# COMPUTER FUNDAMENTALS FOR TECHNICAL STUDENTS

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# Computer Fundamentals

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# TABLE OF CONTENTS

Licensing

## 1: How does a computer work?

- 1.1: What is a Computer?
- 1.2: Hardware and Software
- 1.3: What are the Different Types of Computers?
- 1.4: Components of a Computer
- 1.5: What is an Operating System?
- 1.6: Summary
- 1.7: Checking for Understanding

## 2: Getting Started with Microsoft Windows

- 2.1: Logging in
- 2.2: Windows Desktop
- 2.3: Windows Start Menu
- 2.4: Windows Taskbar (Tutorialspoint.com, n.d.)
- 2.5: Notification Area
- 2.6: Windows 10 Task View
- 2.7: Checking for Understanding

## 3: File Management

- 3.1: Windows File Explorer
- 3.2: Ribbon
- 3.3: Organizing Files and Folders
- 3.4: Cut/ Copy/ Paste
- 3.5: Check for Understanding

## 4: Managing Windows Applications

- 4.1: Using Applications
- 4.2: Windows Store
- 4.3: Uninstalling Applications
- 4.4: Window Management
- 4.5: Application Settings
- 4.6: Checking for Understanding

## 5: Web Browsers and the Internet

- 5.1: Web Browser Interface
- 5.2: Downloading Files
- 5.3: Internet Security
- 5.4: Bookmarks and Internet History
- 5.5: Checking for Understanding

## 6: Customizing Windows Appearance

- 6.1: Changing the Desktop Background
- 6.2: Create a Desktop Background with a Picture Slideshow
- 6.3: Changing the Color Accent in Windows 10
- 6.4: Adjusting between Light and Dark Themes
- 6.5: Customizing Windows 10 Lock Screen
- 6.6: Applying a Theme to Windows 10
- 6.7: Windows Settings
- 6.8: Accessibility Settings
- 6.9: Notification Center
- 6.10: Checking for Understanding

## 7: Windows Security

- 7.1: Computer Viruses
- 7.2: Computer Malware
- 7.3: Phishing
- 7.4: Windows Defender Security Center
- 7.5: Launching Windows Defender Security Center
- 7.6: Using Windows Defender Scan
- 7.7: Viewing the Health/ Performance of your PC
- 7.8: Fresh Start
- 7.9: How to Manage Network Security with Windows Defender Firewall
- 7.10: How to Protect your PC against Malicious Code
- 7.11: User Account Control
- 7.12: Automatic Updates
- 7.13: Internet and Computer Safety Tips
- 7.14: Checking for Understanding

## 8: Media Creation in Windows

- 8.1: Types of Media Files
- 8.2: Extensions for Picture Files
- 8.3: Extensions for Music Files
- 8.4: Other types of Popular Files
- 8.5: Using Windows Photos
- 8.6: Browsing Photos
- 8.7: Using the Built-In Photo Editor
- 8.8: Checking for Understanding

## 9: Office Overview and Office 365

- 9.1: Understanding the Office Suite
- 9.2: Starting an Office App
- 9.3: Common Office Interface
- 9.4: Getting Help
- 9.5: Sharing
- 9.6: Office 365 Web Versions
- 9.7: Checking for Understanding

## 10: Introduction to Microsoft Word

- 10.1: Introduction to Word Processing Software
- 10.2: Starting a Document
- 10.3: Saving a Document
- 10.4: Selecting Text
- 10.5: Formatting Text using the Mini-toolbar and Ribbon
- 10.6: Using a Document Template
- 10.7: Checking for Understanding

## 11: Exploring the Home and View Tab of Microsoft Word

- 11.1: Clipboard
- 11.2: Font Group
- 11.3: Paragraph Group
- 11.4: Styles Group and editing Tab
- 11.5: View Tab
- 11.6: Checking for Understanding

## 12: Using the Insert Tab in Microsoft Word

- 12.1: Introduction to the Insert Tab
- 12.2: Pages Group
- 12.3: Tables Group
- 12.4: Layout Tab
- 12.5: Illustrations Group
- 12.6: Document Item Group
- 12.7: Add-ins Group
- 12.8: Media Group
- 12.9: Links Group
- 12.10: Comments Group
- 12.11: Header and Footer Group
- 12.12: Text Group
- 12.13: Symbols Group
- 12.14: Checking for Understanding

## 13: Design, Layout, References, Mailings, and Review Tabs in Microsoft Word

- 13.1: Design Tab
- 13.2: Layout Tab
- 13.3: References Tab
- 13.4: Captions
- 13.5: Mailings Tab
- 13.6: Write and Insert Fields Group
- 13.7: Review Tab
- 13.8: Checking for Understanding

## 14: Getting Started with Excel

- 14.1: Functions of a Spreadsheet
- 14.2: Identifying Excel Windows Components

- 14.3: Understanding Formulas
- 14.4: Quick Analysis Toolbar
- 14.5: Zoom, View, and Window Options
- 14.6: Check for Understanding

## 15: Home Tab and Working with Formulas and Functions in Excel

- 15.1: Clipboard Group
- 15.2: Font Group
- 15.3: Alignment Group
- 15.4: Number Group
- 15.5: Styles Group
- 15.6: Cells Group
- 15.7: Editing Group
- 15.8: Check for Understanding

## 16: Using Insert Tab

- 16.1: Insert Tab
- 16.2: Sparklines
- 16.3: Filters
- 16.4: Links
- 16.5: Text
- 16.6: Symbols Group
- 16.7: Checking for Understanding

## 17: Page Layout, View and Review Tabs

- 17.1: Page Layout Tab
- 17.2: View Tab
- 17.3: Review Tab
- 17.4: Checking for Understanding

## 18: Formulas Tab

- 18.1: Insert Function (or Introduction to Formulas in Excel)
- 18.2: Why not just add the Numbers and not the Cell Locations?
- 18.3: Autofill using Formulas
- 18.4: Relative vs Absolute Cell References
- 18.5: Function Library Group
- 18.6: Defined Names Group
- 18.7: Formula Auditing Group
- 18.8: The Calculation Group
- 18.9: Checking for Understanding

## 19: Data Tab

- 19.1: Get and Transform Data
- 19.2: Queries and Connections Group
- 19.3: Sort and Filter Group
- 19.4: Data Tools Group
- 19.5: Checking for Understanding

# 20: Appendix


- 20.1: References

Index

Glossary

Glossary

Detailed Licensing

# Licensing

*A detailed breakdown of this resource's licensing can be found in **Back Matter/Detailed Licensing**.*

# CHAPTER OVERVIEW

## 1: How does a computer work?

Computers are amazing devices that have transformed our world. However, before we can begin using one, we first must have a basic understanding of how a computer works. Chapter1 focuses on the hardware and design of a computer first to provide the user with an adequate foundation to begin to master all of the capabilities of a computer.


1.1: What is a Computer?
1.2: Hardware and Software
1.3: What are the Different Types of Computers?
1.4: Components of a Computer
1.5: What is an Operating System?
1.6: Summary
1.7: Checking for Understanding


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# 1.1: What is a Computer?

A computer is an electronic device that can manipulate, process, and execute information or data. You can use a computer to type and share documents, send an email, play video games, and browse the Web.

You can also use it to edit or create spreadsheets, presentations, and even videos, and create other computer programs.

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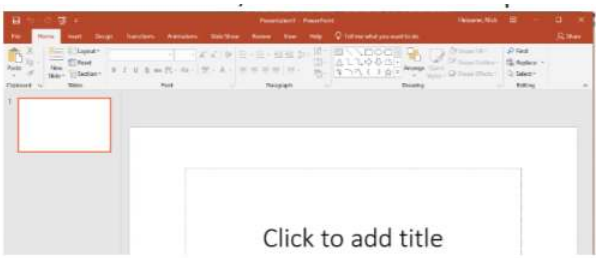
# 1.2: Hardware and Software

There are two main components of a computer: hardware & software

- **Computer Hardware** is all of the physical parts of your computer like the keyboard and mouse. It also includes all the computer's internal parts,
- **Computer Software** is the code/instructions that are programmed to be executed by the computer. The software directs the **hardware** what, when, and how to do something. Examples of software include web browsers, games, and word processors. Below, you can see an image of Microsoft PowerPoint, which is used to create presentations.

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# 1.3: What are the Different Types of Computers?

There are billions of computers in our society today. Computers can come in all shapes and sizes, and they perform a variety of functions to allow our society to function. You use computers to purchase goods, perform a math calculation for a test, or watch tv. It would be hard for you to complete a day without directly or indirectly using a computer.

## Desktop Computers

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Desktop computers are usually large and designed to be typically made up of a few different parts including the computer case, monitor, keyboard, and mouse. Typically, Desktops are the most powerful computers.

## Laptop Computers

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The second type of computer that is the most popular type of traditional computer at present is a laptop computer. Laptops are battery-powered computers that are portable than desktops, allowing you to use them almost anywhere. Most laptops have all of the components of a computer connected so you can easily move your computer. Laptops are usually less powerful than desktops.

## Tablet Computers

Tablet computers are a relatively new form factor of computers. Tablets are handheld computers that are meant for more mobility than laptops. They use touch screen navigation instead of a keyboard or mouse. The iPad is an example of a tablet computer.

## Servers

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Servers are used to provide information to other computers or devices on a local area network (LAN). Servers usually have large hard drives for storage and are very powerful computers. Servers are not usually meant for consumers and are stored in racks by IT professionals to help with cooling. Servers can often run hundreds of computers at once.

## Other types of computers

Many of today's electronics are 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.

**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.

**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.

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# 1.4: Components of a Computer

The next few pages describe all of the components that make up a computer. While computers do come in various sizes and shapes, they all share common attributes to function.

## Computer Case

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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-inone computers come with the internal components built into the monitor, which eliminates the need for a separate case.

## Computer Monitor

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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.

## Keyboard & Mouse

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The keyboard is one of the main ways to communicate with a computer. There are many different types of keyboards, but most allow you to accomplish the same basic tasks. The mouse is another important tool for communicating with computers. A computer mouse functions as a pointing device on the screen allowing the user to select and manipulate objects.

## Motherboard

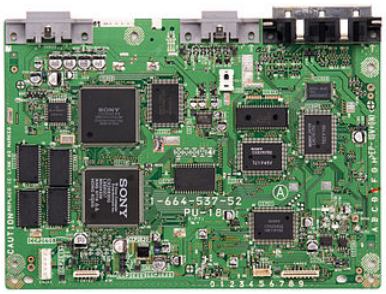

Figure 1.4.4: This Photo by Unknown Author is licensed under CC BY-SA-NC

If a computer were a human being, the motherboard would be the spinal cord. The motherboard is a thin circuit board that connects all of the elements of a computer together. Examples of items connected to the motherboard include 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

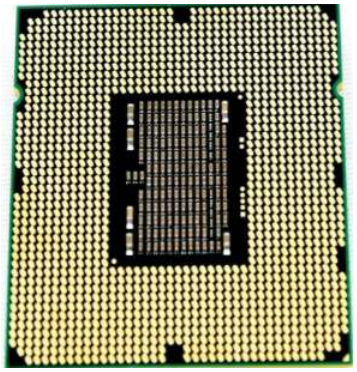

Figure 1.4.5: This Photo by Unknown Author is licensed under CC BY-NC-ND

Continuing the human being analogy, if a computer were a person, the central processing unit (CPU), also called a processor, would be the brain. The CPU is located inside the computer case and is situated on the. The job of a CPU 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 and

usually a fan. A CPU can be cooled passively through just the heat sink, through a fan, or liquid-cooled.

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)

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RAM is your system's short-term memory. Whenever your computer performs calculations, it temporarily stores the data in the RAM. The system retrieves the information to be sent to the processor or other components when needed. Ram only provides temporary storage when the computer is off, all of the information stored in Ram is erased. RAM is measured in megabytes (MB) or gigabytes (GB). The higher the RAM, the more applications and programs that can be run and executed at the same time. One of the fastest ways to speed up a sluggish system is to add more RAM.

## Hard Drive

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The Hard Drive is your computer’s long term memory. The data is also persistent, which means that the information is stored on the drive even when there is no power to the drive. The hard drive is where your software, documents, and other files are stored. The faster the hard drive, the faster your computer can start up and load programs.

## Power Supply

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The power supply unit in a computer converts the power from the wall outlet (AC) to the type of power needed by the computer (DC). It sends power through cables to the motherboard and other components and also ensures that the power is regular and reliable.

## Expansion Cards (Video card, Sound card, Network Card, etc.

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Some computers can be expanded or upgraded. Desktop computers often have expansion slots on the motherboard that allow various types of expansion cards to be added for a fast connection to the CPU. These expansion cards are called PCI (peripheral component interconnect) cards. Adding cards could increase the quality or performance of the software used on a computer. Video editors, for example, install a powerful graphics card to aid them in their editing work.

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# 1.5: What is an Operating System?

An operating system is a computer program that runs on a computer. It manages all the hardware of the computer and the applications which run on a computer. An operating system makes sure all the hardware and software are working together in harmony. Every computer has some sort of operating system. Listed below in table 1.1 are examples of Operating Systems per type of computer.

Table 1.1: Operating System Examples By Computer

| Type of Computer | Examples of Operating Systems |
|---|---|
| Desktop & Laptop | Windows<br>macOS<br>Linux (many distributions) |
| Mobile | iOS<br>Android |
| Wearable | WatchOS (Apple)<br>WearOS (Android) |
| TV | Xbox<br>Android TV<br>tvOS<br>Roku |

Unless you are building your own computer, an operating system is installed on the computer you purchase. All consumer operating systems use a graphical user interface or GUI. A GUI lets you use your mouse to select icons, buttons, and menus. Everything is 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. For the purposes of this course, we will study the Windows Operating System (Windows 10). Obviously, there are many vibrant and fully-functional operating systems available to users in a variety of form factors. While all operating systems perform similar functions, how they perform those functions can very slightly. This text will focus on Windows 10 as it is the preferred operating system in the professional and business world.

## Microsoft Windows

The most common operating system is Microsoft Windows. While there have been many different versions of Windows, the current version is Windows 10.. Windows comes pre-loaded on most new PCs, which helps to make it the most popular operating system in the world. We will be studying Windows 10 in the next chapter. In general, most PC’s built since 2011 are capable of running Windows 10 in varying performance capacities.

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# 1.6: Summary

As this section describes Computers are a complex combination of hardware and software working together to help the user complete his or her tasks. So many functions of the 21st -century world rely upon these computers working together to make our lives easier and more productive. Understanding the components of a computer will help you better understand how to most effective in repairing, maintaining, and using all the computers you interact with daily.

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# 1.7: Checking for Understanding

1. Students create cue cards of the following: CPU, Motherboard, RAM, Storage, Display, Keyboard, Mouse, and Power Supply. They are provided the following scenarios and asked to recreate it with their cue cards on a large board.
   a. Student presses the letter “K” on the keyboard
   b. A student wants to play a song on the computer
2. Students will use electronic store ads and cut-out the computers in the ads and organize them by type by poster board.
3. Students will compile a list of the number of computers they currently own and classify them by type and operating system.

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# CHAPTER OVERVIEW

## 2: Getting Started with Microsoft Windows

Now that you understand the foundations of computer operations, it is time to begin exploring the user interface and navigation features of Microsoft Windows. Make sure you have connected all the necessary components (keyboard, monitor, mouse, power supply) to your computer case, and press the power button on your computer and/or monitor to get started. Windows will boot up into the lock screen.


2.1: Logging in
2.2: Windows Desktop
2.3: Windows Start Menu
2.4: Windows Taskbar (Tutorialspoint.com, n.d.)
2.5: Notification Area
2.6: Windows 10 Task View
2.7: Checking for Understanding


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# 2.1: Logging in

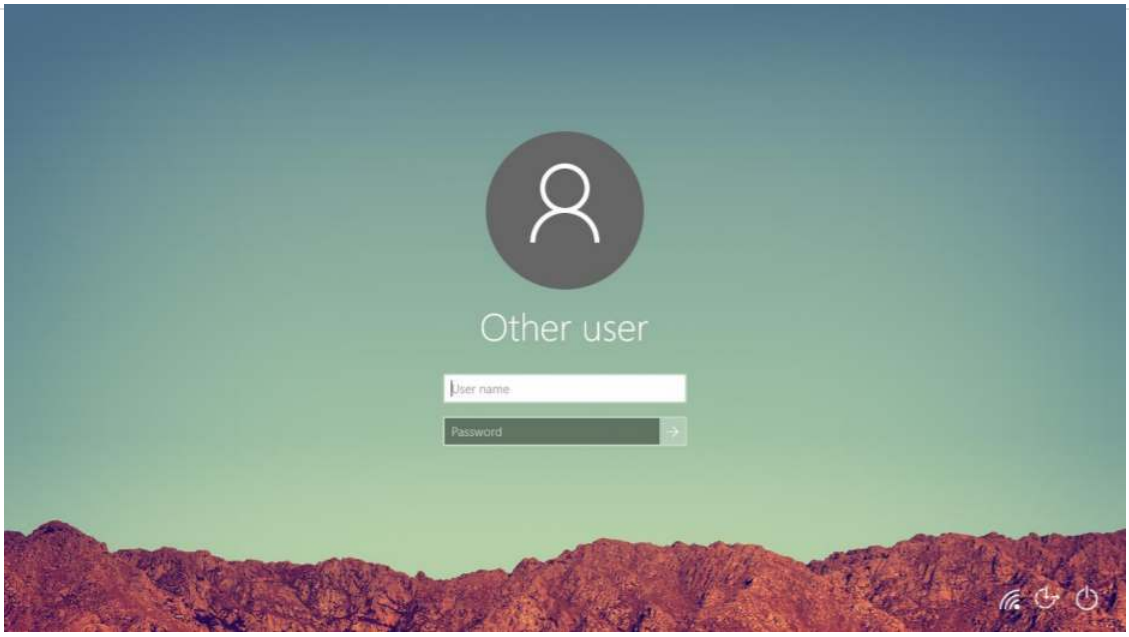


Figure **2.1.1**: This Photo by Unknown Author is licensed under CC BY-SA

The lock screen displays the current date, time, and usually and image background. You will learn how to change this later. The lock screen is displayed when the computer first boots or starts up and if you leave your computer unattended for a while. Windows 10 can also be set up to allow multiple users to have their own profile and files on the PC and utilize the lock screen to switch to their account.

To begin the login process, press the Spacebar on the keyboard to continue the login process. If the computer requires a username and/or password, you will be prompted to enter it here. You will learn how to create a password for your account later in Chapter 6 Windows Security. Depending on your computer hardware, windows may permit login passwords based upon a username and password, personal identification numbers (PIN) biometrics like your facial features or fingerprint, or some other password identification (such as a personal password) When you have completed entering your password, please click on the right arrow to complete the login into Windows.

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# 2.2: Windows Desktop

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The Windows 10 desktop is the first workspace available to you after logging in to your computer. When logging in to a computer for the first time, you may see files (information that applications on your computer use to allow you to complete computing tasks), shortcuts, (icons that will send you to the actual file or application) folders, a place to consolidate files or the recycle bin (a folder that contains items you wish to delete). Some users prefer to keep their desktop uncluttered with none or only a few files that they are currently working on to appear, and others place many files in an unorganized fashion on their desktops. You will develop your own organizational systems as you become more comfortable with windows. There is also a keyboard shortcut to allow you to access the Desktop at any time when the computer is powered on. To perform this keyboard shortcut, simply press the Windows Key and the letter “D” on your keyboard at the same time. At the bottom left of the computer, the display is the Windows Start Menu, and the bottom of the computer display is the taskbar which will be discussed next.

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# 2.3: Windows Start Menu

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Please move your mouse cursor over to the bottom left of the computer display and click on the Start button . After clicking on the start button, the start menu will display. The start menu consists of a list of shortcuts to applications that allow the user to run applications on the computer. When the start menu launches, your user account name and optional picture appear at the top. The menu shows a list of often-used programs and other controls on the left, and variously-sized shaded rectangles called tiles on the right. Each tile represents an app, short for an application program. Some titles show updated content using a feature called a live tile the updates the application with relevant information to share with the user. You may categorize these shortcuts by dragging them into different areas and changing the file folder names to suit your preferences. Apps may also be resized if you right-click on the shortcut and select “resize”. You may also “pin” applications you use often to start menu shortcuts area on the right by dragging and dropping them to the start menu shortcuts menu. or by right-clicking, selecting “more” and then “pin to taskbar.

You can click on “All Apps” to display and scroll through all applications on your computer using the slider. Take some time to navigate and explore the start menu. You will find folders and subfolders and applications on this menu along with helpful shortcuts to several applications and navigation menus on your computer to increase your productivity.

You may also “pin” applications in the start menu to the taskbar, the bar on the lower part of the screen. To do so, right-click on the start menu icon, select “more” and “pin to taskbar” The application will now be always displayed on the Windows Taskbar.

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# 2.4: Windows Taskbar (Tutorialspoint.com, n.d.)

The Windows 10 taskbar sits at the bottom of the screen giving the user access to the Start Menu, as well as the icons of frequently used applications. On the right side, the Taskbar features the Notification Area which informs the user of different things like the state of the Internet connection or the charge of the laptop battery

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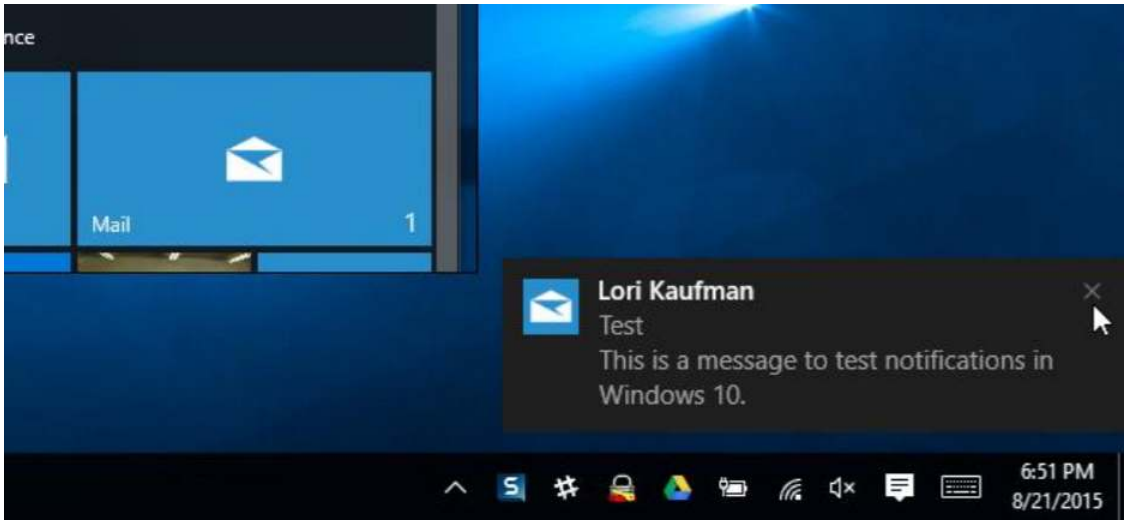
# 2.5: Notification Area

The Notification Area is located on the right side of the Taskbar. It displays different types of notifications that are pertinent and useful to the user, like the Internet connection status or the volume level.

The default display of the notification area is to list only a few icons. By clicking the upward arrow on its left-side the display will expand to see all other icons. Picture of Windows Notification Area

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# 2.6: Windows 10 Task View

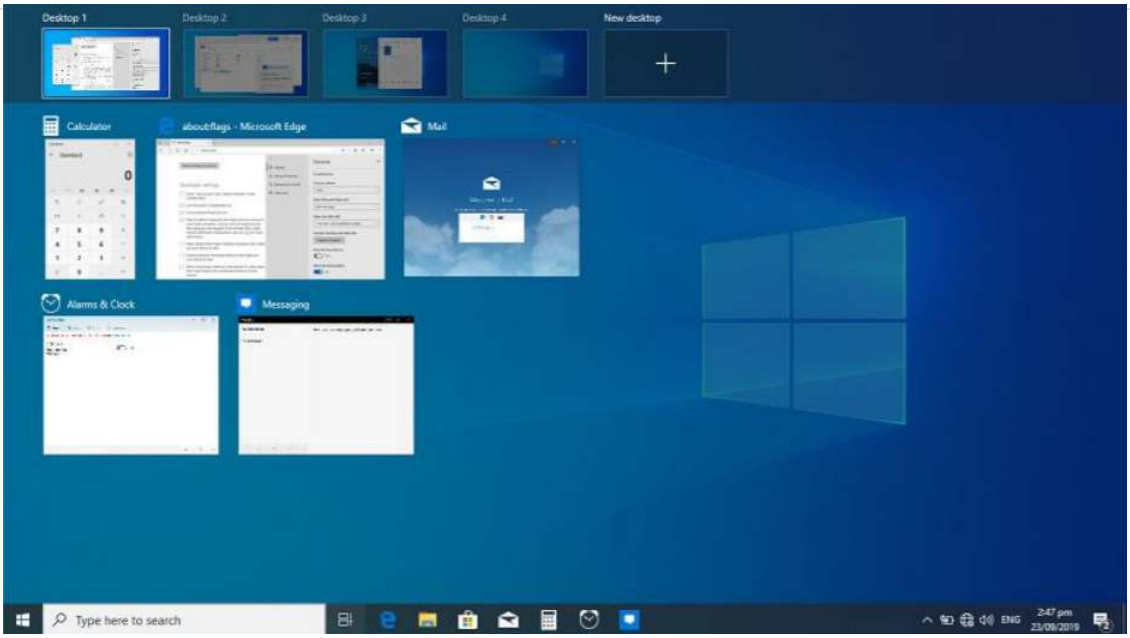


Figure **2.6.1**: This Photo by Unknown Author is licensed under CC BY-SA

Windows 10 Task View allows you to quickly move within your open windows and applications and multiple desktops. Users often use Task view to create efficient workspaces to perform groups of tasks. You can access Task View the “Task View” button from the Taskbar. You can also access it by pressing and holding the Windows key, and then press Tab to achieve the same result.

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# 2.7: Checking for Understanding

1. Demonstrate Pinning five (5) applications from the start menu to the start menu shortcuts area and taskbar. Then unpin the same applications.
2. Demonstrate resizing applications on the Windows Start shortcuts menu and moving them around the shortcut's menu.
3. Demonstrate moving shortcuts on the Windows Taskbar.
4. Demonstrate the Windows 10 Task View- create multiple desktops and place applications on that desktop.
5. Demonstrate adjusting the volume control in the Windows notification area.
6. Demonstrate accessing notifications in the Windows notification area.

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# CHAPTER OVERVIEW

## 3: File Management

3.1: Windows File Explorer
3.2: Ribbon
3.3: Organizing Files and Folders
3.4: Cut/ Copy/ Paste
3.5: Check for Understanding

---

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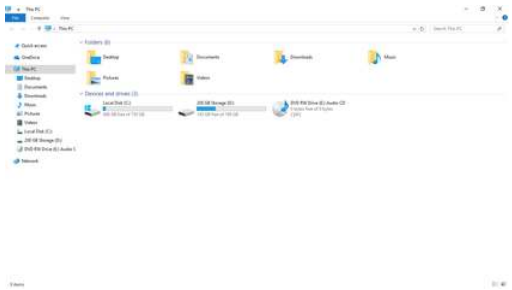
# 3.1: Windows File Explorer

File Explorer is an application built into Windows 10 to help the user find, browse, and select folders and files. The main way to access the File Explorer is by clicking the folder icon in the Taskbar. After clicking the icon, the File Explorer window will open.



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The initial File Explorer window is comprised of the File Explorer Ribbon, the Navigation Pane, Frequent Folders, and Recent Files.

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# 3.2: Ribbon

In Windows 10, the File Explorer features a new ribbon toolbar, like the one featured in the recent versions of Microsoft Office. This ribbon contains buttons and commands for the most common tasks.

## Home Tab of Windows 10 Ribbon

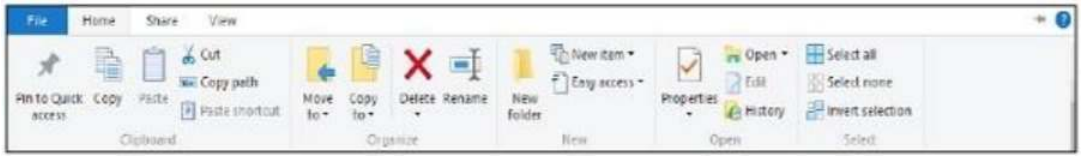
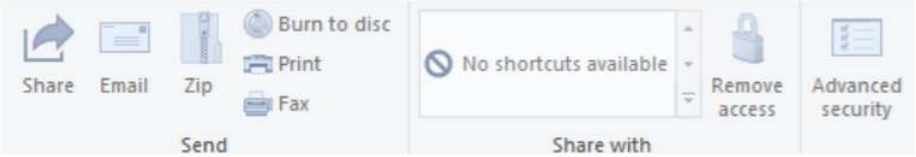



Figure 3.2.1: This Photo by Unknown Author is licensed under CC BY-SA

The Ribbon features four tabs, each with different commands. Among the tasks, you can perform from the Home tab is (Tutorialspoint.com, n.d.) −

- Copying and pasting files and folders from one place to another.
- Moving files and folders to another location.
- Copying files and folders to another location.
- Deleting a file or folder permanently or sending it to the Recycle Bin.
- Renaming a file or folder.
- Creating a new folder or other new items.
- Verifying or modifying the Properties of a document or folder.
- Opening a file or folder.
- Different options to select one or various files and folders.

## Share Tab of the Windows 10 Ribbon

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The Share ribbon gives you different options to share your files and folders. For example: (Tutorialspoint.com, n.d.)

- E-mailing or messaging a file.
- Compressing (“Zip”) a folder to take less space.
- Printing or faxing documents.
- Sharing with other users or networks.

## View Tab of the Windows 10 Ribbon

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The View ribbon allows you to change the way Windows displays your files and folders. Some of the changes you can make here are (Tutorialspoint.com, n.d.) −

- Adding additional panes to show a preview or details of your files.
- Changing the layout of the files and folders from icons to list, and others.
- Sorting and arranging the contents of your folder.
- Hiding selected folders or files.

## File Tab of the Windows 10 Ribbon

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The File tab opens a menu with different options like

- Opening a new File Explorer window.
- Open command prompt (DOS) advanced users.
- Providing more options to change or configure file explorer.
- Frequent places that will link users to specific file folders that are often used.

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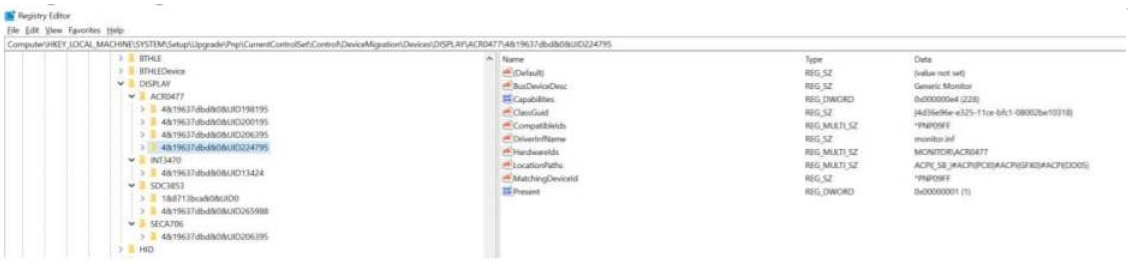
# 3.3: Organizing Files and Folders

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A common method to organize your files is to place them in folders, which can contain files and other folders. Folders can be stored on multiple locations on your PC. The specific location or address allows your computer to keep track of where each file is located. You may also create a Windows File Explorer window for each folder you are working in. Files and Folders may be moved between folders by clicking on the file/folder and dragging the file/folder to the new location.

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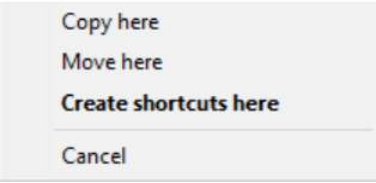
# 3.4: Cut/ Copy/ Paste




One of the most common operations for users is cut, copy, or pasting files & folders. Pasting a file inserts the new file into the new location. Selecting “Cut” to a file will remove it from its current location and paste the file to its new location. The “Copy” command creates a replica of an original file and pastes the file in the selected location. To copy a file, select the file you want to copy and click Copy under the Home tab. In addition, you can copy or move a file without leaving your current location. Under the Home tab within the Organize group, click ‘Copy to’ or ‘Move to’ button, and choose the location if it’s listed, or click the Choose Location button and select the location.

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# 3.5: Check for Understanding

1. Demonstrate the creation of a new folder. Place a folder in that folder. Create another folder in that folder. Rename the Original Folder.
2. Perform the following: create a folder in your “Documents” folder. Drag the new folder into the “Downloads Folder”
3. Cut a newly created folder in the “Downloads folder” and paste it into the “Pictures” folder.

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# CHAPTER OVERVIEW

## 4: Managing Windows Applications


4.1: Using Applications
4.2: Windows Store
4.3: Uninstalling Applications
4.4: Window Management
4.5: Application Settings
4.6: Checking for Understanding


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# 4.1: Using Applications

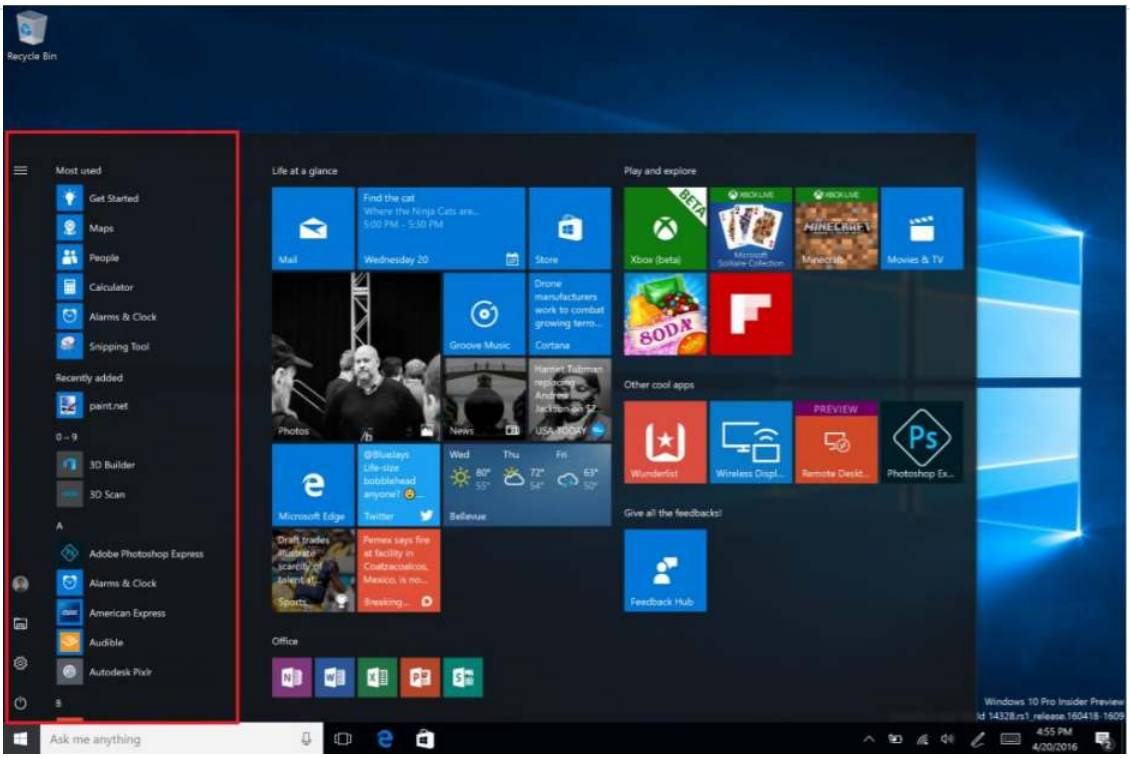


Figure **4.1.1**: This Photo by Unknown Author is licensed under CC BY-SA

Applications are tools built by software developers to use the computing power of the computer to aid the user to accomplish tasks. Millions of distinct applications run on Windows every day. Windows 10 comes with a default set of apps, such as Mail, Photos, and WordPad, all developed by Microsoft. Millions of other applications are available to run on your computer by installing them via physical media like CDs/DVDs, downloading from the internet, or Microsoft store, or creating your own. Windows 10 permits applications to have a variety of permissions to run on the computer, so each application varies in its complexity, visual appearance, navigation, and control of the computer. It is important to understand and know what type of application you are installing on your computer as some applications (known as viruses) install software that is harmful to the computer or the user. More will be discussed in Chapter 6; Security. To improve security, Microsoft has created the Windows Store, which allows the user to view and download applications that have been reviewed and deemed safe for the end-user.

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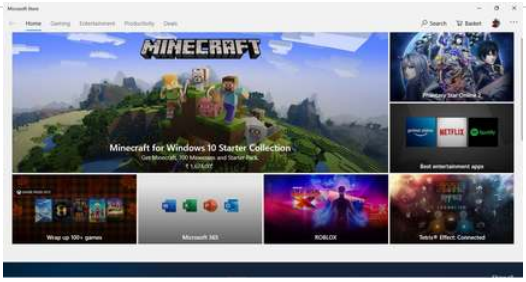
# 4.2: Windows Store

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You can purchase and install applications from the Microsoft Windows Store, which is an application that is pre-installed in Windows 10. You can find applications to download in the Windows store by viewing applications by category or searching for the application of your choice. You may need to create/use a Microsoft Account and link your credit card information to your Microsoft Account to download applications. In the Windows Store, there are a variety of free and paid applications to download. Purchased applications can be downloaded on up to 10 other computers if the user is signed in with the same user account. Users can automatically update applications that have updates available in the Windows store.

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# 4.3: Uninstalling Applications

When you install an app, including the ones that come by default in Windows 10, it takes up storage space on your computer or mobile device. If space becomes limited or you just don't use an app anymore, you can uninstall it to free up storage space.

You can uninstall Windows Store Applications from the Start menu by navigating to the application, right-clicking on the application, and selecting uninstall. After uninstallation is complete, Windows will notify you.

Other older programs may be uninstalled by visiting the Control Panel, clicking on "Programs" and "Uninstall Program". Follow the directions on the screen to complete this process.

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# 4.4: Window Management

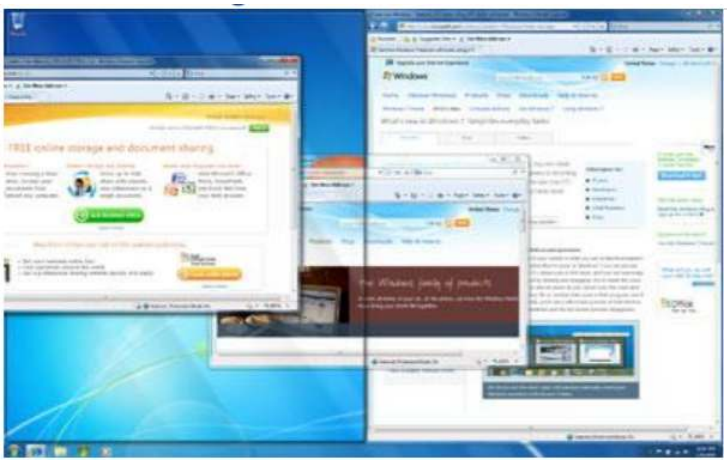

Figure 4.4.1: This Photo by Unknown Author is licensed under CC BY-SA

Windows 10 has several features that make it easier to multi-task and work with multiple windows at the same time.

## Windows Display options

Windows organizes every running application into its namesake- windows. Windows may overlap each other. Windows 10 provides many ways to size your windows accordingly. The top right corner of every running window provides display options of minimizing the window, resize window/maximize the window, and close window/. Minimizing a window removes the window from view. It can be returned to its current view by selecting the running application in the taskbar. Maximizing a Window makes it Fullscreen. The resize feature returns it to an open running window. Closing a window removes the program from active memory.

## Windows Snap

Windows Snap allows you to resize windows quickly and display two windows side by side. To perform Windows Snap, click and drag the desired window to the left or right until the cursor reaches the edge of the screen, then release the mouse. The window will snap into place. To unsnap a window, simply click and drag the window down If you have more than one window open when snapping, you'll be able to choose a window to snap to the other side of the screen automatically.

## Windows Flip

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Windows Flip can be used to switch between open windows. To do this, press and hold the Alt key on your keyboard, then press the Tab key. Continue pressing the Tab key until the desired window is selected.

## Displaying the Windows 10 Desktop

Sometimes, a user can have so many windows open at once, they have trouble finding their desktop! To quickly see your desktop, click the bottom-right corner of the taskbar to minimize all open windows. You can do click the bottom right corner again to restore your windows (which were minimized) to their current location. In addition, there is a keyboard shortcut to do this. Simply press the Windows key and the letter “D” on the keyboard to toggle between your open applications and the Windows Desktop.

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# 4.5: Application Settings

Because windows allow software developers so much flexibility in application design, developers have the flexibility to determine how they allow users to customize their applications. There are three main strategies developers use to allow users to navigate their application and customize application-specific settings:

1. The Ribbon/Control Menu: Located at the top of the screen with various settings organized into groups.
2. The settings “gear” icon in the active window. Which brings you to the settings menu.
3. The “more settings” dots ··· will display more settings related to the application.

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# 4.6: Checking for Understanding

1. Download a free application from the Windows Store. Now delete the application you successfully installed.
2. Launch two (2) applications. Place them in the Windows Snap view.
3. Launch four (4) applications. Practice minimizing them all at once to display the desktop.
4. Launch three (3) applications. Tab between them using Windows Flip
5. Enter the settings menu of the Microsoft News application. Practice Minimizing, Maximizing and Closing the application.

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# CHAPTER OVERVIEW

## 5: Web Browsers and the Internet

A web browser is a type of software that allows you to find and view websites on the Internet. There are many different web browsers, but some of the most common ones include Google Chrome, Internet Explorer, Safari, Microsoft Edge, and Mozilla Firefox.


5.1: Web Browser Interface
5.2: Downloading Files
5.3: Internet Security
5.4: Bookmarks and Internet History
5.5: Checking for Understanding


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# 5.1: Web Browser Interface

## Web Browser Interface

Every web browser contains a different interface, however, there are some common attributes of all of them.

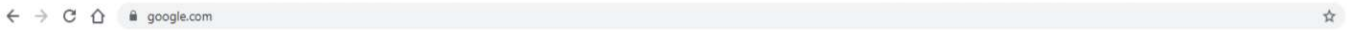
### URLs and the address bar

Each website has a unique address, called a URL (short for Uniform Resource Locator). URL's are street addresses for computers, letting your computer know where to connect to on the internet. URLs are entered on the browser's address bar. The address bar is usually located at the top of the website window. Sometimes, address bars also have built-in search features, to search for the address if you do not know the exact website address. Website addresses usually contain **HTTP://** or **https://** which stands for *Hypertext Transfer Protocol or Hypertext Transfer Protocol Secure*. https:// addresses are more secure. The next letters are usually **www** which stands for *World Wide Web*. After *www*, the website address is displayed. Usually, website addresses end in **.com** (commercial), **.org** (organization), or **.edu** (educational institution) depending on their classification. In the address bar, please type or www.clcmn.edu to take you to the CLC website.

### Hyperlinks

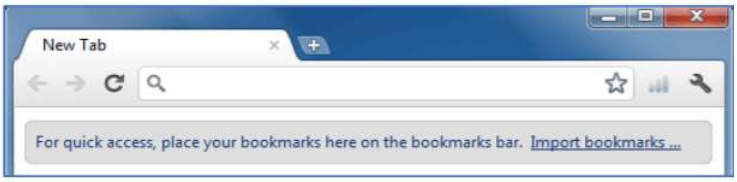
The website www.clcmn.edu displayed above that is underlined in blue is an example of a hyperlink, which provides the user with a direct address to a location on the web. Usually, the mouse pointer icon will switch to a indicating the text is a hyperlink.

### Navigation buttons




The Back and Forward arrow buttons allow you to move backward and forward through websites you've recently viewed. You can also click and hold either button to see your recent history. The Refresh button will load the current website you are viewing a second time. Often a user will click on the refresh button when a website stops working to correct the error or to view new information because the website was updated while the user was viewing the information.

### Browser Tabs




Many browsers allow you to open links in a new tab. Each tab is a new instance of the browser to help you manage your applications more efficiently. The more browser tabs that you open, the more system resources you consume. To open a link in a new tab, right-click the link and select Open link in a new tab (the exact wording may vary from browser to browser). You can close a tab by clicking the "X" on the particular tab, and open a new tab by clicking the "+" button on the particular tab.

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# 5.2: Downloading Files

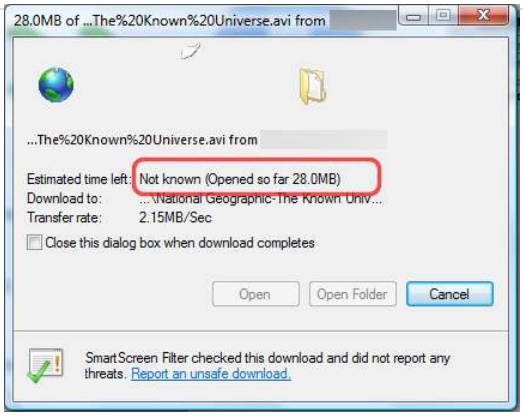


Figure **5.2.1**: This Photo by Unknown Author is licensed under CC BY-SA

Links don't always go to another website. In some cases, they point to a file that can be downloaded, or saved, to your computer. If you click a link to a file, it may download automatically, but sometimes it just opens within your browser instead of downloading. To prevent it from opening in the browser, you can right-click the link and select Save link as (different browsers may use slightly different wording, like Save target as). Files downloaded from the internet are often downloaded to your download folder, which is a quick access folder accessible on the left navigation pane of windows explorer. Sometimes you may want to save an image from a website to your computer. To do this, right-click the image and select Save image as (or Save picture as). Make sure you trust the file that you downloaded to your computer, as downloading any file or program to your computer contains security risks to your computer (links).

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# 5.3: Internet Security

The internet provides many opportunities for the user to learn, collaborate with others, participate in eCommerce, and improve the quality of their work. However, with all these benefits, there are risks associated with Internet use as well. It is important that users understand those risks and take measures to practice safe internet use and maintain their PC to prevent against Internet threats.

## Internet Cookies

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When you browse the Internet, you can access and gather information from websites, but websites can also gather information about you without your knowledge. You can set Internet privacy options to protect your personal identity from unauthorized access. When you visit a website, the site creates a cookie file, known as a first-party cookie, which stores information on your computers, such as your website preferences or personally identifiable information, including your name and email address. The next time you visit that site, it can access the cookie to collect this information. Not all cookies are harmful, many first-party cookies save you time re-entering information on a return visit to a website. However, there are also third-party cookies, which are created by advertisers and can track your web browsing, even from sites you are not currently viewing. Once a cookie is saved on your computer, only the website that created it can read it. You can change how cookies are handled in your web browser and block pop up messages in the website settings menu. It is good practice to delete your cookies and internet history on a weekly basis and review your internet security settings in your web browser regularly. Many web browsers support custom security modes that delete all internet cookies and history upon exiting a browser (also called incognito mode) and other functions to eliminate exposures on websites. Many web browsers also display a lock on the address bar indicating the website is secure.

## Practicing Internet Security

In addition, it is important for the user to be careful about disclosing personal information (Name, Birthdate, Social Security Number, banking information, location, etc.) online unless they are sure of the authenticity of the website. A sophisticated cyber scam, known as “phishing” attempts to convince the internet user of the authenticity of a fake website to attempt to trick the user into disclosing personal financial information online. A good security technique is to view the website address in the browser address bar and search the web for information about the website to ensure it is reputable. When in doubt, you can usually call the company to ensure it is a real operation.

## Cyberbullying

Cyberbullying can be defined as writing mean or inappropriate things online. Examples of cyberbullying include sending unwelcome emails or text messages, making threats, sexual harassment, hate speech, posting lies, rumors, or encouraging others to share this misinformation that may harm another. Instances of cyberbullying have increased significantly as more users spend more time online. Cyberbullying should be handled in a similar way to traditional bullying-if you are being bullied, ask for help! No one deserves to be bullied. Cyberbullying is easy to prosecute as it is very difficult to delete the evidence.

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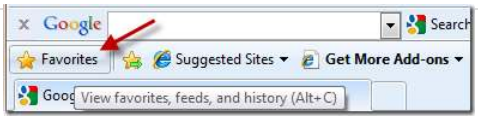
# 5.4: Bookmarks and Internet History

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If you find a website you want to access later, it can be difficult to remember all of the websites you want to visit. Bookmarks or favorites allow your computer to remember your favorite website URLs so you do not have to. To create a bookmark, select the Star icon to bookmark the current website. In addition to bookmarks, your browser will also keep track of every website you visit through your internet history. To view your history, open your browser settings—usually by clicking the icon in the upper-right corner—and select History.

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# 5.5: Checking for Understanding

1. Demonstrate how to download and retrieve a file.
2. Save a picture from the web to your computer.
3. Please demonstrate how to clear browser history and internet cookies.
4. Navigate to the website www.clcmn.edu. Create a bookmark.
5. List methods to prevent yourself from online.
6. Identify Cyberbullying and share strategies to get help if you are being cyberbullied.

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# CHAPTER OVERVIEW

## 6: Customizing Windows Appearance

Windows is a highly customizable operating system that allows users to change the desktop background, change the color accent, customize the Lock screen, apply a theme, and many other features. Customizing Windows 10 allows the user to personalize the look and feel of their computing experience and tailor the system to meet their own workflow needs while using the computer


6.1: Changing the Desktop Background
6.2: Create a Desktop Background with a Picture Slideshow
6.3: Changing the Color Accent in Windows 10
6.4: Adjusting between Light and Dark Themes
6.5: Customizing Windows 10 Lock Screen
6.6: Applying a Theme to Windows 10
6.7: Windows Settings
6.8: Accessibility Settings
6.9: Notification Center
6.10: Checking for Understanding


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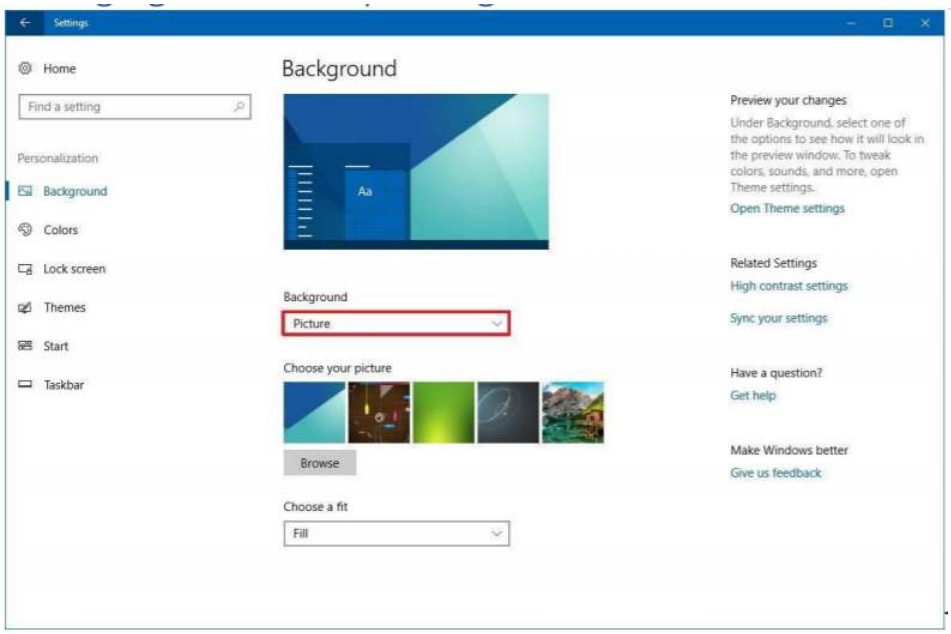
# 6.1: Changing the Desktop Background




To change your desktop background, use these steps (Windows IT Central, n.d.):

1. Open Settings.
2. Click on Personalization.
3. Click on Background.
4. Using the "Background" drop-down menu, select the Picture option.
5. Click the Browse button to select the image you want to use.
6. Using the "Choose a fit" drop-down menu, select the option that best suits the image, including fill, stretch, center, span, etc.

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# 6.2: Create a Desktop Background with a Picture Slideshow

If you wish to display a collection of pictures on the desktop, perform the same previously mentioned steps, but instead of selecting “Picture” in the Background drop-down menu, select the Slideshow option. After selecting slideshow, select the following (Windows IT Central, n.d.):

1. Click the Browse button to select the folder with the images.
2. Use the "Change picture every" drop-down menu to select how often the image will rotate.
3. If the order of the images is not important, turn on the Shuffle toggle switch.
4. Using the "Choose a fit" drop-down menu, select the option that best suits the images, including fill, stretch, center, span, etc.

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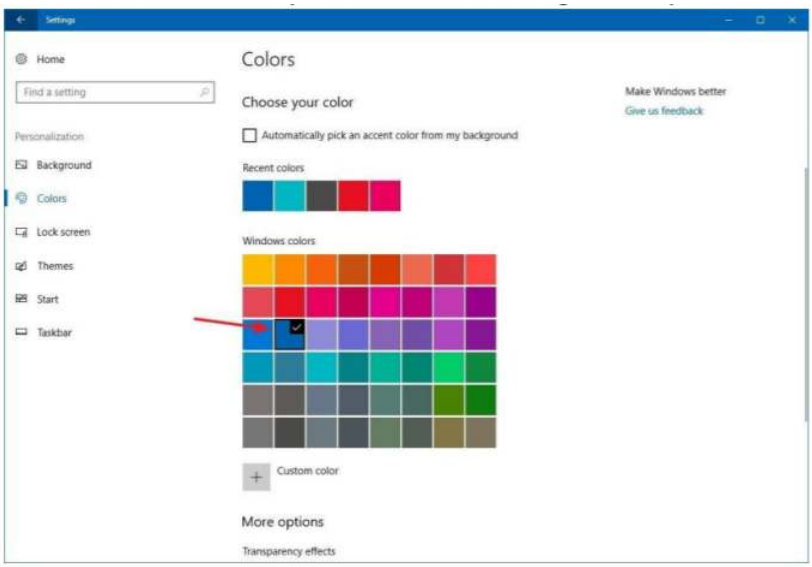
# 6.3: Changing the Color Accent in Windows 10

The color accent in windows 10 changes the color of the start menu, the taskbar, and the color of application windows. To change the default windows color, perform the following: (Windows Central, n.d.)

1. Open Settings.
2. Click on Personalization.
3. Click on Colors.
4. Select the color accent you want to use through the experience.

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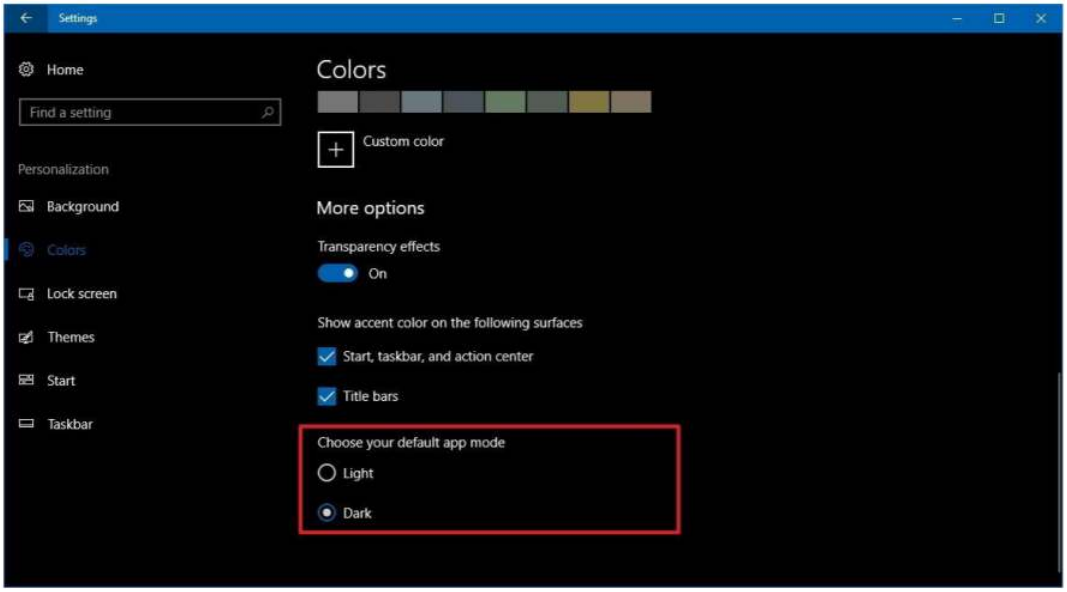
# 6.4: Adjusting between Light and Dark Themes

Windows 10 includes two personalization modes- light mode is the default mode and works well during daytime, and dark mode uses a dark color scheme in backgrounds and another part of the OS and supported apps, and it's an option more suited for a low-light environment. (Windows Central, n.d.)

You can switch between the light and dark mode using these steps:

1. Open Settings.
2. Click on Personalization.
3. Click on Colors.
4. Under "More Options," select the Light (default) or Dark using the "Choose your default app mode" option.

