What is a computer

* A computer is an electronic device, operating under the control of instructions stored in its own memory, that can accept data, process the data according to specified rules, produce results, and store the results for future use.

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* Data and information

Computers process data (input) into information(output).

* Data is a collection of unprocessed items, which can include text, numbers, images, audio, and video.

Definition of software and hardware

• Hardware is the electric, electronic and mechanical equipment that makes up a computer.

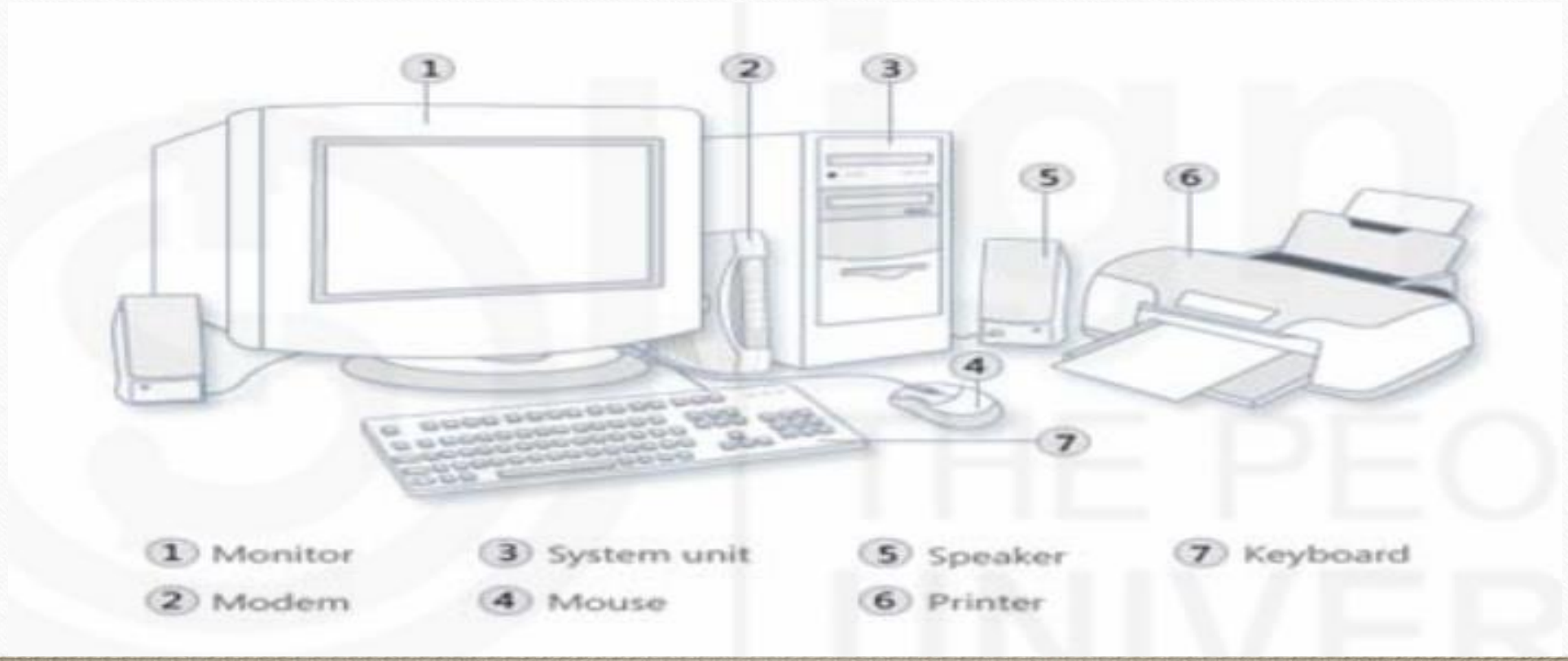
▪ Software is the series of instructions that tells the hardware how to perform tasks.

▪ Software, also called a program, consists of a series of related instructions, organized for a common purpose, that tells the computer what tasks to perform and how to perform them.

