AN INTRODUCTION TO COMPUTERS

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WHAT IS A COMPUTER ?

A computer is a programmable electronic machine used to store, retrieve, and process data.

They are used to type documents, send e-mail, play games, browse the Internet, create presentations, event invitations, and listen to music or watch videos.

Examples and types of computers

Desktop computer   Laptop   **Chromebook**   Hybrid Laptop   Tablet   Smartphone

WHY IS A COMPUTER SO EFFICIENT ?

- It doesn't get tired !!

- The ability to work on projects with amazing speed

- Reliability (low failure rate)

- Very Accurate

- Able to store huge amounts of data and information

- Able to communicate with other computers

HARDWARE VS. SOFTWARE - Before we talk about different types of computers, let's talk about two things all computers have in common: Hardware and Software.

- **HARDWARE** is any part of your computer that has a physical structure that you can touch, such as the computer itself, the keyboard, or the mouse, which you can see in the image below.

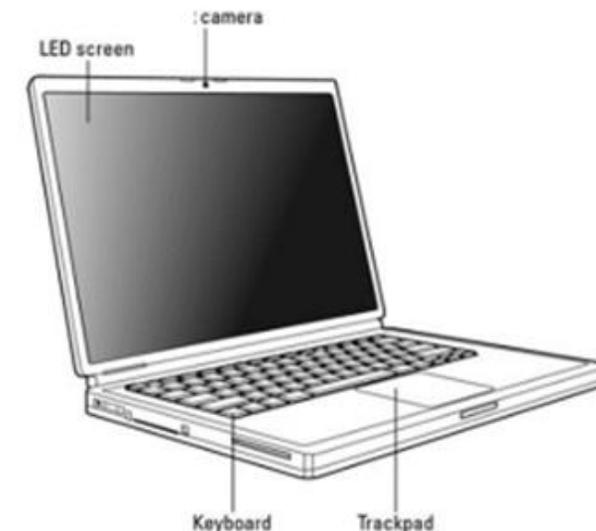- It also includes all the computer's internal parts.

A DESKTOP COMPUTER COMPARED TO A LAPTOP COMPUTER

- **A case, or tower**, that holds the computer's inside parts

- **A monitor**, also called a screen

- **A mouse**, used to move and select information on the monitor

- **A keyboard**, used to type in commands and documents
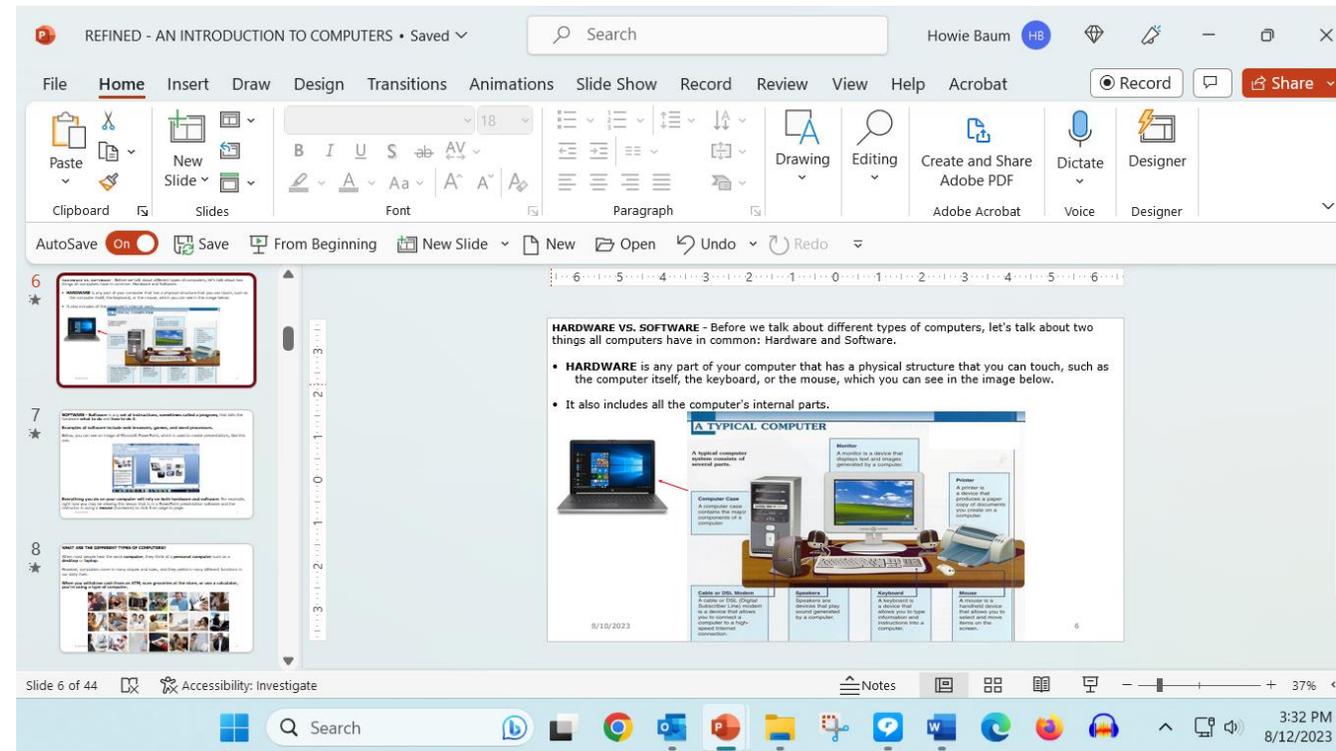
camera

LED screen

Keyboard   Trackpad

Laptop computers have a built-in monitor screen with a small circular camera at the top.

