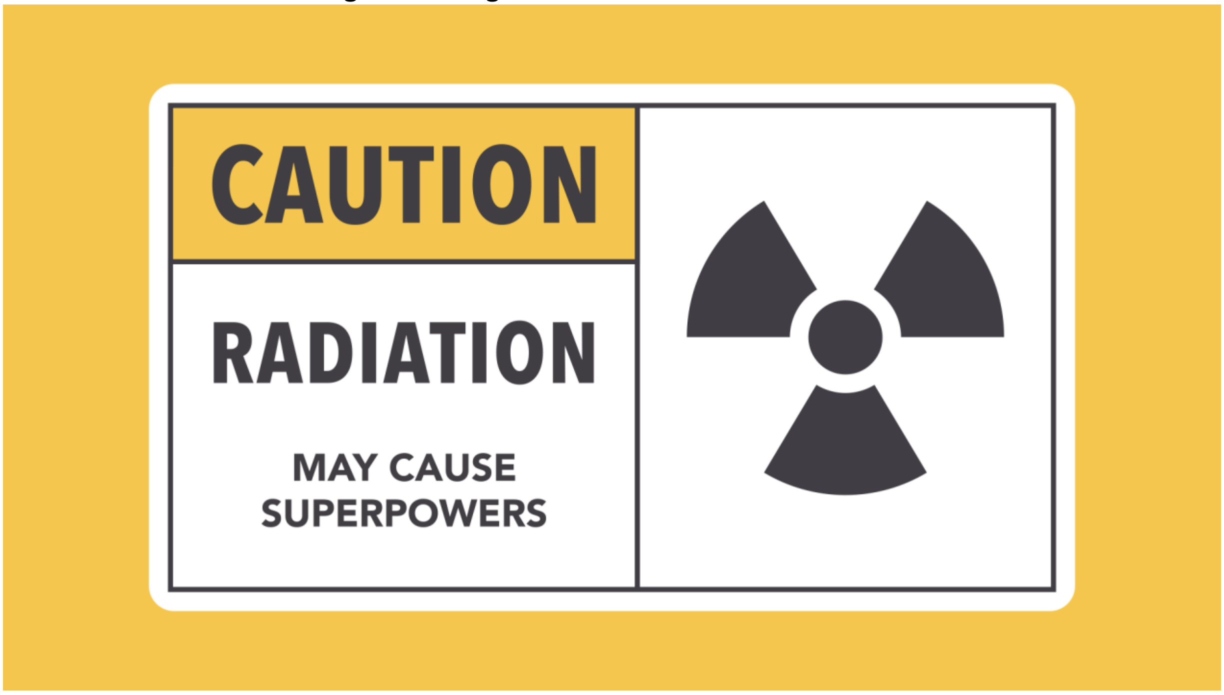



It's this **attention to detail** that makes the composition easier to navigate. Without consistent alignment, your work could start to feel disorganized.

## Contrast

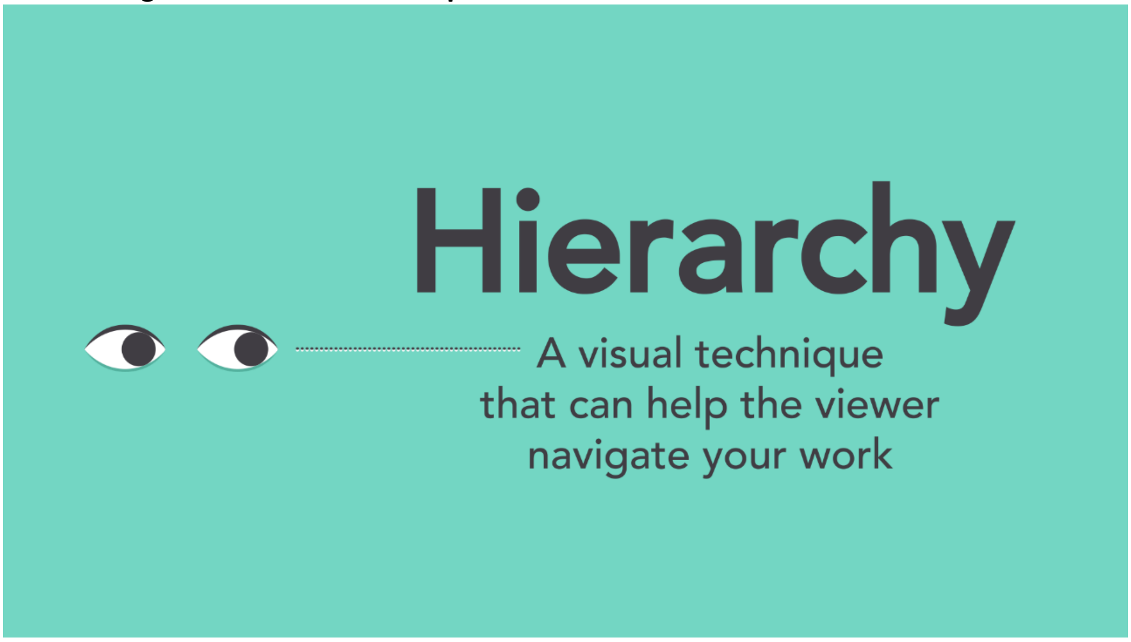
Contrast simply means that **one item is different from another**. In layout and composition, contrast can help you do many things, like catch the reader's eye, create emphasis, or call attention to something important.

To create contrast in the example below, we've used **color**, more than one **style of text**, and objects of **differing sizes**. This makes the design more dynamic and, therefore, more effective at communicating its message.



## Hierarchy

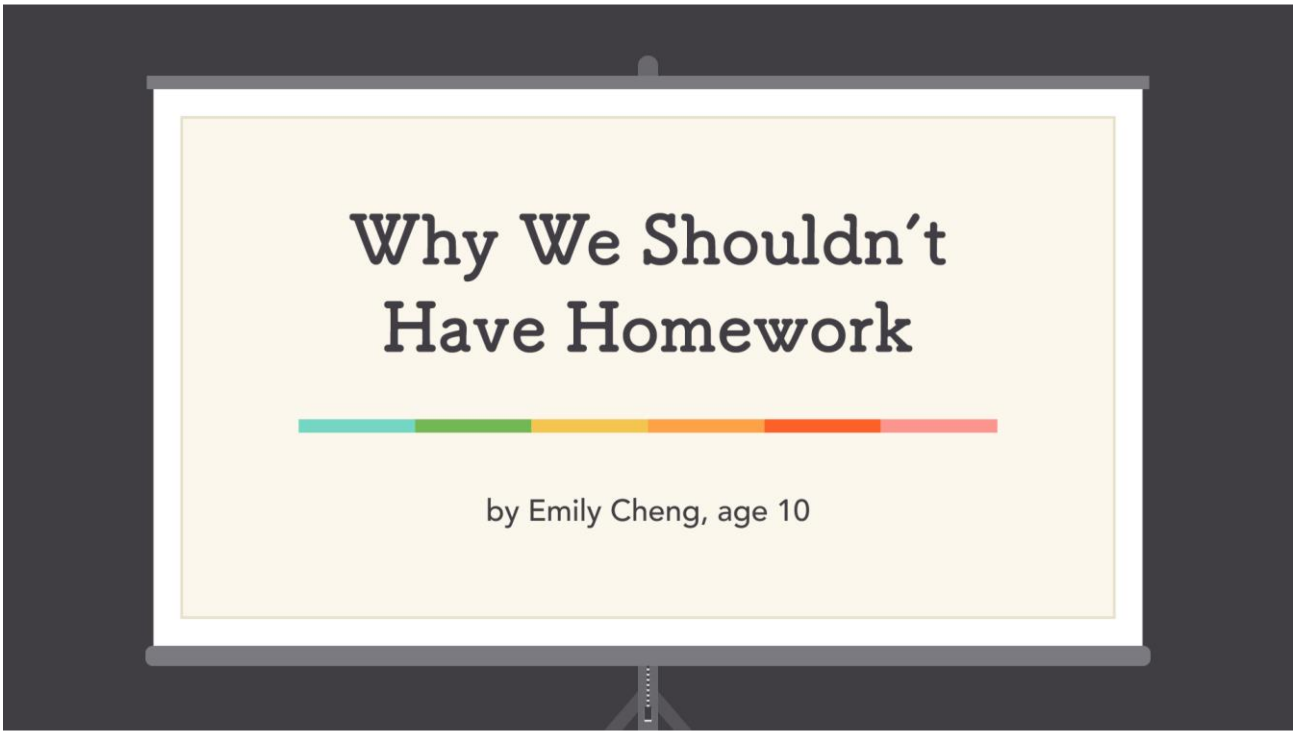
Contrast is also closely tied to **hierarchy**, which is a visual technique that can help the viewer navigate your work. In other words, it shows them where to begin and where to go next using **different levels of emphasis**.



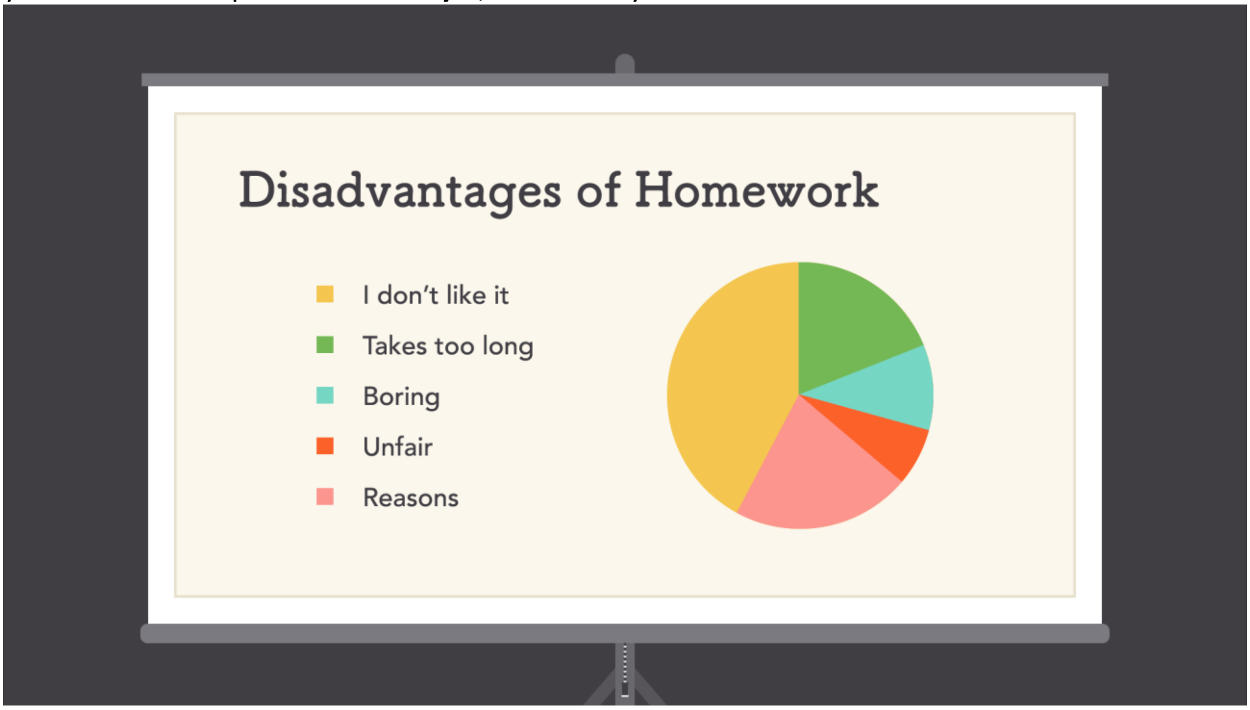

Establishing hierarchy is simple: Just decide which elements you want the reader to notice first, then make them **stand out**. High-level or important items are usually larger, bolder, or more eye-catching in some way.


## Repetition

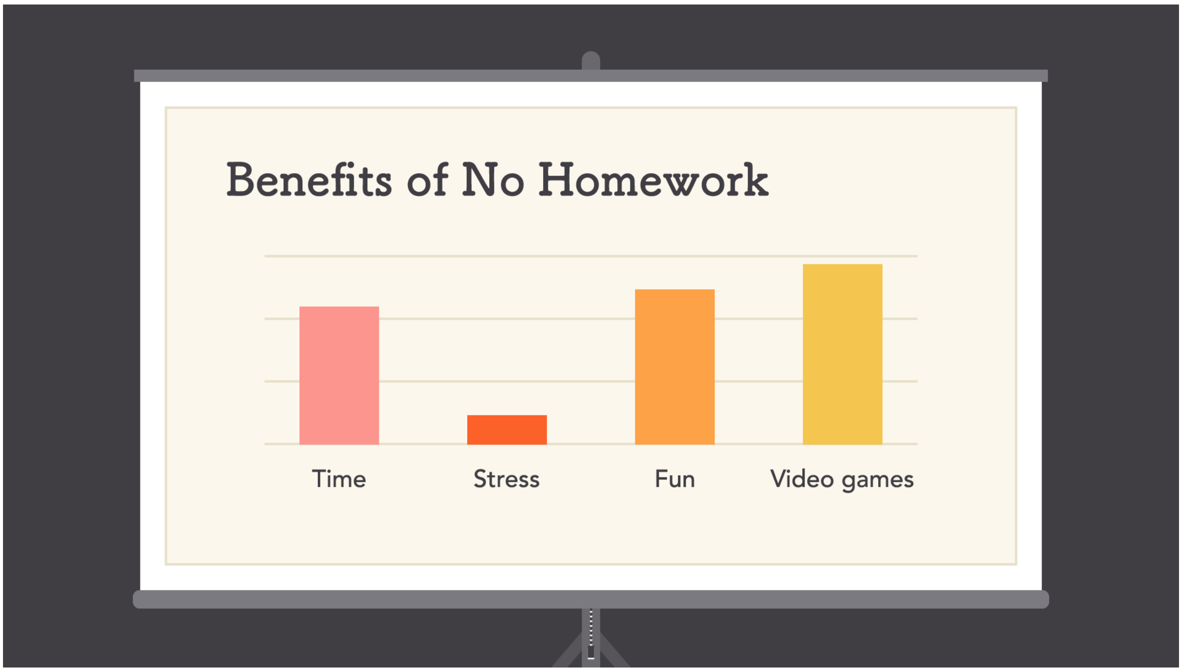
Repetition is a reminder that every project should have a **consistent look and feel**. This means finding ways to **reinforce** your design by repeating or echoing certain elements.




For instance, if you have a specific **color palette**, look for ways to carry it through. If you've chosen a special **header style**, use it every time.




It's not just for aesthetic reasons—being consistent can also make your work easier to read. When viewers know **what to expect**, they can relax and focus on the content.




## Putting it all together

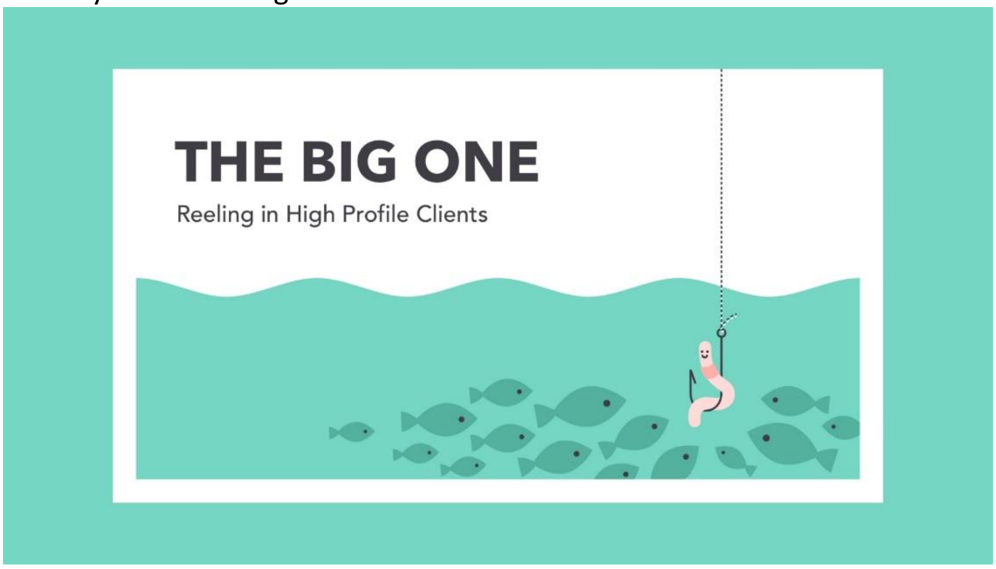
You might say layout and composition are the **unsung heroes** of design. It's easy to overlook their role, but they're part of everything you do.


The principles you just learned can help you elevate any project. All it takes is a little **attention to detail** and you can create beautiful, professional-looking compositions.


## Lesson 4: Images

### The power of images

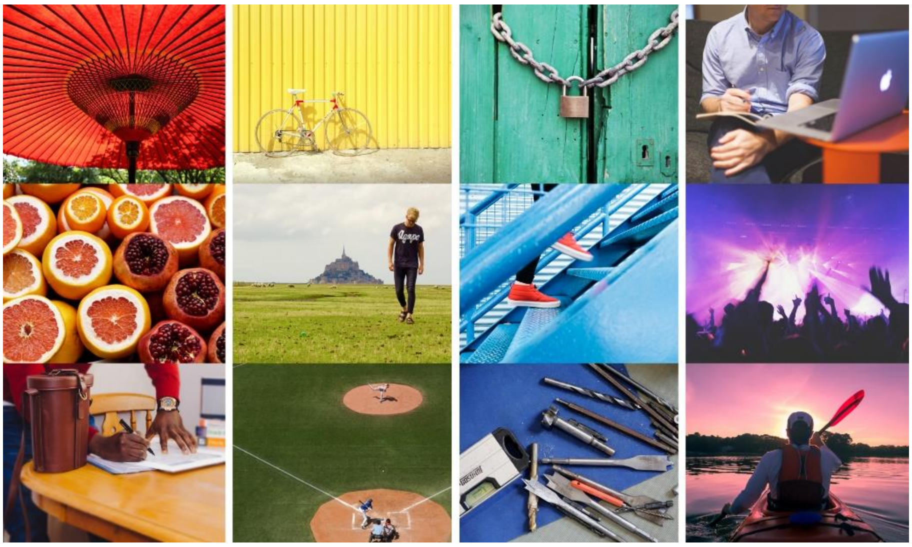
Images can be a powerful force in design. No matter what the subject, we're naturally drawn to them. From beautiful, high-definition **photos** to carefully crafted **graphics**, they're usually the first thing we see.




However, images aren't just for decoration. In design, they're the **hook that draws the viewer in**. Compelling visuals can help you connect with the audience—and make a strong impression—before they've even read a single word.

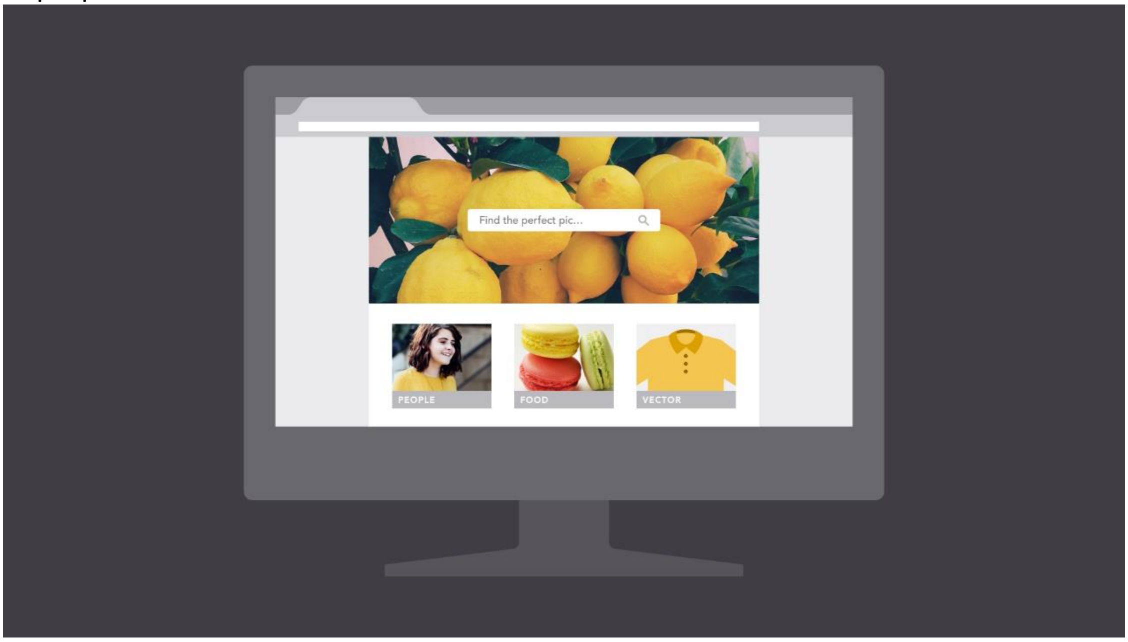
### Finding images

You don't have to be an artist to use images in your work. All it takes is a little creativity and a willingness to think outside the box. With the right resources, you can learn to set your designs apart. First: finding **high-quality images** for almost any type of project.



Using stock

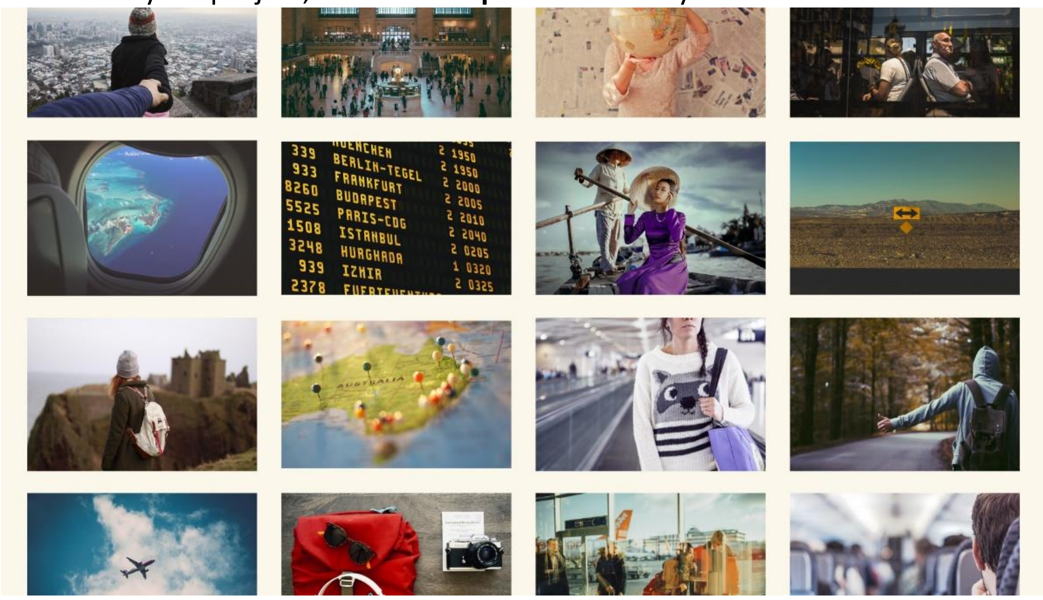
Maybe you're handy with a camera or have some graphic design experience—that's great! If not, don't panic. There are countless **online sources** that offer images for exactly this purpose.




The truth is, most people (including professionals) rely on free or low-cost images called **stock**. Stock is perfect when you need something **specific**—for example, a photo of a tiny dog in a teacup—and you don't have the time or resources to create it yourself.

## Choosing effective stock

Most stock image sites let you browse or search their offerings. Look for results that are **relevant** to your project, but also **unique** in some way.




In this example, we've searched for the word **travel**. The image below would be a fine choice because it subtly illustrates the concept but has a personal feel.

As viewers, we're are naturally drawn to images that feel **authentic**, like distinct but believable photos and graphics that tell a story. The best images are somewhat **open ended**. They set the tone for your project but leave room for interpretation.

Some stock images are just too **generic** to be effective. For instance, how many times have you seen a business presentation with something like the graphic below?


For a more modern, professional design, avoid images that lack context or are too literal in meaning. Instead, look for imagery that's connected to your work, but in a more **subtle**, **relatable** way.

Image usage rights

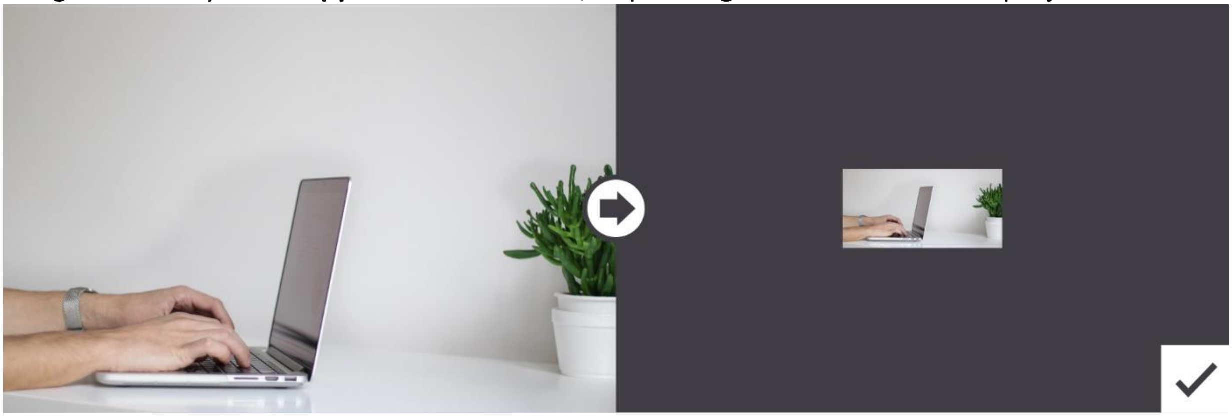
Almost every stock image has a **license** that states how it can be used. Some are very generous and ask for little or nothing in return. Others are more restrictive and can have serious legal ramifications if disobeyed.

Before you use a stock image, make sure you understand the license associated with it (you might need to do some research if it isn't clearly explained).

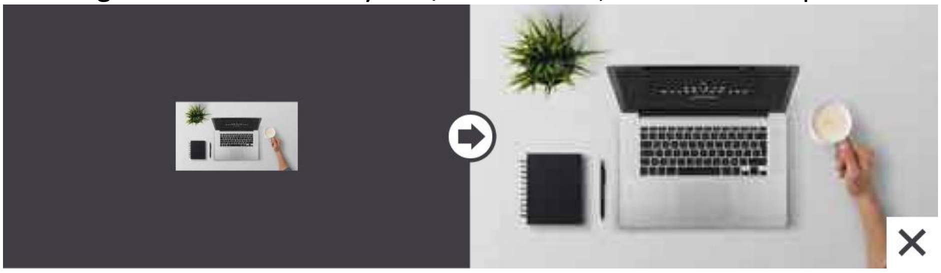
The importance of quality

Of course, it's not just about content. There's also a **technical side** to images, which can have a big impact on your design. It doesn't matter if the photo you've chosen is absolutely perfect in every other way. If it's blurry or pixelated, it could give the **wrong impression**.


Look for high-quality images that are sharp, clear, and free of distortion. In general, **bigger is better**, because it gives you more to work with. A large, high-resolution image can always be **cropped or sized down**, depending on the needs of the project.

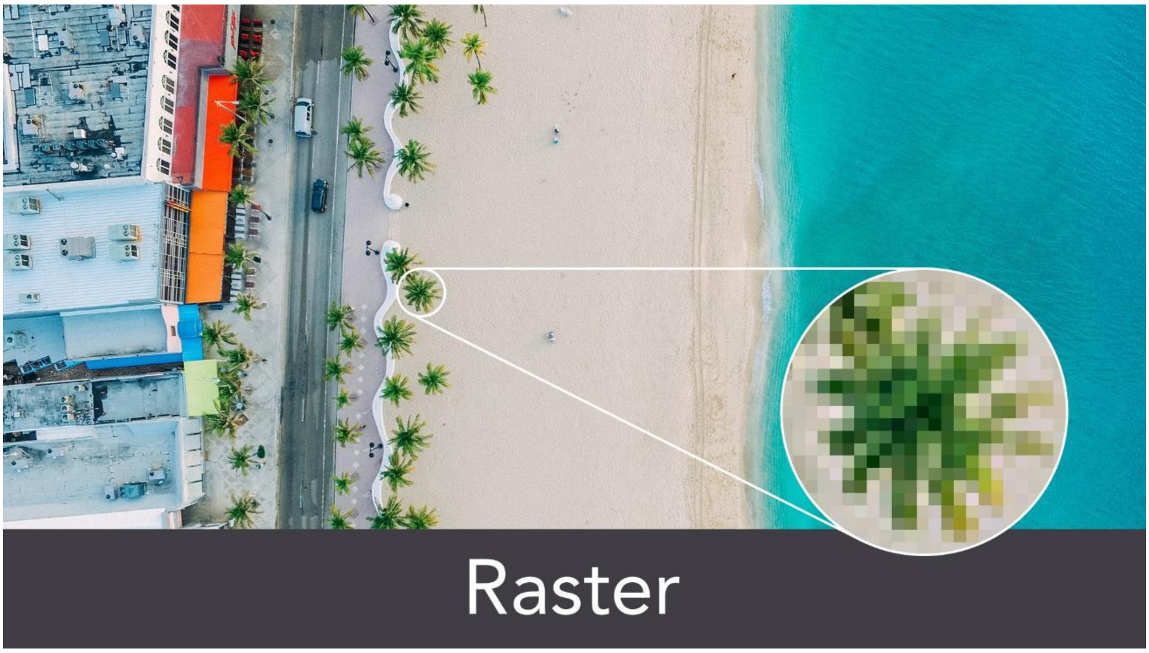


Unfortunately, it doesn't work the other way around. If you enlarge a small image—in other words, make it **bigger than its original size**—there will be a noticeable loss in quality. The image will become blurry and/or distorted, as in the example below.