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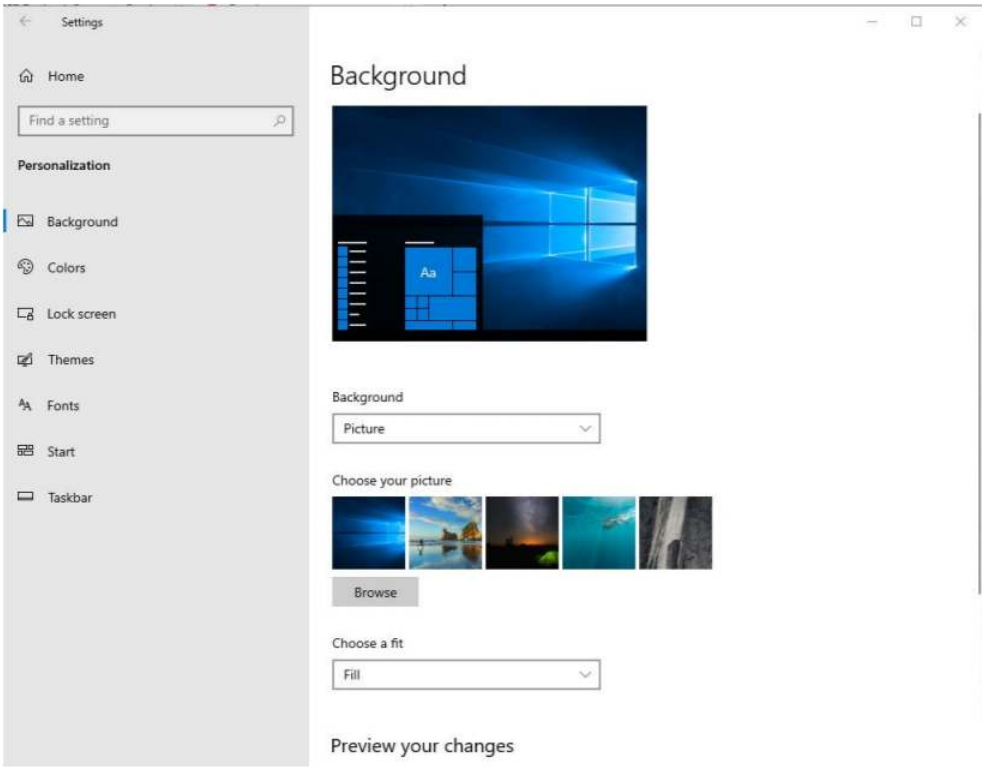
# 6.5: Customizing Windows 10 Lock Screen




The windows lock screen may display a variety of pictures. Like the desktop, you may set up a static picture for the lock screen or a slideshow.

To personalize the Lock screen using a custom image, do the following: (Windows Central, n.d.)

1. Open Settings.
2. Click on Personalization.
3. Click on the Lock screen.
4. Use the "Background" drop-down menu and select the Picture option or slideshow option depending on your preference.

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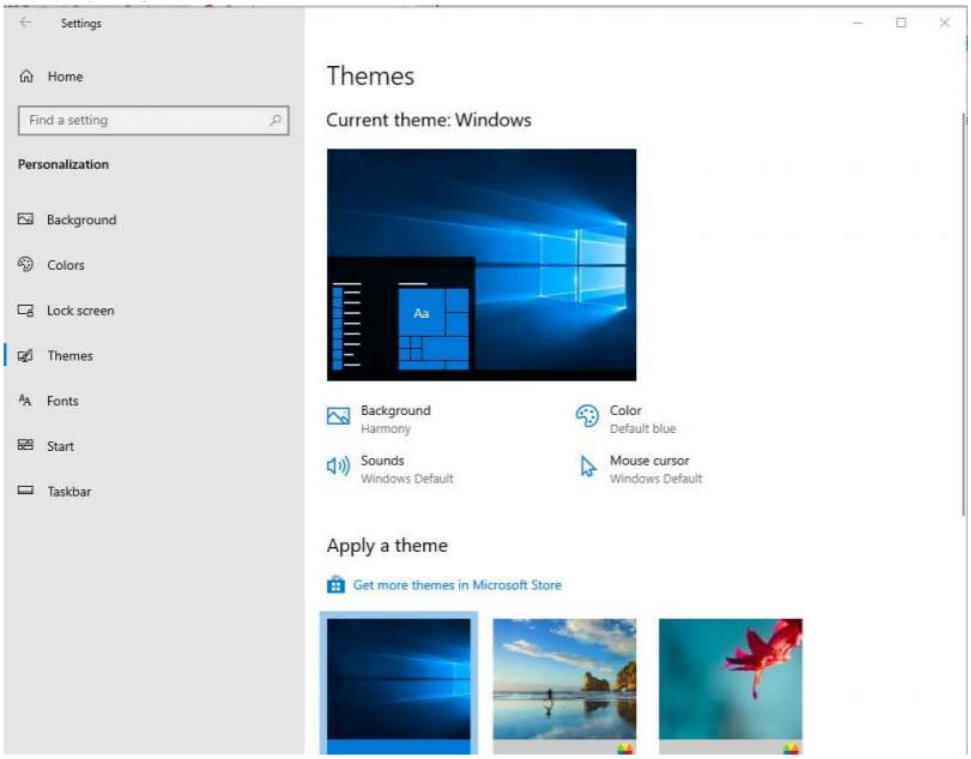
# 6.6: Applying a Theme to Windows 10




Although Windows 10 includes many ways to personalize your experience, the quickest way to change the look and feel is to use a theme. A theme is just a package that can contain one or more background images, color accents, and sounds, and they're quickly acquirable from the Microsoft Store. To get and apply a new theme on Windows 10, do the following: (Windows Central, n.d.)

1. Open Settings.
2. Click on Personalization.
3. Click on Themes.
4. Click the Get more themes in the Store link.
5. In the Microsoft Store, pick the theme you want, and click the “Get” button.
6. Click the Launch button to go back to the Themes settings.
7. Click the newly added theme to apply it.

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# 6.7: Windows Settings

Windows 10 settings can be adjusted in two ways, the Settings App and the Control Panel. The settings can app can change any setting on your computers, like your printer options to how windows looks and sounds. To open the app, click the Start menu, then select Settings. You can also use the Control Panel to adjust your settings, just like in earlier versions of Windows. There are a wide variety of settings to change in Windows 10. It is important that users spend some time reviewing settings for their computer and adjust as needed. If you do not understand the specific settings you are changing, it is best to research it before making changes. Windows 10 settings can change how your PC operates, and also make it more accessible to the end-user

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# 6.8: Accessibility Settings

Accessibility options are built into Windows to help users who may have trouble using their computers normally get a little more functionality out of their favorite OS. Though Windows 10 does innovate on many features we've come to expect from older versions of the operating system, for the most part, Microsoft has opted to keep much of the core functionality of its accessibility features the same to make it easier both on users and developers to adapt without much trouble in between the old system and the new. Even so, here's how to manage all the accessibility options available in the latest update of Windows 10. (How to geek, n.d.)

## Narrator

For the blind or those with acute sight limitations, a Narrator is a vital tool that will read off the contents of any page, window, or application. Windows 10 has the capability to read the characters you type as you type them, playing audio cues when you click into new pages or applications, and reading off hints for controls and buttons which will assist sight challenged. At the bottom of the Narrator settings, users have the option to hear Microsoft David or Zira as the Narrator. (Howtogeek.com, n.d.)

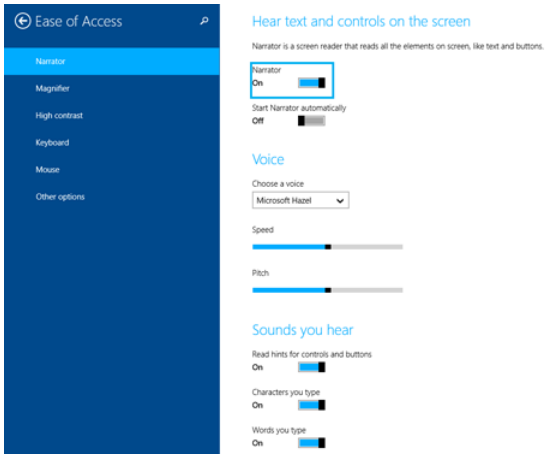
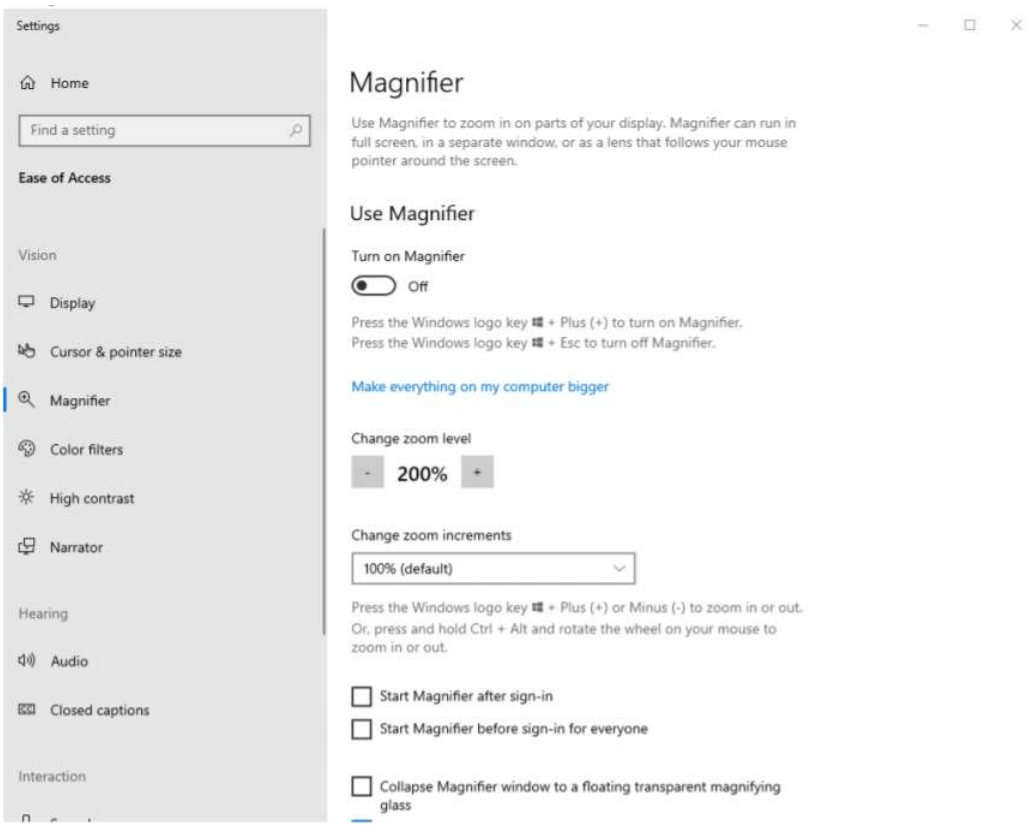


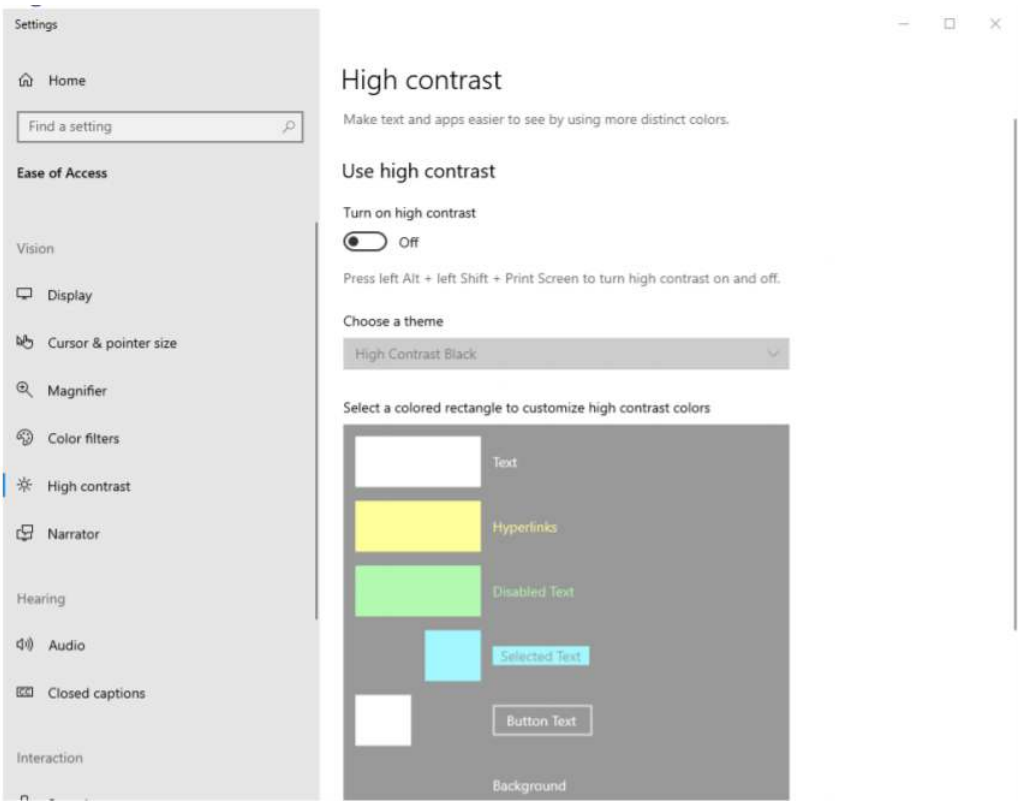

Figure 6.8.1: The Photo by Unknown Author is licensed under CC BY-SA-NC

## Magnifier




Magnifier is another of the Windows Ease of Access features designed to assist anyone who either has trouble reading their screen.

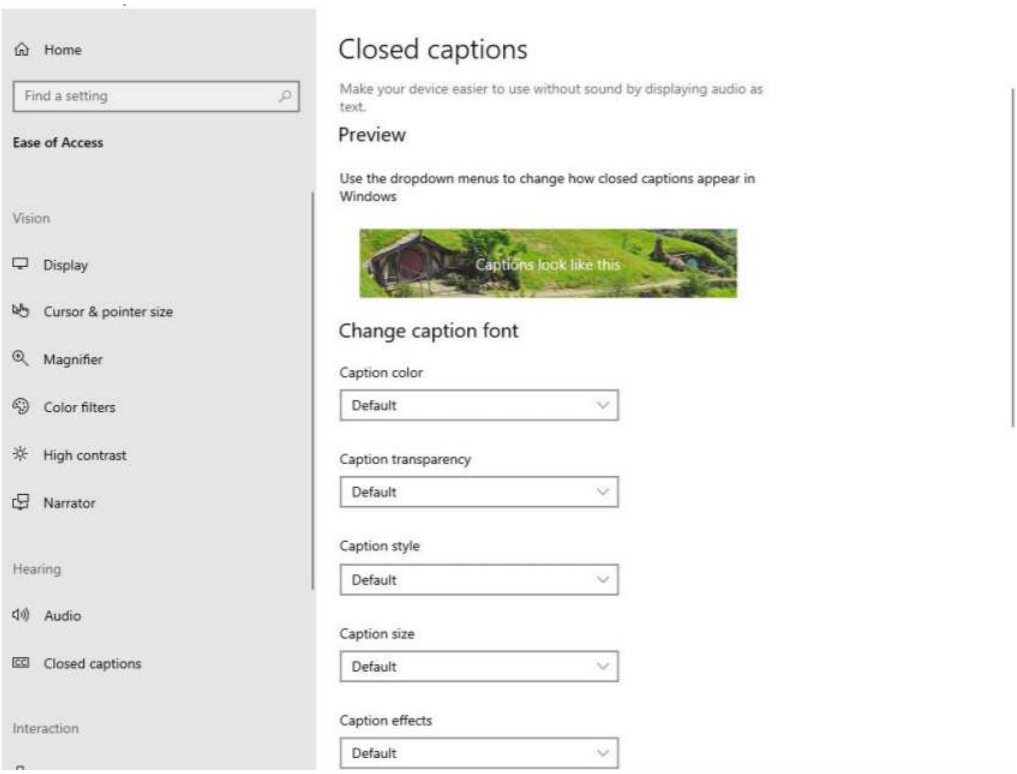
## High Contrast




Sticking with the concept of “making things easier”, Microsoft has opted to group all its visual accessibility features into the top three choices in the Ease of Access panel.

High contrast will drastically alter the overall color scheme so that text, images, application windows, and icons become easier to read for anyone who might have colorblindness.

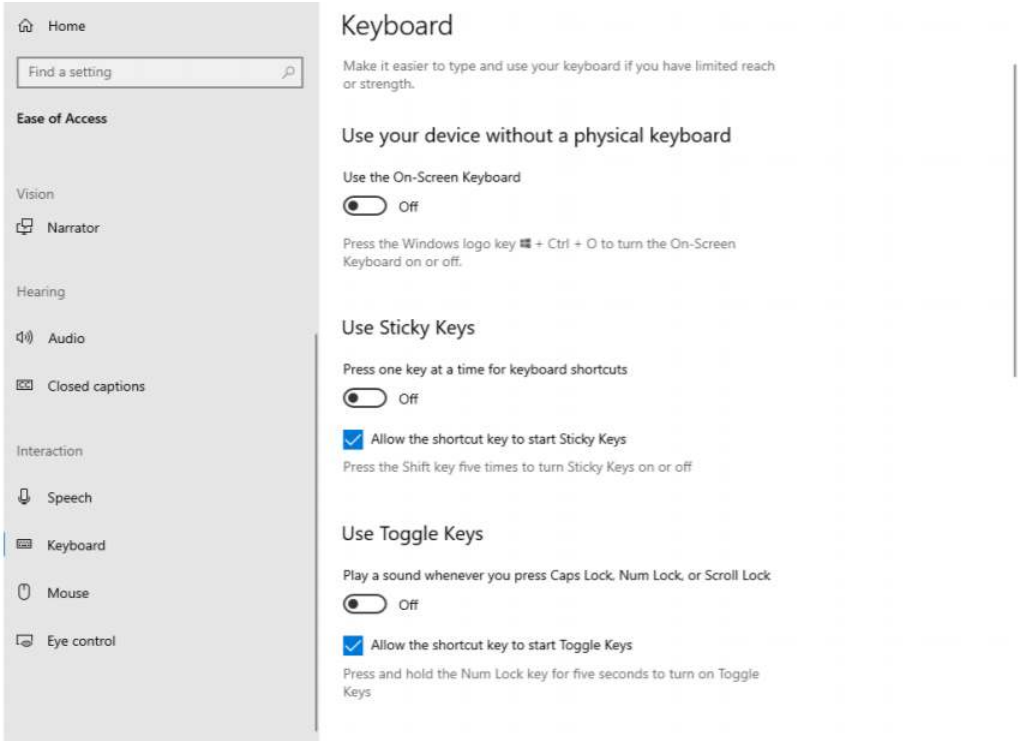
## Closed Captions




The closed captions section can be used to customize how any closed captions in your local media players will appear during the playback of movies or TV shows. For those who have difficulties making out the white text against moving backgrounds, this allows you to choose between any color you'd like on the Windows color palette.

You can opt to change the font, the color of the text, or both at the same time if you have specific needs depending on your own vision requirements.

## Keyboard




The keyboard options in Ease of Access offers up a wide range of customization that will help anyone with disabilities or special needs have exactly the PC experience they want every time they boot up and log in.

An On-Screen Keyboard is a great tool for anyone who's using Windows 10 on a touch screen device or doesn't want to use a keyboard. Sticky Keys will change your keyboard to treat any strikes of the ctrl, shift, or alt keys as a hold command, rather than a tap as it usually would. This is perfect for anyone who has issues maintaining finger dexterity for long periods of time (arthritis patients come to mind), or just users who are too lazy to manage to hold down more than a few keys at once. (Howtogeek.com, n.d.)

## Mouse

You may increase and decrease the size of the mouse cursor to make it more helpful to see your cursor.

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# 6.9: Notification Center

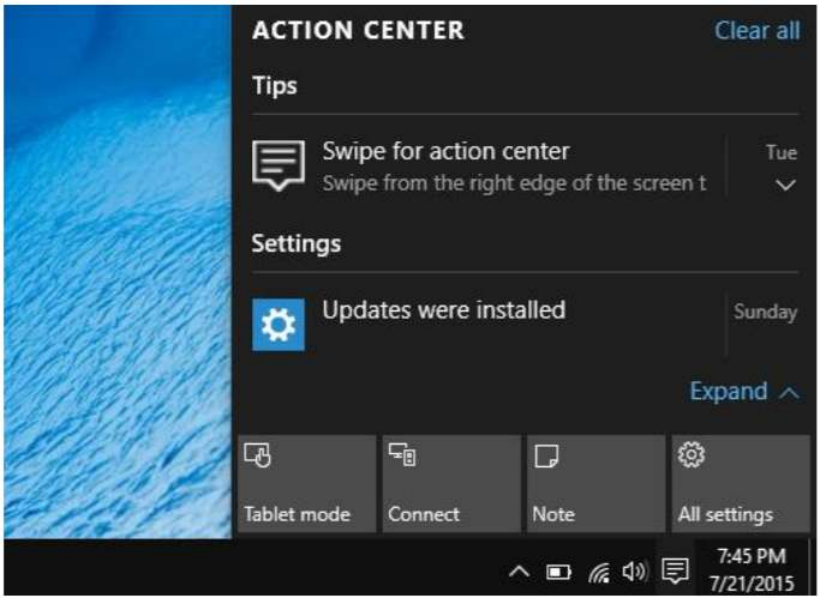


Figure **6.9.1**: This Photo by Unknown Author is licensed under CC BY-SA

As stated previously, Windows 10 has created a Notification Center to view and respond to alerts and notifications from your PC. Users may customize their notification center in the settings menu. Notification settings may be changed by opening Windows 10 settings, and navigating to the System area of settings, and then to “Notifications and Actions”. The options at the top of this screen allow you to change “Quick Actions”. Quick Actions are the first settings a user can view in the Notification Center. If you click the link “Select which icons appear on the taskbar” you’ll be able to decide how crowded or sparse the system tray is, or you can just turn them all “Off”. Scrolling down in this area, you may also change global settings for notifications that affect all of Windows 10 notifications- deciding whether to view tips about windows, application notifications, notifications on the lock screen, alarms, reminders and calls, and notifications during presentations. There are also options to turn off notifications from specific apps. So, if you don’t want to disable app notifications wholesale, but still don’t want to see them from certain ones, you can selectively disable them.

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# 6.10: Checking for Understanding

1. Change the desktop background color.
2. Setup the desktop background to display a photo slideshow.
3. Change the Windows 10 theme.
4. Access the Windows 10 settings & control panel
5. Enable text to speech options and high contrast mode
6. Turn on and off notifications on an application basis.

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# CHAPTER OVERVIEW

## 7: Windows Security

Protecting your PC and your personal information while using your computer is very important. Every year, thousands of individuals have their personal and financial information compromised and suffer tragic consequences. Ensuring your computer is updated to the latest version and is protected is a vital part of using a computer. Three common attacks on computers include computer viruses, malware, and phishing.


7.1: Computer Viruses
7.2: Computer Malware
7.3: Phishing
7.4: Windows Defender Security Center
7.5: Launching Windows Defender Security Center
7.6: Using Windows Defender Scan
7.7: Viewing the Health/ Performance of your PC
7.8: Fresh Start
7.9: How to Manage Network Security with Windows Defender Firewall
7.10: How to Protect your PC against Malicious Code
7.11: User Account Control
7.12: Automatic Updates
7.13: Internet and Computer Safety Tips
7.14: Checking for Understanding


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# 7.1: Computer Viruses

A computer virus, much like a flu virus, is designed to spread from host to host and can replicate itself. In more technical terms, a computer virus is a type of malicious code or program written to alter the way a computer operates and is designed to spread from one computer to another. A virus operates by inserting or attaching itself to a legitimate program or document that supports macros in order to execute its code. In the process, a virus has the potential to cause unexpected or damaging effects, such as harming the system software by corrupting or destroying data (Norton.com, n.d.).

## How does a computer virus attack?

Once a virus has successfully attached to a program, file, or document, the virus will lie dormant until circumstances cause the computer or device to execute its code. For a virus to infect your computer, you must run the infected program, which in turn causes the virus code to be executed. This means that a virus can remain dormant on your computer, without showing major signs or symptoms. However, once the virus infects your computer, the virus can infect other computers on the same network. Stealing passwords or data, logging keystrokes, corrupting files, spamming your email contacts, and even taking over your machine are just some of the devastating and irritating things a virus can do. While some viruses can be playful in intent and effect, others can have profound and damaging effects. This includes erasing data or causing permanent damage to your hard disk. Worse yet, some viruses are designed with financial gains in mind. (Norton.com, n.d.)

## How do computer viruses spread?

In a constantly connected world, you can contract a computer virus in many ways, some more obvious than others. Viruses can be spread through email and text message attachments, Internet file downloads, and social media scam links. Your mobile devices and smartphones can become infected with mobile viruses through shady App downloads. Viruses can hide disguised as attachments of socially shareable content such as funny images, greeting cards, or audio and video files. To avoid contact with a virus, it's important to exercise caution when surfing the web, downloading files, and opening links or attachments. To help stay safe, never download text or email attachments that you're not expecting, or files from websites you don't trust. (Norton.com, n.d.)

## What are the signs of a computer virus?

A computer virus attack can produce a variety of symptoms. Here are some of them: (Norton.com, n.d.)

- Frequent pop-up windows. Pop-ups might encourage you to visit unusual sites. Or they might prod you to download antivirus or other software programs.
- Changes to your homepage. Your usual homepage may change to another website, for instance. Plus, you may be unable to reset it.
- Mass emails being sent from your email account. A criminal may take control of your account or send emails in your name from another infected computer.
- Frequent crashes. A virus can inflict major damage on your hard drive. This may cause your device to freeze or crash. It may also prevent your device from coming back on.
- Unusually slow computer performance. A sudden change in processing speed could signal that your computer has a virus.
- Unknown programs that startup when you turn on your computer. You may become aware of the unfamiliar program when you start your computer. Or you might notice it by checking your computer's list of active applications.
- Unusual activities like password changes. This could prevent you from logging into your computer.

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# 7.2: Computer Malware

Malware is an abbreviated form of “malicious software.” This is software that is specifically designed to gain access to or damage a computer, usually without the knowledge of the owner. There are various types of malware, including spyware, ransomware, viruses, worms, Trojan horses, adware, or any type of malicious code that infiltrates a computer. Generally, the software is considered malware based on the intent of the creator rather than its actual features. Malware creation is on the rise due to money that can be made through organized Internet crime. Originally malware was created for experiments and pranks, but eventually, it was used for vandalism and destruction of targeted machines. Today, much of malware is created to make a profit from forced advertising (adware), stealing sensitive information (spyware), spreading email spam or child pornography (zombie computers), or extorting money (ransomware). Various factors can make computers more vulnerable to malware attacks, including defects in the operating system (OS) design, all the computers on a network running the same OS, giving users too many permissions, or just because a computer runs on a particular operating system, such as Windows, for example. The best protection from malware — whether ransomware, bots, browser hijackers, or other malicious software — continues to be the usual, preventive advice: be careful about what email attachments you open, be cautious when surfing by staying away from suspicious websites, and install and maintain an updated, quality antivirus program. (Norton.com, n.d.)

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# 7.3: Phishing

Phishing is a cyber-attack that uses disguised email as a weapon. The goal is to trick the email recipient into believing that the message is something they want or need — a request from their bank, for instance, or a note from someone in their company — and to click a link or download an attachment. What really distinguishes phishing is the form the message takes: the attackers masquerade as a trusted entity of some kind, often a real or plausibly real person, or a company the victim might do business with. It's one of the oldest types of cyberattacks, dating back to the 1990s, and it's still one of the most widespread and pernicious, with phishing messages and techniques becoming increasingly sophisticated. (Norton.com, n.d.)

While there are several paid-for and free applications that protect against viruses and malware, Windows has built-in applications to monitor the health of your PC and protect it against hostile threats.

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# 7.4: Windows Defender Security Center

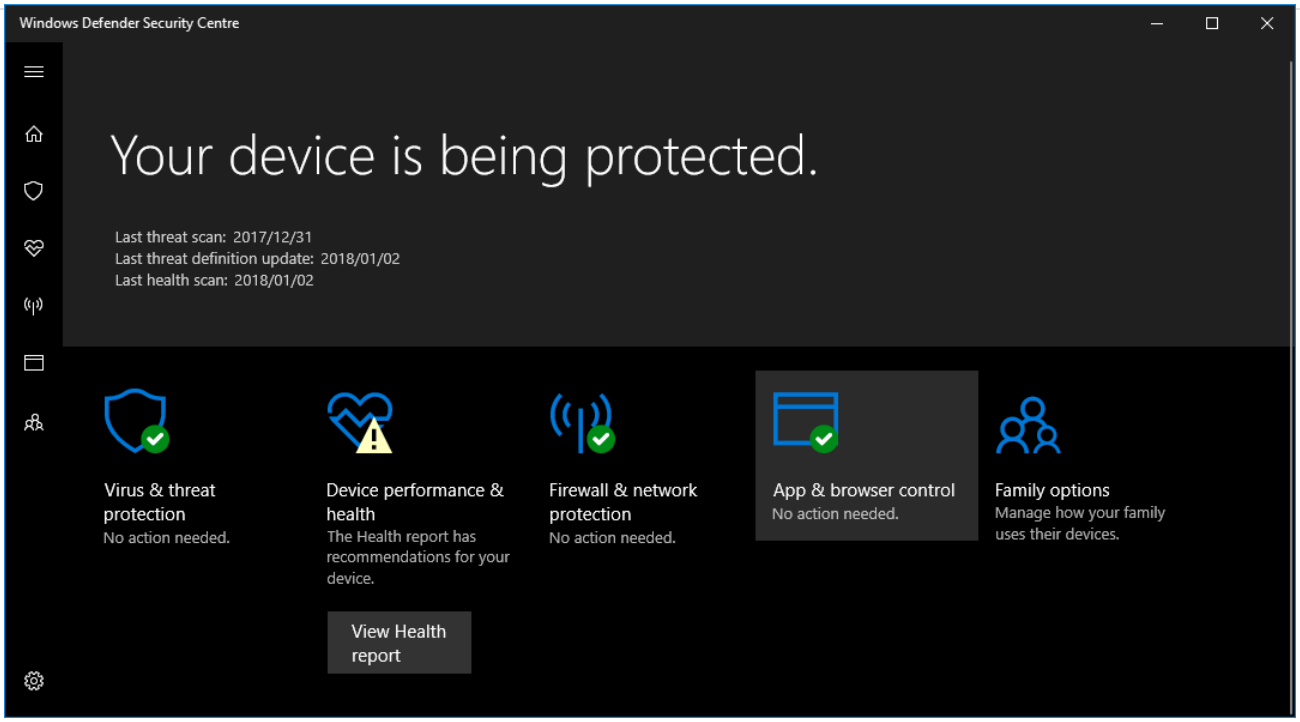


Figure 7.4.1: This Photo by Unknown Author is licensed under CC BY-SA

Windows 10 Defender Security Center is built into Windows 10. It combines the most common security features of Windows into an easy-to-use app allowing technical and non-technical users to view and protect their devices and data against many types of malware, including viruses and ransomware, hacker attacks, security threats, and more. Windows Defender Security Center is an application that provides a unified experience to view status and control security features, such as firewall, antivirus, performance monitor, and other products. Windows Defender Antivirus is the default anti-malware engine of Windows 10 that offers real-time protection against viruses and security threats. Installing a third-party antivirus will disable the Windows Defender Antivirus automatically, but it'll not affect the functionality of the Windows Defender Security Center. In the same way, disabling Windows Defender Antivirus or Windows Defender Firewall will not disable Security Center.

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# 7.5: Launching Windows Defender Security Center

To get started, you can launch the app from the Start menu, or you can double-click the shield icon from the notification area in the taskbar. Although "Home" doesn't include any setting that you can manage, it's a good place to get started, as it provides an overview of the protection of your device. On this page, you can view the status of all the security features and alerts of any action that needs to be taken to keep your computer secure. Also, at the top of the page, you'll be able to find antivirus information, such as when the last scan was performed and when the last definition was installed. The shield icon in the notification area is also capable of alerting you when an action needs to be taken. If there is more than one alert, only the most severe warning will be displayed (Windows Central, n.d.). Windows Defender Security Center includes five areas of protection that you can manage and monitor.

- Virus & threat protection: includes the Windows Defender Antivirus settings, and it allows you to monitor the malware protection, scan your device for threats, and set up its advanced anti-ransomware feature.
- Device performance & health: allows you to check the health and performance of your computer and provides a mechanism to clean up your device to fix errors and slowdown problems.
- Firewall & network protection: lets you monitor the status of network connections, and you can configure various Windows Defender Firewall settings.
- App and browser control: help you to protect your device and data from malicious code hidden on apps, files, and websites.
- Family options: offers easy access to manage your devices and kids' online experience using a Microsoft account.

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# 7.6: Using Windows Defender Scan

To scan your PC for viruses and malware using Windows Defender Antivirus, complete either a quick scan or full scan. To perform a Quick Scan, complete the following:

1. Open Windows Defender Security Center.
2. Click on Virus & threat protection.
3. Click the Quick scan button.

To perform a Full Scan or Custom Scan, complete the following.

1. Open Windows Defender Security Center.
2. Click on Virus & threat protection.
3. Click the link of the Advanced scan.
4. Select the Full Scan or Custom Scan option and select the appropriate folders to scan.

Sometimes if you're dealing with a tough virus or another type of malware, the antivirus may not be able to remove it while Windows 10 is running. If this is the case, save your work, close any running application, and run an offline scan using the following steps:

1. Open Windows Defender Security Center.
2. Click on Virus & threat protection.
3. Click the link of the Advanced scan.
4. Select the Windows Defender Offline scan option.
5. Click the Scan now button.
6. Click the Scan button to continue.

When you start an offline scan, your device will restart and boot using the Windows Defender Antivirus environment. The latest definition update will be installed (if an internet connection is available), a scan will be performed, and if malicious software is detected, it'll be removed or quarantined automatically.

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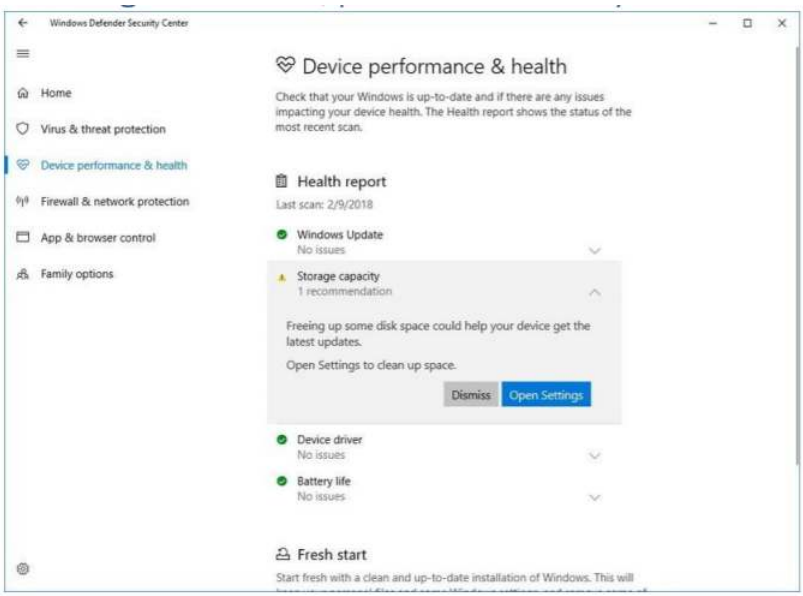
# 7.7: Viewing the Health/ Performance of your PC




Windows Defender Security Center also includes an area that surfaces information about the health and performance of your computer. To view your PC health and performance report, do the following:

1. Open Windows Defender Security Center.
2. Click on Device performance & health.

The report includes a status for Windows Update, storage, device driver, and battery. If action needs to be taken, you'll see an alert with a recommendation on how to remedy the issue (Windows Central, n.d.).

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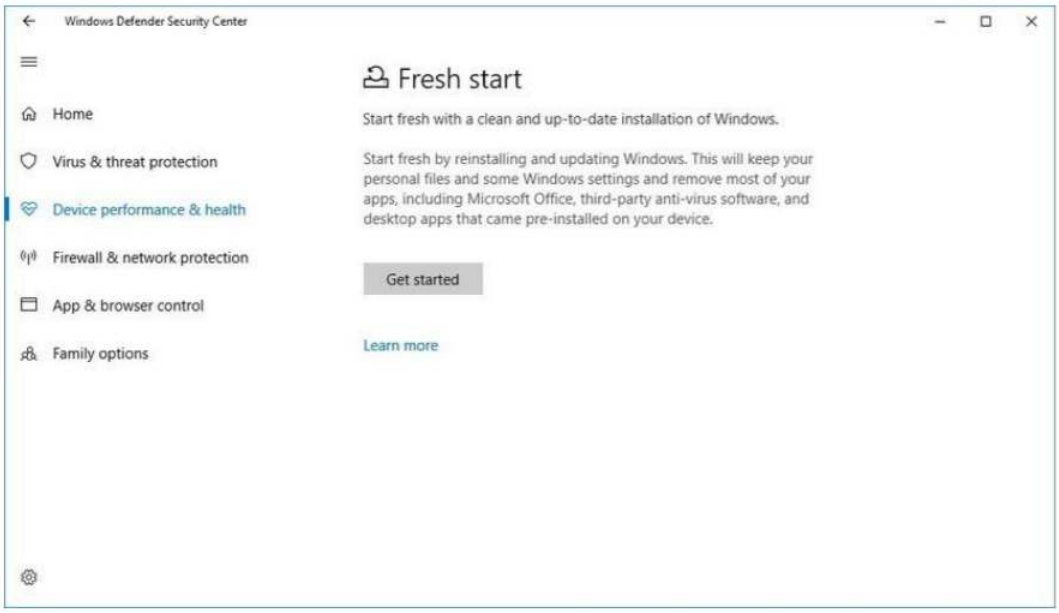
# 7.8: Fresh Start




If your PC is having performance problems, such as issues with memory, shutting down, or everything is working very slow, you can click the Additional info link under "Fresh start" to re-install Windows 10 with the latest updates.

To perform a Fresh Start, perform the following:

1. Click the Get started button
2. Click the Next button.
3. Review the apps that will be removed.
4. Click the Next button.
5. Click the Start button to begin the process.

This process won't delete your files, it'll keep some Windows settings, but it'll remove everything else to help fix performance issues with your device (Windows Central, n.d.).

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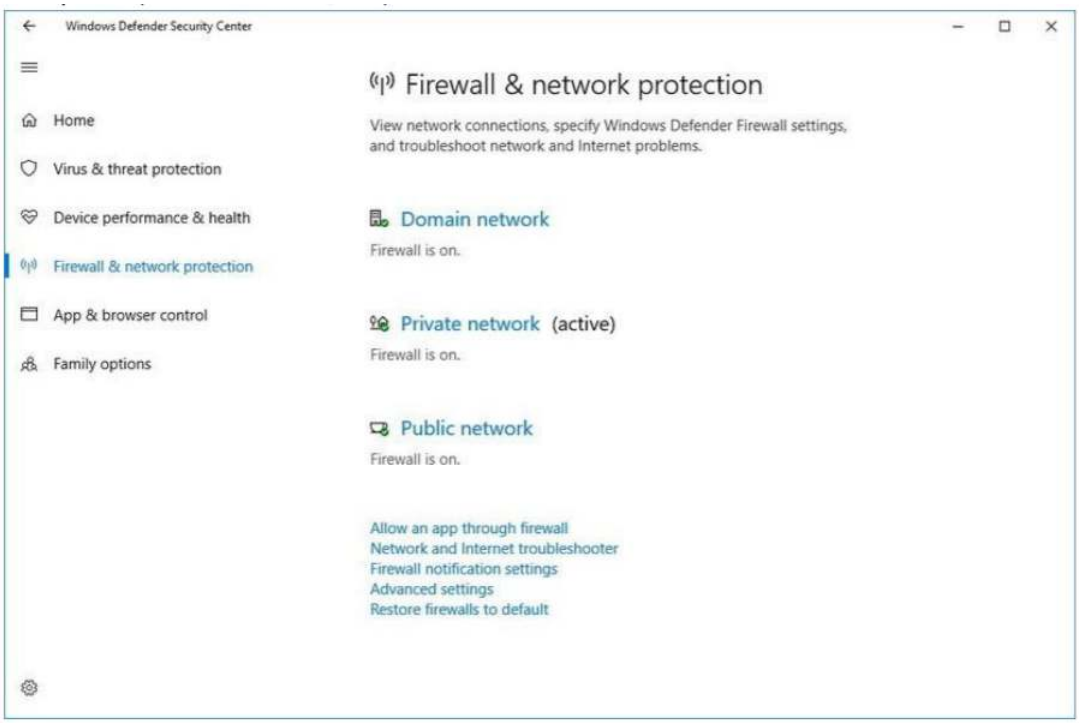
# 7.9: How to Manage Network Security with Windows Defender Firewall

The experience also includes an area to monitor and manage Windows Defender Firewall settings, which you can access with the following steps:

1. Open Windows Defender Security Center.
2. Click on Firewall & network protection.
3. On the page, you can view at a glance in which network profile the firewall is currently enabled and protecting you from unauthorized access.

The one marked as "active" is the network profile currently in use. You can also click any of the networks to disable the firewall and block all incoming network connections for a profile (Windows Central, n.d.).

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# 7.10: How to Protect your PC against Malicious Code

The "App & browser control" page is the place to configure the Windows Defender SmartScreen settings that can help you to protect your computer against sites, apps, and files that may contain malicious code. The default settings are the recommended configuration you should be using. Of course, that is unless you have a specific reason to change them.

1. To change the default SmartScreen settings, do the following:
   a. Open Windows Defender Security Center.
   b. Click on App & browser control.
   c. Select the level of protection you want for apps and files, Microsoft Edge, and Microsoft Store apps.

You'll also notice Exploit protection at the bottom of the page. This is an advanced feature that can help to mitigate malware and vulnerabilities without having to wait for a malware or system update.

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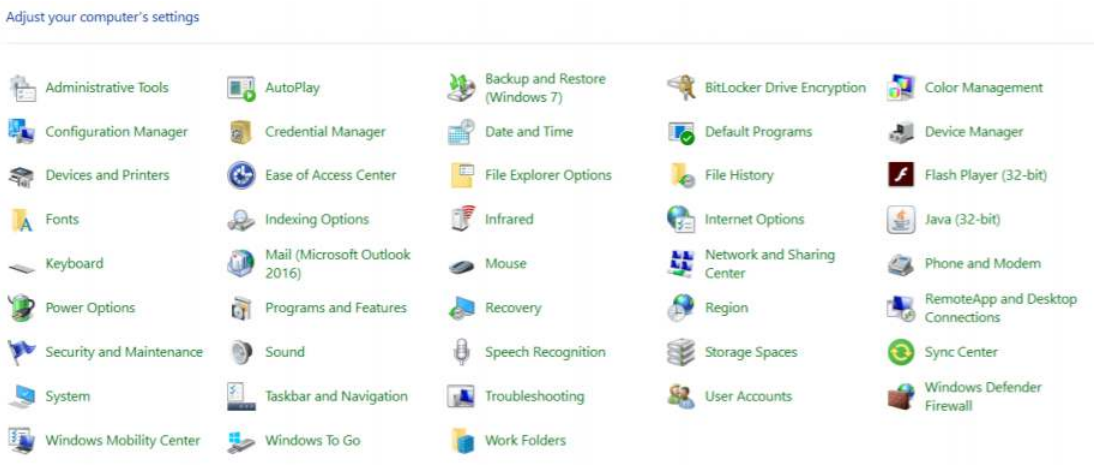
# 7.11: User Account Control




The Windows User Account Control is a tool that warns you when someone or something attempts to change your computer system settings. When this happens, the screen will alert you until an Administrator can confirm the change. This helps protect your computer against accidental changes or malicious software altering your settings. Initially, this User Account Control is set at a moderate to a high level, which means it will notify you only when an application tries to make changes to your computer. However, you can change this setting to your desired level by following these steps − (Tutorialspoint.com, n.d.)

1. Open the Control Panel by searching for it in the search bar.
2. After the Control Panel is open, choose User Accounts.
3. After choosing User Accounts, click on “Change User Account Control settings”.
4. In the User Account Control Settings, you can move the slider to the desired position.

Windows 10 will give you a summary of how your system will behave under that level.

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# 7.12: Automatic Updates

By default, Windows 10 is set up to automatically download the latest updates for the Windows Operating system as soon as they are available. It is important to allow those updates, as often crucial errors or “bugs” that may make your computer susceptible to a computer virus or malware are fixed or “patched” by updates. When updates are installing, it is important to not turn off your computer until they are completed.

Figure **7.12.1**: This Photo by Unknown Author is licensed under under CC BY-SA-NC

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# 7.13: Internet and Computer Safety Tips

*The following article was retrieved from usa.kapersky.com (Kapersky.com, n.d.)*

A 19-year-old running for public office in New Hampshire found out about the importance of following Internet safety rules the hard way. As Seacoast Online reports, his opponents found images in his social media posts that were sexually suggestive and referenced past drug use. Just like that, his political career crashed and burned upon takeoff. But, unfortunately, he isn't the only one, as careless Internet habits have left others exposed to scams, identity theft and physical harm at the hands of people they met online. With more users accessing the Internet through mobile devices, these risks are changing and growing quickly. Even though apps loom larger in most people's daily online interactions than traditional websites do, that does not mean that the basic Internet safety rules have changed. Hackers are still on the lookout for personal information they can use to access your credit card and bank information. Unsafe surfing can also lead to other threats—from embarrassing personal comments or images that, once online, are nearly impossible to erase, to getting mixed up with people you'd rather have had nothing to do with.

**Here are the Top 10 Internet safety rules to help you avoid getting into trouble online (and offline).**

1. Keep Personal Information Professional and Limited: Potential employers or customers don't need to know your personal relationship status or your home address. They do need to know about your expertise and professional background, and how to get in touch with you. You wouldn't hand purely personal information out to strangers individually—don't hand it out to millions of people online.
2. Keep Your Privacy Settings On: Marketers love to know all about you, and so do hackers. Both can learn a lot from your browsing and social media usage. But you can take charge of your information. As noted by Lifehacker, both web browsers and mobile operating systems have settings available to protect your privacy online. Major websites like Facebook also have privacyenhancing settings available. These settings are sometimes (deliberately) hard to find because companies want your personal information for its marketing value. Make sure you have enabled these privacy safeguards and keep them enabled.
3. Practice Safe Browsing: You wouldn't choose to walk through a dangerous neighborhood—don't visit dangerous neighborhoods online. Cybercriminals use lurid content as bait. They know people are sometimes tempted by dubious content and may let their guard down when searching for it. The Internet's demimonde is filled with hard-to-see pitfalls, where one careless click could expose personal data or infect your device with malware. By resisting the urge, you don't even give the hackers a chance.
4. Make Sure Your Internet Connection is Secure. Make sure your device is secure, and when in doubt, wait for a better time (i.e., until you're able to connect to a secure Wi-Fi network) before providing information such as your bank account number.
5. Be Careful What You Download: A top goal of cybercriminals is to trick you into downloading malware—programs or apps that carry malware or try to steal information. This malware can be disguised as an app: anything from a popular game to something that checks traffic or the weather. Don’t download apps that look suspicious or come from a site you don't trust.
6. Choose Strong Passwords: Passwords are one of the biggest weak spots in the whole Internet security structure, but there's currently no way around them. And the problem with passwords is that people tend to choose easy ones to remember (such as "password" and "123456"), which are also easy for cyber thieves to guess. Select strong passwords that are harder for cybercriminals to demystify. Password manager software can help you to manage multiple passwords so that you don't forget them. A strong password is one that is unique and complex—at least 15 characters long, mixing letters, numbers and special characters.
7. Make Online Purchases from Secure Sites: Any time you make a purchase online, you need to provide credit card or bank account information—just what cybercriminals are most eager to get their hands on. Only supply this information to sites that provide secure, encrypted connections. As Boston University notes, you can identify secure sites by looking for an address that starts with https: (the S stands for secure) rather than simply Http: They may also be marked by a padlock icon next to the address bar.
8. Be Careful What You Post: The Internet does not have a delete key, as that young candidate in New Hampshire found out. Any comment or image you post online may stay online forever because removing the original (say, from Twitter) does not remove any copies that other people made. There is no way for you to "take back" a remark you wish you hadn't made or get rid of that embarrassing selfie you took at a party. Don't put anything online that you wouldn't want your mom or a prospective employer to see.

9. Be Careful Who You Meet Online: People you meet online are not always who they claim to be. Indeed, they may not even be real. Be as cautious and sensible in your online social life as you are in your in-person social life.
10. Keep Your Antivirus Program Up to Date: Internet security software cannot protect against every threat, but it will detect and remove most malware—though you should make sure it's to date. Be sure to stay current with your operating system's updates and updates to the applications you use. They provide a vital layer of security.

Keep these 10 basic Internet safety rules in mind and you'll avoid many of the nasty surprises that lurk online for the careless

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# 7.14: Checking for Understanding

1. Students will list 7 out of 10 internet safety rules.
2. Students will adjust Windows 10 User Account Control Settings
3. Students will perform a Windows Defender Security Scan
4. Students will find the location in Windows 10 settings to perform a Fresh Start

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# CHAPTER OVERVIEW

## 8: Media Creation in Windows

Windows 10 allows for thousands of applications that can be utilized by the user to create, edit, and share Media. Professionals invest hundreds of thousands of dollars on computer hardware and software to assist them in their jobs. From editing a document, preparing a presentation, or creating a video with sound, Windows 10 is used daily to make clear and stimulating media creations.


8.1: Types of Media Files
8.2: Extensions for Picture Files
8.3: Extensions for Music Files
8.4: Other types of Popular Files
8.5: Using Windows Photos
8.6: Browsing Photos
8.7: Using the Built-In Photo Editor
8.8: Checking for Understanding


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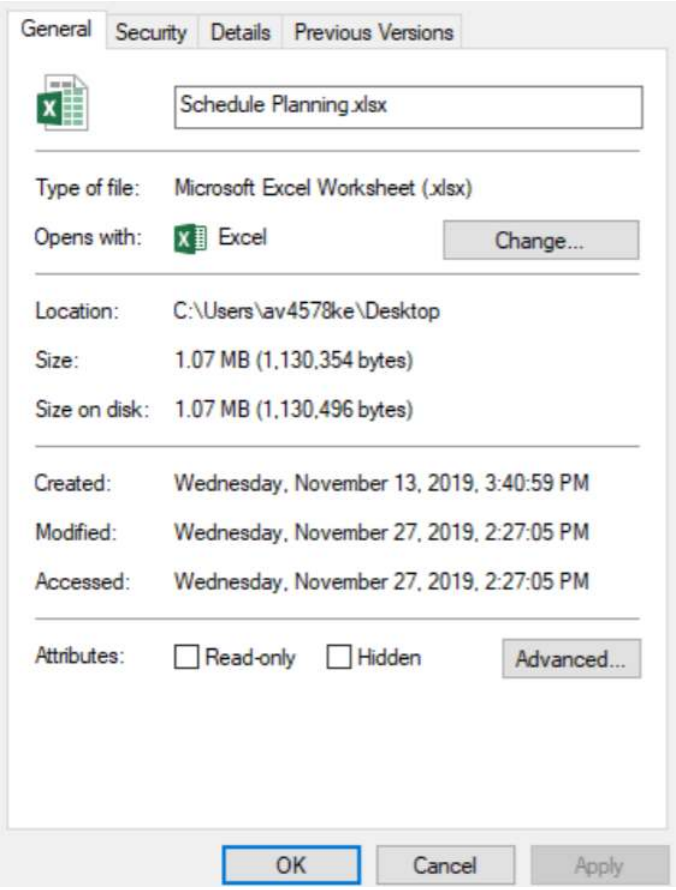
# 8.1: Types of Media Files

To a certain extent, every type of file on your PC could be considered a media file. However, most users associate audio, picture, and video files as Media Files. Every media file has an extension, that the computer uses to associate with a program. Extensions are listed after the file name (for example this textbook has the file name “Computer Fundamentals for Technical Students Textbook” and the file extension is.” pdf” for portable document format. Depending on your Windows View settings, extensions may be hidden by default as changing a file extension could create errors in your computer. You can change viewing properties by launching a Windows Explorer Window, clicking on the “View” tab, and making sure “File Names and Extensions” is checked. In addition, users may also right-click on the file, then navigate to file properties, and view the type of file. Users may also change the program associated with that extension by clicking on the “Change” button next to the “Opens with” section of the screen.

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# 8.2: Extensions for Picture Files

- JPEG files (.jpg and .jpeg)
- GIF files (.gif) • Bitmap files (.bmp)
- PNG files (.png)
- TIFF files (.tif and .tiff)
- Extensions for Video Files
- Audio Video Interleaved files (.avi)
- Motion JPEG files (.avi and .mov)
- Windows Media files (.wm, .wmv, and .asf)
- Matroska multimedia files (.mkv)
- Apple QuickTime files (.mov and. qt)
- MPEG Movie files (.mp4, .mov, .m4v, .mpeg, .mpg, .mpe, .m1v, .mp2, .mpv2, .mod, .vob, and .m1v)

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# 8.3: Extensions for Music Files

- Windows audio files (.wav)
- MP3 audio files (.mp3 and .m3u)
- Windows Media Audio files (asx, .wm, .wma, and .wmx)
- Free Lossless Audio Codec files (.flac)
- AAC files (.aac)

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# 8.4: Other types of Popular Files

- Application files (.exe): Executable files that can run with a double-click
- Text documents (.txt): Simple text documents without any kind of formatting
- Compressed (.zip): Archives of other files and folders
- Portable Document Format files (.pdf): A very popular type of file generally used for sharing non-editable documents that need to look the same on all devices, no matter what operating system you use
- OpenOffice and LibreOffice documents (.odt, .ott, .oth, and .odm): Documents created using free open-source productivity applications, such as OpenOffice and LibreOffice
- Microsoft Word (.doc and .docx)
- Microsoft PowerPoint (.ppt and .pptx)
- Microsoft Excel (.xls and .xlsx)
- Microsoft Publisher (.pub and .pubx)
- Microsoft OneNote (.one)

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# 8.5: Using Windows Photos

Starting up the Photos app is simple: for most new machines and fresh installations of Windows 10, it's already in the Start menu as a big tile. Even if it's not, just press "Start" and then begin typing "photos" to bring it up quickly via search. (Using Windows 10 Built in Photo Editor, n.d.)

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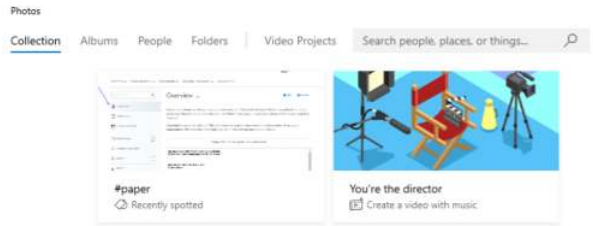
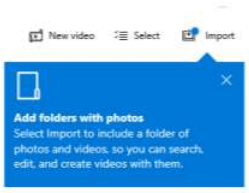
# 8.6: Browsing Photos

(Howtogeek.com, n.d.)




The Photos app offers three different interfaces when looking for photos: Collection, Album, and Folders. You can choose any of the three at any time by clicking the relevant tab, above the main interface and below the “Photos” application label.

## Collections

“Collections” is a view of your most recent photos and screenshots, displayed in reverse order by date. Within the main viewer of “Collection,” and in the nested album or photo viewers of the other tabs, a series of controls appear on the upper-right portion of the interface. These allow you to select multiple items for a specific action like copying, printing or adding to a specific album, or to start a slideshow, refresh the current file view, or import from a camera or mobile device. Contextual items in the Album view allow you to edit the name of the album or change the cover photo. To navigate backward through the Photos interface, click the left-pointing arrow in very top upper-left of the window, or press the Esc or Backspace keys at any time. (Using Windows 10 Built in Photo Editor, n.d.)

## Album

“Albums” is a series of automatically-created photo albums, organized according to the Photo app’s internal logic, though you can add your own and remove or add photos to existing albums. “Folders” is merely a tab for all of the photos on your machine in specific folders—your OneDrive photo folder and your assigned “Pictures” folder in Windows, by default. To add folders to this view, click “Choose where to look” to go to the Photos Settings page, then click “Add a folder” to manually select one in Windows Explorer. (Using Windows 10 Built in Photo Editor, n.d.)

## Using the Photo Viewer Interface

When you finally get down to an individual photo, the interface goes completely black and dedicates the maximum length or width of the window. If you’re using mouse navigation, scrolling up or down will advance or retreat in the current collection, album, or folder. Hold down the “Ctrl” button on your keyboard to turn the mouse wheel into zoom or retract controls. (How to Geek, n.d.) On the bottom of the interface, manual arrow controls to go forward or back in the album are on either side of an “add to album” button and a Delete button. You can use the keyboard for both actions: Ctrl+D to add it to a specific album via a pop-up menu, or simply press the Delete button. If you press “Delete” again, the image will be removed both from the album/collection/folder in the Photos app, and the file itself will be deleted in Windows Explorer and sent to the Recycling Bin. (Using Windows 10 Built in Photo Editor, n.d.)

The top controls are labeled, and self-explanatory. The “Share” button will open Windows 10’s share menu, allowing the user to send the file via email, copy it via Windows’ standard copy and paste function, or open and share it directly in any compatible Windows Store app. Zoom opens a manual slider to zoom in and out—remember that you can do this much faster by holding the Ctrl button and using the mouse wheel. “Slideshow” will begin a full-screen slideshow of the current album, collection, or folder.

## Draw command

(How to geek, n.d.)The “Draw” command allows you to write on the image, with a selection of pen and eraser tools that appear contextually. It’s mainly intended for pen-enabled devices like the Microsoft Surface. You can double-click on any of the tools in the upper bar to select color and width. Note that the drawings can be erased with the Eraser tool, but after you click “save” (the

floppy disk icon) and see the “Letting your Ink Dry,” the original file for this photo is saved over. Don’t click “save” on a photo unless you have it backed up somewhere, or you’re willing to lose the original.