They also have a Trackpad instead of a mouse as well as a built-in keyboard. It also includes small speakers, a microphone on the top surface, and are battery-powered.

SOFTWARE - Software is any **set of instructions, sometimes called a program,** that tells the hardware **what to do** and **how to do it**.

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, like this one.

Everything you do on your computer will rely on both hardware and software. For example, right now you may be viewing this lesson that is in a PowerPoint presentation software and the instructor is using a **mouse or the keyboard** (hardware) to click from page to page.

WHAT ARE THE DIFFERENT TYPES OF COMPUTERS?

When most people hear the word **computer**, they think of a **personal computer** such as a **desktop** or **laptop**.

However, computers come in many shapes and sizes, and they perform many different functions in our daily lives.

When you withdraw cash from an ATM, scan groceries at the store, or use a calculator, you're using a type of computer.

PCS AND MACS

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

This type of computer began with the original **IBM PC** that was introduced in 1981.

Other companies began creating similar computers, which were called **IBM PC Compatible** (often shortened to **PC**).

Today, this is the most common type of personal computer, and it includes the **Microsoft Windows** operating system.

MAC

The **Macintosh** computer was introduced in 1984, and it was the first widely sold personal computer with a **graphical user interface**, or **GUI** (pronounced **gooey**).

All Macs are made by one company (**Apple**), and they always use the **MacOS** operating system. They are usually a lot more expensive than a PC type of computer.

HYBRID LAPTOP COMPUTERS

You can also buy a laptop that has a removable monitor screen that becomes a touch screen tablet when removed from the bottom part, such as the **Microsoft Surface** and other brands**.**

MOBILE DEVICES - A mobile device is a general term for any type of portable **handheld computer**.

Some mobile devices—like **tablets**, **e-readers**, and **smartphones**—are powerful enough to do many of the same things you can do with a desktop or laptop computer.

TABLET COMPUTERS - Like laptops, **tablet computers (sometimes called a Pad)** are designed to be portable. However, they provide a different computing experience.

They usually come in two sizes – 7 or 10 inch, as measured on a diagonal, on the screen.

The most obvious difference is that tablet computers don't have keyboards, a CD/DVD drive, or touchpads.

Instead, the entire screen is touch-sensitive, allowing you to type on a virtual keyboard and use your finger or a stylus as a mouse pointer.

Some newer Tablets also have smart phone capability and are called Phablets.

Some persons like to use a keyboard with a Tablet, so some models come with the keyboard that is part of a protective case, around the Tablet.

Other types have a separate wireless keyboard that can be used with the Tablet.

E-BOOK READERS—also called **e-readers**—are similar to tablet computers, except they are mainly designed for reading **e-books** (digital, downloadable books).

Notable examples include the **Amazon Kindle**, **Barnes & Noble Nook**, and **Kobo**.

Most e-readers use an **e-ink** display, which is easier to read than a traditional computer display.

You can even read in bright sunlight, just like if you were reading a regular book.   E-books can also be read on **tablets**, **smartphones**, **laptops**, and **desktops**.

You can download all types of E-Books for free, from the Public library, other sites, and Amazon too.

SMARTPHONES - In addition to the same basic features—phone calls, voicemail, text messaging—smartphones can **connect to the Internet** over Wi-Fi or a cellular network (which requires purchasing a monthly **data plan**).

This means you can use a smartphone for the same things you would normally do on a computer, such as checking your email, browsing the Web, or shopping online.

Smartphones use a **touch-sensitive screen, so** you type on a virtual keyboard with your fingers or a stylus, to interact with the display.

Other standard features include a high-quality digital camera, the ability to play digital music and video files, and use it as a GPS device for driving directions.

For many people, a smartphone can actually replace electronics like an old laptop, digital music player, and digital camera in the same device.

You can download music or audio books for free from the Public Library, Amazon, and use Bluetooth technology to listen with headphones, or in your car.

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

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.

SERVERS - A **server** is a large, high-speed computer that are stacked together, to provide information to other computers on a network and are usually used for places that need to store and retrieve a lot of information.

For example, whenever you use the Internet, you're looking at something that's stored on a server. Many businesses also use local **file servers** to store and share files internally.

HIGH SPEED, SERVER DATA CENTER
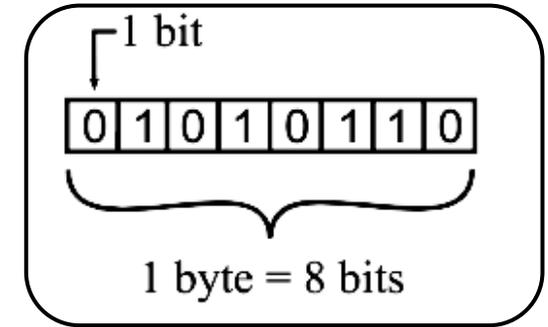
AMOUNT OF MEMORY IN COMPUTERS

Bit - **The smallest amount of memory which represents a 0 or a 1**

The Power button symbol, on a device

OFF
0

1 bit

| 0 | 1 | 0 | 1 | 0 | 1 | 1 | 0 |

1 byte = 8 bits

Byte - **A byte, is made of 8 bits and usually stores one character such as a letter or a number or symbol. (C or 5 or %)**

Therefore, a computer with 8 Megabytes of memory can store about 8 million characters.

One megabyte can hold approximately 768 pages of text information.

A Byte = 8 bits = 1 letter, number, or a symbol

Kilobyte (KB)   = 1 Thousand Bytes

Megabyte (Mb)   = 1 Million Bytes

Gigabyte (GB)   = 1 Billion Bytes

Terabyte (TB)   = 1 Trillion Bytes

Bytes are used to measure the amount of information a device can store.

Byte

One byte is one character. A character can be a number, letter or symbol. One byte consists of eight bits (binary digits). A bit is the smallest unit of information a computer can process.

Kilobyte (KB)

One kilobyte is approximately equal to one thousand characters or one page of text.
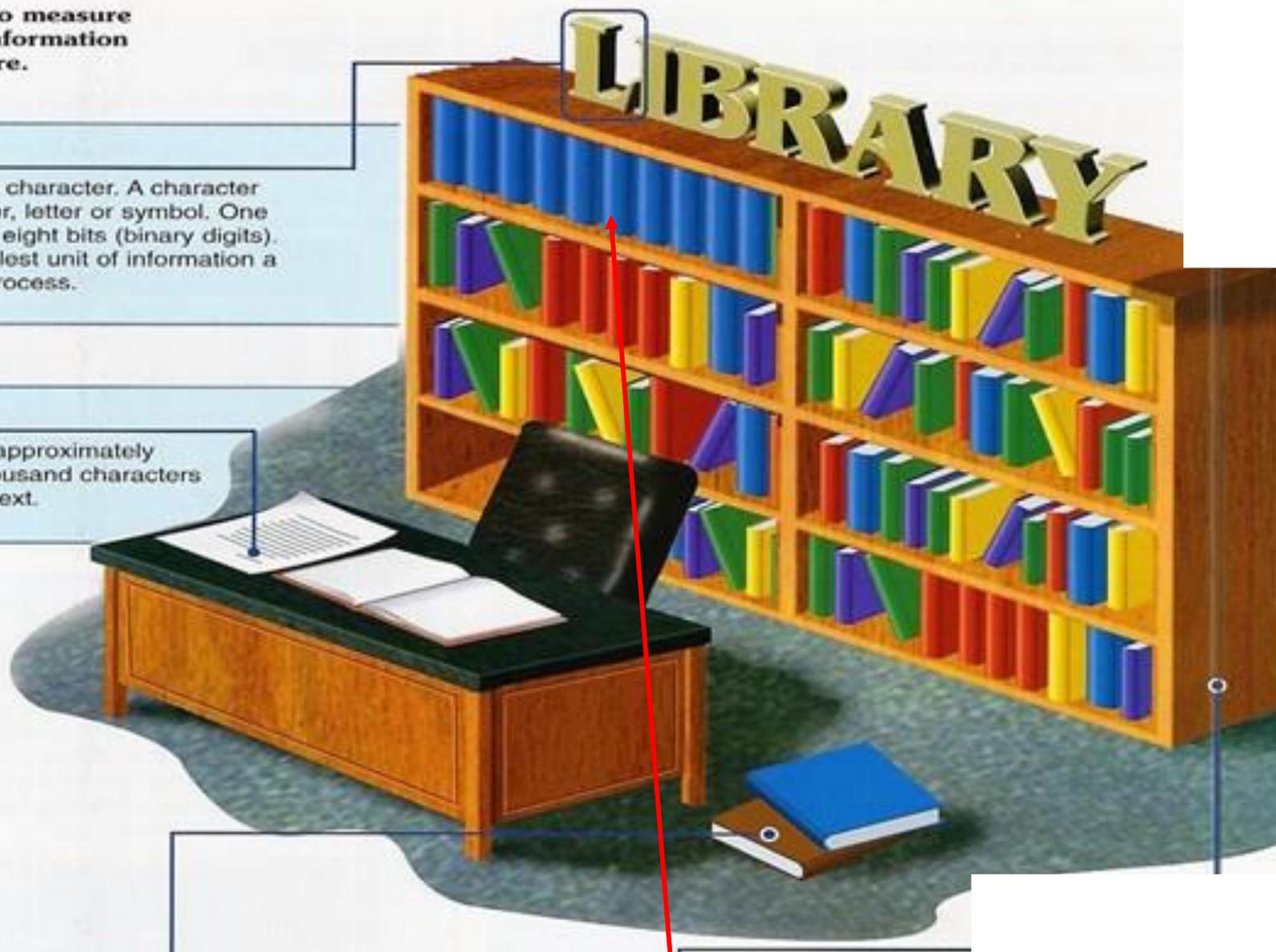
Megabyte (MB)

One megabyte is approximately equal to one million characters or one book **- 768 pgs of printed text.**

Gigabyte (GB)

One gigabyte is approximately equal to one billion characters or a shelf of books in a library. **or a stack of 262 feet of printed pages**

Terabyte (TB)

One terabyte is approximately equal to one trillion characters or an entire library of books. **or a 51 mile stack of printed pages**

LIBRARY

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18

Byte

Kilobyte

Megabyte

Gigabyte

Terabyte

THE HARD DRIVE

HARD DRIVE – It is where your software, documents, and other files are stored permanently.

It contains **long-term memory storage**, which means the data is still saved even if you turn the computer off or unplug it.

When you use a program to work on a document, they both usually are stored on the hard drive.

When you **save** a file, the data is copied back to the **hard drive**. The faster the hard drive, the faster your computer can **start up** and **load programs**.

The type of Hard Drive shown is the older type and uses an electric motor to turn 1 or more platters where the computer information is stored.   Within the last few years, it has been replaced by Solid State drives (SSD).

BASIC PARTS OF A COMPUTER
https://www.youtube.com/watch?v=mLgTnkw558w   2.8 min

SOLID STATE MEMORY DRIVES (SSD)

NO MOVING PARTS   SOLID STATE DRIVE VS A HARD DRIVE

Vs

The Samsung company makes a Solid-State Drive (SSD) with a whopping 30 Terabytes (TB) of storage. (30 trillion bytes !)

It's enough to store 5,700 full length, High Definition movies !!!

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6 ADVANTAGES OF SOLID-STATE MEMORY DRIVES

1) More durable and damage resistant

2) Faster speed than the older type of hard drives

3) They are lighter so the laptop is easier to carry

4) More efficient and reliable than the older type of hard drives.

5) They use less electricity, so the battery lasts longer

6) No moving parts to wear out so they last a lot longer.

KEYBOARD - The **keyboard** is one of the main ways to communicate with a computer.

More information about all of the keys on the keyboard will be given in a separate presentation about the keyboard, Trackpad, and/or mouse.

THE MOUSE

The **mouse** is another important tool for communicating with computers.

It lets you **point** to objects on the screen, **click** on them, and **move** them.

The **optical** mouse is the type used today. It has an LED light on the bottom that senses how you move the mouse, which moves the cursor on the screen to where you want it,

You can buy one with a cord or a wireless mouse.

BLUETOOTH WIRELESS TECHNOLOGY

Bluetooth is a short-range wireless connection that is used in modern smartphones and wireless devices.

It works up to 33 feet away.

It is used with Wireless Computer devices like keyboards, a mouse, headphones, speakers, etc.

A wireless mouse has a battery in it and comes with a small USB connector, called a **Dongle** that uses Bluetooth technology to send the signal to the computer
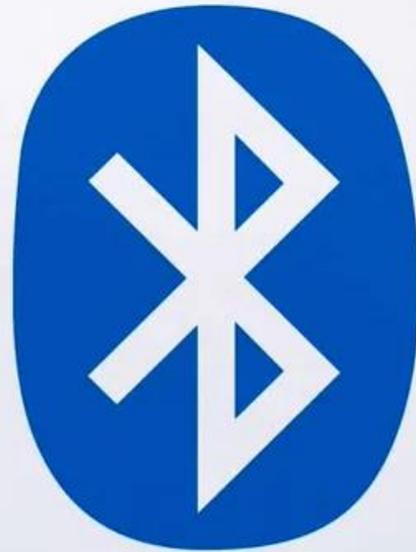

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BLUETOOTH TECHNOLOGY

The symbol for Bluetooth technology is a combination of the Nordic runes for H and B, which refer to the 10th century King, Harald Bluetooth.

Bluetooth technology is a short-length, radio link that is meant to unite devices the same way that King Harald Bluetooth united the tribes of Denmark into a single kingdom.

COMPUTER SOFTWARE

Computer software is the key to productive use of computers.

Software can be categorized into 2 types:

1. **APPLICATION SOFTWARE,** like Word Processing (Word or WordPad), Spreadsheets (Excel or Google sheets), E-mail programs (Outlook or G-mail)

2. **OPERATING SYSTEM SOFTWARE**, like Windows 10 or 11.

Types of Computer Software

Computer software or just software is a collection of computer programs and related data that provides the instructions for telling a computer what to do and how to do it. Any set of instructions that guides the hardware and tells it how to accomplish each task.

Systems Software

Application Software

GetupLearn.com

THE OPERATING SYSTEM

An operating system is the most important software that runs on a computer.

Ours is Windows 10 (or 11 on newer PC computers)

It manages the computer's **memory** & **processes**, as well as all of its **software** and **hardware**.