Raster vs. vector

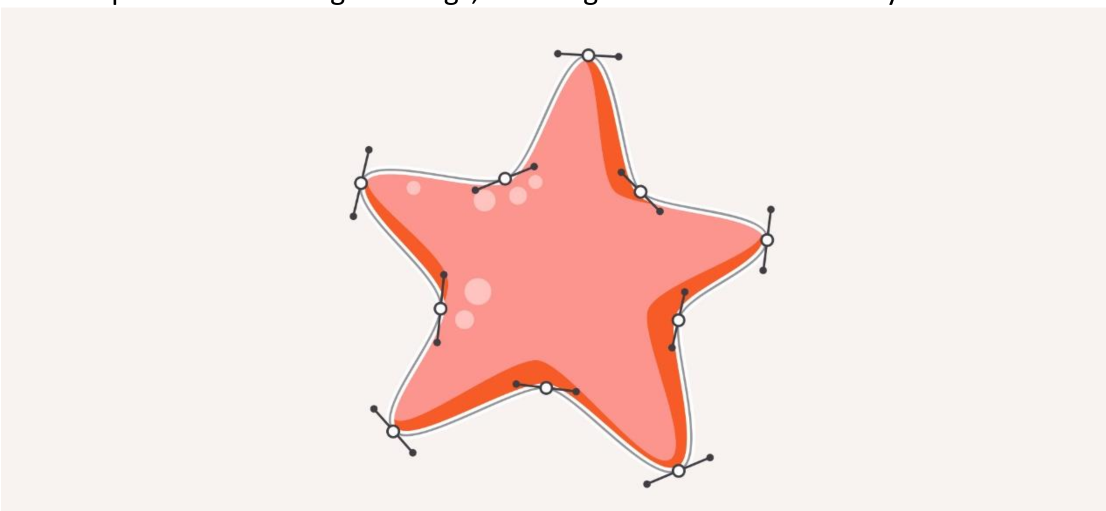
There's a reason small images lose quality when you enlarge them. It's because they're made up of thousands—sometimes even millions—of **tiny little pixels**. The word for this type of image is **raster**.




When you view a raster image at its **original size or smaller**, the pixels are invisible—they're just too small to see. They only become apparent when you zoom in or make the image larger.

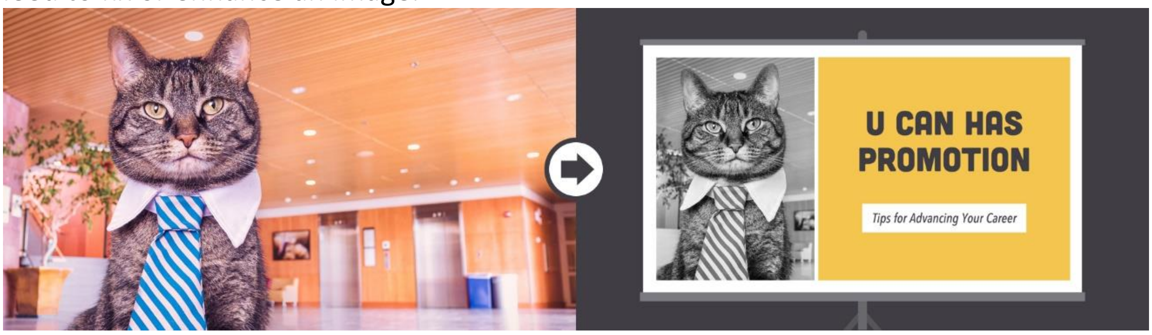
**Vector** graphics are quite different from raster. You can make them **any size**, big or small, without losing quality. In the example below, the image has been enlarged, but there's no pixelation—not even a little bit.


That's because vectors are made of something more complex than pixels. They're rendered using a special form of **geometry**. You're not likely to find vector graphics outside of professional design settings, but it's good to know what they are.



Editing images

Few stock images are perfect as is, even if they're technically high-quality ones. Maybe the image is the wrong size or the colors could use some work. Fortunately, even basic programs let you make **simple adjustments**. Look for these options the next time you need to fix or enhance an image.




For a closer look at image editing, read our **Image Editing 101** tutorial.

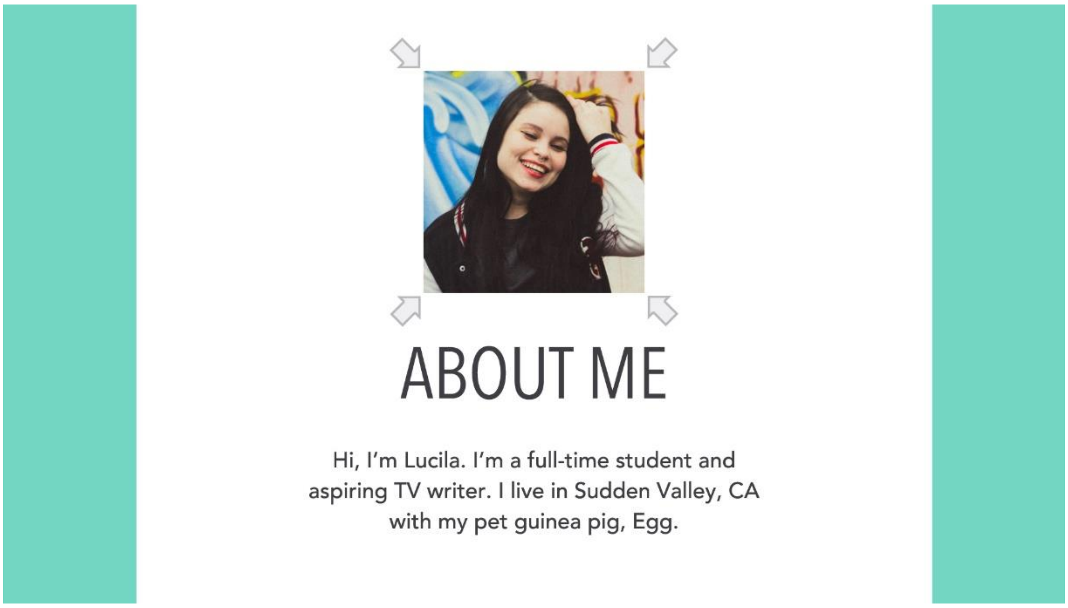
Cropping

**Cropping** can be used to change the size, shape, or focus of an image, making it useful in many different situations.

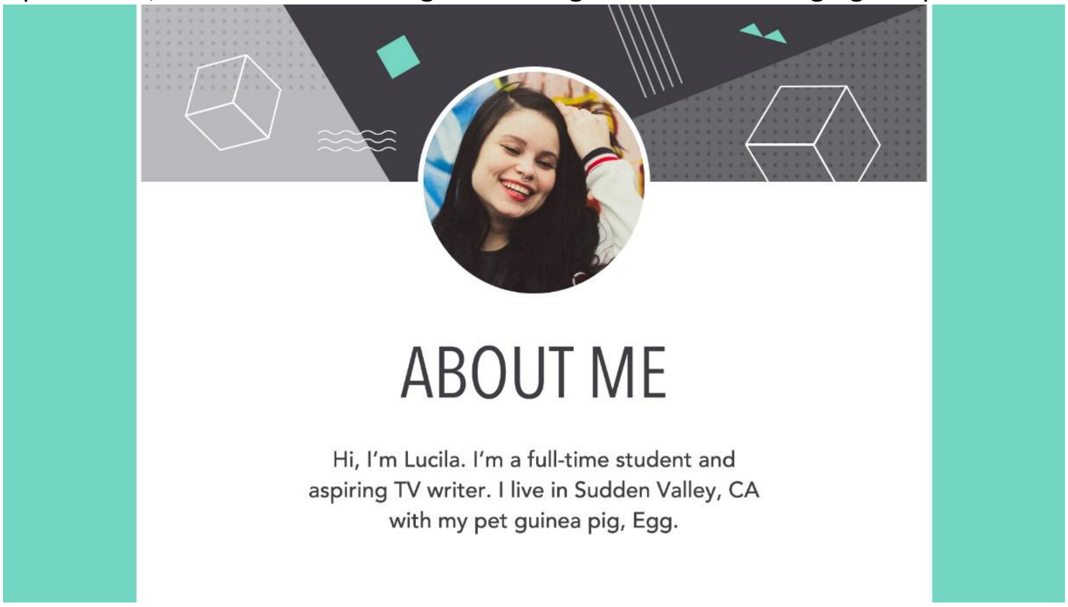
Try this feature if your graphic is the wrong dimensions, or if it includes something you'd rather cut out.

Resizing

**Resizing** an image will ensure it's the perfect fit for your project. Just remember that you can't make an image **bigger** than its original size without affecting its quality.

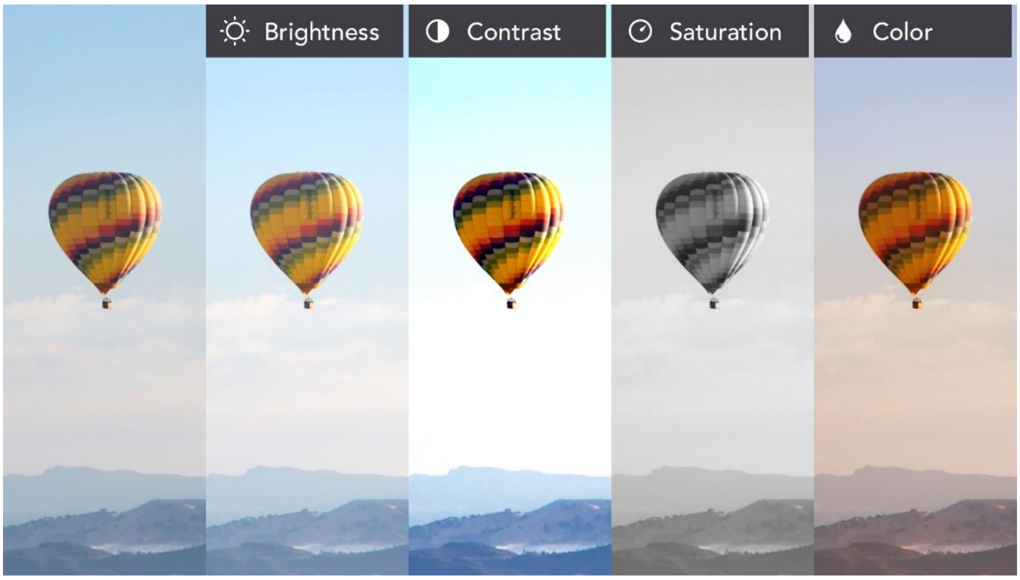



If the image you're working with simply isn't big enough, it's best to choose something else. You can also find a **creative way** to work with the image size you have. In the example below, we've added a background image instead of enlarging the portrait.

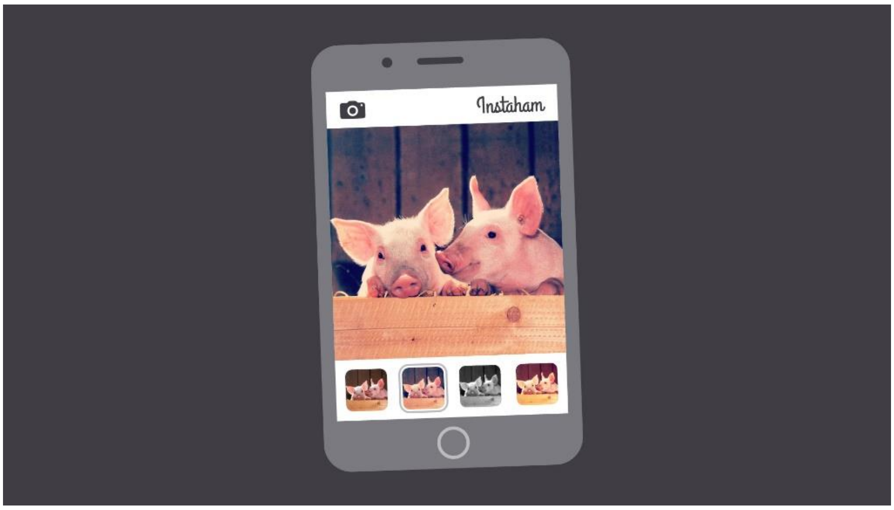



Other adjustments

**Cosmetic adjustments** let you enhance certain image qualities, including brightness, contrast, saturation, and color.

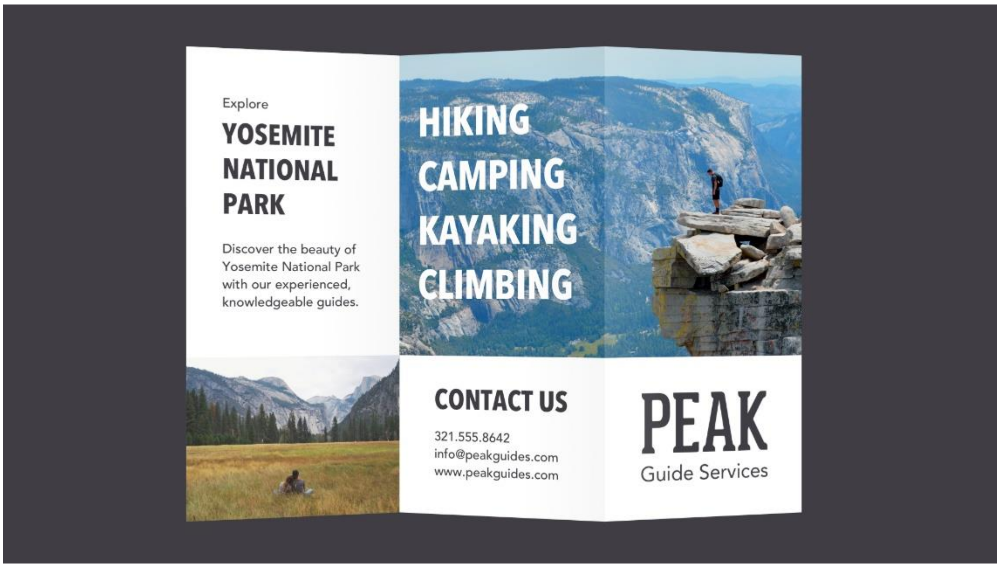



If your favorite program offers **filters or presets**, you can change your image dramatically with very little time and effort.




Putting it all together

Adding **photos**, **graphics**, and **other visuals** to your work is a great way to make it more engaging. Even a simple background image can transform your design into something special.

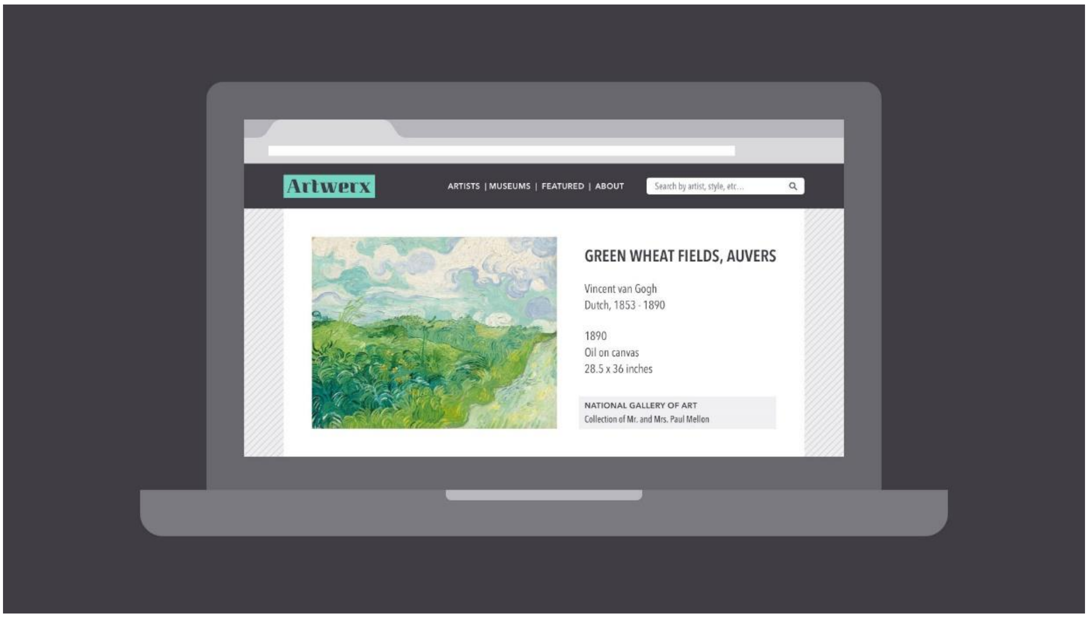



Just remember what you've learned about **image quality**—both technical and conceptual—and your work is sure to stand out for the right reasons.

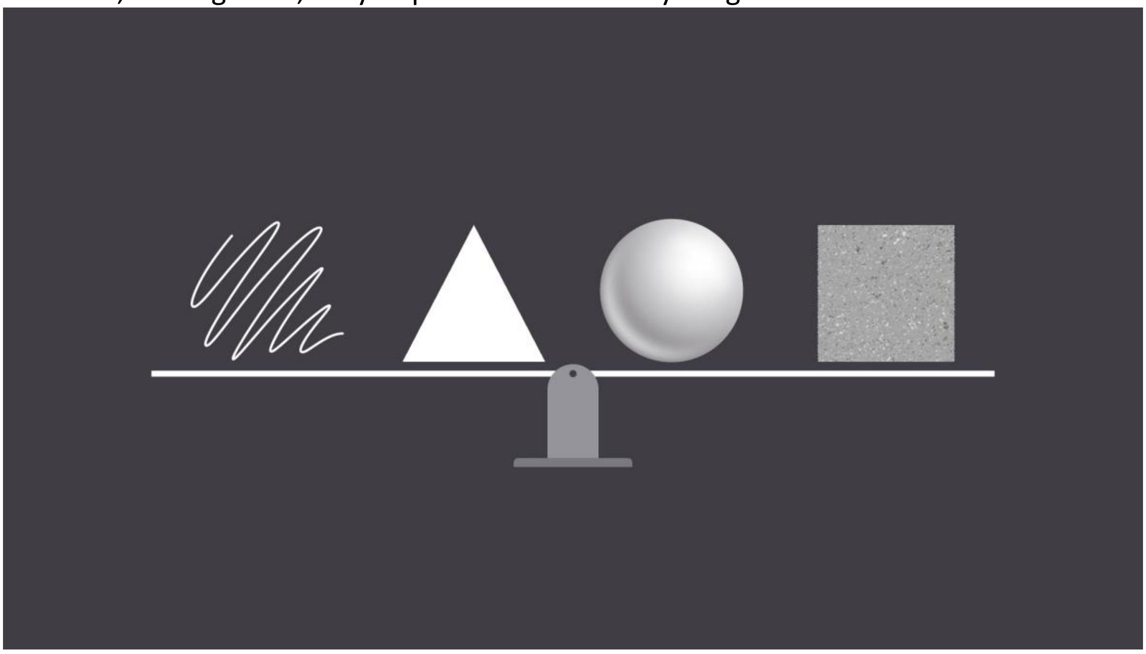

## Lesson 5: Fundamentals of Design

The basis of art, design, and more

The fundamentals of design are the foundation of **every visual medium**, from fine art to modern web design. They're even present in seemingly unimportant details, like the fonts that make up most compositions.




What do these examples have in common? Some very basic elements, including **line**, **shape**, **form**, **texture**, and **balance**. They might not seem like much on their own, but together, they're part of almost everything we see and create.

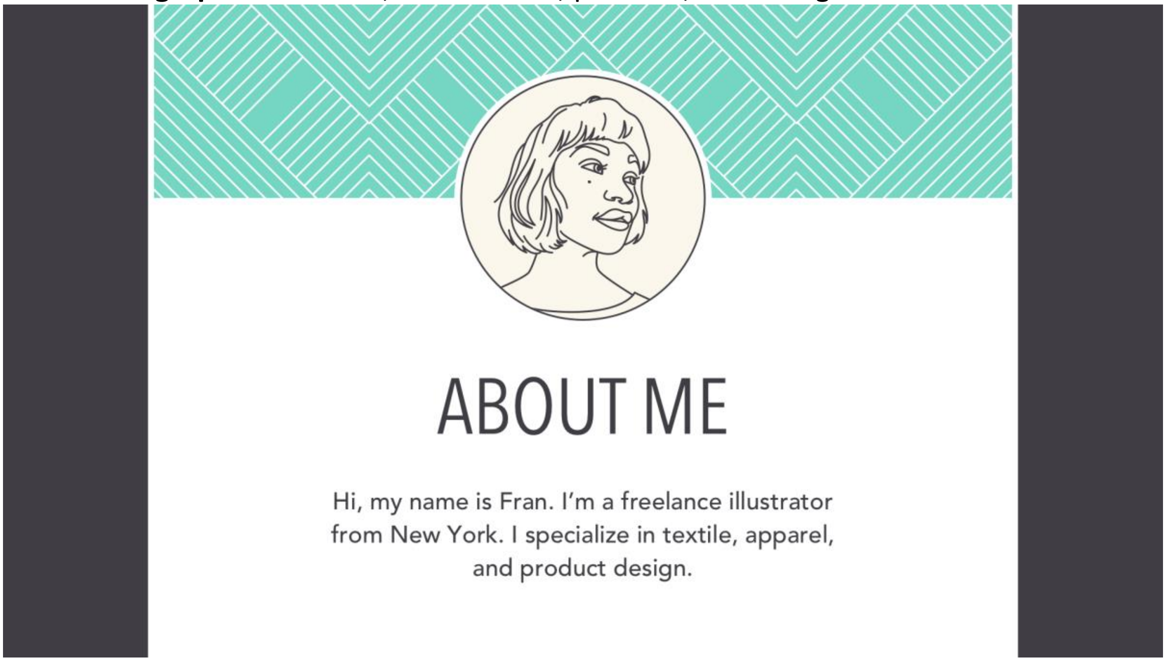


The fundamentals can be intimidating at first, especially if you don't consider yourself an artist. But keep an open mind—there's a lot they can teach you about working with different **assets** and creating **simple visuals** from scratch.

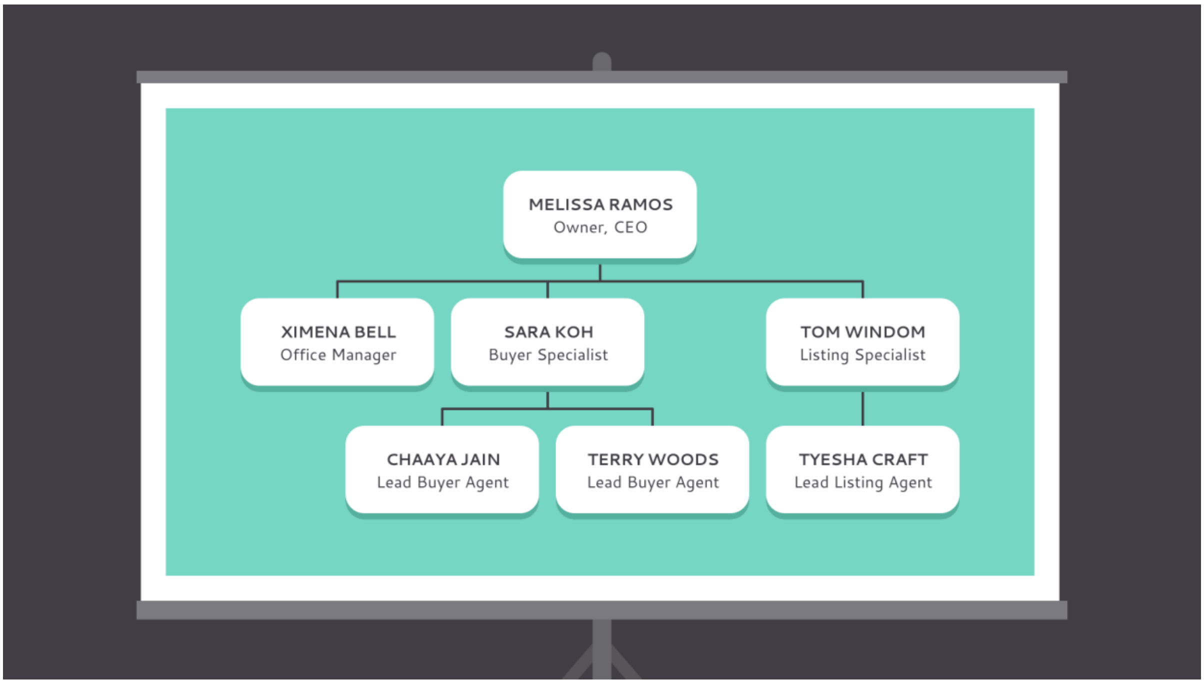
Line

A line is a shape that **connects two or more points**. It can be fat, thin, wavy, or jagged—the list goes on. Every possibility gives the line a slightly different feel.

Lines appear frequently in design; for example, in **drawings and illustrations**. They're also common in **graphic elements**, like textures, patterns, and backgrounds.




Lines can be used in more **humble compositions**, too—for organization, emphasis, or just decoration. In the example below, lines have been used to create a flow chart that guides the reader's eye from one element to the next.

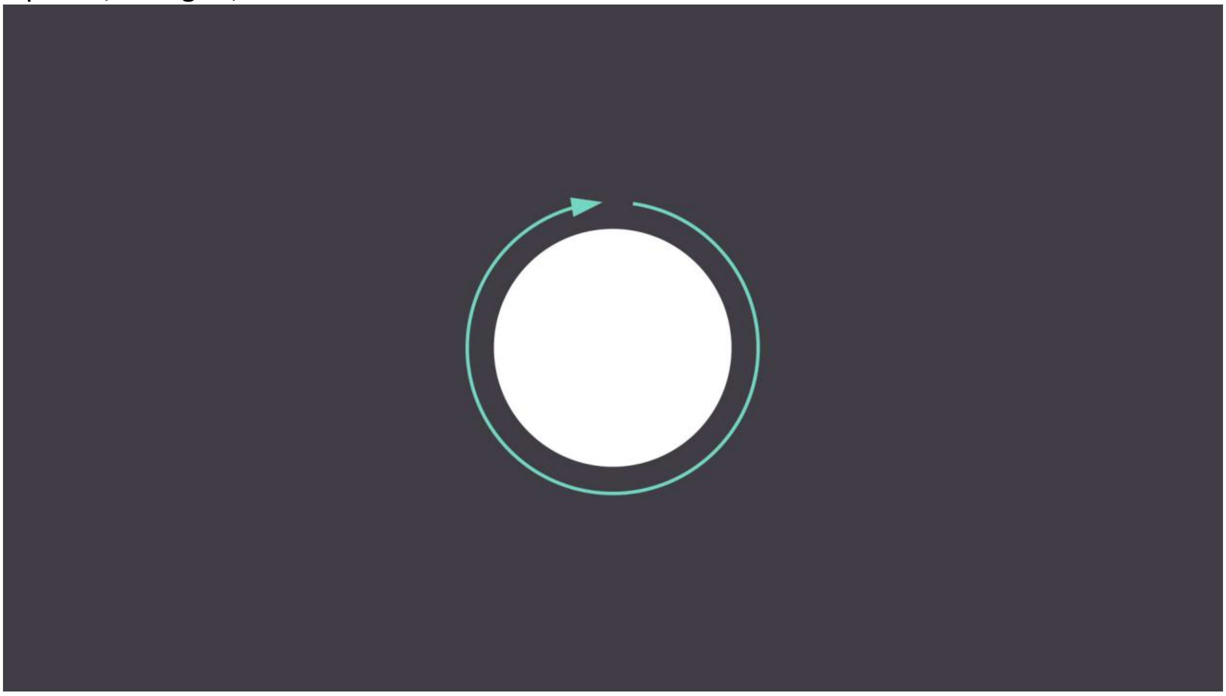



When working with lines, pay attention to things like **weight**, **color**, **texture**, and **style**. These subtle qualities can have a big impact on the way your design is perceived.

