Components of Computer Systems

Lesson plan and teacher's notes · Form 1 Information and Communication Technology · 1 period of 40 minutes

School	(write school name)	**Teacher**	(write name)
Date	(date)	**Class**	Form 1
Subject	Information and Communication Technology	**Enrolment**	Boys ___ Girls ___ Total ___
Time	40 minutes	**Topic**	Components of Computer Systems

Learners identify the main hardware components of a computer, explain what the CPU, RAM, ROM, motherboard and storage devices do, tell input devices from output devices, and classify software as system, application or utility. Examples come from the shops, schools and offices near Feira where learners meet computers.

Specific outcomes

By the end of the lesson, learners should be able to:

1. Identify the main hardware components of a computer
2. Explain the function of the CPU, RAM, ROM, motherboard and storage devices
3. Tell input devices from output devices
4. Classify software as system, application or utility software
5. Say what MS Word, MS Excel, MS PowerPoint and MS Publisher are used for

Prior knowledge

- Hardware and software as the two main categories of ICT tools
- Devices such as the keyboard, monitor and printer seen at school or in a shop
- Typing a document or using a phone

Teaching and learning materials

- chalk and board
- exercise books
- pictures or real examples of a keyboard, a mouse, a flash drive or a hard drive
- cards for the role-play, if available

References

Ministry of Education (CDC) Form 1 Information and Communication Technology syllabus and module; 25Schools learners' note: Components of Computer Systems.

Lesson development

Stage and time	Teacher activities	Learner activities
Introduction 5 min	Ask learners what happens inside a computer when they press a key and a letter appears. Lead them to see that several parts work together. Write the title and key words.	Suggest what parts may be involved and copy the title and key words.
Development: processing parts and storage 10 min	Explain the CPU as the brain, RAM as temporary storage, ROM as permanent start-up instructions, the motherboard as the board that connects everything, and the hard drive and SSD as permanent storage. Use the table from the note.	Copy the table of components and their functions.
Development: input, output and software 10 min	Sort devices into input and output. Then explain the three types of software and what MS Word, Excel, PowerPoint and Publisher are used for.	Copy the input and output lists and the software table.
Practice 10 min	Give the scenarios on components and programs. Run a short role-play in which learners act as the CPU boss, the hard drive librarian and the RAM note-taker. Move around and check answers.	Work the scenarios in groups and take part in the role-play.
Conclusion 5 min	Ask groups to name one input device, one output device and one storage device and say what each does. Set the homework.	Answer orally and copy the homework.

Teacher's content notes

Read these before the lesson. They are what you need to know, not what to copy onto the board.

Processing parts

The CPU processes instructions, executes commands and performs calculations, and its speed is measured in GHz. RAM temporarily stores data for active tasks and programs, and its capacity is measured in GB. ROM is permanent memory holding the essential start-up instructions. The motherboard is the main circuit board that connects all the components.

Input, output and storage

Input devices send data to the computer: keyboard, mouse, microphone, scanner and webcam. Output devices receive data from the computer: monitor, printer and speakers. The hard drive and SSD store data, software and the operating system permanently.

Software

Software is a set of instructions written in a programming language. System software manages the hardware, application software performs user tasks, and utility software maintains the system. MS Word handles text documents, MS Excel handles spreadsheets and calculations, MS PowerPoint handles slide presentations and MS Publisher handles publications.

Questions to ask during the lesson

Question	Expected answer
A group near Feira is shown a CPU, RAM and a hard drive on a picture. (a) Say which one is the brain of the computer. (b) Say which one stores data temporarily. (c) Say which one stores data permanently.	(a) The CPU. (b) RAM. (c) The hard drive.
Learners at a school in Luangwa sort a keyboard, a printer, a scanner and speakers. (a) Name the input devices. (b) Name the output devices. (c) Say what the scanner does.	(a) The keyboard and the scanner. (b) The printer and the speakers. (c) It converts physical documents into digital form.
A class near Feira is asked what type of software an operating system, an antivirus and MS Word are. (a) Which one manages the hardware. (b) Which one performs a user task. (c) Which type of software maintains the system.	(a) The operating system, which is system software. (b) MS Word, which is application software. (c) Utility software, such as an antivirus.

Worked examples for the board

Choosing the right program

A learner needs to list names and marks and find the total for each learner. Marks sit in rows and columns and need a SUM calculation, so the right program is MS Excel.

Temporary and permanent storage

A learner types a report but does not save it before a power cut. The report was held in RAM, which is temporary, so it is lost. A report saved on the hard drive stays.

Board plan

Write the title and key words. Left: the table of CPU, RAM, ROM and motherboard. Centre: input and output devices and storage devices. Right: the three types of software and the four Microsoft programs.