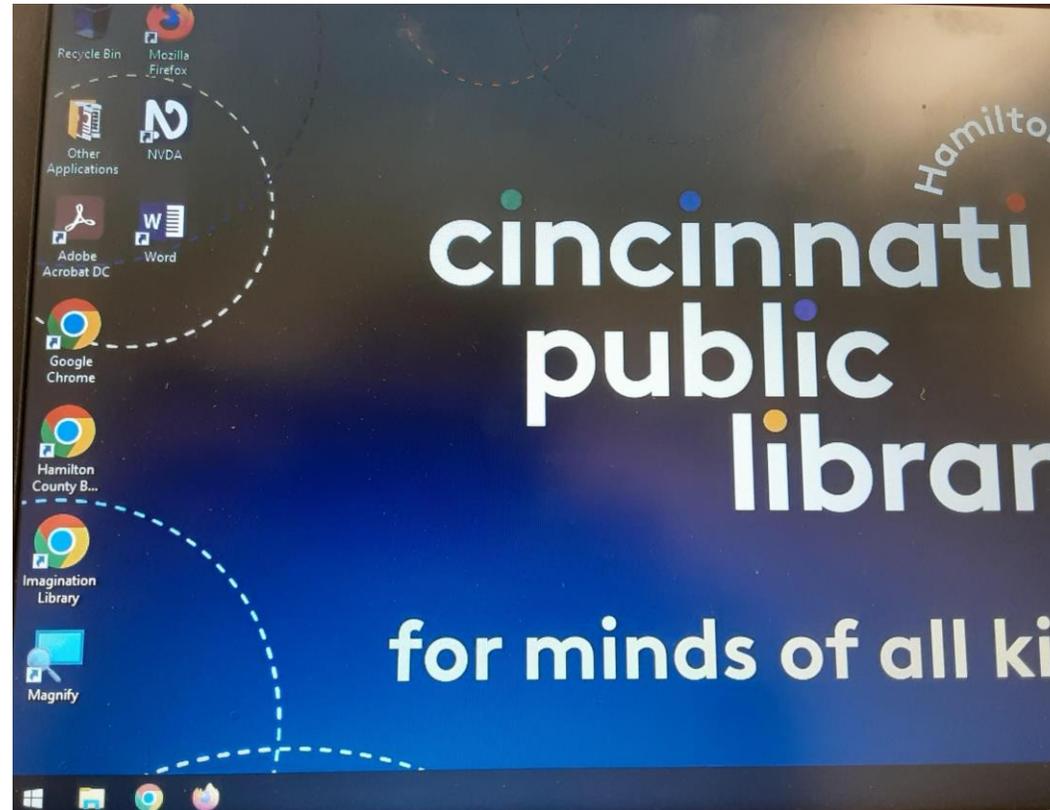It also allows you to **communicate** with the computer without knowing how to speak the computer's language.

Without an operating system, a computer is useless.

Information about Operating Systems will be discussed in the presentation about Windows 10.

Modern operating systems use a **Graphical User Interface**, or **GUI** (pronounced **gooey**).

A GUI lets you use your Touchpad or Mouse to click on **icons**, **buttons**, and **menus**, and everything is clearly displayed on the screen using a combination of **images and text**.

Each operating system's GUI has a different look and feel, so if you switch to a different operating system, it may seem unfamiliar at first.

However, modern operating systems are designed to be **easy to use**, and most of the basic principles are the same.

MAC OS is a line of operating systems created by Apple.

It comes preloaded on all new Macintosh computers, or Macs.

According to **StatCounter Global Stats**, Mac OS X users account for about 20% of global operating systems—much lower than the percentage of Windows users. One reason for this is that Apple computers tend to be more expensive.

However, many people do prefer the look and feel of Mac OS X over Windows.

Linux (pronounced **LINN-ux**) is a family of **open-source** operating systems, which means they can be modified and distributed by anyone around the world.

This is different from **proprietary software like Windows**, which can only be modified by the company that owns it.

The advantages of Linux are that it is free, and there are many different distributions—or versions—you can choose from.

According to **StatCounter Global Stats**, Linux users account for **2.1%** of global operating systems. However, most **servers** run Linux because it's relatively easy to customize.

WHO USES LINUX? - YOU PROBABLY ALREADY USE LINUX, WHETHER YOU KNOW IT OR NOT.

Companies and individuals choose Linux for their servers because it's secure, flexible, and you can receive excellent support from a large community of users,

It is also the background Operating System for many devices you probably own, such as:
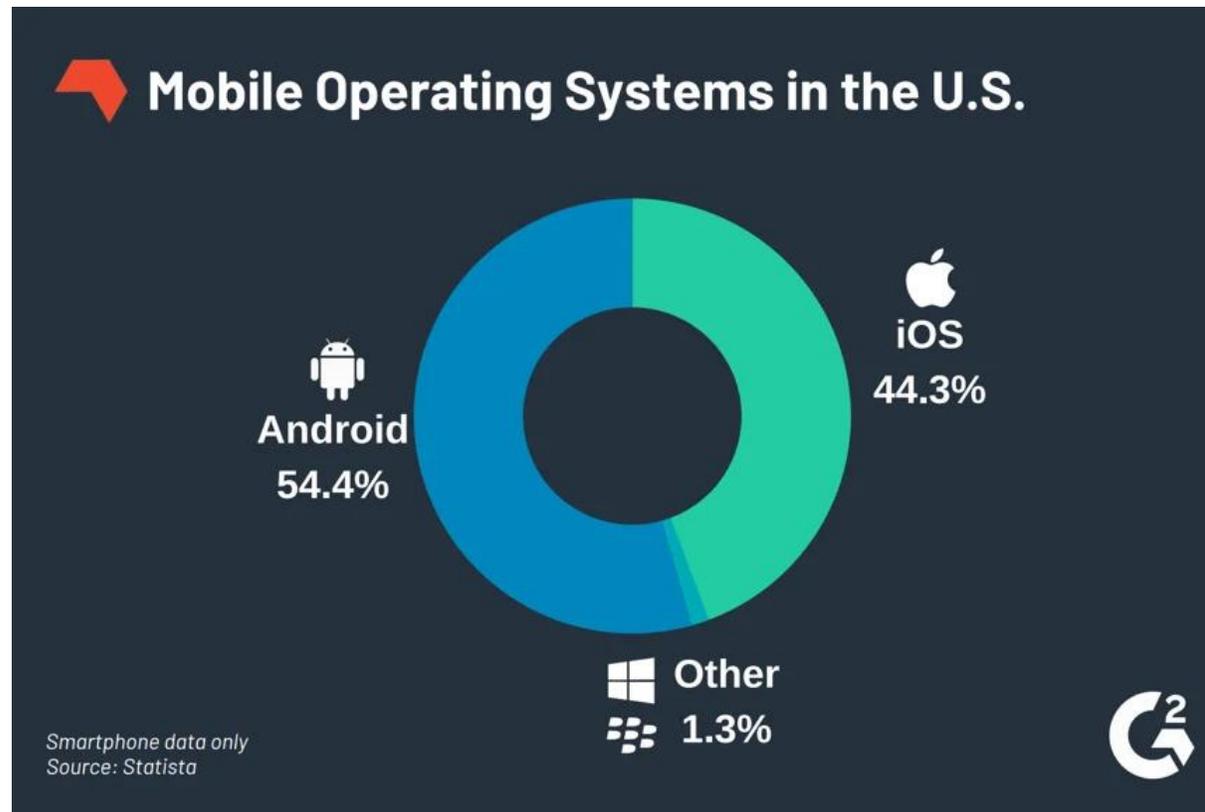
- Between 33% to 67% of the webpages on the Internet are generated by servers, running Linux.