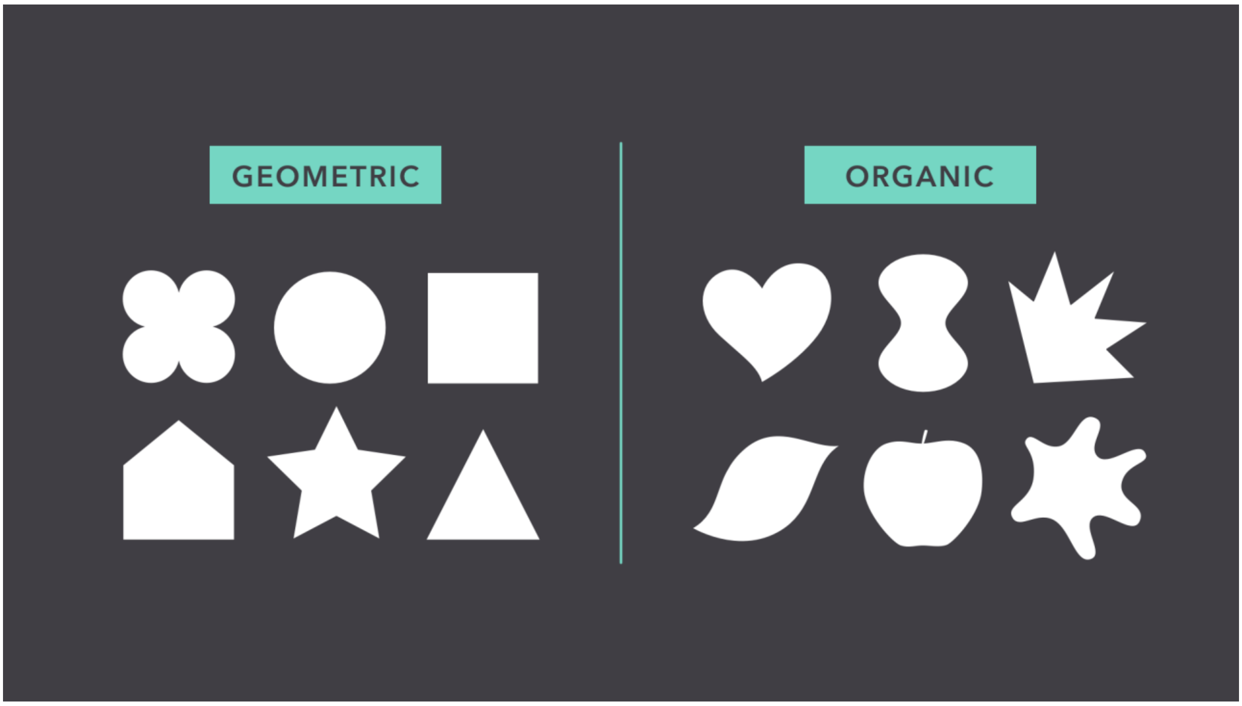
Look for places where lines are hiding in plain sight; for example, in **text**. Even here, experimenting with different line qualities can give you very different results.

Shape

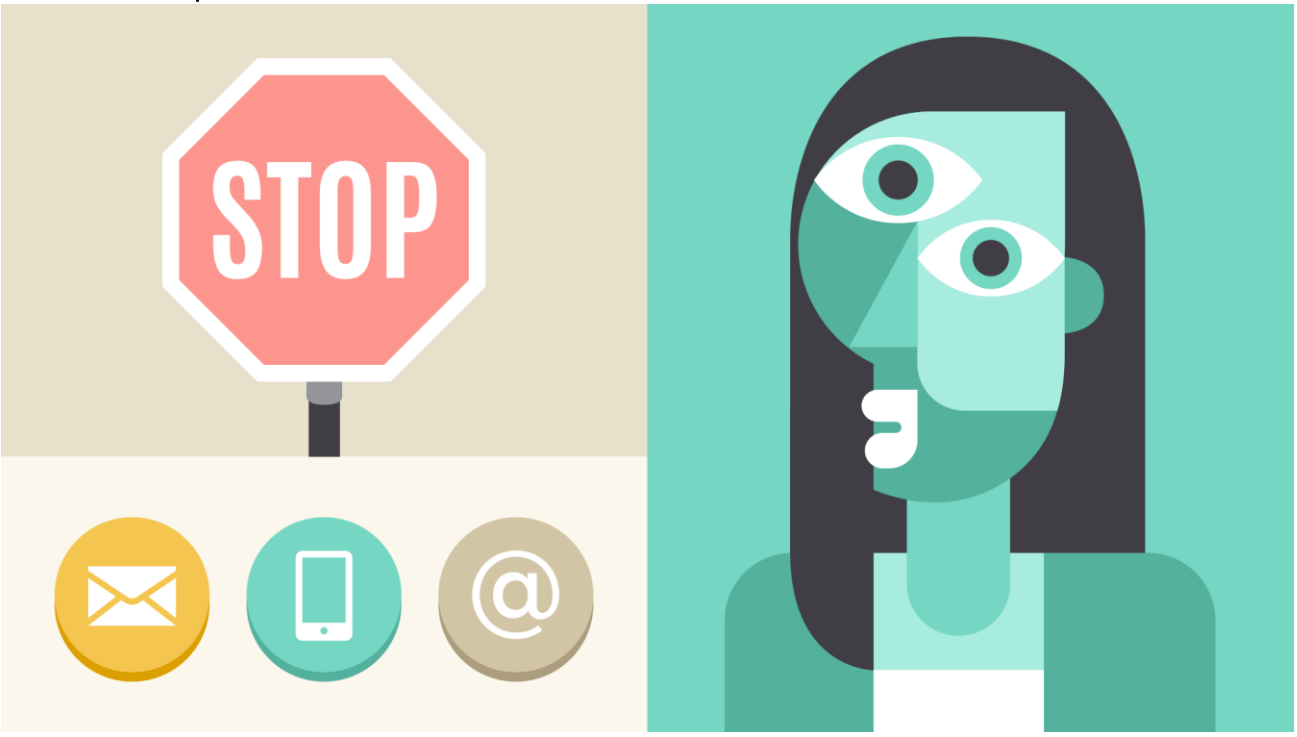
A shape is **any two-dimensional area** with a recognizable boundary. This includes circles, squares, triangles, and so on.



Shapes fall into two distinct categories: **geometric** (or regular) and **organic** (where the shapes are more free form).

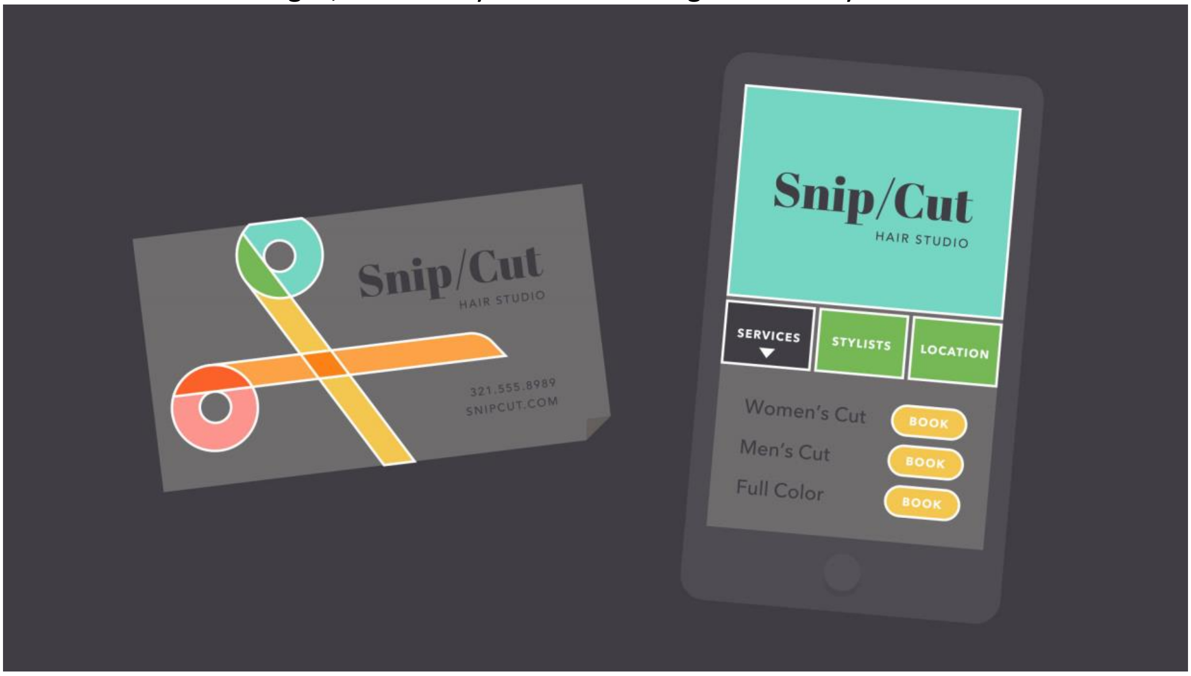



Shapes are a vital part of communicating ideas **visually**. They give images heft and make them recognizable. We understand street signs, symbols, and even abstract art largely because of shapes.




Shapes have a surprising number of uses in **everyday design**. They can help you organize or separate content, create simple illustrations, or just add interest to your work. See if you can spot the many examples in the image below.

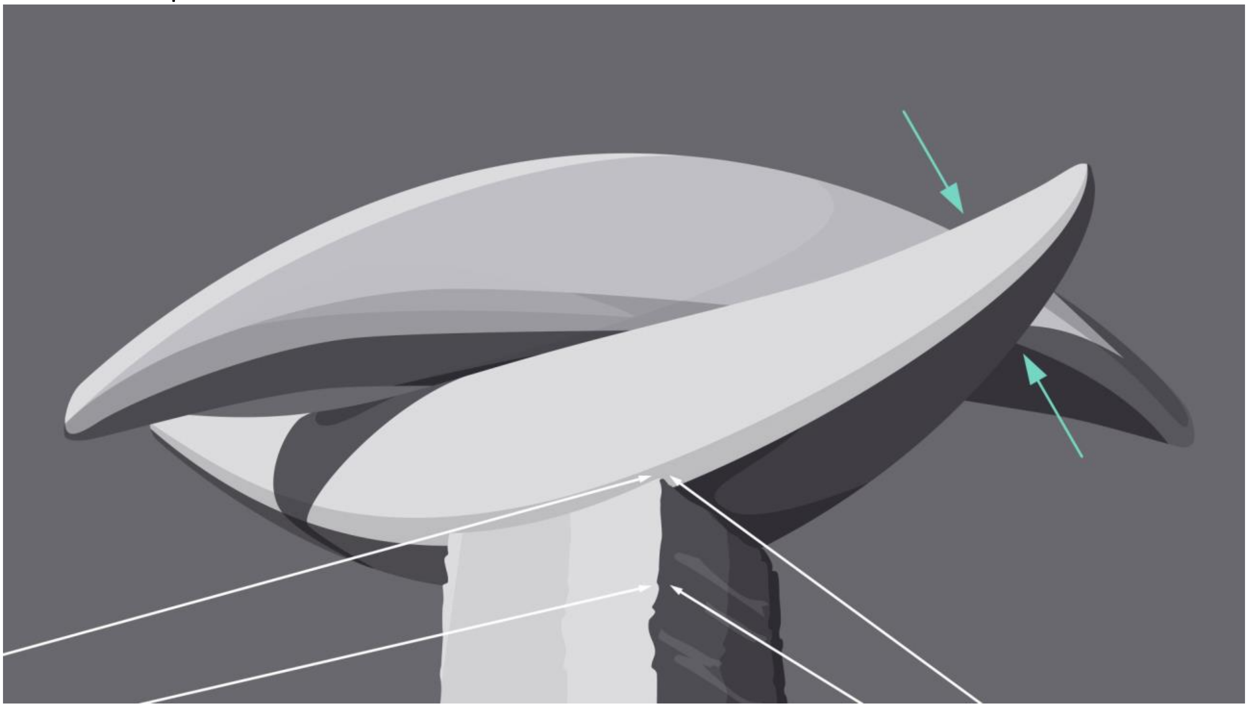

Shapes are important because they're the **foundation** of so many things. Learn to look for them in other designs, and soon you'll start seeing them everywhere.



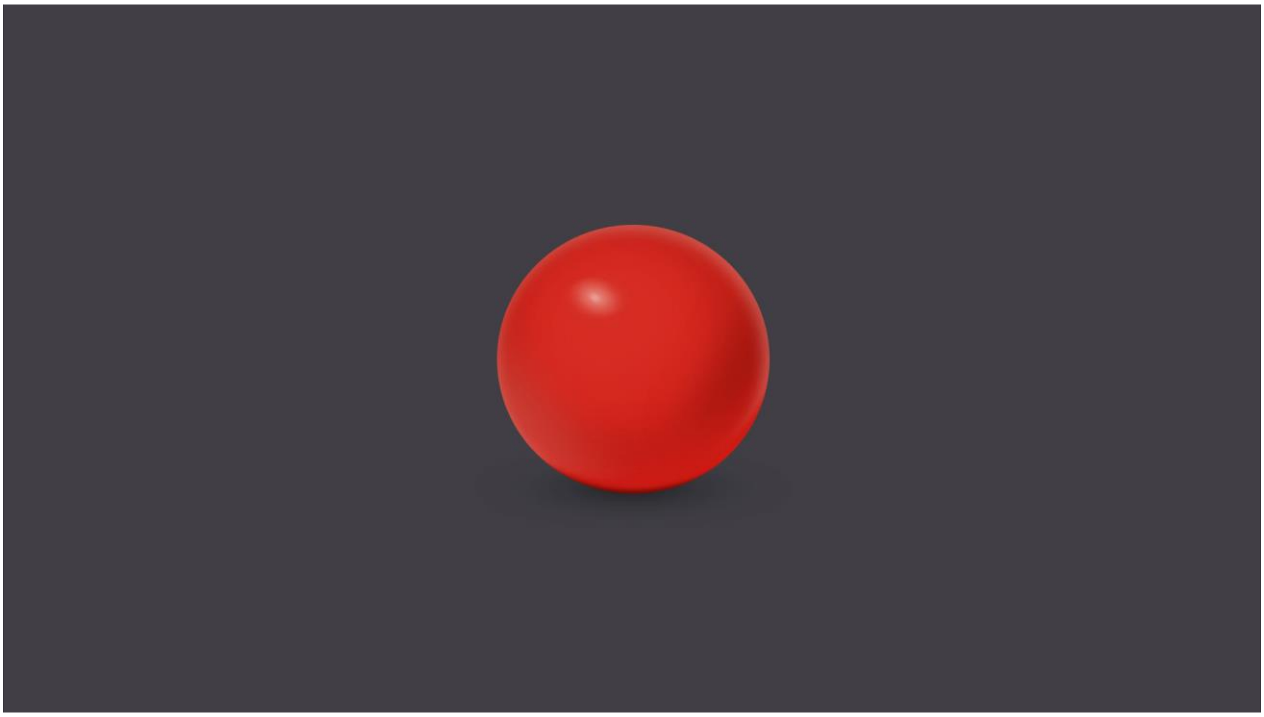

Form

When a shape **becomes 3D**, we call it a form. Forms make up a variety of things in the real world, including sculptures, architecture, and other three-dimensional objects.

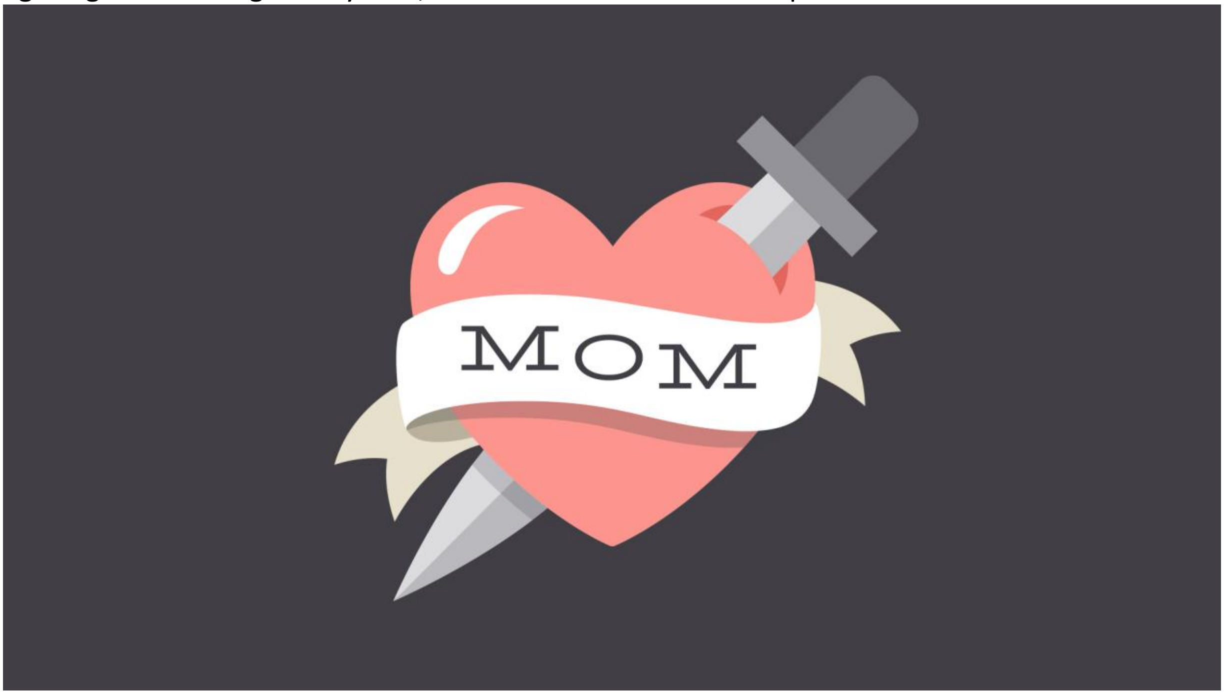
However, forms don't have to be three-dimensional shapes. They can also be implied through **illustration**, using techniques like light, shadow, and perspective to create the illusion of depth.



In two-dimensional design, form makes **realism** possible. Without it, renderings like the image below—a ball with highlights and shading—simply wouldn't be the same.



Even images that are **less realistic** use similar techniques to create dimension. Below, the lighting and shading are stylized, but still hint at form and depth.




In everyday composition, the purpose of form is the same, but on a smaller scale. For example, a simple **shadow** can create the illusion of layers or give an object a sense of place.


Basic forms can bring a touch of realism to your work, which is a powerful tool when used in moderation.

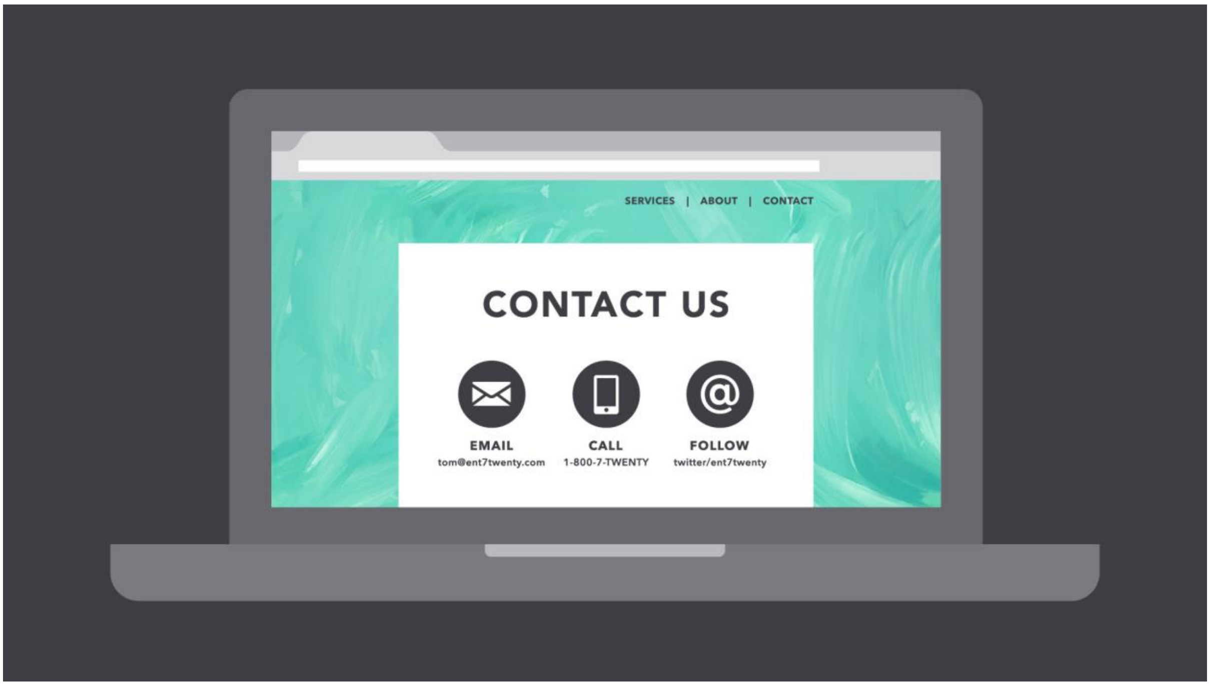
## Texture

Texture is the **physical quality of a surface**. Like form, it can be part of a three-dimensional object, as in the example below (a small prickly cactus in a shiny ceramic pot).

Or it can be **implied** through illustration, suggesting that it *would* have texture if it existed in real life.

In design, texture adds **depth and tactility** to otherwise flat images. Objects can appear smooth, rough, hard, or soft, depending on the elements at play.

For beginners, textures make great **background images** and can add a lot of interest to your work. Look closely, and you may find texture in unexpected places, like distressed fonts and smooth, glossy icons.




Just be careful not to go overboard—too much texture in a single design can quickly become overwhelming.


Balance

Balance is the **equal distribution of visual weight** (more specifically, how much any one element attracts the viewer's eye). Balance can be affected by many things, including **color**, **size**, **number**, and **negative space**.

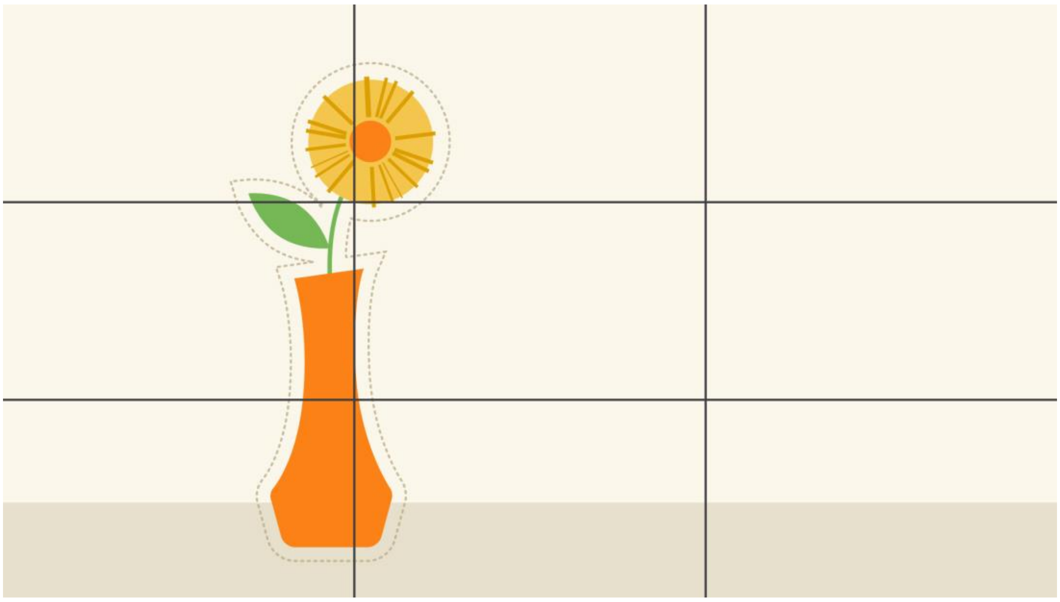
Mastering balance can be tricky for beginners because it does take some intuition. Luckily, the design world is full of examples that can help you understand its different iterations.


**Symmetrical** designs are the same or similar on both sides of an axis. They feel balanced because each side is effectively the same (if not identical).

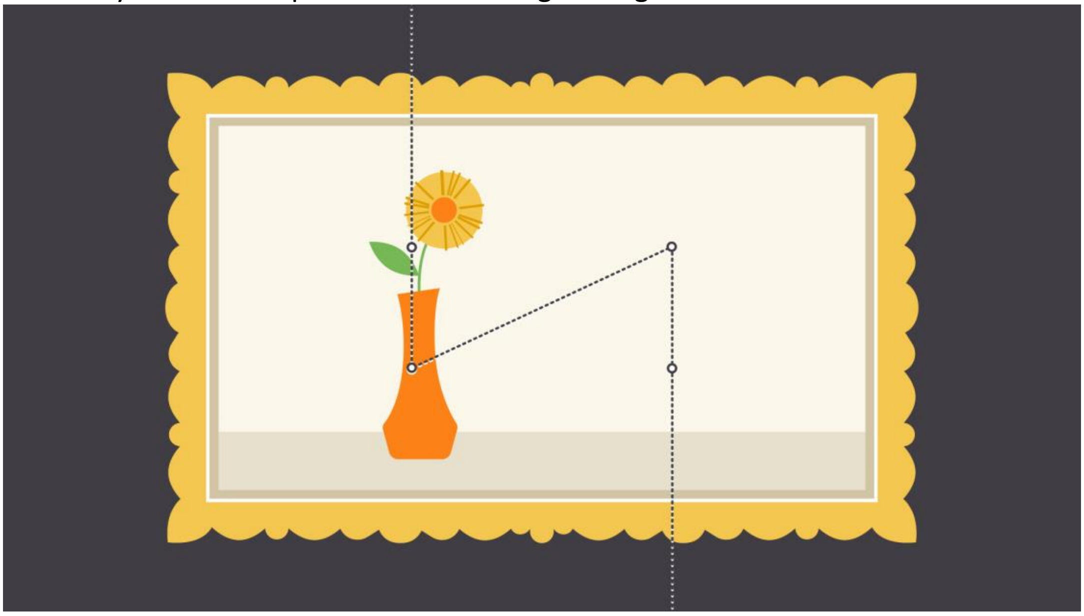

**Asymmetrical** designs are different, but the weight is still **evenly distributed**. The composition is balanced because it calls attention to the right things (in this example, the person's name and company logo).


The rule of thirds

Many people, including designers and photographers, use a strategy called the **rule of thirds**. This imagines your work area divided into a **3x3 grid**. The focal point of the image is placed on or near one of the **grid lines**, creating visual balance with the rest of the space.

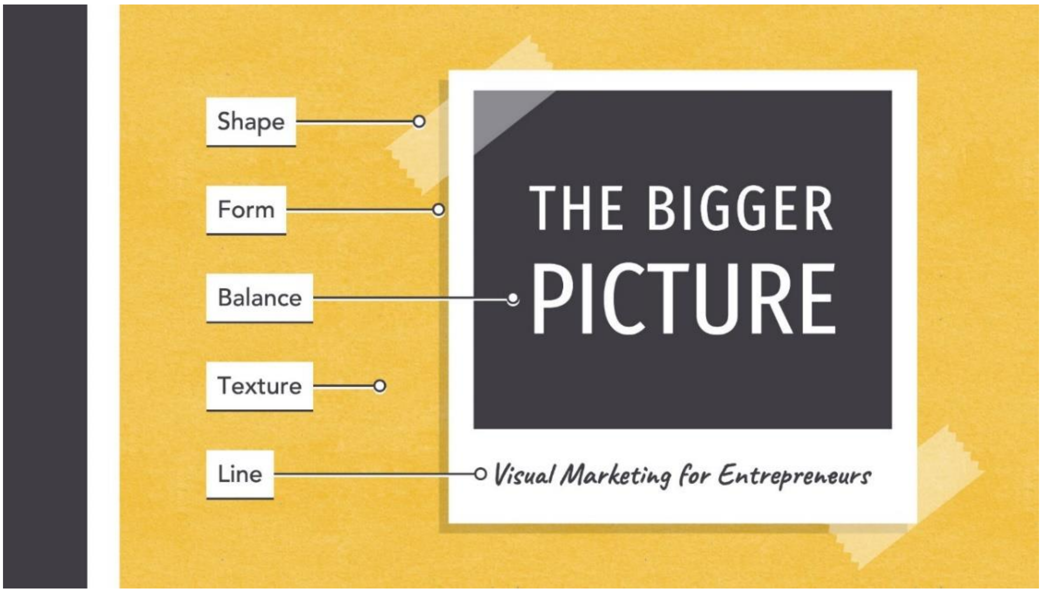


We find this type of composition appealing because, according to studies, the human eye naturally follows this path when scanning a design.