Components of a computer

* These components include:
*input devices
* output devices
* system unit
*storage devices
* communications devices

Components of a Computer



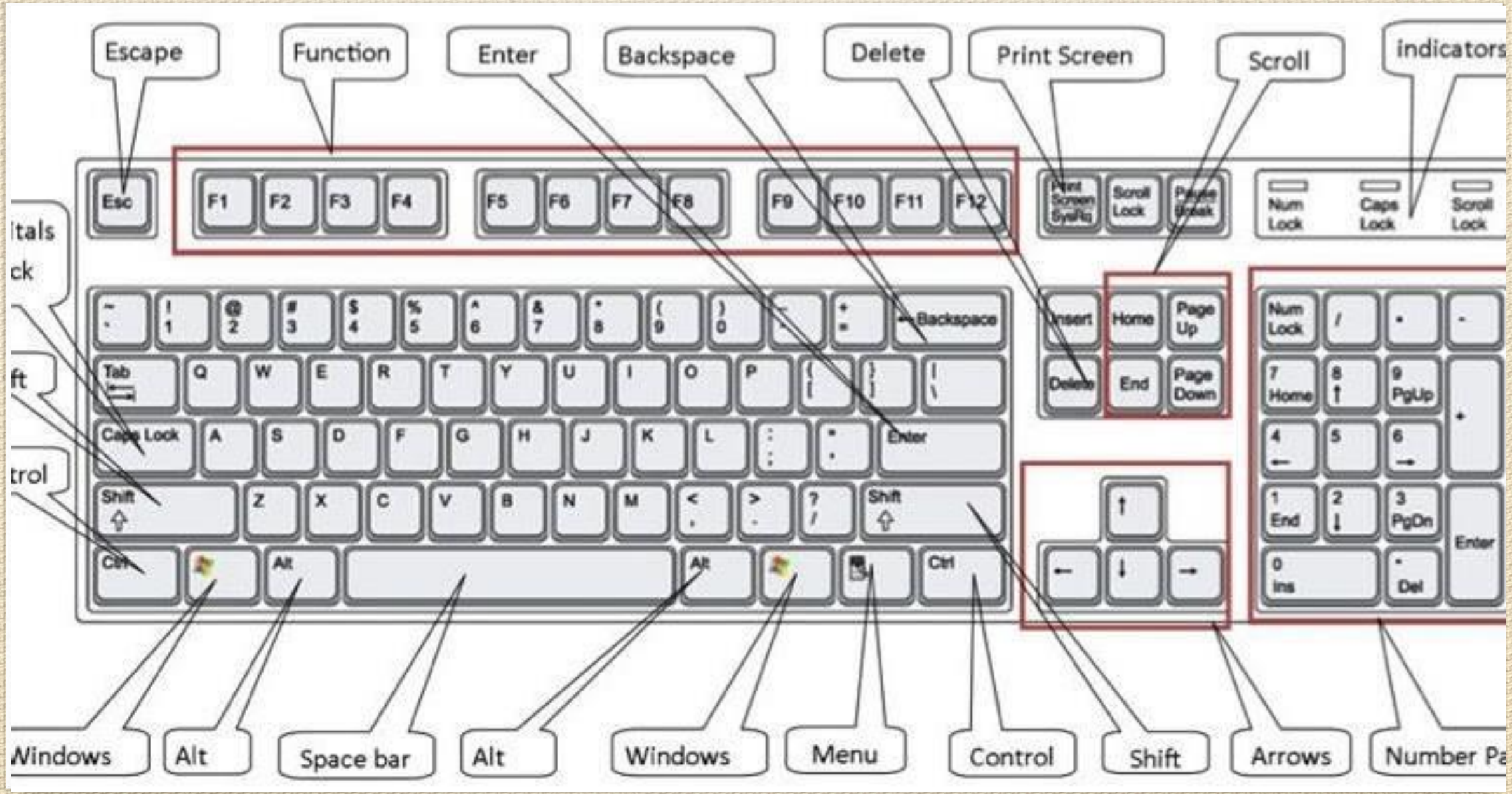
Input devices

*An input device is any hardware component that allows you to enter data and instructions into a computer.
*Five widely used input devices are the keyboard, mouse, microphone, scanner, and Web cam

Input devices

Computer keyboard

A computer keyboard contains keys you press to enter data into the computer.


Escape
Function
Enter
Backspace
Delete
Print Screen
Scroll
indicators
Windows
Alt
Space bar
Alt
Windows
Menu
Control
Shift
Arrows
Number Pa

Keyboard vocabulary

• Shift Key. Press shift at the same time you are pressing any other key and you will get a new character. For instance, press shift at the same time you press a letter and it will capitalize the letter. Press shift at the same time you press a number and you will get a "%" or "$.“

• Tab Key. Just like a typewriter, the tab key helps you indent your text

Keyboard vocabulary

• Function Keys. Sometimes referred to as "F keys," they are not as popular as they once were (with older DOS programs). But there's one F key you can pretty much always count on: the F1 key. It will most often bring up a help menu, no matter what program you're in.

• Enter Key. On your keyboard, the Enter key might be marked as a "Return" key or with only a large arrow. It's used to go down to a new line when typing text. It also can be pressed any time a button or choice is highlighted (within a software program or on the Internet) to tell the computer you select that particular item.