- 85% of all smartphones

- Chromebook laptop computers

- Personal video recorders

- Digital cameras

- Electronic wearable devices

- Your car has Linux running under the hood

- The world's top 500 fastest supercomputers all run on Linux.

OPERATING SYSTEMS FOR MOBILE DEVICES

The operating systems we've been talking about so far were designed to run on **desktop** and **laptop** computers.

Mobile devices such as **phones**, **tablet computers**, and **MP3 players** are different from desktop and laptop computers, so they run operating systems that are designed specifically for mobile devices.

Examples of mobile operating systems include **Apple iOS** and **Google Android**.

WHAT IS AN APPLICATION?

You may have heard people talking about using a **program**, an **application**, or an **app**. But what exactly does that mean?

Simply put, an **app** is a type of software that allows you to **perform specific tasks**.

Applications for desktop or laptop computers are sometimes called **desktop applications**, while those for mobile devices are called **mobile apps**.

Usually, they can be downloaded inexpensively or free.

Watch the video below to learn more about applications.

https://www.youtube.com/watch?v=3gMOYZoMtEs&feature=emb_logo   1.5 min

DESKTOP APPLICATIONS

There are countless desktop applications, and they fall into several categories.

Some are **full featured** (like **Microsoft Word**), while others may only do **one or two things** (like a **clock** or **calendar** app).

WORD PROCESSORS: A word processor allows you to write a letter, design a flyer, and create many other types of documents. Examples: **WordPad** and **Microsoft Word**.

MEDIA PLAYERS - This may already be in your computer.

 If you want to listen to music, someone talking in a Podca watch **movies** you've downloaded, you'll need to use a **m player,** which is free software that you can download to computer.

For the Windows Media Player, go to www.Microsoft.com and for the iTunes player, go to www.Apple.com

GAMES - There are many types of games you can play on your computer.

They range from card games like **Solitaire** to action games like **Halo**.

