

1.2 The Main Components of Computer System

Syllabus 2026 - 2028

WHAT YOU NEED TO KNOW

- The role of the CPU in processing instructions entered into the computer to produce an output
- Internal memory: characteristics of ROM and RAM, and the differences between them
- Input and output devices: their characteristics and the differences between them
- Backing storage: its characteristics, and the differences between backing storage and internal memory

The input, process, output model

A computer system takes data in through **input devices**, **processes** it using the CPU and internal memory, **outputs** the result through output devices, and keeps data for later on **backing storage**.

Central processing unit (CPU)

The CPU is the part of the computer that processes the instructions entered into it so that an output can be produced. It is often called the brain of the computer.

- **Fetch:** an instruction is taken from internal memory (RAM)
- **Decode:** the CPU works out what the instruction means
- **Execute:** the CPU carries out the instruction, for example a calculation or a comparison
- The result is stored in memory or sent to an output device
- The CPU repeats this cycle very quickly, millions or billions of times each second

Internal memory: ROM and RAM

	RAM (random access memory)	ROM (read-only memory)
Volatile?	Yes, contents are lost when power is turned off	No, contents are kept without power
Read and write	Can be read from and written to	Read only; contents cannot normally be changed
Holds	Programs, data and parts of the operating system currently in use	Boot-up (start-up) instructions
Size	Usually large (gigabytes)	Usually small
Speed of changing	Contents change constantly as work is done	Contents stay the same

More RAM lets a computer keep more programs and data ready at once, so it runs more smoothly. The CPU can access internal memory directly and very quickly.

Input and output devices

	Input devices	Output devices
Direction	Send data into the computer	Send results out of the computer
Purpose	Enter data and instructions to be processed	Present information to the user or control something
Examples	Keyboard, mouse, microphone, scanner, camera, sensors, touch screen	Monitor, printer, speakers, projector, actuators, motors
Form of data	Converts real-world data into digital data	Converts digital data into a form people (or devices) can use

Some devices do both, for example a touch screen, which inputs touch and outputs the display.

Backing storage

Backing storage is used to keep programs and data permanently, so they are still there after the computer is switched off. It is also called secondary storage.

- **Non-volatile:** data stays when power is off
- **Large capacity:** can hold far more than RAM
- **Slower** to access than internal memory
- **Types:** internal hard disk (HDD), solid-state drive (SSD), external drives, memory sticks, memory cards, optical discs

Backing storage compared with internal memory

	Backing storage	Internal memory (RAM)
Purpose	Long-term storage of programs and files	Holds what the CPU is working on now
Volatile?	No	Yes (RAM)
Capacity	Large	Smaller
Speed	Slower	Much faster
CPU access	Indirect, data is loaded into RAM first	Direct
Cost per GB	Cheaper	More expensive

EXAM TIP

When asked for differences, write a point about **both** items in the same sentence, for example 'RAM is volatile whereas ROM is not'. Listing facts about only one gets no mark.

Key terms

Term	Meaning
CPU	Processes instructions to produce an output.
Fetch-decode-execute	The cycle by which the CPU runs instructions.
Internal memory	RAM and ROM, directly accessed by the CPU.
RAM	Volatile read and write memory for programs and data in use.
ROM	Non-volatile read-only memory holding boot-up instructions.
Volatile	Loses its contents when power is turned off.
Input device	Sends data into the computer.
Output device	Presents or sends results out of the computer.
Backing storage	Non-volatile, high-capacity storage for long-term use.
Secondary storage	Another name for backing storage.