Keyboard vocabulary

* CTRL Key. The Control key is used in conjunction with another key to initiate a certain action. In most programs, holding down the CTRL key while pressing the S key will save a file, CTRL+P will print a file, etc.

*ALT Key. Also used in combination with other keys to do something. For instance, ALT+F usually opens the File menu.

*Caps Lock. Press it once and when you type the letters they will all be capitalized. Press it again and the letters will go back to lower case.

Keyboard vocabulary

* Num Lock and Numeric Keypad. The Num Lock key toggles the numeric keypad on and off. When off, the keys perform other functions (i.e., directional arrows) instead of typing numbers.

*Space Bar. Used to enter a blank space between sentences when typing text.

*Backspace. This key will remove the character to the left of the cursor(the small blinking vertical line that shows you where you are on a page of text).

* Shift Key. The Shift key allows you to create a capital letter. Or ... You can hold down Shift key and press one of the number keys (on the top row of keyboard) to get a punctuation symbol (!, @, #, $, for instance).

Keyboard vocabulary

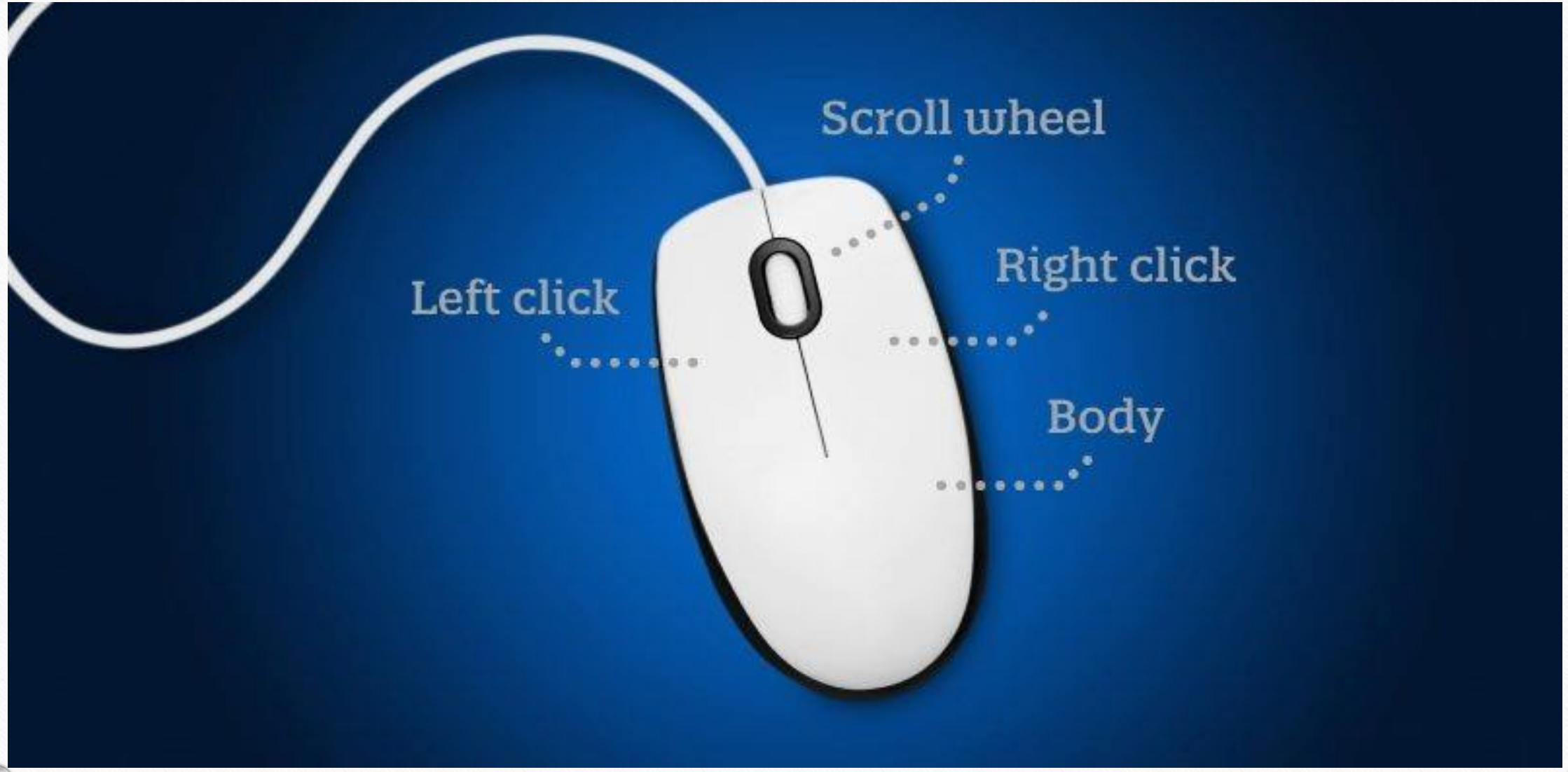
*Tab Key. Within a text document, the Tab key will move the cursor to the next "tab stop." In forms, it is used to move from field to field or from one table cell to the next. Pressing Tab and Shift simultaneously will usually "tab" you back to the previous field.