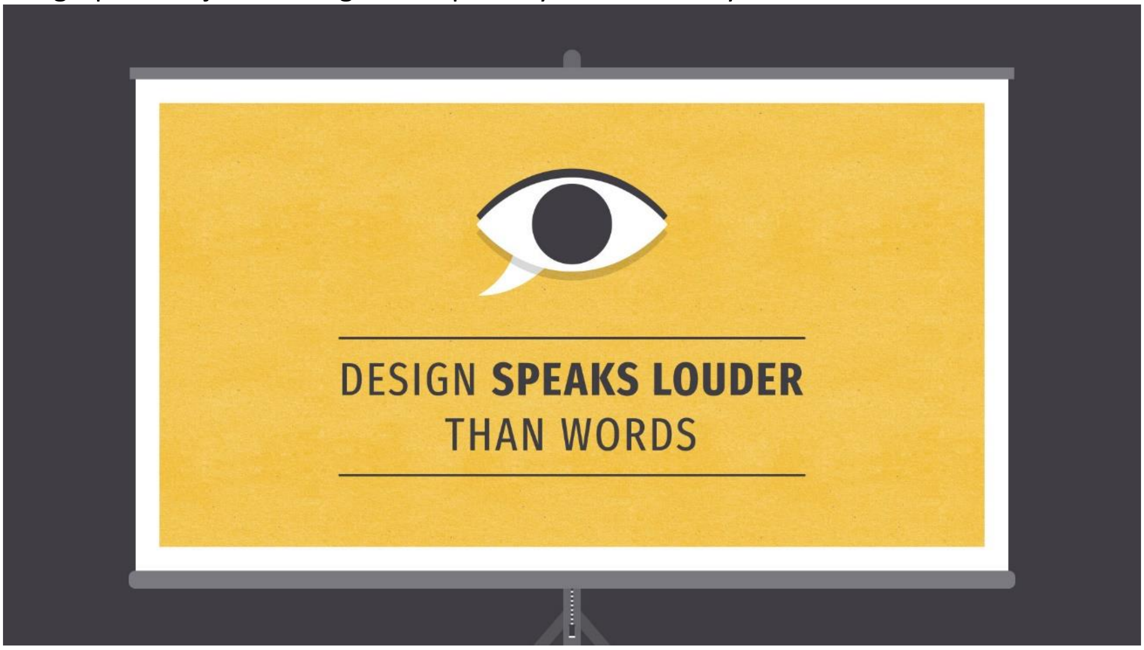


Putting it all together

The fundamentals of design are all about the **bigger picture**—in other words, learning to appreciate the many small details that make up every composition.



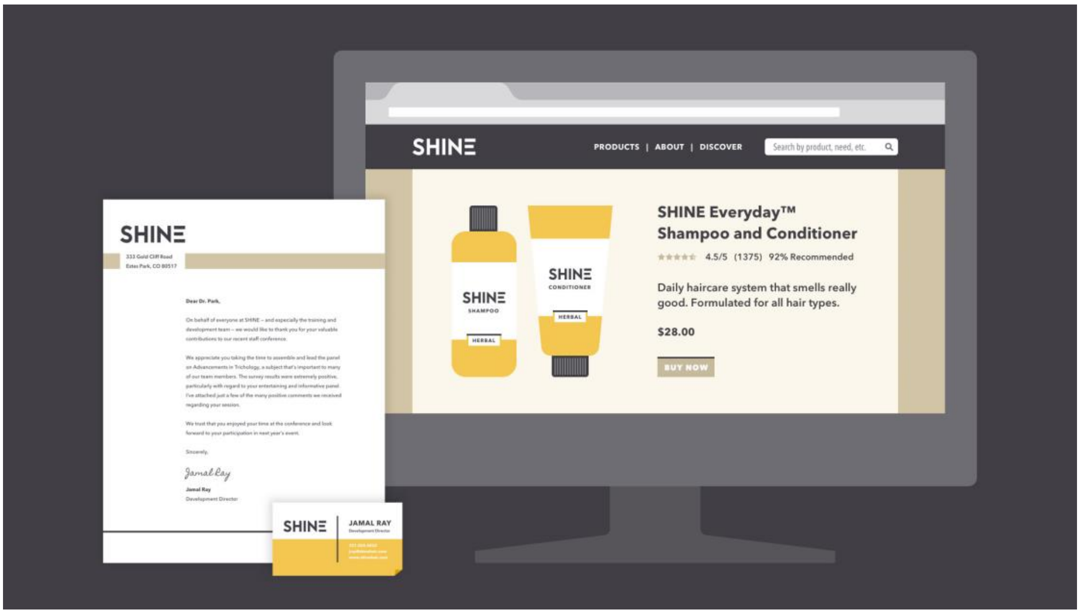

This insight can be applied to almost **any type of project**, whether you're creating your own graphics or just looking for simple ways to enhance your work.



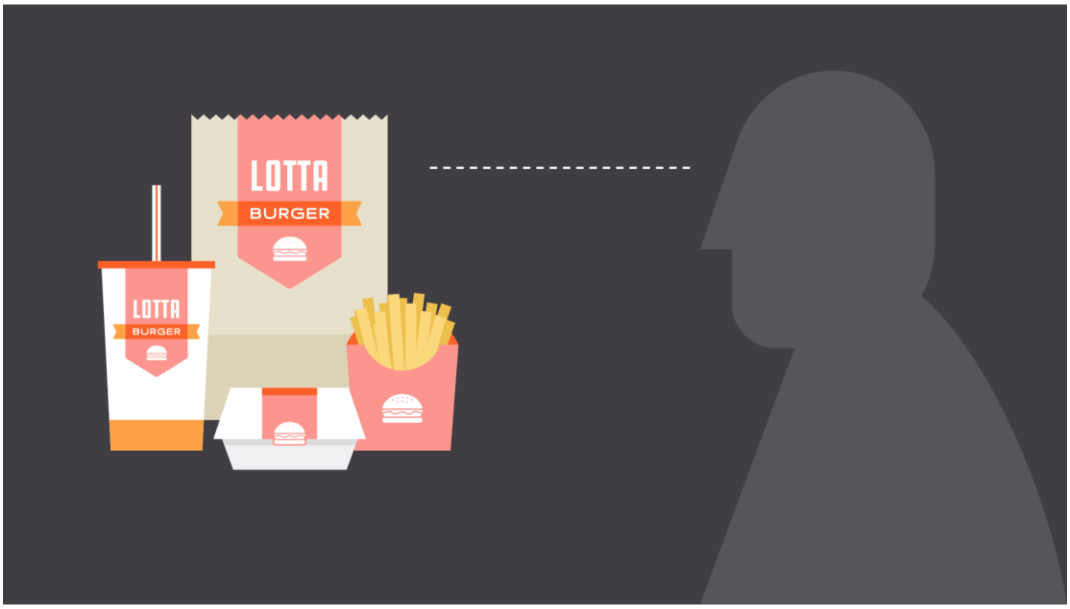

## Lesson 6: Branding and Identity

### Influencing through design

Branding and visual identity are **all around us**. Look closely, and you'll find them on websites, product packaging, and different types of advertising. Even personal items, like documents and business cards, bear some form of identity.




Simply put, **branding** is what other people think—about you, your company, your product, or your service. **Visual identity** is what that brand looks like, from your logo to your color choices and so much more.




Strong visuals can be very persuasive. Think of your own experiences as a **consumer**. Have you ever chosen a product simply because you liked the way it looked? Understanding visual identity can help you make more **thoughtful design decisions**, regardless of your role, medium, or skill level.

A closer look at visual identity

Visual identity is kind of like a **preview** of your brand. Each part of your design is a clue that tells the viewer what they can expect. Your aesthetic can be traditional, modern, or a little more out there—every brand is different. No matter what, all of your design elements **work together** to show exactly what your brand is about.


Of course, it's not all business. You can apply the concept of identity to almost **any type of project**, including personal designs. Whether you're updating your resume or looking for ways to enhance your blog, there are many benefits to having a consistent visual style.


Some companies use an actual **style guide** to keep their brand looking consistent. If you're just getting started with design, it's OK to take a more casual approach.


The main components of visual identity are **logo**, **color**, **typography**, and **images**. Read on to learn more.

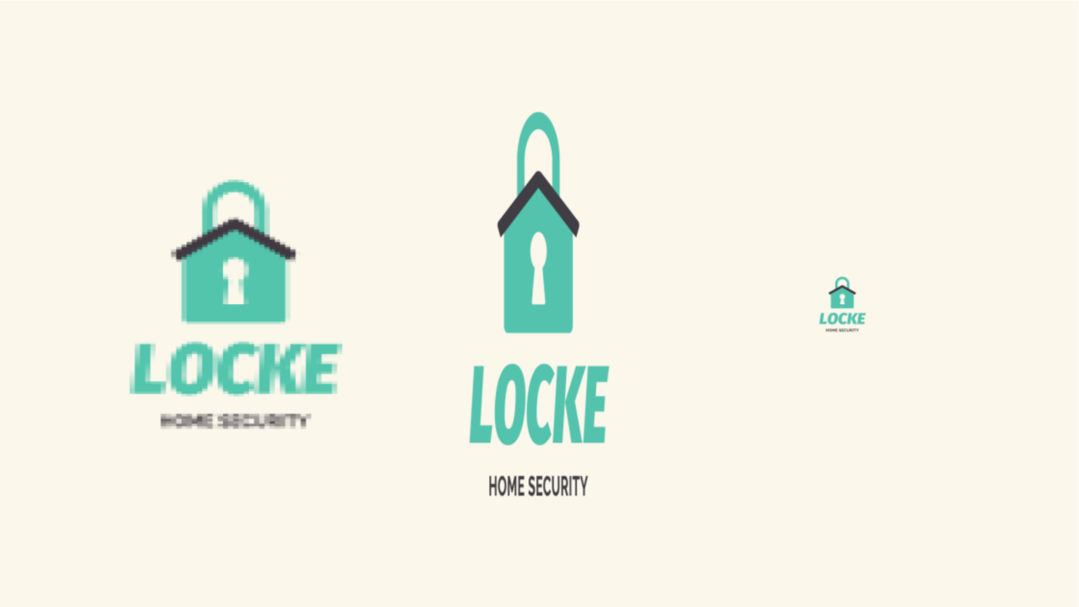
Logo

A logo is what **identifies your brand** using a particular mark, type design, or both. The most effective logos tend to be fairly simple—something viewers will recognize and remember.


Every element of your logo contributes to your **brand identity**, including your font choice, colors, and other imagery. Change even one of these elements, and it can have a big impact on the way your brand is perceived.


In practice, logos are **everywhere**. You'll find them in corporate settings, as well as out and about, representing small businesses, freelancers, and other entrepreneurs. A logo is a lot like a literal **brand**—it's how people come to recognize you and identify your product or service.


That's why it's important to use it wisely. A logo that's pixelated, distorted, or too small to read could give viewers the **wrong impression**. Below, you'll find several examples of low-quality files.

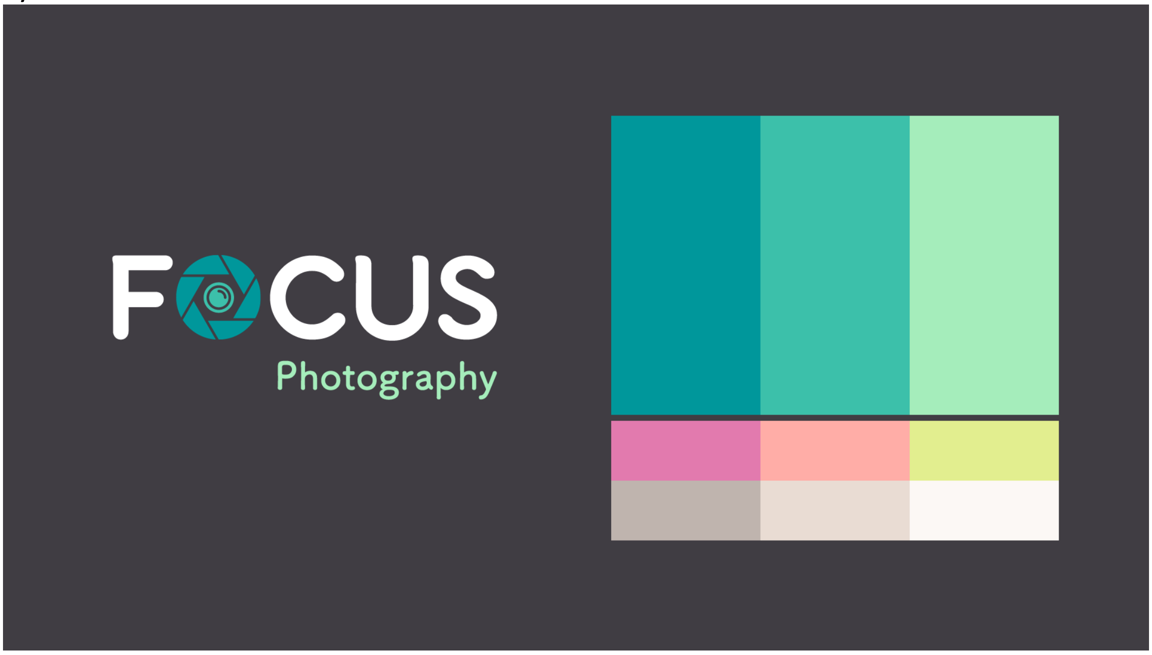



To combat this, keep a **master digital copy** that's sharp, high in quality, and large enough for any project. This way, you're prepared for anything that might come along, whether it's a small print job or something much, much bigger.

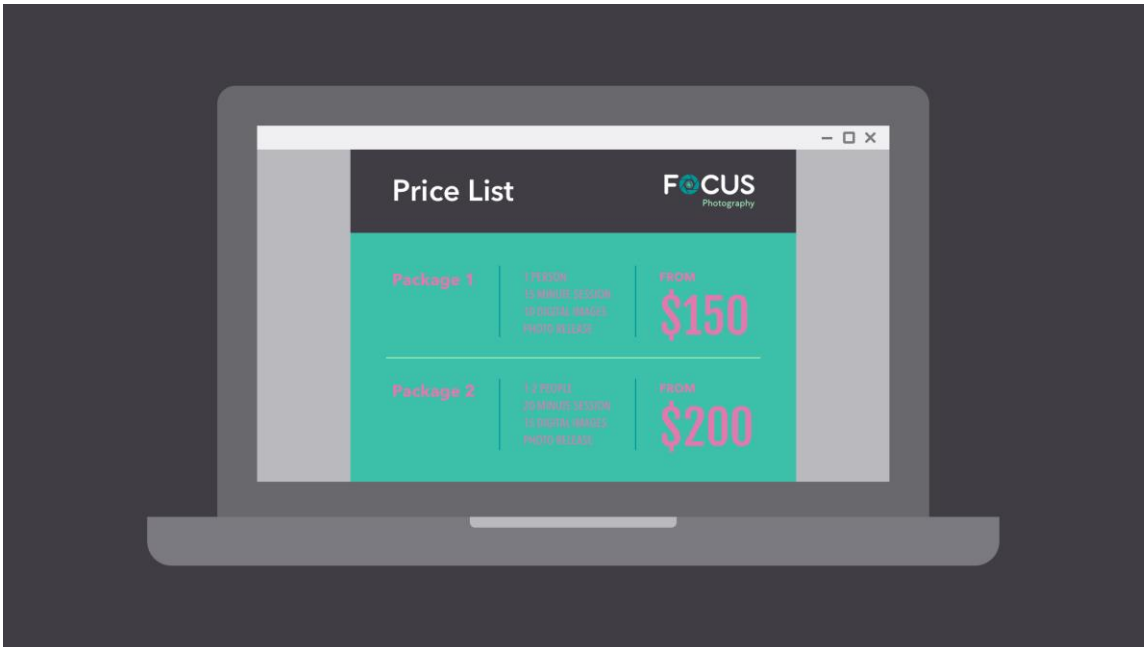

Color

Color helps **define your brand** in a very powerful way. Not only does it make a strong impression on the viewer, but it also creates a sense of unity when used across multiple projects or platforms.

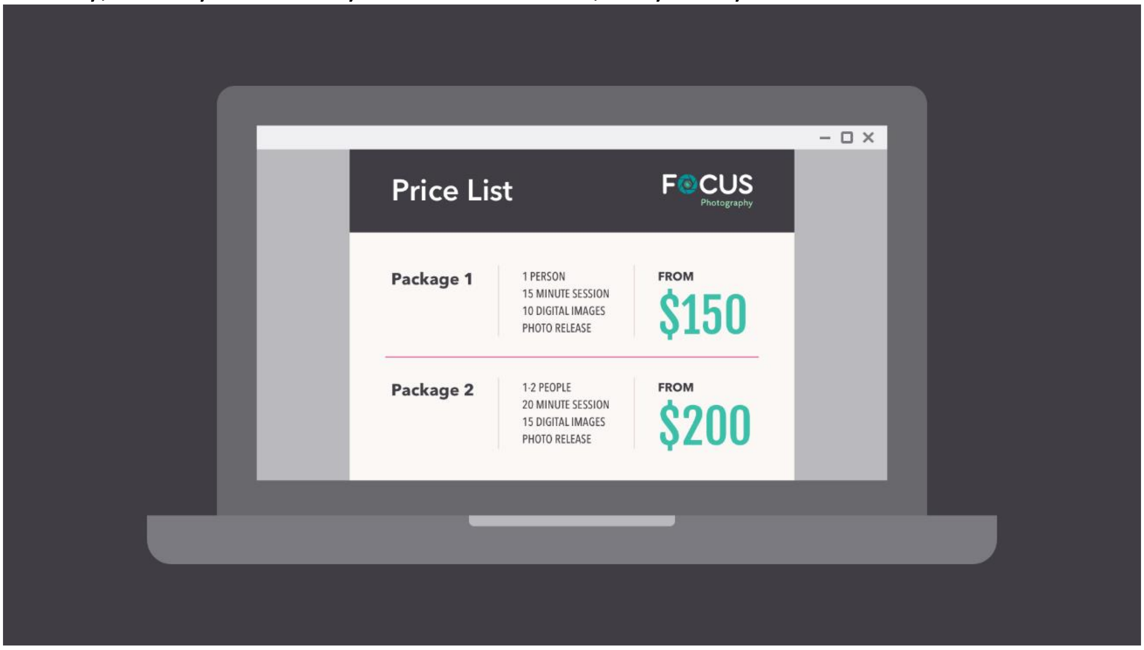

Most brands derive their main colors directly from the **company logo**. Additional colors can help you **expand** the main palette and further define your brand's personality and style.




There are lots of ways to use brand colors. Just be careful not to go overboard or ignore widely accepted design standards. Good color use is all about **moderation**.
Avoid **common pitfalls**, like colors that vibrate or distract viewers from your work. For instance, in the image below, the text clashes with the background, making it difficult to read.




Make sure to include **neutrals** in your color palette, like black, gray, white, or off-white. This way, when you do use your brand's colors, they really stand out.



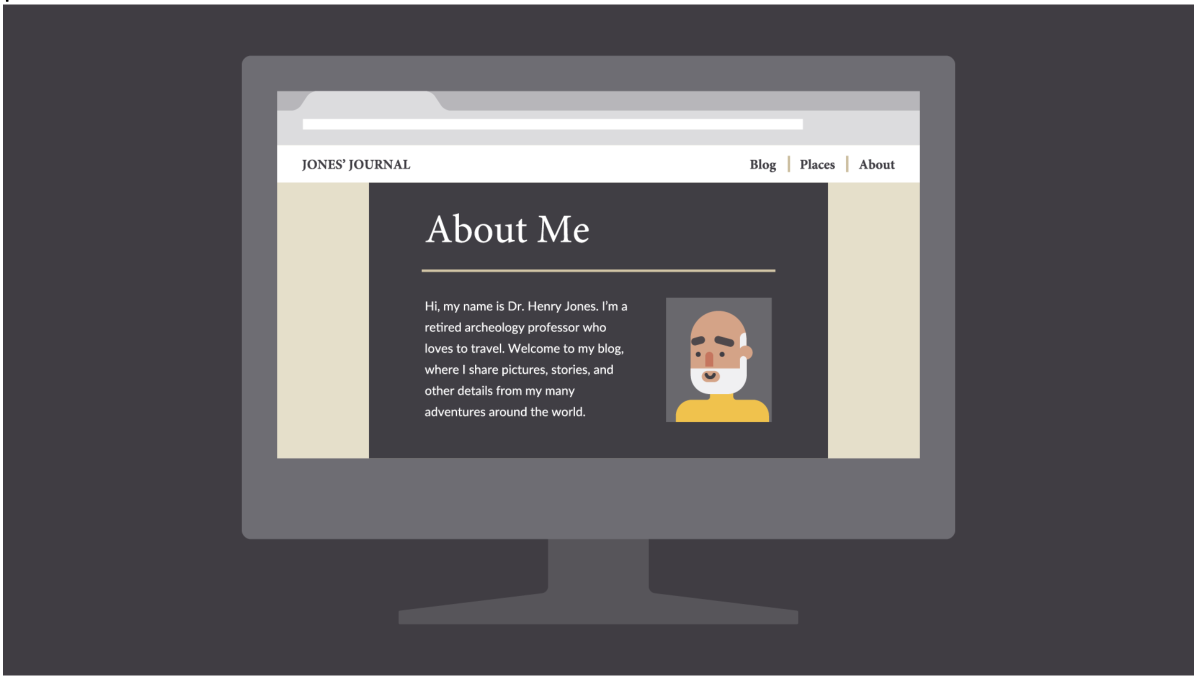

Typography

Text is one of the simpler aspects of identity, but it can be surprisingly **expressive**. All it takes is a different font, and you can subtly (or not so subtly) change the entire feel of your brand.


Most brands choose **two to three fonts**—often inspired by the logo—for basic, everyday use. Creative fonts should also be chosen with care and should be a reflection of your unique visual identity.

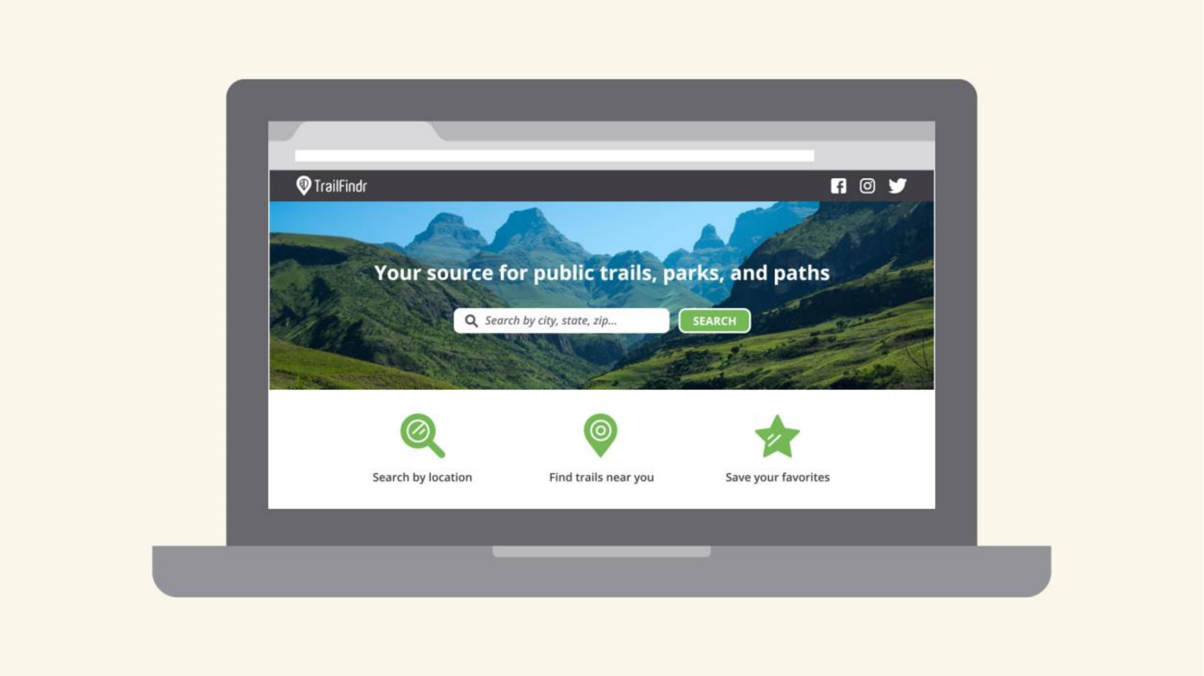

There are certain fonts that professionals know to **avoid**—fonts that were once popular but that are now considered outdated and overused. The fonts below are notorious examples.


When in doubt, a more **timeless**, **understated** font is less likely to detract from your message. Your font choice should complement your brand, but still be current and professional.




Images

Images are a huge part of building a **unique identity**. Every photo, graphic, icon, and button is a chance to showcase your brand and shape the way it's perceived.




In professional settings, images are usually created specifically **for the brand**; for instance, pictures in a catalog or graphics in an app. If you don't have the luxury of this, you can get similar results by choosing images with a subtle **through line**; for example, a signature color or similar style.

Most importantly, avoid images that feel generic or obviously staged. This is difficult if you're relying on **third-party stock**, but there are ways to set your brand apart.


Avoid images that lack **context** or appear frequently in **other brands' designs.** Take the photo below. Some viewers might find it off-putting due to the forced pose and artificial background.

Instead, choose images that seem **genuine** and that feature authentic people, places, and things. The best images are the embodiment of your unique point of view. They represent how you want to be seen when people think about your brand.

Putting it all together

Visual identity isn't just a marketing tool. It's a way of looking at design that removes a lot of the guesswork. With a **clear vision of your brand**, you know exactly what colors, fonts, and images to use. You can create consistent works that viewers will remember.

# Module 13: ICT Legal Environment Awareness in Bangladesh (Short)

## OVERVIEW:

The development of information and communications technologies (ICTs) enables businesses and individuals to communicate and transact with other parties electronically, instantaneously and internationally. This gives rise to a variety of legal and regulatory issues for policymakers, from the validity of electronic methods of contracting and the security risks inherent in them, to concerns over cybercrime and the ability to protect intellectual property rights online. This guide examines distinguishes ICT legal issues into five distinct areas:

- Legal infrastructure, which considers some of the key legal and regulatory facilitators for electronic commerce, from adherence to law reform principles such as 'technology neutrality', to regulatory structures and market liberalization.
- Legal certainty, which examines the legal status of electronic communications and forms of contracting, specifically the need to explicitly recognize the validity, enforceability and admissibility of electronic means of executing legal acts.
- Legal security, which examines the security risks inherent in an electronic environment and considers the methods used to overcome these, in particular the use of digital signatures and certification services.
- Legal protection, which reviews intellectual property rights and how such intangible property is protected in an online environment, as well as the consumer protection issues which the Internet raises.
- Legal deterrence, which examines the development of cybercrime and the regulatory approaches to criminalizing such harmful conduct and ensuring that law enforcement are able to investigate and prosecute offenders.

Information Technologies have generated profound changes in human society. These are quite different from social transformations caused by earlier scientific advances. The invention of the telegraph in the early 19th century started the modern Information & Communication Technology (ICT). By the 21st Century we witness a dramatic new wave of ICT, leading to massive socio-economic changes.

Bangladesh has placed poverty alleviation on the top of its development agenda. It is here that ICT has a critical role to play. It is for developing countries and especially the least developed among them to seize the opportunity and adopt ICT as a priority tool to fight hunger, malnutrition, illiteracy, discrimination against women, children, aged and disabled. The need to invest in ICT infrastructure and especially ICT human resources is paramount.

The ICT sector of Bangladesh is one of the fastest growing sectors of its economy. ICT has been declared as the thrust sector by the Government. A comprehensive ICT Policy has been formulated and a National ICT Task Force, headed by the Honorable Prime Minister, has been formed. The Government organization entrusted for the development and promotion of the ICT sector is the Ministry of Science and Information & Communication Technology. Bangladesh Computer Council (BCC), the apex body for promotion of all kinds of ICT activities in the country, works under the Ministry of Science and Information & Communication Technology.

## A Brief History of Security Awareness

It comes as no surprise that the history of cybersecurity can be traced back to the appearance of the internet. Ever since the worldwide web began to percolate into mainstream society, cybercriminals have been coming up with innovative ways to take advantage of this.

One of the first incidents of hacking took place in the early 1980s when a group of computer hackers known as the 414s (named after their Milwaukee area code) were arrested for breaking into more than 60 computer networks. These include the Memorial Sloan-Kettering Cancer Center and the Los Alamos National Laboratory.

As hacking became increasingly challenging during this period, the Computer Fraud and Abuse Act was created to punish those who were caught victimizing computer systems. By the late 1980s, a unit called the Computer Emergency Response Team (CERT) was formed under the Computer Emergency Response Team (CERT) to investigate the growing volume of hacking on computer networks.

Towards the end of the 1980s, Robert Morris released the historic Internet worm, which caused 10% of the internet to shut down (at the time). It was also possibly the first denial-of-service (DoS) attack ever to appear on the internet.

Though hacking from the 1980s was, for the most part, carried out by amateurs and hacking students, cybercrime took a more serious turn as the 1990s rolled by. By this time, cybercrime had not only increased in sophistication but notoriety. Hackers started to target government agencies and substantial corporate databases, such as Yahoo!, eBay, and Amazon.

From the late 1990s to the beginning of the millennium, viruses, such as Melissa and ILOVEYOU, started making headlines for infecting more than 10 million personal computers and causing the failure of email systems around the world. These threats inevitably led to the development of antivirus technology and the growing importance of security awareness for computer users.

## ICT Policy of Bangladesh

For the development of ICT sector within the framework of overall national development, the Government has approved the National ICT Policy in October 2002. The Vision of this Policy aims at building an ICT-driven nation comprising of knowledge-based society by the year 2006. In view of this, a country-wide ICT-infrastructure will be developed to ensure access to information by every citizen to facilitate empowerment of people and enhance democratic values and norms for sustainable economic development by using the infrastructure for human resources development, governance, e-commerce, banking, public utility services and all sorts of on-line ICT-enabled services. A comprehensive Action Plan "Roadmap for ICT Development" and

Poverty Reduction Strategic Paper (PRSP) based on the ICT Policy, 2002, Kualalampur and Hyderabad declaration and the Millennium Development Goals is under preparation.