## Edit command

“Edit” opens the photo editor, which we’ll cover in the next section. “Rotate” will rotate the image clockwise; if you hit it by accident, just click it again three more times to return the photo to its original orientation.

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# 8.7: Using the Built-In Photo Editor

The editor in Photos isn't exactly incredible, but it can handle some light cropping and adjusting if nothing else is available. On the main interface, using the + and – buttons will zoom in and out, which can also be done with the mouse wheel (no Ctrl button necessary). Click and drag any part of the image to move it around or click the "Actual size" button (the box with corners in the lower-right) to see the whole photo maximized horizontally or vertically.

## The Crop and Rotate Tool

The "Crop and rotate" button is the most prominent tool, as it's visible always. Click it to open a dedicated cropping UI. You can click and drag the circles on the corner to manually select a cropping box or click the "Aspect ratio" button to choose a standard size. This is quite useful if you want your image to be viewed on semi-standardized devices, like a smartphone or TV (16:9), iPad (4:3), or a corporate projector (usually 4:3 as well). The "Flip" button will flip the image horizontally, but not vertically, and the "Rotate" button will spin it clockwise by 90 degrees. To get a non-square rotation, click the circle beside the right-hand menu and slide it up or down. When you're finished, click "Done" to return to the full Edit interface. (How to geek, n.d.)

## The Enhance Tab

Right below the Crop button is two tabs, "Enhance" and "Adjust." Let's look at Enhance first. The "Enhance your photo" tool is an all-in-one slider: click and drag the slider from left to right to apply automatically-selected filters to "enhance" the image, according to the Photo app. You can stop it at any point along the axis. Generally, this tool brightens up an image, smooths out shadows and highlights, makes a more ideal contrast, and just generally makes things look clearer. The rest of the "filters" on the Enhance tab work the same way: click one of the filters, then click the slider beneath "Enhance your photo" to apply the effect, with a left-to-right strength of 0 to 100. You can apply multiple effects by clicking on a new one and then adjusting the slider—rinse and repeat. When you're done, click the "Adjust" tab. (How to Geek, n.d.)

## The Adjust Tab

The controls for this page are similar, but you can adjust multiple factors at once. The "Light" sliders adjust the contrast, exposure, highlights, and shadows of the image, with the master "Light" slider being a combination of all four. The "Color" slider handles saturation, with 0 reducing the image to greyscale and 100 making it overly vibrant. More fine controls can be applied with the Tint and Warmth sliders. The separate "Clarity" slider will outline specific edges with darkened shadows or blend them into the background, and the "Vignette" slider will add a white (left) or black (right) vignette effect to the photo. Finally, the Red Eye tool will let you click on a subject's eyes to remove the red glare from a camera flash, and the "Spot Fix" tool will let you click and drag around a specific area to obscure fine details. It's good removing acne and other blemishes. (How to geek, n.d.)

## Saving Your Edits

When you've edited your image to your liking, you have two options: "Save" will overwrite the original image file (not recommended), or "Save a copy" will let you save the edited version to a folder in Windows Explorer. The second is obviously better unless you're sure you don't want the original. At any time during editing, you can click "Undo all" to return to the original image and start over. (How to geek, n.d.)

## Editing Video Files

To edit a video file, open it in the Photos app. You can do this right from File Explorer by right-clicking the video file, and then selecting Open With > Photos. The video will open and play in the Photos app. To edit the video, click "Edit & Create" on the toolbar. You'll see a variety of video editing tools you can use. Click a tool to use it. For example, to cut a section out of a video, click "Trim" in the menu. To use the Trim tool, simply drag the two handles on the playback bar to select the portion of the video you want to keep. You can drag the blue pin icon to view what appears at that section in the video or click the play button to playback the selected section of the video. When you're done, click "Save a Copy" to save a copy of the trimmed section of the video. To stop editing without saving your changes, click "Cancel" instead. The Photos app places the edited video in the same folder as the original with a similar filename. For example, we edited a video named Wildlife.mp4 and received a video file named WildlifeTrim.mp4. (How to Geek, n.d.)

## Draw Tool

The “Draw” tool provides tools for drawing on a video. You can use a ballpoint pen, pencil, calligraphy pen, and eraser tools, and pick your favorite colors. Anything you draw appears smoothly on the screen during the video—as if you were drawing it—and then fades out and vanishes after a few seconds. (How to Geek, n.d.)

## How to Combine Videos, Add Text, and Apply 3D Effects

To start creating a video project, you can click the “Create a Video with Text” or “Add 3D Effects” tool. You can also click the “Add to a Creation” button at the top left corner with a video open, and then click “New Video with Music.” You can also get started with a custom video project by launching the Photos app from your Start menu, and then clicking Create > Custom Video with Music on the app’s home page. The “Automatic video with music” option also lets you select your own photos or videos. The Photos app automatically combines them into a custom video for you. You’ll be prompted to add at least one video or photo to create a custom video. You can add photos to get a slideshow or combine photos with a video if you like. However, you can also just add one video to edit it, or more than one video to combine them. Whichever way you create a custom video project, you’ll end up on a screen with a project library, video preview, and storyboard pane. To add one or more videos (or photos) to your project, drag them from the project library to the storyboard. Click the “Add photos and videos” option under the Project library to add more videos to the library. You can then drag them to the storyboard. (How to Geek, n.d.)

## StoryBoard Pane

Add a video and you’ll see some editing tools in the Storyboard pane. In addition to the standard Trim tool, you can resize a video with Resize, add visual filters with Filters, insert text with Text, apply motion effects with Motion, and insert 3D effects with 3D Effects. Even if you just want to edit a single video, you can add just that video to your project, use the various editing tools, and then export the video to a new file. Or, if you want to combine videos, you can insert them into the storyboard and edit them together. (How to Geek, n.d.)

## Editing Tools

The editing tools are self-explanatory. The Trim tool works similarly to the Trim tool you see when editing an individual video. The Resize tool can remove black bars from a video, which is important if you’re combining multiple videos with different aspect ratios into a single project. The Filters tool offers a variety of filters—everything from Sepia to Pixel. The Text tool provides different styles and layouts of animated text that you can place at different locations in the video. The Motion tool lets you choose different styles of camera motion for the video or photo. (How to Geek, n.d.)

## 3d Effects

(How to Geek, n.d.)The 3D Effects tool provides a library of 3D effects you can apply to the video: everything from autumn leaves and winter snowflakes to explosions, fires, and lightning bolts. You can apply one or more 3D effects, and each one has different options you can use to customize it. Some 3D effects must be placed somewhere in the scene, while others apply to the entire scene. In the Storyboard pane, you can click the speaker icon to select a volume level for each individual video. This is useful if you’re combining multiple videos and one is louder than the others. Rather than customizing each individual option yourself, the “Themes” option on the top bar of the window lets you choose different themes. This will choose filters, music, and text styles that work together—complete with preview videos that show you how they will look. (How to Geek, n.d.)

## Applying Music

To apply music to a video, click the “Music” button on the top bar. The Photos app includes a few music options you can choose from. You can also select “Your Music” to insert a custom music file. (How to Geek, n.d.)

## Aspect Ratio

There’s also an “Aspect Ratio” button on the toolbar. You can use it to switch between different landscape and portrait orientations for your video. (How to Geek, n.d.)

## Exporting/Sharing Video Files

When you're done, click "Export or Share" to export your video project to a file. You can also click the "Add to Cloud" button if you want to upload your video project to Microsoft's cloud. You can then resume editing it on the Photos app on another PC you've signed in to with the same Microsoft account. Your video projects will appear under "Video Projects" when you launch the Photos app. The Photos app exports the video and tells you where it's saved on your PC. The Photos app placed the video in the Pictures\Exported Videos folder on our PC. While this isn't the most powerful video editor you can get on Windows, it's surprisingly capable, included on all Windows 10 PCs, and can do a lot of the basics with a simple interface. (How to Geek, n.d.)

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# 8.8: Checking for Understanding

1. Describe four (4) different file extensions and their associated programs.
2. Launch Windows 10 Photos App to browse for pictures
3. Crop and enhance a photo downloaded from the website.
4. Used the Built-in Video Editor to create a slide show/Image of your ideal job.

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# CHAPTER OVERVIEW

## 9: Office Overview and Office 365

This Chapter provides an overview of the entire Office Suite of Products. Each product has a different purpose but shares many of the same navigation and organization. Once a user understands one Office Application, it is easier to transition to another Office Application because of the common structures associated with each application.


9.1: Understanding the Office Suite
9.2: Starting an Office App
9.3: Common Office Interface
9.4: Getting Help
9.5: Sharing
9.6: Office 365 Web Versions
9.7: Checking for Understanding


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# 9.1: Understanding the Office Suite

Microsoft Office is a suite of desktop productivity applications that are designed specifically to be used for office or business use. It is a proprietary product of Microsoft Corporation and was first released in 1990. Office applications consist of Word, Excel, PowerPoint, Access, OneNote, Outlook and Publisher applications. Each office application has a specific purpose and integrates with the entire office suite. Applications are also built to work together and share features (such as a shared Office Clipboard for copy/paste features.) The general purpose of each Office Application is listed below.

- Microsoft Word Helps users in creating text documents.
- Microsoft Excel: Creates simple to complex data/numerical spreadsheets.
- Microsoft PowerPoint: Stand-alone application for creating professional multimedia presentations.
- Microsoft Access: Database management application.
- Microsoft Publisher: Introductory application for creating and publishing marketing materials.
- Microsoft OneNote: Alternate to a paper notebook, it enables a user to neatly organize their notes.

Besides desktop applications, Microsoft Office is available to use on tablets and mobile devices and online. All Office documents integrate with cloud-based storage (One Drive) allowing users to store, edit, and share files in the Cloud and work collaboratively with other users. Microsoft Office Applications are sold in bundles. The most recent release is the Office 2019 suite. In addition, Microsoft Office Applications are sold as part of a subscription bundle, Office 365 which provides the user with updated applications, online file storage, and web-based email for a monthly subscription fee.

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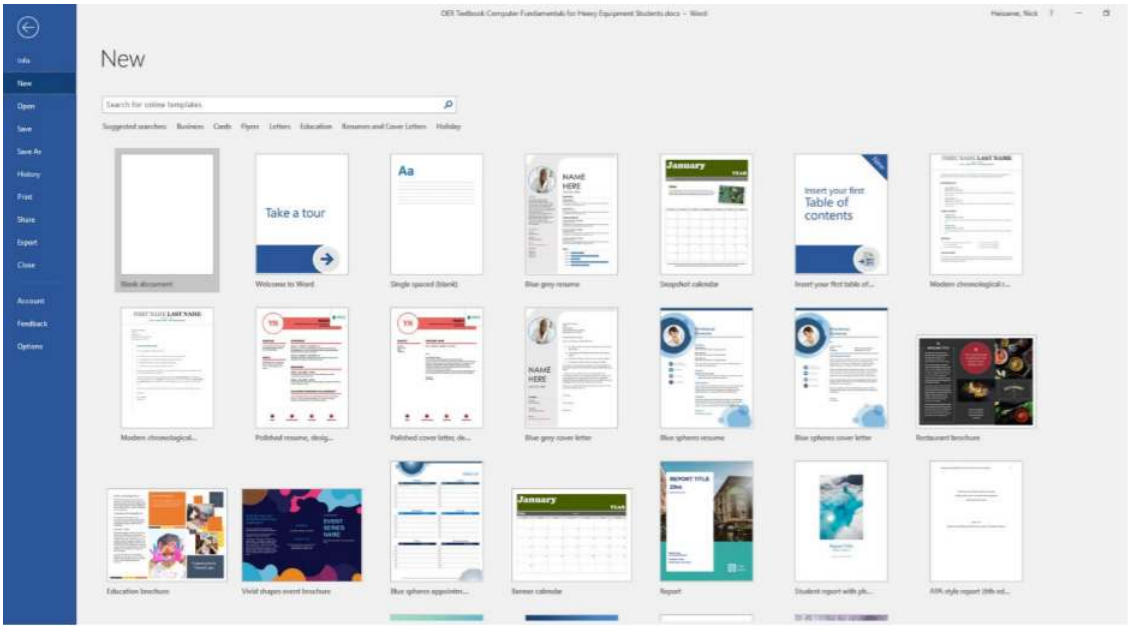
# 9.2: Starting an Office App

Let's begin by starting an Office App: Microsoft Word. To Launch Word, click on the Start Button on the Windows taskbar and locate Microsoft Word. You can quickly navigate to the application by pressing the “W” button. on the keyboard.




Microsoft Word will launch and display its first screen: backstage view. The backstage view presents the user with options to start a new document from a template or as a blank document. A blank document contains no pre-existing organization or formatting while a template provides the user with a document model that has already been formatted and organized for a specific purpose (such as a calendar.). For the purposes of this activity, click on the “Blank document”.

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# 9.3: Common Office Interface

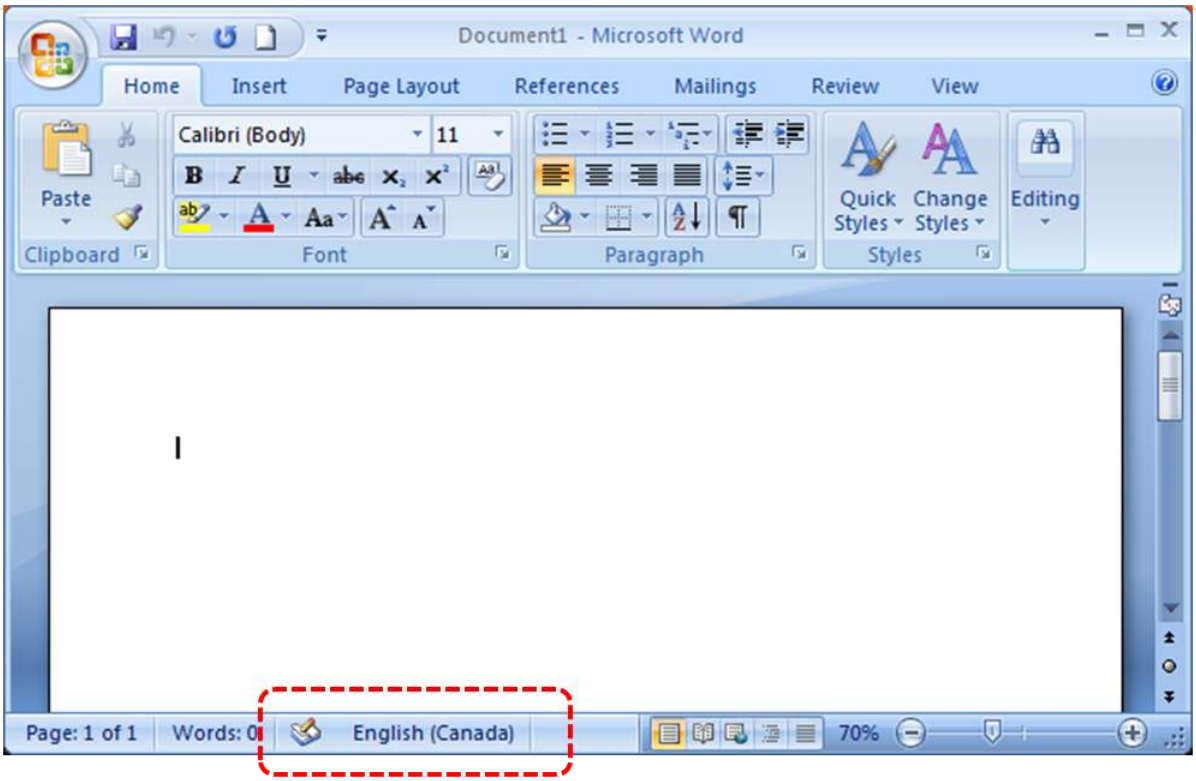


Figure 9.3.1: This Photo by Unknown Author is licensed under CC BY-SA

Each Office document contains common interface elements to help the user navigate the Application.

## Quick Access Toolbar

The Quick Access Tool Bar is in the upper left-hand corner of the screen. By default, save, undo, and redo are on the toolbar. More options can be obtained by selecting the downward arrow to access other commands.

## Office Ribbon

Like the Windows 10 Ribbon, the Office Ribbon Contains controls and menus that allow the user to manipulate the document they are working with. Each Office Application contains the ribbon, but the specific features of the Ribbon vary by application. Each office app contains the Home tab. The Ribbon can be customized using the command, located in the top right corner of the window.

## Title Bar

The Office Title Bar lists the name of the file and the Office Application that is being used. To establish a title for the file you are working on, save the file and create a specific name for the file. After saving, the file name will show on the Title Bar.

## Window Controls

Like Windows 10, Office Window Controls allow the user to minimize, maximize, and close the specific program. Minimizing a window removes the window from view. It can be returned to its current view by selecting the running application in the taskbar. Maximizing a Window makes it Fullscreen. The resize feature returns it to an open running window. Closing a window removes the program from active memory.

## Vertical Scroll Bar

Office documents can often be multiple pages or have information that cannot be displayed on one screen. The Vertical Scroll Bar allows the user to scroll-move up or move down throughout the document.

## Zoom Tools

Zoom Tools are in the lower right-hand corner of the screen. They allow the user to zoom in or magnify or zoom out to see a bigger picture of their document. Document zooming can be completed by the slider, or via the “+” or “- “buttons on the document. The zoom percentage is also displayed.

## Document information

Document information relevant to the Office Application is displayed in the lower-left and corner. In Microsoft Word, this information usually contains the number of changes and words. Excel displays mathematical results, and PowerPoint displays slide numbers.

## Rulers

All office documents can display vertical and horizontal rulers. These rulers can be hidden if a view setting is enabled. Rulers allow the user to see with fine precision their actual location in the document.

## Cursor

Like Windows, Office uses a cursor that looks like an arrow to select commands. Areas, where text can be entered, is shown with a straight cursor instead of an arrow. The straight line is known as the text insertion point.

## Work Area

Finally, the most important part- in the center of each Office Application is the work area, where the actual work and input is completed. This work area varies in appearance depending on the Office Application.

## Creating & Saving File in Word

In addition to common user interface elements, all Office Documents allow the user to open existing files, save files, and create new files in the File Tab. In addition to manual saves, Office has an autosave/recovery function that can automatically save your work in the event of a computer malfunction or “crash” To save a file in Microsoft Office, complete the following actions

1. Click the File tab on the Ribbon in the Upper left-hand corner.
2. A new screen (Backstage view) launches. On the left-hand side of the screen, choose “Save” or “Save As”. If the document has been previously saved, you won't have to select a save destination (e.g., desktop) or a file name--the existing file will simply be updated. Under "Save As", decide on your save location. Typical locations include "This PC" and OneDrive, but you can also click "Browse" to select a specific location.
3. Double-click your save location. This will take you to the file name screen.
4. In the file name screen, enter your desired file name.
5. Click “Save” to save your file.
6. Verify that your file was saved before closing the document. Office Applications will prompt you to save your file if it was not saved before closing as well.

## Viewing & Printing your work

Microsoft Office Applications all present common user interfaces to change the view of an application and print an application. While each office application has specific views, there are three common views in each Microsoft Office Product.

## Read Mode

Read mode is the default view when a document is set to read-only-this means that the viewer cannot edit the file. Read mode is also a helpful mode if the user wants to read the file in full screen without other interface elements of the office on screen.

## Print Layout Mode

Print layout mode allows the user to view the document is it would be displayed printed out on an 8 1/2X11 standard printer paper. It allows the most realistic view of the document's appearance if printed.

## Web Layout Mode

Web Layout mode displays the document to read like it would read if it was on a website. This is helpful if the destination of the document is on the internet to be accessed with a web browser. If the document is being created to display online, the user will want to make sure the layout will be compatible with this format.

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# 9.4: Getting Help

All Microsoft Office Product has a robust help menu. Usually, its location is the furthest right ribbon tab. There are a lightbulb and textbox you can enter text

that allows the user to type in what they want to do or know about. Using artificial intelligence, the Office can locate and often perform the command requested. When you do not know how to perform a command in Office, use the help box.

In addition, by hovering your mouse cursor over different screen elements, such as the ribbon, a ScreenTip will often display; explaining the specific feature or purchase for the element.

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# 9.5: Sharing

Document sharing and collaboration is a central feature in the Office Suites. By clicking on the

Share Command in the upper right-hand corner of the screen, you can share your document electronically with others. By sharing the document, you can choose whether to allow others to collaborate with you on the document-collaboration allows multiple users to work on the document simultaneously, increasing efficiency and creativity. A difference between sharing the document and sending the document in an email or via disk is that the most current version of the document is always accessible to the user. This means that if you shared the document with another colleague, and the next day discovered a typo that needed correction, you could simply correct the typo and that change would be reflected when your colleague viewed the document. In addition, sharing is more secure because you can always remove permissions to view the file whereas an emailed file can never be recovered. Sharing a document provides more control and security for the user.

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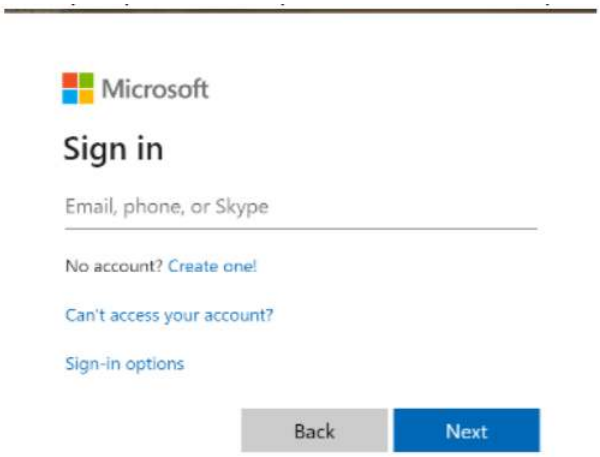
# 9.6: Office 365 Web Versions

An Office 365 subscription includes web-based versions of Outlook, Word, Excel, PowerPoint. In addition, online access to OneDrive provides online storage saves these files in the cloud so these files may be accessed anywhere. In addition, online outlook, word, excel, & PowerPoint by default only access files from the cloud unless a file is manually uploaded or attached to the web application.

## Getting Started

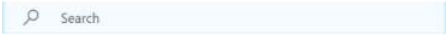
To login to Office 365 web applications, visit www.office.com. Click the "Sign in"

button. You will be sent to the Office Login Screen. Log in with your username and credentials or create an account. Enter your password. Keep in mind the Office 365 passwords are case sensitive.



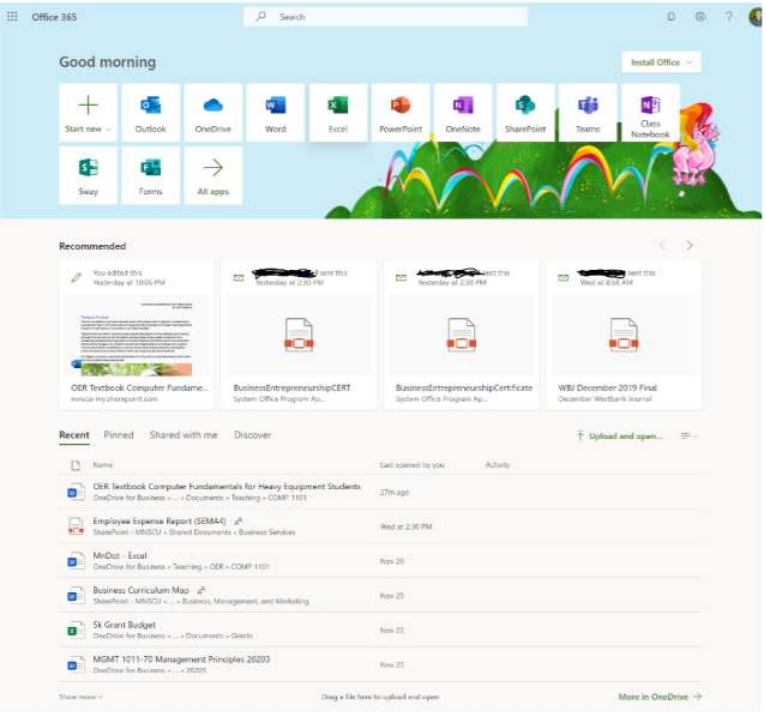

After successfully logging in, an Office start screen is displayed. This start screen provides shortcuts to all your Office applications that have web versions. In addition, files in One Drive which had been recently accessed are automatically displayed. This screen provides much functionality, so we will define all the screen elements below.

Office 365 Application picker allows the user to specify which web application they would like to use.



Search Bar: Allows the user to search for any file saved to OneDrive.

Notification Center: Allows the user to view any notifications they may have received- for example, receiving a shared document, another colleague editing your document, etc.




Settings Menu: Allows you to change the visual appearance of Office, customize your notifications and change your passwords.

Help Menu: Search the Office 365 Knowledge Base for Help. Install Office button allows individuals with an Office 365 subscription may click on this icon to download a free Windows 10 Office Application.

Start new allows the user to create a new Office Document on the web.

Outlook Email, Calendar, and Contacts Application. More information will be provided about this web application in the next section.

OneDrive in the cloud allows a user to view and share all their uploaded files. More information about one drive will be provided later in the text.

Microsoft Word online is a word processing tool. More information will be provided about Microsoft Word in later chapters.

Microsoft Excel online is a spreadsheet and calculation tool. More information will be provided about Microsoft Excel in later chapters.

Microsoft PowerPoint online is a presentation tool. More information will be provided about Microsoft PowerPoint in later chapters.

Microsoft OneNote is a notetaking and list building application. This text does not provide instruction for Microsoft OneNote, but it does have a similar interface to Microsoft Word but has limited functionality.

Microsoft SharePoint online is used in the organization as a hub to share information and files. It allows departments to privately collaborate on documents and communicate with each other. This text does not provide instruction for Microsoft SharePoint.

Class Notebook is a shared note-taking web application that is available to educational institutions and students using Office365. This textbook does not provide instruction for the Class Notebook.

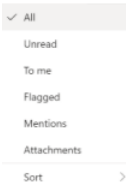
Microsoft Teams online is a collaborative application that allows groups of individuals working on a project to chat, schedule meetings, share and work collaboratively on documents, and communicate in private groups. This textbook does not provide instruction for Microsoft Teams.

Microsoft Sway is a new application from Microsoft Office that makes it easy to create and share interactive reports, personal stories, presentations, and more. This textbook does not provide instruction for Microsoft Sway.

Microsoft Forms allows users to create secure web forms that can be used inside or outside an organization to obtain information from others. This textbook does not provide instruction for Microsoft Forms.

Click here to access all other less frequently used Microsoft Online Applications that are available as part of the Office 365 subscription.

## Microsoft Outlook Online




The Outlook online application is divided into a three-column view. The column on the left consists of different mailbox folders. You can use mailbox folders to better sort your messages, so they are easy to find. You can create a new folder at any time by clicking on the "New Folder" New folder link. Clicking on the icon hides the left column. Above the left column is the New message New message link which allows the user to create a new email message.

The center column is where you organize your messages that you receive. There are three default views above your messages that allow you to sort your messages: "Focused" or "Other". Focused Other Filter. The "checkbox" icon selects all your messages. The "Focused" icon only shows you messages that Outlook's artificial intelligence filters as important to you. The "Other" icon usually displays items Outlook believes are junk mail or email that is not important. The "Filter" icon allows multiple ways to sort your messages as described in Figure 2.

The right column displays the content of a selected email. To select the email, you may click on the message you wish to view. The message will display with the name of the person and picture of them (if this information is entered your contacts, and some message options: 1 . 1. Sends a response to the sender that you "liked" the message. Replies to the message. Replies to everyone who was sent the message if you were part of a group email. forward the message that was written to you to someone else. Contains less frequently used settings for the message like to mark it as unread, to delete it, to mark as junk, print, show message details, Flag, or block the sender. If you choose an action to reply or forward the message, you will enter the message authoring text box.

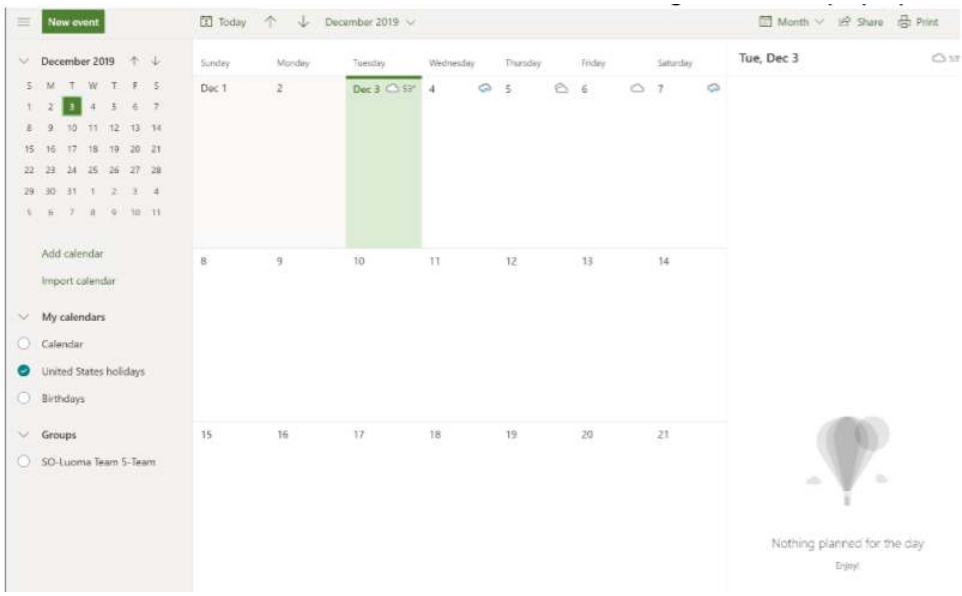
The message authoring text box will appear in a separate box above the email you are referencing. In addition to being able to type your message, it has a few options to change the text size, font, formatting, and text effects of the email through a toolbar at the bottom of the screen.

Students are encouraged to experiment with the text functions. These functions are also available in Microsoft Word which will be discussed in a later chapter. At the top of the textbook authoring window are options to send the completed message, discard or delete the message, attach a file to the message, insert an image or an emoji. Send Discard When writing an email, please use professional language and write in alignment with proper web etiquette- this means no writing in caps or using slang or acronyms like "lol".

At the bottom left corner of the outlook window are additional features; . The mailbox is the email application that was previously described. Clicking on the other icons will allow the user to view their calendar, contacts list, and tasks list.

## Outlook Calendar

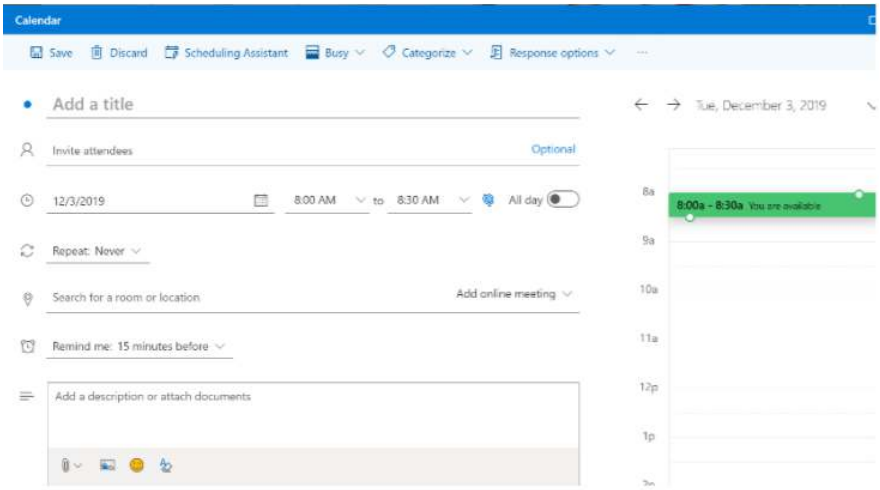
The Outlook Calendar retains the same three-column navigational design as the email application. The left column provides the user with multiple calendars of specific events and sub-calendars. The center column allows the user to select certain calendar views. The right column displays specific event details.




Clicking on "New Event"

Will allow you to create a new calendar event. When creating a new event, you are permitted to create a title for the event, invite other attendees (which will send a calendar invitation to their email address and display if they accept the invitation on their calendar), choose the time and date and location, as well as make it a one-time meeting or a repeating meeting, such as a weekly staff meeting. You can also view your calendar to find available times that do not conflict with other meetings, schedule a time to be reminded, and add a description of the meeting or attach documents, such as a meeting agenda to the appointment. Clicking on the menu at the top of the window allows other useful features:

. *"Save"* allows for the invitation to be saved and sent to others if invited. "Discard deletes the calendar appointment. *"Scheduling Assistant"* allows you to search for an open day and time on every person whom you have invited if everyone is using Office 365 as their email client. Scheduling assistant will not show details of the other schedules but will show busy and free time. *"Busy"* settings allow you to customize the type of appointment, for example, you could create a calendar appointment to complete paperwork at the office desk at a certain time but still want to be open for meeting if needed, so you could create an appointment "Work at my desk" and mark it as "Free" instead of busy. *"Categorize"* allows you to classify meetings by color if you choose to do so. Finally, "Response options" allow you to specify what options recipients of a calendar invitation would have available to them.




## Contacts

You may also want to review your contact list in Outlook as well. Contacts are useful to maintain for individuals whom you may need to work with have to be able to reach. You may maintain any contact information you find helpful in Outlook Contacts including your contact's name, email, company, title, phone number, address, birthday, picture, etc. The Contacts Application continues the three-column view with the left view being a place to sort your contacts into groups, the middle list containing all your contacts in a group, and the right column providing the details of a selected contact on the right. At the top of both columns in your menu bar.

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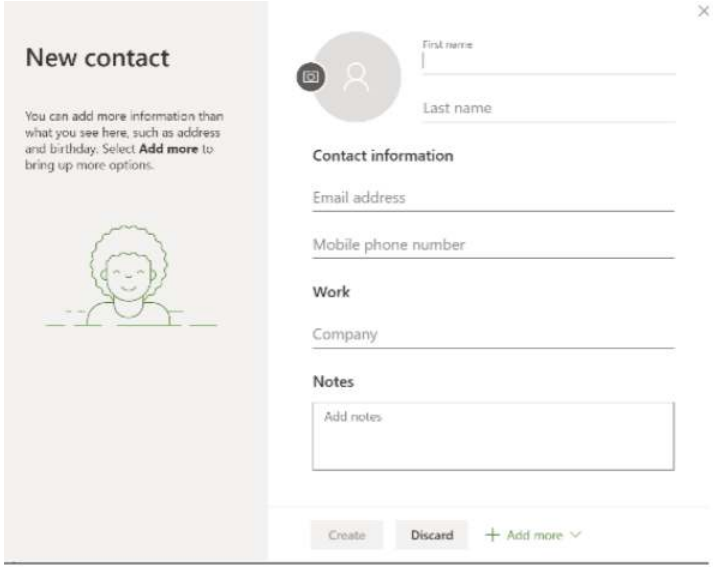



*New Contact* allows the data entry of a new contact. A variety of contact information is available. If you do not see the information you wish to enter click *Add more* at the bottom right of the screen.

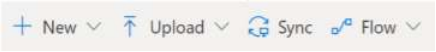
*Add to favorites* allows you to select a contact to favorites. You would perform this action is you wished to reference this contact information frequently.

*Edit* allows you to edit a contact's information.

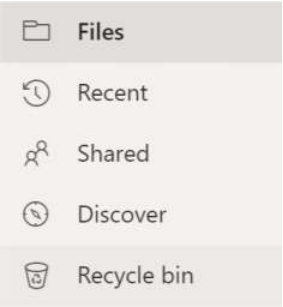
*Delete* allows you to delete a contact form your list.

*Add to list* adds a selected contact to a specific folder of your choosing to better organize your contacts.

## Microsoft OneDrive

Microsoft OneDrive contains all your applications stored in the OneDrive cloud. Files in OneDrive may be accessed anywhere you have an internet connection. The user interface of Microsoft OneDrive maintains a two-column setup. The left column is the navigation bar that helps the user navigate the directory of OneDrive to find the specific location of their files or folders. The Center column displays the actual files. Clicking on a file will display the file in the appropriate web application in a new browser window. Files can be uploaded to OneDrive by selecting *Upload* from the top menu 

and selecting the proper file. You may also create a new file to save to OneDrive by selecting New.



The left navigation pane displays different file views in OneDrive. Files view allows the user to search the folder directory that they have established, like using Windows Explorer in Windows 10. Recents allows the user to view files they have more recently accessed or edited. Shared displays files that were shared by or shared with the account user. Discover allows the user to view files that were recently edited by others that may relate to the user. OneDrive uses artificial intelligence to determine which files to view. Finally, the Recycle bin provides the user with files that were most recently deleted. Files are purged from the Recycle bin after 90 days. The user may also manually delete these files permanently by clicking on the Empty recycle bin icon

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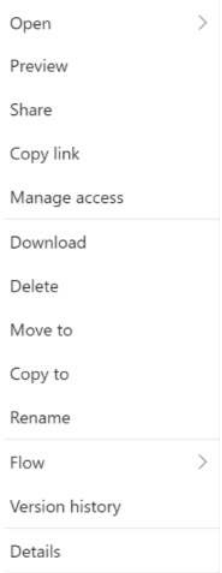

The right navigation pane displays your files. Hovering the mouse cursor over a specific file will highlight specific commands to the user-*Share* and *More Options*. *Share* allows a user to share online access to the file to another user to view or edit. This is helpful when working collaboratively. As previously discussed, sharing is also more secure and convenient, because the recipient will always be able to view the most recent changes made to the document, and the person who shared the document always has control over who can and cannot always view or edit the document. More options bring up a menu to perform a variety of functions on the document.

## Summary

Office 365 Web Applications provide the user with the most frequently used controls in a similar user interface to the Office 365 Windows 10 Applications. The convenience of working on the web allows for any computer anywhere with an internet connection

to access the power of Microsoft Office. Now that you have a familiarity with Microsoft Office, it is time to explore the features of the Windows 10 applications, beginning with Microsoft Word.

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# 9.7: Checking for Understanding

1. Students will describe the types of commonly used Office Applications and what they are used for.
2. Students will send an email with an attachment in Outlook web.
3. Students will create a calendar event and invite a classmate to the event in Outlook web.
4. The student will create a contact in Outlook web.
5. The student will upload a file to OneDrive and share it with another classmate.

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# CHAPTER OVERVIEW

## 10: Introduction to Microsoft Word

Microsoft Word provides users with a balanced approach to usability- the application is easy to use so the user can begin working on a document immediately, or sophisticated enough to write complex textbooks, professional business reports, and novels using its features. This chapter provides an overview of using the basic features of Microsoft Word to construct a document.


10.1: Introduction to Word Processing Software
10.2: Starting a Document
10.3: Saving a Document
10.4: Selecting Text
10.5: Formatting Text using the Mini-toolbar and Ribbon
10.6: Using a Document Template
10.7: Checking for Understanding



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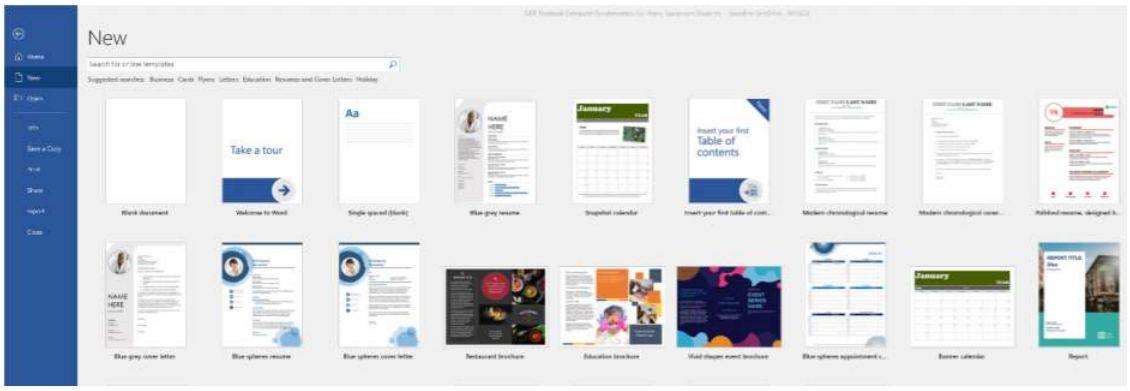
# 10.1: Introduction to Word Processing Software

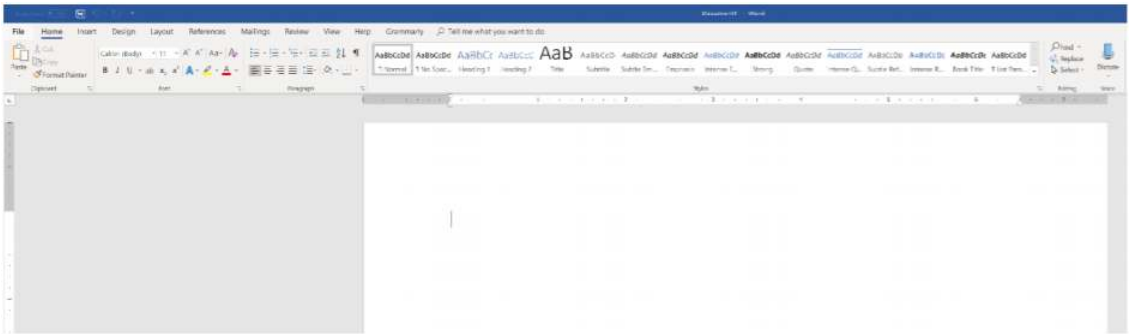
A word processing program is a software program that includes tools for entering, editing, and formatting text and graphics. The electronic files you create using Word are called documents. One of the benefits of using Word is that document files can be stored in a variety of places on your computer, or in the cloud using one drive, and easily shared with others via disks, emails, or online file storage. Microsoft Word allows users to accomplish the following tasks.

- Type and edit text.
- Copy and move text from one location to another in the document, or to other documents.
- Format text and paragraphs with fonts, colors, pictures, tables, and many other tools.
- Design pages for specific purposes- from personal letters to sophisticated memos and reports.
- Enhance documents for readability with pictures, charts, graphics, etc.
- Use mail merge features to quickly and easily send customized communications to customers.
- Share documents securely to others.
- Communicate clearly and professionally with others by using the built-in tools of Word.

Now that you are aware of some of the uses for Microsoft Word, let's get started by creating a new document. Launch Microsoft Word and click on “Blank Document”.




Take some time to explore the user interface. A few notable features of Word include:



- Title bar: displays the name of the document and the name of the program. Until you give a new document a different name, its temporary name is Document 1. The left side of the title bar contains the Quick Access toolbar, which includes buttons for saving a document and undoing, redoing, and repeating a change. The right side of the title bar contains the Ribbon Display Options button, which you use to hide or show the Ribbon and tabs, the resizing buttons, and the program Close button.
- The File Tab provides access to Backstage view where you manage files and the information about them.
- The Ribbon contains the Word tabs. Each tab on the Ribbon includes buttons for commands related to editing and formatting documents. The commands are organized in groups. For example, the Home tab includes the Clipboard, Font, Paragraph, Styles, and Editing Groups. The Ribbon also contains the “Tell me what you want to do” box, which you can use to find a command or access help. The ribbon also contains the share command, which you can use to easily share documents.
- The document window displays the current document. This is the space you are working inside.

- The rulers only appear in the Print Layout view. The horizontal ruler displays left and right document margins as well as the tab settings and paragraph indents, if any, for the paragraph. The vertical ruler displays the top and bottom button margins.
- The vertical and horizontal scroll bars are used to navigate inside your document. They contain arrows to help you navigate the document.
- The status bar displays the page number of the current page and the total number of pages and words in the document. It also displays spelling and grammar checking.
- The view buttons on the status bar allow you to adjust the view, toggling between print layout, read mode, or web layout view. The Zoom slider allows you to zoom in and out of the document.

In the document window, you should see a blinking cursor. This is known as your “insertion point”. Your insertion point is where text or objects we are placed in the document. You can change the insertion point using your arrow keys or mouse.

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# 10.2: Starting a Document

Before beginning to use Microsoft Word, your first step should be to take some time to plan your document. Better document planning will save you time and ensure your document is written to the correct audience with the right message and visual appearance. Some aspects to consider before writing a document include:

- Purpose of the message- why are you sending the message?
- Who is your audience? What type of writing or visual style will appeal to them?
- What type of communication will you send? Will it be a newsletter, professional letter?
- Will you need outside information like graphics or charts?
- Is there any research you need to conduct before beginning to write?

Now that you have a plan, let's write a document.

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# 10.3: Saving a Document

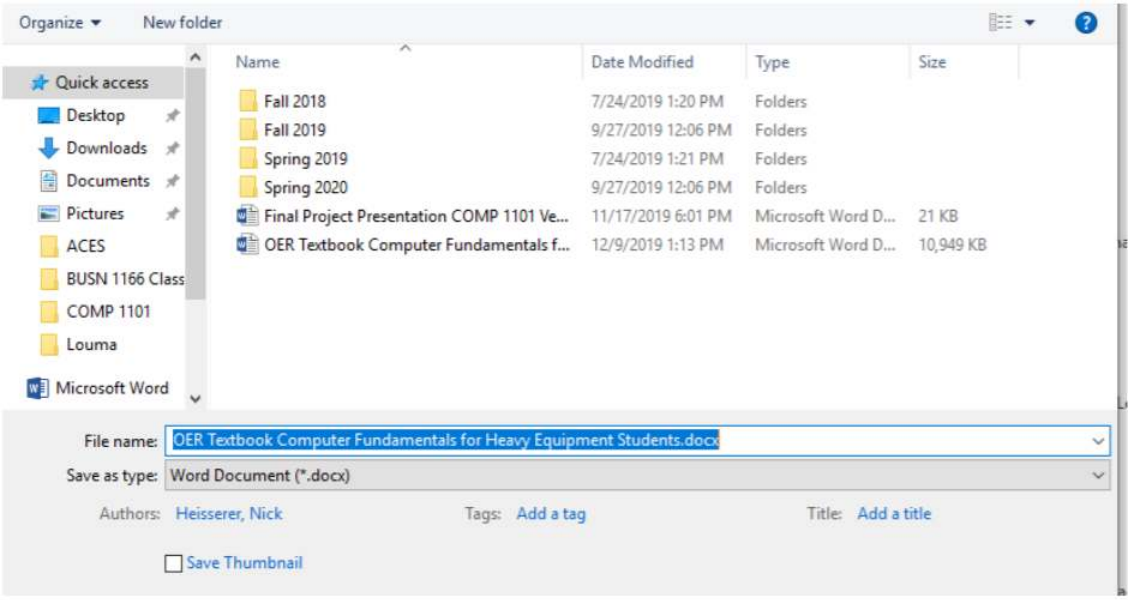
Once you have successfully entered text into your document, you should get into the habit of saving work. Saving your work often is a good idea in the event of a computer error or power outage that could cause you to lose your progress. While Word does have an Autosave feature that can be helpful to recover most of your document, saving your work regularly is the sure-fire way to make sure your work is not lost.

To save your work in word, you can do one of the following:

- Keyboard Shortcut: “Control + “S”
- Quick Access Toolbar: Use the Disk/icon in the upper left-hand corner of the screen.
- Backstage View: Click on “File” in the Ribbon and navigate to “Save” on the left side of the backstage view.

## Difference between “Save” and “Save As”

Microsoft Word has two different Save commands: “Save-As” allows you to name the file and save it in a location of your choosing. “Save” keeps the same file name and location. If you have never saved a file before, pressing “Save” will take the user to the “Save-As” menu of options. When completing the “Save As” command, Word will also allow you to save the document as another file type, like a portable document format (pdf) file, or other types.




1EXAMPLE OF THE "SAVE-AS" DIALOG BOX.

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# 10.4: Selecting Text

Microsoft Word allows the user to manipulate text by “left-clicking” on the insertion point and continuing to hold the left click and moving the mouse around the document to the selected text. When text is highlighted, you can perform multiple actions with the selected text using the ribbon & minitoolbar by “right-clicking” on the selected text. When text is selected, a blue highlight will be displayed over the text.

This·is·an·example·of·Word·highlighting·selected·text.¶

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# 10.5: Formatting Text using the Mini-toolbar and Ribbon

Selected text can be manipulated by using the mini-toolbar or ribbon. The mini-toolbar is displayed when you “right-click” on the selected text. “Right-clicking” in Microsoft Word provides the user with quick actions like “Copy”, “Cut”, “Paste”, Changing the Font, Paragraph Settings, Synonym Tools, and many other quick actions.

The most common and powerful methods available to users is the Ribbon in Microsoft Word.

The Ribbon in Microsoft Word provides the user with organizational groupings of many different commands and controls to change and manipulate text. The various groupings are below:

## Home Tab

The Home Tab contains the most commonly used document controls; actions in the Home Tab can change the font and size of the text, paragraph, and line spacing, copy and paste, change the organizational structure of the document.

## Insert Tab

The insert tab allows the user to insert any number of items that were not originally included in the Word document and that cannot be entered by keyboard entry. Examples include page breaks, pictures/shapes/icons, charts, links, bookmarks, comments, headers and footers, page numbers, Word Art, Drop Caps, Equations, Symbols, Signatures, Dates, and Other Objects (like other office documents).

## Design Tab

The Design Tab has features that allow the user to change the overall appearance and structure of the document with Themes. Creating customized colors, fonts, and paragraph spacing is also on this tab. Finally, this tab allows the user to create Watermarks, adjust the Page Color and Page Borders.

## Layout Tab

The Layout tab provides the user with edit controls to the physical characteristics of the document when it is printed. Examples of tools available on the Layout Tab include margin adjustment, orientation (Portrait or Landscape), changing the size of the page to accommodate other paper sizes, inserting columns or line numbers, changing indentation or position of text, and aligning text with other graphics/figures.

## References Tab

The References Tab is utilized especially for research papers and long word documents. The Reference tab allows the user to build tables of contents, inserting citations, managing a bibliography, inserting captions, or creating indexes. Research papers often require sources to be cited in a specific way, and the Reference Tab in Word makes this easy.

## Mailings Tab

The mailings tab is used to make it easy for the user to send out customized documents to individuals via mail. The tab has a wealth of features for this activity, like a mail merge feature, custom text blocks that can be changed depending on the database they are pulled from. It is possible to use Word in conjunction with an address list in excel to create customized documents with individual characteristics (like the person’s name, title, address, etc.” that are printed.

## Review Tab

The Review Tab provides essential features to use in Word after a first draft has been created. The Review Tab contains Spelling and Grammar Review, Thesaurus, Word Count, Text to Speech, accessibility checker, translation functions, document comment and

review features, and comparing versions. Finally, the Review Tab may also be used to “Ink” the page by drawing on it and restricting editing to the document.

## View Tab

The View Tab allows the user to change how they may view the document. In addition, they can choose what type of features are viewable in Microsoft Word. Users can change the view mode between reading Mode, Print Layout Mode, Web Layout, Draft and Outline views. In addition, they can choose whether to display one page or multiple pages at a time and adjust how large or small documents are. Finally, they can create Macros, which are user-programmed shortcuts that can be used in specific documents in the View Tab.

## Help Tab

Couldn’t find what you were looking for? If nothing else works, clicking on the Help Tab will allow the user to show training and search for the related topics.

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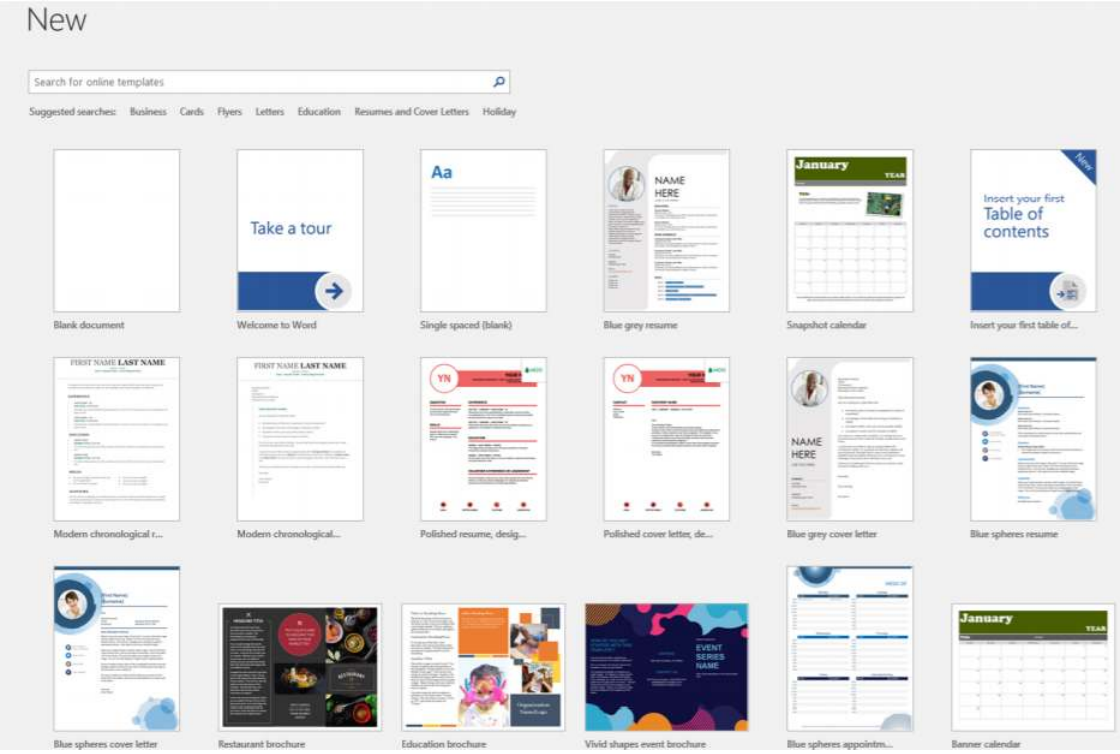
# 10.6: Using a Document Template

While many users prefer to begin their work with a blank web page, word has many templates or preformatted documents that make it easy to create a Résumé or a Flyer. To create a template, click on the File tab of the Ribbon, and then “New”.




Word will then showcase all the available templates. Users may also search online for templates in different styles or formats. There are so many templates available, the most important aspect for the user is to find one that meets their needs.

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# 10.7: Checking for Understanding

1. Describe the main features and purposes of Microsoft Word
2. Create a New Blank Document, Format text in the document, and Save the document as a .pdf
3. Create a document from Template and Save the document as a new file.
4. Describe three (features) of each organizational tab in Microsoft Word.

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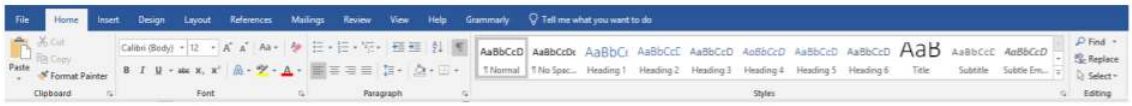
# CHAPTER OVERVIEW

## 11: Exploring the Home and View Tab of Microsoft Word

The Home Tab contains the most commonly used document controls; actions in the Home Tab can change the font and size of the text, paragraph, and line spacing, copy and paste, change the organizational structure of the document.




The Home Tab is grouped into four distinct areas: Clipboard, Font, Paragraph, and Styles.


- 11.1: Clipboard
- 11.2: Font Group
- 11.3: Paragraph Group
- 11.4: Styles Group and editing Tab
- 11.5: View Tab
- 11.6: Checking for Understanding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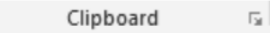
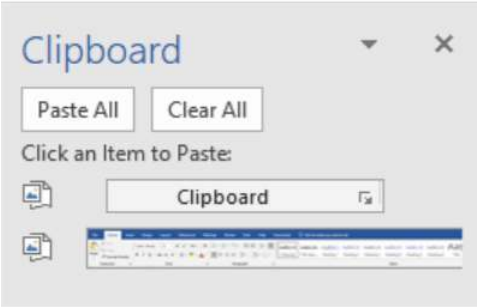
# 11.1: Clipboard

The main function of Clipboard is the Cut, Copy, and Paste feature. All Office Applications share a Universal Clipboard. This means that items that are copied in Windows 10 can be shared between Office Applications. You can view the Universal Clipboard by clicking on the clipboard box with an arrow facing down and to the right 

in Word. A new navigation pane will open on the left side of the screen. It will display all the items that you have cut or copied in Windows 10 recently. This allows you to work with multiple items you have pasted




In addition to the Clipboard Navigation pane, users can also utilize Format Painter

. Format Painter allows the user to copy the text size, fonts, and any other formatting, to another selected body of the text. To use the format painter functionality, users should select the text they would like to copy, and then click on “Format Painter”. Then select the text they wish to change. Users may also doubleclick on “Format Painter” and change as many text selections as they would like. When they have completed changing the text selections, they can click on “Format Painter” to stop. While Format Painter is a useful tool to change selected text, the Font groupings of the Home Tab have many more features.

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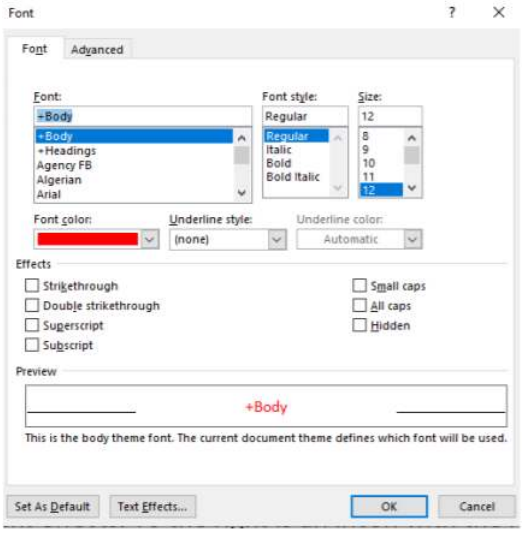
# 11.2: Font Group

The Font group provides unlimited customization of text. It allows users to change the font or style of the text, the size of the text, provide text emphasis, and even change the colors.