*Delete. Pressing this key will remove the character to the right of the cursor when pressed.

*Print Screen. The Print Screen button will send a copy of your monitor's screen to the "clipboard" ready to be pasted into another program.

Input devices

* A mouse is a small handheld device. With the mouse, you control movement of a small symbol on the screen, called the pointer, and you make selections from the screen.


Scroll wheel
Left click
Right click
Body

Mouse vocabulary

• Pointer/Cursor- When you move the mouse around, you will see a symbol that moves around on the computer's monitor screen that changes depending on what you're pointing to. You'll see an arrow or hand when there's a choice to be made, an "I" beam when you're in an area where text can be inserted, a cross of arrows when you can move something, and more.

Mouse vocabulary

* Left-Click- (Select/Highlight) This is the standard click when you're choosing or selecting something. It's done with your pointer-finger on the left button (think about how it's like you're pointing at something you want!).

* Double-Click- (Open/Start) By pointing to something and then double-clicking (double-clicks are ALWAYS with the left mouse button), you are telling the thing you're clicking on to open or to start. In text areas, however, double-clicking can select a whole word. (Try triple-clicking in text to select a whole paragraph!)

Mouse vocabulary

*Right-Click- (Menu) The right-click ALWAYS means MENU. By right-clicking on an item or in a certain area, you'll get context menus, special menus specifically about whatever you're pointing to, letting you know what your options

* Scroll Bars- In open windows you'll sometimes see scroll bars along the right side or along the bottom of the window. They're usually grey-colored bars that can be dragged up and down or sideways

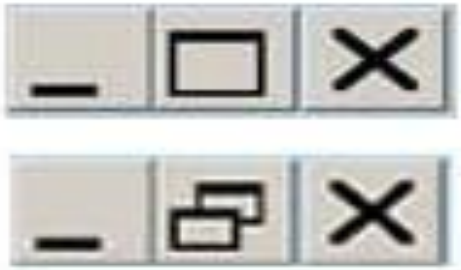
* Close Button- This "X" on a field of red is found in the upper right-hand corner of your screen. One-click on the "X" closes out what ever happens to be open on your screen.

Mouse vocabulary

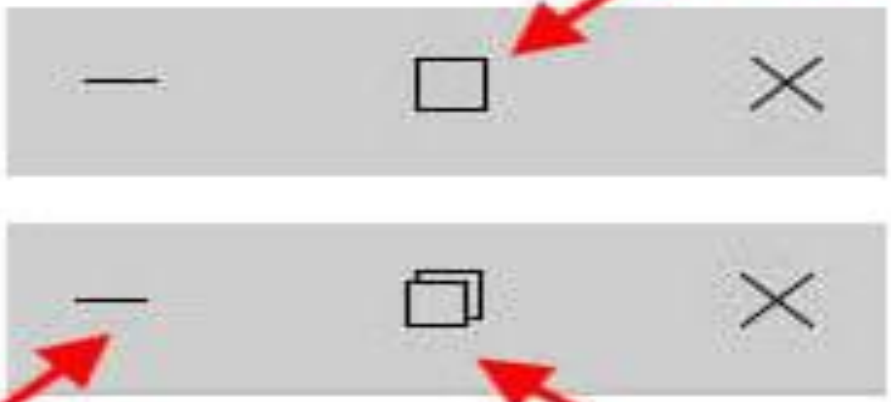
* Minimize- This button on the upper right-hand corner of your screen will shrink your work into a button so you can work on something else. Click that button once to restore your previous work to the full screen.

*Maximize- This button on the upper right-hand corner of your screen will increase the size of the document that you're working on to fill the entire screen.