Intellectual Property Rights (Copyright) Law

To help the ICT sector flourish in the country, there is a need for an effective legal framework. Timely and suitable legal reforms can create an ICT-friendly legal environment. Such an environment will help this sector grow by attracting investment. In order to create such a legal environment, the amendment of the Copyright Act 2000 incorporating issues related to ICT is in the process of finalization. Bangladesh is presently signatory to two important international copyright agreement/convention and is presently working for upgrading the Intellectual Property Rights (IPR) Law in light of the changing needs.

Law on Information Technology

To create a smooth environment for e-Commerce and to safeguard the dealings over the net and to check the threat to computer communication, the government has drafted the ICT law and is in the process of enactment by the Parliament. The Information Technology (Electronic Transaction) Act will provide a legal framework that recognizes digital signatures and other electronic documents and have enough provisions to check cybercrimes, which are not covered by any existing law of the land. The draft has been made based on the Model Law on E-commerce framed in 1996 by the United Nations Commission on International Trade Law (UNICITRAL).

Challenges and Prospects of e-Governance

The government is considering aggressively to move into e-governance for providing all needed information to citizens and for efficient and transparent services and to create an information environment and enhance the efficiency, effectiveness, dynamism in public agencies and to ensure their accountability. Transformation to e-Government is only possible with the right governance structure, together with the political will to drive change across the whole of government services encompassing such vital sectors as Human Services, Justice & Public Safety, Revenue, Defense, Education, Transport & Motor Vehicles, Regulation & Democracy, Procurement and Postal.

ICT ACT 2006

In order to facilitate e-commerce and promote the growth of information technology, the Information and Communication Technology Act (ICT) of 2006 of Bangladesh established provisions with a maximum penalty of up to 10 years imprisonment or a fine of up to 10 million taka or both. The ICT Act, 2006 as amended in 2013 is obviously quite a brilliant feat in the cyber law field of Bangladeh.

In Bangladesh, the ICT Act, 2006 was enacted to prevent cybercrimes and regulates e-commerce. Before this Act was enacted, the law applicable to cyber offences was the Penal Code, which was enacted long ago in 1860 when nobody even thought of computer technology or cyber crime. With the entry into force of the ICT Act, 2006, in order to meet the new requirements of cyber space crimes as well as c-commerce disputes, it becomes necessary to introduce certain consequential changes in certain provisions of the Penal Code, 1860 as well as in the Evidence Act, 1872.

What are the main offences in Bangladesh in regards to the Information Technology Law, Internet and ICT Act?

Some of the main offences are pointed out below that may arise out of Online Law / Internet Law in Bangladesh ICT Rules, Regulations and Rights in Bangladesh (not in any specific order.)

Fake Electronic Publication

If any person intentionally publishes or transmits or causes to be published or transmitted on the website or in an electrical form any material which is false or obscene or which has the effect of tending to debase and corrupt persons, who are likely, having regard to all relevant circumstances, to read, see or hear the matter contained or embodied in it, or causes to deteriorate or creates possibility to deteriorate law and order, prejudice the image of the State or person or causes to hurt or may hurt religious belief or instigate against any person or organization, then this activity will be regarded as an offence.

- Punishment for Fake Electronic Publication

Anyone who commits the offense of electrically publishing false, obscene or defaming information shall be punished with imprisonment for a term of at least 7 years and a maximum of 14 years, and with a fine of up to 10 Taka lakes or both.

Hacking an electronic device ( Hacking a Computer/Phone/Info):

If any person with the intent to cause or knowing that he is likely to cause wrongful loss or damage to the public or any person, does any act and thereby destroys, deletes or alters any information residing in a computer resource or diminishes its value or utility or affects it injuriously by any means or damages through illegal access to any such computer, computer network or any other electronic system which do not belong to him, then such activity shall be treated as hacking offence.

- **Punishment of Hacking an electronic device ( Hacking a Computer/Phone/Info):**

Anyone who commits the offense of electrically publishing false, obscene or defaming information shall be punished with imprisonment for a term of at least 7 years and a maximum of 14 years, and with a fine of up to 10 Taka lakes or both.

**3**. Unauthorized access to protected systems in Bangladesh

Any person who secures access to or attempts to secure access to a protected system will be treated as an offence.

- Punishment for Unauthorized Access to Protected Systems

Anyone who commits an offense of unauthorized access to protected systems shall be punished with imprisonment for a term which may extend to a minimum of 7 years and a maximum of 14 years or a fine which may extend to or with 10 lakes of Taka.

**4**. Disclosure of confidentiality and privacy in Bangladesh:

No person having secured access to any electronic record, book, register, correspondence, information, document or other material shall disclose such electronic record book, register, correspondence, information, document or other material to any other person without the consent of the person concerned as an offence.

- Punishment for disclosure of confidentiality and Privacy

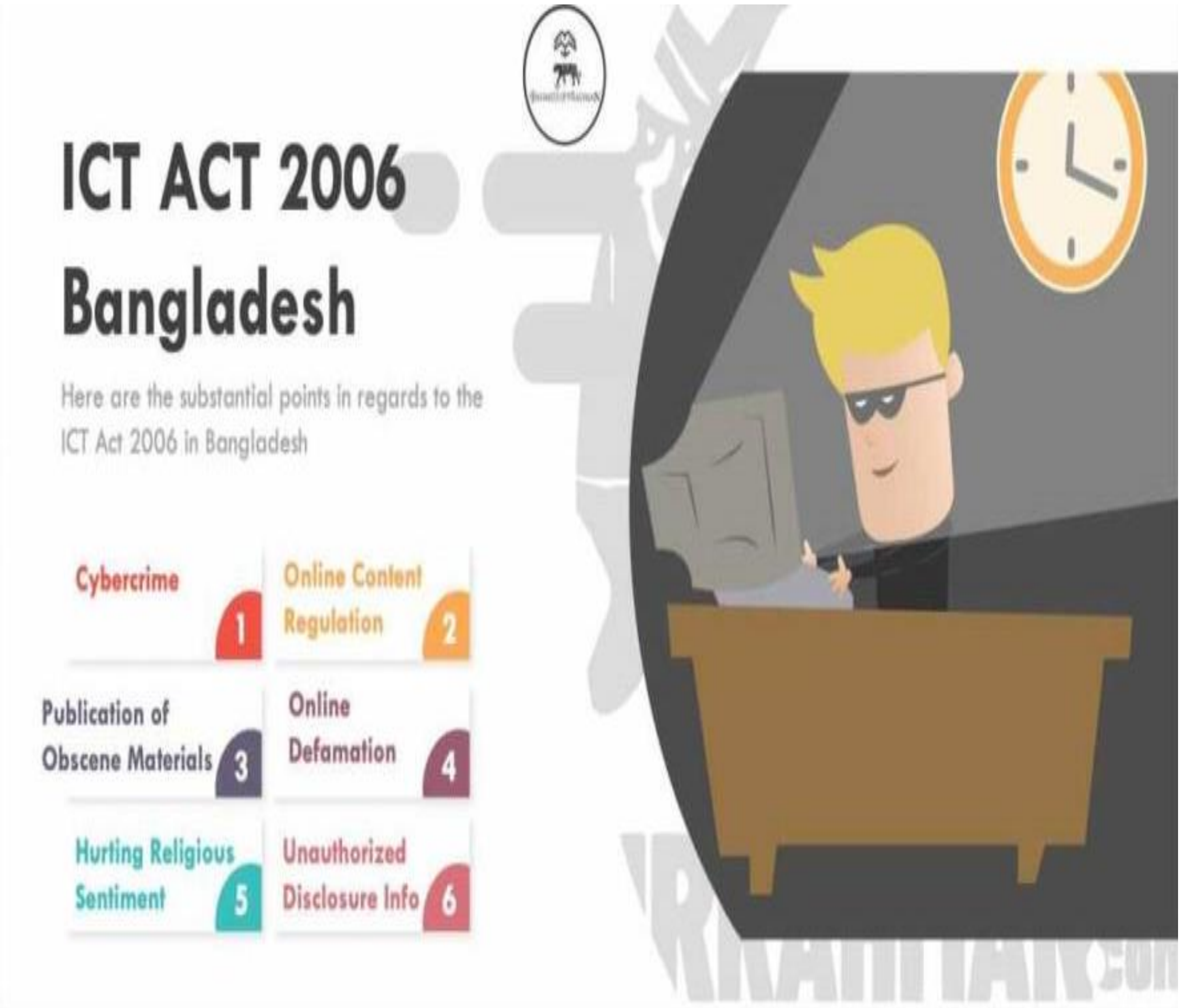
Any person committing disclosure of confidentiality and privacy shall be punished with imprisonment for a term of up to two years or with a fine of up to two Taka lakes or both.

Using a computer to help commit an offence in Bangladesh

Whoever knowingly assists in committing crimes under the ICT Act, using any computer, email or computer network, resource or system shall be considered an offense.

- Punishment for using a computer to help commit an offence

Any person who assists in committing an offense as set out above shall be punished with the penalty for the core offence.




What is the purpose of the ICT Act 2006 in Bangladesh (Online Law / Internet Law in Bangladesh | ICT)?

The purpose of this Act is to guarantee the legal security of documentary communications between persons, partnerships and the State, irrespective of the medium used; the consistency of legal rules and their application to documentary communications using information technology-based media, whether electronic, magnetic, optical, wireless or otherwise, or based on technology combinations.

The ICT Act promotes the Public Key Technology Trust Chain. The law allows digital certificate infrastructure to be developed and managed by the Controller of Certifying Authorities (CCA), including audits to be carried out.

The ICT law was formulated to promote the development of Bangladesh's information and communication technologies. The aim is to facilitate the use of information and communication technologies to build the information society.

Where the information contained in a document is considered confidential by statute, confidentiality must be covered by appropriate means, including on a communication network.

Some Cyber Crimes which are to be dealt through this act are follows:

- Hacking or unauthorised entry into information systems
- Introduction of viruses
- Publishing or distributing obscene content in electronic form
- Tampering with electronic documents required by law
- Fraud using electronic documents
- Violation of privacy rights such as STALKING
- Violation of copyright, trademark or trademark rights

**Advantages to be fruitful from the Act:**

This Act has provided us with few advantages such as the conduct of important security issues under the ICT Act, 2006, which are so critical to the success of electronic transactions. The Act has given the concept of secure digital signatures a legal definition that would have to be passed through a system of a security procedure, as stipulated by the government at a later date. On the other hand, businesses can now conduct electronic commerce using the legislative framework established by the Act. This Act also provided other facilities for the operation of cyber business or information and technology sector.

The purpose of this Act is to guarantee the legal security of documentary communications between persons, partnerships and the State, irrespective of the medium used; the consistency of legal rules and their application to documentary communications using information technology-based media, whether electronic, magnetic, optical, wireless or otherwise, or based on technology combinations. -Online Law / Internet Law in Bangladesh|ICT Rules, Regulations and Rights in Bangladesh

## Criticism of the ICT Act 2006

Although Critics ocassionally point out that certain specific limitations of the Act still remain. (Online Law / Internet Law in Bangladesh | ICT)

A. Practical Difficulty of Application

The legislation was originally intended to apply to crimes committed both in Bangladesh and worldwide but barely people practically take actions to execute their rights under the act.

B. Difficulties with Electronic Transaction

'The enactment has an important effect on Bangladesh's e-commerce and m-commerce. But as for the electronic payment of any transaction it keeps itself almost impractical.

C. Intellectual property Security

The Act is not vocal on the various intellectual property rights, such as copyright, trademark and e-information and data patent rights.

D. Not Addressing Mobile crime and contradicting Email Evidence

One of the staggering part of the act is that no crime committed via mobile phones is addressed in the Act. Also, this law admitted to convey emails as evidence, contrary to the Evidence Act of the country, which does not recognize emails as evidence.

## The Digital Security Act

The Digital Security Act was enacted to ensure national data security and develop laws regarding data crime identification, prevention, suppression, trial, and other related matters. Below are the relevant provisions laid out in the Digital Security Act-

Under the Digital Security Act, if any data or information published or propagated in digital media regarding a subject that comes under the purview of the Director General which threatens data security, then the Director General can request the relevant regulatory authority to remove or block said data or information as appropriate.

DATA PROTECTION AUTHORITY -REGULATORY AUTHORITY

Main regulator for data protection

Under the Digital Security Act, the NDSC has been entrusted with the authority to formulate and issue data protection guidance as and when required. However, for executive matters such as blocking content or decrypting a data source, the Digital Security Agency ('DSA') has the executive power.

Main powers, duties and responsibilities

The powers, duties, and responsibilities of the NDSC include:

- if digital security is under threat, providing necessary directions on how to remedy the situation;
- advising on how to improve the digital security infrastructure, how to increase in its manpower, and how to increase in its quality;
- enacting inter-institutional policies with the aim of ensuring digital security; and
- taking necessary steps to ensure the implementation of the Digital Security Act and of the Rules enacted under the Digital Security Act.

The powers, duties, and responsibilities of the DSA include:

- taking necessary actions to ensure digital security of critical infrastructure;
- formulating a strategy for risk management;
- developing standards of digital security and standard operating procedure;
- establishing, operating, and controlling the Digital Forensic Laboratory;
- fixing the standards and value of hardware, software, and human skill used for digital protection;
- taking measures against crimes involving digital devices and cybercrime;
- establishing digital security service systems and operating, protecting, inspecting, controlling, and managing the interoperability among different institutions;

- facilitating research on digital security and collaboration among different universities and research institutions;
- inspecting if digital security service is being rightly implemented;
- monitoring internal and international risk and conduct awareness;
- actively participating in remedying any breach of digital security issues related to national security, public health, public discipline, and essential services;
- nurturing and facilitating digital security related industries;
- following and collating digital security related information from different countries and analysing their impact in the local context; and
- investigating any weakness of digital security, as well as breaches and harmful activities.

KEY DEFINITIONS

Personal data:

Personal data is not expressly defined. However, the Digital Security Act expressly defines 'identity information' as any information which is biological or physical or any other information which uniquely or jointly with other information can identify a person (which includes body corporates) or system, whose name, photograph, address, date of birth, mother's name, father's name, signature, national identification card, birth and death registration number, finger print, passport number, bank account number, driving licence, E-TIN number (i.e. electronic tax identification number), electronic or digital signature, user name, credit or debit card number, voice print, retina image, iris image, DNA profile, security related personal data, or any other identification which, due to the facilitation of technology, is easily available.

Sensitive data:

Has not been expressly defined.

Data controller|data processor:

The concepts of data controller, joint controller, and data processor are not defined in Bangladesh law. Additionally, there is no distinction between the concepts of data controller and data processor. Whoever deals with such data is considered as the 'data user', which refers to the person who collects, sells, takes possession, supplies, or uses such data.

Data subject:

Data subject has not been expressly defined. In local context it refers to whoever owns such data or to whomever the personal information is tagged to and is considered the data owner.

Biometric data:

Biometric Data has not been expressly defined. However, certain biometric data has been covered under the definition of 'identity information' as discussed above.

Health data:

Health Data has not been expressly defined in the Digital Security Act.

Pseudonymisation:

Pseudonymisation has not been expressly defined in the Digital Security Act.

LEGAL BASES

As per Digital Security Act, if any person without any legal authority collects, sells, takes possession, supplies, or uses any person's identity information, then that activity will be an offence under the Act. The concept of 'legal authority' is similar to the concept of 'legal basis' in the General Data Protection Regulation (Regulation (EU) 2016/679) ('GDPR') and can be granted in form of the below:

Consent

The data subject may give his/her prior specific informative consent for processing or relevant purpose irrespective of any consideration. In addition to prior specific informative consent, consent may also be granted on terms inserted in the related contract for the subject matter. The person may supply data on their own with some pre-determined usage granted.

Contract with the data subject

In order the to get the consent from the data subject, as stated above, the data controller can either grant prior specific informative consent or such consent may also be granted on terms inserted in the related contract for the subject matter.

Legal obligations

In addition to consent, the data controller can also process data to which they are contractually or statutorily authorised to process without any additional consent.

Interests of the data subject

Such interest has not been expressly granted under the Digital Security Act. As such, as long as the data controller acts as per the terms of the contractual terms on consent.

Public interest

Access and use of data belonging to a data user on the grounds of public interest is only allowed by law enforcement agencies per the Digital Security Agency.

Legitimate interests of the data controller

Not applicable.

**Legal bases in other instances**

Not applicable.

## CONTROLLER AND PROCESSOR OBLIGATIONS

Data processing notification

The data protection laws of Bangladesh do not expressly impose any obligation over the controller and processor except for those agreed in the relevant contract of data usage (such as prior specific informative consent), except that the data user needs to ensure protection and confidentiality of such data and may be held accountable for any breach. Unless there is a specific term agreed in such contract, the data user is not obliged to any of the below obligations such as data processing notification.

Data transfers

The data protection laws of Bangladesh do not expressly impose any obligations on data transfers or any localisation requirements, except as otherwise agreed between the data user and data subject. However, for certain industries such as banking and telecommunications there is a restriction on the transfer of certain data beyond the jurisdictional limit of the country.

Data processing records

The data protection laws of Bangladesh do not expressly impose any obligation on data processing records, except as otherwise agreed between the data user and data subject.

Data protection impact assessment

The data protection laws of Bangladesh do not expressly impose any obligation to conduct a Data Protection Impact Assessment ('DPIA'), except as otherwise agreed between the data user and data subject.

Data protection officer appointment

The data protection laws of Bangladesh do not expressly impose any obligation on data protection officer appointment.

Data breach notification

The data protection laws of Bangladesh do not expressly impose any obligation on data breach notification.

Data retention

The data protection laws of Bangladesh do not expressly impose any obligation on data retention.

Children's data

The data protection laws of Bangladesh do not expressly address regulating the processing of children's data.

Special categories of personal data

No such requirements have been imposed by Bangladesh data protection laws.

Controller and processor contracts

No such requirements have been imposed by Bangladesh data protection laws.

## PENALTIES

As per the Digital Security Act, if any person without any legal authority collects, sells, takes possession, supplies, or uses any person's identity information, then such person will be penalized with imprisonment for a term not exceeding five years or a fine not exceeding BDT 500,000 (approx. €4,970) or with both. If any person commits the offence for the second time or recurrently commits it then they will be penalized with imprisonment for a not exceeding seven years or with a fine not exceeding BDT 1 million (approx. €9,950) or with both.

Offences under the Digital Security Act

Unauthorized access in critical information infrastructure ('CII'):

- If any person intentionally or knowingly illegally accesses, or by means of such unauthorized access, harms, or destroys or renders inactive a CII or attempts to do so, then such offence may be punished with imprisonment for a term not exceeding seven years, and/or with a fine not exceeding BDT 2.5 million (approx. €24,860). If such offence is committed with the intention to commit any crime, then such person may be punished with imprisonment for a term not exceeding 14 years and/or with a fine not exceeding BDT 10 million (approx. €99,450).

Illegal entrance to a computer, digital device, or computer system:

- Such offence is punishable with imprisonment for a term not exceeding six months and/or by a fine not exceeding BDT 300,000 (approx. €2,980). If such offence is committed with the intention to commit any crime, then the offence will be penalized with imprisonment for a term not exceeding three years and/or with a fine not exceeding BDT 1 million (approx. €9,950). If an offence is committed in the case of a secured computer or computer system or computer network, then the punishment is imprisonment for a term not exceeding three years and/or by a fine not exceeding BDT 1 million (approx. €9,950).

Damage to a computer or computer system:

- Such offence is punishable with imprisonment for a term not exceeding seven years and/or a fine not exceeding BDT 1 million (approx. €9,950).

Offences relating to a computer source code change:

- Such offence is punishable with imprisonment for a term not exceeding three years and/or a fine not exceeding BDT 300,000 (approx. €2,980).

Digital or electronic forgery:

- Such offence is punishable with imprisonment for a term not exceeding five years and/or with a fine not exceeding BDT 500,000 (approx. €4,970).

Digital or electronic fraud:

- Such offence is punishable with imprisonment for a term not exceeding five years and/or with a fine not exceeding BDT 500,000 (approx. €4,970).

Identity fraud:

- It shall be considered an offence if any person intentionally or knowingly uses any computer, computer program, computer system, computer network, digital device, digital system, or digital network:
  - with the intention of deceiving or cheating, carries the identity of another person or shows any person's identity as his own; or
  - assuming, by forgery, the identity of an alive or dead person as one's own in order:
    - to achieve some advantages for oneself or for any other person;
    - to acquire any property or interest in any property; or
    - to harm a person by using another person's identity in disguise.
- Such offence is punishable with imprisonment for a term not exceeding five years and/or by a fine not exceeding BDT 500,000 (approx. €4,970).

Punishment for collecting or using identity information without permission:

- If any person without any legal authority collects, sells, takes possession, supplies or uses any person's identity information, then this activity will be an offence under the Act. If any person commits any such offence, the person may be punished with imprisonment for a term not exceeding five years and/or a fine not exceeding BDT 500,000 (approx. €4,970).

Cybercrime:

- It is considered an offence if any person:
  - with the intention to breach national security or to endanger the sovereignty of the nation and to instil terror within the public or a part of them, creates an obstruction in the authorised access to any computer, computer network or internet network, or illegally accesses the said computer, computer network or internet network, or causes the act of obstruction of access or illegal entry through another person;
  - creates such virus within any digital device or inserts malware which results in the death of a person or results in serious injury to a person or raises a possibility of it;
  - damages or destroys the supply of daily necessities of the public or adversely affects any CII; or

  - intentionally or knowingly enters or penetrates any computer, computer network, internet network, any secured data information or computer database or such secured data information or computer database which can be used to damage friendly relations with another foreign country, or can be used for acts against public order, or which can be used for the benefit of any foreign country or any foreign person or any group.

Such offences are punishable with imprisonment for a term not exceeding 14 years and/or with a fine not exceeding BDT 10 million (approx. €9,950).

Regarding e-transactions without legal authority:

- It shall be considered an offence if any person:
  - performs an e-transaction through an electronic or digital medium of any bank, insurance, or any other financial institution or any mobile money service providing organisation without legal authority; or
  - performs an e-transaction that has been declared illegal by the Government or the Bangladesh Bank ('the Central Bank').
- Such offence is punishable with either a maximum of five years of imprisonment and/or a fine of BDT 500,000 (approx. €4,970).

Illegal transferring, saving, etc. of data or information:

- if any person enters any computer or digital system illegally and does any addition or subtraction, transfer or act with the aim to transfer, save, or aid in saving any data or information belonging to a government, semi-government, autonomous or statutory organisation or any financial or commercial organisation, then the activity of that person will be considered an offence. If any person commits such an offence, then they may be sentenced to a term of imprisonment not exceeding five years and/or with a fine not exceeding BDT 1 million (approx. €9,950).

Hacking-related offences:

- If a person commits hacking, then it will be considered an offence and for this, they may be sentenced to a term of imprisonment not exceeding 14 years and/or with fine not exceeding BDT 10 million (approx. €99,450) or with both.

## Offences under the Technology Act

Damage to a computer or computer system:

- A person may be punishable with imprisonment for a term which may extend to 14 years (minimum seven years), and/or with a fine which may extend to BDT 1 million (approx. €9,950), if he/she, without permission of the owner or any person who is in charge of a computer, computer system, or computer network:
  - accesses or secures access to such computer, computer system, or computer networks for the purpose of destroying information or retrieving or collecting information or assists others to do so;
  - downloads, copies, or extracts any data, computer database or information from such computer, computer system or computer network including information or data held or stored in any removable storage medium;
  - introduces or causes to be introduced any computer contaminant or computer virus into any computer, computer system or computer network;
  - damages or causes damage to occur willingly in any computer, computer system or computer network, data, computer database or any other

programs residing in such computer, computer system, or computer network;
    - disrupts or causes disruption of any computer, computer system, or computer network;
    - denies or causes the denial of access to any person authorised to access any computer, computer system, or computer network by any means;
    - provides any assistance to any person to facilitate access to a computer, computer system, or computer network, in contravention of the provisions of the Technology Act, rules or regulations made thereunder;
    - for the purpose of advertisement of goods and services, generates or causes the generation of spam or sends unwanted electronic mail without any permission of the originator or subscriber; or
    - charges the services availed of by a person to the account of another person by tampering with or manipulating any computer, computer system or computer network.

Tampering with a computer source code:

- Under Section 55 of the Technology Act the activity of, intentionally or knowingly concealing, destroying, or altering, or causing another person to conceal, destroy, or alter, any computer source code used for a computer, computer program, computer system, or computer network, when the computer source code is required to be kept or maintained by any law, is regarded as an offence. Whoever commits such an offence shall be punishable with imprisonment for a term which may extend to three years, and/or with a fine which may extend to BDT 1 million (approx. €9,950).

Hacking a computer system:

- Under Section 56 of the Technology Act, activities considered a hacking offence include:
    - if any person with the intent to cause or knowing that he/she is likely to cause wrongful loss or damage to the public or any person, does any act and thereby destroys, deletes, or alters any information residing in a computer resource or diminishes its value or utility or affects it injuriously by any means; or
    - if any person damages through illegal access to any such computer, computer network or any other electronic system which does not belong to him/her.
- Whoever commits hacking offences shall be punishable with imprisonment for a term which may extend to 14 years (minimum seven years), and/or with a fine which may extend to BDT 10 million (approx. €99,450).

Disclosure of confidentiality and privacy:

- As per Section 73 of the Technology Act, no person who, in pursuance of any of the powers conferred under this Act, or rules and regulations made thereunder, has secured access to any of the following, shall, without the consent of the person concerned, disclose:
    - electronic records;
    - books;
    - registers;

    - correspondence;
    - information;
    - documents; or
    - other material.
- Whoever commits the offence of disclosing confidential and private information shall be punishable with imprisonment for a term that may extend to two years, and/or with a fine which may extend to BDT 200,000 (approx. €1,990).

## Understanding Threats and preventions

### Hackers and Predators

People, not computers, create computer security threats and malware. Hackers and predators are programmers who victimize others for their own gain by breaking into computer systems to steal, change, or destroy information as a form of cyber-terrorism. These online predators can compromise credit card information, lock you out of your data, and steal your identity. As you may have guessed, online security tools with identity theft protection are one of the most effective ways to protect yourself from this brand of cybercriminal.

### Social Engineering

Social engineering is the term used for a broad range of malicious activities accomplished through human interactions. It uses psychological manipulation to trick users into making security mistakes or giving away sensitive information.

Social engineering attacks happen in one or more steps. A perpetrator first investigates the intended victim to gather necessary background information, such as potential points of entry and weak security protocols, needed to proceed with the attack. Then, the attacker moves to gain the victim's trust and provide stimuli for subsequent actions that break security practices, such as revealing sensitive information or granting access to critical resources.

### Social engineering prevention

Social engineers manipulate human feelings, such as curiosity or fear, to carry out schemes and draw victims into their traps. Therefore, be wary whenever you feel alarmed by an email, attracted to an offer displayed on a website, or when you come across stray digital media lying about. Being alert can help you protect yourself against most social engineering attacks taking place in the digital realm.

Moreover, the following tips can help improve your vigilance in relation to social engineering hacks.

- Don't open emails and attachments from suspicious sources – If you don't know the sender in question, you don't need to answer an email. Even if you do know them and are suspicious about their message, cross-check and confirm the news from other sources, such as via telephone or directly from a service provider's site. Remember that email addresses are spoofed all of the time; even an email purportedly coming from a trusted source may have actually been initiated by an attacker.
- Use multifactor authentication – One of the most valuable pieces of information attackers seek are user credentials. Using multifactor authentication helps ensure

your account's protection in the event of system compromise. Imperva Login Protect is an easy-to-deploy 2FA solution that can increase account security for your applications.

- Be wary of tempting offers – If an offer sounds too enticing, think twice before accepting it as fact. Googling the topic can help you quickly determine whether you're dealing with a legitimate offer or a trap.
- Keep your antivirus/antimalware software updated – Make sure automatic updates are engaged, or make it a habit to download the latest signatures first thing each day. Periodically check to make sure that the updates have been applied, and scan your system for possible infections.

## Spyware, and Malware

**Spyware Threats**

A serious computer security threat, spyware is any program that monitors your online activities or installs programs without your consent for profit or to capture personal information. We've amassed a wealth of knowledge that will help you combat spyware threats and stay safe online.

While many users won't want to hear it, reading terms and conditions is a good way to build an understanding of how your activity is tracked online. And of course, if a company you don't recognize is advertising for a deal that seems too good to be true, be sure you have an internet security solution

**Malware** is malicious software such as spyware, ransomware, viruses and worms. Malware is activated when a user clicks on a malicious link or attachment, which leads to installing dangerous software. Cisco reports that malware, once activated, can:

- Block access to key network components (ransomware)
- Install additional harmful software
- Covertly obtain information by transmitting data from the hard drive (spyware)
- Disrupt individual parts, making the system inoperable

## Social Media

As the number of users accessing social platforms is increasing day by day, so are the risks. As social media has grown by leaps and bounds, it has brought various benefits simultaneously, and it has posed serious social media cyber security concerns.

**Identity Theft:** As millions share their personal information for getting registered in one or more social media platforms, these data becomes vulnerable as hackers and identity thieves use this information's to reset passwords, apply for loans, or other malicious objectives.