Component	Function
CPU	Processes instructions; the brain of the computer
RAM	Temporarily stores data for active tasks and programs
ROM	Permanently stores the start-up instructions
Motherboard	Connects all the components
Hard drive or SSD	Stores data, software and the operating system permanently

Components and what they do

Mistakes to expect

Learners often think	Put it right
RAM and the hard drive do the same job.	RAM stores data temporarily for active tasks. The hard drive or SSD stores data, software and the operating system permanently.
The CPU stores all the files on the computer.	The CPU processes instructions and performs calculations. Files are kept on storage devices such as the hard drive or SSD.
All software does the same kind of job.	System software manages the hardware, application software performs user tasks, and utility software maintains the system.

Differentiation

Learners who struggle

Give learners a two-column table headed input and output with a list of devices from the note, and let them copy each device under the correct heading before they write what it does.

Learners who finish early

Ask learners who finish early to explain in two sentences why a computer needs both RAM and a hard drive.

Hearing or visual impairment

For learners with visual impairment, let them handle a keyboard, a mouse or a flash drive and describe each aloud. For learners with hearing impairment, write each component and its function on the board and use the tables.

No projector, no printing

Draw the components on the board or use pictures. Learners do the role-play without computers, acting as the CPU, RAM and hard drive, and sort devices by writing.

If time is short

Skip the role-play and the Microsoft programs and work only the component and input and output scenarios; set the rest as homework.

Evaluation

Question or task	A correct answer shows
A teacher near Feira wants learners to type a letter, record their marks in rows and columns, and make a flyer for a school event. (a) Which program should they use for the letter. (b) Which program should they use for the marks and the totals. (c) Which program should they use for the flyer.	(a) MS Word. (b) MS Excel. (c) MS Publisher.
A learner buys a computer for a small shop near Feira. A sales list typed but not yet saved is gone after a power cut, while the saved programs are still there. (a) Which component stores the programs permanently. (b) Which component loses its data when the power goes off. (c) Which component holds the start-up instructions.	(a) The hard drive or SSD. (b) RAM. (c) ROM.

Homework

A learner at a school near Feira sees a computer in the office with a monitor, a keyboard, a printer and a scanner. (a) Name the two input devices. (b) Name the two output devices. (c) Say what the scanner does.

Extra practice with answers

Question	Answer
1. A teacher at a school in Luangwa wants learners to present a lesson on slides with pictures and animations, and to print a poster for the school gate. (a) Which program should they use for the slides. (b) Which program should they use for the poster. (c) Name one feature of the slide program.	(a) MS PowerPoint. (b) MS Publisher. (c) Any one of themes and templates, animations, transitions or slide show mode.
2. A shop owner near Feira says the computer will not start, but the monitor and keyboard are plugged in. The technician says the instructions needed to start up are damaged. (a) Which component holds those instructions. (b) Which component connects all the parts so they can communicate. (c) Which comp	(a) ROM. (b) The motherboard. (c) The CPU.
3. A learner at a school near Feira is given a list of a monitor, a webcam, a microphone and speakers and asked to sort them. (a) Name the two input devices. (b) Name the two output devices. (c) Say what the webcam is often used for.	(a) The webcam and the microphone. (b) The monitor and the speakers. (c) Capturing video and images, often for video calls.
4. A clerk at an office near Feira wants to keep a budget with totals, and also asks which software keeps the computer working. (a) Which program organises the budget in rows and columns. (b) Which type of software manages the hardware. (c) Which type of software maintains the system.	(a) MS Excel. (b) System software, such as an operating system. (c) Utility software.

Answers to the learners' check-yourself questions

1. What is the function of the CPU.
   It processes instructions, executes commands and performs calculations. It is the brain of the computer.
2. Say how RAM is different from ROM.
   RAM temporarily stores data for active tasks and programs. ROM is permanent memory that stores the essential instructions for starting up.
3. What does the motherboard do.
   It is the main circuit board that connects all the hardware components and lets them communicate.
4. Name two input devices and two output devices.
   Input: any two of keyboard, mouse, microphone, scanner and webcam. Output: any two of monitor, printer and speakers.
5. Name the three types of software and say what each one does.
   System software manages the hardware, application software performs user tasks, and utility software maintains the system.
6. A teacher at a school near Feira wants learners to type a letter, record their marks in rows and columns, and make a flyer for a school event. (a) Which program should they use for the letter. (b) Which program should they use for the marks and the totals. (c) Which program should they use for the f
   (a) MS Word, which creates, edits and formats text documents. (b) MS Excel, which organises data in rows and columns and calculates with functions such as SUM. (c) MS Publisher, which creates publications such as flyers and posters using templates, image tools and design tools.
7. A learner buys a computer for a small shop near Feira. It starts up, but the owner finds that a sales list typed but not yet saved is gone after a power cut, while the saved programs and the operating system are still there. (a) Which component stores the programs and the operating system permanentl
   (a) The hard drive or SSD, which stores data, software and the operating system. (b) RAM, which stores data temporarily for active tasks. (c) ROM, which stores the essential start-up instructions.

Teacher's reflection

What went well:

What I will change next time:

Learners who need follow-up: