# SS1 DIGITAL TECHNOLOGIES

**Topic: Computer Hardware – Input/Output Devices, Storage Systems and Peripheral Devices**

## Meaning of Computer Hardware

Computer hardware refers to the physical parts of a computer that can be seen and touched.
Hardware works together with software to enable a computer to perform different tasks.
**Examples of computer hardware include**: Monitor, Keyboard, Mouse, System unit, Printer, Scanner, Speakers, Hard disk, Flash drive, Webcam

### Major categories of computer hardware

Computer hardware can be grouped into the following categories:
1) Input devices (2) Output devices (3) Processing devices (4) Storage devices (5) Communication devices

## Input Devices:

An input device is a hardware component used to enter data and instructions into a computer for processing.

### Examples of input devices and their functions

**Keyboard:** A keyboard is used to enter letters, numbers, symbols and commands into a computer. Examples of keys include alphabet keys, number keys, Enter, Shift, Backspace and Spacebar.
**Mouse:** A mouse is a pointing device used to move the pointer, select items, click icons, drag objects and open files.
**Scanner:** A scanner converts printed documents, photographs and pictures into digital form for use on a computer.
**Microphone:** A microphone captures sound or voice and sends it to a computer. It is useful for recording, video calls and voice recognition.
**Webcam:** A webcam captures live images and video for video conferencing, online classes and recording.
**Touchscreen:** A touchscreen accepts input when a user touches the display with a finger or stylus. It functions as both an input and output device.
**Barcode reader**: A barcode reader reads coded lines or patterns on products and sends the information to a computer, commonly in supermarkets.
**Biometric reader**: A biometric reader captures identifying features, such as fingerprints, for identity verification and access control.

## Output Devices:

An output device is a hardware component that presents the results of computer processing to the user. Output may be presented as text, images, sound or printed documents.

### Examples of output devices and their functions

**Monitor:** A monitor displays text, pictures, videos and other information on a screen.
It produces soft copy output because the result is displayed electronically rather than printed on paper.
**Printer:** A printer produces hard copies of documents, photographs, charts and other computer output on paper.
**Speakers:** Speakers produce sound from a computer, such as music, recorded lessons, alerts and video audio.
**Projector:** A projector displays computer images or videos on a large screen or wall for teaching, meetings and presentations.
**Headphones:** Headphones allow a user to hear sound from a computer privately without disturbing other people.
**Braille embosser**: A Braille embosser produces raised Braille dots on paper so that people who read Braille can access printed information.

### Types of computer output

**Soft copy**: Output displayed or played electronically, such as a document on a monitor or sound through speakers.
**Hard copy:** Output produced in a physical form, such as a printed examination result.

### Differences between input and output devices

| Input devices | Output devices |
|---|---|
| Used to enter data and instructions. | Used to present processed information. |
| Send data into the computer. | Present results from the computer. |
| Examples: keyboard, mouse and scanner. | Examples: monitor, printer and speakers. |

## Computer Storage Systems:

A storage system is the hardware and technology used to save data, instructions, programs and processed information for present or future use.
Storage is important because computers need to retain information while working and after they are switched off.
**Types of computer storage:** Computer storage is commonly divided into primary storage and secondary storage.

**Primary storage:** Primary storage is memory directly accessible to the processor. It holds data and instructions that the computer needs while operating.

**Random Access Memory (RAM):** RAM temporarily holds programs and data currently being used by the computer.

- It is generally volatile, meaning its contents are lost when power is switched off.
- More RAM can help a computer handle more tasks at once.

**Read-Only Memory (ROM)**

ROM stores instructions that help a computer or electronic device perform essential functions.

- It is non-volatile, so its contents are retained without power.
- Traditional ROM is not easily changed during normal use.

**Cache memory**

Cache is a small, very fast memory that keeps frequently needed data and instructions close to the processor to speed up processing.

**Secondary storage:** Secondary storage is used to keep data and programs for long periods, even when the computer is switched off.

**Hard Disk Drive (HDD):** An HDD stores large amounts of data on magnetic disks. It is commonly used to store the operating system, applications, documents and videos.

**Solid-State Drive (SSD):** An SSD uses flash memory to store data. It has no moving mechanical parts and is generally faster than a traditional HDD.

**USB flash drive:** A flash drive is a portable storage device connected through a USB port. It is used to transfer and back up files.

**Memory card:** A memory card is a small flash-storage device used in phones, cameras and other electronic devices.

# Peripheral Devices

A peripheral device is a hardware device connected to a computer to provide additional input, output, storage or communication functions. Peripheral devices may be connected internally or externally, although the term is often used in schools to describe external devices attached to a computer.

Examples include keyboards, mice, printers, scanners, webcams, external drives and some network adapters.

## Types of peripheral devices

Input peripherals: These allow users to enter data into a computer. Examples: keyboard, mouse, scanner, microphone and webcam.

Output peripherals: These present information from the computer. Examples: monitor, printer, speakers and projector.

Storage peripherals: These provide extra or removable storage. Examples: USB flash drives, external HDDs, external SSDs and card readers.

Communication peripherals: These help computers communicate with networks or other devices. Examples: Wi-Fi adapters, Bluetooth adapters and some external modems.

## How peripheral devices connect to computers

- USB port: connects devices such as keyboards, mice, printers and flash drives.
- HDMI port: carries digital video and audio to compatible monitors or projectors.
- Audio port: connects compatible microphones, headphones and speakers.
- Bluetooth: connects supported devices wirelessly.
- Wi-Fi: allows a computer to communicate over a wireless network.