**Romance Scams:** A romance scam is a fraudulent scheme in which a swindler pretends romantic interest in a target, establishes a relationship, and then attempts to get money or sensitive information from the target under pretenses.

**Whistle-blower:** People are often impulsive on social media; they show their vexation with their colleagues or bosses without thinking. They may deliberately reveal sensitive data in their posts, which can cause significant damage to the reputation of the organization.

**Cyber Stalking:** It refers to harassment over the internet. Cyber stalkers harass victims on social media by sending unpleasant and lewd messages. They morph photos of victims and circulate them on social media, alleging rumors making the victim's life unbearable.
**Cyber Bullying:** It refers to bullying through the digital medium. It can take place on social media, gaming platforms, messaging platforms, etc. It is aimed at scaring, shaming, or annoying the targeted victim.
**Cyber Terrorism:** Nowadays, social media is also used to facilitate terrorism-related activities. It can support, promote, engage, and spread terrorism propaganda like incitement to terrorism, recruitment, radicalizing training, and planning of terrorist attacks.

Solutions on social media threats

i. Creating strong passwords is the primary option to ensure the privacy of your information.
ii. Ensure passwords are complex, including upper & lower case, numbers, and special characters. It should be memorized and never be written on paper.
iii. We need to be sensitive in what we upload/share in our social networking accounts and avoid sharing personal information like date of birth, social security details, phone numbers, names, and pictures of family members.
iv. Use security and privacy options provided by social media platforms viz: 2-factor authentication system, access control.
v. Connect our devices only to authorized wifi access, use privacy options provided by various mobile operating systems, use auto-lock features, and download apps only from authorized app stores.
vi. Keep the operating system updated with the latest patches, turn-on the firewall, and avoid installing cracked software.
vii. Ensure our antivirus is updated and scans are performed frequently.
viii. We need to be smart using the internet and avoid visiting untrusted websites; referral links to visit websites are never to be clicked; instead, type in the browser's URL address.
ix. Care needs to be taken to accept friend requests only from people we know and block those who post upsetting content or comments.

Secure Passwords

With the right password, a cyber-attacker has access to a wealth of information. Social engineering is a type of password attack that Data Insider defines as "a strategy cyber attacker's use that relies heavily on human interaction and often involves tricking people into breaking standard security practices." Other types of password attacks include accessing a password database or outright guessing.

Two-Factor Authentication

Two factor authentication is all about ensuring that the person standing at the door is who they claim to be. It's designed to guard against unauthorized users from picking up a lost or stolen card or using another users PIN to unlawfully gain access.

**How it works**

Two factor authentication is often a combination of what you have (physical or mobile credential), what you know (PIN), or who you are (biometric data).

I. What you have: This is likely to be either a physical credential such as a card or tag or a mobile credential that is linked to your smart phone.
II. What you know: This is often a password or PIN that is unique to the user.
III. Who you are: Two Factor Authentication is not limited to Card and PIN. Biometric data is something that is inherent to each user and can include their fingerprint, face structure, or their retina pattern.

Each of these authentication methods have varing levels of security on their own, but when combined, they can offer a high level of security that is often required for data centers, medical facilities and financial institutions.

## Securing Mobile Devices

### Encryption

Encryption attempts to make information unreadable by anyone who is not explicitly authorized to view that data. People or devices can be authorized to access encrypted data in many ways, but typically this access is granted via passwords or decryption keys. There are various strengths and methods of encryption and as technology evolves, older methods of encryption are no longer considered secure. Sensitive information should be encrypted using the best method available whenever possible.
Data can be encrypted in several ways:

- Encrypted Communication
- Virtual Private Network (VPN)
- Destroying Sensitive Data

**There are many important uses of encryption**

Most of us encounter encryption every day. Popular uses include:

I. Every time you use an ATM or buy something online with a smartphone, encryption is used to protect the information being relayed.
II. Securing devices, such as encryption for laptops.
III. Most legitimate websites use "secure sockets layer” (SSL), which is a form of encrypting data when it is being sent to and from a website. This keeps attackers from accessing that data while it is in transit. Look for the padlock icon in the URL bar and the "s" in the "https://" to ensure you are conducting secure, encrypted transactions online.
IV. Your WhatsApp messages are also encrypted, and you may also have an encrypted folder on your phone.
V. Your email can also be encrypted with protocols such as Open PGP.
VI. VPNs – Virtual Private Networks – use encryption, and everything you store in the cloud should be encrypted. You can encrypt your whole hard drive and even make encrypted voice calls.
VII. Encryption is used to prove the integrity and authenticity of information using what are known as digital signatures. Encryption is an integral part of digital-rights management and copy protection.

Encryption in cyber security is a way of protecting private information from being stolen or compromised. Another important aspect of online safety is using a high-quality antivirus solution, such as Kaspersky Total Security, which blocks common and complex threats like viruses, malware, ransomware, spy apps, and the latest hacker tricks.

CLEAN TRACES OF YOUR WORK OFF YOUR DEVICE

Set a regular schedule to wipe your device's unused memory securely, to continue to ensure sensitive files do not remain on your devices, hard drives, USB memory sticks, removable memory cards (SD cards) from cameras, mobile phones or portable music players, and any other device that saves sensitive information.

TO FULLY WIPE A DEVICE

**All devices**

- Close down all unnecessary apps.
- Disconnect from the Internet, turning off wifi or unplugging the internet cable as needed.
- Create an encrypted backup of your important files, as discussed in our guide How to recover from information loss.
- You may want to start by clearing your browser's temporary files.

- **WHEN YOU SELL, GIVE AWAY, OR DISPOSE OF AN OLD COMPUTER OR PHONE**
  - Fully wipe the device using the instructions above.
  - Remove USB drives, CDs, DVDs, SD cards, SIM cards, dongles, or other small devices that may be inserted or plugged into your device.
  - If possible, when you are selling or giving away an old computer, do not give the new owner the hard drive; but if you must, be sure you have followed instructions on how to erase it first.
  - If you are disposing of an old hard drive, consider destroying it physically as well as wiping it. You can do this by hitting it hard a few times with a hammer, hammering nails through the drive, or with a drill. Do not burn or pour acid on a drive, and do not put it in the microwave.
  - You can also keep a wiped drive that is in good condition to re-use yourself, in a new device or as an external hard drive.

## Physical Security Measures

### #1: Lock up the server room

Even before you lock down the servers, in fact, before you even turn them on for the first time, you should ensure that there are good locks on the server room door. Of course, the best lock in the world does no good if it isn't used, so you also need policies requiring that those doors be locked any time the room is unoccupied, and the policies should set out who has the key or keycode to get in.

More work is being completed via mobile device. Are your employees using their devices safely? If not, there may be consequences.

The server room is the heart of your physical network, and someone with physical access to the servers, switches, routers, cables and other devices in that room can do enormous damage.

### #2: Set up surveillance

Locking the door to the server room is a good first step, but someone could break in, or someone who has authorized access could misuse that authority. You need a way to know who goes in and out and when. A log book for signing in and out is the most elemental way to accomplish this, but it has a lot of drawbacks. A person with malicious intent is likely to just bypass it.

A better solution than the log book is an authentication system incorporated into the locking devices, so that a smart card, token, or biometric scan is required to unlock the doors, and a record is made of the identity of each person who enters.

A video surveillance camera, placed in a location that makes it difficult to tamper with or disable (or even to find) but gives a good view of persons entering and leaving should supplement the log book or electronic access system. Surveillance cams can monitor continuously, or they can use motion detection technology to record only when someone is moving about. They can even be set up to send e-mail or cell phone notification if motion is detected when it shouldn't be (such as after hours).

#3: Make sure the most vulnerable devices are in that locked room
Remember, it's not just the servers you have to worry about. A hacker can plug a laptop into a hub and use sniffer software to capture data traveling across the network. Make sure that as many of your network devices as possible are in that locked room, or if they need to be in a different area, in a locked closet elsewhere in the building.

#4: Use rack mount servers
Rack mount servers not only take up less server room real estate; they are also easier to secure. Although smaller and arguably lighter than (some) tower systems, they can easily be locked into closed racks that, once loaded with several servers, can then be bolted to the floor, making the entire package almost impossible to move, much less to steal.

#5: Don't forget the workstations
Hackers can use any unsecured computer that's connected to the network to access or delete information that's important to your business. Workstations at unoccupied desks or in empty offices (such as those used by employees who are on vacation or have left the company and not yet been replaced) or at locations easily accessible to outsiders, such as the front receptionist's desk, are particularly vulnerable.

Disconnect and/or remove computers that aren't being used and/or lock the doors of empty offices, including those that are temporarily empty while an employee is at lunch or out sick. Equip computers that must remain in open areas, sometimes out of view of employees, with smart card or biometric readers so that it's more difficult for unauthorized persons to log on.

#6: Keep intruders from opening the case
Both servers and workstations should be protected from thieves who can open the case and grab the hard drive. It's much easier to make off with a hard disk in your pocket than to carry a full tower off the premises. Many computers come with case locks to prevent opening the case without a key.

You can get locking kits from a variety of sources for very low cost, such as the one at Innovative Security Products.

#7: Protect the portables

Laptops and handheld computers pose special physical security risks. A thief can easily steal the entire computer, including any data stored on its disk as well as network logon passwords that may be saved. If employees use laptops at their desks, they should take them with them when they leave or secure them to a permanent fixture with a cable lock, such as the one at PC Guardian.

Handhelds can be locked in a drawer or safe or just slipped into a pocket and carried on your person when you leave the area. Motion sensing alarms such as the one at SecurityKit.com are also available to alert you if your portable is moved.

For portables that contain sensitive information, full disk encryption, biometric readers, and software that "phones home" if the stolen laptop connects to the Internet can supplement physical precautions.

#8: Pack up the backups

Backing up important data is an essential element in disaster recovery, but don't forget that the information on those backup tapes, disks, or discs can be stolen and used by someone outside the company. Many IT administrators keep the backups next to the server in the server room. They should be locked in a drawer or safe at the very least. Ideally, a set of backups should be kept off site, and you must take care to ensure that they are secured in that offsite location.

Don't overlook the fact that some workers may back up their work on floppy disks, USB keys, or external hard disks. If this practice is allowed or encouraged, be sure to have policies requiring that the backups be locked up at all times.

#9: Disable the drives

If you don't want employees copying company information to removable media, you can disable or remove floppy drives, USB ports, and other means of connecting external drives. Simply disconnecting the cables may not deter technically savvy workers. Some organizations go so far as to fill ports with glue or other substances to permanently prevent their use, although there are software mechanisms that disallow it. Disk locks, such as the one at SecurityKit.com, can be inserted into floppy drives on those computers that still have them to lock out other diskettes.

#10: Protect your printers

You might not think about printers posing a security risk, but many of today's printers store document contents in their own on-board memories. If a hacker steals the printer and accesses that memory, he or she may be able to make copies of recently printed documents. Printers, like servers and workstations that store important information, should be located in secure locations and bolted down so nobody can walk off with them.

Also think about the physical security of documents that workers print out, especially extra copies or copies that don't print perfectly and may be just abandoned at the printer or thrown intact into the trash can where they can be retrieved. It's best to implement a policy of immediately shredding any unwanted printed documents, even those that don't contain confidential information. This establishes a habit and frees the end user of the responsibility for determining whether a document should be shredded.

## Insider threats

An insider threat occurs when individuals close to an organization who have authorized access to its network intentionally or unintentionally misuse that access to negatively affect the organization's critical data or systems.

Careless employees who don't comply with their organizations' business rules and policies cause insider threats. For example, they may inadvertently email customer data to external parties, click on phishing links in emails or share their login information with others. Contractors, business partners and third-party vendors are the source of other insider threats.

Some insiders intentionally bypass security measures out of convenience or ill-considered attempts to become more productive. Malicious insiders intentionally elude cybersecurity protocols to delete data, steal data to sell or exploit later, disrupt operations or otherwise harm the business.

## Preventing insider threats

The list of things organizations can do to minimize the risks associated with insider threats include the following:

- limit employees' access to only the specific resources they need to do their jobs;
- Train new employees and contractors on security awareness before allowing them to access the network. Incorporate information about unintentional and malicious insider threat awareness into regular security training;
- set up contractors and other freelancers with temporary accounts that expire on specific dates, such as the dates their contracts end;
- implement two-factor authentication, which requires each user to provide a second piece of identifying information in addition to a password; and
- Install employee monitoring software to help reduce the risk of data breaches and the theft of intellectual property by identifying careless, disgruntled or malicious insiders.

### Viruses and worms

Viruses and worms are malicious software programs (malware) aimed at destroying an organization's systems, data and network. A computer virus is a malicious code that replicates by copying itself to another program, system or host file. It remains dormant until someone knowingly or inadvertently activates it, spreading the infection without the knowledge or permission of a user or system administration.

A computer worm is a self-replicating program that doesn't have to copy itself to a host program or require human interaction to spread. Its main function is to infect other computers while remaining active on the infected system. Worms often spread using parts of an operating system that are automatic and invisible to the user. Once a worm enters a system, it immediately starts replicating itself, infecting computers and networks that aren't adequately protected.

Preventing viruses and worms

To reduce the risk of these types of information security threats caused by viruses or worms, companies should install antivirus and antimalware software on all their systems and networked devices and keep that software up to date. In addition, organizations must train users not to download attachments or click on links in emails from unknown senders and to avoid downloading free software from untrusted websites. Users should also be very cautious when they use P2P file sharing services and they shouldn't click on ads, particularly ads from unfamiliar brands and websites.

Carefully evaluating free software, downloads from peer-to-peer file sharing sites, and emails from unknown senders are crucial to avoiding viruses. Most web browsers today have security settings which can be ramped up for optimum defense against online threats. But, as we'll say again and again in this post, the single most-effective way of fending off viruses is up-to-date antivirus software from a reputable provider.

Botnets

A botnet is a collection of Internet-connected devices, including PCs, mobile devices, servers and IoT devices that are infected and remotely controlled by a common type of malware. Typically, the botnet malware searches for vulnerable devices across the internet. The goal of the threat actor creating a botnet is to infect as many connected devices as possible, using the computing power and resources of those devices for automated tasks that generally remain hidden to the users of the devices. The threat actors -- often cybercriminals -- that control these botnets use them to send email spam, engage in click fraud campaigns and generate malicious traffic for distributed denial-of-service attacks.

Preventing botnets

Organizations have several ways to prevent botnet infections:

- monitor network performance and activity to detect any irregular network behavior;
- keep the operating system up to date;
- keep all software up-to-date and install any necessary security patches;
- educate users not to engage in any activity that puts them at risk of bot infections or other malware, including opening emails or messages, downloading attachments or clicking links from unfamiliar sources; and
- Implement anti botnet tools that find and block bot viruses. In addition, most firewalls and antivirus software include basic tools to detect, prevent and remove botnets.

- **Drive-by download attacks**

In a drive-by download attack, malicious code is downloaded from a website via a browser, application or integrated operating system without a user's permission or knowledge. A user doesn't have to click on anything to activate the download. Just accessing or browsing a website can start a download. Cybercriminals can use drive-by downloads to inject banking Trojans, steal and collect personal information as well as introduce exploit kits or other malware to endpoints.

Preventing drive-by download attacks

One of the best ways a company can prevent drive-by download attacks is to regularly update and patch systems with the latest versions of software, applications, browsers, and operating systems. Users should also be warned to stay away from insecure websites. Installing security software that actively scans websites can help protect endpoints from drive-by downloads.

### Phishing attacks

Phishing attacks are a type of information security threat that employs social engineering to trick users into breaking normal security practices and giving up confidential information, including names, addresses, login credentials, Social Security numbers, credit card information and other financial information. In most cases, hackers send out fake emails that look as if they're coming from legitimate sources, such as financial institutions, eBay, PayPal -- and even friends and colleagues.

In phishing attacks, hackers attempt to get users to take some recommended action, such as clicking on links in emails that take them to fraudulent websites that ask for personal information or install malware on their devices. Opening attachments in emails can also install malware on users' devices that are designed to harvest sensitive information, send out emails to their contacts or provide remote access to their devices.

### Preventing phishing attacks

Enterprises should train users not to download attachments or click on links in emails from unknown senders and avoid downloading free software from untrusted websites.

### Distributed denial-of-service (DDoS) attacks

In a distributed denial-of-service (DDoS) attack, multiple compromised machines attack a target, such as a server, website or other network resource, making the target totally inoperable. The flood of connection requests, incoming messages or malformed packets forces the target system to slow down or to crash and shut down, denying service to legitimate users or systems.

### Preventing DDoS attacks

To help prevent DDoS attacks, companies should take these steps:

- Implement technology to monitor networks visually and know how much bandwidth a site uses on average. DDoS attacks offer visual clues so administrators who understand the normal behaviors of their networks will be better able to catch these attacks.
- Ensure servers have the capacity to handle heavy traffic spikes and the necessary mitigation tools necessary to address security problems.
- Update and patch firewalls and network security programs.
- Set up protocols outlining the steps to take in the event of a DDoS attack occurring.

### Ransomware

In a ransomware attack, the victim's computer is locked, typically by encryption, which keeps the victim from using the device or data that's stored on it. To regain access to the device or data, the victim has to pay the hacker a ransom, typically in a virtual currency such as Bitcoin. Ransomware can be spread via malicious email attachments, infected software apps, infected external storage devices and compromised websites.

Preventing ransomware

To protect against ransomware attacks, users should regularly back up their computing devices and update all software, including antivirus software. Users should avoid clicking on links in emails or opening email attachments from unknown sources. Victims should do everything possible to avoid paying ransom. Organizations should also couple a traditional firewall that blocks unauthorized access to computers or networks with a program that filters web content and focuses on sites that may introduce malware. In addition, limit the data a cybercriminal can access by segregating the network into distinct zones, each of which requires different credentials.

Exploit kits

An exploit kit is a programming tool that enables a person without any experience writing software code to create, customize and distribute malware. Exploit kits are known by a variety of names, including infection kit, crimeware kit, DIY attack kit and malware toolkit. Cybercriminals use these toolkits to attack system vulnerabilities to distribute malware or engage in other malicious activities, such as stealing corporate data, launching denial of service attacks or building botnets.

Preventing exploit kits

To guard against exploit kits, an organization should deploy antimalware software as well as a security program that continually evaluates if its security controls are effective and provide protection against attacks. Enterprises should also install antiphishing tools because many exploit kits use phishing or compromised websites to penetrate the network.

Advanced persistent threat attacks

An advanced persistent threat (APT) is a targeted cyberattack in which an unauthorized intruder penetrates a network and remains undetected for an extended period of time. Rather than causing damage to a system or network, the goal of an APT attack is to monitor network activity and steal information to gain access, including exploit kits and malware. Cybercriminals typically use APT attacks to target high-value targets, such as large enterprises and nation-states, stealing data over a long period.

Preventing APT attacks

Detecting anomalies in outbound data may be the best way for system administrators to determine if their networks have been targeted.

Indicators of APTs include the following:

- unusual activity on user accounts;
- extensive use of backdoor Trojan horse malware, a method that enables APTs to maintain access;
- odd database activity, such as a sudden increase in database operations involving massive amounts of data; and
- the presence of unusual data files, possibly indicating that data that has been bundled into files to assist in the exfiltration process.

To combat this type of information security threat, an organization should also deploy a software, hardware or cloud firewall to guard against APT attacks. Organizations can also use a web application firewall to detect and prevent attacks coming from web applications by inspecting HTTP traffic.

Malvertising

Malvertising is a technique cybercriminals use to inject malicious code into legitimate online advertising networks and web pages. This code typically redirects users to malicious websites or installs malware on their computers or mobile devices. Users' machines may get infected even if they don't click on anything to start the download. Cybercriminals may use malvertising to deploy a variety of moneymaking malware, including cryptomining scripts, ransomware and banking Trojans.

Some of the websites of well-known companies, including Spotify, The New York Times and the London Stock Exchange, have inadvertently displayed malicious ads, putting users at risk.

Preventing malvertising

To prevent malvertising, ad networks should add validation; this reduces the chances a user could be compromised. Validation could include: Vetting prospective customers by requiring legal business paperwork; two-factor authentication; scanning potential ads for malicious content before publishing an ad; or possibly converting Flash ads to animated gifs or other types of content.

To mitigate malvertising attacks, web hosts should periodically check their websites from an unpatched system and monitor that system to detect any malicious activity. The web hosts should disable any malicious ads.

To reduce the risk of malvertising attacks, enterprise security teams should be sure to keep software and patches up to date as well as install network antimalware tools.

Spot the differences between a real email and a scam email!

While phishing and spam emails can often look the same and use similar language, the biggest differences are in what the sender seeks. Spam is flooding the Internet with the same message sent to millions. The majority of spam is commercial advertising for products that might seem rather suspicious. They want you to buy their dubious wares, access their dubious sites, or just forward their message to others.

Phishing emails want your information — your usernames, passwords, credit card details and more. Phishing emails are also usually more personalized and may seem to have some relevance. It might be from a credit card you recently opened or an organization you’ve donated to before.

It’s important to remember that phishing emails can have many different goals. A phishing email could be an attempt to hack a network or infect it with malware. Phishing emails, especially spear phishing, are attempting to acquire sensitive information: spam emails do not. That is the major difference between the two.

Phishing emails are also targeted to a person. The email likely has a salutation with the person’s name. Spam isn’t this personal; it’s broader. In fact, you may find that your email address is only in the BCC field. This is, of course, a sure sign that it’s spam.

A sense of urgency is one tell-tale sign of phishing. Language like "only the first 50 respondents" or "offer ends tomorrow" will be found in the message. Spam doesn't typically have a timetable.

Hoax Emails

These type of fake email is disguised as communications from a trusted source, such as a bank or known affiliate like Booking.com. It may contain their branding or even replicate their common email format.

Email Hoax Definition

According to Technopedia an email hoax is: "a scam that is distributed in email form. It is designed to deceive and defraud email recipients, often for monetary gain."

The objective:

To convince the recipient that the email is from a trusted source, in order to obtain payment details or confidential information.

How to tell if an email is a hoax:

The "from" name may state that the email was delivered from the trusted source, but the email address will be slightly different. If it's not from an email using their official website domain you should be on high alert. An example of this would be an email coming from invoice@booking-ltd.com instead of invoice@booking.com.

Incorrect logos or slightly different design.

Generic salutation such as "Dear Sir or Madam", or use of the business name instead of addressing you personally. Banks and genuine affiliates will know your name.

If the reason for the email is a surprise, such as an overdue payment reminder when your account is up-to-date.

How to protect yourself from hoax emails:

When logging into a trusted website, always look for "https" at the beginning of the URL. The "s" stands for secure.

Check for the padlock symbol in your browser's address bar. This also means the website is secure.

Make sure the URL is genuine. Hoax emails often link to a hoax website with URLs similar to the real one, but different.

Enter website URLs straight into your address bar. Don't reply on links within emails as they could be fake.

Phishing Emails

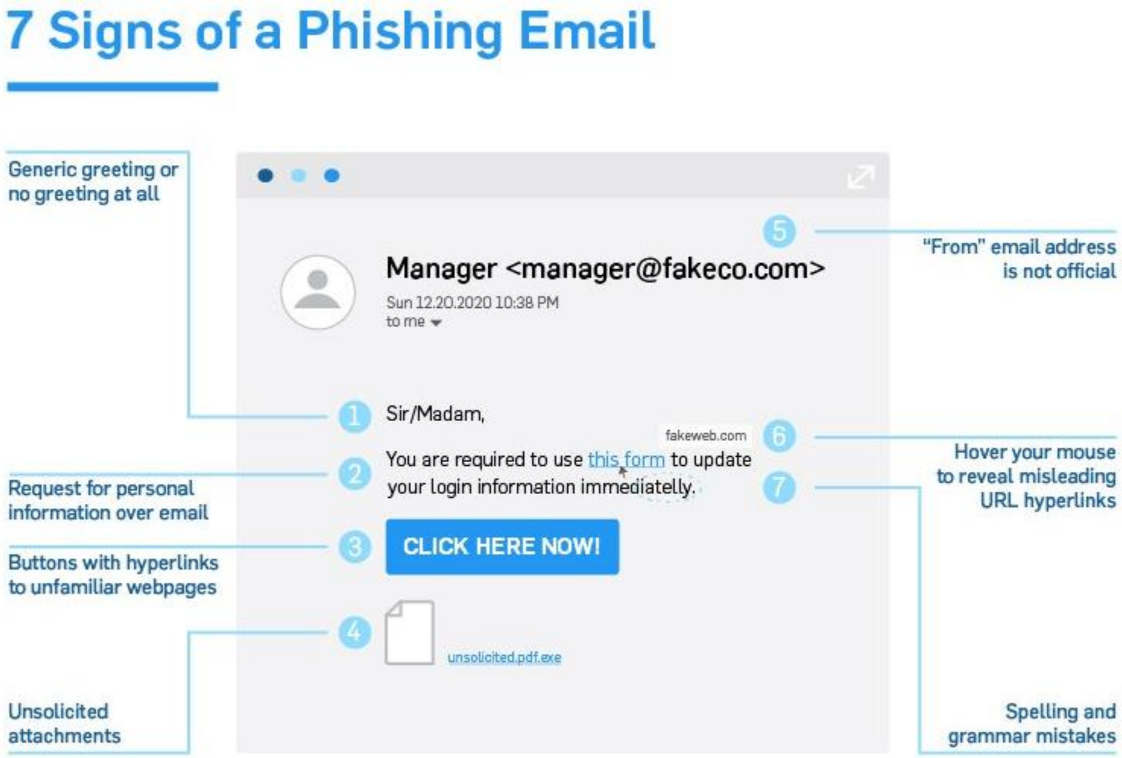
The people behind phishing emails are experts in manipulation. They will use urgency to convince you to open a deceptive link or attachment before you have time to consider the consequences. An example of this would be an email with the subject line "FINAL NOTICE – IMMEDIATE PAYMENT REQUIRED" containing minimal description and referring to an invoice attached. Without hesitation many will open the attachment to see which payment is overdue, but instead it allows software to be installed on your computer. This type of fake email may also include a link to a malicious website with the same outcome.

Phishing Email Definition:
According to the Australian Cyber Security Centre, phishing is: “a way that cybercriminals steal confidential information, such as online banking logins, credit card details, business login credentials or passwords/passphrases, by sending fraudulent messages (sometimes called ‘lures’).

The objective:
To use pressure and quick emotional responses to trick the recipient into making a payment, visiting a malicious website, or to open an attachment containing a virus or spyware.

How to identify a phishing email:

- Urgent or upsetting statements demanding your immediate reaction.
- Requests for payment or your financial/personal information.
- They often use a generic greeting in their emails, such as “Dear user”.
- Wrong or out-of-date logos or design
- How to protect yourself from phishing emails:
- Always check the “from” name and email address. Never open attachments or click links from senders you do not know and trust.




Beware of false links. Just because the text says “www.google.com” does not mean that it will direct you to Google. For example, here I have created a link with text facebook.com which instead goes to Twitter when clicked. Always hover your mouse over links to see the true destination before clicking. If the address looks suspicious in any way, do not click!

### Scam Emails

Scam emails often include “too good to be true” offers, such as lottery wins, surprise inheritance and unsolicited job offers. People and businesses may also receive a fake email requesting payment for products or services they did not purchase. You’ve likely never heard from the sender before, but the email will try to imply a connection.

#### The objective:

To use a false affiliation or unbelievable offer to trick you into giving them money. Often will try to encourage you to reply to the email.

#### How to tell if an email is a scam:

You do not know the sender (even if their email suggests they know you, you can’t recall the affiliation).

- The email presents an unrealistic promise or offer.
- The email requests payment for a purchase you did not make.
- How to protect yourself from scam emails:
- If the sender, product or service doesn’t seem familiar, ignore or delete the email. Do not reply.
- If you have received an email requesting to renew a product or service, always make sure that it is for a service you genuinely signed up for.
- If it sounds too good to be true, it probably is!

## Methods to browsing the web safe!

### Keep your browser and any plugins updated

Web browsers are often your first point of contact with the internet no matter what device you are using. Developers release frequent updates to ensure you can experience the latest the web has to offer – more than ever websites are taking advantage of all the new features enabled by HTML5 video and audio, advanced styling and improved speeds. Many sites have stopped supporting older versions browsers, due to compatibility and security concerns.

Hackers often target vulnerabilities in web browsers which is why the companies that make them release regular updates to patch any vulnerabilities. Installing the latest versions helps keep your device secure – fortunately, most common browsers include options to automatically update either in the browser themselves or as part of the operating system update tools.

### Use a browser that allows you to take your bookmarks with you between devices

Most modern browsers allow you to create an account so that you can reduce your reliance on search engines and synchronize your bookmarks between your laptop, tablet, and smartphone. Many even enable you to see the pages you have open in other devices and open them in the device you are using at the time.

### Block Pop-ups

While desktop pop-ups from your operating system are unavoidable, pop-ups in your web browser can often be switched off. Browser pop-ups typically open new browser windows to push adverts, and while most are just annoying, some can contain malicious links or inappropriate content. Most browsers come with filters that automatically block pop-ups and enable you to allow them for those trusted sites where they may be advantageous.