Many action games require a lot of **computing power**, so they may not work unless you have a newer computer.
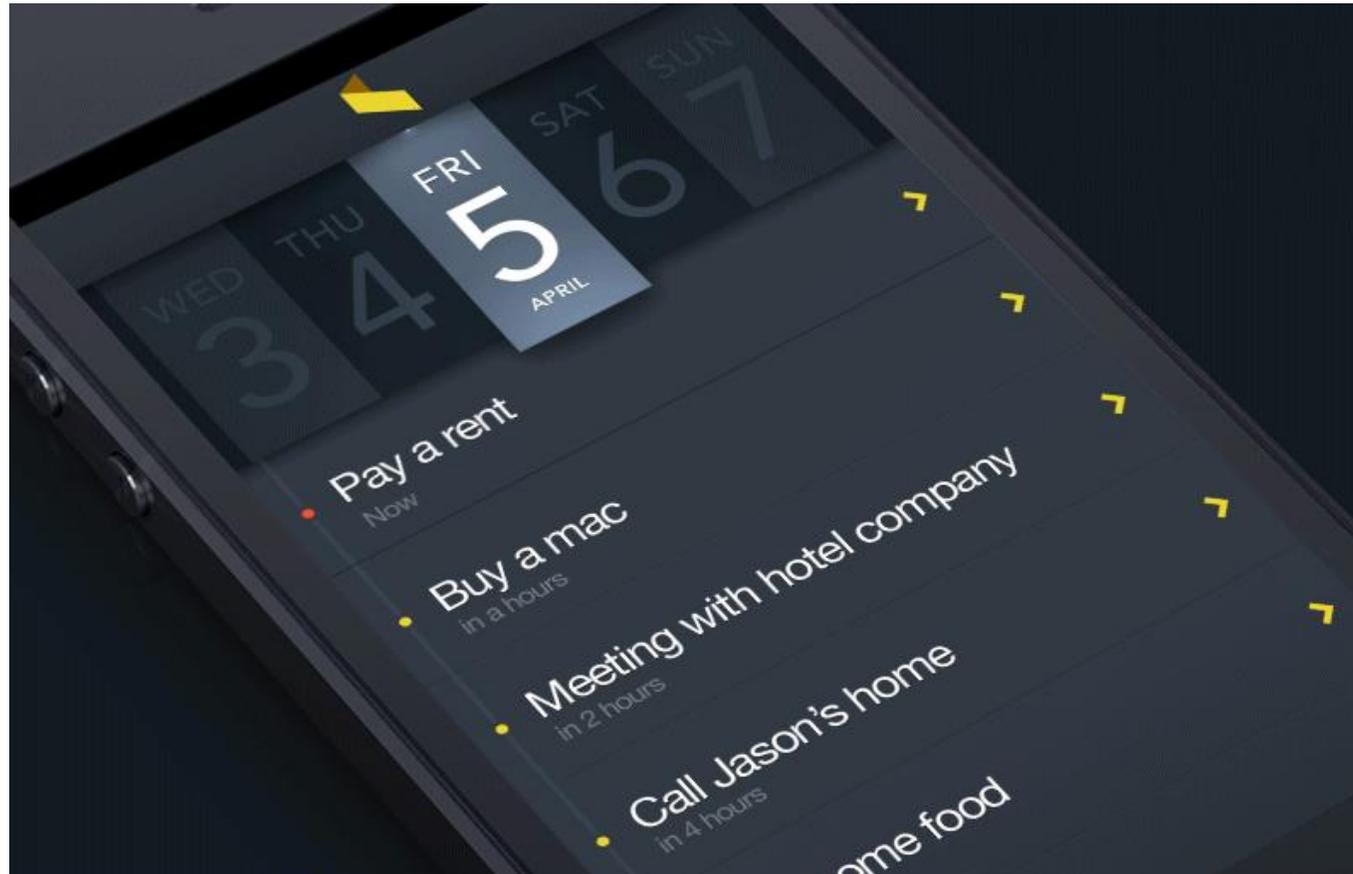
MOBILE APPS

Desktop and laptop computers aren't the only devices that can run applications.

You can also download apps for mobile devices like **smart phones** and **tablets**. Here are a few examples of mobile apps.

Gmail: You can use the Gmail app to easily view and send emails from your mobile device. It's available for **Android** and **iOS** (Apple) devices.
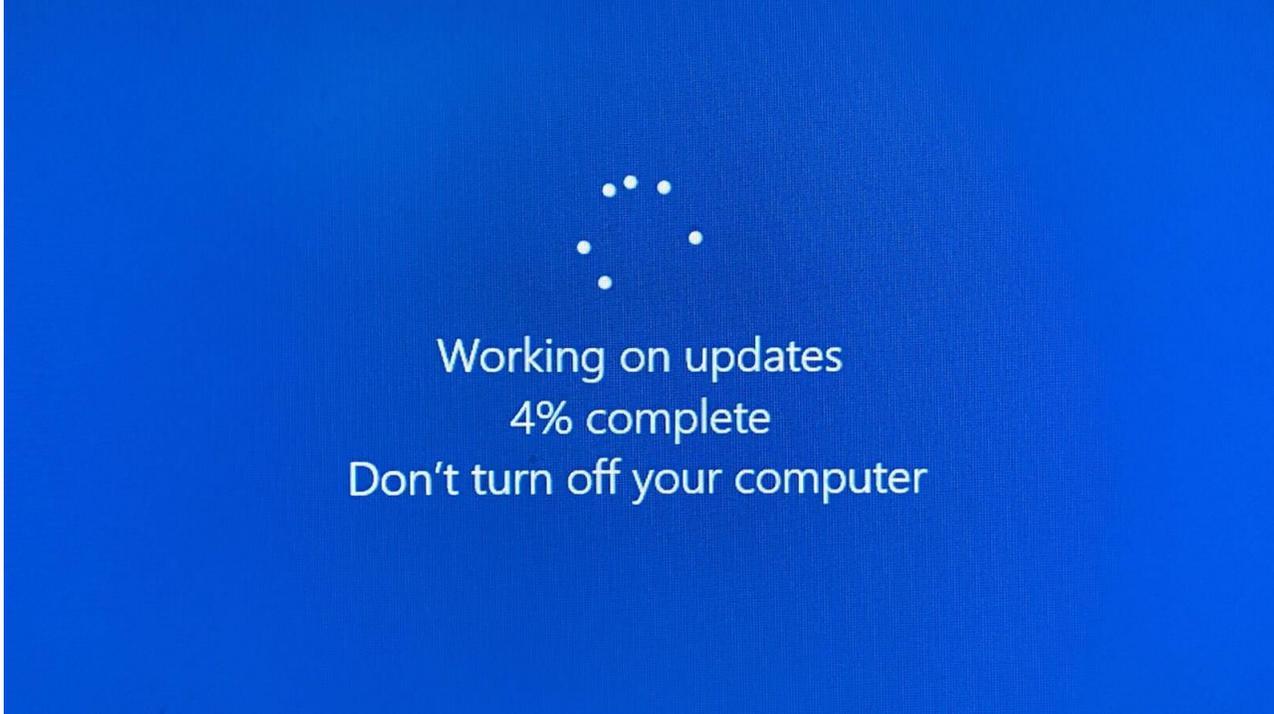
WINDOWS AND BROWSER UPDATES

The Microsoft company regularly provides free updates to download and install patches to fix bugs, vulnerabilities, or improve the overall experience for using your PC computer or device.