Win 7

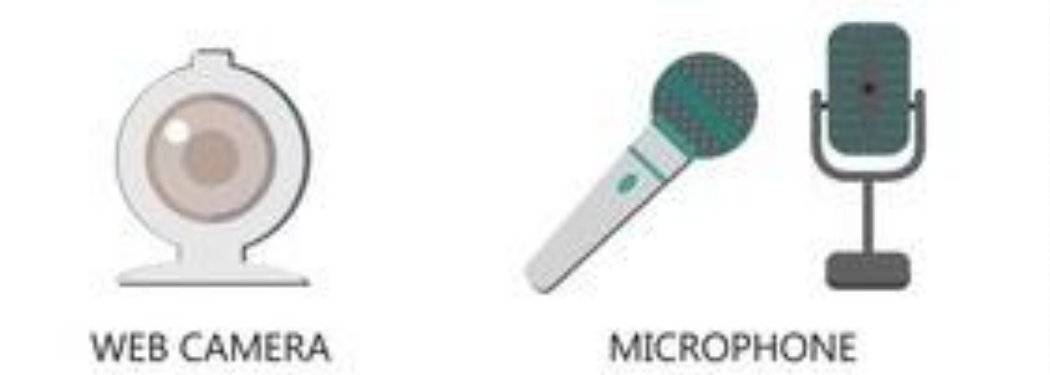


Win 10



Input devices

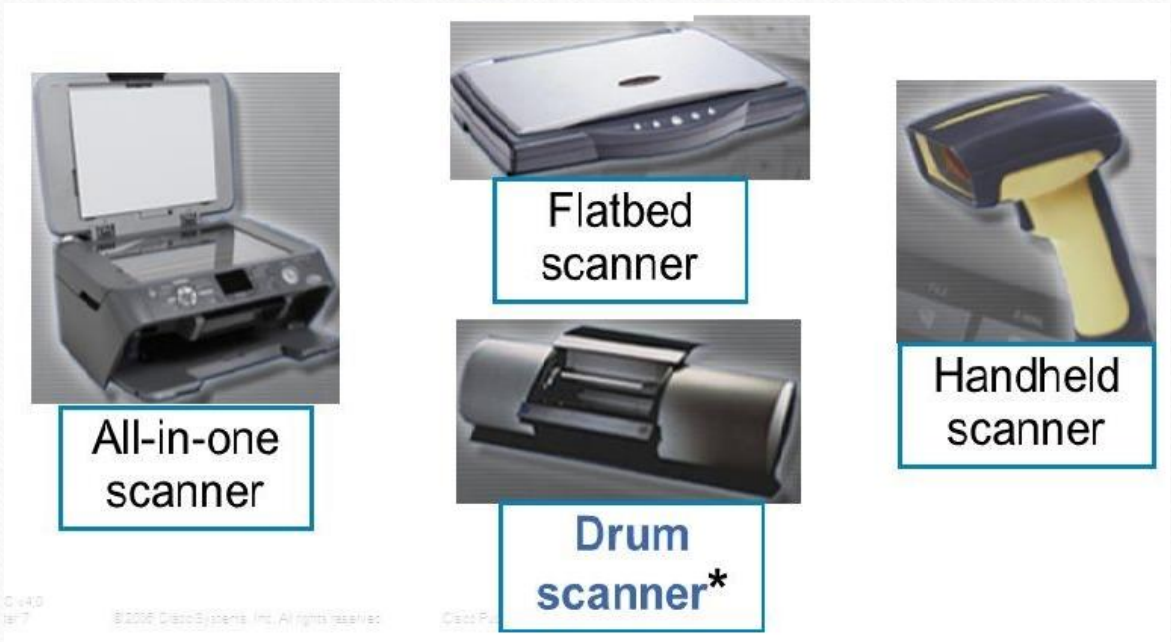
* A microphone allows you to speak into the computer.
* A Web cam is a digital video camera that allows you to create movies or take pictures and store them on the computer instead of on tape or film.



Input device

• A scanner converts printed material (such as text and pictures) into a form the computer can use