Beginning in the upper left-hand corner, the Font Selection Box and Text Size boxes allow customizations of hundreds of font designs and text sizes. The capital "A" button on the right allows the user to gradually increase the text size with the smaller capital "A" button next to it on the right decreases the text size. The capital "Aa" button to the right changes the case of the text. Using this feature, selected text can be made into lower case, UPPER CASE, Capitalize Each Word, tOGGLE eACH cASE, and regular Sentence case. Finally, in the button to the right that appears to have an "A" with an eraser removes all the formatting's from the Font menu. The lower row of the Font group contains **Bold**, *Italics*, and Underline (without underline options for line thickness). Next to these commonly used emphasis tools are strikethrough (which places a line in the text), subscript (which types small letters under the text), and superscript (which types small letters above the text).Next to subscript and superscript is an outlined letter "A" which allows the adjustments of text effects and typography to create shadows for other text effects. To the right is an icon with the letter's "ab" with a pen . This is the highlighter option which allows the student to choose between multiple colors to highlight the selected text. Finally, to the right of the highlighter menu is an icon of the letter "A" with a line underneath . This control allows the user to change the color of any selected text with an almost infinite number of color options. By clicking on the arrow pointing down and to the right in the Font group, an expanded menu with even more options will launch, allowing the user with many more text customization options, as well as the option to set default text options and effects.

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# 11.3: Paragraph Group

The Paragraph Group focuses on arranging text in a paragraph. Users may create lists, adjust the indentation, sort items, show paragraph formatting, correctly, align text in a paragraph, adjust line spacing, add fill color in shapes, and create borders.

## Bullet Lists

Starting in the upper left corner are bullet lists . Bullet lists should be used when creating a list of similar items that do not require any order. Clicking on the drop-down arrow allows for customization of the appearance of bullet lists. Pressing “Tab” on the keyboard will indent a list item and create a sub bulleted item.

## Numbered Lists

To the right of Bullet, Lists are numbered lists . Numbered lists are like bullet lists, but they should be used when listing out a sequence of events that must be followed in order. Clicking on the drop-down arrow will allow for customization of the numbered list. Pressing “Tab” on the keyboard will indent a list item and create a sub numeral.

## Multi-Level Lists

To the left of Numbered Lists are Multi-Level Lists . Multi-Level Lists provide more customization of lists and sub-lists to the user.

## Increase/Decrease

Indent Next on the right, the increase/decrease indent icons allow the user to move the selected text to the right or left five spaces, or to the next tab setting. Increase/Decrease indent also changes the hierarchy of the list. Increasing an indent to the right will make an item a sub-bullet or sub-number of the item above it and decreasing indent to the left will do the opposite.

## Sort

After an increase/decrease indent is the Sort icon allows the user to arrange a current selection of text in alphabetical or numerical order. It is usually used when working with tables in Microsoft Word.

## Show/Hide Paragraph Formatting

Finally, in the top right corner of the paragraph group is the Show/Hide Paragraph Formatting icon allows the user to view all the hidden formatting options that are currently attributed to the document. This is useful if the formatting seems incorrect in a document and the user is trying to investigate it. Any formatting displayed is not printed.

## Paragraph Alignment

The bottom row of the paragraph group begins with Paragraph Alignment settings . The settings align the selected text to the left side of the screen (which is standard formatting), centered (which is common for titles), right-aligned, and justified, which distributes text evenly between the margins. Most word documents are written with left alignment, so that is the default settings.

## Line & Paragraph Spacing

To the right of the paragraph alignment icons is Line & Paragraph Spacing . These settings allow the user to choose how much space exists between lines and between paragraphs. This is helpful to enhance the readability of paragraphs by creating enough space between sentences and paragraphs. For more customization, users can click on “Line Spacing Options” in the drop-down menu for even greater controls.

## Shading

The Shading function to the right of Line & Paragraph Spacing allows the user to change the color behind a paragraph, table, or selected text. It can be used in flyers and more creative word documents.

## Borders

The Page Borders icon allows the user to create borders around selected text and/or paragraphs and define the type of borders from the drop-down menu. There is every type of border imaginable for the user. Borders are usually created to create distance or space between separate ideas or paragraphs.

## More settings

Users who desire more control in paragraph formatting can click on the arrow icon facing down and to the right. . This will launch a more settings menu that will provide customization of the line & paragraph spacing and page breaks.

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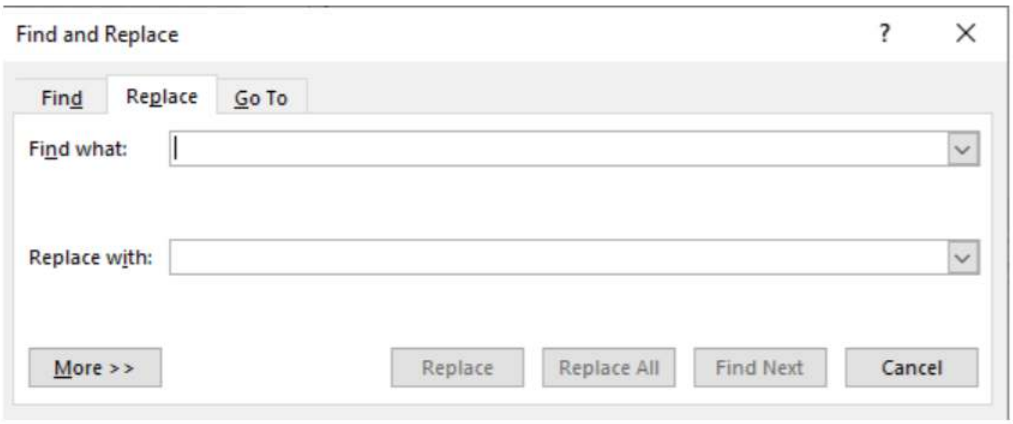
# 11.4: Styles Group and editing Tab

The Find/Replace/Selection Pane allows you to search for any text in Microsoft Word and replace the text with another text entry. Clicking on the "Find" menu will display a side navigation bar allowing the user to find any word or phrase in the document. Clicking on the Replace icon will launch a Find and Replace Dialogue box which will allow the user to replace specific text with different text. For example, I wrote a five-page paper on arc-welding, and discovered that arc-welding should be changed to the word "robotic arc welding", I could use find and replace to automatically replace every phrase "arc welding" with "robotic arc welding".




Finally, the Select icon allows the user with more options in selecting text and or objects in the document.

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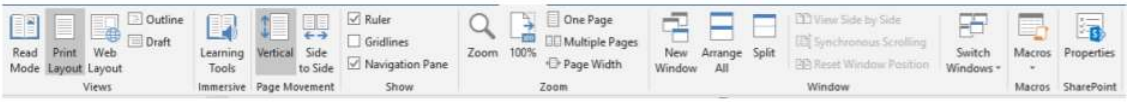
# 11.5: View Tab




Microsoft Word provides a variety of options to view their document for the user to customize their workspace. *Read Mode* allows the document to be viewed without any editing tools available in Fullscreen mode. *Print Layout* simulates what the document would look like if the document were printed. It is the default view mode in Microsoft Word. Web Layout simulates the view of the document if it were on a web. *Outline* mode is for a way to quickly insert ideas on the page, while *Draft* allows the user to just see the text in the document.

*Learning Tools* allows the document viewer to customize the way the document is presented and read to them. It allows the user how text and pictures are displayed. Users can also determine whether to display the *Ruler* on the top and left sides of the workspace, *gridlines* on the document to make it appear like graph paper, and the *navigation pane* on the left-hand side of the document. The user can also Zoom in or out, and have the document automatically be adjusted to the display size of one page or multiple pages. Users can even open a new window of the document to work in two different places at the same time, or split the document at the insertion point to work in multiple sections at the same time in the document. Finally, Word users can click on the *Switch Windows* icon on the screen to switch between open word documents, and *Record Macros*, which allow the user to create their shortcuts by recording actions on the screen and creating a shortcut to perform everything they previously did. When they need to replicate that task, they can enter shortcut and the Macro would be initiated. Macros are for advanced users and not covered in detail in this text.

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# 11.6: Checking for Understanding

1. Create a flyer that provides a visual example of every feature on the home tab.
2. Create an instruction manual to operate a large truck using four headings and two (2) bulleted lists.
3. Copy a news article from the New York Times. Paste it into word. Use Replace to change every word “The” to “Green”
4. Create a “For Sale” add selling equipment from your employer. Make sure to adjust paragraph spacing to two (2). Make sure to view Gridlines, the Ruler, and Navigation Pane in your document.

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# CHAPTER OVERVIEW

## 12: Using the Insert Tab in Microsoft Word


12.1: Introduction to the Insert Tab
12.2: Pages Group
12.3: Tables Group
12.4: Layout Tab
12.5: Illustrations Group
12.6: Document Item Group
12.7: Add-ins Group
12.8: Media Group
12.9: Links Group
12.10: Comments Group
12.11: Header and Footer Group
12.12: Text Group
12.13: Symbols Group
12.14: Checking for Understanding


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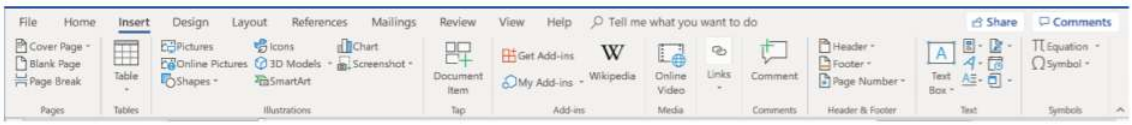
# 12.1: Introduction to the Insert Tab




The Insert Tab allows the user to insert a variety of items into their document. In contrast to the Home Tab which provides controls for the user to manipulate and adjust their entered text, the Insert tab allows the users to add items to the document such as new pages, tables, graphics, document items, Microsoft Word add-ins, video, comments, header/footer, text boxes, and Symbols. Just like the Home Tab, all functions of the Insert Tab are placed into groups that are described below.

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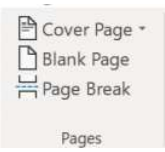
# 12.2: Pages Group




The Pages Group contains features to insert a Cover Page, Blank Page, or a Page Break to your document. Clicking on Cover Page will launch a drop-down menu allowing the user to choose from a variety of cover page templates to place as the first page or cover page of the text. After the templates are selected, the user must enter text into the appropriate fields. The Blank Page command inserts twopage breaks, one above and one below the cursor's current position. The user selects to insert a Blank Page break when they want to ensure one entire page of space between paragraphs. Finally, the Page Break command inserts a Page Break just after the insertion point. A Keyboard shortcut for a Page Break is Ctrl + Enter. The Page Break command is used to ensure the next text after the insertion point is on a new page.

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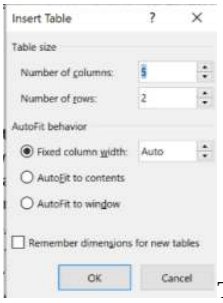
# 12.3: Tables Group

The Tables Group has one icon with many features. Clicking on the Table icon will launch an additional commands dialog box below. Users will have the option to insert a table by selecting how many row and column cells the table contains as the first option. Cells are the individual “boxes” that make up a table. Rows are groupings of cells that move left to right. Columns are groupings of cells that move up to down. A table can allow information to be shared with the reader in an easy to understand way. As an example, see the table below for a detailed example of all the table command options available to the user.

| Table Command | Function |
|---|---|
| Insert Table Command |   The Insert Table Command will allow the user to customize the number of columns and rows and determine whether they would like to size the table themselves with a fixed column with or allow Word to autofit the table to the specific text or window area. Word users may always resize the table by moving their cursor between the table cells until their insertion point cursor changes to a cursor with arrows pointing left and right. Clicking on the mouse at this point will allow the user to adjust the size of tables columns and/or rows. |
| Draw Table | Selecting the Draw Table command will change the cursor’s image from the insertion point to a pen. When the user selects a location with the pen and clicks the mouse, they can insert a table cell. |
| Convert Text to Table | Users can apply this command after selecting words they wish to place into a table. With the command entered, Word will attempt to place the text into the cells which it thinks is correct. It may still require the user to manipulate the table. |
| Excel Spreadsheet | Selecting an Excel Spreadsheet will allow the user to place a mini excel worksheet in their document at the insertion point. The excel document not only can appear as a table but can also be used to perform several calculations. |
| Quick Tables | Selecting Quick Tables will launch a variety of table templates from Microsoft Word, allowing the user to select from already created tables that have been formatted and choose the best one for their project. |

After the Table has been created it is easy to add additional rows/columns, resize the table, or add additional features and formatting. By using the primary mouse button (usually left-clicking) inside the table will add two additional modules to the Word

Ribbon: Design & Layout.

. In addition, using the secondary mouse button (usually right-clicking) brings up other shortcuts for the table that are found in the Design and Layout Tab.

## Design Tab

The Design Tab allows for manipulation of the appearance of the Table. In the Design, Tab is Table Style Options, Table Styles, and Borders Groups.

### Table Style Options

Table Style Options allow the user to allow to Program Word to understand the type of table that was created. Selecting Header Row will change the formatting of the top row to differentiate the shading and the font of the header row. Total Row will change the formatting and shading of the bottom row. This is usually selected if the table is displaying a total (such as the total cost of supplies in a table about supply costs. Banded Rows are always selected by default. Banded Rows indicates that every that the shading in every row will be alternated to provide better visual clarity of the table. First Column indicates that the First Column on the left of being shaded differently to provide visual separation from the table information. This can also be selected for the last column. Finally, Banded Columns are the exact same as Banded Rows, except that they apply to columns. Depending on the table created and the information in the table, there are many options to make the information in the table stand out to the reader.

### Table Styles

The Table Styles Group has two main options: to change the appearance and shading of the table and to manipulate the color options. Selecting the downward-facing arrow will launch a dialog box to provide the user with additional Table Styles with variations on color, spacing, and line thickness. Users can even create their own Table Style or edit a Table Style template. Finally, selecting the shading paint can button will allow the user to change the color of the cell.

### Table Borders

Table Borders allows the user to adjust the line thickness, color, and pattern of the table borders. Clicking on the downward arrows will provide even more options about Border styles, font size (default is ½ pt.) and Pen color. In addition, users can add or remove cell lines by selecting the Borders icon Finally, the Border Painter icon will change the cursor to a paintbrush. Word users may add page borders by directing the cursor to the border of a table to add a line or increase the darkness of the line.

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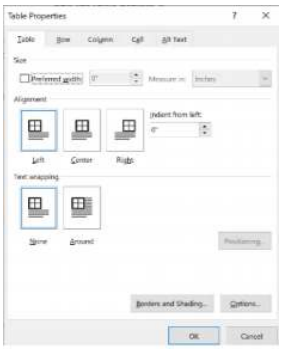
# 12.4: Layout Tab

In contrast to the design tab, the layout tab allows for manipulation of the table itself. The Layout Tab consists of the Table Group, the Draw Group, the Rows & Columns group, the Merge Group, Cell Size, Alignment, and Data Groups.

## Table Group

The Select button relates to the specific location of the insertion point in a specific cell in a table. Clicking on the Select icon will display Select Cell, Select Row, Select Column, and Select Table. Select Cells will highlight the specific cell. Select Row will highlight the entire row with the insertion point contained in it. Select Column will select the entire column. Finally, a select table will highlight the entire table. View Gridlines shows are hiding the gridlines of a table. By default, the gridlines are displayed in a table. Sometimes, the user wishes to not display these lines for cosmetic reasons. Finally, Table Properties allow for the manipulation of table formatting, row and column information, and allows the user to enter Alt Text, which allows users with screen readers to view information about the content in the table. Users can also adjust borders and shading and text wrapping in the table, along with preferred width of cells.




## Draw Group

The Draw Table group has two options, Draw Table and Eraser. Draw Table allows the user to use the mouse to draw custom table boundaries, including diagonal lines. The Eraser icon allows the user to remove table boundaries and lines to merge cells in order to customize a table.

## Rows & Columns Group

The Rows & Columns Group allows the user to insert cell rows or columns above, below, left, or right of the insertion point. Often when designing a table, new information requires a new row or column. Users can also do this by right-clicking on the table, but this can be a solution with more options.

## Merge Group

The merge group consists of Merge Cells, Split Cells, and Split Table. If a user highlights information in two adjacent cells, it will merge the information together in one cell that takes up the same area of space. Split Cells does the opposite, it separates one cell into multiple cells. Finally, Split Table allows a new table to be created beginning at the row that is currently the insertion point.

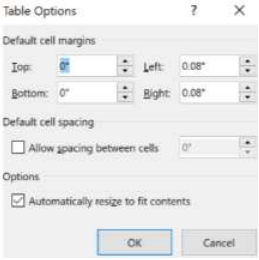
## Cell Size

Cell Size determines the length and width of each cell in a table. The first option is the Autofit command. Autofit allows the user to resize the entire table. It provides three options, Autofit Content, Autofit Window, and Fixed Column Width. Autofit Content allows Microsoft Word to automatically size the table to take up as little space on the page as possible. Autofit Window resizes the table

based upon the size of the window. Finally, Fixed Column Width allows the user to manually resize the table with the measurements to the right. Distribute Rows & Columns allow for an equal distribution of rows/columns in the table.

## Table Alignment

Table Alignment allows the user to orientate the text within each table cell top left centered, centered, top right centered, middle left alignment, middle center, middle right alignment, lower left alignment, lower-middle centered, and lower middle right alignment. The text direction allows the user to change the direction text is displayed. Text can be displayed by default as left to right, but it can also be up to down, right to left, and up to down.




Finally, Cell Margins allows the user to set up margins between cells, and left, right, upper, or lower indentation for text.

## Table Data

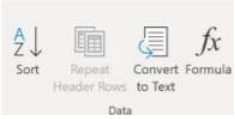



Table Data allows the user to use some features of Excel in a Microsoft Word table. Information can be sorted. If a table occupies more than one page, selecting Repeat Header Row will display the table header on the next page so the viewer can see the headings. Convert to Text removes all table formatting and automatically places each table row into paragraphs. Users may need to additionally adjust the table to ensure the data displays the way they would like it to after selecting this command. Finally, the formula allows for some features of excel to be used in their table to perform calculations.

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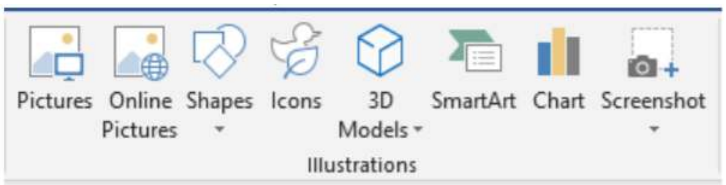
# 12.5: Illustrations Group




The Illustrations group allows the user to insert pictures or shapes within a document.

## Inserting Pictures

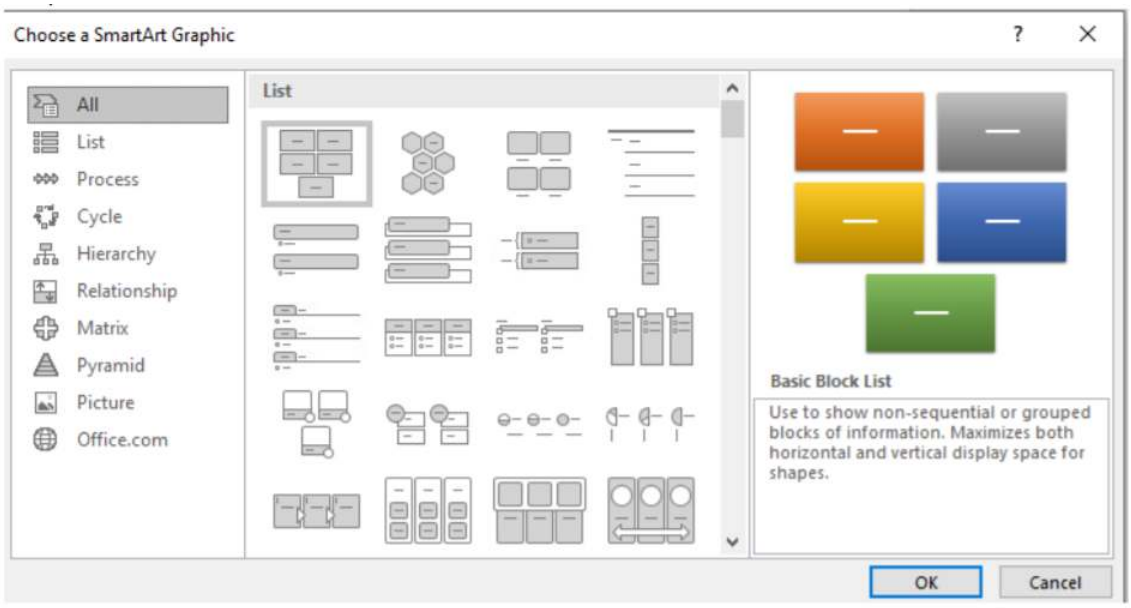
The first options are for pictures. Users can insert Pictures that are saved on their computer (or an external drive), millions of online pictures on the internet using Bing Search. While it is possible for users to find a picture on the web, save it to their computer, and place it in the document, using the Insert Online Pictures option is the best method because Microsoft Word provides the citation of the picture, so the picture is properly sourced.

## Inserting Shapes, Icons, & 3d Models

Clicking on the Shapes Icon will launch a drop-down menu of an assortment of shapes, lines, and symbols for the user. If the user needs a shape/symbol that is not available, there is even an option to design their own shape. The Icons Icon launches an online database of thousands of graphics and emojis to search from. The 3d Models Menu launches a drop-down box with similar search options for 3d Images compared with the Icons launcher. Users can search the web for a 3d image or upload their own.

## SmartArt

The Smart Art Icon allows the user to insert SmartArt to visually communicate information with diagrams or flow charts. Upon clicking on the Smart Art icon, a multitude of SmartArt Graphical templates launch.



## Chart

The Chart Icon

will allow the user to create a chart using numbers in Microsoft Word. While more attention will be given to charts in the Excel Chapters, users are encouraged to practice the many different chart patterns on their own in Word. Upon clicking on the Chart icon, a new window will launch showcasing all the different chart creation templates available. When the chart loads on the Word Document, an Excel spreadsheet will also load embedded in Microsoft Word's Chart. Changing the numbers will change the appearance of the chart or graph. The Excel Spreadsheet is not visible if printed.

## Screenshot

The Screenshot icon

is the last of the illustrations group. The command allows Microsoft Word to take a screenshot of other open/running programs or Windows Explorer windows to place directly inside the document. Unfortunately, the screenshot tool does not allow the screenshot to be taken inside Microsoft Word. Once the icon is selected, a drop-down box indicating other open arrows can be displayed as eligible to take a screenshot. The portion of the screen to be captured should be highlighted prior to taking the screenshot. Using a screenshot can be incredibly helpful when communicating with others if you are trying to ensure they understand what is occurring on your computer.

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# 12.6: Document Item Group

Image a scenario if you were creating a document that provided a quote for a job to a prospective employer and then soon after completing this quote, another prospective employer asked you for a similar quote. Instead of creating the second quote all over again, it might be nice to re-use some of the other quotes you completed to save you time. Document Item

of the insert tab allows the user to do just that. Clicking on Document Item will launch a right navigation bar allowing the user to access parts of a document; text, pictures, charts, tables, etc. in other documents saved to their computer or in Microsoft One Drive or SharePoint. Other Office documents, such as Excel or PowerPoint may also be accessed.

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# 12.7: Add-ins Group

The Add-ins group in Microsoft Word is a place where various plugins or optional programs that run inside of Microsoft Word can be installed and run. Depending on your Office license, you may or may not be able to access Microsoft Add-ins. The default add-in installed is Wikipedia, which allows Wikipedia to be searched and text/photos/objects selected to be inserted into the Word Document.

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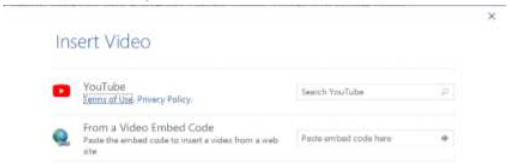
# 12.8: Media Group

The Media group contains one function: Online Video. Users can insert video into their documents that can be played by the user. In this way, Microsoft Word takes on characteristics of a webpage by allowing rich levels of interactive media to be displayed in a Word Document. When selected, two sources for videos are displayed. Option 1 is to search for and insert a video via Youtube. The second option is to insert a video from a website if you have the hyperlink.

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# 12.9: Links Group

Link allows the user to create a hyperlink to a website, email address, or a specific location (via a bookmark) in the document. It is expected that any website that is written in a document be hyperlinked. A document appears to be correctly hyperlinked if its color is blue and it is underlined. Users can also allow for bookmarks to be placed in the document. When a bookmark is created, another text must be hyperlinked and connected to the bookmark. When this occurs, a connection is established, and anytime that a user clicks on the hyperlinked item, they are transported in the document to that specific bookmark. To set up a bookmark, first, the user must highlight the text to be marked, and navigate on the Insert Tab to Bookmark. Next, to link to the bookmark from another place, the user must create a hyperlink. When an email address is hyperlinked, the email application of the computer will automatically be launched, and a compose email window will appear with the specified email address as the receiver. Finally, Cross Reference is like a bookmark, except that it displays the specific name of the text that is bookmarked in the word document.

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# 12.10: Comments Group

The comments group is useful when the user wants to place a note in the document for themselves or another user that they do not want to be printed. To enter a comment, click on the Comment button after highlighting the text that pertains to the comment. When the Comment button is selected, a new right-side panel of Microsoft Word screen will be created, and the name of the user will be displayed, allowing them to enter in as much text about that specific text. Users can reply to comments, delete comments, and create as many comments in the document as needed.

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# 12.11: Header and Footer Group

The header and footer group control the text that is displayed at the top and bottom of every page of a document. The top of every page is the Header Row. The bottom of the page is the Footer Row. Text that is inserted into the header row is displayed on every page of the specific section (most documents only have one section, but you can change the header by creating a section break). Often, the header contains the title of the document and the author, and the footer contains the date the document was created or page number. Clicking on the drop-down arrows for header and footer creates standardized options for a header and footer, but the user can customize the rows to their liking. The Page Number command provides options for how to insert page numbers throughout the document. The benefits of Microsoft Word inserting page numbers or doing it manually is that Microsoft Word automatically adds page numbers if pages are modified.

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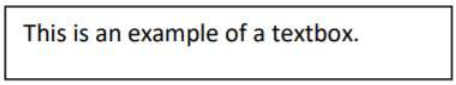
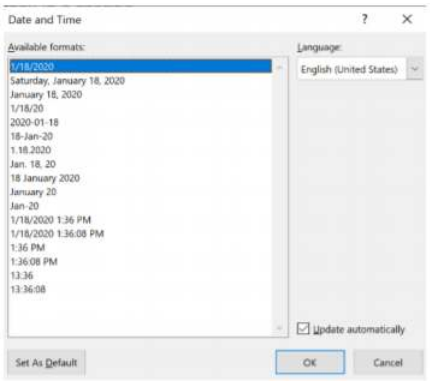
# 12.12: Text Group




The text group options allow for the insertion of a variety of text options. Text Box allows the user to insert a textbox in a specific space in Microsoft Word. Once inserted, Word treats the text box as a picture in that the text can be resized, moved around, and reshaped in relation to other text on the screen. There are several textbox options to use in word as templates. Quick parts allow the user to create shortcuts in Microsoft Word. For example, a user could create a Quick Part command so that every time they typed “CLC”, Word would convert those letters to “Central Lakes College”. Users often create Quick Type commands so that when they enter their initials, Microsoft Word automatically inserts their entire name. the Word Art command box allows the user to create colorful and artistic text/phrases in their document with a greater degree of flexibility than simply changing the font size.

A drop cap creates a large first letter at the beginning of a sentence. Drop caps are often used in novels and creative writing. Clicking on the drop cap icon will allow several different options to display the drop cap. The Signature Line command creates a custom field in Microsoft Word where another user must sign. This command allows for e-Signature, or just a preformatted professional-looking field for the signee to return after the signature. Date & Time provides the user with multiple options to display the current date and time in a variety of languages.




Users are encouraged to insert the date here rather than entering it on the keyboard because Microsoft Word will automatically update the date on the document unless the “update automatically” command box is left unchecked.

Finally, Inserting an Object allows for other Microsoft Office files to be inserted inside of the document, along with options for specific functionality of that file’s application. Users may select this command if they wish to insert an excel document.

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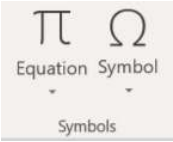
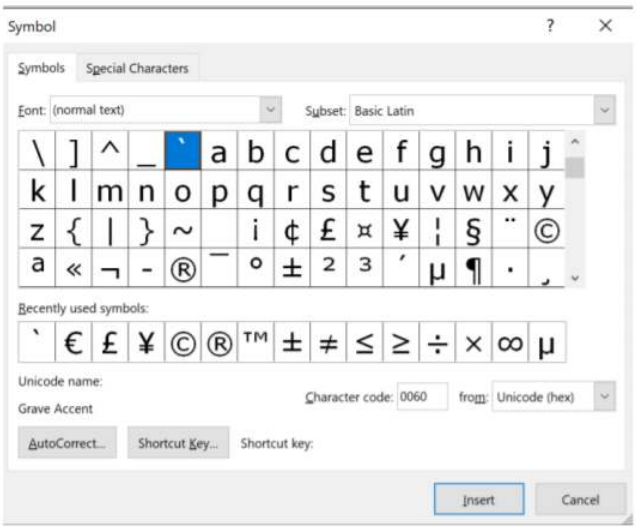
# 12.13: Symbols Group




The final insert group, the Symbols group, allows the user to insert an equation or symbol. The Equation option will allow the user to insert a mathematical equation into the document, which is helpful when trying to display complex math problems inside Word. Using the Insert Symbol command allows for Word to provide options for thousands of symbols and characters to be added to the document or text group.

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# 12.14: Checking for Understanding

1. Create a document titled “Monthly Sales” for items sold in your respective industry. Insert a Cover page to this document.
2. In this monthly sales document, create a table with 13 Rows, and 2 columns. The Header row should state “Month” and “Number of Sales” Enter the months of the year in the first column under “Month”
3. Using Microsoft Word, create a Totals field to total the number of sales for the year.
4. Insert a Chart to visualize this table and 2 online pictures. Add a comment, and create a header & footer with your name, the document name, and the page number.
5. Create a title with some word art and insert the date and time.
6. Write one paragraph explaining the charts and use a drop cap.

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# CHAPTER OVERVIEW

## 13: Design, Layout, References, Mailings, and Review Tabs in Microsoft Word

If the Home Tab allowed the user to manipulate the text in the document and the Insert Tab allowed the user to insert items into the document, the Design and Layout Tabs are more “big picture” tabs that allow various organizational structures to apply to a document section or the entire document.


13.1: Design Tab
13.2: Layout Tab
13.3: References Tab
13.4: Captions
13.5: Mailings Tab
13.6: Write and Insert Fields Group
13.7: Review Tab
13.8: Checking for Understanding


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# 13.1: Design Tab

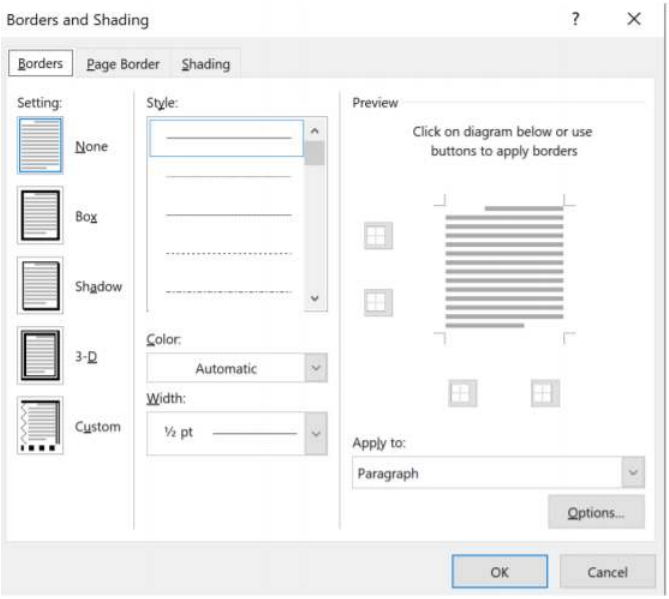
The Design tab allows the user to adjust the organization and visual structure, of the document. The first option to change in the upper left-hand corner of the tab is a Design Theme. Clicking on the Themes icon

will launch a drop-down box with a large variety of templates for document themes. A document theme is a uniform set of organizational and stylistic structures that provide differentiation between headings and subheadings and provide easy navigation and comprehension for the reader. Just as you could imagine that PowerPoint has a variety of specific themes to choose from to display your slide show, so to can Microsoft Word provide themes. In addition to themes, Microsoft Word has many document style formats that ensure uniform line spacing and document & font organization to the entire document. The colors and fonts buttons/button allow you to apply different colors to the different document styles options, and the Fonts menu applies a unique font to the entire document. Paragraph Spacing, Effects, and Set as Default options

allow the user to set the default Paragraph Spacing, and default text effects to apply to the entire document and to Microsoft Word when the document is launched.

Finally, the Page Background Group

Allow the user to create a document Watermark, which is a light color that covers the document (examples include the words Draft, Confidential, or Private. You can also use the drop-down menu that launches when the Watermark icon is selected to customize your Watermark. Page Color changes the background color of the document page (the default background color is white. Finally, Page Borders launches the Border menu for Borders and Shading and this menu has been described previously in detail. In summary, the Borders and shading group determine the shading effect for a page border and the thickness and style of the border. The border settings can apply to a paragraph or the entire document.

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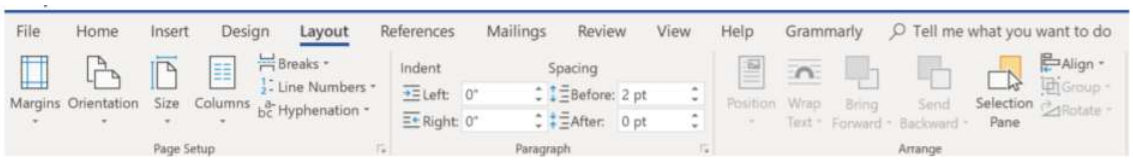
# 13.2: Layout Tab




The Document Layout Tab allows the user to create some spacing and margin controls for specific objects, pictures, paragraphs, sections, or the entire document.

Margins, allows the user to customize how much white space, or upper, lower, left, and right page boundaries. Page Margins are often utilized to ensure a document expands to become a full page or is condensed to be one page. Document. The orientation button allows the user to change the page layout from the default portrait landscape, where the page is taller than it is wider, to landscape, where the page is wider than taller.

The Size button changes the size of the page Word is preparing to print. By default, most printer paper is 8.5X11 inches. However, there are other larger and smaller paper sizes. Changing the Size option will increase or decrease the amount of room each page.

The Columns button allows the user to insert multiple columns on a word document. This is useful if the user is creating a flyer or newsletter. Columns are a lot like tables, however, they fill from left to right, and after one column is full, the text will move to the next column instead of being self-contained in a cell.

The Breaks button allows the user to place in a variety of breaks, which are text stoppers which prevent text from being added below the break until the next page, column, section, etc. Clicking on columns will launch a drop-down menu allowing the user to set up page breaks or sections breaks. As specified earlier, section breaks allow for not only a break in the text but they also allow for different layout options and page orientation settings, whereas page breaks, being in the same section, keep all the same formatting.

Line numbers are not activated by default but can be activated with this button selected. Line numbers number each line of a page, section, or entire document (depending on which is selected). They are also helpful in technical and reference documents when the user is would like to help another locate a specific sentence or word. For example, in a Vehicle Service manual, a technician could be told to go to line 4320, instead of “the third sentence in the sixth paragraph).

Finally, the Hyphenation command changes whether Word will require a word to be on only one line or joined in two lines with a hyphen. For example, if the word “Mississippi” was being entered close to the right margin, the default setting would be to place the word in the next line below. This setting can be changed to have word hyphenate the word.

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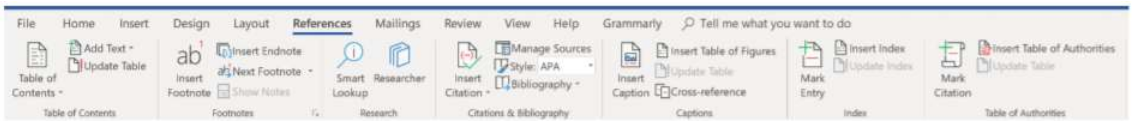
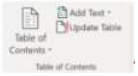
# 13.3: References Tab



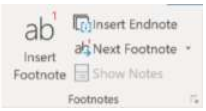

The References Tab is used to provide a hub to use citations, footnotes, endnotes, tables of contents. bibliographies, and any other type of references in a document. Often users will use the references tab when writing a research paper or a long document with many chapters.

## Table of Contents Group

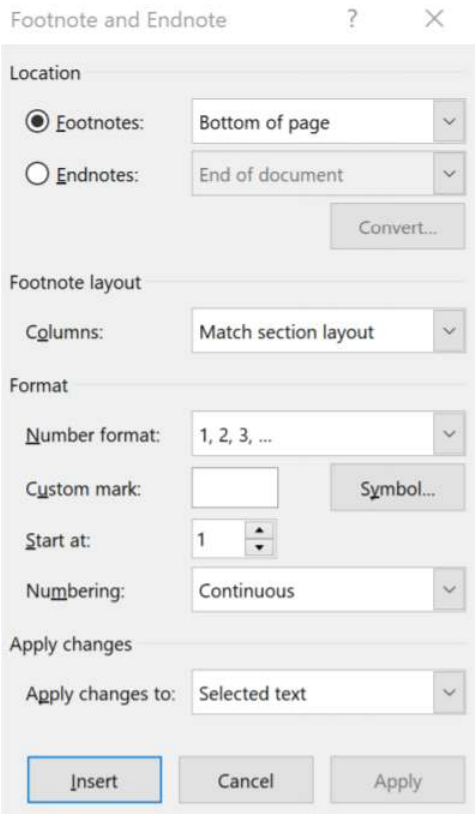



The Table of Contents Group requires the use of Headings, which were previously described. Using the headings, a Table of Contents is created and automatically connects the headings and subheadings with the appropriate page number. Every time the document is substantial, the user should click on the “Update Table” button, which will allow the user to choose between updating the entire table (to include new headings & subheadings), or simply to update the page number. When clicking on the Table of Contents icon, there are a variety of different styles to choose from.

## Footnotes Group

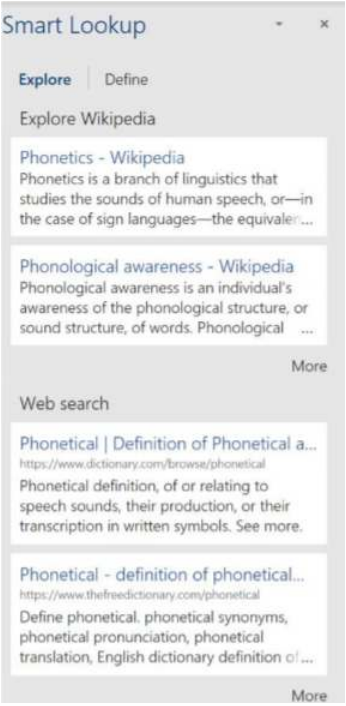



Footnotes are additional information that the writer may place at the bottom of the specific page. Usually, footnotes are not required information for the reader to understand but allow for a “deeper dive” into the material if desired. Footnotes are numbered. The first footnote is given a [1] at after a specific word, the next footnote on the page is given a [2]. Compared to a footnote, an endnote is placed at the end of a document section, or end of the document if the document has only one sentence. The *Next Footnote* command allows the user to quickly move around in their document between footnotes or endnotes. The *Show Notes* icon displays to the user where the Footnotes or endnotes are located. Finally, there is a more settings box  Which allows for additional customization of footnotes and endnotes. When selected, a new window will launch allowing customization of where footnotes and endnotes appear, and the numbering and location of footnotes and endnotes on a page along with how they are displayed and referenced.



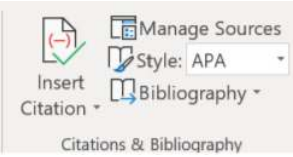

## Research Group

The Research Group was added in 2016 to Microsoft Word. The Smart Lookup icon allows a word used in the document to be searched online for definitions, web-related information, and phonetical spelling. For example, highlighting the word “phonetical” and selecting *Smart Lookup* provides the user with this information: using the lookup feature.

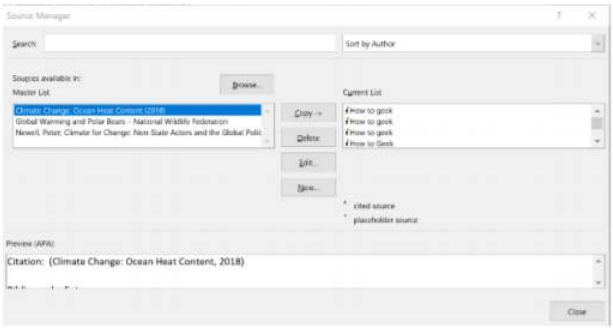



The Researcher icon allows the user to quickly search the web for accurate sources of information and insert them into the document and include them inside the bibliography. This is particularly helpful to a student writing a research paper as scholarly journals are made easily available for searching and citations can be quickly added to the document.

## Citations & Bibliography




Group Citations tell the reader where a document was retrieved and how it was used. Selecting the *Insert Citation* field launches a drop-down dialogue box allowing the user to add a new source, add a new placeholder (if you want to insert the source later), and insert a citation you have already used. *Manage Sources* launches a new Source Manager window to allow the user to edit existing sources to make changes to the Citation or remove citations not needed in the document.




Users can also change the citation style between APA (default) to other citation standards as required, and finally, inserting a bibliography with the theme of their choice. Usually, Bibliographies should be placed at the end of the document.

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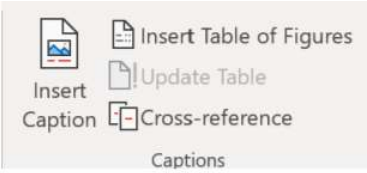
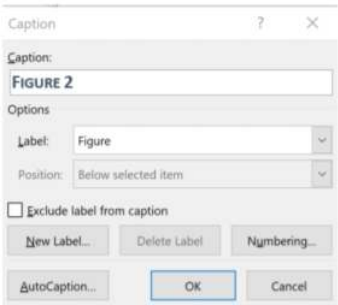
# 13.4: Captions




Captions allow the user to mark text under a specific graphic to further explain the picture. Selecting the *Insert Caption Icon*, Users can customization their caption text, and its location in the document.

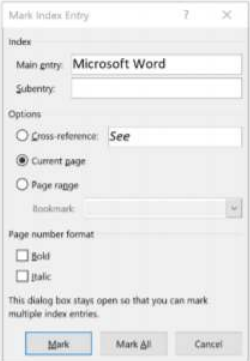
Example of caption settings




Inserting a *Table of Figures* is like a Table of Contents, except it is only for captions. Usually, a table of figures, if used, is placed at the end of the document. Finally, *cross-references* allow the user to quickly place links in a document to other information in the document. For example, if I wanted to remind the user what a Motherboard on a computer was, I could create a Cross-reference of the word “Motherboard:” and it would be hyperlinked to Chapter One, so when the user clicked on “Motherboard”, they were immediately sent to Chapter 1. The cross-reference feature of Microsoft Word requires the use of headings, or other citations to be able to navigate the document.

## Index Group

Have you ever looked at the end of a book and found an enormous index that contained everything in the book and wondered how it was that this was created? Microsoft Word creates an easy way to create an index if needed. First, to place a word or phrase in the index, highlight the word(s) and select Mark Entry. Users can then specify how they want that phrase to appear in the index.




The *Insert Index* creates an index at the insertion point from every item that was marked for entry into the index. Finally, the *Update Index* icon updates the index with any new entries entered after the initial index was created.

Table of Authorities Group

If a user wanted to write a legal brief that contained an index of cases, laws, court decisions, etc., they would use a Table of Authorities at the end of the document instead of a bibliography. Just like the Citations command, the Mark Citation in the Table of Authorities Group will create a citation in the proper format, and users can insert a Table Authorities at their desired insertion point and update the table as needed.

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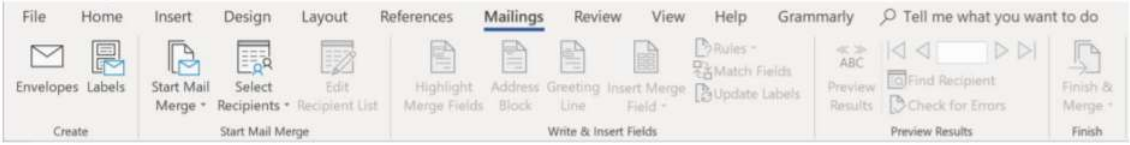
# 13.5: Mailings Tab



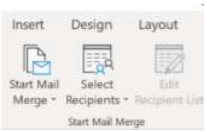

Do you ever wonder how a business can send out thousands of letters with your first name in the letter and your address correctly printed on the envelope? It is likely they are performing a mail merge to quickly print customized documents with different information very quickly. Mail Merge features are found on the *Mailings tab* of Microsoft Word provides a variety of features to help the user quickly and with relative ease conduct a mail merge.

## Create

The *Create* group allows the user to create customized envelopes or sheets of address & name labels with one address. The create group should be used for simple mail merges where only one address is needed.

When the user selects Envelopes, an Envelopes and Labels dialog box will launch, and the user can insert the address for the specific envelope to be printed. When labels have selected the Envelopes and Labels dialog box will launch again and will allow the user to print out a single address in a specific label location on a page, or have the same address be added to every label.

## Start Mail Merge




The Start Mail Merge Group icons are what allow the user to begin the mail merge process. The *Start Mail Merge* icon allows the user to select the type of document that is to be created with the mail merge process. Determine whether the mail merge is a letter, email message, envelopes, or labels. If Envelopes are selected, a new dialog box will launch allowing the user to customize the size of the envelopes being used. Finally, the user can launch the Step-by-Step Mail Merge wizard to help the user complete the mail merge.

*The Select Recipients* icon allows the user to select a file that contains a list of recipients that was previously created in Microsoft Excel or Access (existing list). If the user selects to create a new list, they can begin to insert the list of addresses and names in customized fields using Microsoft Word and an embedded Access document. The user can also use their Outlook contacts to create a list.

Finally, the *Edit Recipient List* icon allows the user to edit the list they had selected for a mail merge. Perhaps you had created a mail merge list to send out a newsletter to customers and just before printing, a new customer was added. You can add the customer using this command without changing the list in other locations.

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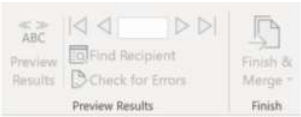
# 13.6: Write and Insert Fields Group

One of the best ways to create customer engagement is to treat each customer like they are a unique person. Using the *Write & Insert Fields* icons, you can do just that. You can create custom text fields in the document that receive mail merge information. You can do this with the *Address Block, Greeting Line, and Insert Merge Field Command*. *The Address Block & Greeting Line* allows the user to apply Word's templates, where the *Insert Merge Field* icon allows the user to customize the fields that are inserted into Word. After inserting all the fields, the user can select *Highlight Merge Fields* to display all the mail merge fields in the documents.

When conducting the mail merge, Word has many pre-populated field descriptions. The *Match Fields* command allows the user to match their own fields (in an excel document for example) to Word's custom fields. Finally, the *Rules* icon allows the user to specify criteria for inserting special fields into a document, for example, they could create a message that says, "Happy Birthday!" if it was determined that the birthday of the recipient was the same date the letter was being printed. Finally, the *Update Labels* command will update the field information to all other merge fields in the document.

## Preview Results & Finish




Once the Mail Merge has been created and customized fields have been created, the user can click on *Preview Results* which will cause Word to create customized letters determined by the number of fields in the excel document or database from which Word is using to create Mail merges. The mail merged letters will appear in alphabetical order, and the user can search by the recipient to find the individual they wish to find or navigate forward or backward their mail merge list. The user should also select Check for Errors to ensure there was no missing information in the mail merged fields. Finally, when everything appears correct, selecting *Finish & Merge* will create all the documents in this mail merge to be printed or emailed. The user can still edit the individual documents manually if needed.

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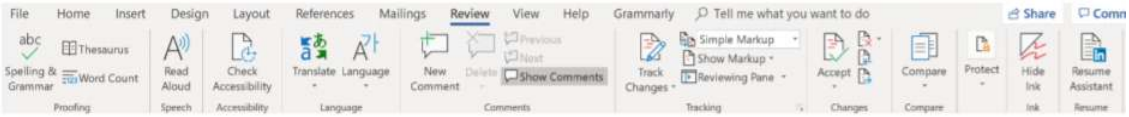
# 13.7: Review Tab




The purpose of the *Review Tab* is for proofing your document and providing possibilities for seeking feedback on your final edits. The Review Tab is separated into multiple groups: Proofing, Speech, Accessibility, Language, Comments, Tracking, Changes, Compare, Ink, & Resume.

## Proofing

The Proofing Group allows the user to improve the words in their document. Users can click on *Spelling & Grammar* to launch Word's built-in spelling and grammar checker to fix words and phrases that may be incorrect. When selected, the icon launches a navigation pane on the right side of the document, allowing the user to review spelling and grammar errors that the textbook does not find accurate, and make the changes, or ignore the recommendations.

## Speech & Accessibility

Microsoft Office can read any text in the document by clicking on the *Read Aloud* icon in the Speech Group. Once the *Read Aloud* button is selected, Word will begin reading at the insertion point of the text. The *Check Accessibility* button launches the Accessibility Checker tool in Microsoft Word on a right-side panel of the page. The Accessibility Checker will review the entire document to find areas that would impair screen readers and other accessibility programs to aid those who have difficulty seeing or reading a document to still be able to understand the text in the document.

## Language

The Language group allows the user to translate words in the document into a different language. Users will have the opportunity to translate a highlighted section or an entire document into another language. There are a variety of languages available for translation. In addition, the *Language* icon provides the user with the option to change which language Microsoft Word will use for use in the *Spelling & Grammar checker*.

## Comments

Want to place a note in your document to review at a later time, or are you working collaboratively with someone else on the document? Using the Comments group is the easiest way to keep track of information about the document without changing characters in the actual document itself. Comments are automatically "turned off" by default. They can be enabled by selecting the *Show Comments* icon. To enter a comment, highlight the text you wish to comment about or place your insertion point where you

want the comment to be placed. Then, select *New Comment*. A new section of the Word Document will launch on the right-hand side of the page. This will not be able to be printed but will display to the user with a line connecting the comment to the insertion point of the comment.

## Tracking & Changes

When you are working with multiple individuals on a document it can become difficult to keep track of which changes each user has made. The *Tracking & Changes* group can help the user determine which text additions or deletions were entered and which user made the changes. Be default, the *Track Changes* icon is not enabled. To turn on tracking, click on the Track Changes icon. The user can also select the type of changes made in the document selecting *Show Markup*. A change in the document is entered in Red with an underline. Once a change has been entered, the author has the option to accept or reject the change in the *Changes* group. Users can navigate through the changes by clicking on *Previous* and *Next*. Once the user has accepted or rejected the change, the text will revert back to the standard text and fonts in the document. Users can also approve or deny all changes in the section or entire document. Remember, you can always stop tracking changes by clicking on the *Track Changes* icon.

## Compare, Protect, & Ink Groups

Finally, users can place the finishing touches on the document by using *Compare* & *Protect* groups. *Compare* allows the user to compare their current version with previous versions of the document. Microsoft Word stores each version of the document when it is saved. The user can review each version of the document with the current version. This allows the user to revert the document back to a previous version if a catastrophic change is made to the document. The *Protect* group allows the author to stop certain authors from being able to edit or restrict others from making any changes to a document to make it read-only or restrict permission to change words in the document.

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# 13.8: Checking for Understanding

1. You are tasked with writing a paragraph that will be placed in a newsletter that will be emailed to your community. The paragraph will share what you do on a day-to-day basis in your current position. Please use the Design Tab of Microsoft Word to change the document theme with relaxed paragraph spacing and place a Watermark of “Draft” on the paragraph.
2. Make the margins in your paragraph at .5” margins with a landscape orientation.
3. Add a picture with a caption to your paragraph that describes your vocation.
4. Launch Spelling & Grammar to ensure your document is written correctly and add a comment on your document.

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# CHAPTER OVERVIEW

## 14: Getting Started with Excel

Microsoft Excel is a spreadsheet program. Spreadsheets are used to create grids of texts, numbers, and formulas to complete calculations and display information in an organized manner. Microsoft Excel is frequently used for budgeting and accounting, as well as to create charts and visuals based upon numbers and other calculations. Excel is a powerful product that once the user can understand its navigation, can become incredibly useful and easy to use.


14.1: Functions of a Spreadsheet
14.2: Identifying Excel Windows Components
14.3: Understanding Formulas
14.4: Quick Analysis Toolbar
14.5: Zoom, View, and Window Options
14.6: Check for Understanding


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# 14.1: Functions of a Spreadsheet

The purpose of a spreadsheet is to organize and calculate information. Spreadsheets are utilized by many different businesses and organizations to perform a variety of tasks. The most commons tasks performed by spreadsheet software include functions, computations, statistical analysis, and formatting. This text will focus on excel when discussing spreadsheets.

**Functions**: Excel is a spreadsheet consisting of unlimited numbers of cells. Cells are where information is stored. Spreadsheets feature columns and rows to keep information legible and simple to understand. You can use spreadsheets to enter data, calculate equations and create charts and graphs. What's more, you can build upon previous work by using formulas and functions so that if the information is changed, your calculations adjust to the changes.

**Computations**: Excel is able to compute a variety of mathematical functions, from simple equations like addition, subtraction, multiplication, and division to more complex financial calculations like Mortgage Amortizations, and Net Present Value (NPV). It can also create “what-if” scenarios and can create relational functions such as greater than, equal than and less than.

**Statistical Analysis**: Excel is also able to allow the user to conduct statistical analysis, calculating mean, median, mode, averages, and standard deviation. Excel can be used to calculate percentiles and rank categories and items.

**Formatting**: Excel provides maximum flexibility to customize the worksheet (the workspace of excel) and organize data. Excel allows cells, rows, and columns to expand, merge, be inserted and deleted. You can even place inside cells pictures, tables, hyperlinks, and text from other word documents. Data can be sorted in alpha and numerical order.

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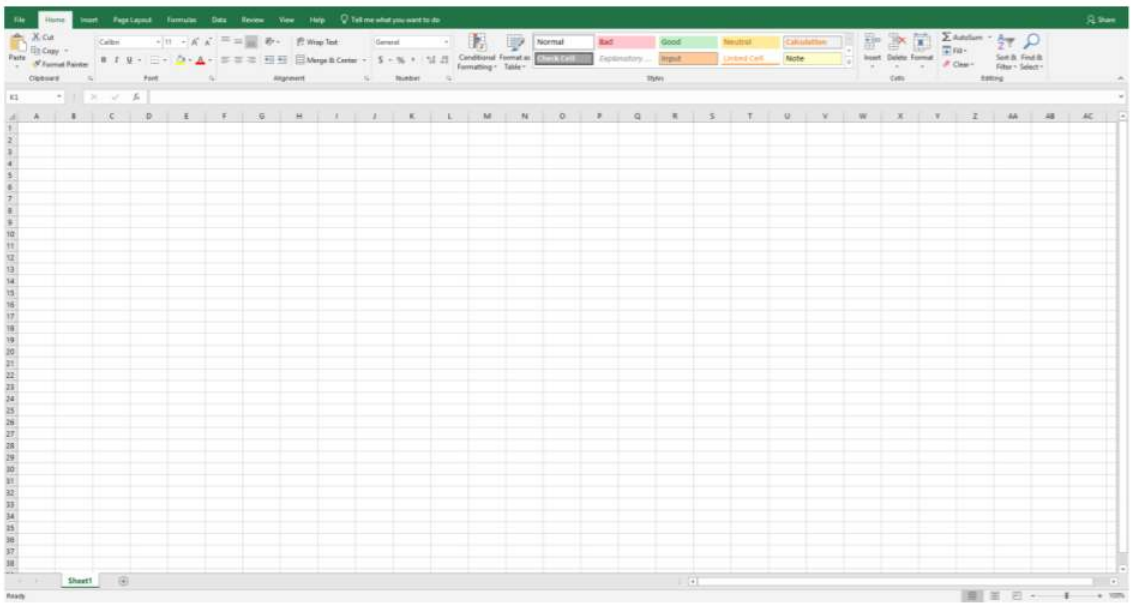
# 14.2: Identifying Excel Windows Components

Like all Microsoft Office Documents, Microsoft Excel has a common window organizational structure. Each excel document is called a “workbook”. Inside each workbook can be multiple “worksheets” that contain data. Each point of data has a cell address. Each cell address has a letter and a number associated with it. For example, the cell address in the first row and column (top left corner) is “A1”. The cell to the right of “A1” is “B1”. The cell below “A1” is “A2”. This naming scheme continues for the entire document.

For a visual of Microsoft Excel, please launch the program in Microsoft Windows, and then launch a new worksheet by selecting the “File” Tab, then “New Worksheet”. The worksheet pictured below should be displayed on your computer.



## Key Excel Components

Common Excel components are listed below.

**Name Box**: The name box displays the active cell address that is selected. The selected cell in the Name box is called the “active cell”. In the picture provided, the Name Box is “A1”.

**Formula Bar**: The Formula Bar is to the right of Name Box. It allows you to enter information into the worksheet or make edits to data in the worksheet.

**Worksheet Window**: The Worksheet Window consists of all of the cells in the worksheet. Cells are classified by lettered columns, and numbered rows. Every cell in the worksheet has a unique address.

**Sheet Tabs & Sheet Tab Scrolling buttons**: As written previously, each workbook is composed of worksheets. Most Excel users place different, but related information in multiple worksheets in the same workbook. For example, you may maintain an Excel workbook that contains your department budgets, and each worksheet represents a different year. You can browse between worksheets by using the Sheet Tab Scrolling buttons. The active sheet appears visually to be at different depths on the document as other sheets.

**Status Bar**: The Status bar displays you various information about the cell or a calculation in place. It when selecting and highlighting multiple cells, it may provide information about the sum of the components, or an average, depending on the information inside the cells.

**Range**: When selecting multiple cells with a mouse and dragging the cursor to another cell address, the selected cells are referred to a range. A range of cells is usually selected to perform a calculation.

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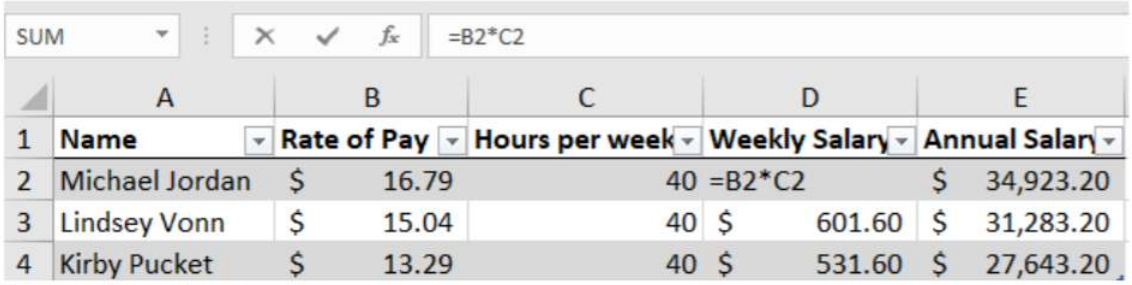
# 14.3: Understanding Formulas

Imagine that you are a manager of a construction company. You must maintain your staff budget to make sure you can afford to pay your employees and make a profit every year. You plan to pay the following employees accordingly:

Table 14.3.1: Salary Information Calculations

| Name | Rate of Pay | Hours per week | Weekly Salary | Annual Salary |
|---|---|---|---|---|
| Michael Jordan | $ 16.75 | 40 | $ 670.00 | $ 34,840.00 |
| Lindsey Vonn | $ 15.00 | 40 | $ 600.00 | $ 31,200.00 |
| Kirby Pucket | $ 13.25 | 40 | $ 530.00 | $ 27,560.00 |

You use your calculator and finally finish adding up the total salary owed to each employee when your new state regulations require you to provide each employee a $.04 per hour raise. You are frustrated because you must now take extra time to recalculate your spending plan all over again. However, you are using Excel, and you discover you don't have to. This is because you used formulas connected to the cell reference content instead of a number. As a result, you can just insert the updated rate of pay, and Excel will automatically recalculate the weekly and annual salary. The formula entered in the Name box below is "B2*C2". Which Excel uses to calculate the weekly salary in Column D.



UPDATED SALARY CALCULATIONS

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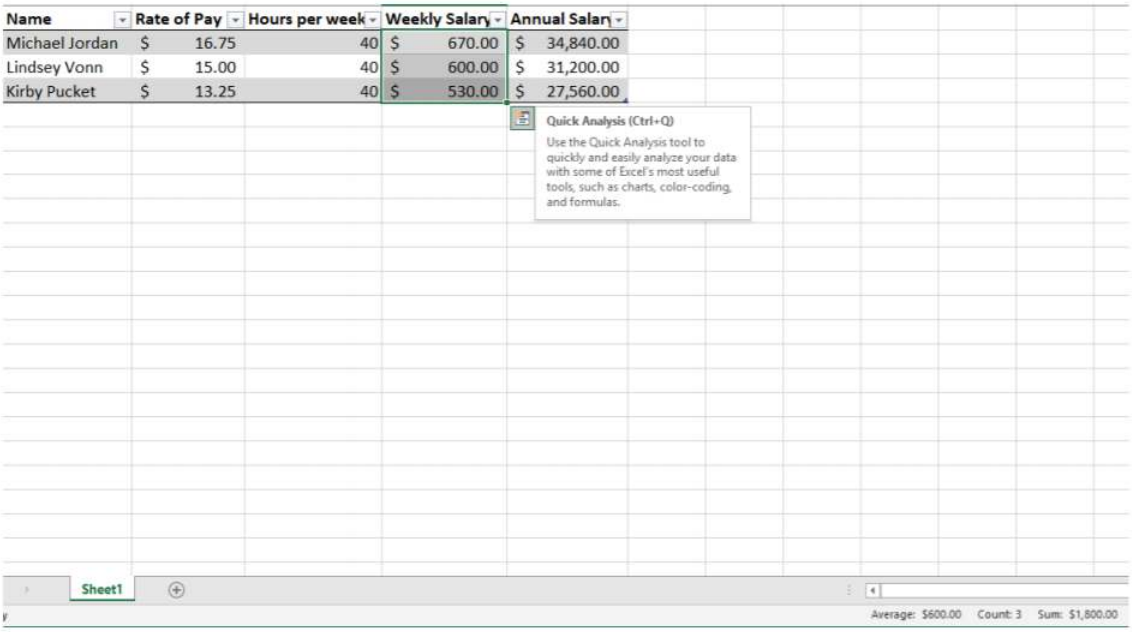
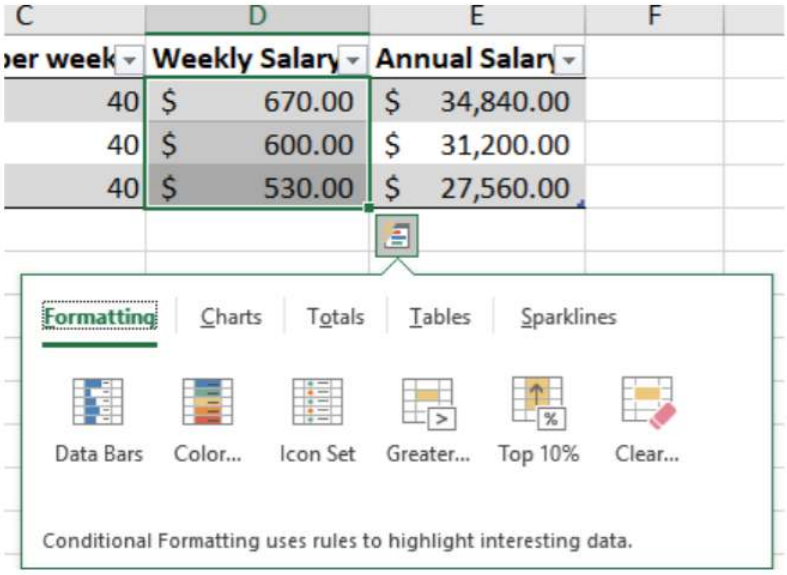
# 14.4: Quick Analysis Toolbar

Excel provides many tools to help the user complete their work quickly and efficiently. Another helpful tool is the Quick Analysis Toolbar. When highlighting multiple cells at once, depending on the type of information in the cell, a quick analysis toolbar may appear in the lower right-hand corner below the last cell highlighted. In addition, the status bar provides helpful calculations in reference to the information highlighted like Average, Count, and Sum.




Selecting the Quick Analysis button allows for multiple options to format your information, or to create Charts of the data, calculate the data, create tables, or visual sparklines. More information about these items will be explored in future chapters.




In addition, in the lower right-hand corner of the highlighted cell, there may be a "+" button. This is an autofill button that will be explained in further detail, but a quick summary of the autofill button is that it can allow the user to copy text from the above cell to other cells by clicking on the "+" sign, and dragging the mouse and highlight the other cells. The autofill button can also copy formulas and are other references.

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# 14.5: Zoom, View, and Window Options

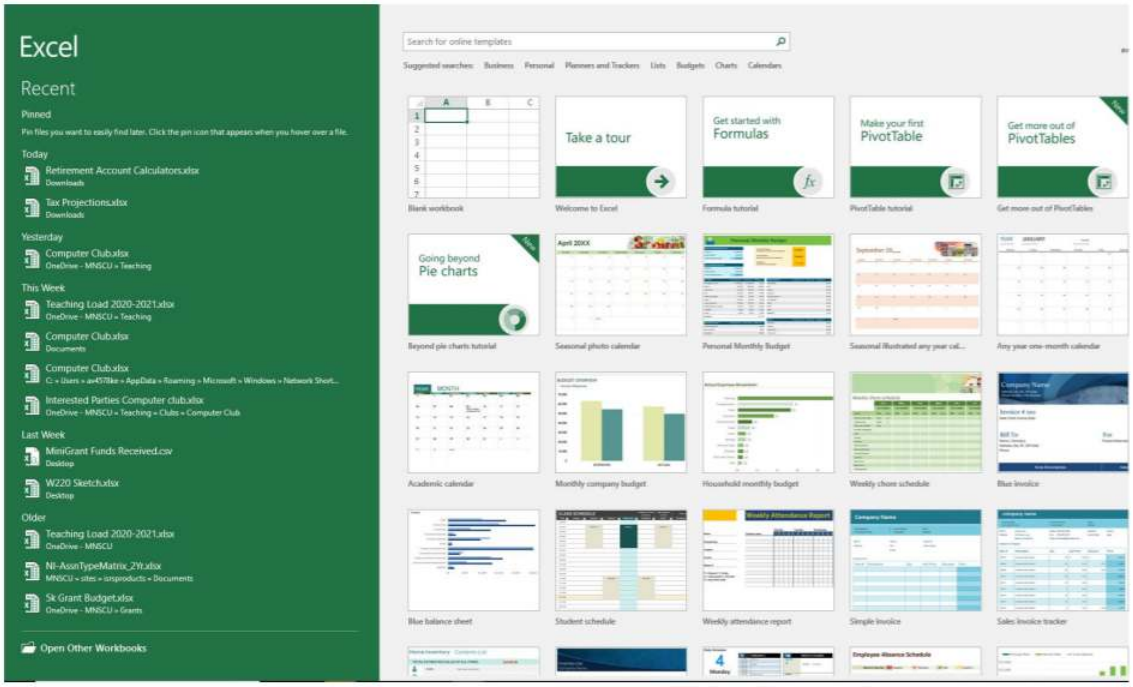
Just like Microsoft Word, the bottom right-hand corner provides multiple views and zoom options. The three Zoom options from left to right are Normal, Page Layout, and Page Break Preview.

. Normal is the standard view with just cell information in the worksheet available to the user. In this view, the user can focus on their work and is not able to determine how their sheet would appear if printed. Page Layout View provides a preview of what the document will look like when printed. Page Layout view is also the place where the user can add headers and footers to their worksheet. Finally, the page break view displays the normal view with dotted lines where the printer would print a new page. To the right of the various views is a zoom slider to allow the user to zoom in or out of their worksheet.

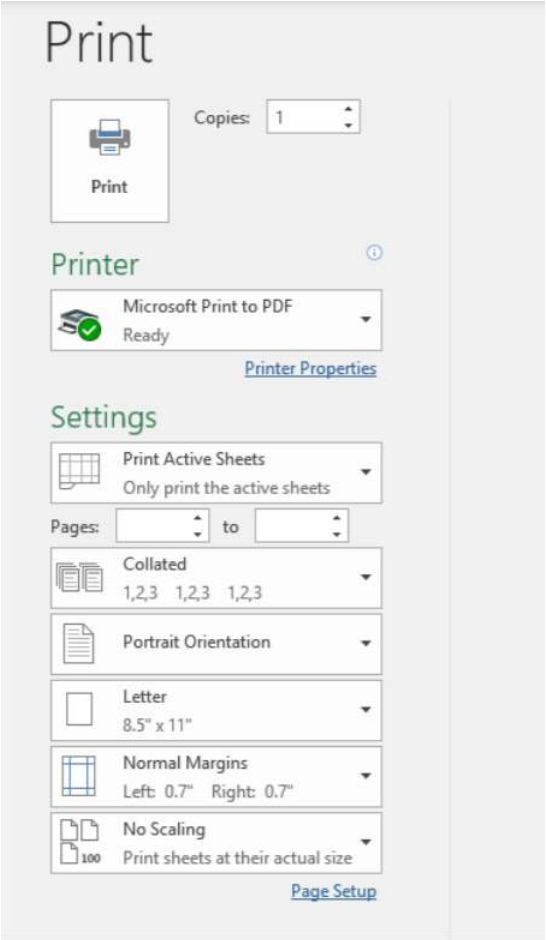
Finally, just like Word, Microsoft Excel's top of the document contains numerous window management and document management capabilities, including the Excel Ribbon.

The Excel Ribbon consists of the File, Home, Insert, Page Layout, Formulas, Data, Review, View, and Help Tabs.

The File Tab is responsible for saving your workbook, creating new workbooks, or opening other workbook files. It also has options for sharing the workbook and exporting it to other formats. Like Microsoft Word, it also contains options for other Excel Templates for a variety of functions.




In addition to Open, Saving, and sharing options, Excel contains multiple print options, allowing the user to customize their workbook. As Word, Excel users can choose their printers, the orientation of the printing, as well as what is printed. By default, only the active sheet – the document the user is currently working in, will be printed. Worksheets can also be scaled to fit the entire worksheet on one page, or multiple pages, depending on the user settings. Finally, the user can specify the printing margins on the document in this window as well.




TAB OPTIONS IN MICROSOFT EXCEL

The **Home Tab** allows various options to change the fonts, text size, cell properties, and insert, delete and modify cell contents and formulas.

The **Insert Tab** allows for a variety of tables, charts, pictures, text and symbols to be used in Excel.

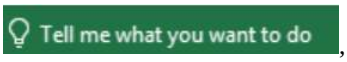
The **Page Layout Tab** allows for customization of how the worksheet is oriented and appears during printing.

The **Formulas Tab** allows for a vast amount of customization of Excel formulas and calculation options.

The **Data Tab** allows the user to import and export data as well as manipulate data sets, to establish queries and connections and separate and sort data.

The **Review Tab** allows for various worksheet protections and sharing settings along with help with spell and grammar check and accessibility checking. Similar to Microsoft Word, changes to the document can be recorded, and collaboration settings may be controlled.

The **View Tab** allows for further worksheet customization to the user to display or hide document tools bars, freeze or expand cells, and Macro settings to complete multiple tasks at once.

Finally, the **Help Tab** allows the user to receive help from frequently asked questions. Like Microsoft Word, users can enter their questions in plain text in the "Tell me what you want to do" field 

, and Excel will use artificial intelligence to retrieve a solution.

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# 14.6: Check for Understanding

1. Enter the Excel Table information listed in this chapter to your own excel table. Practice creating simple formulas with Excel. Increase the wages by $1.22 per hour each and determine the new monthly and yearly salary of the employees.
2. Describe the differences between a Cell, Row, Column, Worksheet, and Workbook.
3. Describe the purpose of the three different views in Excel – which one allows the user to adjust the header/footer?
4. To your document in #1, create a new worksheet titled “2030 salary projections” Copy your original worksheet to this worksheet and increase the wages by $40.00 per each employee. What are the totals?

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# CHAPTER OVERVIEW

## 15: Home Tab and Working with Formulas and Functions in Excel

The Home Tab contains many common formatting and simple functions tools to properly utilize Excel. Like Microsoft Word, the Home Tab is divided into multiple groups, Clipboard, Font, Alignment, Number, Styles, Cells, and Editing.


15.1: Clipboard Group
15.2: Font Group
15.3: Alignment Group
15.4: Number Group
15.5: Styles Group
15.6: Cells Group
15.7: Editing Group
15.8: Check for Understanding


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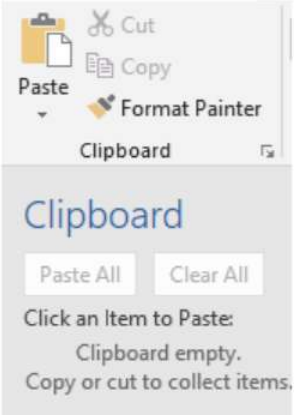
# 15.1: Clipboard Group

## Clipboard Group




The main function of Clipboard is the Cut, Copy, and Paste feature. All Office Applications share a Universal Clipboard. This means that items that are copied in Windows 10 can be shared between Office Applications. You can view the Universal Clipboard by clicking on the clipboard box with an arrow facing down and to the right Clipboard in Excel. A new navigation pane will open on the left side of the screen. It will display all the items that you have cut or copied in Windows 10 recently. This allows you to work with multiple items you have pasted.

In addition to the Clipboard Navigation pane, users can also utilize Format Painter Format Painter. Format Painter allows the user to copy the text size, fonts, and any other formatting, to another selected body of the text. To use the format painter functionality, users should select the text they would like to copy, and then click on “Format Painter”. Then select the text they wish to change. Users may also doubleclick on “Format Painter” and change as many text selections as they would like. When they have completed changing the text selections, they can click on “Format Painter” to stop. While Format Painter is a useful tool to change selected text, the Font groupings of the Home Tab have many more features.

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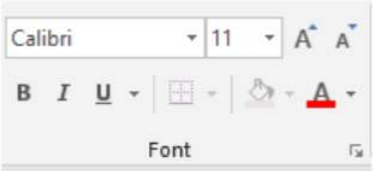
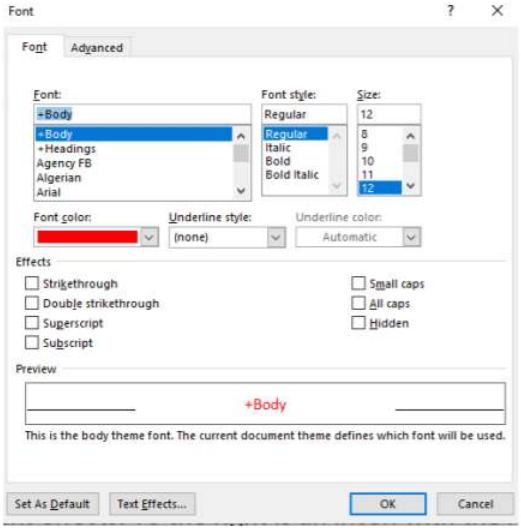
# 15.2: Font Group

The Font group provides unlimited customization of text. It allows users to change the font or style of the text, the size of the text, provide text emphasis, and even change the colors.




Beginning in the upper left-hand corner, the Font Selection Box and Text Size boxes allow customizations of hundreds of font designs and text sizes. The capital "A" button on the right allows the user to gradually increase the text size with the smaller capital "A" button next to it on the right decreases the text size. The lower row of the Font group contains **Bold**, *Italics*, and Underline (without underline options for line thickness). To the right of the Underline, the button is the border settings button. This button allows the user to control border lines around highlighted cells. Users can select top, left, right, bottom, or all borders to their selected cells. To the right of the border settings are the paint can icon. The painted icon allows the user to color a cell. Finally, to the right of the paint can menu is an icon of the letter "A" with a line underneath. This control allows the user to change the color of any selected text with an almost infinite number of color options. By clicking on the arrow pointing down and to the right in the Font group, an expanded menu with even more options will launch, allowing the user with many more text customization options, as well as the option to set default text options and effects.

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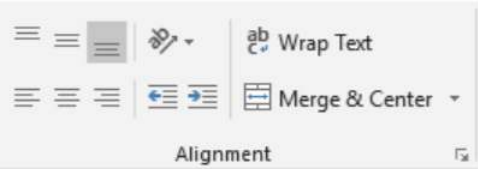
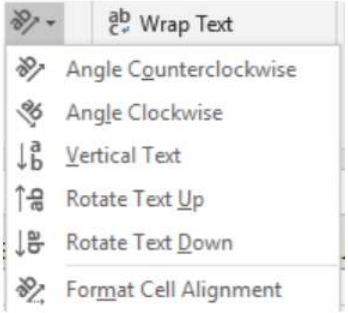
# 15.3: Alignment Group




The alignment group allows the user to control how text is displayed in cells. The first group in the upper left-hand corner that has horizontal lines/controls the vertical alignment of text or numbers in a cell. The first icon on the left is Top Alignment, which connects the text to the top of the cell. The next icon is Middle Alignment, which centers the text vertically between the top and bottom of the cell. The last vertical alignment is Bottom Alignment, which places the text near the bottom of the cell. The bottom Alignment is the default vertical alignment.




The next alignment is Orientation which allows the user to rotate the text vertically or diagonally. There is a drop-down box with more options to allow even more customization of how text is oriented in the cell to angle the text counterclockwise, clockwise, vertical, rotate text up and rotate text down. In addition, there are more options by clicking “Format Cell Alignment in the drop-down box in excel. In terms of text orientation, the cell is very flexible.

Next to Orientation on the right is Wrap Text

. The Wrap Text feature allows Excel to automatically adjust the vertical height of the cell to include all of the text in the cell by allowing the text to be placed on multiple lines. The default line format of excel is to display text on one line in a cell. If the cell is not long enough to accommodate the text, the text will be contained in the cell, but appear to be added to the next cell on the right. While each cell height and width can be adjusted with the mouse, the Wrap Text command allows for long text fields to be better displayed in the document.

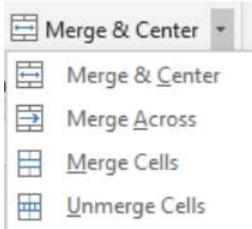
The bottom row of the Alignment group begins with Horizontal Alignment settings . The settings align the selected text to the left side of the cell (which is standard formatting), centered (which is common for titles), and right-aligned of the cell.

Next on the right, the increase/decrease indent icons allow the user to move the cell closer or further away from the cell border depending on the horizontal alignment of the cell.

The last icon in the Alignment Group, Merge and Center

allows the user to allow information that is in one cell, to span multiple highlighted columns or rows and be treated as one cell. When two cells are merged together, the usual column or cell divider is removed, and the contents are displayed in both cells.

. There are several options available to merge or unmerge cells in the drop-down dialog box to the right of Merge & Center with a downward arrow.




When selecting multiple cells. Merge & Center performs what was previously described: allowing highlighted cell information that spans more than the current cell length to occupy multiple columns as one cell and centers the information. Merge Across allows the user to take information that exists in multiple cells, and convert them into one cell that spans multiple columns. Merge Cell creates highlighted cells into one cell spanning multiple columns, and unmerge cells perform the opposite, it takes a merged cell that spans multiple columns and removes the cells that are merged into separate columns of cells. The information in the formerly merged cell is placed in the left cell.

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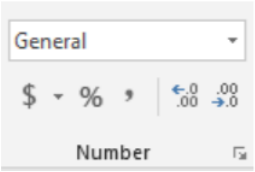
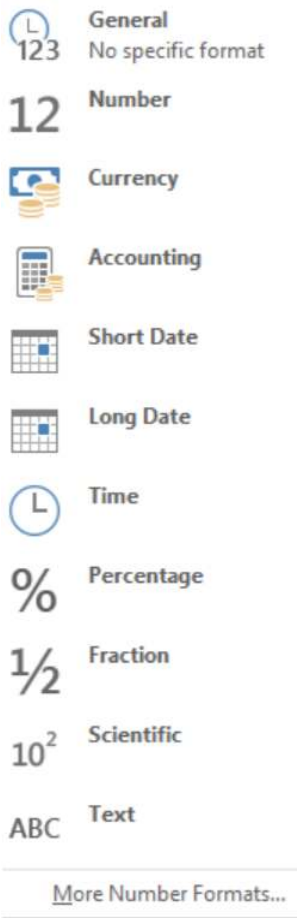
# 15.4: Number Group




In addition to determining the way that information is displayed in a cell, the user can also determine the format a number is displayed inside a cell. The default display is “General” but selecting the drop-down box allows for many more options for the user to select depending on the cell conditions.



| Cell Format | Function |
|---|---|
| General | Any text or number will display in the cell as written. |
| Number | This allows the user to only display numbers in this field and specifies the number of decimal places. |
| Currency | Similar to Number format, this displays numbers in the cell and the number of decimal places and the chosen currency symbol (depending on the currency) for the user. |
| Accounting | Similar to Currency, Accounting lines up the decimal points in a column so the amounts are displayed with the same alignment. |
| Short Date | Displays a set of numbers as the date, beginning from the year 1900. For example, the number “1” is 1/1/1900 |
| Long Date | Displays a set of numbers as the date, beginning from the year 1900. For example, the number “1” is Sunday, January 1, 1900 |
| Time | Displays a set of numbers as the time, beginning from the year 1900. For example, the number “1.1” is 2:24:00 AM. |
| Percentage | Displays decimals as a percentage. For example, .2 = 20% |
| Fraction | Displays decimals as a fraction. For example, .2 = 1/5. |
| Scientific | Displays a number as a scientific calculation, for example, .2 = 2.00E^-1 |
| Text | Displays the cell information exactly as entered even if a number is displayed. |

In addition, students can select more formatting options by selecting the diagonal arrow for more customization. Below the formatting, the box is some quick shortcut icons $ % , that allow the user to quickly format a cell with the Accounting ($), Percentage %, or to add a comma “,” to numbers that have the thousandths place. Finally, to the right of the shortcut icons are decrease indent and increase indent icons. These options allow the user to specify how much numerical detail to place in a cell. As an example, our cell currently contains the numbers 2.1345 as a repeating number which means the decimal will continue to infinity. The cell information goes to the fourth decimal because it was formatted this way by the user (the user can decide how many decimal places to display).

By decreasing the indent to the left the number rounds the last decimal up or down depending, and only displays the next decimal place. In the case of this example, 3 decimal places. Therefore, the new number is 2.135 because excel rounded the fourth decimal up. By decreasing the indent to the right, more decimal places will be displayed, and the number becomes 2.13452.

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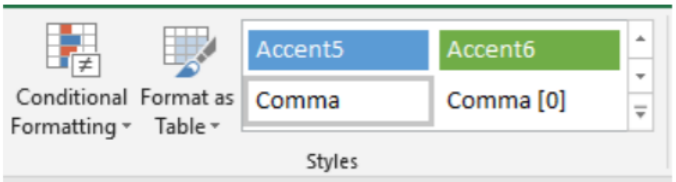
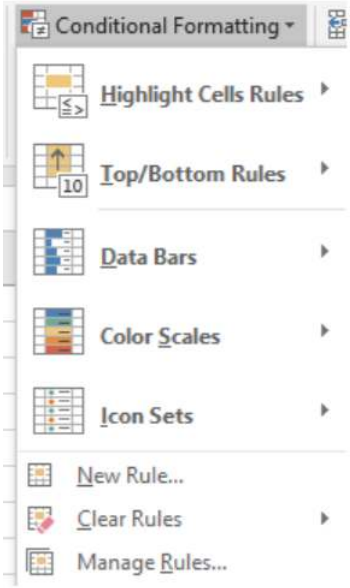
# 15.5: Styles Group




The Styles Group allows the user to use some predetermined styles consisting of fonts and colors to determine the appearance of the cell. Conditional Formatting allows the user to program Excel to change the color of selected cells based upon the conditions in a cell. Selecting Conditional Formatting will launch a drop-down menu allowing the user to customize the specific conditional formatting.

## Conditional Formatting

When preparing a large financial report, and excel user may want to make specific cell ranges more recognizable to focus the attention of their audience; perhaps they would like to highlight specific areas indicating profits visually and also showcase areas of financial losses another. The user can use Conditional Formatting to have Excel automatically label or create graphics for cells based upon properties they specify.

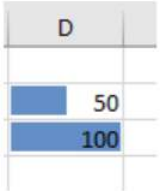



Selecting **Highlight Cell Rules** will apply the specific cell shading to selected cells with values either greater than, less than, between, equal to, the text contains, or a specific date, or duplicate values. Once the specific measure is selected, a new dialog box will launch allowing the user to input their specific value and the cell shading color that would be associated with it.

**Highlight Cell Rules**: Typically, an Excel user would utilize Highlight Cell Rules to program Excel to display certain cells to stand out to the user. For example, a CFO may use conditional formatting to program cells with negative balances to be colored red to stand out to their boss.

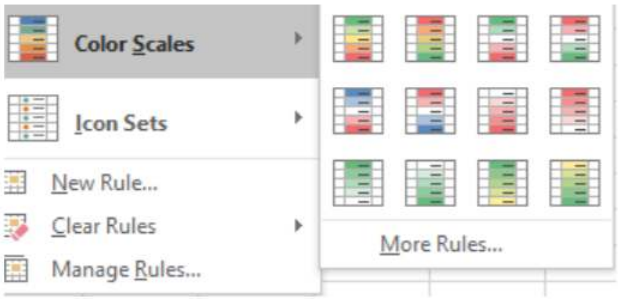
**Top/Bottom Rules**: These selection options allow the user to highlight the Top 10 items in a list, the Top 10%, Bottom 10 items, Bottom 10%, Above Average, and Below Average. In addition, any custom rules can be created as well.

**Data Bars**: Once the user has set rules for Conditional Formatting, Excel allows for multiple ways to display the data. Using the Data Bars feature of Conditional Formatting, users can create a fill a cell with a chosen color that fills relative to the data in the cell. For example, for the purposes of simplicity, a user could have two data points in two different cells, 50 and 100. Using the Conditional Formatting with Data Bars, the user can create a visual that compares the two data points in the cells visually. The number "50" makes the cell appear half-filled, while "100" fills the entire cell. Colors can be changed.

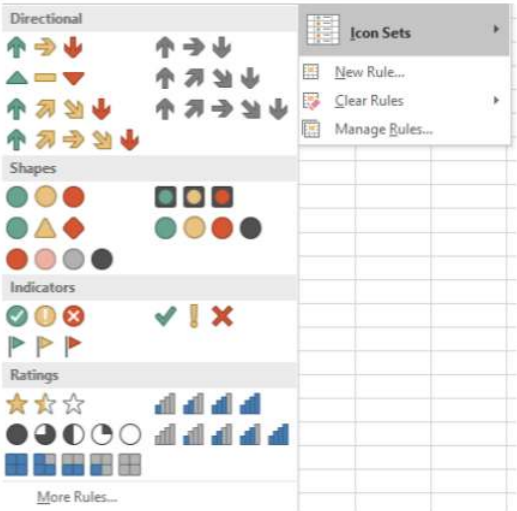



The user can always program the data bars to calculate differently by selecting the last option in the drop-down menu, More Rules.

**Color Scales**: In addition to Data Bars, the user can determine multiple color gradients to appear in cells based upon the Conditional Formatting rules. The cell can be shaded completely, or outlined depending on the user's preferences. Like Data Bars, the user can always provide more detail as to what data is displayed in the Color Scales by selecting "More Rules". Below the gradient options.

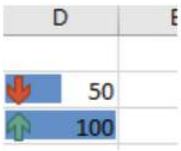



**Icon Sets**: In addition to colors, Excel users can display specific images or symbols in cells based upon their parameters and the data in the cell. There are a variety of arrows and shapes that can be associated with cells.




Using the previous example of placing "50" in one cell and "100" in the one below it, using Icon Sets, the user can place pictures (such as arrows) in the cells to indicate their value with or without the shading properties from the data bars. In addition to the

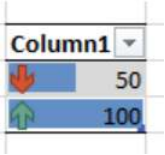
multiple graphic options, users can create custom rules by selecting the “More Rules” field in the Icon sets drop-down menus to determine how each cell appears. Depending on the rules established, the arrows, shapes, indicators or ratings will change.



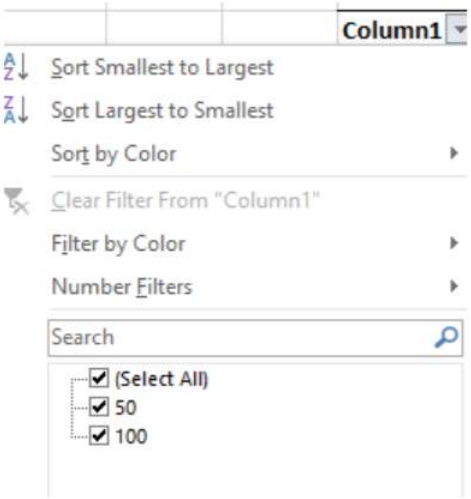

## Format as Table

While Excel is organized to present information in a grid-like table, the cells can be more precisely configured to be organized into a separate table format. To set up a table, select the cells that will compose the table and click the “Format as Table”

icon in the styles group. A dropdown arrow will launch a variety of table shading styles to select in terms of color and gradient (Light, Medium, and Dark). Formatting the table will allow for each row to be shaded in alternating colors to best differentiate the rows, and a header row will be placed at the top of the table. The header row allows the user to label the data in each column and also perform a variety of data sorting activities.




By clicking on the downward arrow on the right of the header row cell, a dropdown box will launch a variety of data manipulation options. Users can sort the data in that row from smallest to largest, largest to smallest, sort by color (if using conditional formatting), filter by color, and create filters for numbers in a cell. Filters only display text that the user specifies. For example, in a table with multiple numbers ranging from 1 to 10, filtering numbers “1” and “3” will only display those numbers in the table. The rest of the numbers will disappear until the user removes the filter, which is also located in the drop-down menu. In addition, the user can select the specific numbers to filter.

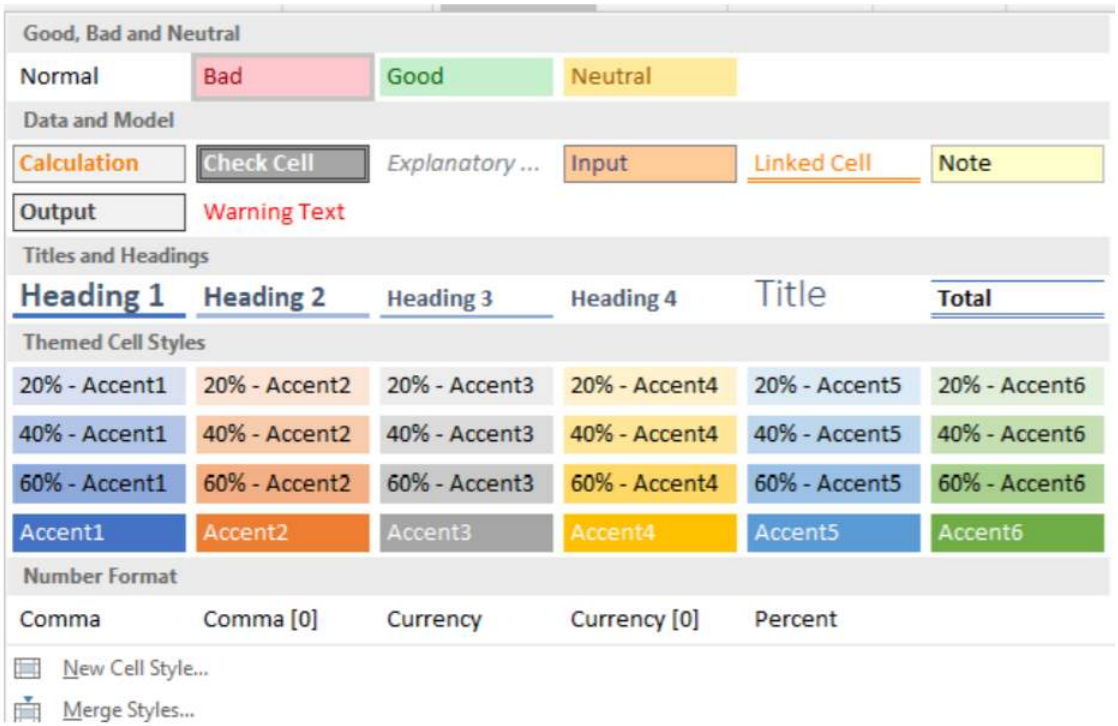



## Cell Styles

The last option in the Styles Group is the Cell Styles icon.

. Like Microsoft Word, Excel provides a number of preset styles with different colors and fonts. Instead of styles relating to paragraphs or sentences, they relate to individual cells instead. Selecting Cell Styles will load a dropdown menu that provides a variety of cell shading options, different font and heading

styles, and style themes in addition to number formats. Using styles allows the user to create standard cell properties across their document by using the same cell styles.

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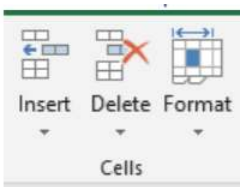
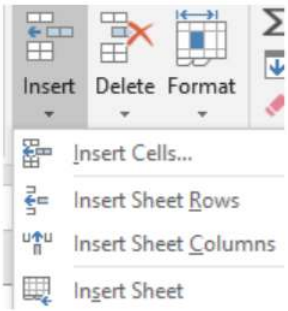
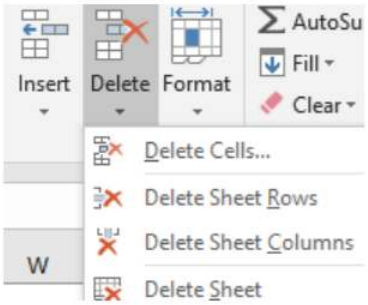
# 15.6: Cells Group



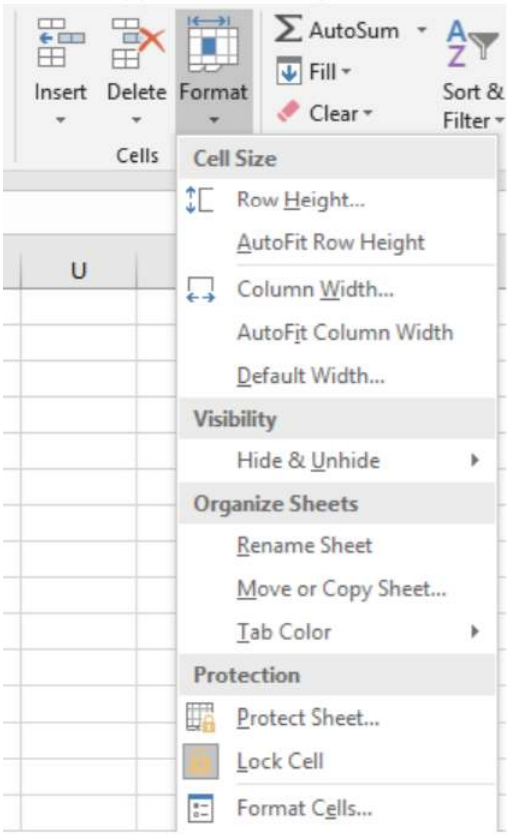

The Excel Cells Group allows the user to add, delete, or change specific cells. The Cells group does not format the information inside the cells, but rather the cells themselves. Selecting the Insert icon will launch a drop-down dialog box allowing the user to insert cells, rows, columns, or entire sheets into the workbook. The insert command is particularly helpful in Excel if the user wishes to enter new cell information between existing cells of data. When a new cell, column, or row is inserted, the default action is to move the other data down, or to the right of the insertion point depending on whether a row or column was inserted. Information that is moved is maintained in its form, and any formulas associated with it are moved to the new relative cell location so calculations are correct.




The Delete function performs in the opposite way compared to the Insert Command. It allows the user to Delete selected cells, rows, columns, or entire sheets. Users chose to perform this function to quickly remove sets of data that are no longer needed.

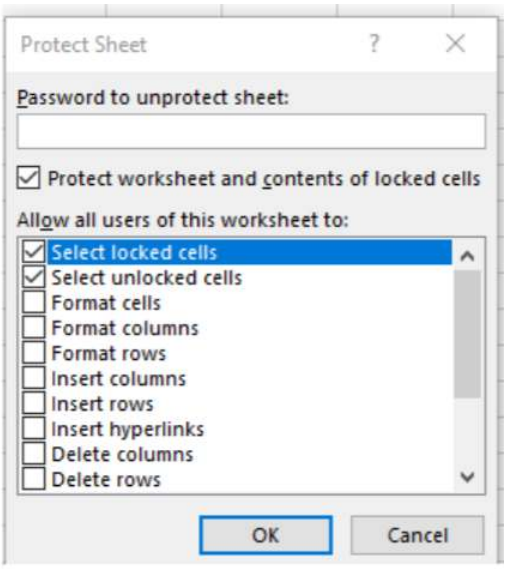



Finally, the Format icon of the Cells Group allows for multiple adjustments to be made to specific cell properties. Cells can be adjusted for Row Height and Column width manually, or via AutoFit, which automatically sizes the row or column to be just large enough to fit the selected cell height or width. Hide & Unhide settings allow the user to hide selected rows or columns so that they do not display to the user. The data in the cells are still there but must be unhidden using this icon to display the data again. The Hide command is often used when presenting a spreadsheet and the workbook creator does not want to show the viewer all of the Excel calculations in order to keep the spreadsheet simple. When rows or columns are hidden, there will be a break in the alphabetical or numerical order of the column or row to show that there is hidden information. The organize sheets command lets a user quickly rename, copy, move, or change the tab color of sheets in a workbook.




## Protect Sheet & Lock Cell

Imagine that you are distributing a budget with detailed figures on employee salaries to your management team. You are concerned that someone may decide to change the information in the budget and send it out to others. To prevent this from happening, you may decide to select the Protect Sheet icon. Using the Protect Sheet command, workbook creators can create a password to protect the sheet against unauthorized changes and prevent the user from making any number of changes to specific contents of a worksheet. Because this command is restricted to specific sheets, the user can protect one sheet, and not others if they choose to.




Once Protect Sheet is enabled with a password and specific actions are allowed or prevented, users can select the “Lock Cells” command beneath the “Protect Sheet” command to require a password before a user can make any changes to the cells that the user

selected prior to clicking “Lock Cells”. If a user would like to unprotect the sheet and allow editing without a password, they can enter the password again in the “Protect Sheet” dialog box to unprotect the sheet.

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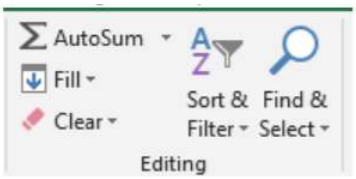
# 15.7: Editing Group



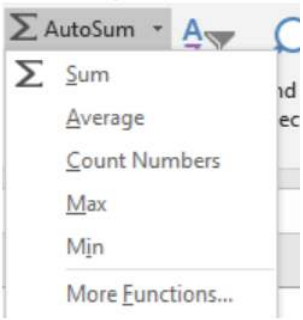

The Editing Group allows the user to manipulate data inside each cell using the AutoSum, Fill, and Clear Commands as will as sort & filter and Find & Select. We will first review AutoSum.

## Autosum

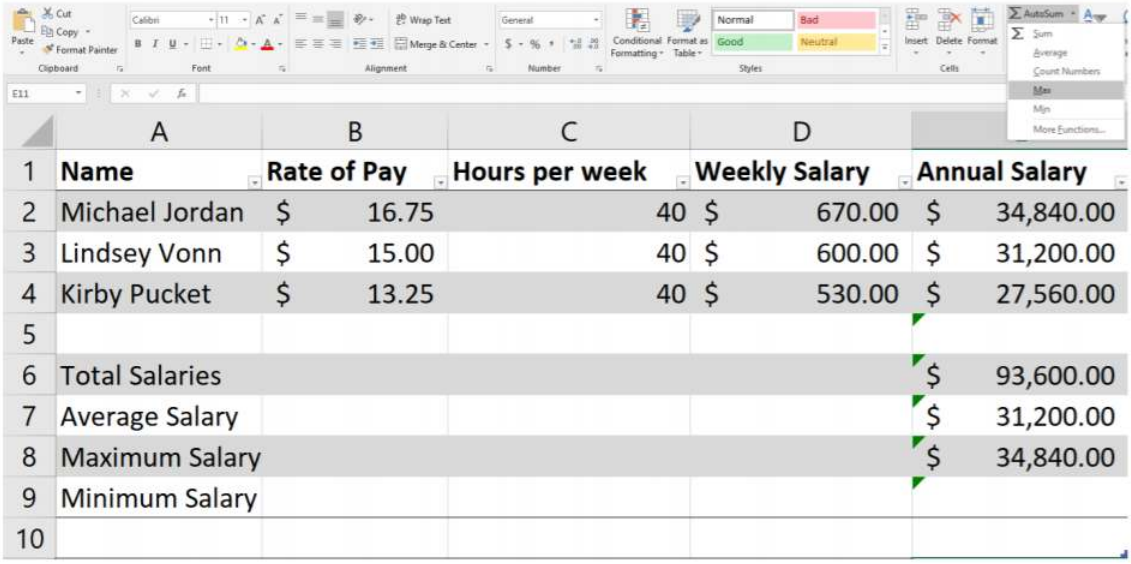
Let's go back to an example in a previous chapter. You are the owner of a construction company hiring three individuals to perform work for you. You have already used excel to calculate their weekly salary, but now you need more information; you need to know the total salary you expect to spend, the average salary, and the maximum and minimum salaries.

| | A | B | C | D | E |
|---|---|---|---|---|---|
| 2 | Name | Rate of Pay | Hours per week | Weekly Salary | Annual Salary |
| 3 | Michael Jordan | $ 16.75 | 40 | $ 670.00 | $ 34,840.00 |
| 4 | Lindsey Vonn | $ 15.00 | 40 | $ 600.00 | $ 31,200.00 |
| 5 | Kirby Pucket | $ 13.25 | 40 | $ 530.00 | $ 27,560.00 |
| 6 | | | | | |
| 7 | Total Salaries | | | | $ - |
| 8 | Average Salary | | | | $ - |
| 9 | Maximum Salary | | | | $ - |
| 10 | Minimum Salary | | | | $ - |
| 11 | | | | | |

Now, using the AutoSum Icon and corresponding drop-down commands options, the user can allow excel to automatically calculate this information



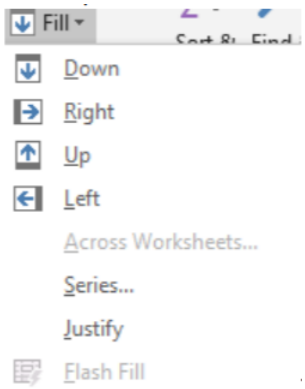

**Sum** calculates the total numbers added together in a specified range. **Average** calculates the value of the cells added together in a specified range divided by the number of cells in the range. **Count** Numbers provides the number of cells selected in a range. **Maximum** provides the highest number in a selected range, and **Minimum** provides the lowest number in a range. While these numbers automatically include the cells above them, the user can specify in the Excel Formula Bar the correct ranges if needed.



| | A | B | C | D | |
|---|---|---|---|---|---|
| 1 | Name | Rate of Pay | Hours per week | Weekly Salary | Annual Salary |
| 2 | Michael Jordan | $ 16.75 | 40 | $ 670.00 | $ 34,840.00 |
| 3 | Lindsey Vonn | $ 15.00 | 40 | $ 600.00 | $ 31,200.00 |
| 4 | Kirby Pucket | $ 13.25 | 40 | $ 530.00 | $ 27,560.00 |
| 5 | | | | | |
| 6 | Total Salaries | | | | $ 93,600.00 |
| 7 | Average Salary | | | | $ 31,200.00 |
| 8 | Maximum Salary | | | | $ 34,840.00 |
| 9 | Minimum Salary | | | | |
| 10 | | | | | |

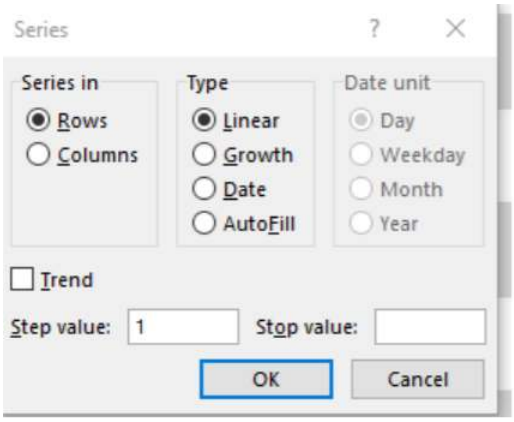
## Fill Command

In addition to using AutoSum, the Fill Command allows the user to continue a pattern of cell number, or copy the contents of one cell to the next cell in any direction. This could help when the user is creating a numbered list or needs to enter the same data points in many cells.



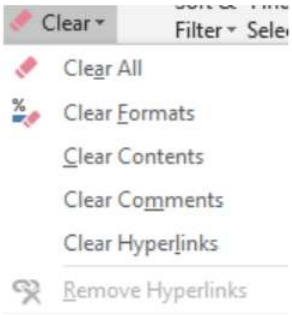

The Down, Right, Up, and Left Fill commands copy data from one cell to the next cell. Selecting the Series menu allows the user to select multiple methods for a cell to increase in value. Users can specify how much the cell increases and by what value, and whether the information increases in rows or columns. When the user is ready to fill cells, they should highlight the first cell (which has the starting number) and select the “Fill” icon on the menu, and select “Series”, and place the step value and the stop value (when the series should end) and click “Ok”. Their highlighted cells will then display the series in the cell.

This feature is especially helpful when creating numbered lists.




## Clear Command

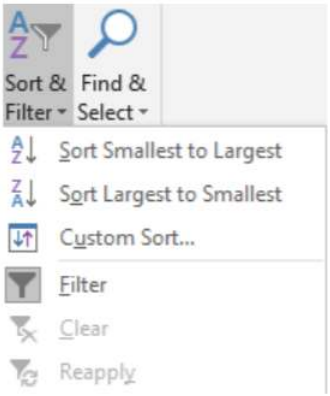
The Clear Command removes formatting and cell contents from selected cells. Once the Clear command is selected, a drop-down menu of options emerges with Clear All, Clear Formats, Clear Contents, Clear Comments, Clear Hyperlinks, and Remove Hyperlinks (if Hyperlinks are present).



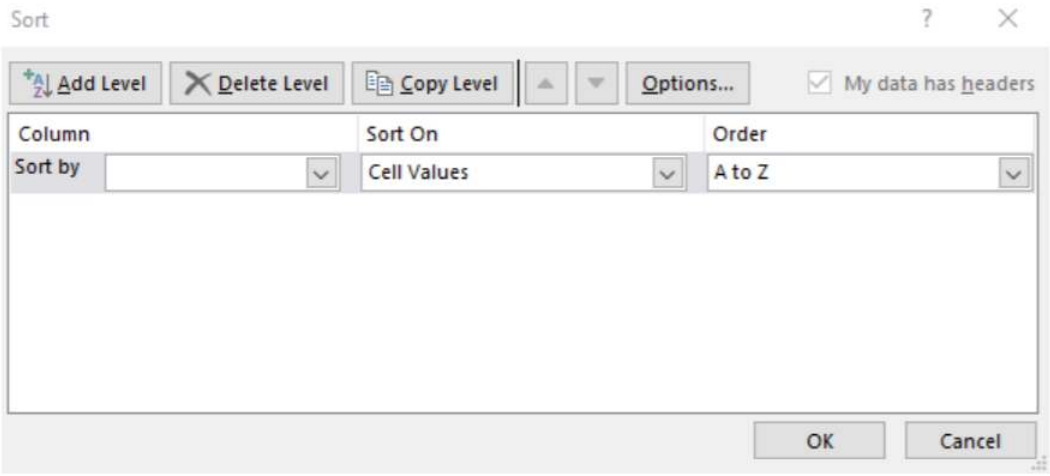

The Clear All will remove all of the contents and formatting of the selected cells. This allows the user an easy way to delete information without accidentally moving other data into other columns or rows. Clear Formats removes any formatting (like Bold or Italics) applied to any of the select cells. Clear contents only clear the information inside the cell, not the formatting or cell settings. Clear Comments removes Comments from other users but not the Cell Contents, Clear Hyperlinks remove the hyperlinks from the Cell, but keeps the text, and Remove Hyperlinks removes all text and link from the applicable Cell.

## Sort & Filter

One of the powerful features of Excel is to be able to analyze data. One way to analyze data is to sort it by specific fields. The Sort & Filter/feature in Excel allows the user to perform this action. To use the Sort & Filter process, select a cell, and then click on the Sort & Filter menu. A drop-down menu of options will emerge, allowing the user to Sort from Smallest to Largest, Largest to Smallest, Custom Sort, Filter, Clear a previous Sort & Filter, and Reapply a Cleared filter.

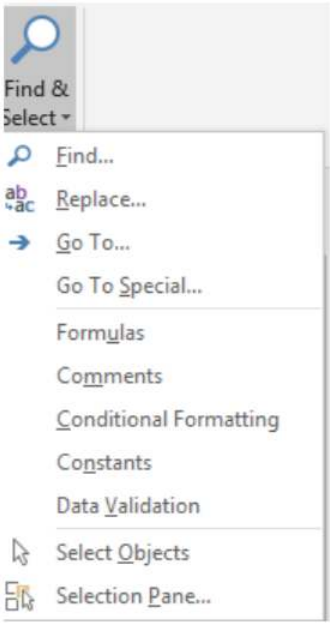


Smallest to largest moves all other columns in Excel to be in order with the smallest number in the selected column to be displayed first. Sort Largest to Smallest is the opposite, Custom Sort allows the user to apply multiple sort levels to the document.




## Find & Select

Finally, the Find & Select Menu of Excel allows the user to find or replace text, numbers, formulas, comments, or other data in any cell. Selecting the Find & Select Icon will launch a drop-down menu which allows the user to find items, or replace one word or number with another in the entire worksheet. In addition, special search parameters (formulas, comments, conditional formatting, constants, and data validation are also parameters that can be used.

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# 15.8: Check for Understanding

1. You have been asked to track department spending for your unit for the month. Please create a budget with the following headings:

| Item | Category | Number Purchased | Cost per item | Total Cost | Percent of Total spent |
|---|---|---|---|---|---|

Now, also calculate the totals, maximum and minimum spend amounts using the AutoSum feature. All amounts are only in dollars, not cents.

2. Once your budget has been created, use conditional formatting to highlight any number under $500 in Red.
3. On your next sheet, please create a spending tracking report with the A column cells being numbers from 1-100 using autofill. In addition, change the name of Sheet2 to “Spending” and change the color of the tab to blue.

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# CHAPTER OVERVIEW

## 16: Using Insert Tab

Similarly to Microsoft Word, the Insert Tab of Excel allows the user to place multiple objects and information into their worksheet. The Insert Tab Consists of grouped functions: Tables, Illustrations, Add-Ins, Charts, Tours, Sparklines, Filters, Links, Text, and Symbols.


16.1: Insert Tab
16.2: Sparklines
16.3: Filters
16.4: Links
16.5: Text
16.6: Symbols Group
16.7: Checking for Understanding


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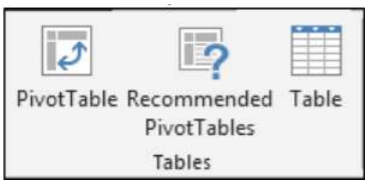
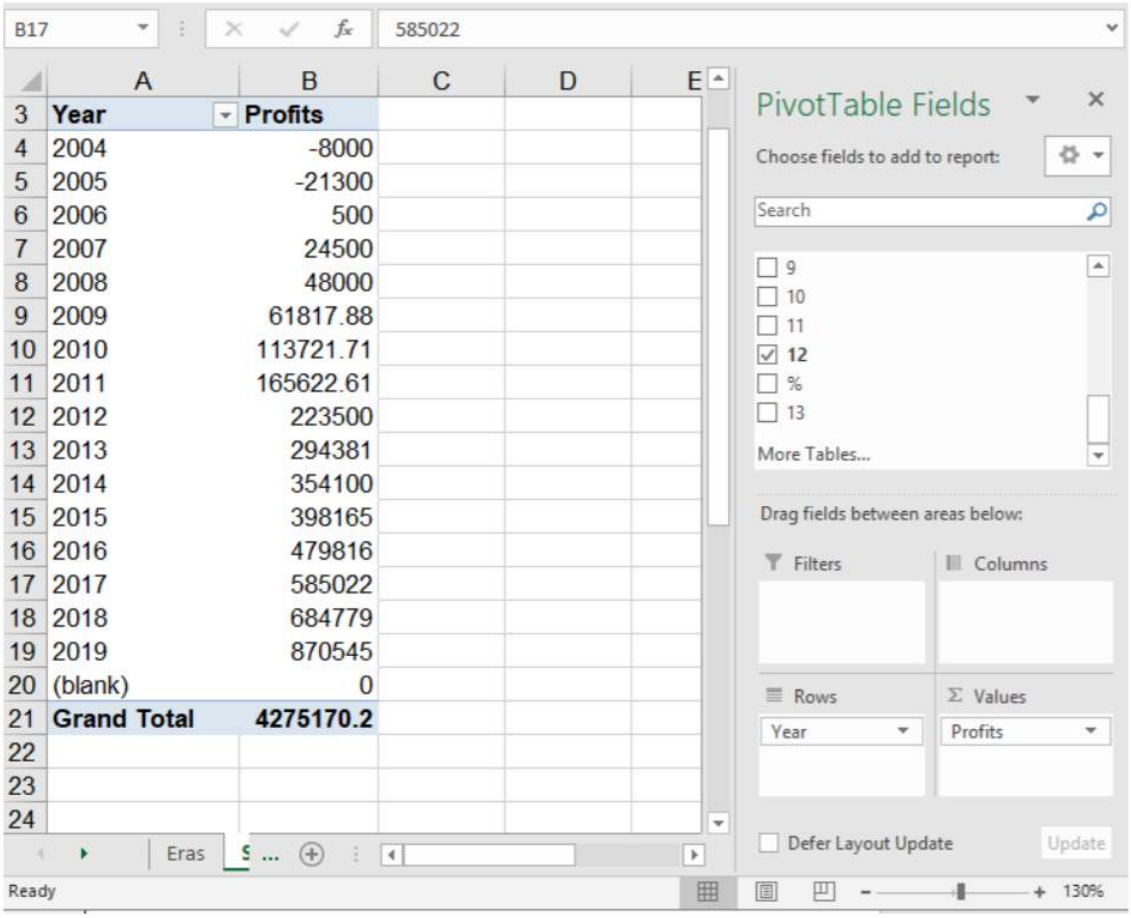
# 16.1: Insert Tab

## Tables Group



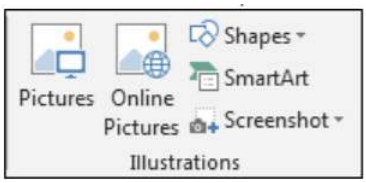

As previously described, Tables are used in excel to easily select and sort information. Excel allows the user to use tables (which allow for basic functions) and pivot tables, which are used to create the summary reports of large data sets with the built-in calculation, and we have the option to make our own calculation. Tables make it easy to sort, filter and format the data within a sheet. Excel even has a Recommended PivotTables option to automatically create Pivot Tables based upon the data provided in the highlighted cells.

To create a Pivot Table, select a cell within the table of data you wish to use. Then select Pivot Table. You may also use *Recommended Pivot Tables* for some predetermined templates. Regardless of which option you choose, the Pivot Table Wizard will launch and automatically select the data associated with your table that will be available in the Pivot Table. In addition, the user can select to add the Pivot Table in their current worksheet or a new worksheet. Once you have selected specific properties associated with your Pivot Table or selected the default options, click “ok” to create the Pivot Table.

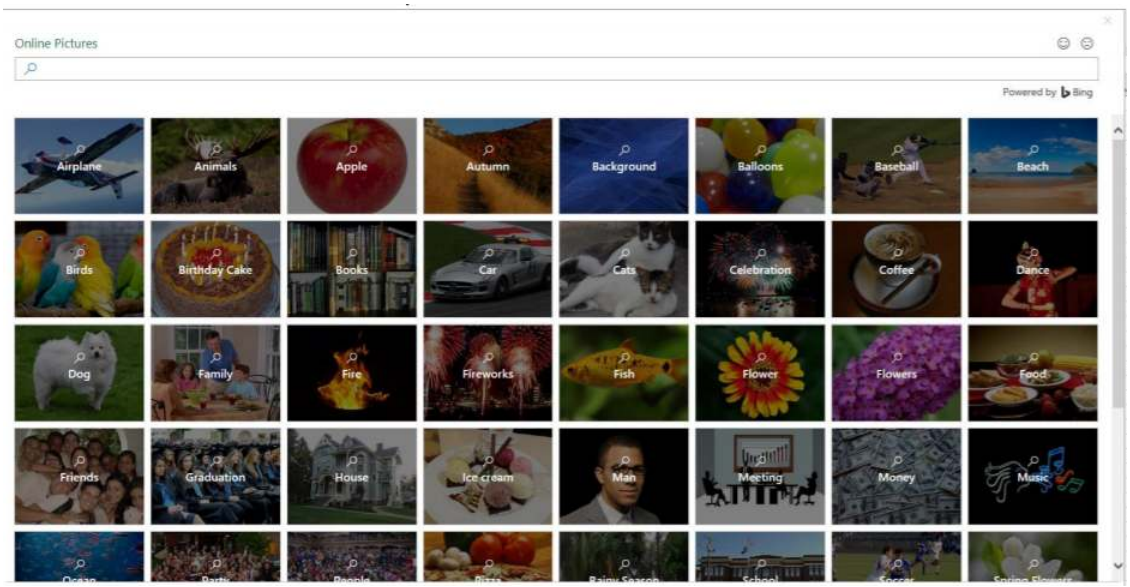


By default, the PivotTable Fields will be displayed in the upper left-hand corner. The user can select the appropriate column and determine whether it should be listed in a column, row, or values view. This flexibility allows the user to explore interrelationships between multiple data sets. While performing complex PivotTable calculations is outside the scope of this course, it is important to understand the purpose of Pivot Tables.

## Illustrations Group

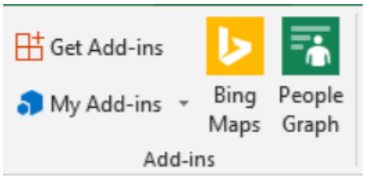



We use this option to insert the Pictures, Online Pictures, Shapes, SmartArt and Screenshot. It means if we want to insert any image, we can use Illustration feature. Selecting the Pictures icon will allow the user to import their own picture file into Excel. Selecting Online Pictures will launch an Excel Online Bing Search tool to search for any picture using Bing that has a Creative Commons license that permits its free use in a document.




Once a picture is inserted into excel, it will be displayed on top of the cell and cover any contents in a cell. The picture can be manipulated with the same Picture Format tools when selected as Microsoft Word. For more information on adjusting picture properties in Microsoft Office, please visit Inserting Pictures in Chapter 12. The picture size can also be adjusted by selecting the edges of the picture and dragging resizing them to the preferred size.

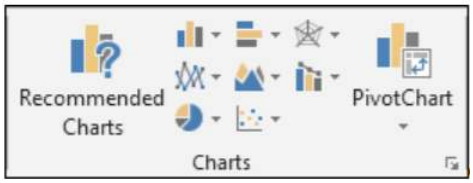
## Add-ins



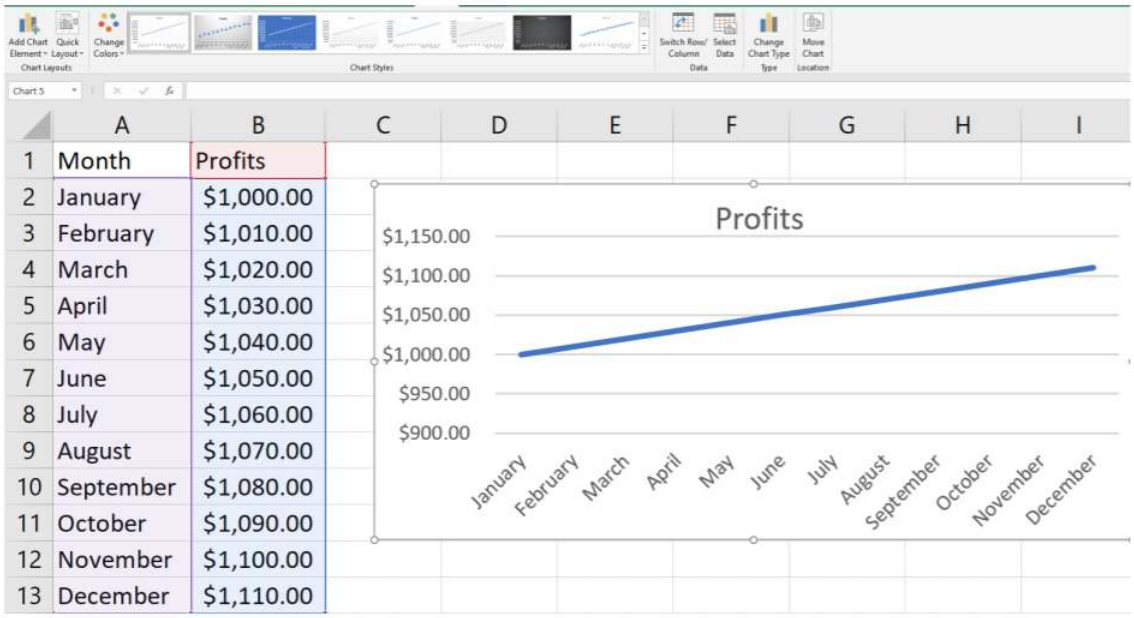

Like Microsoft Word, Excel provides the user the option to insert Add-In Applications that operate inside of Excel to expand the functionality to the user. The default options automatically added are *Bing* Maps and *People Graph*. Depending on your Office 365

subscription or Excel license, your use of Add-ins may be limited. Users can download more add-ins by selecting the *Get Add-ins* icon.

## Charts




Charts are one of the key uses of excel when there is a need to display numerical information graphically. In Excel, users can insert a variety of charts: Column, Bar, Radar, Line, Area, Combo, Pie and Bubbles chart. If the user doesn't know what kind of chart to use, the can select "Recommended Charts" and Excel will automatically insert a chart from the data selected. To create a chart, select the range of cells to be included in the chart. You may include the header columns and rows if desired. Once the data is selected, simply select the preferred chart type and Excel will automatically create a chart.




## Types of Charts

Excel contains a variety of charts for users to utilize to display data visually to others. Each Chart has a specific utility depending on the types of data. All charts can be customized by selecting the chart and using the Design and Format tabs which will be described later.

**Pie Chart**: A Pie Chart can only display one series of data. A data series is a row or column of numbers used for charting. Excel uses the series identifier (column or row heading) as the chart title and displays the values for that series as proportional slices of a pie. If we had selected multiple series of data, Excel would ignore all but the first series. There are sub-types of the Pie Chart available. The second chart below is the Pie Chart in 3-D and the third chart is an Exploded Pie Chart; an Exploded Pie in 3-D is also available.

**Column Chart**: The Column & Bar Charts shows the comparison of one or more series of data points. But the Clustered Column Chart is especially useful in comparing multiple data series. In a Column Chart, the vertical axis (Y-axis) always displays numeric values, and the horizontal axis (X-axis) displays the time or another category. And by default, Excel will always plot the category (row or column heading) that contains the most entries on the horizontal axis (X-axis). One variation of this chart type is the Stacked Column Chart. In a Stacked Column Chart, the data points for each time period are "stacked" instead of "clustered."

This chart type lets us see the percentage of the total for each data point in the series. Also available is the 100% Stacked Column Chart, where each value in a series is shown as a portion of 100%. An example of a 100% Stacked Chart is shown in the section on Bar Charts. All the Column Charts have a version in which the columns display in three-dimension - as illustrated by the 3-D Stacked Column Chart above. But one chart, the "3-D Column Chart," is special because the chart itself is three-dimensional - displaying multiple series on the X-axis, Y-axis, and Z-axis. The first chart below is a 3-D Column Chart of our data series.

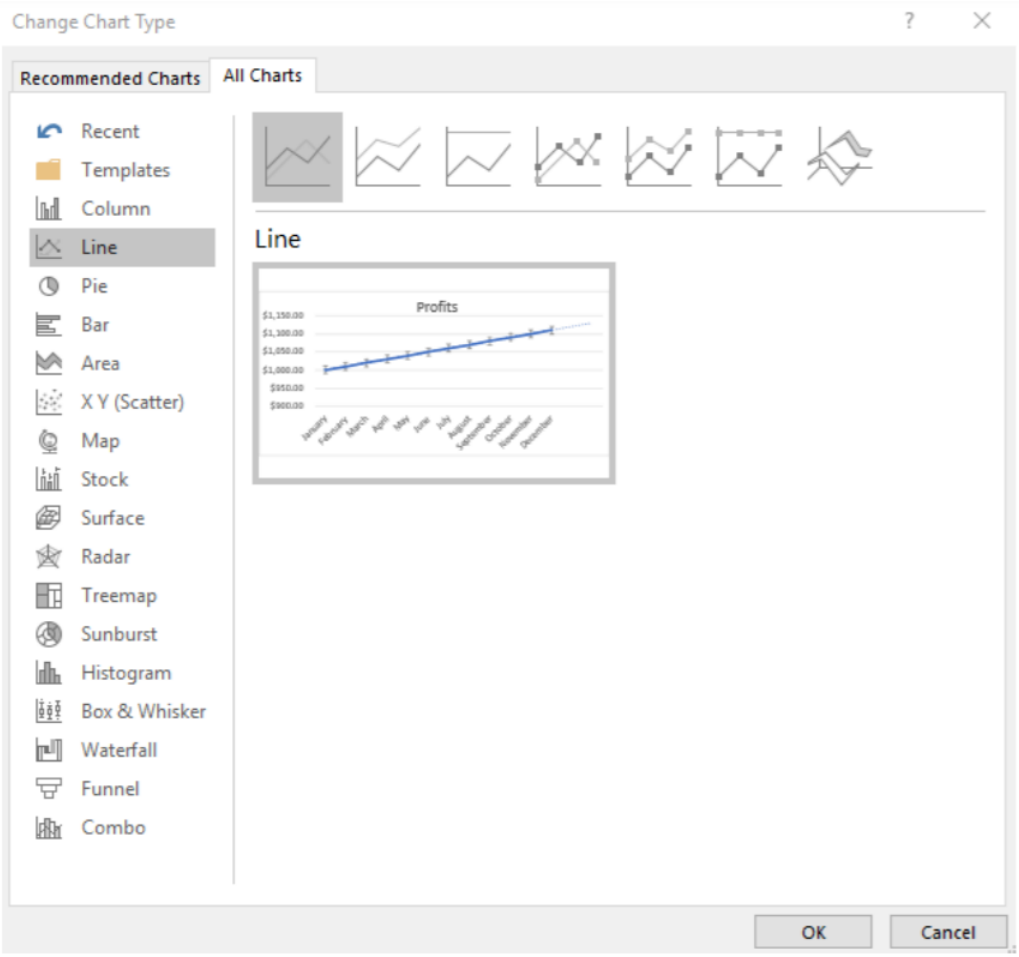
**The Bar Chart**: The Bar Chart is like a Column Chart lying on its side. The horizontal axis of a Bar Chart contains the numeric values. The first chart below is the Bar Chart for our single series, Flowers. When to use a Bar Chart versus a Column Chart depends on the type of data and user preference. Sometimes it is worth the time to create both charts and compare the results. However, Bar Charts do tend to display and compare a large number of series better than the other chart types.

**Line Chart & Area Charts**: The Line Chart is especially effective in displaying trends. In a Line Chart, the vertical axis (Y-axis) always displays numeric values and the horizontal axis (X-axis) displays the time or another category. You may choose each Line Chart type with or without markers. Markers are circles, squares, triangles, or other shapes that mark the data points. Excel displays a unique marker - different shape and/or color - for each data series. Besides the Line Chart, we have the Stacked Line Chart and the 100% Stacked Line Chart - with or without markers.

**Area Chart**: The Area Chart is very similar to a Line Chart with the addition that underneath the trend line is solid. Area Charts are used primarily to show trends over time. There are three charts available: the Area Chart, the Stacked Area Chart, and the 100% Stacked Area Chart. Each of these charts come in 2-D format and in true 3-D format with X, Y, and Z axes.

**The Scatter Chart**: The purpose of a Scatter Chart is to observe how the values of two series compare overtime or another category. Scatterplots are similar to line graphs in that they use horizontal and vertical axes to plot data points. However, they have a very specific purpose. Scatter plots show how much one variable is affected by another. The relationship between two variables is called their correlation."

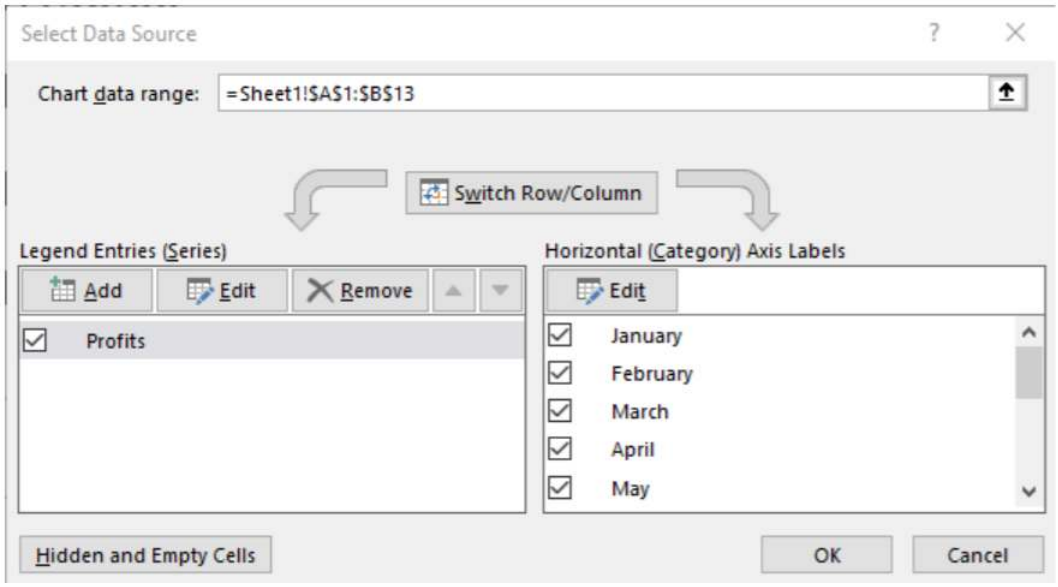
The series pair has a Positive Correlation if they increase similarly, and a Negative Correlation if they both decrease in like manner. Otherwise, they have No Correlation. The Scatter Chart comes in several different formats: markers can indicate the data points, and the points can be unconnected or connected with smooth or straight lines. Finally, there are many other types of Charts Excel provides for the user that are not described in detail in this book. The user can click on the More options arrow in the Chart Group to view all of the Chart options available to the user.




## Chart Design

Once you have inserted a Chart, there are many options available to customize it. Users can select Design Tab (it only appears when you have first selected a chart) and have the option to choose from a variety of Chart Styles, to adjust the data or change the chart type, or add many already created quick layout elements, such as field labels or specific text properties. Users can also change the colors of the chart, or move the chart location. The most comprehensive feature to chart design is the Add Chart Elements icon that launches a drop-down menu with common chart customization features depending on the chart selected.

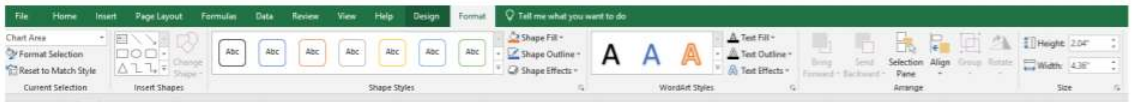
The **Chart Data Group** allows the user to toggle the row and column axis, and customize the data being reported by clicking on the Select Data icon. Once the Icon is clicked, a new dialog box will launch and allow the user to customize the data used.



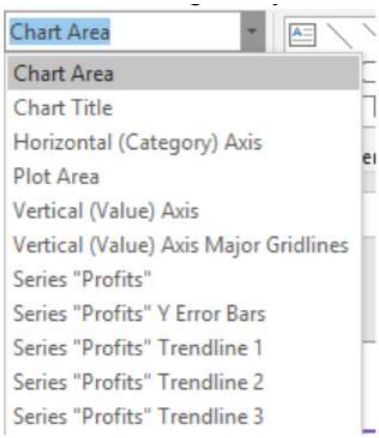

The Chart Data Range is the first customizable field. You can use it to select the data included in the chart. You can do so by manually typing in the data, or selecting the data by clicking on the specific range of cells to be included. The user can also edit the specific columns of data to be included (or not included) in the chart by selecting the Legend Entries (Series) on the left-hand side and also adjust the Horizontal Category Axis Levels on the right. Users can explore these customization options. If they ever think that they made a mistake, they can always select the *Cancel* button to not save the changes. Selecting *OK* saves the changes to the chart.

## Chart Format

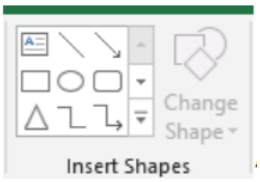
The Chart Formatting Tab also is available when you select a chat that you have created. The Format tab allows the user to insert shapes and lines in a chart, change the outline styles, and change the size of the Chart.



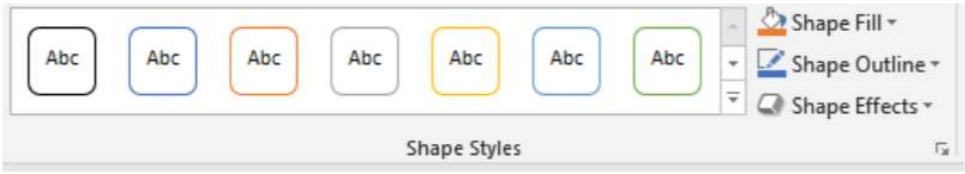
The first grouping, *Current Selection* allows the user to adjust the Chart Border and fill settings. While the default settings to adjust is *Chart Area*, any number of aspects of the chart can be adjusted.




Next to the Current Selection Group is the Insert Shapes group. A wide variety of shapes, lines, boxes, and emojis can be inserted into the chart. Clicking the downward arrow in the menu of options will provide the user with even more options. In addition to shapes, new text boxes can also be inserted.



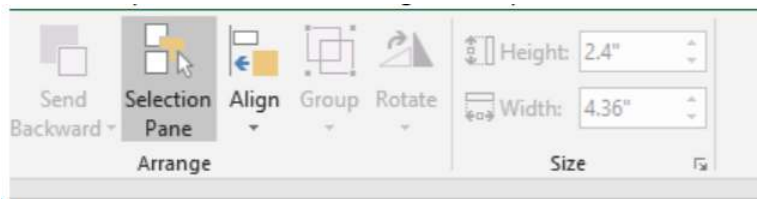

To the right of the *Insert Shapes Group* is the *Shape Styles* group. Shapes styles allow you to adjust any color or visual effect of the chart. You can choose presets for background fill of your chart, or choose your own color with the *paint can icon*. You can also adjust the border for the chart with the *Shape Outline icon*, and any transparency effects with the *Shape Effects icon*.




The next group, Word Art Styles focuses on text effects.

The user can choose from a variety of Word Art styles, or make their own with various Text Fill, Text Outline, and Text Effects. There is so much customization available to charts in Excel that it is possible that no two charts ever created are completely the same.

Finally, the Arrange & Selection Groups allow the user to change the shape of the chart and select between multiple charts. If eligible, a chart can be rotated, and also aligned to other charts or data on the excel spreadsheet.

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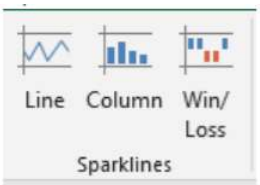
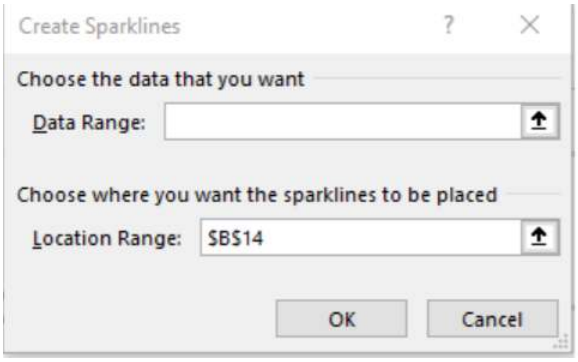
# 16.2: Sparklines



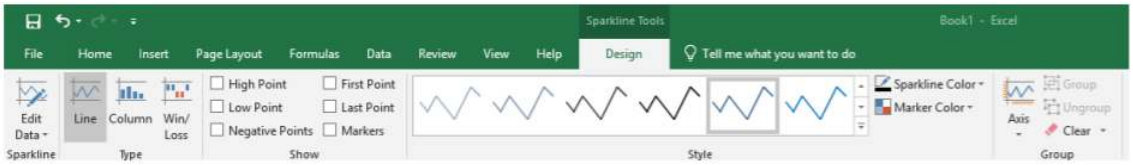

Sparklines are very small graphs or charts that exist within a cell. They are usually entered as a quick visual reference or representation of numerical data. There are three types of Sparklines available: Line, Column/Loss. Line & Column Sparklines provide the same type of visual reference of information as charts. Win/Loss Sparklines show an upward-facing chart for positive values and a downward-facing chart for negative values. To add a sparkline to a cell, highlight the cells in which you want to use their data to create a sparkline. Then click on the icon corresponding to the type of Sparkline you would like to create. Once selecting the Sparkline, a Sparkline dialogue box will appear, allowing you to select or change the cells to be used to generate the Sparkline and a cell to select to insert the Sparkline. When all data is entered, click OK and the Sparkline will be inserted in the appropriate cell.



| | A | B |
|---|---|---|
| 1 | Month | Profits |
| 2 | January | $1,000.00 |
| 3 | February | $1,010.00 |
| 4 | March | $1,020.00 |
| 5 | April | $1,030.00 |
| 6 | May | $1,040.00 |
| 7 | June | $1,050.00 |
| 8 | July | $1,060.00 |
| 9 | August | $1,070.00 |
| 10 | September | $1,080.00 |
| 11 | October | $1,090.00 |
| 12 | November | $1,100.00 |
| 13 | December | $1,110.00 |
| 14 | | |

## Sparkline Design Tools

After a Sparkline is created, the user can adjust some of the design elements of the Sparkline by selecting the cell and then navigating to the Design Tab in the Excel Ribbon.




Using the Design tools, users may edit the Sparkline Data, change the type of Sparkline, and select whether to display different points/stages of data in the sparkline. Users may also adjust the Sparkline color.

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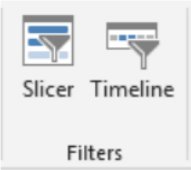
# 16.3: Filters




The filter group contains controls for Slicer and Timeline Filters. These are associated with Pivot Tables. Inserting a Timeline or Slicer allows the user to place visual controls to be associated with a Pivot Table to change the data being displayed. Since this book does not go into detail in Pivot Tables, this will be the extent of the information shared on this subject.

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# 16.4: Links

The link command allows the user to create a link in the document to another location, or another document, or a website to quickly access other content. Clicking on the Link icon will display a box to create a connection to another file or location.

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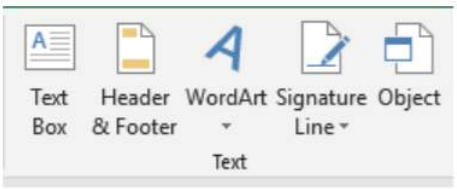
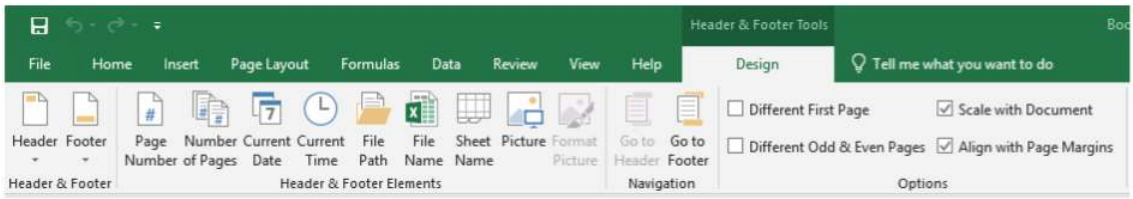
# 16.5: Text




The Text Group allows the user to insert a number of objects into an Excel document to make it more visually appealing and easier to understand. The **Text Box** command allows the user to insert a textbox anywhere on the document. The **Header & Footer** command allows for the user to place a document header (usually a title) on a worksheet and a footer (such as the date) on the bottom of the document. The Header and Footer views are visible on the Page Layout view. Selecting Header & Footer launches the Header & Footer Design view, which allows for many customizations to the document.




In the Design Tab, both Header & Footer display a large number of drop-down menus to allow the user to choose a number of pre-populated fields pertaining to the document. In addition, users can insert page numbers, the number of pages, Current Date, Current Time, the File Path, File Name, Sheet Name, and Picture. In addition, users can specify what pages should relate to the Header & Footer and align the Header/Footer with the page that will be printed.

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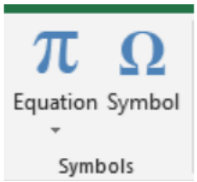
# 16.6: Symbols Group




We use this option to insert the symbols and equations. The equation is used to insert the common mathematical equations to your document and also we can add equation by using the mathematical symbols. We use Symbols to insert the symbols which are not on the keyboard and, to create the equation, we use the symbols from here. Once an equation is inserted, by clicking on the Equation that was inserted, the Design Tab of the Ribbon will launch.

The Design view for equations allows for much more customization of an Equation, as well as inking and mathematical calculations.

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# 16.7: Checking for Understanding

1. You are tracking monthly sales for your parts and equipment company in 2019 and 2020. Your monthly sales are as follows with 2019 displayed first followed by 2020:
   a. January: 2400, 2670
   b. February 3300, 3100
   c. March 2700, 1900
   d. April 1900, 1920
   e. May 2700, 2450
   f. June 2650, 3200
   g. July 3200,1700
   h. August 1700, 1650
   i. September 1560, 1649
   j. October 1890, 1919
   k. November 2100,2400
   l. December 3400, 3600

Please create an excel document with the following Table Columns:

| Month | 2019 Sales | 2020 Sales | Sparklines |
|---|---|---|---|

Format your information as a table, and insert a Bar Chart Displaying the monthly profits in dollars. In addition, create a totals row to add the total profits.

2. Create a Pie Chart to measure each month of sales in relation to the whole. Add an Image pertaining to Sales next to the chart.
3. Place a document header & footer on the worksheet. The Header should be “Monthly Parts Sales”. The Footer should be the Date.

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# CHAPTER OVERVIEW

## 17: Page Layout, View and Review Tabs

The Page Layout, View, & Review Tabs allow you to create views for your document to make your workbook easier to understand and navigate for the user.


17.1: Page Layout Tab

17.2: View Tab

17.3: Review Tab

17.4: Checking for Understanding


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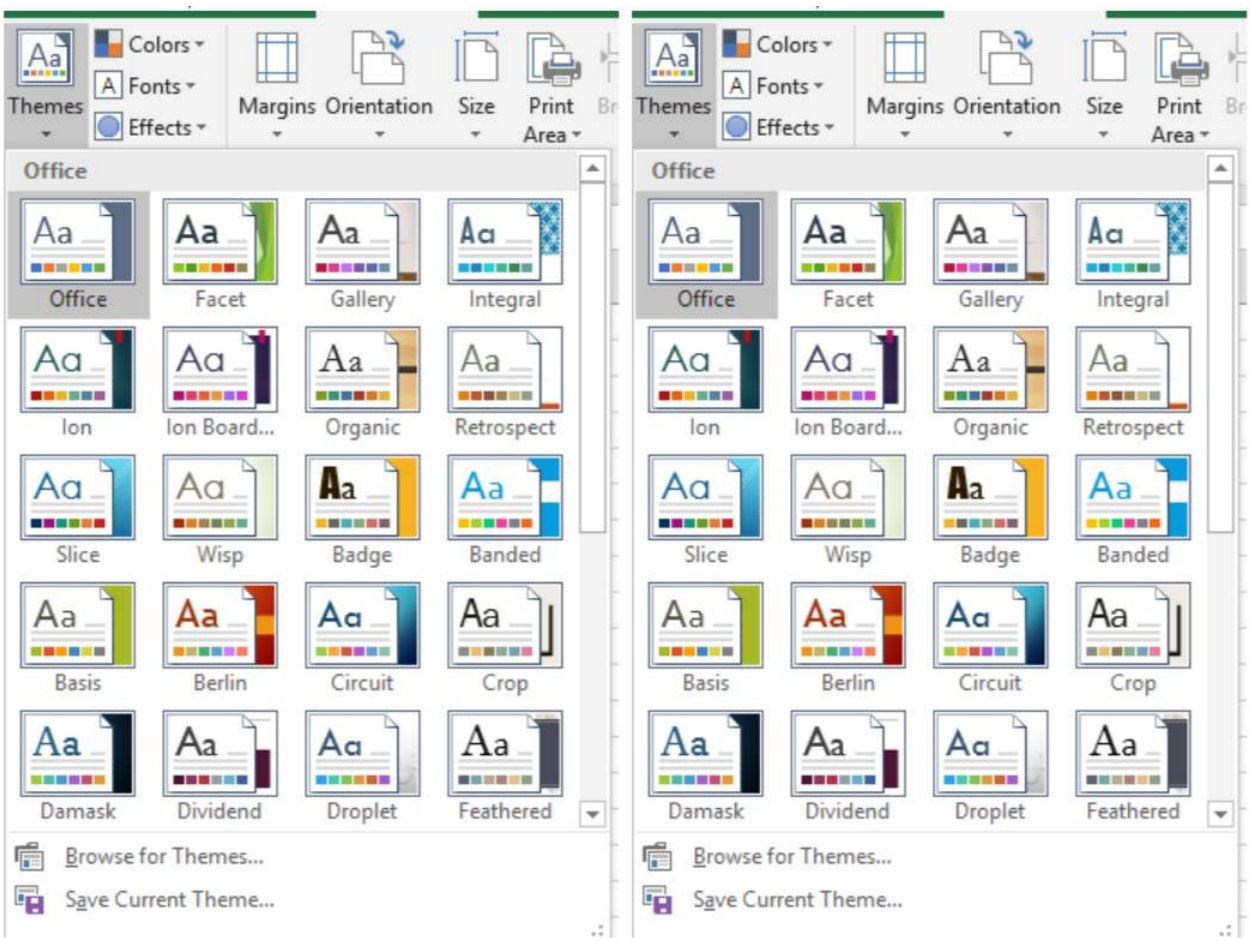
# 17.1: Page Layout Tab

## Page Layout Tab

The Page Layout Tab allows the user to control the visual appearance of the worksheet when it is printed. The Page Layout Tab consists of five major groups: Themes, Page Setup, Scale to Fit, Sheet Options, and Arrange.

### Themes Group

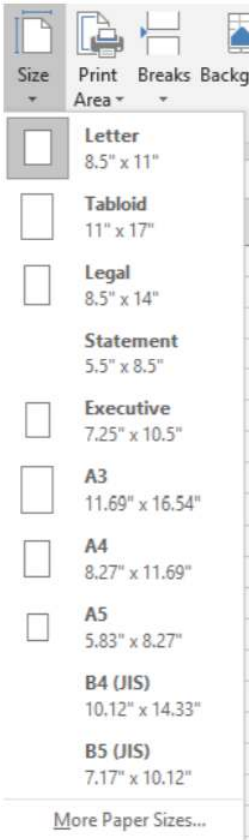



Microsoft Excel provides a variety of themes- fonts, colors, and backgrounds that go together to make Excel very customizable and visually appealing to the viewer. If none of the stock Excel themes interest the user, they can always make their own theme by customizing the Colors, Fonts, and Effect icons to the left of the Themes Icon

.

### Page Setup Group

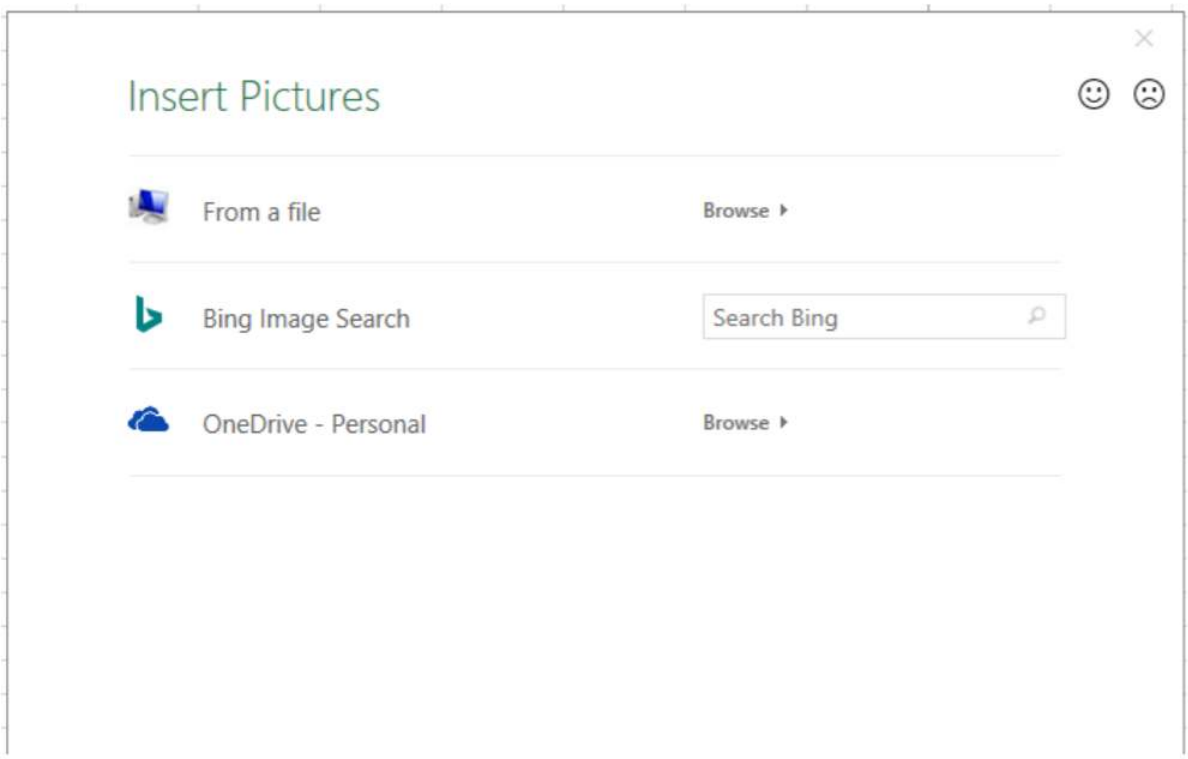
Users can select the **Margins** icon if they wish to print their worksheets. Margins allow the user to specify how close to the top, bottom, left, and right of the printed page cell information is placed. Narrower margins allow more information to be placed on a printed page, wider margins will contain less information. The **Orientation** icon allows the user to determine whether the worksheet is created in a portrait or landscape view. Portrait orientations are best suited when a worksheet contains many rows of data, as the orientation provides more vertical room. Landscape orientation is best when a document has more column views.




The **Size** icon allows the user to set up their worksheet page height and width relative to the paper size they wish to print in Excel. For example, if the user selects Tabloid, Excel will allow more room in a worksheet to match the print area of the larger document (11" X17"). If a user would like to create a custom area on their excel document that they would like to print, for example- they have created charts that correspond to a table, but they only want to print the charts from a worksheet, they can select the cells they would like to print and then select the Print Area icon. They can also remove the print area by selecting the same icon and then clicking on *Clear Print Area*. Excel Users may also create custom page breaks and separate sections of their worksheet by selecting the **Breaks** icon. After selecting the cell where they wish to be the top right corner of the second page, they should click on the *Breaks* icon

If a user wishes to remove the Page Breaks, they can select the Breaks icon again and click on *Remove Page Break*. A user may also insert a background image into their worksheet by selecting the **Background** Icon

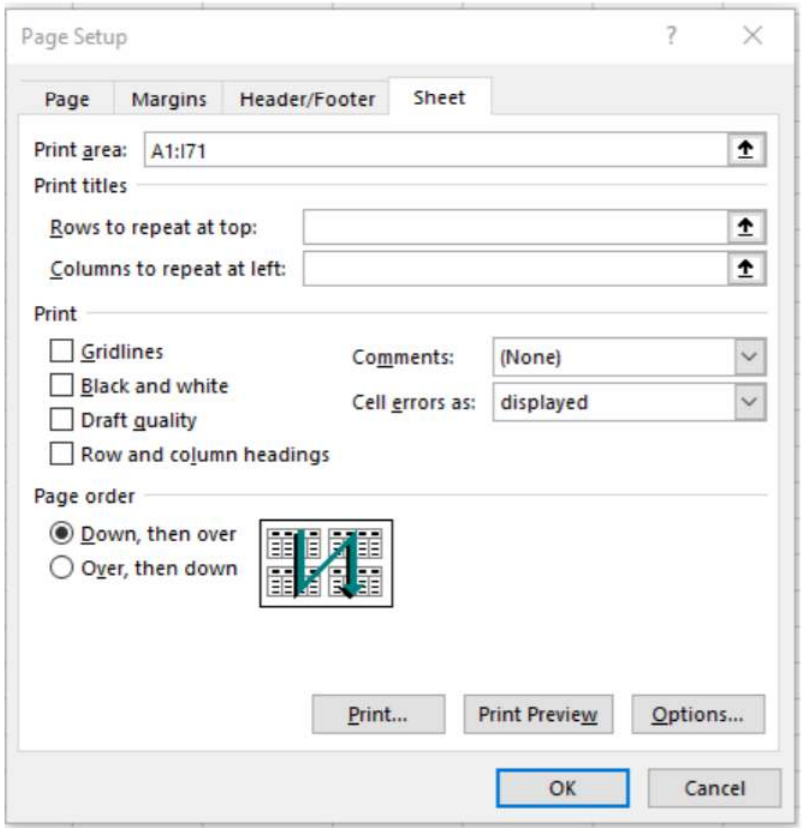
. When selected, Excel will allow a user to find an image online using Bing Search, search their OneDrive Account for a picture, or find a picture on their computer.



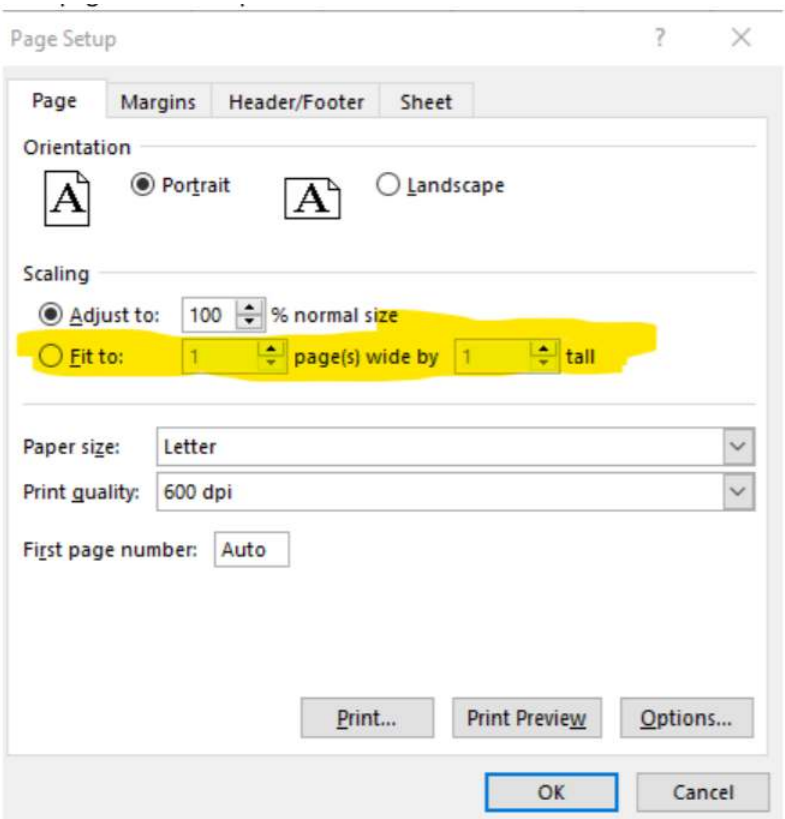

Once an image is inserted, the icon changes to *Delete Background*

, allowing the user to delete the image from their worksheet. Finally, **Print Tiles**

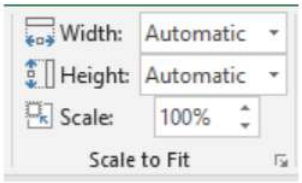
provides the user with many options to best display your worksheet on a printed page. When selected, Print Tiles will launch the Excel Page Setup menu, which allows the user to select the Print Area, Rows to repeat at the top of each page, columns to repeat on each page on the left, and whether to print Gridlines, Comments, Row and Column Headings, and the order or the worksheet will print.




Using the Page Setup menu, users can also adjust the Header/Footer text, the Margins, and the Page Settings, which provide a number of formatting changes that have already been discussed. On the *Page* tab, a few help options for printing are the Fit to settings which allow the user to specify how many total pages should be printed for their worksheet. A commons choice is to fit 1 page.

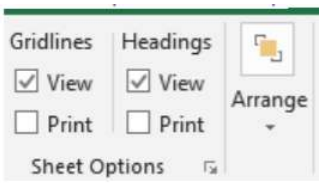



## Scale to Fit Group

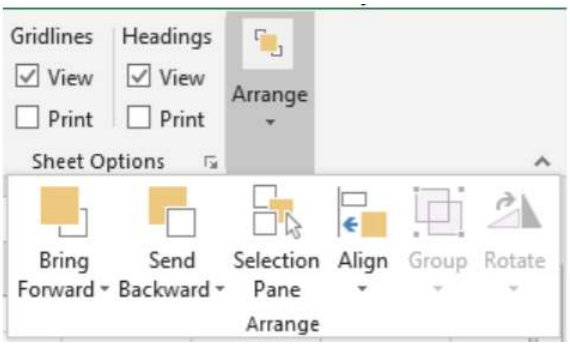



The **Scale to Fit** group provides similar controls to the Page Setup menu. Users may determine the page width and height to specify how many pages in a worksheet to print, depending on the settings selected for Width and Height, the Scale percentage box will adjust. Selecting the more options arrow, will launch the *Page Setup* menu again.

## Sheet Options Group




The Sheet Options group allows the user to control whether they can view gridlines and headings in their worksheet on their computer screen and/or on the printed page. The **Arrange** icon is used to manipulate images to allow them to be aligned with cells or appear on top of or behind other cell information. Objects can also be rotated and placed in groups.

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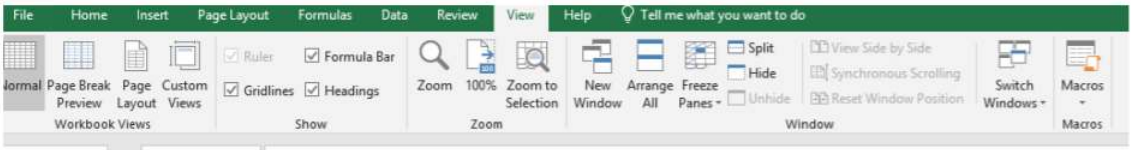
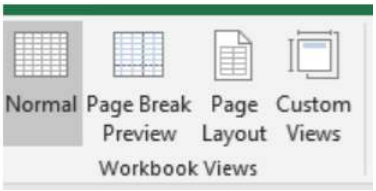
# 17.2: View Tab

The View Tab controls how information is displayed to the user. It allows the user to customize their workflow and make the document easy to understand to the user. It also allows for the creation of Macros, which are recorded combinations of commands that allow the user to create “buttons” to perform complex commands and functions at once. The View Tab is divided into five groups: Workbook Views, Show, Zoom, Window, and Macros.

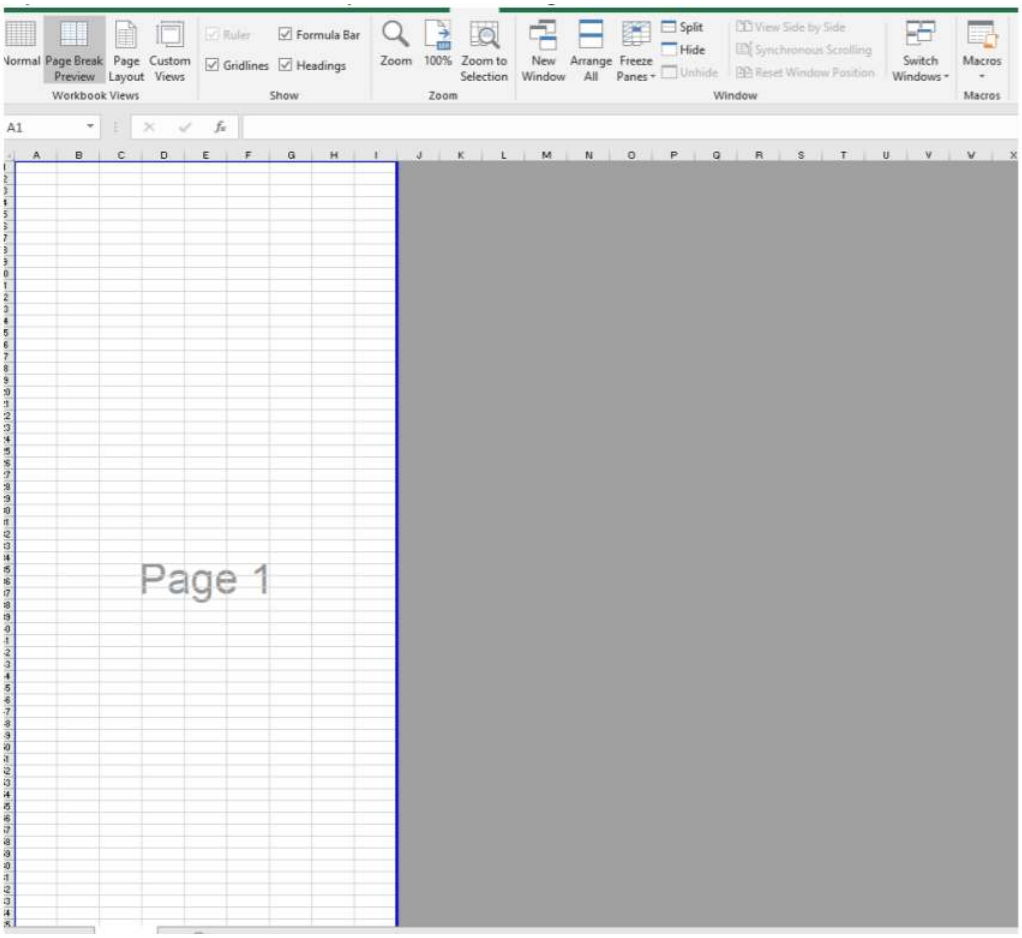



## Workbook Views Group



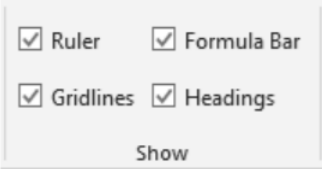

The Workbook Views Group allows the user to toggle between common spreadsheet views in Microsoft Excel. The **Normal** view is the default view and provides information just the cell views in a spreadsheet.

The **Page Break preview** displays a visual of what the document looks like if printed. A visual of this view is provided below. You cannot edit your document in Page Break Preview.



**Page Layout View** allows the user to determine what their document would look like if printed as well, but with the opportunity to edit your document and insert page breaks. Finally, **Custom Views** allows the user to create specific views and save them.

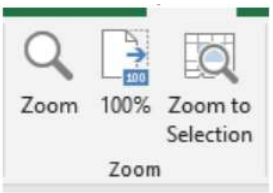
## Show Group



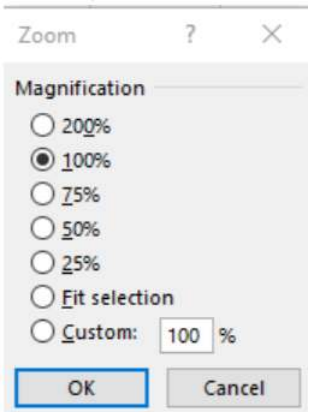

The Show Group has just four setting toggles to control the visual appearance of the worksheet. The **Ruler** checkbox displays or hides the Ruler in the Page Layout View. A picture of the ruler is below.

**Gridlines** are the boxes around each cell. Unchecking this box will remove all lines from cells. The cells will remain. The **Formula Bar** can be checked and displayed or hidden. Finally, unchecking the **Headings** box will remove the numbered rows and lettered columns from the sheet view.

## Zoom Group

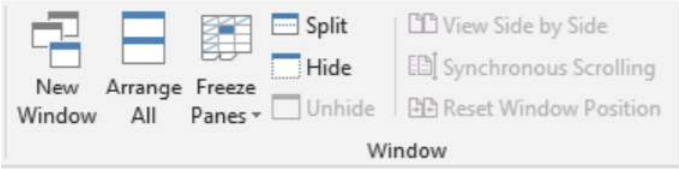



The Zoom Group allows the user to adjust how close each cell will appear in size on in the worksheet. The **Zoom** icon allows the user to customize the magnification of Zoom using presets or creating a custom preset. The *Fit selection* radio box allows to enlarge and center a selected range of cells.



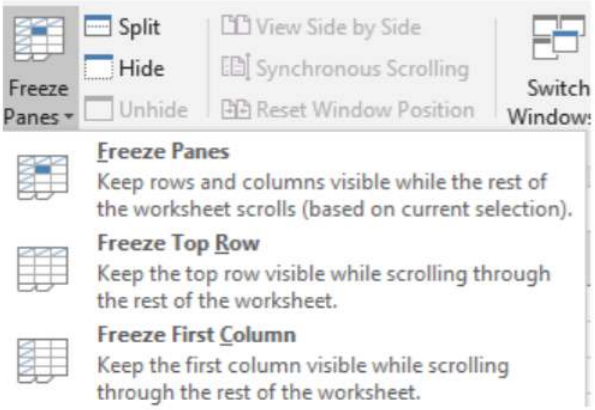

The **100%** icon allows the Zoom to be returned to the default view while **Zoom to selection** allows for the user to magnify the selected cell or range of cells.

## Window Group

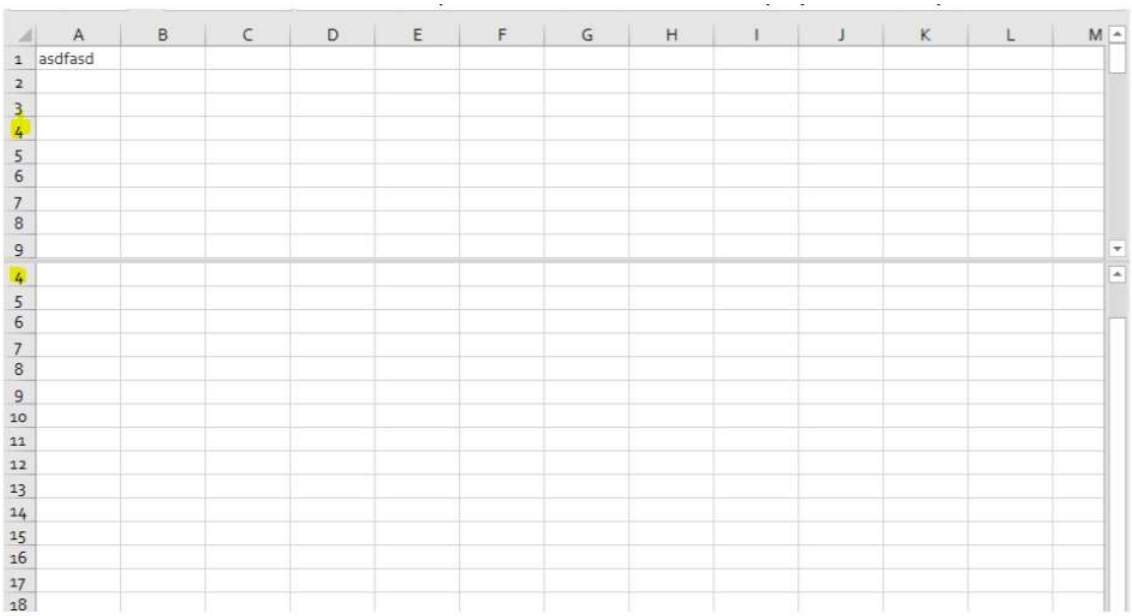



The Window Group allows the user to customize their worksheet view to display the same worksheet in multiple ways to be as efficient as possible. The **New Window** icon allows the user to have multiple open windows for the same document so they can work in different areas of the Worksheet at the same time. For example, perhaps you want to work on a table of data at the top of the worksheet and charts based upon the data at the bottom of the worksheet. By creating a New Window, you can view multiple places in the same worksheet at the same time. By clicking on **Arrange All**, the user can display these worksheet views side by side and by selecting the icon **Switch Windows**,

select between them. **Freeze Panes** can be a very helpful way to view data when working with a large dataset. As an example, imagine that you are working with a long list of sales data. When entering data in new rows, you are no longer able to see the top header rows. To ensure that you are able to view the top header rows, the Freeze Panes icon allows the user to Freeze either the Top Row, the First Column (for worksheets with many columns, or freeze a specific cell location so that all cells above it is does not move when scrolling.

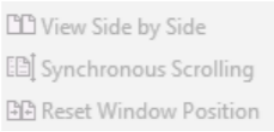



The **Split** Icon allows very similar functionality to the **New Window** command, except that the Split Command allows the user to specify the location for the split. Any row above the Split line will be displayed above, and any row below the split will be displayed in the same worksheet below. Each area receives its own scrollbar. Notice in the picture below how row 4 is displayed in both split views.



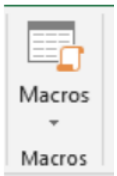

The **Hide** command

allows the user to hide their workbook to not display to the user, while *unhide* allows the worksheet to become visible again. To hide specific rows or columns, right-click on the row or column you wish to Hide and select the Hide command. You can determine which rows or columns are hidden because they are no longer presented in chronological order.

. To unhide a column, click on both rows or columns and select *Unhide*. The last commands in the Windows Group 

View Side by Side, Synchronous Scrolling, and Reset Window Position are used when using the *New Window* command to display the same document in multiple views. These commands allow the document to be viewed next to each other, to sync the scrolling so each window moves at the same time, and bring the window position back to its default setting.

## Macros




An Excel Macro is a piece of programming code that runs in an Excel environment and helps automate routine tasks. A macro is an excel task recording and playback tool. You simply record your Excel steps and the macro will play it back. Let's say you work as a cashier for a water utility company. Some of the customers pay through the bank and at the end of the day, you are required to download the data from the bank and format it in a format that meets your business requirements. You can import the data into Excel and format. The following day you will be required to perform the same ritual. It will soon become boring and tedious. Macros solve such problems by automating such routine tasks. Macros will be covered in a later chapter of this text for advanced users.

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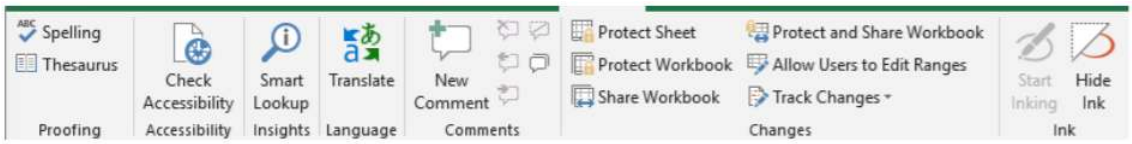
# 17.3: Review Tab




The Review Tab allows your document to be inspected to make sure it is as professional and accessible as possible. In addition, it contains many collaboration features that allow users to work together. The Review tab contains the Proofing, Accessibility, Insights, Comments, Changes, and Ink Groups to make your document the best it can be.