### Use an ad blocker

Pop-up ads and the feeling of ads following you around the internet have led to the rise in popularity of the adblocker. Ad blockers stop webpages showing you ads, which sounds great until you realize how controversial this subject is and the profound impact it could have on the websites you visit.

Most websites are paid for by ads on a pay per impression basis – so if you have an ad blocker running, you deny the publisher the revenues that are paying to keep the site going.

By all means, protect yourself using an ad blocker, but do consider whitelisting your favorite sites as the ad revenue is what keeps them in business!

### Enable “do not track” in your browser

Many browsers include the ability to send a “do not track” request to websites which asks them not to collect or track your browsing data. However, what happens depends on how the sites respond to the request – but most websites and web servers don’t change their behavior and would appear to ignore the request. Still, making it clear you don’t wish to be tracked is a good start.

### Clear your web browser cache and cookies

Even if websites do decide to track your browsing data, you can limit the impact by regularly clearing your browser cache and deleting unwanted cookies. This prevents ads from following you around the web and can also ensure you have the latest version of a web page downloaded.

All major browsers allow you to do this manually, and you can easily clear all your data, but there are also software options that automate the process to make your life easier. Whichever route you choose to go it may be worth considering whitelisting those sites that you regularly log in to avoid having to re-enter login details constantly.

### Turn on private browsing

Private browsing protects your private information and blocks some websites from tracking your search and browsing data. It won’t hide your activity from your internet service provider, but it does reduce the accumulation of cookies and can be helpful if you are buying presents online for a significant other.

### Use a VPN

Virtual proxy networks or VPNs help you maintain your privacy by encrypting your data and internet requests before they ever hit the internet. The technology works the same no matter how you have connected to the internet – the encrypted data is sent to the VPN server which decrypts the requests before sending them on to the online destination. The information is then sent back through the same process meaning that sites, advertisers and internet service providers can’t track what you are doing.

VPNs such as the one included in Panda Dome uses the most secure encryption protocols on the market to ensure the only person that can see your data is you.

### Use a password manager

The number of password leaks that occur when websites are hacked makes it very dangerous to reuse the same password for a range of different sites. To prevent password leaks from being too damaging, you need to use unique passwords on every website. These should also be strong passwords – long, unpredictable passwords that contain numbers and symbols.

However, remembering strong passwords for all those different passwords is almost impossible – that's where a password manager comes in. They encrypt and securely store your login information for all the websites you used and help you log in automatically – leaving you to remember just the one master password.

Ensure you have up-to-date antivirus and firewall protection

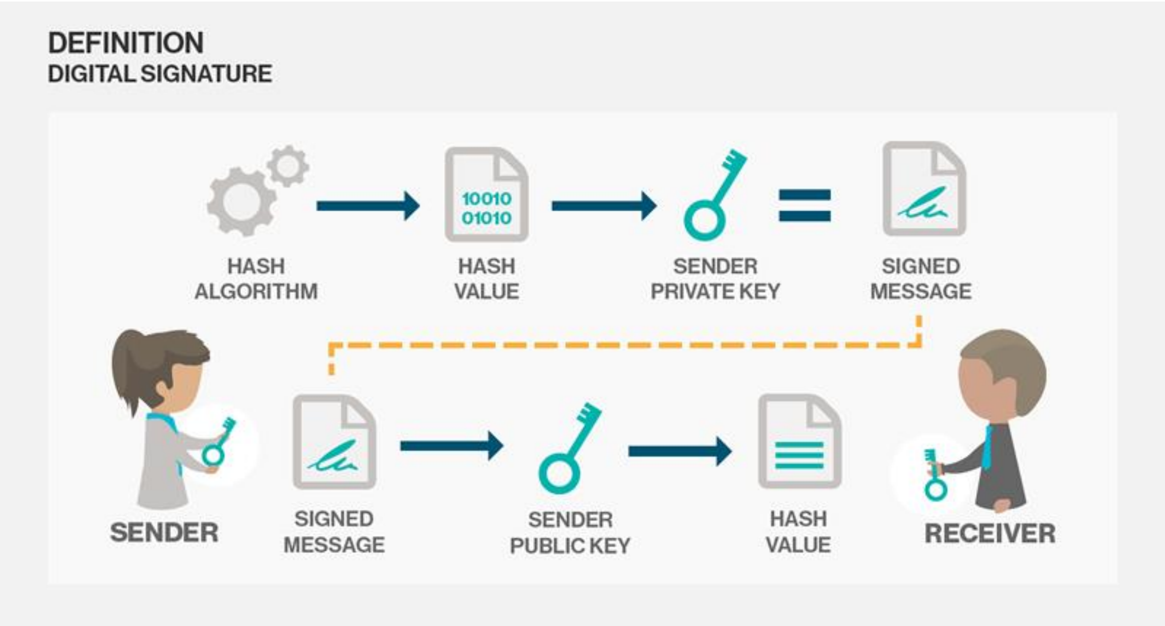
You need antivirus and firewall protection software on your computer no matter how carefully you browse the web or how smart you think you are about the links you click and the files you open.

Threats can be hidden in even in the most reputable websites or files from the most trusted of sources and ensuring you are protected with a smart antivirus platform is well worth a small investment in time to ensure you are protected. The most reputable antivirus software solutions currently available, use big data and AI to monitor every running application and detect attacks before they happen.

**Digital Signatures**

A digital signature is a type of electronic signature that uses a specific technical implementation. Digital signature providers follow the PKI (Public Key Infrastructure) protocol.

Digital signatures use a standard, accepted format, called Public Key Infrastructure (PKI), to provide the highest levels of security and universal acceptance. They are a specific signature technology implementation of electronic signature (eSignature).




The use of electronic signatures is gaining momentum in Bangladesh, but the laws dealing with them are still being expanded. Electronic signatures are recognized under the country's Information and Communication Technology Act 2006 (ICT Act), meaning they can be used to sign any documents that require a signature, subject to certain exceptions.

While the ICT Act is the primary legislation dealing with electronic signatures in Bangladesh, also relevant are the Information Technology (Certifying Authority) Rules 2010 (CA Rules); National Information and Communication Technology Policy 2018; and the Certification Practice Statement published by the Office of the Controller of Certifying Authorities (CCA). At this time there is no case law that deals with electronic or certificate-based digital signatures.

The ICT Act uses the terms electronic signature and digital signature interchangeably. In fact, the Bengali version of the ICT Act refers to "electronic signature" whereas the English version uses "digital signature". According to the Act, electronic signatures (or digital signatures, in the English version) must be able to:

- identify the signatory;
- affix with the signatory uniquely;
- be created in a safe manner or using means under the sole control of the signatory; and
- be related with the attached data in such a manner that is capable of identifying any alteration made in the data thereafter.

Any type of electronic signature will be treated as ineffective if the electronic record related to it is tampered with or amended.

### Special considerations

In Bangladesh, several use cases require a traditional signature. In others, such as dealing with public sector entities, the requirements will vary from case to case.

### Transacting with public sector entities

Bangladesh has no fixed requirements or restrictions for using digital or electronic signatures when dealing with Government entities. However, restrictions may apply depending on the particular department's terms of engagement. Also, under the ICT Act, the Government and its agencies have no obligation to accept documents in an electronic form.

### Use cases that generally require a traditional signature

There are certain types of documents or agreements that cannot by law be signed or executed electronically in Bangladesh. Such documents generally require the person executing them to be physically present before the Government office in question, or to provide a thumb impression along with a "wet signature". Examples of these documents may include:

- Will;
- Power of Attorney;
- Deed of Sale in relation to immovable property;
- Agreements where stamp duty is payable;
- Documents which need to be signed before the notary public and/or witnessed.

Documents relating to legal proceedings which need to be sworn before an affidavit commissioner.

How Can Security Awareness Be Improved?

An effective cybersecurity awareness information plan must be fun and not stringent, and it must be backed up by the executive and management board. It must be targeted at improving user behavior and be interactive in a way that necessitates feedback from all users. It should also be diverse in such a way that it penetrates the totality of the corporation with security awareness training materials, including email tips, posters, newsletters, and other regularly distributed communication materials.

Other ways to improve your security awareness training include:

- Being flexible with your corporate culture.
- Avoid punishing mistakes for clicks on phishing and spear phishing attempts.
- Preparing phishing simulations at random intervals.
- Frequently training staff and constantly reviewing training materials.
- Ensuring that your security awareness training includes everything that is relevant to the security of your organization.
- Customizing trainings to the right people and at the right time.
- Look at security awareness training from the standpoint of behavioral change instead of theoretical pursuits and compliance requirements.

# Module 14: Mobile Technology

## Mobile Technology:

An overview

Mobile technology is technology where the user uses mobile phone to do the operations related to communication system, for example to establish communication with friends, relatives and others. It uses to transmit the data from one system to others. Mobile Technology consists of portable two-way communications systems, computing devices, and the related networking equipment.

Mobile technology is a technology which is used primarily in cellular communication system and other related aspects. It uses a network type in which several transmitters are able to send data on a single channel at the same time. This model is known as Code-Divisions Multiple Accesses (CDMA). This platform allows many users to use single frequencies, as it limits the possibility of frequency interference from two or more sources. Over the years, the channel has grown. Mobile technology is evolving rapidly; its applications are becoming increasingly diverse over the years and are gradually replacing some similar sources on the market that are also used for communication, e.g. post office and land lines. Mobile technology has improved from a basic phone call and texting device into a multi-tasking system used for GPS navigation, internet browsing, gaming, instant messaging, etc. With the rise, professionals argue that computer technology's future depends on wireless networking and mobile computing. Mobile technology is becoming more and more popular through tablets and portable computers.

Nowadays this smartphone system has been upgraded to a very large multitasking computer that is used for GPS navigation, gaming, and internet browsing and instant messaging. Mobile technology has gained growing popularity through tablets and portable computers.

Wireless systems are loosely called the networking networks linking these devices. They allow mobile devices to share speech, data, and (mobile) applications.

obile technology is popular and on the rise. The number of smartphone users has gone up over 3 billion1 and by 2022 the global mobile workforce is projected to hit 1.87 billion.

Mobile Technology is characterized as any device with internet capabilities that can be accessed from wherever the user is. Current devices in this class contain devices like smartphones, tablets, some iPods and laptops, although this list will certainly increase in the coming years.

### Mobile Device Examples

Mobile devices are everywhere and they're not just limited to the phones in our pockets. Whether it's distributing a stronger WiFi signal or enabling a user to access phone calls from their wrist, mobile devices come in all shapes, sizes, and functionalities. Some of the most popular forms of mobile technology include:

**Smartphones** – most people have access to a smartphone today but any cell phone can be considered mobile technology.

**Laptops** – An evolution from the notebook computers of the past, modern laptops come in a variety of sizes but nearly all contain two-way network connectivity capabilities and can be used in a variety of environments.

**Tablets** – Often operating on the same systems as smartphones but with more powerful components, tablets offer even more portability than laptops with much of the same functionality.

**Smartwatches** – These devices are designed to sync with other devices, like smartphones or laptops, and utilize cloud capabilities to display notifications and applications on a smaller, wearable screen.

**Hotspots** – Devices require an internet connection of some kind to access the internet and hotspots provide a solution when a connection would be otherwise unattainable. Often running via cellular networks, hotspots host private WiFi networks that users can connect to in unorthodox environments.

**Mobile gaming consoles** – Gaming consoles have long existed in portable forms but recent generations possess the power to rival home consoles and feature two-way connectivity for accessing downloadable content, playing games with others over a network, and sending messages.

**IoT Devices** – Many, but not all, IoT devices can be considered mobile technology, such as sensors and smartwatches. These devices represent a broad category and react to their environment to communicate specific signals when an event is triggered.

## Types of Mobile Technologies

Followings are the key mobile technologies,

1. SMS
2. MMS
3. 4G
4. 3G
5. GSM
6. CDMA
7. Wi-Fi

### 1) SMS

"SMS" means Fast Messaging Service. It is nowadays the oldest and most commonly used text messaging service. It includes MMS (Multimedia Messaging Service) that allows SMS users to send multimedia content, such as images, audio, and visual files. Both SMS and MMS are sent using cellular networks, so a wireless plan and a wireless carrier is needed.

If you give your phone a typical "email" message it is called an SMS. You just sent an MMS while you are sending the gif.

As a low cost messaging tool SMS is rapidly gaining popularity in the US. The SMS is described as text messages sent to mobile phones, up to 160 characters in length. SMS has been synonymous with every text message sent to a cellular phone in recent months.

SMS is used for sending text messages to cell phones. Usually the messages can be up to 160 characters in length, although some services use 5-bit mode that supports 224 characters. SMS was initially designed for phones using GSM (Global System for Mobile Communications) communication, but it is now supported by all major cellular phone systems.

Although SMS is most widely used between friends or co-workers for text messaging, it also has many other applications. SMS subscription services, for example, can transmit weather, news, sports updates, and stock quotes to phones of users. SMS may also notify employees of sales requests, service stops and other business-relevant information. Doctors are able to accept SMS messages about emergencies in patients.

Fortunately, text messages sent via SMS do not require the receiver's telephone to be on for efficient transmission of the message. The SMS service will keep the message until the recipient turns on his or her phone and the message is sent to the recipient 's phone at which point. Most cell phone companies allow you to send a certain number of text messages at no charge per month. Although figuring out what that number is will be a good idea before you go nuts with the text message.

### How does SMS Works?

When you send a text message, it goes first over a network called the control channel to a nearby cellular tower and then into an SMSC hub. The SMSC resends the message to the recipient's nearest tower, and then it goes to their cell. SMS also sends message related data including message length, size, time stamp and destination.

Of the 109 text messages I sent yesterday, 15 were, for example, SMS messages sent to people who have phones on other networks, 70 were sent via iMessage, and the rest were sent via OTT apps.

### 2) MMS

MMS messaging known as Multimedia Messaging Service is a standard way to deliver multimedia content-including messages. In comparison to SMS, MMS can offer a variety of media including up to 40 seconds of video, one picture, a multi-image slideshow, or audio. Most of the modern devices will support texting with MMS. MMS support is usually built into the text message interface and automatically turns on when required. For example, a text-only message will be sent via SMS if you type in. The multimedia portion will be transmitted through MMS, if you add a graphic or video. Likewise, if anyone sends you a multimedia message, your phone will receive the file automatically using MMS. If your phone does not support MMS messages, you will most likely receive a text message which includes a URL from a web browser where you can access the file from.

An MMS message can send rich media content any time, anywhere, directly to mobile devices. It is a powerful and effective tool which helps businesses and businesses to reinforce and deepen customer loyalty by keeping them updated about their products and services with vital information. MMS texts are an important marketing communication tool since the text is packed with photos and videos. And other audios. MMS is really a modern way to connect with people over mobile devices. Text messages are more successful as they provide the receiver with valuable information and services. The more a company approaches its clients, the more likely a long-lasting brand partnership would be built up.

### How Does MMS Work?

In a standard phone-to-phone MMS transaction, the method of sending and receiving an MMS message works like this:

- The sending phone triggers a data link, usually via GPRS ( General Packet Radio Service), which provides TCP / IP connectivity.
- The sending phone encodes the MMS message HTTP POST to the Multimedia Messaging Service Center (MMSC) in the MMS Encapsulation Protocol, as specified by the Open Mobile Alliance; The encoded MMS message contains all of the MMS

message text, along with header information that includes a list of intended message recipients. (In most cases, the HTTP POST will be routed via a proxy server. Some devices will use WP-HTTP (Wireless Profiled HTTP) and TCP via a WAP 2.0 proxy server while other devices will use the Wireless Session Protocol via a traditional Wireless Application Protocol [WAP] proxy server / gateway.)

- The MMSC receives the MMS message sent, and validates the message sender.
- The MMSC stores MMS message content, making it accessible as a dynamically generated URL connection.
- The MMSC generates an MMS message, which is sent to the recipient(s) of the message via WAP Push over SMS. This MMS notification message contains a URL pointer for the content of the dynamically generated MMS.
- The receiver receives an MMS notification message and then initiates a data link providing access to the TCP / IP network (usually via GPRS).
- The receiver phone executes a GET HTTP (Hyper Text Transfer Protocol) to retrieve the MMS message link URL from the MMSC.

3) 3G

Number three in 3 G's name means third generation access technology which allows mobile phones to be connected to the internet.

Every new technology has new frequency bands and higher rates of data transmission.

The 1980s saw the first generation emerging. Know mobile phones? First-generation networking was used on those voluminous phones that were typically mounted in cars because they were too heavy to hold comfortably. Sometimes that large briefcase a bureau worker was carrying around wasn't full of important papers, but he was lugging around a massive "mobile" phone instead!

The second generation network, which became available in the '90s, allowed text messaging to be used. This significant and groundbreaking improvement also offered a more secure network and paved the way for the ever-present 3 G and 4 G technologies.

In 2001, 3 G connection-based networks were launched, marking the beginning of widespread Internet use on mobile phones. Smartphones were introduced soon after, offering all the possibilities of a device in the palm of your hand.

How 3 G technologies work?

3 G data technology uses a network of telephone towers to transmit the signals, ensuring a stable and relatively fast long distance link. The tower closest to the mobile phone of the user is transferring data into it. Although it may not sound complex, at the time it was launched 3 G technology was groundbreaking.

Today we enjoy more mature 4 G technology which will soon be replaced by powerful 5 G networks themselves. Many people will use 3 G when 4 G is unavailable, but even after almost two decades of use the system will holds up. You might have noticed the connectivity on your own mobile phone moving from 4 G to 3 G depending on which service is more readily accessible at a given venue.

3 G networks can upload speeds up to 3 Mbps (about 15 seconds for uploading a 3-minute MP3 song). By contrast, up to 144Kbps (about 8 minutes to download a 3-minute song) can be achieved with the fastest 2 G phones.

With your new 3 G enabled phones you may be shocked to visit some countries and it refuses to pick up the network until you choose the 2 G search mode! 3 G systems are designed for digital mobile phones with a full display screen and improved connectivity.

Requirements for 3 G Use

Unlike Wi-Fi, which you can use in hotspots for free, you need to pay to a service provider to get 3 G access to the network. This sort of service is sometimes referred to as a data plan or a network plan.

Your computer is connected to the 3 G network through its SIM card (in the case of a mobile phone) or 3 G data card (which may be of various forms, such as USB, PCMCIA, etc.), all of which are typically supplied or sold by the service provider.

These cards are how the system connects to the Internet when it's within a 3 G network's range. The technology is also backward compatible with older technologies, which is why a 3 G compliant phone will get 2 G service when there is no 3 G service available.

4) 4G

4 G is the fourth generation of mobile networking technology. It carries on from mobile technology of 3 G and 2G.

2 G technology introduced in the 1990's allowed digital telephone calls to be made and texts sent. Then 3 G arrived in 2003, allowing you to search web sites, make phone calls, and stream music and video on the move.

4 G technology builds on what 3 G does but does it all at a much quicker pace.

Naturally, there is now also 5 G, which follows the same trend. It's the fifth generation and still is quicker.

To put it simply, 4 G is described as the fourth generation of mobile technology which follows the preceding 2 G and 3 G networks. It is often referred to as 4 G LTE, but this is not technically correct because LTE is just a single 4 G type. Currently it is the most mature technology embraced by most mobile network service providers.

However, as you might have read, 5 G is growing alongside current 3 G and 4 G mobile networks and is beginning to operate.

When it first came out 4 G changed the way we use mobile internet easily. Although 3 G networks were reasonably small, 4 G network connectivity allowed users to access the web and display HD videos on mobile devices that effectively turned smartphones into modern-day computers.

Today, on handheld devices such as smartphones or tablets, you can perform most of the tasks that you do on a laptop or desktop computer. 4 G networks mean you can maintain reliable speeds virtually anywhere, no matter how much data you need.

4 G released in UK in 2012. Right now, its forerunner 3 G is dwarfing the number of mobile users who use 4G. Nevertheless, expect that to change in years to come as 4 G contracts decline in price and 4 G network coverage expands further across the UK.

How fast is 4G?

Compared with 3 G, the 4 G networks are very good.

Premium 4 G provides download speeds of about 14 Mbps, which is almost five times faster than that provided by its predecessor, the 3 G network. Currently, 4 G networks can reach speeds as high as 150 Mbps, enabling users to download gigabytes of data in minutes or even seconds, rather than hours like with 3 G networks.

Uploading data is also much quicker – typical 4 G upload speeds are around 8 Mbps, with potential rates reaching as high as 50 Mbps, while 3 G caps off at approximately 0.5 Mbps. It is a substantial difference, no matter how you look at it.

Today, with data plans being more accessible, the use of mobile and local WiFi networks has been mixed by many users, as both have similar speeds. Some companies also sell home-based 4 G networks for people who want a mobile hotspot that they can take wherever they go with them.

5. Global System for Mobile technology:

The (GSM) is an acronym for Global System for Mobile Communication. GSM is a cellular technology that is open and digital and is used for mobile communication. It operates on the 850 MHz, 900 MHz, 1800 MHz, and 1900 MHz frequency ranges. It employs a hybrid of FDMA and TDMA.

Code Division Multiple Access:

(CDMA) is an acronym for code division multiple access. It is a channel access mechanism that also serves as an example of multiple access. Multiple access simply means that data from multiple transmitters can be delivered onto a single communication channel at the same time.

Wi-Fi (Wireless Fidelity):

Wi-Fi is a wireless networking technology that allows us to connect to a network or to other computers or mobile devices across a wireless channel. Data is delivered in a circular region over radio frequencies in Wi-Fi. Wi-Fi (Wireless Fidelity) is a generic acronym for a communication standard for a wireless network that functions as a Local Area Network without the use of cables or other types of cabling.

Use of Mobile technology

The incorporation of mobile technology into business has aided tele collaboration. Now, people could connect from anywhere using mobile technology, and access the papers and documents they need to complete collaborative work.

Work is being redefined by mobile technologies. Employees are no longer confined to their desks; they can work from anywhere in the world.

Mobile technology can help your company save time and money. Employees who work from home save thousands on a regular basis. Mobile phones eliminate the need for costly technology like landline carrier services. Cloud-based services are less expensive than traditional systems. Technology can also help your company become more flexible and productive.

Mobile technology has the potential to boost productivity significantly. Mobile application integration saves an average of 7.5 hours per week per employee. Workers can also become more productive with the use of smartphones and mobile gadgets.

The popularity of cloud-based services has skyrocketed in recent years. Cloud-based mobile technology applications have been seen to be more useful than any smartphone, particularly in terms of available storage space.

Advantages of Mobile technology

- Through a variety of applications, we can now stay in touch with our friends and family members anytime we choose. We may now communicate or video visit with anybody we want by just using our cell phone or cell phone. Aside from that, the portable keeps us informed about the rest of the globe.
- Today's mobile phones have made our day-to-day activities much more natural. Today, one may check the current traffic situation on their phone and make appropriate decisions to arrive on time. The weather is also a factor.
- With the advancement of mobile technology, the entire gaming world is now under one roof. When we are tired of monotonous work or during breaks, we can listen to

music, view movies, watch our favorite shows, or simply watch a video of our favorite song.

- Mobile phones are being used for a variety of legitimate tasks, including meeting schedules, sending and receiving documents, providing introductions, warnings, and job applications, among others. Cell phones have become an indispensable tool for all working people.
- These days, mobile phones are also used as a wallet to make payments. Utilities might be used to send money to friends, relatives, and others right now.

### Disadvantages of Mobile technology

- The modern family has become reliant on mobile phones. In any case, when we don’t have to travel, we surf the internet, play around, and create a genuine junkie.
- Because of the widespread use of mobile technology, people nowadays don’t meet in person but rather tweet or comment on social media sites.
- Because of the widespread use of mobile devices, there is a major risk of losing one’s protection. By efficiently reading through your web-based social networking account, anyone may now easily obtain data such as where you reside, your loved ones, what you do for a living, where you live, and so on.
- Mobile phone prices have risen in tandem with their worth. People nowadays spend a significant amount of money on cell phones, which could be better spent on more useful things like education or other beneficial items throughout our lives.

## Mobile Technology & Reach

Mobile technology has grown leaps and bounds over the last few decades. The journey from the clunky wireless phone to sleek smartphone has been peppered by a number of amazing innovations and discoveries.

With the 3G mobiles available today, users can do a lot more with their smartphones than just sending a voicemail or SMS. They can browse the web, check the weather, read a book, prepare a to-do-list, carry their favorite music around, find their way around a new city with GPRS, and do much more.


Mobile Marketing Technology & Reach

In such a scenario, every business person willing to practice the mobile marketing technique has to be aware about the following top 5 ways in which mobile technologies have changed the way users interact with mobile devices −

Anywhere anytime access

Unlike laptops and desktops, tablet and mobile devices are easy to carry around. Users can access the internet in their mobile devices at anytime and anywhere and it has decreased use of the laptops.

Mobile Apps are easier than websites

Companies that have an online customer base for instance e-commerce portals have noticed that the sales and subscriptions they get from their apps are higher in comparison to that of their websites. This means, online purchasing from the mobile phones are easier.

Advertisements should be personalized

Most of the users feel that the mobile are more personal device than say a laptop or a desktop. Therefore, they expect that the content they receive on their mobile phones must be personalized as well.

Social media is a prime channel

Whether your customers are business professionals, students, home-makers, teenagers etc., commonly, they spend more than 3 hours a week on social media channels, such as Twitter, Facebook etc. Surprisingly, most of these customers access these channels on their smartphones.

Mobiles are turning into mini-computers

Slowly but surely technicians and developers are packing the mobile phones with computer-like features. With bigger screens, faster performance, optimum storage capacity, longer battery life, and a ton of productivity booster applications. The evolution of phones from a simple calling device to multi-tasking-pocket-size computers has revolutionized the world.

Key capabilities of effective mobile technology

**Scalability:** Creating point solutions that don't scale across an enterprise can be costly in terms of development, management and maintenance. Apps need to be conceived holistically with consideration for lines of business, processes and technical environments.

**Integration:** IDC has pointed out (PDF, 611KB) that "…applications offered on mobile phones and tablets have a separation between the mobile app and back-end business logic and data services." Being able to connect logic and data services to the app is critical, whether the logic and data are on premises, on the cloud or in hybrid configurations.

**Reuse:** Over 105 billion mobile apps were downloaded in 2018.[6] Many are, or can be modified or combined, for business applications. Using existing apps accelerates time-to-value and improves cost efficiency by taking advantage of domain and industry expertise built into the app.

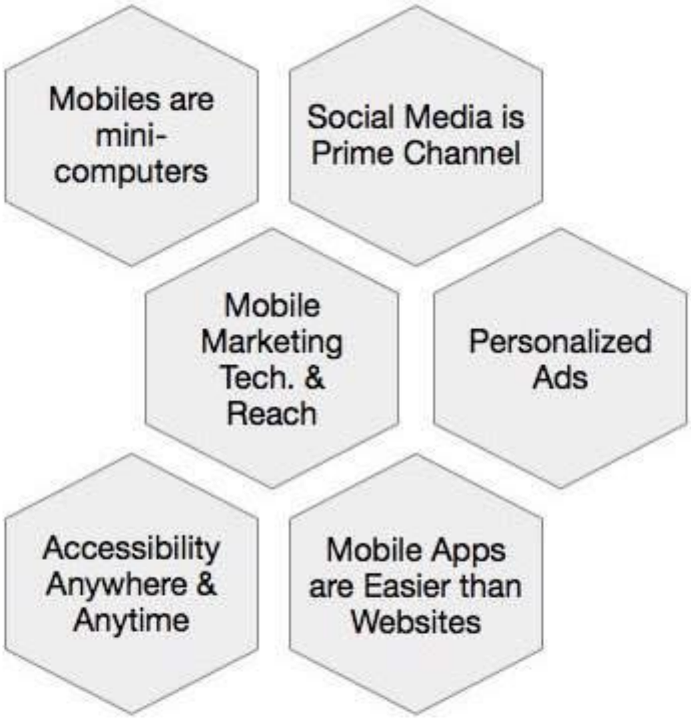
**Cloud-based development:** The cloud offers an efficient platform to develop, test and manage applications. Developers can use application programming interfaces (API) to connect apps to back-end data and focus on front-end functions. They can add authentication to bolster security, and access artificial intelligence (AI) and cognitive services.

**Mobility management:** As mobile technology is deployed, organizations look to enterprise mobility management (EMM) solutions to configure devices and apps; track device usage and inventories; control and protect data; and support and troubleshoot issues.

**BYOD:** Bring your own device (BYOD) is an IT policy that allows employees to use personal devices to access data and systems. Effectively adopted, BYOD can improve productivity, increase employee satisfaction and save money. At the same time, it presents security and device management questions that need to be addressed.

**Security:** The mobile security battle is daunting in terms of volume and complexity. Artificial Intelligence (AI) is emerging as a key weapon to discern security anomalies in vast amounts of data. It can help surface and remediate malware incidents or recommend actions to meet regulatory requirements from a central dashboard.

**Edge computing:** One of the key advantages of 5G is that it can bring applications closer to their data sources or edge servers. Proximity to data at its source can deliver network benefits such as improved response times and better bandwidth availability. From a business perspective, edge computing offers the opportunity to perform more comprehensive data analysis and gain deeper insights faster.