scanner

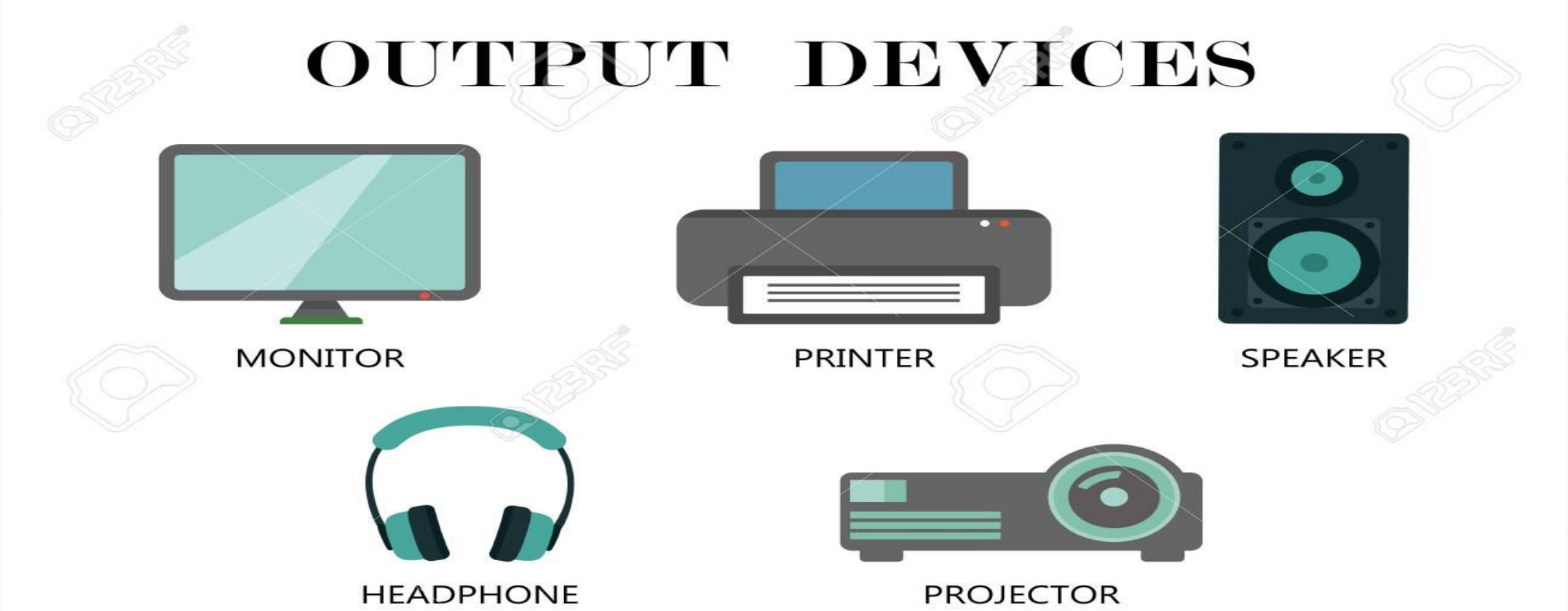


Output devices

An output device is any hardware component that conveys information to one or more people.
Three commonly used output devices are
* printer,
* monitor
* speakers

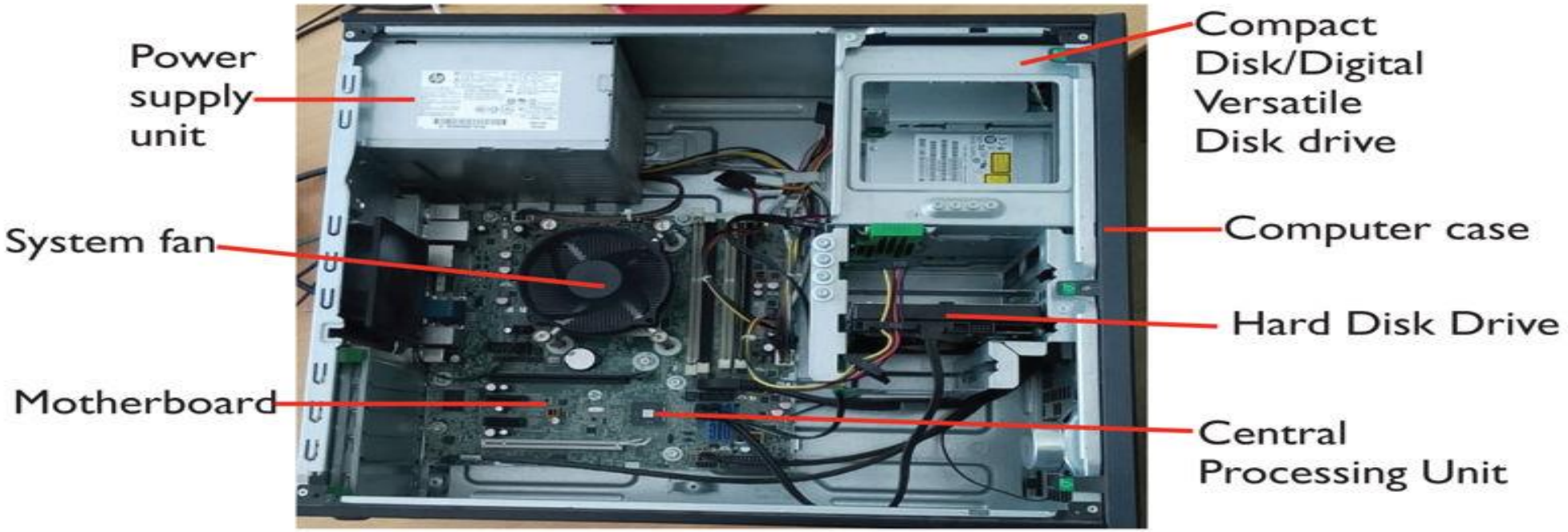
Output devices

* A printer produces text and graphics on a physical medium such as paper.
* A monitor displays text, graphics, and videos on a screen.
*Speakers allow you to hear music, voice, and other audio (sounds).



