

### Unit 3 Inside the system

Read the text below answer the following questions.

#### Processing

The nerve centre of a PC is the processor, also called the CPU, or central processing unit. This is built into a single chip which executes program instructions and coordinates the activities that take place within the computer system. The chip itself is a small piece of silicon with a complex electrical circuit called an integrated circuit. The processor consists of three main parts:

- The **control unit** examines the instructions in the user's program, interprets each instruction and causes the circuits and the rest of the components - monitor, disk drives, etc. - to execute the functions specified.
- The **arithmetic logic unit** (ALU) performs mathematical calculations (+, -, etc.) and logical operations (AND, OR, NOT).
- The **registers** are high-speed units of memory used to store and control data. One of the registers (the program counter, or PC) keeps track of the next instruction to be performed in the main memory. The other (the instruction register or IR) holds the instruction that is being executed

The power and performance of a computer is partly determined by the speed of its processor. A system clock sends out signals at fixed intervals to measure and synchronize the flow of data. Clock speed is measured in gigahertz (GHz).

#### RAM and ROM

The programs and data which pass through the processor must be loaded into the main memory in order to be processed. Therefore, when the user runs a program, the CPU looks for it on the hard disk and transfers a copy into the RAM chips. RAM (random access memory) is volatile - that is, its information is lost when the computer is turned off. However, ROM (read only memory) is non-volatile, containing instructions and routines for the basic operations of the CPU. The BIOS (basic input/output system) uses ROM to control communication with peripherals. RAM capacity can be expanded by adding extra chips, usually contained in small circuit boards called dual in-line memory modules (DIMMs).

#### Buses and cards

The main circuit board inside your system is called the motherboard and contains the processor, the memory chips, expansions slots, and controllers for peripherals, connected by buses - electrical channels which allow devices inside the computer to communicate with each other. For example, the front bus carries all data that passes from the CPU to other devices. The size of a bus, called bus width, determines how much data can be transmitted. It can be compared to the number of lanes on a motorway - the larger the width, the more data can travel along

the bus. Expansion slots allow users to install expansion cards, adding features like sound, memory and network capabilities.

1. What are the main parts of the CPU?
2. What does ALU stand for? What does it do?
3. What is the function of the system dock?
4. What type of memory is temporary?
5. What type of memory is permanent and includes instructions needed by the CPU?
6. How can RAM be increased?
7. What term is used to refer to the main printed circuit board?
8. What is a *bus*?
9. What is the benefit of having expansion slots?

### Language work: Relative clauses

We can define people or things with a restrictive (defining) relative clause. Look at these sentences:

- a) *The teacher **who** is responsible for the computer centre has just arrived.*
- b) *The microprocessor is a chip **which** processes the information provided by the software.*
- c) *The computer we saw in the exhibition runs at 100 MHz.*

In (a) we use the relative pronoun *who* because it is the subject and because it refers back to a person. We could also have used the pronoun *that*.

In (b) we use *which* because it refers back to a thing, not a person. We could also have used *that*.

In (c) the relative pronoun is not necessary. A relative pronoun can be omitted when it is not the subject of the relative clause.

#### Complete these sentences with suitable relative pronouns. Give alternative options if possible.

1. That's the CPU .....I'd like to buy.
2. The microprocessor is a chip ..... processes data and instructions.
3. The microprocessor coordinates the activities ..... take place in the computer system.
4. Last night I met someone ..... works for GM as a computer programmer.
5. Some smartphones have expansion sockets..... allow us to connect to our tv