## Proofing Group

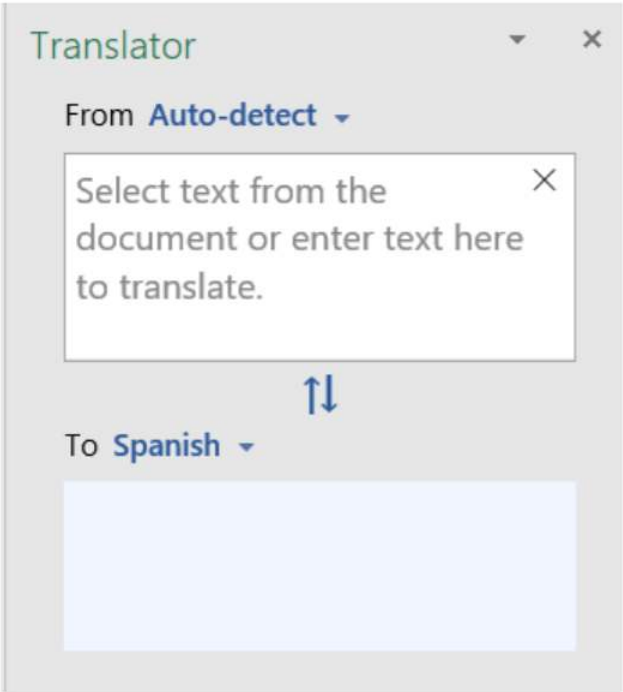
The Proofing Tab allows the user to check heir worksheet for spelling errors, and research synonyms available for selected words and launches a Thesaurus toolbar on the right of the screen. The Proofing Tab checks the current active worksheet for errors.

## Accessibility Group

The Accessibility Tab holds one icon- Check Accessibility. Selecting this icon will cause Excel to review their active worksheet t determine if it is readable and accessible for individuals with sight impairment. It will also review any images inserted in the document to make sure that they contain AltText which screen readers use to describe the Image. The Accessibility Checker will launch a window on the right side of the screen to suggest strategies to make your document more accessible.

## Language Group

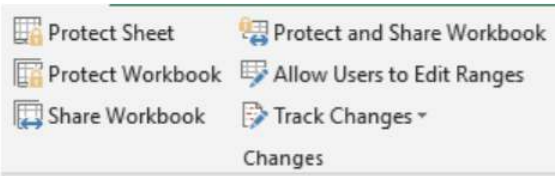
Like the Accessibility Tab, the Language Tab contains one icon: Translate. Selecting this icon will launch the translator feature of Excel on the right side of the screen. Users can enter the text they wish to translate into another language.



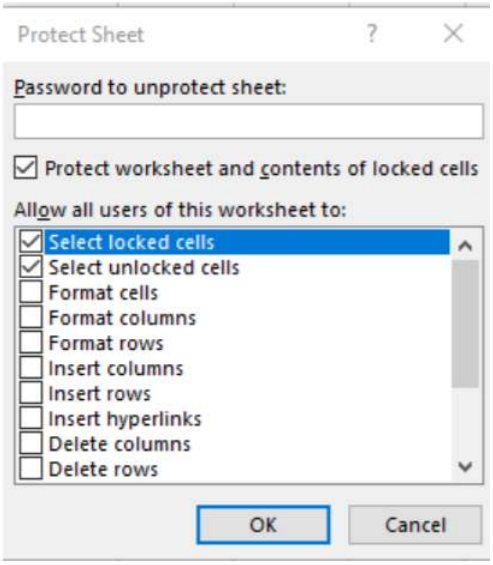

## Comments Group

The Comments group allows for opportunities to collaborate with other users on the same document. Users can add comments about the document that is unavailable to view with Excel and are usually not printed when the worksheet is completed. Users can also use the controls in this area to delete comments, hide comments, move to the next comment and previous comment.

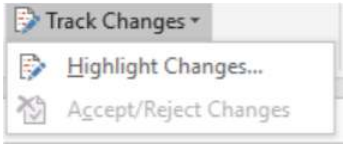
## Changes Group




The Changes group allows the user to determine who may or may not make changes to the document. By default, only the user with the file may edit the workbook. However, the workbook or worksheet can be protected even if the file is shared with the Protect Sheet or Protect Workbook function. If the user decides that their worksheet or workbook must be protected they will select the applicable command, and an additional options window will launch.




Users can specify whether others may view or edit various aspects of their document and create a password to protect the sheet. Only by entering the password can the user receive full editing access to the document.

In addition to protecting their work, users may elect to share their workbook with others who have a OneDrive account for realtime document collaboration- allowing multiple users to work on a document at the same time. The user can even decide which parts of the document they are able to edit by selecting the **Allowing Users to Edit Ranges** icon. Finally, users can Track the Changes made to the document and also review changes that have been made using the **Track Changes** icon, which will launch a dialog box with more options. 

Tracked Changes are helpful when working with others on a document and to be able to see the changes made (additions, deletions, formatting, etc) made by other users.

## Ink Group

Finally, users can draw with their mouse onto their document with the Ink Group. Users can draw on charts and images, and Hide all of their inkings as well. Using Inking can be helpful when making a presentation.

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# 17.4: Checking for Understanding

1. You are tracking monthly sales for your parts and equipment company in 2019 and 2020. Your monthly sales are as follows with 2019 displayed first followed by 2020:
   a. January: 2400, 2670
   b. February 3300, 3100
   c. March 2700, 1900
   d. April 1900, 1920
   e. May 2700, 2450
   f. June 2650, 3200
   g. July 3200,1700
   h. August 1700, 1650
   i. September 1560, 1649
   j. October 1890, 1919
   k. November 2100,2400
   l. December 3400, 3600

Please create an excel document with the following Table Columns:

| Month | 2019 Sales | 2020 Sales | Total Sales |
|---|---|---|---|

2. Using the data you entered, perform the following:
   a. Add a Theme to the Chart
   b. Change the Margins to .5 inches
   c. Make the document Landscape
   d. Add a Background Image of a Tool of your choice to the worksheet.
   e. Make sure your document is printing gridlines
   f. Freeze the Header Rows
   g. Add a comment to your document
   h. Run Accessibility Tracker
   i. Protect your sheet with a password.

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# CHAPTER OVERVIEW

## 18: Formulas Tab

Formulas are the heart and soul of excel. Formulas used in Excel provide users to perform many complicated and complex calculations and tasks to manipulate data as needed. While this text will not provide an exhaustive list of how to use each formula, by providing an overview of each of the functions, the user can begin to learn on their own how to specialize in the hundreds of formulas that Excel provides, or make their own. The Formulas Tab is divided into five groups: Insert Function, Function Library, Defined Names, Formula Audint, and Calculation.


18.1: Insert Function (or Introduction to Formulas in Excel)
18.2: Why not just add the Numbers and not the Cell Locations?
18.3: Autofill using Formulas
18.4: Relative vs Absolute Cell References
18.5: Function Library Group
18.6: Defined Names Group
18.7: Formula Auditing Group
18.8: The Calculation Group
18.9: Checking for Understanding



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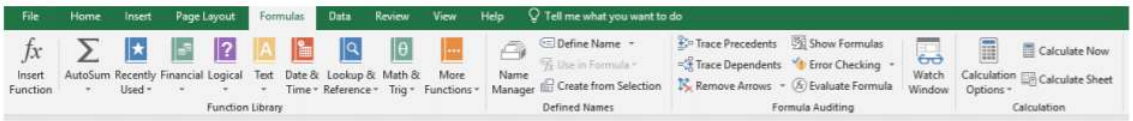
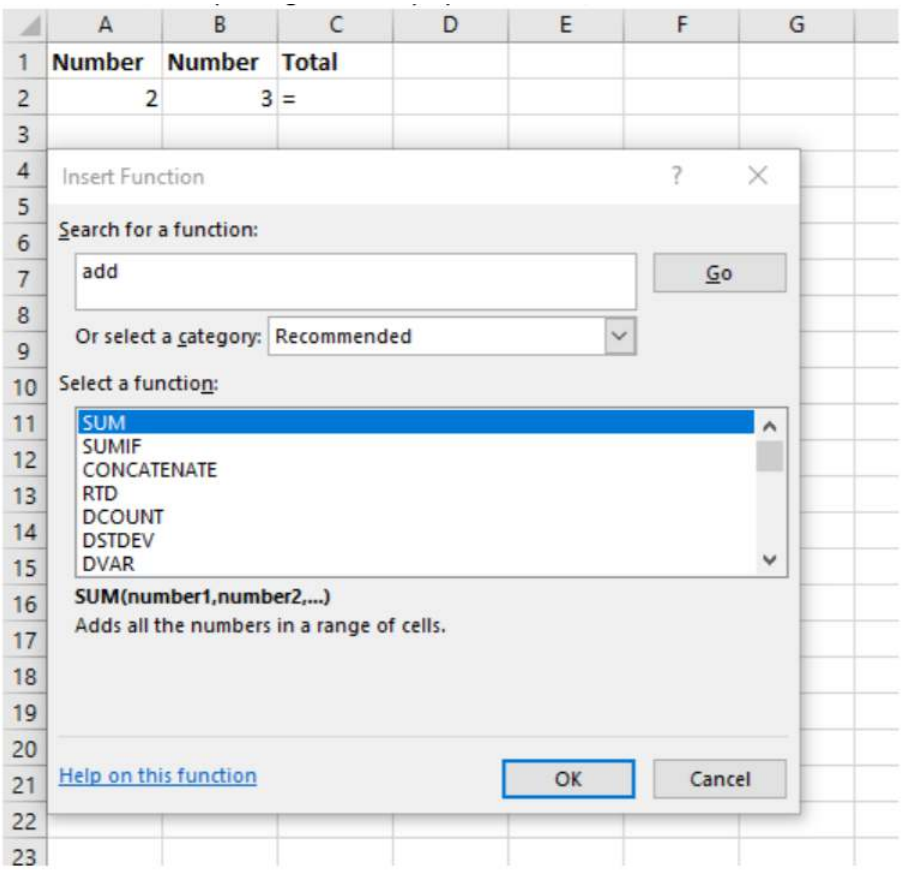
# 18.1: Insert Function (or Introduction to Formulas in Excel)

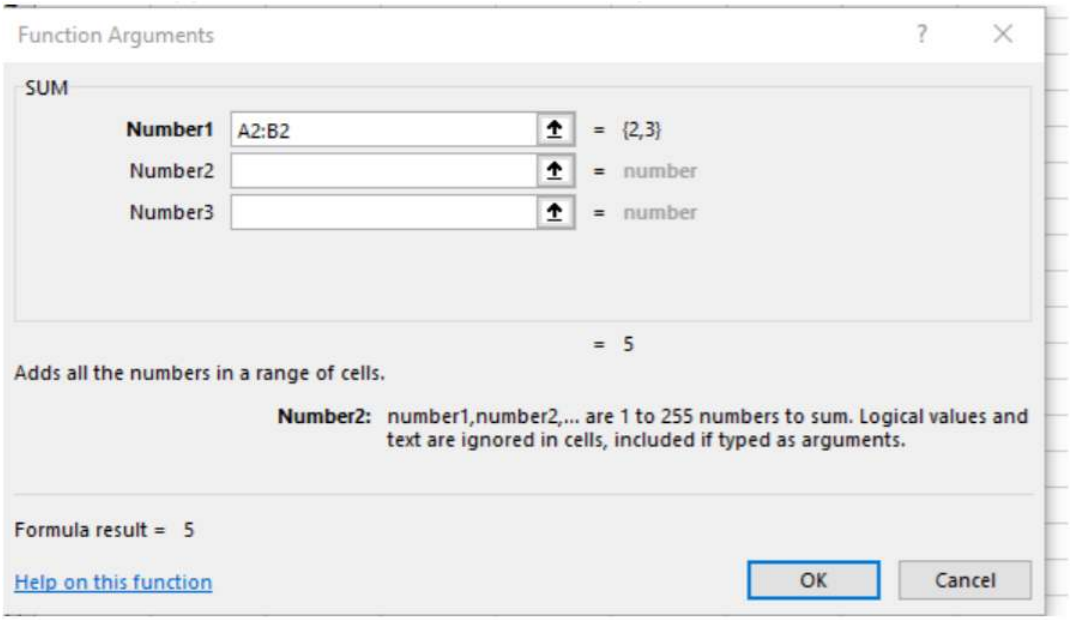


Since Excel is an object-oriented program (meaning that calculations must be completed in a physical location, before inserting a function, the user must select the cell they would like to add a formula to. For the purposes of this illustration, I will select the cell "C2". When I select the Insert Function icon, an equals sign "=" is displayed in cell C2, and an Insert Function control panel is displayed.

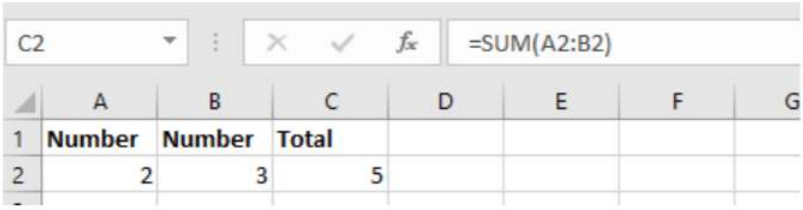



Using the Insert Function control panel, I can either navigate to the type of function I would like to use, or I can search for a function. For the purposes of this example, I would like to add the numbers "2" and "3" which are located in cell "A2" and "B2". I search "add" because I want to add the two numbers together. Excel provides the "SUM" function as the option I think it wants. It also displays the formula that would be used

along with a description of what it does. I agree with Excel that this is what I want to do, and click "OK". Now a *Function Arguments dialog box* launches so I can correctly place the cells I would like to use in the equation.




Because I had the cell selected (C2) where I wanted the sum of A2 and B2 to be, Excel automatically placed the cell range to be added together in the *Number1* area. It also shares with me the numbers in those two fields and what the answer would be. If I was adding multiple cells in different areas together, I could use the *Number2* and *Number3* fields as well. When I begin to enter a cell in Number3, another field will be created (*Number4*). When I think my calculation and formula are correct, I press "OK".




Notice that the number "5" is correctly added in C2, and in the cell, the formula is shown in the formula bar. =SUM(A2:B2) If I know the formula, I can also enter it manually via the keyboard into the formula bar as well. Remember to place a "=" sign first, and then the formula command, followed by the cells selected in brackets (). While this is a simple example, regardless of the complexity, formulas work the same.

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# 18.2: Why not just add the Numbers and not the Cell Locations?

To extend this example, I could place the same numbers in A3 and B3. This time, however, instead of using the cell references to add together, I could manually, just add the numbers together in C3 as displayed below.

C3 =2+3

| | A | B | C | D | E |
|---|---|---|---|---|---|
| 1 | Number | Number | Total | | |
| 2 | 2 | 3 | 5 | | |
| 3 | 2 | 3 | 5 | | |
| 4 | | | | | |

While this will get me the correct data, it is risky to do this, because if the data ever changes in any of the cells, the answer will no longer be correct. For example, let's pretend that the Number columns corresponded to cars sold in February at an automotive dealership. Recently, they discovered a recording error, they did not sell just 2 and 3 cars, they sold 20 and 30! Updating the calculation table leads to the following results.

C3 =2+3

| | A | B | C | D | E |
|---|---|---|---|---|---|
| 1 | Number | Number | Total | | |
| 2 | 20 | 30 | 50 | | |
| 3 | 20 | 30 | 5 | | |
| 4 | | | | | |

Row 2 has the correct sales numbers, but row 3 does not because the user used numbers instead of cell references. It is always wise in Excel to use cell locations instead of numbers, even if it means creating extra rows and columns. That way, if any of your data changes, Excel immediately can recalculate the information. This is also helpful for autofill.

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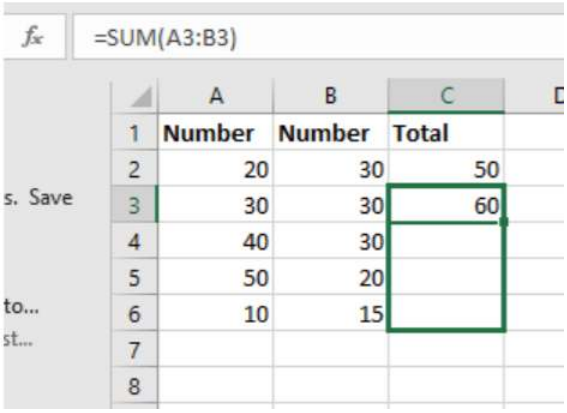
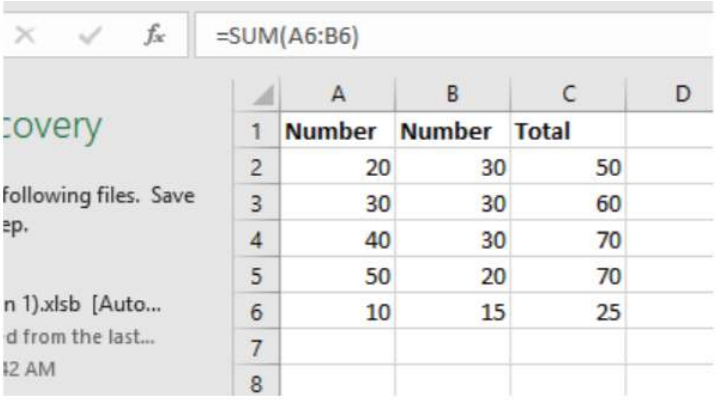
# 18.3: Autofill using Formulas

Another benefit of using formulas is the ability to use autofill. Autofill can use a formula previously used in one cell, and copy that formula for use in the cells relative to the new cell. To perform this action, select the specific reference cell you would like to use to copy the formula to the adjacent cells with Autofill. In the lower right-hand corner of the cell will appear as a “+” marker to use the fill handle.




Click on the marker and drag cursor to select the adjacent cells you wish to copy the formula. When all of the cells are included, release the mouse button and all cells will be auto-filled with the same formula.

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# 18.4: Relative vs Absolute Cell References

There are two types of cell references: relative and absolute. Relative and absolute references behave differently when copied and filled to other cells. Relative references change when a formula is copied to another cell. Absolute references remain the same no matter where they are copied.

By default, all cell references are relative references. When copied across multiple cells, they change based on the relative position of rows and columns. For example, if you copy the formula =A1+B1 from row 1 to row 2, the formula will become =A2+B2. Relative references are especially convenient whenever you need to repeat the same calculation across multiple rows or columns.

However, there may be a time when you don't want a cell reference to change when copied to other cells. Unlike relative references, absolute references do not change when copied or filled. You can use an absolute reference to keep a row and/or column constant. An absolute reference is designated in a formula by the addition of a dollar sign ($). It can precede the column reference, the row reference, or both.

In addition, Excel allows you to refer to any cell on any worksheet, which can be especially helpful if you want to reference a specific value from one worksheet to another. To do this, you'll simply need to begin the cell reference with the worksheet name followed by an exclamation point (!). For example, if you wanted to reference cell A1 on Sheet1, its cell reference would be Sheet1!A1. If you rename your worksheet, Excel will automatically adjust the cell references to the new worksheet name.

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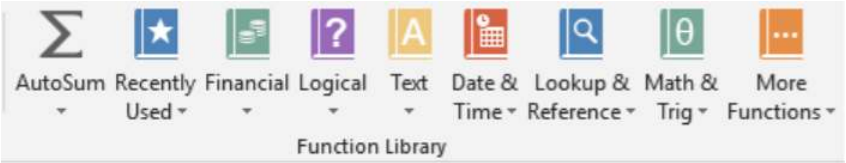
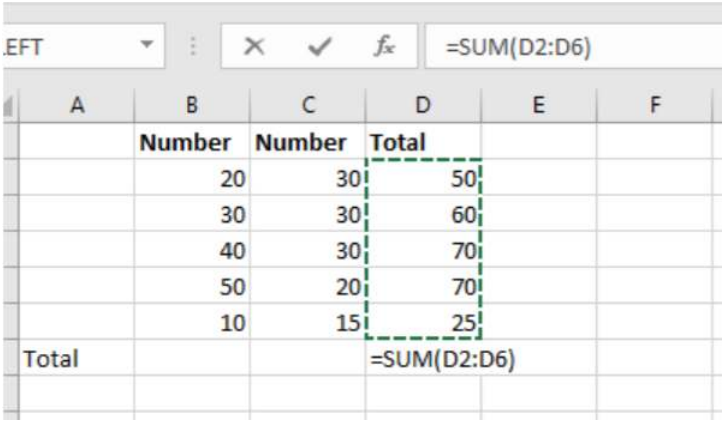
# 18.5: Function Library Group



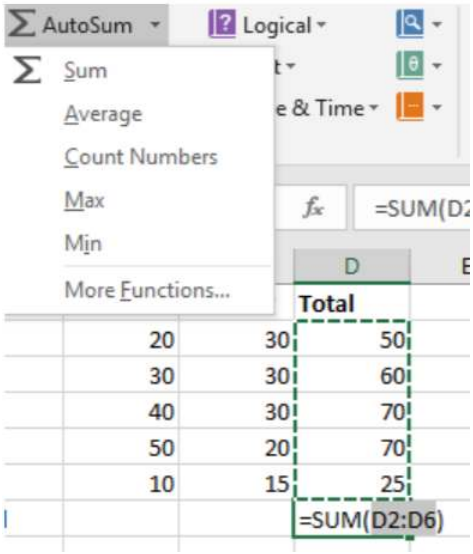

The Function Library Group allows the user to utilize all of the formulas in Excel. The function is automatically inserted in the cell that is selected.

## Auto Sum

The first icon on the left is AutoSum. Autosum adds multiple cells together. After selecting Autosum, Excel intelligently guesses the range for your calculation based upon the cells around the insertion point. The user can change the cell location in the address bar.

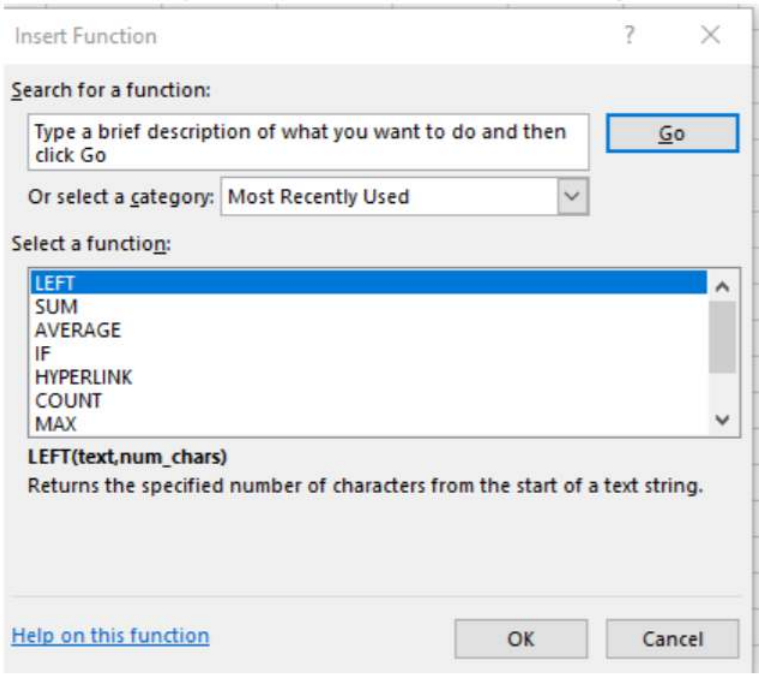



If the user wants other frequently used commands for multiple cells, they can select the more options arrow next to Autosum. A list of options will generate.

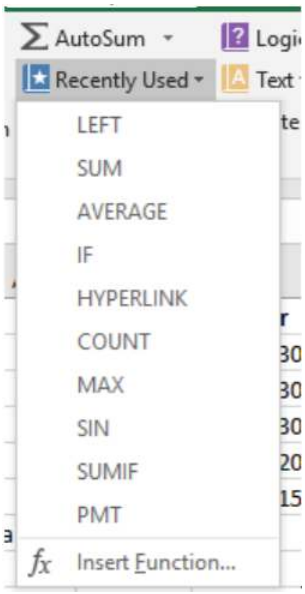



**Average** calculates the sum of all the selected cells divided by the number of cells selected to find the average. **Count Numbers** allows the user to quickly calculate the number of cells included. **Max** determines the largest number in the group, and **Min**

calculates the smallest number. More Functions launches the **Functions Arguments** box to allow for more options to search for a function in all categories of Excel.

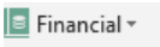



## Recently Used




The recently used icon allows the user to select functions they have used most recently in Excel. This is especially helpful when performing similar calculations.

## Financial




Financial functions are used to calculate business equations such as interest, depreciation, and valuation. Information about the following functions is provided via support.office.com (anonymous, 2020).

| Financial | Function Description |
|---|---|
| ACCRINT function | Returns the accrued interest for a security that pays periodic interest |
| ACCRINTM function | Returns the accrued interest for a security that pays interest at maturity |
| AMORDEGRC function | Returns the depreciation for each accounting period by using a depreciation coefficient |
| AMORLINC function | Returns the depreciation for each accounting period |
| COUPDAYBS function | Returns the number of days from the beginning of the coupon period to the settlement date |
| COUPDAYS function | Returns the number of days in the coupon period that contains the settlement date |
| COUPDAYSNC function | Returns the number of days from the settlement date to the next coupon date |
| COUPNCD function | Returns the next coupon date after the settlement date |
| COUPNUM function | Returns the number of coupons payable between the settlement date and maturity date |
| COUPPCD function | Returns the previous coupon date before the settlement date |
| CUMIPMT function | Returns the cumulative interest paid between two periods |
| CUMPRINC function | Returns the cumulative principal paid on a loan between two periods |
| DB function | Returns the depreciation of an asset for a specified period by using the fixed-declining balance method |
| DDB function | Returns the depreciation of an asset for a specified period by using the double-declining balance method or some other method that you specify |
| DISC function | Returns the discount rate for a security |
| DOLLARDE function | Converts a dollar price, expressed as a fraction, into a dollar price, expressed as a decimal number |
| DOLLARFR function | Converts a dollar price, expressed as a decimal number, into a dollar price, expressed as a fraction |
| DURATION function | Returns the annual duration of a security with periodic interest payments |
| EFFECT function | Returns the effective annual interest rate |
| FV function | Returns the future value of an investment |
| FVSCHEDULE function | Returns the future value of an initial principal after applying a series of compound interest rates |
| INTRATE function | Returns the interest rate for a fully invested security |
| IPMT function | Returns the interest payment for an investment for a given period |
| IRR function | Returns the internal rate of return for a series of cash flows |

| Financial | Function Description |
|---|---|
| ISPMT function | Calculates the interest paid during a specific period of an investment |
| MDURATION function | Returns the Macauley modified duration for a security with an assumed par value of $100 |
| MIRR function | Returns the internal rate of return where positive and negative cash flows are financed at different rates |
| NOMINAL function | Returns the annual nominal interest rate |
| NPER function | Returns the number of periods for an investment |
| NPV function | Returns the net present value of an investment based on a series of periodic cash flows and a discount rate |
| ODDFPRICE function | Returns the price per $100 face value of a security with an odd first period |
| ODDFYIELD function | Returns the yield of a security with an odd first period |
| ODDLPRICE function | Returns the price per $100 face value of a security with an odd last period |
| ODDLYIELD function | Returns the yield of a security with an odd last period |
| PDURATION function 2013 | Returns the number of periods required by an investment to reach a specified value |
| PMT function | Returns the periodic payment for an annuity |
| PPMT function | Returns the payment on the principal for an investment for a given period |
| PRICE function | Returns the price per $100 face value of a security that pays periodic interest |
| PRICEDISC function | Returns the price per $100 face value of a discounted security |
| PRICEMAT function | Returns the price per $100 face value of a security that pays interest at maturity |
| PV function | Returns the present value of an investment |
| RATE function | Returns the interest rate per period of an annuity |
| RECEIVED function | Returns the amount received at maturity for a fully invested security |
| RRI function 2013 | Returns an equivalent interest rate for the growth of an investment |
| SLN function | Returns the straight-line depreciation of an asset for one period |
| SYD function | Returns the sum-of-years' digits depreciation of an asset for a specified period |
| TBILLEQ function | Returns the bond-equivalent yield for a Treasury bill |
| TBILLPRICE function | Returns the price per $100 face value for a Treasury bill |
| TBILLYIELD function | Returns the yield for a Treasury bill |
| VDB function | Returns the depreciation of an asset for a specified or partial |

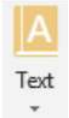
| Financial | Function Description |
|---|---|
| | period by using a declining balance method |
| XIRR function | Returns the internal rate of return for a schedule of cash flows that is not necessarily periodic |
| XNPV function | Returns the net present value for a schedule of cash flows that is not necessarily periodic |
| YIELD function | Returns the yield on a security that pays periodic interest |
| YIELDDISC function | Returns the annual yield for a discounted security; for example, a Treasury bill |
| YIELDMAT function | Returns the annual yield of a security that pays interest at maturity |

## Logical Functions

Logical functions are used to compared data in different cells. Depending on the logical functions used, excel populates the cell with the logical formula as TRUE or FALSE depending on the calculation of the formula. Information about the following functions is provided via support.office.com (anonymous, 2020).

| Logical Function | Description |
|---|---|
| AND function | Returns TRUE if all of its arguments are TRUE |
| FALSE function | Returns the logical value FALSE |
| IF function | Specifies a logical test to perform |
| IFERROR function | Returns a value you specify if a formula evaluates to an error; otherwise, returns the result of the formula |
| IFNA function 2013 | Returns the value you specify if the expression resolves to #N/A, otherwise returns the result of the expression |
| IFS function 2019 | Checks whether one or more conditions are met and returns a value that corresponds to the first TRUE condition. |
| NOT function | Reverses the logic of its argument |
| OR function | Returns TRUE if any argument is TRUE |
| SWITCH function 2016 | Evaluates an expression against a list of values and returns the result corresponding to the first matching value. If there is no match, an optional default value may be returned. |
| TRUE function | Returns the logical value TRUE |
| XOR function 2013 | Returns a logical exclusive OR of all arguments |

## Text Functions



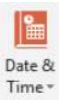

Text functions are powerful components of Excel that convert numbers into letters and can also remove or copy letters or numbers from other cells into the current cell. Information about the following functions is provided via support.office.com

(anonymous, 2020).

| Text Function | Description |
|---|---|
| ASC function | Changes full-width (double-byte) English letters or katakana within a character string to half-width (single-byte) characters |
| BAHTTEXT function | Converts a number to text, using the ß (baht) currency format |
| CHAR function | Returns the character specified by the code number |
| CLEAN function | Removes all nonprintable characters from text |
| CODE function | Returns a numeric code for the first character in a text string |
| CONCAT function 2019 | Combines the text from multiple ranges and/or strings, but it doesn't provide the delimiter or IgnoreEmpty arguments. |
| CONCATENATE function | Joins several text items into one text item |
| DBCS function 2013 | Changes half-width (single-byte) English letters or katakana within a character string to full-width (double-byte) characters |
| DOLLAR function | Converts a number to text, using the $ (dollar) currency format |
| EXACT function | Checks to see if two text values are identical |
| FIND, FINDB functions | Finds one text value within another (case-sensitive) |
| FIXED function | Formats a number as text with a fixed number of decimals |
| LEFT, LEFTB functions | Returns the leftmost characters from a text value |
| LEN, LENB functions | Returns the number of characters in a text string |
| LOWER function | Converts text to lowercase |
| MID, MIDB functions | Returns a specific number of characters from a text string starting at the position you specify |
| NUMBERVALUE function 2013 | Converts text to number in a locale-independent manner |
| PHONETIC function | Extracts the phonetic (furigana) characters from a text string |
| PROPER function | Capitalizes the first letter in each word of a text value |
| REPLACE, REPLACEB functions | Replaces characters within text |
| REPT function | Repeats text a given number of times |
| RIGHT, RIGHTB functions | Returns the rightmost characters from a text value |
| SEARCH, SEARCHB functions | Finds one text value within another (not case-sensitive) |
| SUBSTITUTE function | Substitutes new text for old text in a text string |
| T function | Converts its arguments to text |
| TEXT function | Formats a number and converts it to text |
| TEXTJOIN function 2019 | Combines the text from multiple ranges and/or strings, and includes a delimiter you specify between each text value that will be combined. If the delimiter is an empty text string, this function will effectively concatenate the ranges |
| TRIM function | Removes spaces from text |

| Text Function | Description |
|---|---|
| UNICHAR function 2013 | Returns the Unicode character that is referenced by the given numeric value |
| UNICODE function 2013 | Returns the number (code point) that corresponds to the first character of the text |

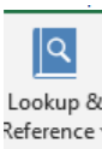
## Date & Time Function




Date & Time functions calculate numbers into dates. There are many options available to return the date as desired from a variety of data sets. Information about the following functions is provided via support.office.com (anonymous, 2020).

| Date & Time Function | Description |
|---|---|
| DATE function | Returns the serial number of a particular date |
| DATEDIF function | Calculates the number of days, months, or years between two dates. This function is useful in formulas where you need to calculate an age. |
| DATEVALUE function | Converts a date in the form of text to a serial number |
| DAY function | Converts a serial number to a day of the month |
| DAYS function 2013 | Returns the number of days between two dates |
| DAYS360 function | Calculates the number of days between two dates based on a 360-day year |
| EDATE function | Returns the serial number of the date that is the indicated number of months before or after the start date |
| EOMONTH function | Returns the serial number of the last day of the month before or after a specified number of months |
| HOUR function | Converts a serial number to an hour |
| ISOWEEKNUM function 2013 | Returns the number of the ISO week number of the year for a given date |
| MINUTE function | Converts a serial number to a minute |
| MONTH function | Converts a serial number to a month |
| NETWORKDAYS function | Returns the number of whole workdays between two dates |
| NETWORKDAYS.INTL function 2010 | Returns the number of whole workdays between two dates using parameters to indicate which and how many days are weekend days |
| NOW function | Returns the serial number of the current date and time |
| SECOND function | Converts a serial number to a second |
| TIME function | Returns the serial number of a particular time |
| TIMEVALUE function | Converts a time in the form of text to a serial number |
| TODAY function | Returns the serial number of today's date |
| WEEKDAY function | Converts a serial number to a day of the week |
| WEEKNUM function | Converts a serial number to a number representing where the week falls numerically with a year |
| WORKDAY function | Returns the serial number of the date before or after a specified number of workdays |
| WORKDAY.INTL function 2010 | Returns the serial number of the date before or after a specified number of workdays using parameters to indicate which and how many days are weekend days |
| YEAR function | Converts a serial number to a year |
| YEARFRAC function | Returns the year fraction representing the number of whole days between start_date and end_date |

## Lookup & Reference Formulas




Lookup and Reference formulas allow you to work with large sets of data, and especially useful when you need to reference between multiple data sets. They can provide information about a range of data, find the location of a given address or value, or look up certain values in a large set of data. Information about the following functions is provided via support.office.com (anonymous, 2020).

| Lookup & Reference Function | Description |
|---|---|
| ADDRESS function | Returns a reference as text to a single cell in a worksheet |
| AREAS function | Returns the number of areas in a reference |
| CHOOSE function | Chooses a value from a list of values |
| COLUMN function | Returns the column number of a reference |
| COLUMNS function | Returns the number of columns in a reference |
| FILTER function Office 365 | Filters a range of data based on criteria you define |
| FORMULATEXT function 2013 | Returns the formula at the given reference as text |
| GETPIVOTDATA function | Returns data stored in a PivotTable report |
| HLOOKUP function | Looks in the top row of an array and returns the value of the indicated cell |
| HYPERLINK function | Creates a shortcut or jump that opens a document stored on a network server, an intranet, or the Internet |
| INDEX function | Uses an index to choose a value from a reference or array |
| INDIRECT function | Returns a reference indicated by a text value |
| LOOKUP function | Looks up values in a vector or array |
| MATCH function | Looks up values in a reference or array |
| OFFSET function | Returns a reference offset from a given reference |
| ROW function | Returns the row number of a reference |
| ROWS function | Returns the number of rows in a reference |
| RTD function | Retrieves real-time data from a program that supports COM automation |
| SORT function Office 365 | Sorts the contents of a range or array |
| SORTBY function Office 365 | Sorts the contents of a range or array based on the values in a corresponding range or array |
| TRANSPOSE function | Returns the transpose of an array |
| UNIQUE function Office 365 | Returns a list of unique values in a list or range |
| VLOOKUP function | Looks in the first column of an array and moves across the row to return the value of a cell |
| XLOOKUP function Office 365 | Searches a range or an array, and returns an item corresponding to the first match it finds. If a match doesn't exist, then XLOOKUP can return the closest (approximate) match. |
| XMATCH function Office 365 | Returns the relative position of an item in an array or range of cells. |

## Math & Trig Function

The Excel Math & Trig functions allow the user to perform mathematical equations like addition, subtraction, multiplication, and division, as well as trigonometry. Information about the following functions is provided via support.office.com (anonymous, 2020).

| Math & Trig Function | Description |
|---|---|
| ABS function | Returns the absolute value of a number |
| ACOS function | Returns the arccosine of a number |
| ACOSH function | Returns the inverse hyperbolic cosine of a number |
| ACOT function 2013 | Returns the arccotangent of a number |
| ACOTH function 2013 | Returns the hyperbolic arccotangent of a number |
| AGGREGATE function | Returns an aggregate in a list or database |
| ARABIC function | Converts a Roman number to Arabic, as a number |
| ASIN function | Returns the arcsine of a number |
| ASINH function | Returns the inverse hyperbolic sine of a number |
| ATAN function | Returns the arctangent of a number |
| ATAN2 function | Returns the arctangent from x- and y-coordinates |
| ATANH function | Returns the inverse hyperbolic tangent of a number |
| BASE function 2013 | Converts a number into a text representation with the given radix (base) |
| CEILING function | Rounds a number to the nearest integer or to the nearest multiple of significance |
| CEILING.MATH function 2013 | Rounds a number up, to the nearest integer or to the nearest multiple of significance |
| CEILING.PRECISE function | Rounds a number the nearest integer or to the nearest multiple of significance. Regardless of the sign of the number, the number is rounded up. |
| COMBIN function | Returns the number of combinations for a given number of objects |
| COMBINA function 2013 | Returns the number of combinations with repetitions for a given number of items |
| COS function | Returns the cosine of a number |
| COSH function | Returns the hyperbolic cosine of a number |
| COT function 2013 | Returns the cotangent of an angle |
| COTH function 2013 | Returns the hyperbolic cotangent of a number |
| CSC function 2013 | Returns the cosecant of an angle |
| CSCH function 2013 | Returns the hyperbolic cosecant of an angle |
| DECIMAL function 2013 | Converts a text representation of a number in a given base into a decimal number |
| DEGREES function | Converts radians to degrees |

| Math & Trig Function | Description |
|---|---|
| EVEN function | Rounds a number up to the nearest even integer |
| EXP function | Returns e raised to the power of a given number |
| FACT function | Returns the factorial of a number |
| FACTDOUBLE function | Returns the double factorial of a number |
| FLOOR function | Rounds a number down, toward zero |
| FLOOR.MATH function 2013 | Rounds a number down, to the nearest integer or to the nearest multiple of significance |
| FLOOR.PRECISE function | Rounds a number down to the nearest integer or to the nearest multiple of significance. Regardless of the sign of the number, the number is rounded down. |
| GCD function | Returns the greatest common divisor |
| INT function | Rounds a number down to the nearest integer |
| ISO.CEILING function 2013 | Returns a number that is rounded up to the nearest integer or to the nearest multiple of significance |
| LCM function | Returns the least common multiple |
| LN function | Returns the natural logarithm of a number |
| LOG function | Returns the logarithm of a number to a specified base |
| LOG10 function | Returns the base-10 logarithm of a number |
| MDETERM function | Returns the matrix determinant of an array |
| MINVERSE function | Returns the matrix inverse of an array |
| MMULT function | Returns the matrix product of two arrays |
| MOD function | Returns the remainder from division |
| MROUND function | Returns a number rounded to the desired multiple |
| MULTINOMIAL function | Returns the multinomial of a set of numbers |
| MUNIT function 2013 | Returns the unit matrix or the specified dimension |
| ODD function | Rounds a number up to the nearest odd integer |
| PI function | Returns the value of pi |
| POWER function | Returns the result of a number raised to a power |
| PRODUCT function | Multiplies its arguments |
| QUOTIENT function | Returns the integer portion of a division |
| RADIANS function | Converts degrees to radians |
| RAND function | Returns a random number between 0 and 1 |
| RANDARRAY function Office 365 | Returns an array of random numbers between 0 and 1. However, you can specify the number of rows and columns to fill, minimum |

| Math & Trig Function | Description |
|---|---|
| | and maximum values, and whether to return whole numbers or decimal values. |
| RANDBETWEEN function | Returns a random number between the numbers you specify |
| ROMAN function | Converts an Arabic numeral to Roman, as text |
| ROUND function | Rounds a number to a specified number of digits |
| ROUNDDOWN function | Rounds a number down, toward zero |
| ROUNDUP function | Rounds a number up, away from zero |
| SEC function 2013 | Returns the secant of an angle |
| SECH function 2013 | Returns the hyperbolic secant of an angle |
| SERIESSUM function | Returns the sum of a power series based on the formula |
| SEQUENCE function Office 365 | Generates a list of sequential numbers in an array, such as 1, 2, 3, 4 |
| SIGN function | Returns the sign of a number |
| SIN function | Returns the sine of the given angle |
| SINH function | Returns the hyperbolic sine of a number |
| SQRT function | Returns a positive square root |
| SQRTPI function | Returns the square root of (number * pi) |
| SUBTOTAL function | Returns a subtotal in a list or database |
| SUM function | Adds its arguments |
| SUMIF function | Adds the cells specified by a given criteria |
| SUMIFS function 2019 | Adds the cells in a range that meet multiple criteria |
| SUMPRODUCT function | Returns the sum of the products of corresponding array components |
| SUMSQ function | Returns the sum of the squares of the arguments |
| SUMX2MY2 function | Returns the sum of the difference of squares of corresponding values in two arrays |
| SUMX2PY2 function | Returns the sum of squares of corresponding values in two arrays |
| SUMXMY2 function | Returns the sum of squares of differences of corresponding values in two arrays |
| TAN function | Returns the tangent of a number |
| TANH function | Returns the hyperbolic tangent of a number |
| TRUNC function | Truncates a number to an integer |

## Statistical Functions

Statistical Functions are responsible for statistical analysis calculating items like mean, median, mode, etc. Information about the following functions is provided via support.office.com (anonymous, 2020).

| Statistical Function | Description |
|---|---|
| AVEDEV function | Returns the average of the absolute deviations of data points from their mean |
| AVERAGE function | Returns the average of its arguments |
| AVERAGEA function | Returns the average of its arguments, including numbers, text, and logical values |
| AVERAGEIF function | Returns the average (arithmetic mean) of all the cells in a range that meet a given criteria |
| AVERAGEIFS function 2019 | Returns the average (arithmetic mean) of all cells that meet multiple criteria |
| BETA.DIST function 2010 | Returns the beta cumulative distribution function |
| BETA.INV function 2010 | Returns the inverse of the cumulative distribution function for a specified beta distribution |
| BINOM.DIST function 2010 | Returns the individual term binomial distribution probability |
| BINOM.DIST.RANGE function 2013 | Returns the probability of a trial result using a binomial distribution |
| BINOM.INV function 2010 | Returns the smallest value for which the cumulative binomial distribution is less than or equal to a criterion value |
| CHISQ.DIST function 2010 | Returns the cumulative beta probability density function |
| CHISQ.DIST.RT function 2010 | Returns the one-tailed probability of the chi-squared distribution |
| CHISQ.INV function 2010 | Returns the cumulative beta probability density function |
| CHISQ.INV.RT function 2010 | Returns the inverse of the one-tailed probability of the chi-squared distribution |
| CHISQ.TEST function 2010 | Returns the test for independence |
| CONFIDENCE.NORM function 2010 | Returns the confidence interval for a population mean |
| CONFIDENCE.T function 2010 | Returns the confidence interval for a population mean, using a Student's t distribution |
| CORREL function | Returns the correlation coefficient between two data sets |
| COUNT function | Counts how many numbers are in the list of arguments |
| COUNTA function | Counts how many values are in the list of arguments |
| COUNTBLANK function | Counts the number of blank cells within a range |
| COUNTIF function | Counts the number of cells within a range that meet the given criteria |
| COUNTIFS function 2019 | Counts the number of cells within a range that meet multiple criteria |

| Statistical Function | Description |
|---|---|
| COVARIANCE.P function 2010 | Returns covariance, the average of the products of paired deviations |
| COVARIANCE.S function 2010 | Returns the sample covariance, the average of the products deviations for each data point pair in two data sets |
| DEVSQ function | Returns the sum of squares of deviations |
| EXPON.DIST function 2010 | Returns the exponential distribution |
| F.DIST function 2010 | Returns the F probability distribution |
| F.DIST.RT function 2010 | Returns the F probability distribution |
| F.INV function 2010 | Returns the inverse of the F probability distribution |
| F.INV.RT function 2010 | Returns the inverse of the F probability distribution |
| F.TEST function 2010 | Returns the result of an F-test |
| FISHER function | Returns the Fisher transformation |
| FISHERINV function | Returns the inverse of the Fisher transformation |
| FORECAST function | Returns a value along with a linear trend Note: In Excel 2016, this function is replaced with FORECAST.LINEAR as part of the new Forecasting functions, but it's still available for compatibility with earlier versions. |
| FORECAST.ETS function 2016 | Returns a future value based on existing (historical) values by using the AAA version of the Exponential Smoothing (ETS) algorithm |
| FORECAST.ETS.CONFINT function 2016 | Returns a confidence interval for the forecast value at the specified target date |
| FORECAST.ETS.SEASONALITY function 2016 | Returns the length of the repetitive pattern Excel detects for the specified time series |
| FORECAST.ETS.STAT function 2016 | Returns a statistical value as a result of time series forecasting |
| FORECAST.LINEAR function 2016 | Returns a future value based on existing values |
| FREQUENCY function | Returns a frequency distribution as a vertical array |
| GAMMA function 2013 | Returns the Gamma function value |
| GAMMA.DIST function 2010 | Returns the gamma distribution |
| GAMMA.INV function 2010 | Returns the inverse of the gamma cumulative distribution |
| GAMMALN function | Returns the natural logarithm of the gamma function, Γ(x) |

| Statistical Function | Description |
|---|---|
| GAMMALN.PRECISE function 2010 | Returns the natural logarithm of the gamma function, Γ(x) |
| GAUSS function 2013 | Returns 0.5 less than the standard normal cumulative distribution |
| GEOMEAN function | Returns the geometric mean |
| GROWTH function | Returns values along an exponential trend |
| HARMEAN function | Returns the harmonic mean |
| HYPGEOM.DIST function | Returns the hypergeometric distribution |
| INTERCEPT function | Returns the intercept of the linear regression line |
| KURT function | Returns the kurtosis of a data set |
| LARGE function | Returns the k-th largest value in a data set |
| LINEST function | Returns the parameters of a linear trend |
| LOGEST function | Returns the parameters of an exponential trend |
| LOGNORM.DIST function 2010 | Returns the cumulative lognormal distribution |
| LOGNORM.INV function 2010 | Returns the inverse of the lognormal cumulative distribution |
| MAX function | Returns the maximum value in a list of arguments |
| MAXA function | Returns the maximum value in a list of arguments, including numbers, text, and logical values |
| MAXIFS function 2019 | Returns the maximum value among cells specified by a given set of conditions or criteria |
| MEDIAN function | Returns the median of the given numbers |
| MIN function | Returns the minimum value in a list of arguments |
| MINA function | Returns the smallest value in a list of arguments, including numbers, text, and logical values |
| MINIFS function | Returns the minimum value among cells specified by a given set of conditions or criteria. |
| MODE.MULT function 2010 | Returns a vertical array of the most frequently occurring, or repetitive values in an array or range of data |
| MODE.SNGL function 2010 | Returns the most common value in a data set |
| NEGBINOM.DIST function 2010 | Returns the negative binomial distribution |
| NORM.DIST function 2010 | Returns the normal cumulative distribution |
| NORM.INV function 2010 | Returns the inverse of the normal cumulative distribution |
| NORM.S.DIST function 2010 | Returns the standard normal cumulative distribution |

| Statistical Function | Description |
|---|---|
| NORM.S.INV function 2010 | Returns the inverse of the standard normal cumulative distribution |
| PEARSON function | Returns the Pearson product-moment correlation coefficient |
| PERCENTILE.EXC function 2010 | Returns the k-th percentile of values in a range, where k is in the range 0..1, exclusive |
| PERCENTILE.INC function 2010 | Returns the k-th percentile of values in a range |
| PERCENTRANK.EXC function 2010 | Returns the rank of a value in a data set as a percentage (0..1, exclusive) of the data set |
| PERCENTRANK.INC function 2010 | Returns the percentage rank of a value in a data set |
| PERMUT function | Returns the number of permutations for a given number of objects |
| PERMUTATIONA function 2013 | Returns the number of permutations for a given number of objects (with repetitions) that can be selected from the total objects |
| PHI function 2013 | Returns the value of the density function for a standard normal distribution |
| POISSON.DIST function 2010 | Returns the Poisson distribution |
| PROB function | Returns the probability that values in a range are between two limits |
| QUARTILE.EXC function 2010 | Returns the quartile of the data set, based on percentile values from 0..1, exclusive |
| QUARTILE.INC function 2010 | Returns the quartile of a data set |
| RANK.AVG function 2010 | Returns the rank of a number in a list of numbers |
| RANK.EQ function 2010 | Returns the rank of a number in a list of numbers |
| RSQ function | Returns the square of the Pearson product-moment correlation coefficient |
| SKEW function | Returns the skewness of a distribution |
| SKEW.P function 2013 | Returns the skewness of a distribution based on a population: characterization of the degree of asymmetry of a distribution around its mean |
| SLOPE function | Returns the slope of the linear regression line |
| SMALL function | Returns the k-th smallest value in a data set |
| STANDARDIZE function | Returns a normalized value |
| STDEV.P function 2010 | Calculates standard deviation based on the entire population |
| STDEV.S function 2010 | Estimates standard deviation based on a sample |
| STDEVA function | Estimates standard deviation based on a sample, including |

| Statistical Function | Description |
|---|---|
| | numbers, text, and logical values |
| STDEVPA function | Calculates standard deviation based on the entire population, including numbers, text, and logical values |
| STEYX function | Returns the standard error of the predicted y-value for each x in the regression |
| T.DIST function 2010 | Returns the Percentage Points (probability) for the Student tdistribution |
| T.DIST.2T function 2010 | Returns the Percentage Points (probability) for the Student tdistribution |
| T.DIST.RT function 2010 | Returns the Student's t-distribution |
| T.INV function 2010 | Returns the t-value of the Student's t-distribution as a function of the probability and the degrees of freedom |
| T.INV.2T function 2010 | Returns the inverse of the Student's t-distribution |
| T.TEST function 2010 | Returns the probability associated with a Student's t-test |
| TREND function | Returns values along with a linear trend |
| TRIMMEAN function | Returns the mean of the interior of a data set |
| VAR.P function 2010 | Calculates variance based on the entire population |
| VAR.S function 2010 | Estimates variance based on a sample |
| VARA function | Estimates variance based on a sample, including numbers, text, and logical values |
| VARPA function | Calculates variance based on the entire population, including numbers, text, and logical values |
| WEIBULL.DIST function 2010 | Returns the Weibull distribution |
| Z.TEST function 2010 | Returns the one-tailed probability-value of a z-test |

## Engineering Functions

Engineering Functions are used to perform common engineering calculations. Information about the following functions is provided via support.office.com (anonymous, 2020).

| Function | Description |
|---|---|
| BESSELI function | Returns the modified Bessel function In(x) |
| BESSELJ function | Returns the Bessel function Jn(x) |
| BESSELK function | Returns the modified Bessel function Kn(x) |
| BESSELY function | Returns the Bessel function Yn(x) |
| BIN2DEC function | Converts a binary number to decimal |
| BIN2HEX function | Converts a binary number to hexadecimal |
| BIN2OCT function | Converts a binary number to octal |
| BITAND function 2013 | Returns a 'Bitwise And' of two numbers |
| BITLSHIFT function 2013 | Returns a value number shifted left by shift_amount bits |
| BITOR function 2013 | Returns a bitwise OR of 2 numbers |
| BITRSHIFT function 2013 | Returns a value number shifted right by shift_amount bits |
| BITXOR function 2013 | Returns a bitwise 'Exclusive Or' of two numbers |
| COMPLEX function | Converts real and imaginary coefficients into a complex number |
| CONVERT function | Converts a number from one measurement system to another |
| DEC2BIN function | Converts a decimal number to binary |
| DEC2HEX function | Converts a decimal number to hexadecimal |
| DEC2OCT function | Converts a decimal number to octal |
| DELTA function | Tests whether two values are equal |
| ERF function | Returns the error function |
| ERF.PRECISE function 2010 | Returns the error function |
| ERFC function | Returns the complementary error function |
| ERFC.PRECISE function 2010 | Returns the complementary ERF function integrated between x and infinity |
| GESTEP function | Tests whether a number is greater than a threshold value |
| HEX2BIN function | Converts a hexadecimal number to binary |
| HEX2DEC function | Converts a hexadecimal number to decimal |
| HEX2OCT function | Converts a hexadecimal number to octal |
| IMABS function | Returns the absolute value (modulus) of a complex number |
| IMAGINARY function | Returns the imaginary coefficient of a complex number |
| IMARGUMENT function | Returns the argument theta, an angle expressed in radians |
| IMCONJUGATE function | Returns the complex conjugate of a complex number |

| Function | Description |
|---|---|
| IMCOS function | Returns the cosine of a complex number |
| IMCOSH function 2013 | Returns the hyperbolic cosine of a complex number |
| IMCOT function 2013 | Returns the cotangent of a complex number |
| IMCSC function 2013 | Returns the cosecant of a complex number |
| IMCSCH function 2013 | Returns the hyperbolic cosecant of a complex number |
| IMDIV function | Returns the quotient of two complex numbers |
| IMEXP function | Returns the exponential of a complex number |
| IMLN function | Returns the natural logarithm of a complex number |
| IMLOG10 function | Returns the base-10 logarithm of a complex number |
| IMLOG2 function | Returns the base-2 logarithm of a complex number |
| IMPOWER function | Returns a complex number raised to an integer power |
| IMPRODUCT function | Returns the product of from 2 to 255 complex numbers |
| IMREAL function | Returns the real coefficient of a complex number |
| IMSEC function 2013 | Returns the secant of a complex number |
| IMSECH function 2013 | Returns the hyperbolic secant of a complex number |
| IMSIN function | Returns the sine of a complex number |
| IMSINH function 2013 | Returns the hyperbolic sine of a complex number |
| IMSQRT function | Returns the square root of a complex number |
| IMSUB function | Returns the difference between two complex numbers |
| IMSUM function | Returns the sum of complex numbers |
| IMTAN function 2013 | Returns the tangent of a complex number |
| OCT2BIN function | Converts an octal number to binary |
| OCT2DEC function | Converts an octal number to decimal |
| OCT2HEX function | Converts an octal number to hexadecimal |

## Other Functions

Other functions groups, such as Cube, Information, Compatibility, & Web are also located at support.office.com (anonymous, 2020).

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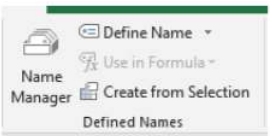
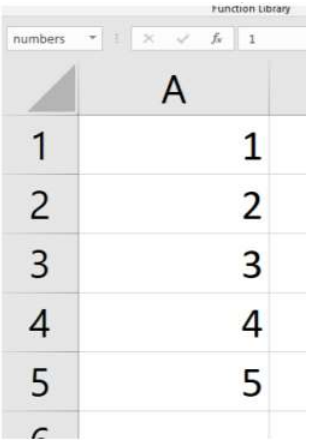
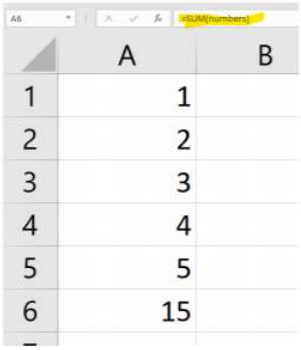
# 18.6: Defined Names Group




Cells can be named in excel to simplify equations in Excel. For example, I may decide to enter the numbers 1-5 in cells A1-A5. By highlighting cells A1-A5 we can name these cells “numbers” in the upper left-hand corner name box by entering the text. Now, these group of cells will be referred to by the title “numbers” when using a formula or searching for specific cell locations and calculations.

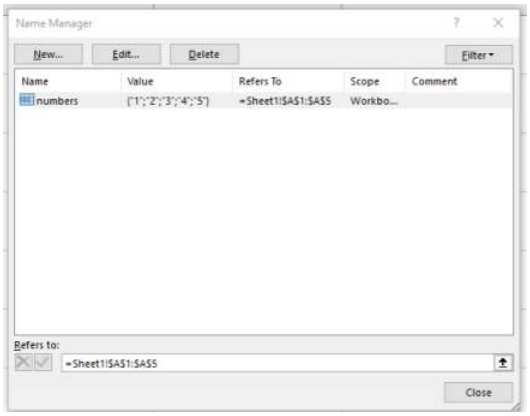



I can create a formula in cell A6 =sum(numbers) and Excel will understand that I want to add all of the data in Cells A1-A5 because I named those cells numbers. The formula bar displays the cell name.