System Unit

* The **system unit** is a case that contains the electronic components of the computer that are used to process data.
* The circuitry of the system unit is connected to a circuit board called the **motherboard**.



System Unit

* Two main components on the motherboard are the **processor** and **memory**.
* The **processor**, also called a CPU (central processing unit), is the electronic component that interprets and carries out the basic instructions that operate the computer.
*** Memory** consists of electronic components that store instructions waiting to be executed and data needed by those instructions.

PROCESSOR

•Processors contain a **control unit** and an **arithmetic logic unit (ALU)**. These two components work together to perform processing operations.
•The next slide illustrates how other devices connected to the computer communicate with the processor to carry out a task.

Input-Process-Output (IPO) Cycle

INPUT

Keyboard

Mouse

Camera

Mic

CPU

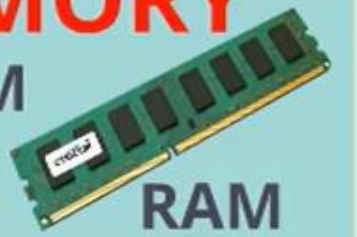
ALU
Arithmetic and Logical Unit

CU
Control Unit

Registers

MEMORY

ROM



RAM

OUTPUT

Monitor

Speaker

Printer

The processor

▪ Most devices connected to the computer communicate with the processor to carry out a task. When a user starts a program, for example, its instructions transfer from a storage device to memory. Data needed by programs enters memory from either an input device or a storage device. The control unit interprets and executes instructions in memory, and the ALU performs calculations on the data in memory. Resulting information is stored in memory, from which it can be sent to an output device or a storage device for future access, as needed.

Memory

What is Random Access Memory (RAM)?
Random Access Memory, is a type of volatile memory that your computer uses to temporarily store data for quick access. Here are some key points about RAM:
It’s volatile, meaning it loses its contents when the power is turned off
RAM is used to store data that the CPU needs to access quickly
It allows for both reading and writing of data
More RAM generally means better performance, especially for multitasking
*How RAM Works
When you open an application or file, it gets loaded into RAM. This allows your computer to access this data much faster than if it had to read it from the hard drive each time. The more RAM you have, the more applications and files your computer can keep readily accessible.

What is Read only memory (rom)

Read-Only Memory, is a type of non-volatile memory used to store permanent data. Here’s what you need to know about a memory chip:

It’s non-volatile, meaning it retains data even when the power is off

ROM typically stores firmware or software that rarely changes

It’s generally slower than RAM but faster than a hard drive

Data in ROM is “read-only” and not easily modified

*The Role of Non-Volatile Memory in Computers

ROM plays a crucial role in your computer’s startup process. It stores the BIOS (Basic Input/Output System) or UEFI (Unified Extensible Firmware Interface), which is the first software run when you turn on your computer and initializes hardware components. This software initiates the boot process and helps load the operating system.

Types of Programmable Read Only Memory

Storage capacity

Capacity is the number of bytes (characters) a storage medium can hold. E.g. USB flash drive can store up to 4 GB of data (app. 4 billion bytes) and a typical hard disk has 320 GB (app. 320 billion bytes).

SL.No.	Unit	Description
1	Kilobyte (KB)	1 KB = 1024 Bytes
2	Megabyte (MB)	1 MB = 1024 KB
3	GigaByte (GB)	1 GB = 1024 MB
4	TeraByte (TB	1 TB = 1024 GB
5	PetaByte (PB)	1 PB = 1024 TB

