Form 4 Computer Note 3

Components outside a computer

Components	Functions	Characteristics
System Unit 	The main computer box placed on or underneath a computer desk. It holds many electronic components required for the computer to work.	The box consists a metal cover designed to allow users to position it both vertically and horizontally. Front side of the unit normally includes the computer system's off/on power switch, as well as the opening slits or trays for the optical drives.
Monitor  	Displays information in visual form, using text and graphics.	There are two basic types of monitors: CRT (cathode ray tube) monitors and the newer LCD (liquid crystal display) monitors. Monitors come in several sizes but normally the LCD monitors would be thinner and lighter than the older CRT monitors. The computer system must have a video card installed in order to provide video output through the monitors.
Keyboard 	A keyboard is used mainly for typing text into your computer.	A keyboard consists of keys, which are pressed to enter text as input to the computer. These keys are arranged or grouped according to the functions they do when pressed. For instance, the keys that display numbers and letters belong to one group called the alphanumeric keys whereas the keys F1-F12 are grouped at the top of the keyboard since they perform different functions.
Mouse 	A mouse is a small device used to point to and select items on your computer monitor.	A mouse in either connected to a port (commonly USB port) using a wire or wirelessly. The mouse controls a pointer found on the monitor using lasers found as the bottom of the device. This device also includes buttons that perform various tasks when clicked.
Speakers 	To play sound. Speakers allow you to listen to music and hear sound effects from your computer.	Speakers come in various of shapes and sizes. They can be built into the system unit or connected from outside. They are connected to the computer system by inserting the wire to the audio jack or via Bluetooth. The computer system must have a sound card installed in order to use the speakers.
Printers  	Transfers data from computer onto a paper. You don't need a printer to use your computer, but having one allows you to print e-mail, cards, invitations, and other documents.	Printers are often connected to the computer system using the USB port. Once installed properly, the printer can be used to print different type of documents. Some printers may also have additional features such as a scanner or a fax.

Common Input/Output (I/O), communication and processing devices.

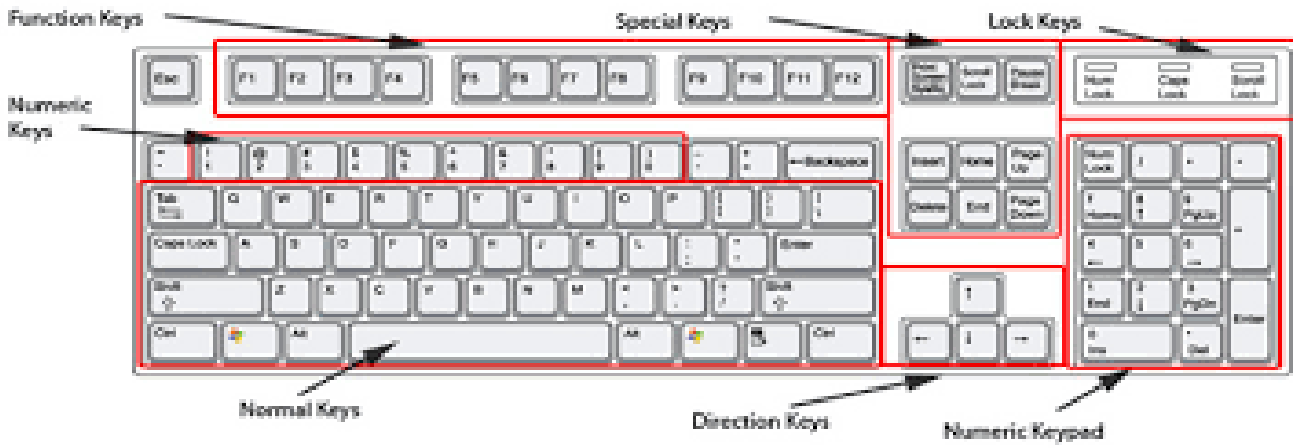
INPUT (Data sent to the computer)	OUTPUT (Data displayed from the computer	COMMUNICATION (Data being transmitted to other devices)	PROCESSING (Control storing and retrieving of data)
Keyboard	Monitor or TV	Computer modem	CPU
Mouse	Printers	Network Interface Cards (NIC)	Graphics Cards
Web Cam or Digital Camera	Speakers or Headphones	WIFI and access point	Computer Memory
Scanner	Projector	Bluetooth	Network Cards
Card Reader		Smart Phones	
Microphone			

Common peripheral devices

1. Keyboard

The keyboard is an input device used to enter data. The keyboard layout consists of numbers and letters. Without the keyboard you cannot enter your name, address or numbers into the computer. The computer needs the keyboard to take in data.

Today most users use the **QWERTY** style keyboards, as shown below.



The different types of keys (key types) on the keyboard are:

Function Keys (F1…… F12): These keys may have a variety of different uses or no use at all. These uses depend on the operating system installed on the computer and the application software running.