Mobile Technology Applications

- Business (point-of-sale transactions [seller, buyer], Internet purchases, online banking)
- Communication (voice, text, social media, email, Internet access, travel directions)
- Computing
- Entertainment (gaming, music, streaming video, ebooks)
- IoT
- Mobile apps
- Remote sensing
- Travel directions (GPS, cellular-based)
- Wearables

Mobile Technology Components

- Hardware (communication subsystem [Wide Area Network components, Local Area Network components, Personal Area Network components, antennas, Near Field Communication], processor, memory, sensors)
- Security (hardware and software)
- Software/firmware (mobile apps, software/firmware, mobile operating systems)
- User interfaces (hardware [displays, wearable components], software/firmware)

Mobile Technology Collateral Components

- Centralized storage
- Infrastructure
- Sensors/transducers

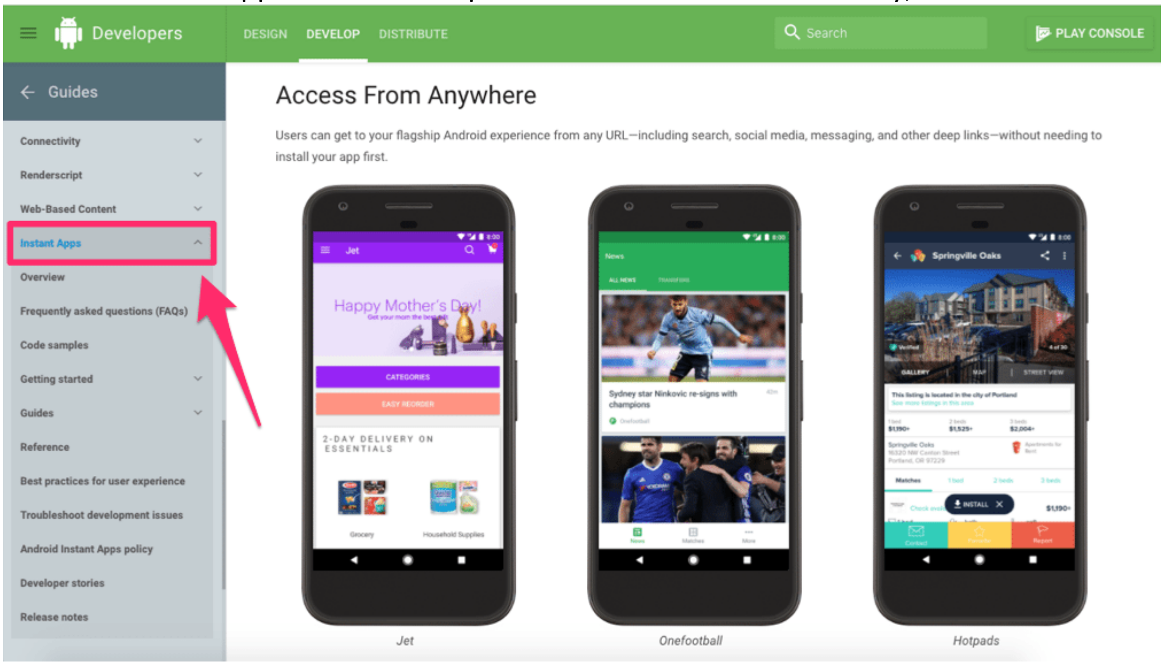
Our attorneys practicing in these fields have experience in the mobile technology industry and understand the constantly changing complexity of these inventions. They have experience in mobile-related technologies such as social networks and associated operations, software, wireless communications, speech recognition, GPS systems, video applications, and image processing. Our educational and work backgrounds enable us to effectively communicate with our clients to understand their goals, so that we can obtain effective long-term global protection for them.

## 23 Mobile Technology Waves for 2022

### 1. Android Instant Apps are on the rise

Android app developers or people who have an app available on the Google Play Store have probably heard of Android Instant Apps.

These are native apps that don't require installation and run instantly, hence the name.




This technology is now available to all developers. So whether you're an existing Android developer or a new one, anyone has access to this type of development.

Android Instant apps are revolutionary for both developers and users. Now a user can run an app and test it out without needing to download it first.

This works on the newest Android devices. It's supported by devices from Android 5.0 to Android 8.0, or API level 21 to API level 26.

Having a smooth Instant App will be necessary to get users to download your app. If they don't have a good experience when they're trying it out, they probably won't install it.

This new technology also poses some new questions. Will Apple follow this trend and create a similar feature for there app store?

As of now, this feature is strictly for Android devices. But I'll be interested to see how this plays out over the next year. You should keep an eye on this as well.

### 2. Mobile artificial intelligence

In 2022, we are one step closer to robots taking over the world. *I'm kidding*, of course. While we're not quite there yet, we are seeing more and more advances in artificial intelligence, especially in the mobile industry.

Some AI software that you might be familiar with include:

- Siri
- Cortana
- Alexa

- Google Assistant

But now regular mobile apps are using voice recognition software and AI to enhance the user experience. Voice recognition also improves hands-free use. Some mobile app accessibility is also linked to AI.

Artificial intelligence is used to bridge translation gaps with voice recognition.

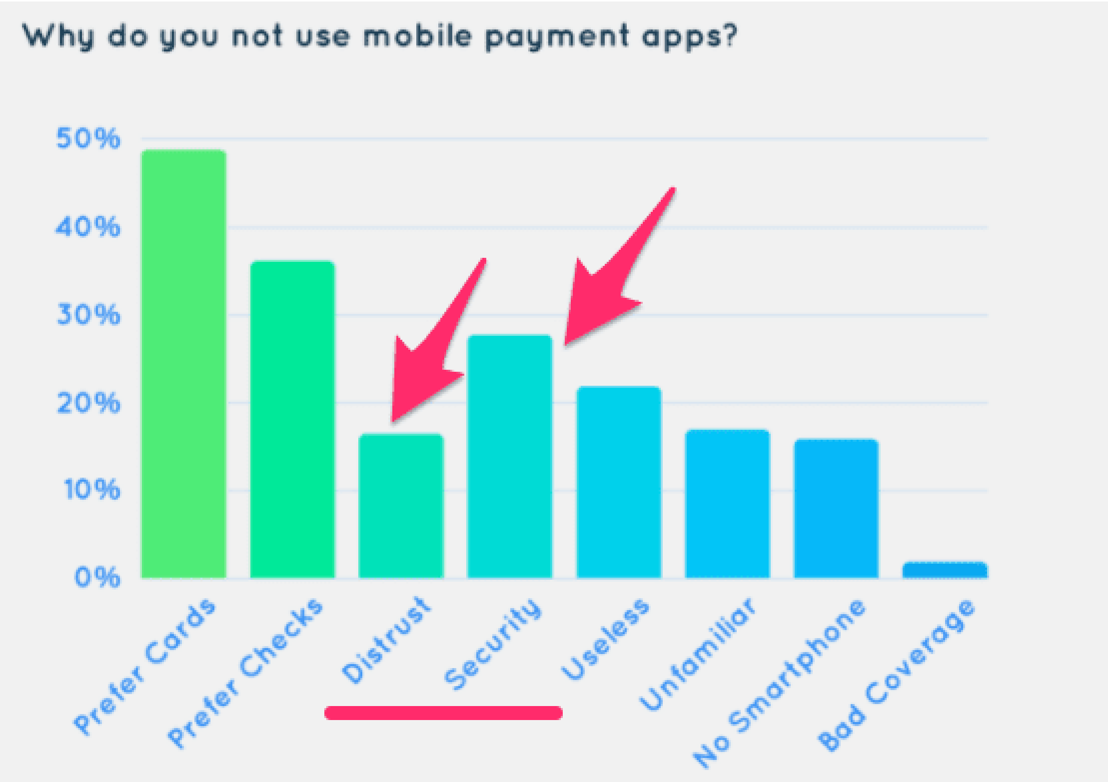
Understanding the user's voice will help developers and marketers learn more about these people.

As a result, you'll be able to target users better and generate more revenue with relevant advertisements.

3. Mobile security

Businesses need to start prioritizing mobile security to protect user information and make sure that all transactions are safe.

That's because some users are hesitant to use payment apps for reasons related to security and distrust.




Businesses who rely on mobile payments need to put these concerns to rest in the coming year.

56% of consumers in the United States believe that mobile payments increase their chances of falling victim to theft and fraud.

Only 5% of these consumers believe that mobile payments reduce theft and fraud chances. An additional 13% of US consumers don't think it makes a difference.

With so many companies going mobile and relying on mobile payments to turn a profit, I expect mobile security to be a top priority for these businesses.

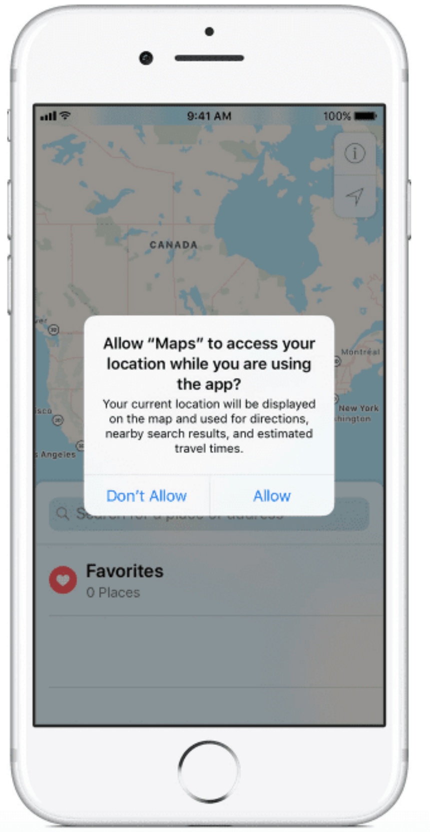
Companies will come up with ways to ease the minds of their consumers. As a result, I'm expecting there to be a shift in the perception of mobile payments in the coming year. Consumers will feel safer about making these transactions.

If you're one of the companies that offers a mobile payment option, you need to address these security concerns ASAP.

4. Geofencing and location-based services

It's no secret that mobile apps are tracking the location of their users. In fact, users are giving them permission to do so.

Whenever you download and use a new app, you'll get a notification that requests permission to access your location. Here's an example of what this notification looks like on iOS devices.




You can't even use some apps unless you share your location with them. For example, if you're using a rideshare app like Uber or Lyft, you won't be able to get connected with a driver unless the app knows exactly where you are.

But now location-based services are trending in a new direction. Companies that don't need your location are still requesting it.

They are using it to improve their marketing efforts. In fact, 70% of apps share user data with third-party services.

It's easier to target users from a marketing perspective if you know their location. For example, businesses are using geofencing to make more money.

If someone with an app downloaded to their device walks into a certain geofenced area, they'll get a push notification from the app with some kind of promotion based on that location.

We're going to see an increase in this type of marketing strategy in 2022.

### 5. Mobile applications for small businesses

Mobile applications are no longer just for the giant companies anymore. Any business in any industry needs to have a mobile app. It doesn't matter how big or small your company is.

Small business owners are recognizing this trend and starting to develop. In fact, roughly 50% of small business owners plan to develop a mobile app.

55% of small businesses say that they're developing an app to increase sales. While other businesses site an improvement in the customer experience and staying competitive in a specific market as the reasons for development.

Regardless of the reason, small business apps are still on the rise.

### 6. Augmented reality will be incorporated into more apps

More mobile apps will adapt to augmented reality in 2022.

These types of apps incorporate the real world with the app. Pokemon Go is a perfect example of an augmented reality app. Here's an example of the game.


The sidewalk, grass, benches, trees, sky, people, and power lines all exist in reality for the image above. If you were to take out your camera, you'd see all of this on the screen.

But this type of mobile tech adds elements to your device that aren't actually there, like the fictional Pokemon character above.

Pokemon Go was downloaded 752 million times and generated more than $1.2 billion in revenue. There are more than 5 million daily active users playing this game across the globe.

It’s safe to say that this was a huge success. Because of this, more companies are going to try and use augmented reality apps to drive downloads, engagement, and revenue for their business.

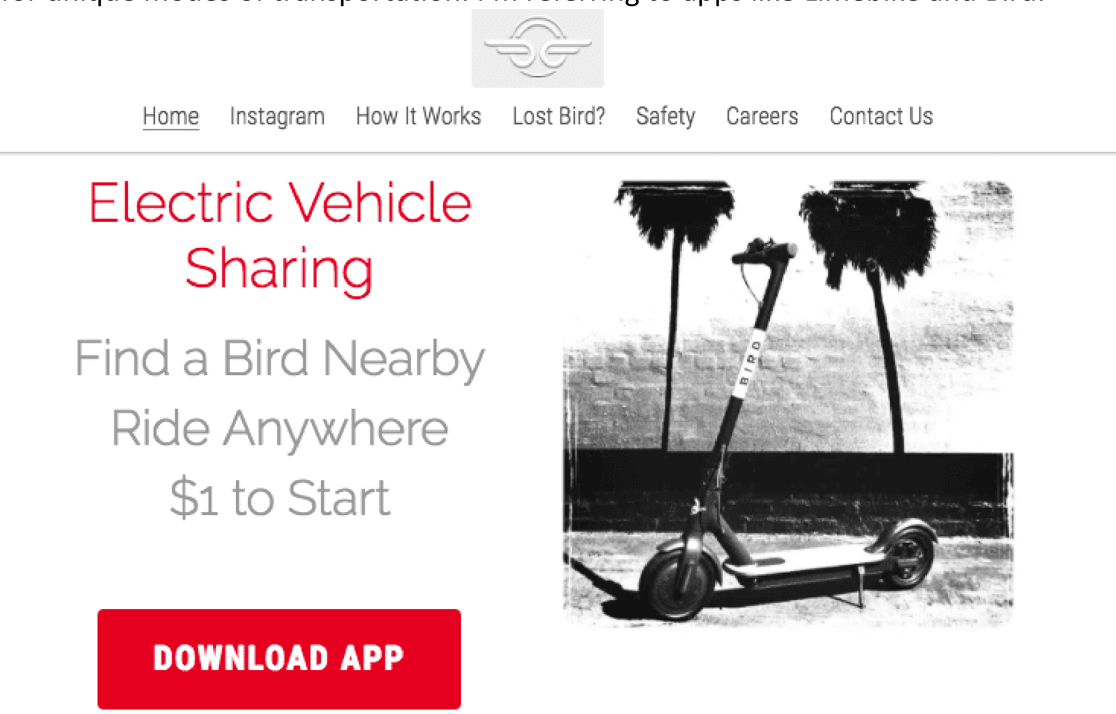
7. Apps built for transportation are evolving

Transportation apps are changing.

We’re already familiar with mobile tech like Uber and Lyft. People even use car sharing apps like Turo or Zipcar to get around.

There are apps for train schedules, buses, and planes. Everything that I’ve just mentioned is something that we have grown accustomed to in the past several years.

But now we’re seeing even more companies starting to appear with a mobile application for unique modes of transportation. I’m referring to apps like Limebike and Bird.




With Bird, users who download the app can locate electric scooters in their area. The scooter is unlocked and started by using the app.

Then a user can go for a ride and leave it anywhere when they’re finished by locking it through the app and completing the ride. Once the ride is completed, another user has the option to use that same scooter and pick it up exactly where it was left.

People don’t need to bring the scooters to a specific location or charging station, which makes it really appealing to the users.

Bird raised more than $15 million to start their business. With so much money being invested into this new technology, I anticipate this company to expand and for other businesses to replicate their business model in the coming year.

8. Mobile app revenue is on the rise

The Google Play Store and the Apple App Store both saw a major increase in app revenue last year. What caused this?

For starters, there was a 13.5% increase in global app downloads. There was a 6.7% increase and 16.7% increase from the Apple App Store and Google Play Store, respectively.

There is no sign of this trend slowing down in 2022. In fact, experts predict that markets like India and Brazil alone will see a 30% to 50% increase in total hours spent using a mobile application.

According to Statista, the global app revenue is expected to reach $935 billion by 2023. That's roughly 2.5x the figures from 2018.

How can your company get a piece of that massive share?

9. Wearable technology being paired with mobile apps

In 2022 we'll see an increase of wearable mobile tech. I'm talking about things like:

- smart watches
- fitness bracelets
- glasses
- healthcare monitors

All of these devices, and more, will be paired and used with mobile apps. For example, look at a company like Fitbit.

Their wearable mobile tech can be monitored and accessed through their app. Users can see things like how many steps they took in a day, their heart rate, and other trackable information.

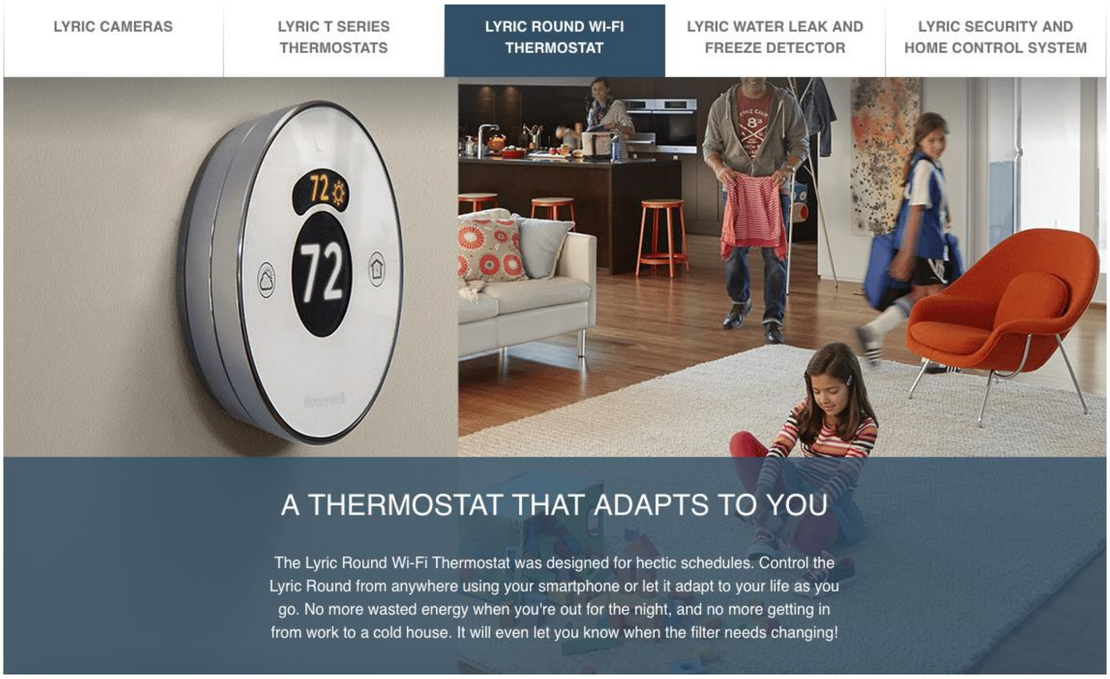
The idea behind this concept is for the consumer to track and monitor their fitness and health journey. With the app, it's easy to compare data and how you're improving over the course of a day, week, month, or even year.

125 million units of wearable technology to be shipped this year. The lion's share of these devices will be used in conjunction with mobile apps.

10. People will control their homes with a mobile app

More consumers are going to use mobile tech to improve their experience in their homes.

For example, Honeywell has a wide range of products in this space.




Here's one of their thermostats that connects to the Wifi network in a home. Users can control the temperature and adjust the thermostat from their devices, even if they aren't home.

Honeywell, along with other companies, also has products for home security and home appliances. They all operate a similar way and can be controlled from mobile devices.

More companies and more consumers will adapt to this trend in the coming year.

This is a space where machine learning will also come into play in the near future.

## 11. Cross platform mobile development

Mobile app developers who want to launch their app for Android and iOS devices will start to take advantage of cross platform mobile application development tools.

It's no longer a viable business model for an app to only be available on one platform and not the other. In the past, businesses were hesitant to launch on both platforms simultaneously because of the high costs.

They would need to build two completely separate apps. But now, with cross platform mobile development trending upward, it's easier and more realistic for companies to do so.

That's why we'll also see an increase in the number of total apps available for download across both stores. This number is directly related to the total global app revenue, which we've previously discussed.

## 12. Mobile payments are on the rise

With an increase in global app revenue as well as a more positive outlook on mobile security, mobile payments will be on the rise in 2022.

I'm talking about mobile tech payment methods like:

- Apple Pay
- Venmo
- Google Pay
- Paypal

Even bank apps and mobile apps that allow users to pay for products or services directly within the app.

Take a look at how these alternative payment options have been trending up in recent years, and I don't expect to see this trend slowing down anytime soon.

2022 should be another huge year for mobile payments.

### 13. Virtual reality apps

Earlier we discussed augmented reality apps. But virtual reality will continue to grow in 2022 as well.

These are apps that require more than just a smartphone or tablet to operate.

Users will also wear some form of goggles or helmet. They may even have separate controllers or joysticks paired with mobile tech as well.

According to Zion Market Research, the global virtual reality market valuation will be worth more than $26 billion in 2022.

### 14. Biometrics

Biometrics are officially part of the mobile application world.

Mobile devices and apps are using this mobile tech as a security measure for their users.

I'm referring to things like:

- fingerprints
- voice recognition
- signature recognition
- facial recognition

The newest iPhone model uses facial recognition software to unlock the device.

Other apps are enabling fingerprints and other biometrics in conjunction with two-factor authentication to improve security.

You can expect to see more devices and more mobile apps using biometrics technology in 2022.

### 15. Cloud-based technology

Based on research and expert predictions, the cloud market is growing at a rate of 22% CAGR.

76% of all revenue from cloud platforms are controlled by Google, Microsoft Azure, and Amazon Web Services.

Cloud-based technology is also penetrating the world of mobile apps.

Although it may seem marginal, cloud-based mobile tech is still on the rise and will continue to be prominently used in apps and mobile devices throughout 2022.

### 16. Personalization is still king

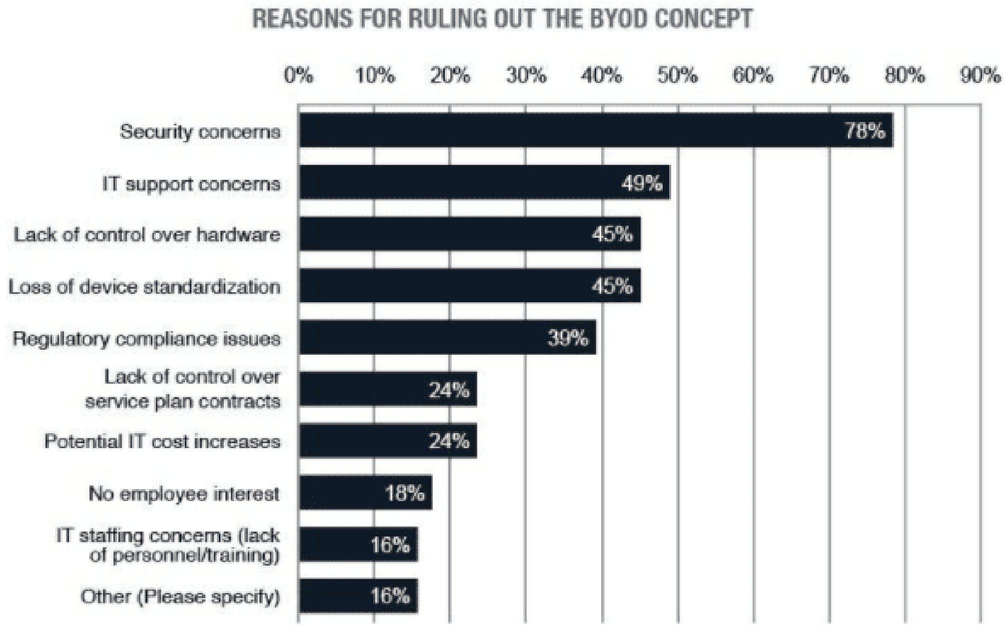
One thing that won't change in 2022 is personalization.

- Mobile users still want a personalized experience, regardless of what they're doing.
- New apps and new technology will help focus on the user's personal experience. Refer back to some of the trends that we previously discussed.
- Geofencing will focus on personalization based on a user's location.
- In order to pay for things with a mobile device, users will have their personal information stored in their profiles. They may even use biometrics to access these.

- Apps are starting to use machine learning to learn more about users. Machine learning technology makes it much easier to automatically personalize in-app content.
- With so many trends to keep up with in the coming year, just make sure that your company doesn't lose focus when it comes to optimizing the user experience.
- You've still got to make your mobile app as unique as possible for each user.

17. BYOD

In the past, businesses didn't want employees to use their own computers, laptops, phones, tablets, and other mobile devices for work. Here's why businesses were hesitant in the past to adapt to the bring your own device concept.




But today with new mobile tech and security, more and more companies are considering BYOD to be safe.

That's why 87% of businesses today rely on employees using their personal devices to access work-related material.

59% of companies allow their staff to use personal devices directly for work. An additional 13% plan to allow this within the next year.

As you can see from the data, although companies in the past have had security concerns about BYOD, its presence in the workplace is still trending upward. I expect that trend to continue in 2022.

Allowing BYOD saves businesses money and also boosts productivity. Studies show that employees who use personal devices for work have a 34% increase in productivity.

18. In-App Gestures

Touch has now become a norm in the mobile app space.

Therefore, gestures like taps, double taps, swipes and scrolls have taken over. Actions like sharing or deleting a particular in app activity or content is now commonly being done with the help of a swipe. Gestures can vary from industry to industry and new and innovative gestures are becoming a prominent part of any mobile application customer experience.


**Reasons Why Gestures are Preferred Over Buttons**

- Gestures make the user-experience very lively and real. They ensure that the app interface remains clean and pleasing. The user finds no obstructions while taking an action.
- What you can experience now is that you just need to swipe to delete an unwanted email in your inbox. Gestures bring in useful shortcuts in each and everything we are doing in the app, hastening and simplifying the process.

**More Importance To Visual Cues In Gestures**

Many a times it has been observed that gestures are inconsistent across apps and devices. The situation can at times, become slightly confusing for the user. A user may get used to a certain gesture which may not perform the same way in another app or device.

Visual cues about gestures are helpful in making it easier for the user. Progressive gestures are thus an upcoming trend in this space.

19. Minimalistic Interface

A faster, easy to load app must be easy on the users' eyes as well.

Too many design elements in any app makes a user get confused. A minimal UI design ensures that the users can understand and use the application with ease.

With shorter attention span of users and the need for a speedy app, a minimal UI is surely the way forward.

20. User On-boarding

The impression that the app users get, the first time they use an app, decides its fate with that user. An out-of-the box on-boarding experience is crucial for the success of the app.

When the user comes on-board, it is their first tryst with the app and if you can sell the application at this time, the task is done.
A progressive on-boarding works well to get the user to become comfortable with the application while understanding it better.


**Improving the Initial Experience**

As soon as the visitor opens your app for the first time, you need to communicate about some of the unique features of the application.
An introductory video can be quite effective in building a relationship with the users while telling them what's in store for them.
Provide them with a walk through of the app and some basic tips on using its core features.
Helping the users to personalize the app experience by adding their preferences is quite common as well.

**Make The Users Feel Positive**

App gamification is a trend that's fast catching up. Once the user knows how to use the app, you need to make sure that the interaction is consistent. Praise them on having completed a step or thank them at completion of a particular activity like a sign up. You can add these simple messages to keep them motivated and interested at each step.

21. User Off-boarding

Every story has an ending that should be equally inviting. Provide your users with a happy passage while exiting the app. For example, if it's a gaming application, you can tell them about the points they have accumulated in the completed session. You can congratulate them and motivate them to come back again for more action. A pleasant off-boarding experience will surely get the user to talk about the app and get you word-of-mouth publicity.
User off-boarding is fast catching up as a trend and more and more apps and UX professionals are joining in the bandwagon. This is one of the key trends to watch out for in the coming year.

22. Internet of Things

The Internet of Things technology has been around for a while and has added tremendous value to businesses globally.
With sensor technology becoming cheaper, IoT will continue to grow in the coming times. The UX of an IoT app plays a very important role in its success. The key challenge the UX designers of IoT apps face is to provide the precise information to the user so they do not get confused and overwhelmed with extra stuff.

In an IoT app the information flows between service providers, apps, things and people and one has to ensure that this information is clear, concise and engaging for the user. One of the key concerns of the UX professionals and business owners is the security of this information. Another important aspect of an app UX built for IoT is the level of customization that can be done for different groups of users. Personal users of an IoT app require a different experience from that of the business users. One has to clearly understand app functionality in each of the cases while doing the app UX.

### 23. Animated and Motion Based Design

Motion based design adds to the delight of the users. Animations are used to communicate the story behind each feature and functionality.

## Relevance of Animation

Animation works when relevant. You need to understand your audience to create stories that connect with your audience. Talk to your prospective users and understand their expectations of the app. The next step is to understand the user journey and the context in which the user action will be taken.

There are situations in the app's user journey where the user is looking for answers to stuff like:

- What's happening next?
- Have I completed this action?
- What does this mean?

These are opportunities to add animation and ensure it helps the users to complete the action and move to the next one.

## Conclusion

No matter what type of business you're in, you've got to stay updated on the newest technology trends.

More specifically, you need to know what's happening in the mobile world because that's where your current and prospective customers are living.

Understanding the latest mobile technology trends of the coming year will help your company prepare and make any adjustments to stay up to date. Whether its machine learning, VR, or AR, you may want to consider applying some of these trends to your own app.