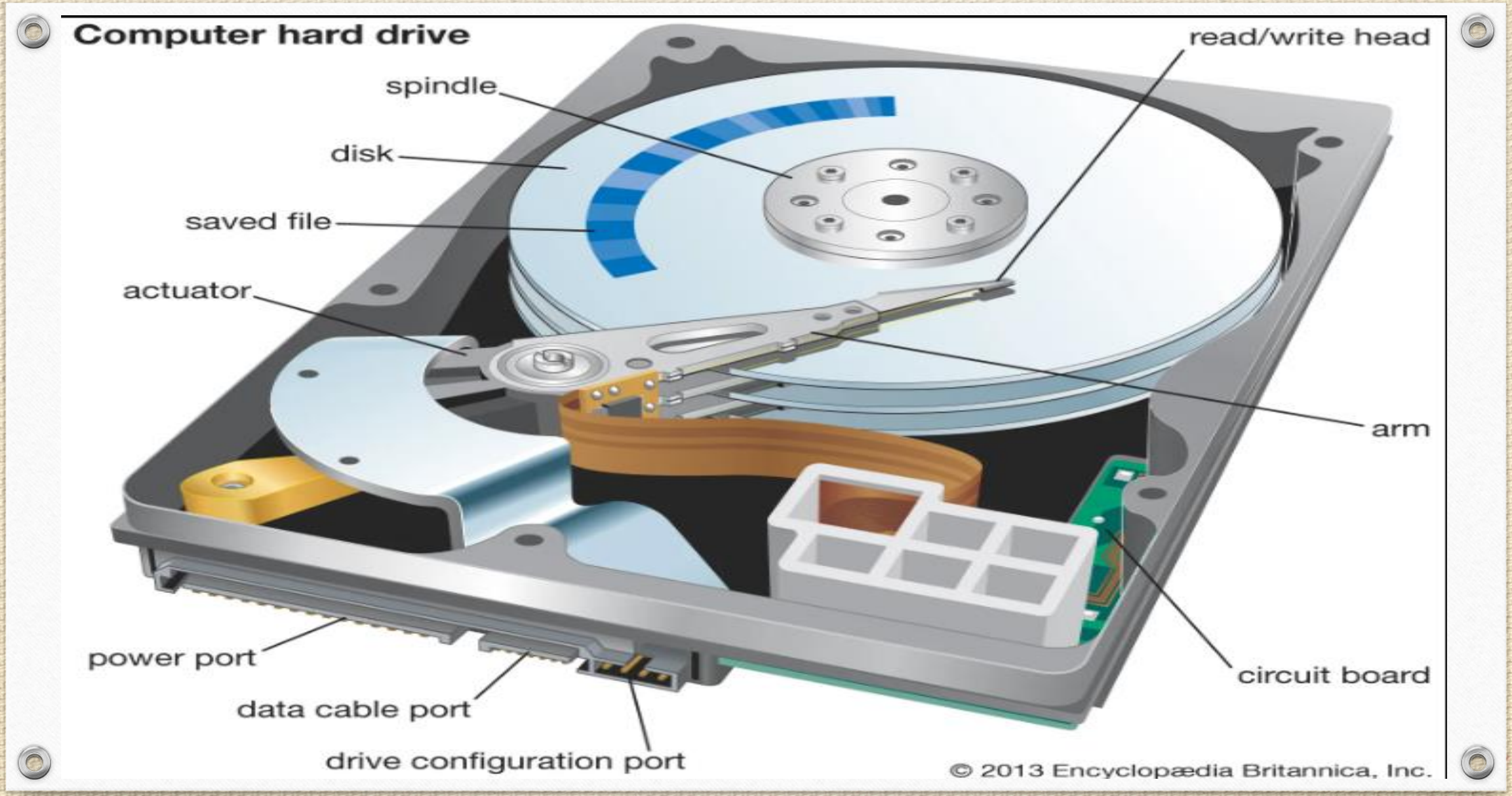
USB flash drive

A USB flash drive(thumb drive) is a portable storage device that is small and lightweight enough to be transported on a keychain or in a pocket. plugs in a USB port on a computer or mobile device. users easily transfer documents, photos, music, and videos from one computer to another.

Hard Disk

A Hard Disk is a data storage device used in computers to store and retrieve digital information using magnetic storage. It Stores everything your operating system, software programs, files, photos, videos, music, and documents. Unlike memory (RAM), the data on a hard disk stays permanently even when the computer is turned off.

Hard Disk have Large storage capacity typically measured in gigabytes (GB) or terabytes (TB).


Computer hard drive
read/write head
spindle
disk
saved file
actuator
arm
power port
data cable port
drive configuration port
circuit board
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Advantages of using a computer

This include: speed, reliability, consistency, storage, and communications.

*Speed: When data, instructions, and information flow along electronic circuits in a computer, they travel at incredibly fast speeds. Many computers process billions or trillions of operations in a single second. Processing involves computing (e.g., adding, subtracting), sorting (e.g., alphabetizing), organizing, displaying images, recording audio, playing music, and showing a movie or video.

* Reliability: The electronic components in modern computers are dependable and reliable because they rarely break or fail.

* Storage: A computer can transfer data quickly from storage to memory, process it, and then store it again for future use. Many computers store enormous amounts of data and make this data available for processing anytime it is needed.

* Communications: Most computers today can communicate with other computers, often wirelessly. Computers with this capability can share any of the four information processing cycle operations input, process, output, and storage with another computer or a user.