For example: F1 – is usually used as the help key. In fact, almost every program opens a help screen when this key is pressed.

Alphanumeric: This is a combination of alphabetic and numeric characters. The alphabetic keys consist of the letters A to Z and used to type text whereas the number keys are used to type numbers (0,1,2,3,4,5,6,7,8,9).

Space bar key: The longest key on the keyboard is the space bar. It is used to display spaces between characters.

Modifier keys: These keys are only used in combination with another key. For example, on an IBM compatible PC, the Alt, Ctrl, and Shift keys are modifier keys. On the Apple Macintosh computer, the Control, Option, and Shift keys are modifier keys. The combination of the modifier keys and other keyboard keys can be used to perform computer keyboard shortcuts.

Navigation keys: These keys help users move around in different sections of documents or webpages, as well as in editing text. They include arrow keys, Home, End, Page Up, Page Down, Delete, and Insert.

- Up arrow
- Down arrow
- Right arrow
- Left arrow

Control Keys:

These keys are used alone or in combination with other keys to perform certain actions. The most frequently used control keys are CTRL, Alt, the Windows logo key Picture of the Windows logo key and Esc.

2. Mouse

The computer mouse is considered an input device. With a click of a button, the mouse sends information to the computer.

A mouse commonly has two buttons. At the top of the device you will find a left and a right button which allows for clicks. Some mouse have a scrolling wheel in between the two buttons.

The Different Types of Computer Mice

Mechanical Mouse:

A mechanical mouse is a computer mouse with a rubber ball inside that when used comes in contact with the table surface. This contact is what allows the mouse to do what its supposed to do. When the user moves the mouse around on the table surface, the following things happen:

The ball rolls along with these movements. This rolling is detected by two wheels at 90 degrees angles from each other. They are

positioned in this way so that one wheel can detect up and down movements, while the other detects left and right movements. Together they can detect mouse movements in any direction. A third wheel, the guide wheel is spring-loaded and presses the ball against the two sensor wheels.

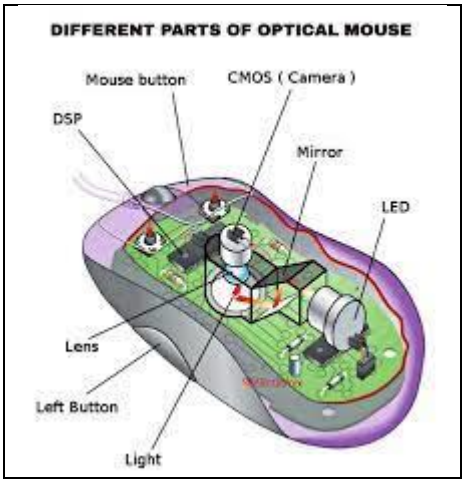
Operating Mechanical Mouse.

1) Moving the mouse turns the ball
2) X and Y rollers grip the ball and transfer movement
3) Optical encoding disks include light holes
4) Infrared LEDs shine through the disks
5) Sensors gather light pulses to convert to X and Y VECTORS

You may need to clean the mouse ball regularly to clear dust particles.

Optical Mouse:

Uses a Light-Emitting Diode (LED) sensor to detect tabletop movement and then sends off the information to the computer. This information is then what moves the on-screen mouse pointer in the same direction as the mouse.



The optical mouse gets it power from the main computer system when it is plugged in. The powers up the many components inside the mouse (such as the LED lights and the camera or sensor).

The camera takes an image of the surface it is on at a rate of 1500 frames and these images are then sent to the Digital Signal Processor (DSP). The DSP processes the images and creates the co-ordinates of the mouse (relative to its movement on the surface) and sends them back to the PC.

The mechanical mouse has a ball, whereas the optical mouse has a light emitting from the bottom.

An optical mouse does not need cleaning, because it has no moving parts.

Infrared (IR) or radio frequency cordless mouse:

With both these types, the mouse relays a signal to a base station wired to the computer's mouse port. The cordless mouse uses batteries for power.

Trackball mouse: Like an upside-down mouse. Rather than roll the mouse around, you use your thumb or index finger to roll a ball on top of the mouse. The mouse does not move, so it doesn't need a lot of room, and its cord never gets tangled.

3. Monitor (Computer Screen or Display)

Monitors are used to display data from a computer through the video graphic display cards.

Monitors are come in two major types – Liquid crystal display (LCD) or Cathode Ray Tube (CRT).

LCD monitor

CRT monitor

The most important characteristics of a monitor depend on the following;

i. Size: Computer screen sizes are measured in diagonal inches, the distances from one corner to another opposite corner diagonally
ii. Resolution: The quality of what is being displayed on the screen
iii. Bandwidth: The amount of data that can be transmitted to the monitor

Resolution refers to the number of individual dots of color, known as pixels, contained on a display screen. It is expressed by identifying the number of pixels on rows and the number on column, such as 800x600. Resolution is affected by a number of factors, including the size of the screen.