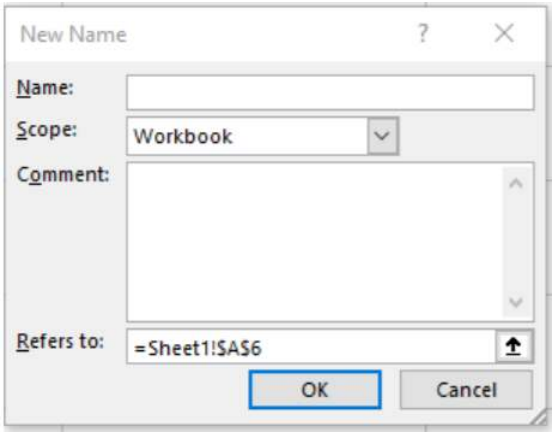


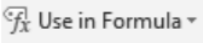

The Name Manager icon

in the Defined Names group allows for easy management of cell names. Users can delete, edit, and create new names to use in cells and formulas.

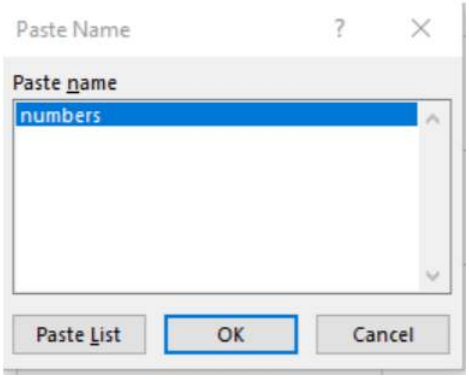



By selecting the Define Name/icon, users may utilize the New Name Dialog box to select name their cells and also provide a definition of what their name (or group) of cells is named for. This is another way to name a group of cells than was previously provided.



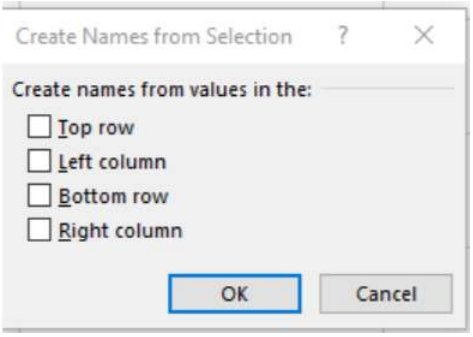

The Use in Formula icon 

contains a drop-down that contains a list of all the named ranges in the workbook. The Paste Names command displays the "Paste Name" dialog box that can paste a name into the formula bar for use when creating a formula.




Finally, the Create from Selection

Displays the "Create Names from selection" dialog box. This enables you to name a selected range of cells using a row or column title previously entered.

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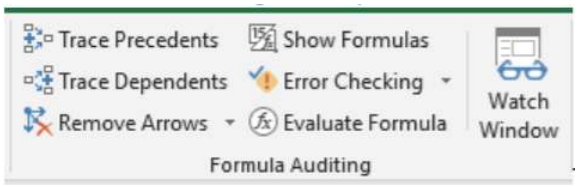
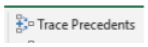
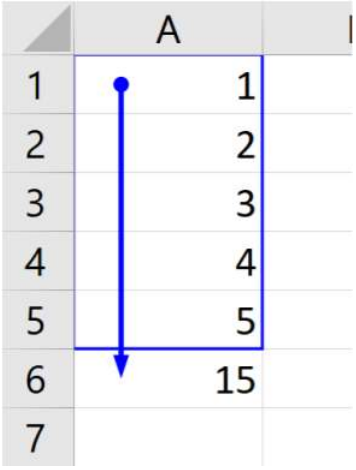
# 18.7: Formula Auditing Group




The Formula Auditing group helps the user understand which cells are being used by formulas and check for errors to make sure formulas are calculating accurately.

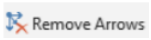
The **Trace Precedents** icon 

Displays arrows that indicate what cells affect the value of the currently selected cell. Usually, these cells are included in a formula. As provided in the previous example, a Trace President shows that the Sum of cells A1-A5 is 15 and the cells included are outlined.




The **Trace Dependents** icon

Displays arrows that indicate what cells are affected by the value in the currently selected cell. Trace Dependents is the opposite of Trace Precedents.

The **Remove Arrows** icon 

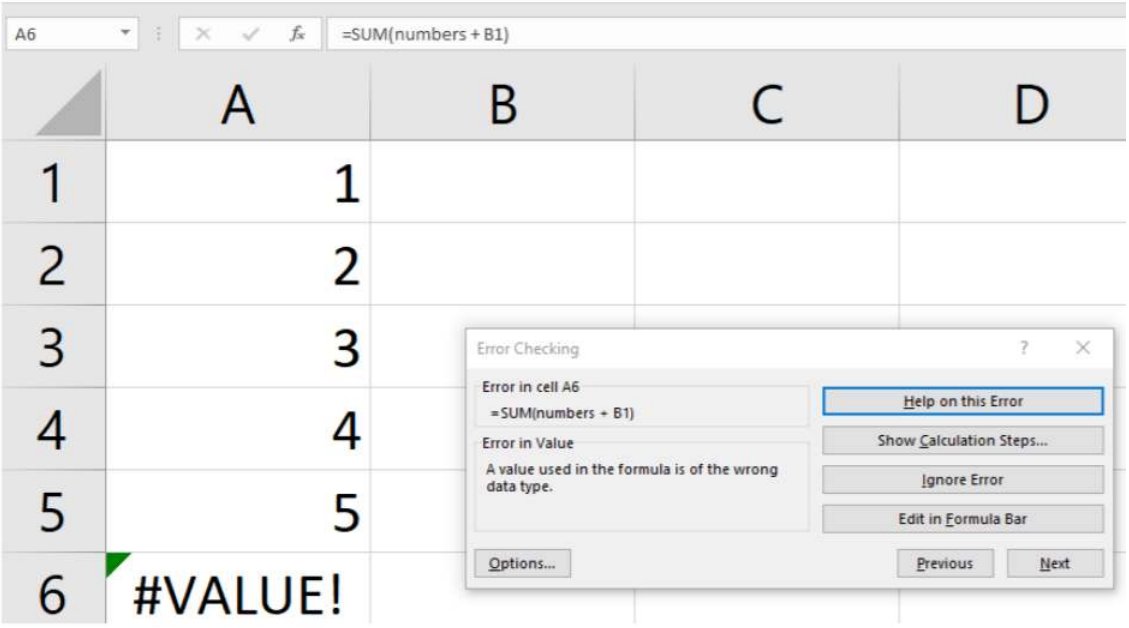
Button with Drop-Down. The button removes all the arrows drawn by the trace precedents and trace dependents. The drop-down contains the commands for more **fine**-tuning: *Remove Arrows*, *Remove Precedent Arrows* and *Remove Dependent Arrows*.

The **Show Formulas** icon

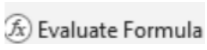
- (Ctrl + ') allows the user to toggle between showing formulas in the cells and the result of the formula in all cells in a worksheet.

The **Error Checking** icon

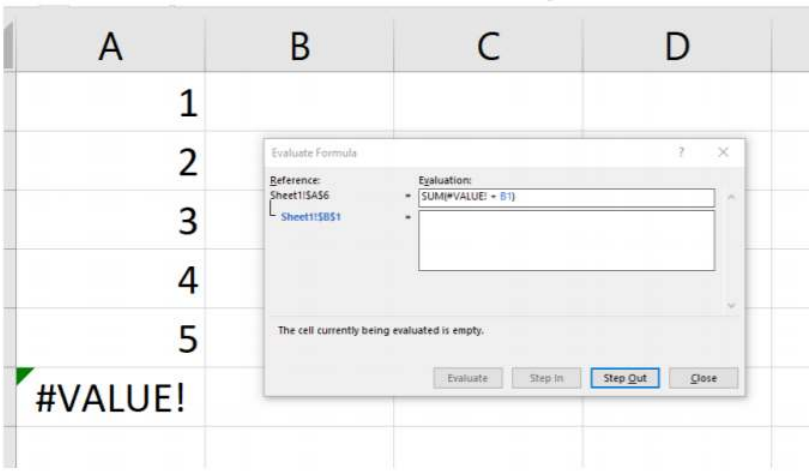
with more drop-down options displays the "Error Checking" dialog box. If you have created a formula that is not working correctly, the Error Checking dialog box can assist. As demonstrated below, the formula was changed to include the addition of cell B1, which contains no data. Error checking provides an analysis of the formula, and options to correct the error.




The drop-down contains the commands: Error Checking, Trace Error, and Circular References. All commands will only activate if the worksheet contains an error.

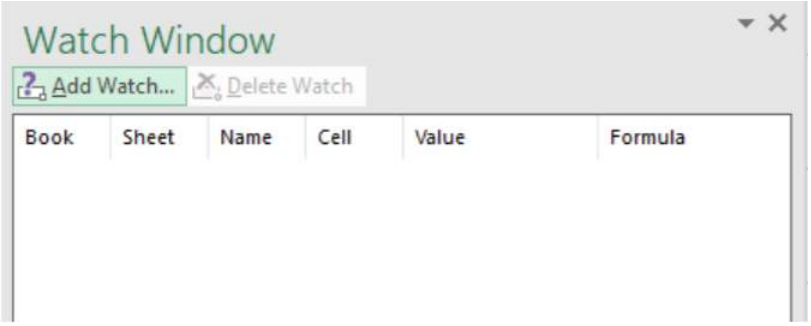
The **Evaluate Formula** icon 

displays the Evaluate *Formula* dialog box. In the previous example provided, the formula did not include a value in cell B1, so it was incorrect, the Evaluate formula dialog box provides information that the problem is cell B1 because it is empty. The buttons *Step in* and *Step Out* allow the user to review each aspect of the formula to determine where the error is (in this case it is in Cell B1 as described in the dialog box.




Finally, the **Watch Window** icon

- Displays the. Watch Window




Allows you to view the contents of cells and their results as you make changes in other places in the document. Using the watch window, you can Add Watch by selecting a range of cells and click *Add Watch*. This will allow the user to continue to view the value of those cells as they work in other places in the workbook. This can be helpful if a user is working in a complicated formula that may change a value that is very important.

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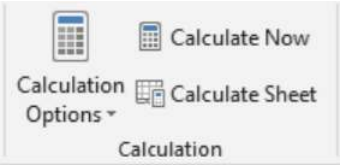
# 18.8: The Calculation Group




By default, Excel automatically calculates every formula automatically. This means that when values in a cell change, the formula recalculates immediately to display the correct information. However, there may be occasions when you do not want this to happen. The Calculation group allows the user to have flexibility in terms of when values are calculated. In most cases, the user should not change the Calculation Options from automatic, but it is nice that Excel provides the user the flexibility.

The first icon, **Calculation Options** contains a drop-down menu that allows the user to quickly change the calculation setting in the active workbook between Manual, Automatic and Automatic except for Data Tables.

The **Calculate Now** icon (F9) allows the user to recalculate all formulas in a workbook if the calculation setting was set to manual.

Likewise, the **Calculate Sheet** icon- (Shift + F9). Allows the user to update all of the calculations in a worksheet if calculation settings were sent to manual.

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# 18.9: Checking for Understanding

1. Your supervisor has requested that you create a supplies budget request for your department for next year. Your supervisor would like you to create three budget request worksheets Elements of the Budget request should contain the following columns:
    a. Budget Item
    b. Quantity
    c. Price per item
    d. Subtotal Total cost
    e. Tax on item (6.5%)
    f. The grand total of item cost

The Budget should contain a Grand Total of all Budget expenses. It is expected that you have at least ten (10) budgeted items. In addition, your supervisor has asked you to create three budget requests- one normal request, one for lean times (.95% of original budget request), and one for good times (107% of budget).

Please create three budget requests on three worksheets using formulas.

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# CHAPTER OVERVIEW

## 19: Data Tab

The Data Tab contains a variety of commands in Excel import, organize, and ensure data is accurate. The Data Tab consists of the following groups: Get & Transform Data, Queries & Connections, Sort & Filter, Data Tools, and Forecast.


19.1: Get and Transform Data

19.2: Queries and Connections Group

19.3: Sort and Filter Group

19.4: Data Tools Group

19.5: Checking for Understanding


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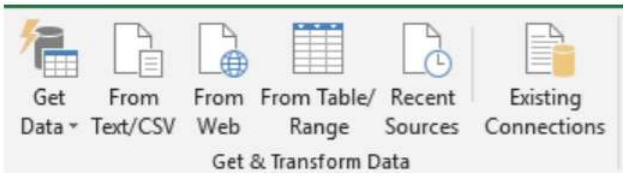
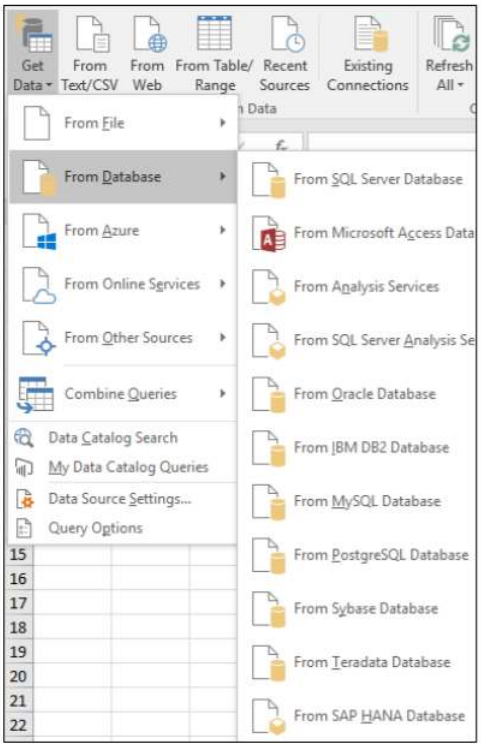
# 19.1: Get and Transform Data




The Get & Transform Data group is responsible for importing data from a variety of sources. You can search for data sources, make connections, and then change data (for example remove a column, change a data type, or merge tables) in ways that meet your needs. Once you've shaped your data, you can share your findings or use your query to create reports. The following information was retrieved from www.support.office.com.

You can begin a new query by selecting the **Get Data icon**. Select a data source. Users will have the option to select from obtaining data from a file on their PC, from an Access Database, from Microsoft Azure, from an Online Service, or other services.




When you connect to a data source, **Get & Transform** displays a **Navigator** pane, which allows you to edit the data from its source. When you select **Edit** from the **Navigator** window, **Get & Transform** launches the **Query Editor**, which is a dedicated window that facilitates and displays your data connections and the transformations you apply.

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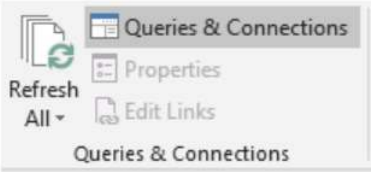
# 19.2: Queries and Connections Group




Once you have imported data, you can use the Queries & Connections Group to also adjust the data. Queries and Connections launches a Queries & Connections dialog box, and the Refresh all command retrieves the data again from its original source.

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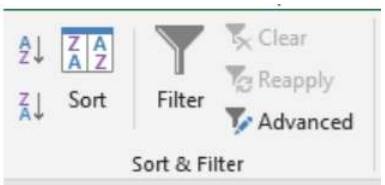
# 19.3: Sort and Filter Group

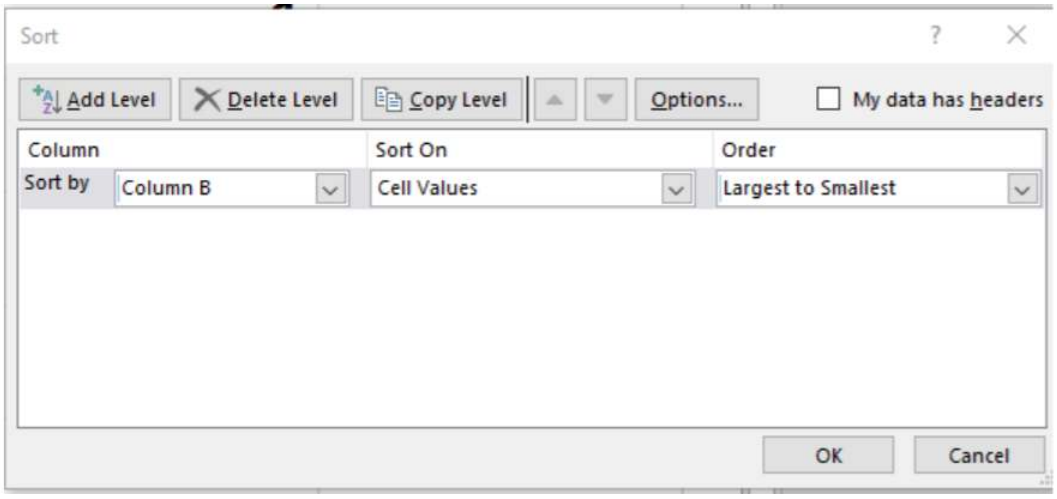



The Sort & Filter group is responsible for assisting the user in organizing their data. Sort allows a table to be organized by one column. An example of the utility of the Sort commands is as follows- data is currently organized by State in the following table. In this example, let us imagine that the user would like to display the data below from largest to smallest.

| State | Number |
|---|---|
| Wisconsin | 2 |
| Texas | 4 |
| New York | 9 |
| Minnesota | 1 |
| Alabama | 3 |

Using the Sort command

, the Sort dialog box appears, and the user can choose to sort Column B Largest to Smallest.



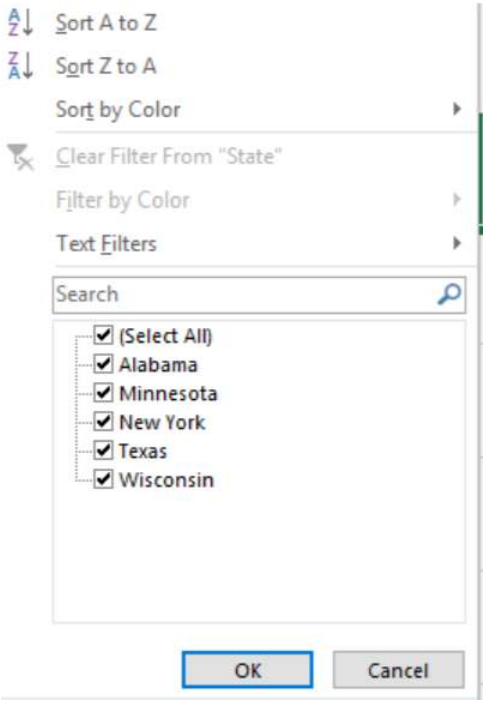

After selecting OK, the data is now displayed accordingly. Note that each State previously associated with each value continues to move with that value. It is important to ensure that all cells that should be associated with a sort are selected to ensure one group of data does not move without the other.

| State | Number |
|---|---|
| New York | 9 |
| Texas | 4 |
| Alabama | 3 |
| Wisconsin | 2 |
| Minnesota | 1 |

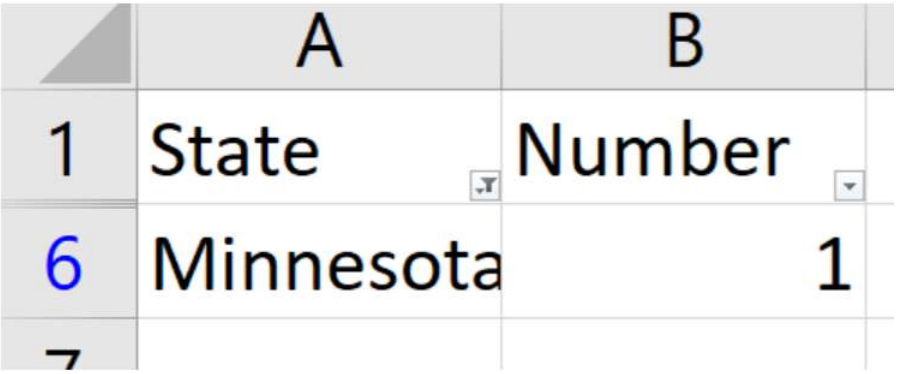
Continuing with this data set, selecting the Filter icon

will create a small box with an arrow pointing downward in the lower right-hand corner of the screen of the first row of the dataset. Selecting the arrow in the first column and row launches a filter

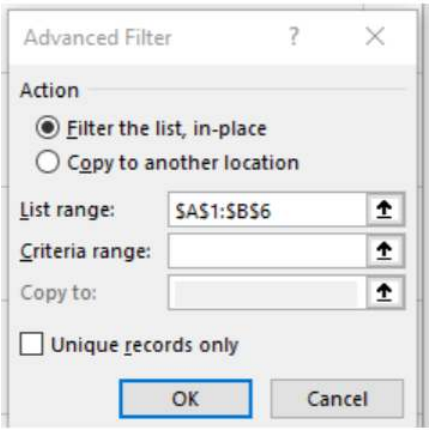
options window.




The Filter Options Window allows the user to sort the data in that column, and specify which information to include in the table. As an example, if only Minnesota was checked, only data with Minnesota in column one would be displayed. The user can visually see that other rows are being omitted because there is a gap in rows, and the filter icon (box with a downward arrow) now appears differently . The user can un-apply the filter, by selecting the filter icon again , or select the clear icon Clear in the Sort & Filter group. Likewise, the filter can be Reapplied by selecting the **Reapply** icon Reapply to add the filter back.




The Advanced icon Advanced launches the Advanced Filter window which allows more customization of the cells that should be filtered and where the information should be displayed.

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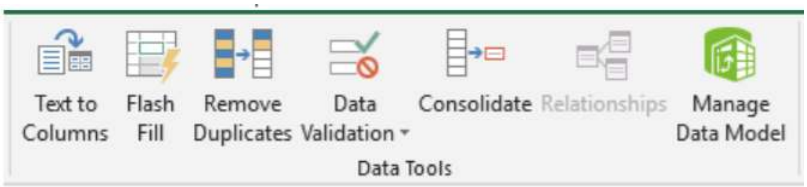
# 19.4: Data Tools Group




The Data Tools group provides some powerful commands that allow a user to manipulate their data. Imagine you have imported a set of data from a web-based program that contains customer addresses interested in a particular product. You would like to use the data to send out brochures with coupons to them about products they could buy. However, the data you received from your database contained all of the information in one cell per row.

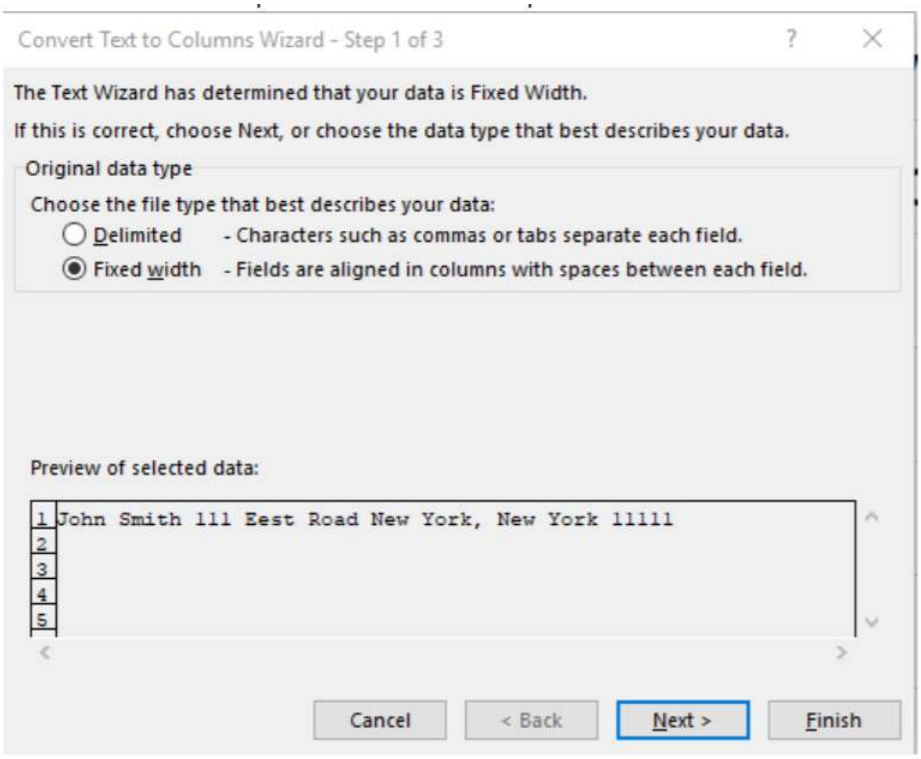
| |
|---|
| **John Smith 111 East Road Paynesville, NY 11111** |
| **Latisha Jones 1235 West Lane Sacramento, CA 22222** |

Your mail merge program cannot print address labels for data in this format, as you require separate information in particular cells for first & last name, address, city, state, and zip code. Using the data tools group, you can manipulate the data to get the data into the required format.

## Converting Text to Columns

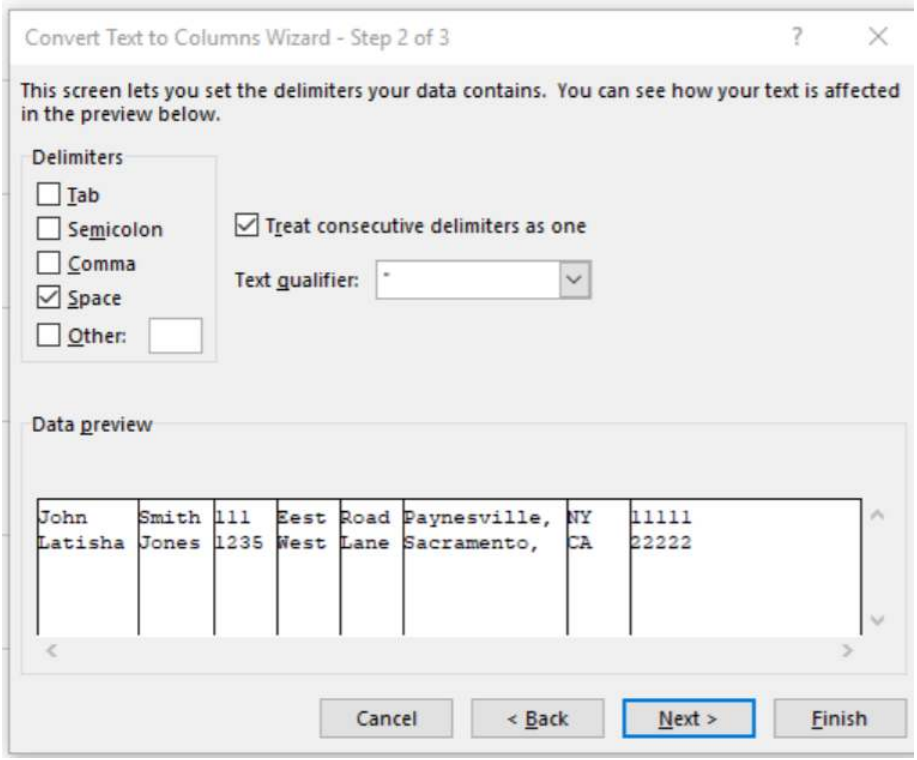
By selecting Text to Columns

icon, a **Convert Text to Columns Wizard** launches, allowing the user to determine how to separate the text into multiple columns.

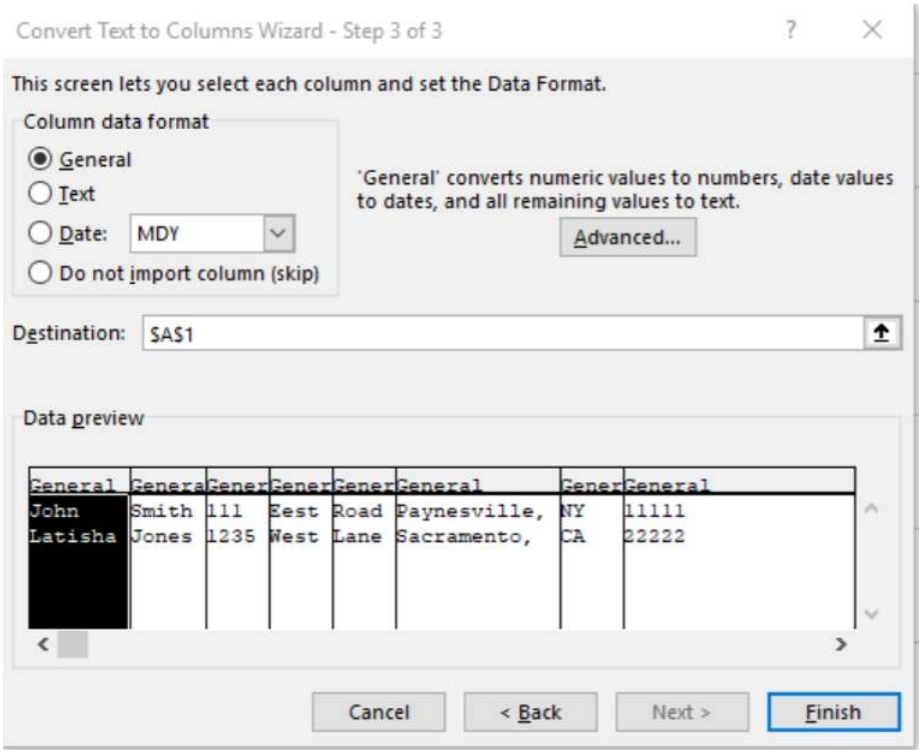



The Delimited option allows the user to instruct Excel to separate text based upon a character in the text, while Fixed Width allows for the columns to be separated by their width. Usually, Delimited is the most useful option, but Fixed Width can be used if all of

the data contain data sets that can be separated at the same measurements. For the purposes of this illustration, we will use Delimited. After selecting Delimited and clicking Next, Step 2 of the Wizard is available.



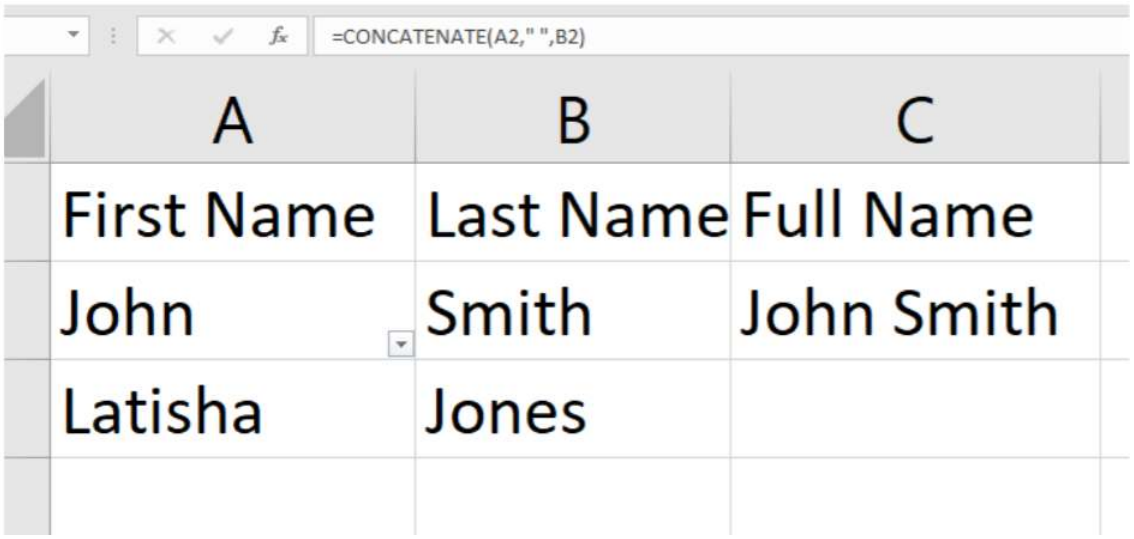

Now, the user can decide the specific type of Delimiter Excel can use to move the text into the next column. I have chosen the Space Delimiter (though I could also create a custom delimiter). A preview of the data is provided below. Selecting Next, the wizard will launch the final step of the wizard by allowing the user to determine which columns are to be included in the Wizard and the type of data in the cells and the location where the cells should be entered. The default is to begin in the same column as the original.




Finally, the user can select *Finish* to complete the Wizard. Now displayed is the information completely separated by spaces.

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **John** | **Smith** | **111** | **East** | **Road** | **Paynesville,** | **NY** | **11111** |
| **Latisha** | **Jones** | **1235** | **West** | **Lane** | **Sacramento,** | **CA** | **22222** |

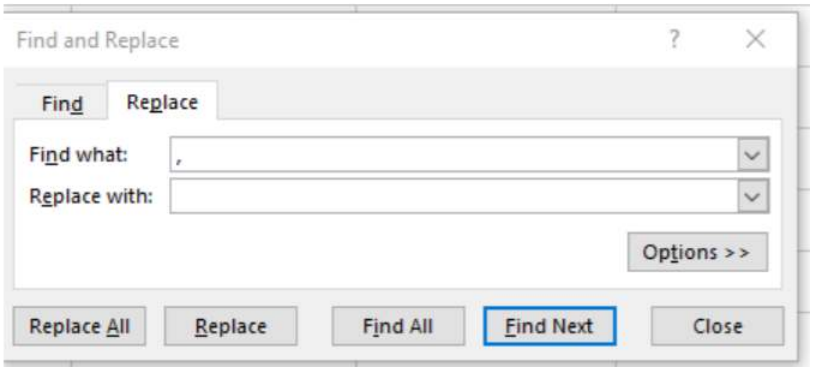
While the Excel function has correctly completed the task, the fields still are not in the correct format, because certain fields are supposed to be together. As a reminder, cells should contain the first & last name, address, city, state, and zip code. Now, we must use formulas in Excel to merge the data as needed. We can use the Concatenate Formula in a newly created Column we will name *Full Name* to combine the First and Last Name Fields. We add the formula "=CONCATENATE(A2," ", B2)" into the Full Name cell with the " " added so Excel places a space between the first and last name. After executing the formula, the First and Last Names are merged.



Now, we can add this formula to merge the other applicable cells, and hide the cells with information that is unnecessary. Now, we have the following table:

| Full Name | Column 1 | Column 2 | Column 3 | Address | City | State | Zip |
|---|---|---|---|---|---|---|---|
| **John Smith** | 111 | East | Road | 111 East Road | Paynesville, | NY | 11111 |
| **Latisha Jones** | 1235 | West | Lane | 1235 West Lane | Sacramento , | CA | 22222 |

We are almost completed, but we must first remove the comma "," that is in the City field. To do so, we will use the Replace feature of Excel. We wish to find all commas and replace them with a space.




Finally, now our data is accurate.

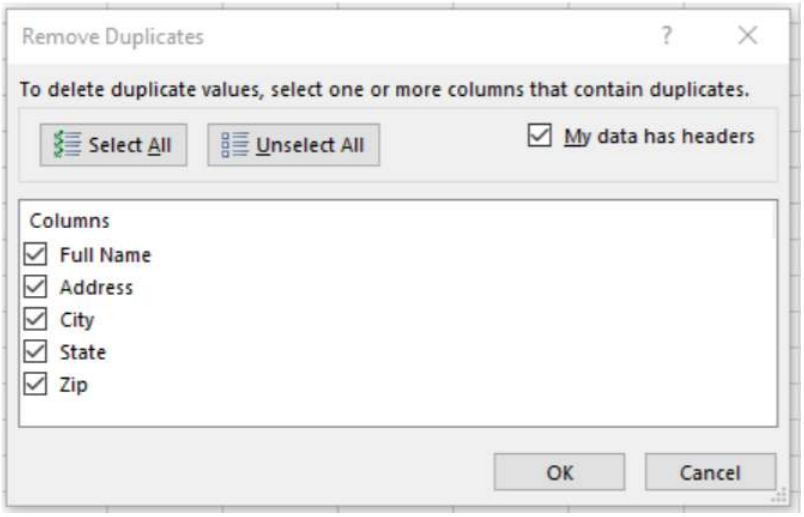
| Full Name | Address | City | State | Zip |
|---|---|---|---|---|
| **John Smith** | 111 East Road | Paynesville | NY | 11111 |
| **Latisha Jones** | 1235 West Lane | Sacramento | CA | 22222 |

## Remove Duplicates

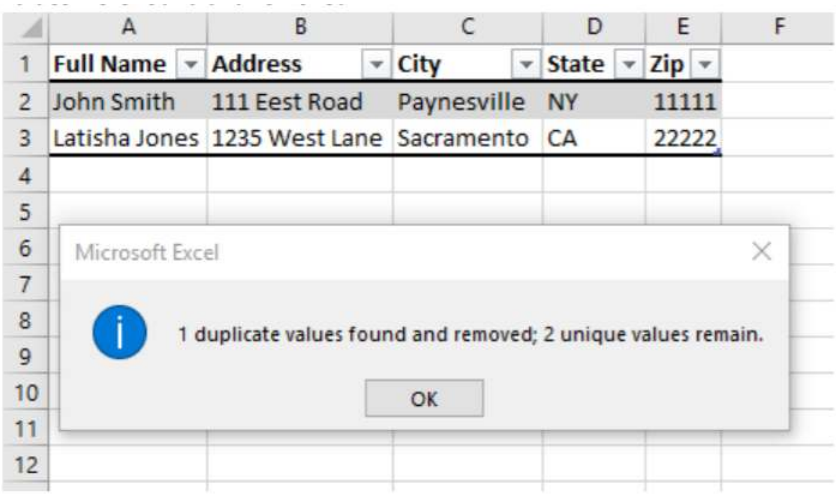
The Remove Duplicates feature in the Data Tools group is also very helpful when working with a large set of data. To continue the example, let us imagine that we downloaded a large set of data that contained the names of every customer who had expressed interest in a product. So as not to waste resources or mail individuals twice, you decide you want to remove duplicates. Usually, the data set can be too large to accomplish this. However, using the Remove Duplicates feature, it is not.

| Full Name | Address | City | State | Zip |
|---|---|---|---|---|
| **John Smith** | 111 East Road | Paynesville | NY | 11111 |
| **Latisha Jones** | 1235 West Lane | Sacramento | CA | 22222 |
| **John Smith** | 111 East Road | Paynesville | NY | 11111 |

With a cell selected in your table, selecting the Remove Duplicates icon will launch the Remove Duplicates wizard. The wizard will ask the user to determine which columns should be evaluated for duplicates. I will select the full name column.

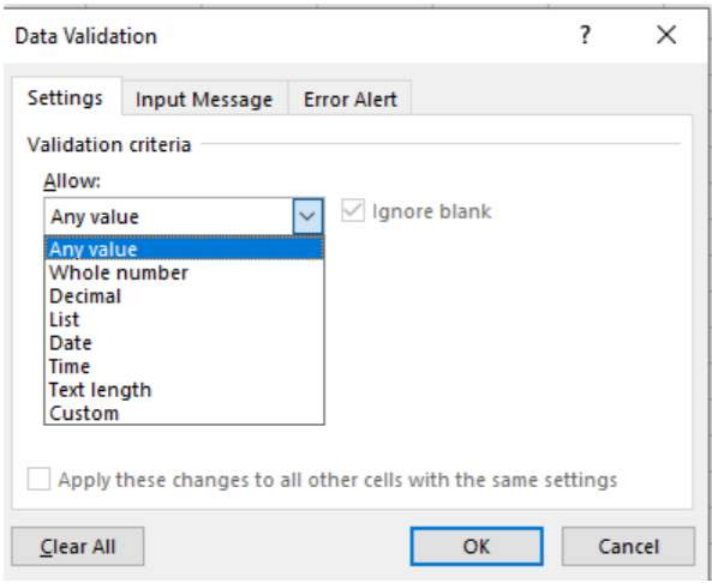



After clicking OK, Excel removes the duplicate row information and informs the user that 1 duplicate values were found and removed.



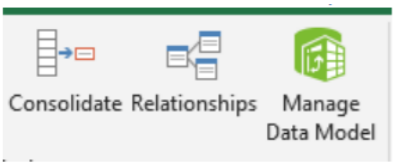

## Data Validation Tool

Excel's Data Validation Tool allows the user to specify which kinds of information can be inserted into a cell. The user can require only specified text, or limit a text field to numbers only. Selecting the Data Validation icon will launch a Data Validation wizard




Using the wizard, users can determine program excel to require a whole number, or decimal, or a list of options (that you provide from a range of cells in the workbook), date, time, a limit for text, and any other custom options. Users can also program the cells to display a message with instructions for the user.

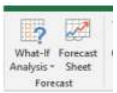
## Consolidate, Relationships, and Manage Data Model & Forecast Group




(*Retrieved from Office.com Help*). Users can select the **Consolidate** Icon to summarize and report results from separate worksheets, you can consolidate data from each sheet into a master worksheet. The sheets can be in the same workbook as the master worksheet, or in other workbooks. When you consolidate data, you assemble data so that you can more easily update and aggregate as necessary.

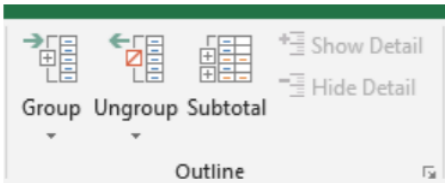
For example, if you have an expense worksheet for each of your regional offices, you might use consolidation to roll these figures into a master corporate expense worksheet. This master worksheet might also contain sales totals and averages, current inventory levels, and the highest-selling products for the entire enterprise.

The **Relationships** & Manage Data Model icons allow the user to create relationships between different tables and workbooks of data. This might allow data to be matched between tables, or to connect the tables for more batch processing. As this is not a Beginner to Intermediate class, Relationships and Manage Data Model will not be addressed in depth.

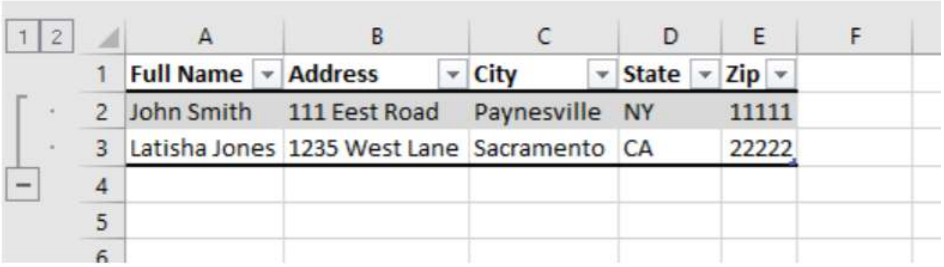
The Forecast Group 

is made to make projections based upon different variables in formulas and create forecasts. This information is also saved for an advanced class.

## Outline Group



Perhaps you are working with large sets of data that contain information that you want to keep together or organize. The Outline Group has a variety of tools that allow the user to group, ungroup, or subtotal sets of data together. Reviewing the data previously used an example, perhaps you would like to group this data because each of these customers requested information on the same day. To do so, highlight the cells to be included in a group, and select the Group icon in the ribbon. The user is provided with the choice to group either rows or columns (we select rows) and the cells are grouped.



| | A | B | C | D | E |
|---|---|---|---|---|---|
| 1 | Full Name | Address | City | State | Zip |
| 2 | John Smith | 111 Eest Road | Paynesville | NY | 11111 |
| 3 | Latisha Jones | 1235 West Lane | Sacramento | CA | 22222 |
| 4 | | | | | |
| 5 | | | | | |
| 6 | | | | | |

line to the left of the row headings is set to indicate the rows are together. The user can simply click the *Ungroup* icon to remove these from a group. The subtotal icon quickly and compute rows of numerical data to calculate a subtotal. The Show and Hide Detail icons collapse and hide the group.

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# 19.5: Checking for Understanding

1. You have imported the following information into Excel from your customer relations management system (CRM)

| |
|---|
| Jim Jones jjones@gmail.com 1123 East Street Reno, NV 55434 500 |
| Catherine Ford cford@yahoo.com 3432 West Street Lansing, MI 233423 600 |
| Jules Brown jbrown@msn.com 4322 North Lane Marietta, GA 53234 1200 |

a. Using the data function of excel, organize the data and add it to the following header groups.

   i. First & Last Name
   ii. Email Address
   iii. Street
   iv. City
   v. State
   vi. Zip
   vii. Quantity (last number)

b. Sort the data from the largest quantity to the smallest
c. Add a Data Validation column to the right of quantity with the heading “Shipped”? Make the options available only “Yes” “No” or “NA”
d. Format the data as a table.

---

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# CHAPTER OVERVIEW

## 20: Appendix

20.1: References

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# 20.1: References


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How to Geek. (n.d.). Retrieved from www.howtogeek.com/wpcontent/...js+rj+rp+rw+ri +cp+md.ic.vpXSdQ3Jth.png

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# Index

## W

Word
10.1: Introduction to Word Processing Software
word processing
10.1: Introduction to Word Processing Software

# Glossary

**Amdahls law** | a law or argument used to find the maximum expected improvement to an overall system when only part of the system is improved.

**Analog data** | Data that is represented in a physical way.

**Assembler** | Computer program which translates assembly language to an object file or machine language format.

**Assembly Language** | Low-level programming language for a computer, or other programmable device, in which there is a very strong (generally one-to-one) correspondence between the language and the architecture's machine code instructions.

**Cache memory** | Random access memory (RAM) that a computer microprocessor can access more quickly than it can access regular RAM. This memory is typically integrated directly with the CPU chip or placed on a separate chip that has a separate bus interconnect with the CPU

**Compiler** | Computer program (or a set of programs) that transforms source code written in a programming language (the source language) into another computer language (the target language), with the latter often having a binary form known as object code.

**Computer performance** | Characterized by the amount of useful work accomplished by a computer system or computer network compared to the time and resources used.

**Digital data** | Discrete, discontinuous representations of information or works, as contrasted with continuous, or analog signals which behave in a continuous manner, or represent information using a continuous function.

**Direct memory access** | A method that allows an input/output (I/O) device to send or receive data directly to or from the main memory, bypassing the CPU to speed up memory operations. The process is managed by a chip known as a DMA controller (DMAC).

**Input / Output** | the process of input or output, encompassing the devices, techniques, media, and data used

**Interrupt** | A hardware signal that breaks the flow of program execution and transfers control to a predetermined storage location so that another procedure can be followed or a new operation carried out.

**Machine Language** | Set of instructions executed directly by a computer's central processing unit (CPU).

**Micro architecture** | A description of the electrical circuitry of a computer, central processing unit, or digital signal processor that is sufficient for completely describing the operation of the hardware.

**Multicore** | A type of architecture where a single physical processor contains the core logic of two or more processors or packaged into a single integrated circuit

**Multiprocessor** | Refers to the ability of a system to support more than one processor and/or the ability to allocate tasks between them.

**Peripheral devices** | Any auxiliary device such as a computer mouse or keyboard that connects to and works with the computer in some way. Other examples of peripherals are image scanners, tape drives, microphones, loudspeakers, webcams, and digital cameras.

**Polling** | refers to actively sampling the status of an external device by a client program as a synchronous activity. Polling is most often used in terms of input/output (I/O), and is also referred to as polled I/O or software-driven I/O.

**Quantization** | The process of mapping a large set of input values to a (countable) smaller set.

**Sampling** | The reduction of a continuous signal to a discrete signal. A common example is the conversion of a sound wave (a continuous signal) to a sequence of samples (a discrete-time signal).

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# Glossary

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    - TitlePage - *CC BY 4.0*
    - InfoPage - *CC BY 4.0*
    - Table of Contents - *Undeclared*
    - Licensing - *Undeclared*
  - 1: How does a computer work? - *CC BY 4.0*
    - 1.1: What is a Computer? - *CC BY 4.0*
    - 1.2: Hardware and Software - *CC BY 4.0*
    - 1.3: What are the Different Types of Computers? - *CC BY 4.0*
    - 1.4: Components of a Computer - *CC BY 4.0*
    - 1.5: What is an Operating System? - *CC BY 4.0*
    - 1.6: Summary - *CC BY 4.0*
    - 1.7: Checking for Understanding - *CC BY 4.0*
  - 2: Getting Started with Microsoft Windows - *CC BY 4.0*
    - 2.1: Logging in - *CC BY 4.0*
    - 2.2: Windows Desktop - *CC BY 4.0*
    - 2.3: Windows Start Menu - *CC BY 4.0*
    - 2.4: Windows Taskbar (Tutorialspoint.com, n.d.) - *CC BY 4.0*
    - 2.5: Notification Area - *CC BY 4.0*
    - 2.6: Windows 10 Task View - *CC BY 4.0*
    - 2.7: Checking for Understanding - *CC BY 4.0*
  - 3: File Management - *CC BY 4.0*
    - 3.1: Windows File Explorer - *CC BY 4.0*
    - 3.2: Ribbon - *CC BY 4.0*
    - 3.3: Organizing Files and Folders - *CC BY 4.0*
    - 3.4: Cut/ Copy/ Paste - *CC BY 4.0*
    - 3.5: Check for Understanding - *CC BY 4.0*
  - 4: Managing Windows Applications - *CC BY 4.0*
    - 4.1: Using Applications - *CC BY 4.0*
    - 4.2: Windows Store - *CC BY 4.0*
    - 4.3: Uninstalling Applications - *CC BY 4.0*
    - 4.4: Window Management - *CC BY 4.0*
    - 4.5: Application Settings - *CC BY 4.0*
    - 4.6: Checking for Understanding - *CC BY 4.0*
  - 5: Web Browsers and the Internet - *CC BY 4.0*
    - 5.1: Web Browser Interface - *CC BY 4.0*
    - 5.2: Downloading Files - *CC BY 4.0*
    - 5.3: Internet Security - *CC BY 4.0*
    - 5.4: Bookmarks and Internet History - *CC BY 4.0*
    - 5.5: Checking for Understanding - *CC BY 4.0*
  - 6: Customizing Windows Appearance - *CC BY 4.0*
    - 6.1: Changing the Desktop Background - *CC BY 4.0*
    - 6.2: Create a Desktop Background with a Picture Slideshow - *CC BY 4.0*
    - 6.3: Changing the Color Accent in Windows 10 - *CC BY 4.0*
    - 6.4: Adjusting between Light and Dark Themes - *CC BY 4.0*
    - 6.5: Customizing Windows 10 Lock Screen - *CC BY 4.0*
    - 6.6: Applying a Theme to Windows 10 - *CC BY 4.0*
    - 6.7: Windows Settings - *CC BY 4.0*
    - 6.8: Accessibility Settings - *CC BY 4.0*
    - 6.9: Notification Center - *CC BY 4.0*

- 6.10: Checking for Understanding - *CC BY 4.0*

- 7: Windows Security - *CC BY 4.0*
  - 7.1: Computer Viruses - *CC BY 4.0*
  - 7.2: Computer Malware - *CC BY 4.0*
  - 7.3: Phishing - *CC BY 4.0*
  - 7.4: Windows Defender Security Center - *CC BY 4.0*
  - 7.5: Launching Windows Defender Security Center - *CC BY 4.0*
  - 7.6: Using Windows Defender Scan - *CC BY 4.0*
  - 7.7: Viewing the Health/ Performance of your PC - *CC BY 4.0*
  - 7.8: Fresh Start - *CC BY 4.0*
  - 7.9: How to Manage Network Security with Windows Defender Firewall - *CC BY 4.0*
  - 7.10: How to Protect your PC against Malicious Code - *CC BY 4.0*
  - 7.11: User Account Control - *CC BY 4.0*
  - 7.12: Automatic Updates - *CC BY 4.0*
  - 7.13: Internet and Computer Safety Tips - *CC BY 4.0*
  - 7.14: Checking for Understanding - *CC BY 4.0*

- 8: Media Creation in Windows - *CC BY 4.0*
  - 8.1: Types of Media Files - *CC BY 4.0*
  - 8.2: Extensions for Picture Files - *CC BY 4.0*
  - 8.3: Extensions for Music Files - *CC BY 4.0*
  - 8.4: Other types of Popular Files - *CC BY 4.0*
  - 8.5: Using Windows Photos - *CC BY 4.0*
  - 8.6: Browsing Photos - *CC BY 4.0*
  - 8.7: Using the Built-In Photo Editor - *CC BY 4.0*
  - 8.8: Checking for Understanding - *CC BY 4.0*

- 9: Office Overview and Office 365 - *CC BY 4.0*
  - 9.1: Understanding the Office Suite - *CC BY 4.0*
  - 9.2: Starting an Office App - *CC BY 4.0*
  - 9.3: Common Office Interface - *CC BY 4.0*
  - 9.4: Getting Help - *CC BY 4.0*
  - 9.5: Sharing - *CC BY 4.0*
  - 9.6: Office 365 Web Versions - *CC BY 4.0*
  - 9.7: Checking for Understanding - *CC BY 4.0*

- 10: Introduction to Microsoft Word - *CC BY 4.0*
  - 10.1: Introduction to Word Processing Software - *CC BY 4.0*
  - 10.2: Starting a Document - *CC BY 4.0*
  - 10.3: Saving a Document - *CC BY 4.0*
  - 10.4: Selecting Text - *CC BY 4.0*
  - 10.5: Formatting Text using the Mini-toolbar and Ribbon - *CC BY 4.0*
  - 10.6: Using a Document Template - *CC BY 4.0*
  - 10.7: Checking for Understanding - *CC BY 4.0*

- 11: Exploring the Home and View Tab of Microsoft Word - *CC BY 4.0*
  - 11.1: Clipboard - *CC BY 4.0*
  - 11.2: Font Group - *CC BY 4.0*
  - 11.3: Paragraph Group - *CC BY 4.0*
  - 11.4: Styles Group and editing Tab - *CC BY 4.0*
  - 11.5: View Tab - *CC BY 4.0*
  - 11.6: Checking for Understanding - *CC BY 4.0*

- 12: Using the Insert Tab in Microsoft Word - *CC BY 4.0*
  - 12.1: Introduction to the Insert Tab - *CC BY 4.0*
  - 12.2: Pages Group - *CC BY 4.0*
  - 12.3: Tables Group - *CC BY 4.0*
  - 12.4: Layout Tab - *CC BY 4.0*
  - 12.5: Illustrations Group - *CC BY 4.0*
  - 12.6: Document Item Group - *CC BY 4.0*
  - 12.7: Add-ins Group - *CC BY 4.0*
  - 12.8: Media Group - *CC BY 4.0*
  - 12.9: Links Group - *CC BY 4.0*
  - 12.10: Comments Group - *CC BY 4.0*
  - 12.11: Header and Footer Group - *CC BY 4.0*
  - 12.12: Text Group - *CC BY 4.0*
  - 12.13: Symbols Group - *CC BY 4.0*
  - 12.14: Checking for Understanding - *CC BY 4.0*

- 13: Design, Layout, References, Mailings, and Review Tabs in Microsoft Word - *CC BY 4.0*
  - 13.1: Design Tab - *CC BY 4.0*

- 13.2: Layout Tab - *CC BY 4.0*
- 13.3: References Tab - *CC BY 4.0*
- 13.4: Captions - *CC BY 4.0*
- 13.5: Mailings Tab - *CC BY 4.0*
- 13.6: Write and Insert Fields Group - *CC BY 4.0*
- 13.7: Review Tab - *CC BY 4.0*
- 13.8: Checking for Understanding - *CC BY 4.0*

- 14: Getting Started with Excel - *CC BY 4.0*
  - 14.1: Functions of a Spreadsheet - *CC BY 4.0*
  - 14.2: Identifying Excel Windows Components - *CC BY 4.0*
  - 14.3: Understanding Formulas - *CC BY 4.0*
  - 14.4: Quick Analysis Toolbar - *CC BY 4.0*
  - 14.5: Zoom, View, and Window Options - *CC BY 4.0*
  - 14.6: Check for Understanding - *CC BY 4.0*

- 15: Home Tab and Working with Formulas and Functions in Excel - *CC BY 4.0*
  - 15.1: Clipboard Group - *CC BY 4.0*
  - 15.2: Font Group - *CC BY 4.0*
  - 15.3: Alignment Group - *CC BY 4.0*
  - 15.4: Number Group - *CC BY 4.0*
  - 15.5: Styles Group - *CC BY 4.0*
  - 15.6: Cells Group - *CC BY 4.0*
  - 15.7: Editing Group - *CC BY 4.0*
  - 15.8: Check for Understanding - *CC BY 4.0*

- 16: Using Insert Tab - *CC BY 4.0*
  - 16.1: Insert Tab - *CC BY 4.0*
  - 16.2: Sparklines - *CC BY 4.0*
  - 16.3: Filters - *CC BY 4.0*
  - 16.4: Links - *CC BY 4.0*
  - 16.5: Text - *CC BY 4.0*
  - 16.6: Symbols Group - *CC BY 4.0*
  - 16.7: Checking for Understanding - *CC BY 4.0*

- 17: Page Layout, View and Review Tabs - *CC BY 4.0*
  - 17.1: Page Layout Tab - *CC BY 4.0*
  - 17.2: View Tab - *CC BY 4.0*
  - 17.3: Review Tab - *CC BY 4.0*
  - 17.4: Checking for Understanding - *CC BY 4.0*

- 18: Formulas Tab - *CC BY 4.0*
  - 18.1: Insert Function (or Introduction to Formulas in Excel) - *CC BY 4.0*
  - 18.2: Why not just add the Numbers and not the Cell Locations? - *CC BY 4.0*
  - 18.3: Autofill using Formulas - *CC BY 4.0*
  - 18.4: Relative vs Absolute Cell References - *CC BY 4.0*
  - 18.5: Function Library Group - *CC BY 4.0*
  - 18.6: Defined Names Group - *CC BY 4.0*
  - 18.7: Formula Auditing Group - *CC BY 4.0*
  - 18.8: The Calculation Group - *CC BY 4.0*
  - 18.9: Checking for Understanding - *CC BY 4.0*

- 19: Data Tab - *CC BY 4.0*
  - 19.1: Get and Transform Data - *CC BY 4.0*
  - 19.2: Queries and Connections Group - *CC BY 4.0*
  - 19.3: Sort and Filter Group - *CC BY 4.0*
  - 19.4: Data Tools Group - *CC BY 4.0*
  - 19.5: Checking for Understanding - *CC BY 4.0*

- 20: Appendix - *CC BY 4.0*
  - 20.1: References - *CC BY 4.0*

- Back Matter - *CC BY 4.0*
  - Index - *CC BY 4.0*
  - Glossary - *CC BY 4.0*
  - Glossary - *Undeclared*
  - Detailed Licensing - *Undeclared*