Keeping your Windows 10 (or 11) operating system and any Microsoft programs updated, is one of the most important steps in protecting yourself from viruses, malware, and other Internet security threats.

Be sure to accept any "OK to update ?" message from Microsoft or from one of the Internet browsers you use, such as Chrome, Firefox, or Edge.

Usually, this process happens automatically, as long as you keep your computer on, even in "Sleep" mode.
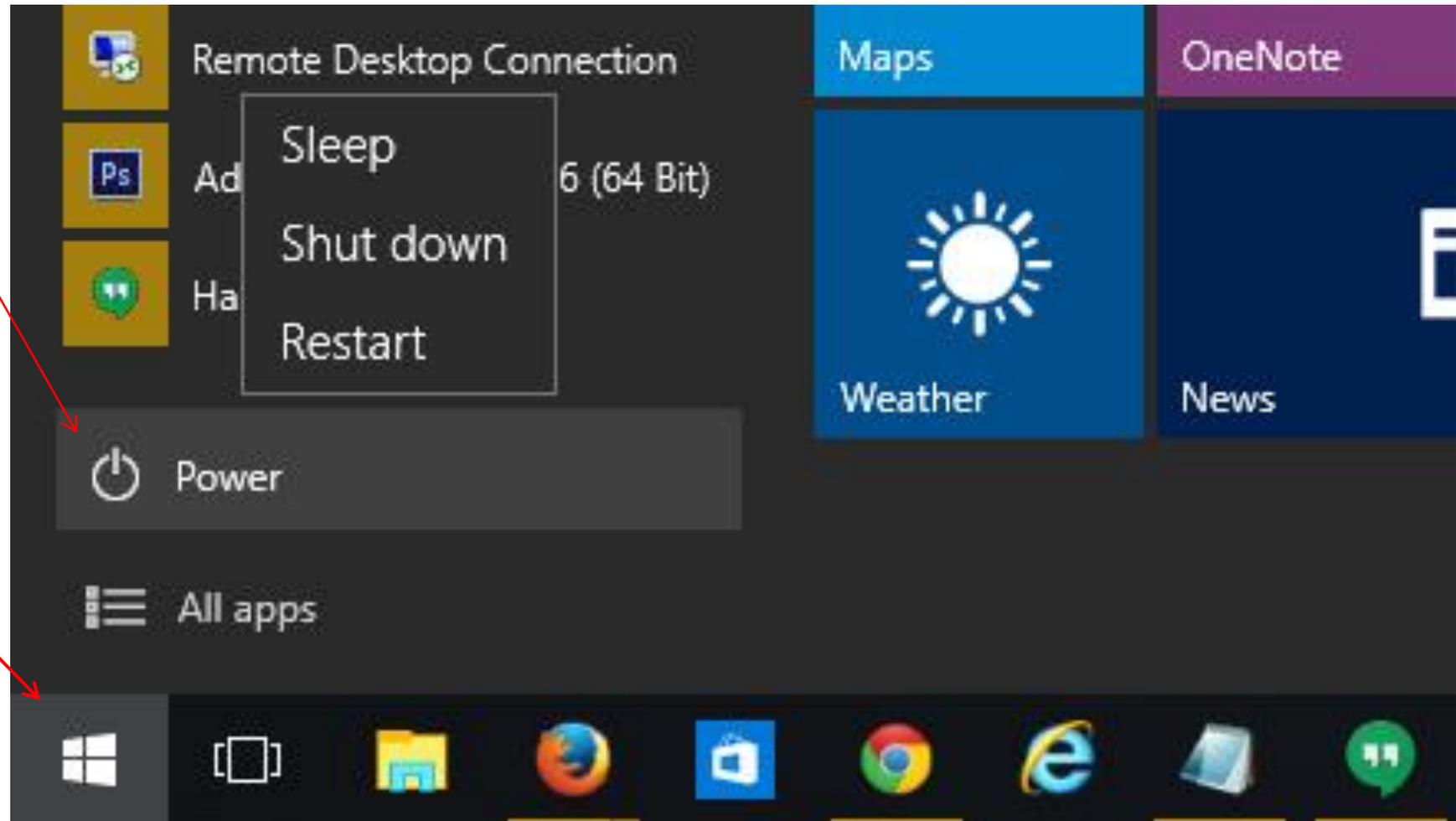
How to Properly Turn the Computer off

The computer should be turned off by closing all the software being used (Wordpad, Word,etc.), and making sure you saved all of your documents, before turning off the power.

NEVER TURN THE COMPUTER OFF BY PRESSING THE POWER BUTTON !

To shut down the computer, click on the "Start" (also called the Microsoft) button on the lower left corner of the screen (or on the bottom left side of the keyboard), click on "Power", and then click on "Shut down".   **If you will use it again soon, click on Sleep.**

Evolution of the Desk

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THE END