1. INTRODUCTION TO DIGITAL DEVICES

LEARNING OUTCOMES

By the end of this module, you should be able to:

- Identify and understand various components, functions and applications of Computer
- Understand components, functions and applications of Mobile Phones
- Understand components, functions and applications of Tablet

LESSON PLAN

I. Components, Functions and Applications of Computer
II. Components, Functions and Applications of Mobile Phones
III. Components, Functions and Applications of Tablet

I. COMPONENTS, FUNCTIONS AND APPLICATIONS OF COMPUTER

1.1 BASICS OF COMPUTER

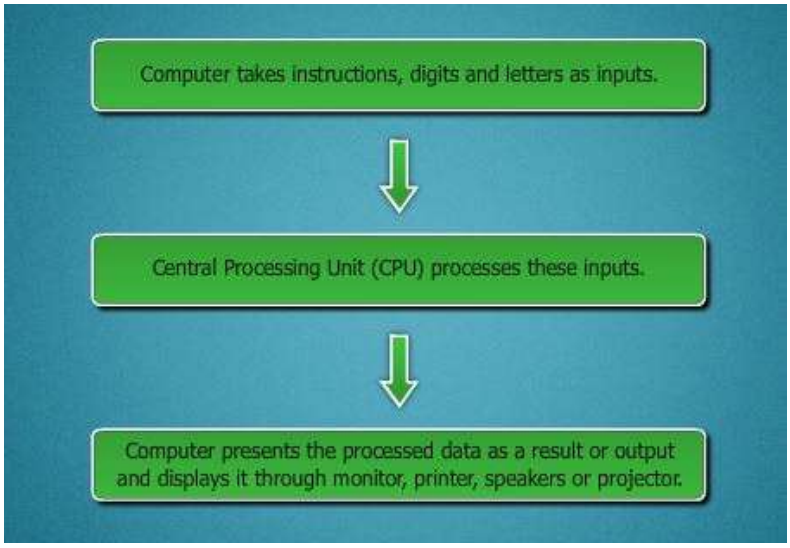
What is a Computer?

A computer is an electronic device used to store and process data and information. It is a collection of two components - Hardware and Software. Hardware consists of the computer itself and any equipment connected to it and Software is the set of instruction that the computer follows in performing a task.

Through a computer you can connect with your family and friends living miles away, store information, book railway tickets, access your bank accounts, etc.

How does a computer work?

A snapshot of the work process of a computer is as below:



For example, you want a sum of five numbers – 245, 435, 510, 640 and 715.

1. Input these numbers using the keyboard
2. Instruct the computer to provide the sum of these five numbers
3. These numbers get processed in the CPU as per instructions
4. The output or the sum is displayed on the monitor.

Components of a Computer

Computers are made up of different components:

- Input Devices
- Processing Devices
- Output Devices

Input devices

Input devices are those devices that can be used to insert data, instructions or information into a computer. A few input devices are mouse, keyboard, microphone, joystick and scanner.

How do we provide input to the computer?

We give data or instructions to a computer using input devices. A **Keyboard** is used to enter data into a computer. There are different types of keys and their functions:

Typing keys: They include letters, numbers, symbols, punctuations and space bar.

Control keys: Control key, alt key, the windows logo key and the escape key are the control keys. These keys are used alone or in combination with the other keys to perform certain actions.

Function keys: These are labelled as f1, f2, f3, f4 and so on up to f12. The functionality of these keys differs from program to program and is used to perform specific actions.

Navigation Keys: It means locating position. It helps you to move around in documents, data sheets, presentations or WebPages and edit text. These include the arrow keys, home, end page up, page down, delete and insert.

The **Numeric keypad** is designed like a conventional calculator used to input numbers.

What is a mouse and how is it used?

A mouse is used as a pointing device to point to and interact with items on the computer screen. When you move the mouse, you can see a small moving arrow - this is called the 'pointer'. The pointer can provide data or instructions to the computer for processing. A mouse has two buttons - left and right. It also includes a scroll wheel between the two buttons that helps you to move between documents and webpages more easily.

Processing Device

Processing devices in a computer are responsible for controlling the storage and retrieval of information. The information is processed by the computer processor (CPU), which performs data calculations, data comparisons, and data copying with the information from the processing devices. The CPU then saves that information to the computer memory (RAM).

Output Devices

Output devices are used to display the result to the user. The main output devices are Monitor, Printer, Speaker, Headphones and Projector.

Monitors: Monitor is the most common output device. Monitor is a screen used to display the output, such as words, numbers and graphics.

Monitors are of 2 types - Cathode Ray Tube (CRT) and Flat Panel Displays. CRT's are cheaper and have good viewing angle but they are bulky and consume more power. Flat Panel Displays are lighter and have no magnetic interference. They are also costlier.

Printer: A printer takes the processed data from the computer (soft copy) and generates a hard copy of the same. They are commonly used to print text data and images. Soft copy is and image or text file viewed on a computers display whereas a hardcopy is the printed version of the same.

There are three types of printers: Inkjet Printer, Laser Printer and Dot Matrix Printer.

Speaker: A speaker is an output device through which we can hear sound. Without a speaker you will not be able to listen to music, hear an audio content, etc.

Headphones: They give sound output from the computer. They are similar to speakers except that they are worn on the ears, so that only one person can hear the output at a time.

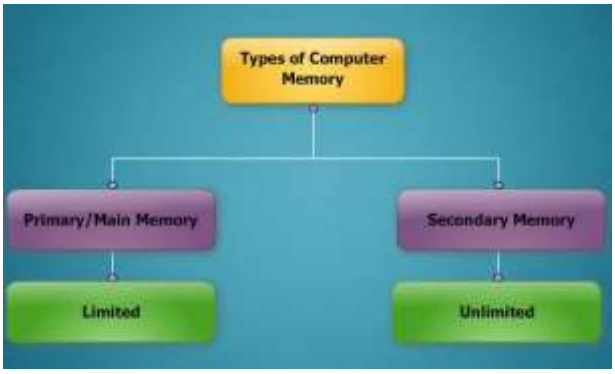
Projector is an output device with which a text or an image is projected onto a flat screen. A projector is often used in meetings or to make presentations. It allows the display to be visible to many people.

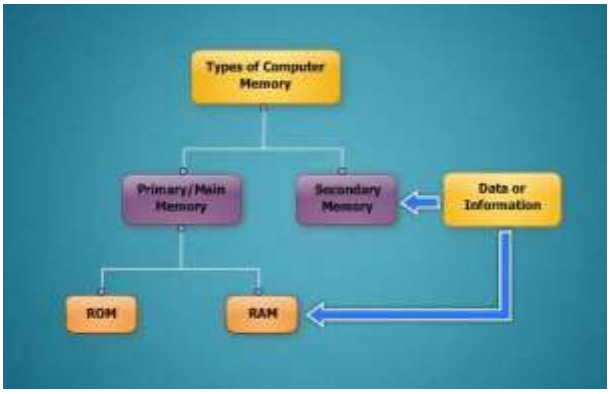
What is a Computer Memory?

When you know something, it is stored in your memory. In the same way, the place where computer stores data and programs is called Computer Memory.

Computer has 2 types of Memory - Primary/Main Memory and Secondary Memory.

The main memory is very fast. It is called Random Access Memory or RAM. Data and instructions are stored in the main memory from where it can be retrieved from Central Processing Unit (CPU) for processing results. RAM is the memory in which all the programs are stored. The speed of the computer depends on the RAM. Cache memory is a memory that is a part of RAM and is very near to the processor. It is used to improve processing speed.





The primary memory is limited, so to store unlimited data we use secondary memory. Any data or program that is kept in secondary memory has to be copied by RAM because the computer cannot process data directly on secondary memory.

The examples of Secondary Memory are – Pen Drives, Hard Disk, Floppy Disk, Magnetic Tapes, Magnetic Bubble Memories and Optical Memories.

How does a computer store data in its memory?

Computer stores all information in just two digits 0 and 1. A single binary digit, that is, a 1 or a 0 is called a bit. A group of eight bits is called a byte.

- 1 byte is equal to 8 bits.
- 1 Kilobyte or 1 KB is equal to 1024 Bytes
- 1 Megabyte or 1 MB is equal to 1024 KB
- 1 Gigabyte or 1 GB is equal to 1024 MB

1.2 CONCEPT OF HARDWARE AND SOFTWARE

All physical components of a computer that can be touched or felt are called Hardware. The electronic circuits and mechanical components such as Hard Disk, Printer, CPU, Keyboard and Mouse are Hardwares.

Hardware devices are very important but they are useless without the instructions that control them. The Instructions that are used to control hardware and accomplish tasks are called Software.

Software is a general term used for computer programs. These programs are planned step-by-step set of instructions that direct the computer what to do and how to do. There are two types of software - Application Software and System Software.

Application Software: An application is a job or a task that a user wants to accomplish through a computer. Application Software is a program that helps the user to perform a specific job. It enables a user to write a letter or create a drawing. Microsoft Word and Microsoft Paint are examples of Application Software.

System Software: The programs that are directly related to the computer hardware are called System Software. For example, to run a computer you need an operating system, which is a System Software.

1.3 SETTING UP AND WORKING OF A COMPUTER

How do you use a computer?

A computer or a computer system mainly consists of a system unit or case and other devices such as Monitor, Keyboard, Mouse, Speakers and Microphone. In order to use a computer we need to connect all the devices to the system unit.

How do you connect a computer?

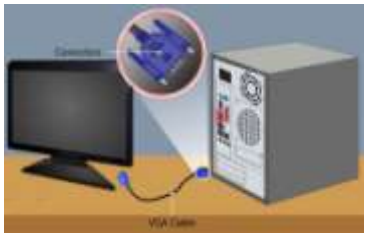
You need to follow the following steps in order to connect a computer:

1. Place the computer on a desk or table.

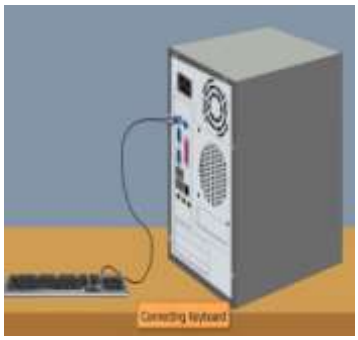
2. Set the system unit next to the Monitor. Be sure of the place where the system unit is to be kept. The place should be well ventilated and should have sufficient airflow which will prevent the system unit from overheating.

3. The rear portion of the system unit has all the various connection slots or ports for connecting various devices. First, connect the monitor to the system unit.

4. The video port of the system unit is called the VGA port. The colour of the video port and the connectors of the VGA cable are blue to make them easier to identify. Connect one end of the VGA cable to the video port in the system unit and the other end to the monitor.



5. Now you need to connect the keyboard into the system unit. A keyboard has 2 types of connectors – PS/2 connector and USB Connector. You can connect the keyboard to any of the 2 ports depending on its type. Desktop computer keyboard often comes with a PS/2 connector. Connect the keyboard to the keyboard port of the system unit.



6. A mouse has three models of connectors: (i) Mouse with PS/2 Connector; (ii) Mouse with USB Connector; and (iii) Mouse with Serial Connector. You need to connect the mouse in the appropriate port in the system unit. For example, if it has a serial connector, connect it to the serial port in system unit.

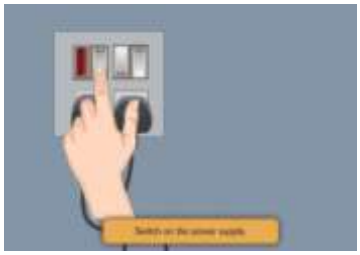
7. Now, you need to connect the printer to the system unit. A printer has two models of connectors - Parallel Port Connector and USB Port Connector. You can connect the printer to any one of the two ports in the system unit depending on the type of connector in the printer.

8. Now that all the main components like the monitor, printer mouse and keyboard are connected to the system unit, all you have to do is to provide power supply to the system unit and the monitor using two power supply cables that come with the computer. Plug one power supply cable into the power supply plug in the system unit, plug another power

supply cable into the monitor. Now plug both these power supply cables to the power plugs in a switch board. The computer system is now ready to be used.

Steps to Start a Computer

1. Switch on the power supply of both the system unit and the monitor.



2. Press the power button of the system unit. It is usually located in the front side of the system unit. Ensure that the LED of the unit is switched on.

3. Now, switch on the monitor. Press the power button on the front bottom side of the monitor. Ensure that the LED of the monitor is turned on.

4. In few seconds, the display appears on the monitor. The boot screen could be seen as soon as the monitor starts. Wait until everything is loaded and Windows desktop screen is displayed on the monitor. Now your computer is ready to be used.

COMMON TROUBLE SHOOTING

Some common problems might occur even after you have started a computer. For example:

Problem: You have switched on the power supply of the system unit and the monitor and pressed the power button of the system unit. Still the LED of the system unit is not ON and the system does not start.
Solution: In this case double check if there is any loose connection in the cables. It is advised to remove it and plug-in again and try repeating the procedure of starting a computer.

Problem: After starting the computer, the boot screen does not appear on the monitor.
Solution: Check if the monitor is turned on, check the connection of the monitor or re-connect.

Problem: The computer has started but you are unable to use the keyboard or the mouse.
Solution: You need to check that the keyboard or mouse is connected to the correct port. Check the keyboard or mouse connector for bent, broken or missing pins. Also, you can try re-connecting your keyboard and mouse, restart your computer and see if that fixes it.

II. COMPONENTS, FUNCTIONS AND APPLICATIONS OF MOBILE PHONES

What is a Mobile Phone?

A mobile phone is a wireless handheld device that allows users to make calls and send text messages, among other features. The earliest batch of mobile phones could only make and receive calls. Nowadays mobile phones, however, are packed with a lot of additional features such as Web browsers, games, cameras, video players and even in navigational systems. A mobile phone may also be known as a cellular phone or simply cell phone.

Keys and Parts of Mobile Phone

- Microphone
- Scroll key: Left soft key/Right soft key
- End/Power key
- Keypad
- Call Key/Pick up Key
- Selection Key/Navigation Keys
- Main Screen
- Charger connector
- Headset connector
- Keypad
- Loudspeaker

How to insert a SIM Card and Battery?

Step 1: Switch the phone off, and then remove the back cover.

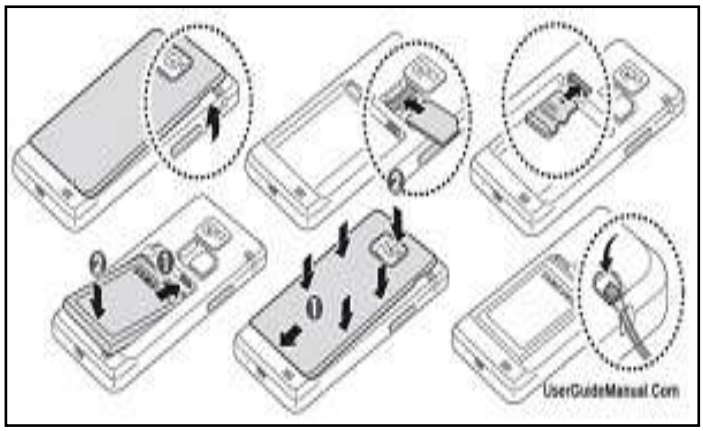
Step 2: If the battery is in the phone, take it out.

Step 3: Insert the SIM as per the phone's specification.

Step 4: Put back the battery in the phone.

Step 5: Replace the back cover.

Step 6: Restart phone.



How to charge the phone battery?

Step 1: Plug the charger into a wall outlet.

Step 2: Connect the charger to the phone.

Step 3: When your mobile shows 'Battery Full', unplug the charger from the phone and then from the wall outlet.

How to lock and unlock the keys?

It is always better to lock the keys of your phone when not in use for a long time.

Step 1: To lock, select Menu, then press * key.

Step 2: To unlock, press the Unlock button and then press * key.

OR

Step 1: Press the power key to lock the screen

Step 2: Press the power key again to unlock the screen

Note: If you have set an unlock pattern, PIN or password for your phone, you need to draw the pattern or enter the PIN/password to unlock your screen.

How to explore the features of your phone?

Step 1: Press/touch Menu.

Step 2: To go back to the previous view, press/touch the 'Back' button.

Step 3: To go back to the home screen, press/touch Home icon/button on the phone.

How to Change the Ringtone of your phone?

Step 1: Select Menu > Settings.

Step 2: Select 'Tones' and then scroll to 'Ringtone'.

Step 3: Scroll to open 'Gallery'. A list of Ringtones will appear.
Step 4: Choose the ringtone of your choice by clicking on it.

OR

Step 1: Touch the Home Key > Menu Key > Personalization/Settings.
Step 2: Touch Profile setting
Step 3: Touch Phone ringtone or Notification ringtone.
Step 4: Scroll through the ringtone list and select the ringtone you want to use.
Step 5: Touch OK.

How to set an alarm?

Step 1: Select Menu > Applications > Alarm Clock.
Step 2: Set the alarm time, then select Save.
Step 3: To repeat the alarm, select Options > 'Repeat Days' and select the days, then select 'Done'.

OR

Step 1: Touch Menu
Step 2: Touch Clock
Step 3: Touch Alarm
Step 4: Set the Alarm time, then touch Save.

III. COMPONENTS, FUNCTIONS AND APPLICATIONS OF TABLET

What is a Tablet?

A tablet is a compact device that is similar to a Smartphone, computer/laptop and is used for multiple purposes. Nowadays, tablets are very popular because of their ease of use, portability and features. It can be used for various purposes viz. browse the Internet, check e-mail, download and read books, play games, watch videos, organize content, and much more. Generally, tablets are touch operated and are between the size of a Smartphone and a laptop.

Charging the Battery

Before using the device for the first time, you must charge the battery for at least 6-8 hours or until the battery is full.

Note: Use only authorised chargers. Unauthorized chargers may cause damage to your device and/or may lead to overcharging and/or explosion. When your battery is low, the battery level indicator will be very thin. If the battery level reaches a critical level, the device will automatically turn off. Recharge the battery to continue use.

How to charge the Battery

Step 1: Insert the cable into the charging head and plug in the head into a standard AC power outlet.

Step 2: After the charging is complete, unplug the charging head.

Note: It is best to charge the device at room temperature. It is not necessary to wait until the battery is completely discharged before recharging, you may charge at any time. Also, the battery will maintain its lifespan longer if it is not left uncharged for periods of more than 2 weeks at a time.

Power Save Mode and Lock Screen

You can turn off the screen to save power by pressing the Power Save button. The screen will turn to Lock Screen mode. Repeat the process to reactivate the device.

How to turn off the device

Step 1: Press and hold Power button for few seconds.

Step 2: A menu will appear confirming that you would like to power off.

Step 3: Touch power off to turn off the Tablet.

Knowing your Home screen

The Home screen is the starting point for your phone's applications, functions, and menus. This is the screen that you see as soon as you switch on your phone. You can customize your home screen by adding application icons, shortcuts, folders, widgets, and more. Your home screen extends beyond the initial screen. Swipe the screen left or right to display additional screens.

How a Touch Screen Works

Most of the tablet comes with a responsive touch screen which works as follows:

Tap: To activate an on-screen item (e.g., application icons, buttons, menu items, and the letter/symbols of the on-screen keyboard), simply tap them with your fingertip.

Double Tap: Quickly tap the screen twice on a webpage or other application screen to zoom. Within the browser, double-tapping a webpage section will cause the browser to zoom and fit that section to the width of the screen.

Drag and Drop: If you want to change the position of any application or any on screen icon, you can just drag the icon to the desired place on the screen and drop it there.

To drag an item: Touch and hold it for a moment, then without lifting your fingertip, move your fingertip on the screen until the item reaches its target destination.

Swipe: Swipe up/down on the screen to scroll through a list. On some screens, you may be able to swipe left/right to change the view.

To swipe: Touch the screen and then quickly move your fingertip across the screen without lifting your fingertip.

Note: Do not pause on the screen with your fingertip at the initial point of contact or you may accidentally drag an item instead.