As monitor sizes have increased over the years, display standards and resolutions have changed.

Cathode Ray Tube (CRT) have been used in almost all computer monitors for many years until LCD started appearing. Bigger in size because they have a glass tube inside that helps ion displaying the images on the monitor screen. CRT displays can be viewed to work like an electron gun. These monitors have an electrode (a metal that sends out electrons when heated) called the Cathode.

Liquid Crystal Display Monitors (LCD) consists of a panel that can either let light pass or completely block it. Inside the panels are blocks that are filled with liquid crystal. These blocks are pixels, which in groups, forms visible images on a screen.

4. Printers

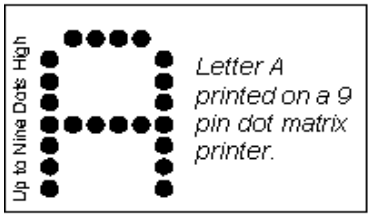
A printer is any device that prints text or pictures on paper. There are main two types of printing technologies:

1. Impact Printers
2. Non-Impact Printers

Impact Printer Technology: Have mechanism that touches the paper in order to create an image. This is the oldest printing technologies still in use today. Three most common forms of impact printers are **dot-matrix, daisy-wheel, and line printers.**

Example: Dot Matrix printers- uses a little hammer with many small pins to strike a ribbon coated with ink, causing the ink to transfer to the paper at the point of impact.

Dot Matrix Printer



Non-Impact Printer Technology: Type of printer that does not operate by striking a head against a ribbon. Examples of non-impact printers include **laser** and **ink-jet printers.**

Ink-Jet Printing: works by spraying ionized ink at a sheet of paper. Magnetized plates in the ink's path direct the ink onto the paper in the desired shape. Capable of producing high quality print that is close to that produced by laser printers. Provides a resolution of 300 dots per inch.

Laser Printing: Laser printers are a lot like photocopies since both use a similar type of technology. When you print something, your computer sends many streams of electronic data to your laser printer.

An electronic circuit in the printer checks what all this data means such as what it needs to look like on the page. It makes a laser beam back and forth across a drum inside the printer, building up a pattern of static electricity. Static electricity attracts onto the page a kind of powdered ink called **toner.**

The laser printing process:

1. **Charging-** The photosensitive drum surface is negatively charged with a static charge.
2. **Exposure-** Laser beams scan the photosensitive drum to form an image. Areas exposed to the laser beams lose their electric charge.
3. **Developing**- Toner is brought in close proximity to the drum and affixes to non-charged areas.
4. **Transfer-** The photosensitive drum is brought into contact with the paper and a positive charge is applied from behind, transferring the toner onto paper.
5. **Fixing-** Heat and pressure are applied to fix the toner to the paper.

Printing Advantages

Types of Printing Technology	Types of Printers	Advantages and Disadvantages
Impact Printers	Dot-matrix Daisy-wheel Line Printers	**-**They are the most useful for printing multipart forms such as invoices or receipts that may require carbon copy -Very low costing printing -Printing can be noisier than non-impact printers
Non-Impact Printers	Ink Jet Laser	-They have much higher resolutions because instead of using metal pins they can use drops of ink or toner particles -Can be expensive -Better quality -Much quieter

5. Multimedia Devices

Multimedia is the presentation of information using the combination of text, sound, pictures, animation and video.

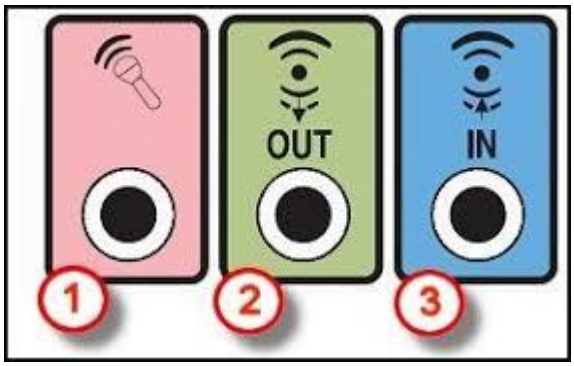
Allows you to accomplish a wide range of tasks. From typing a document, taking a picture, listening to music or producing a video. You can also transfer media files from one device to another to share them with someone else.

Some common multimedia devices:

- **Mobile Phone or Smart Phones-** used for making phone calls, sending text messages, taking pictures as well as connecting to the internet.
- **Tablet Computers-** a mobile computer is a single panel with a touch screen.

- **Audio devices (Microphones, speakers, and headphones)-** A microphone converts sound waves into electrical signals. This signal is then changed into a sound by a speaker or headphone.

Connecting Audio Devices: Most sound cards have at least one **line-out port** to connect speakers and a **line-in port** where you can connect an audio input device.



1. Mic-in/Digital I/O jack

2. Line-out jack

3. Line-in jack

Any questions? Don't hesitate to call your Teacher!

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