LESSON 13

Inside the machine that runs your game

40 minutes | Strand 1: Introducing computer science | Outcome 1.2 | Outcome 1.3

WHAT THIS LESSON DOES

Explore the parts inside the computer that runs your games. Name the CPU, memory, storage, input and output devices. See how your game moves from storage to memory and runs on the CPU, and sort hardware from software.

CURRICULUM OUTCOMES

Outcome	What the specification asks for
1.2	describe the main components of a computer system (Central Processing Unit (CPU), memory, main storage, Input/Output (I/O) devices, buses)
1.3	explain how computers are devices for executing programs via the use of programming languages

WHAT STUDENTS SHOULD BE ABLE TO DO

- Name and describe the main components of a computer system: CPU, memory, main storage, input and output devices (LO 1.2)
- Explain how your own game gets from storage into memory and runs as instructions executed in order by the CPU, and the difference between hardware and software (LO 1.2, LO 1.3)

BEFORE THE BELL

- Prepare a sample game project ready in case any student cannot access their saved work.
- Open the lesson so that the layers diagram on the second step is on the board, and leave it up for the whole lesson.
- Check that the interactive sort activity is loaded on all machines.
- Student devices with access to their saved Scratch or Arcade games; recovery sample game ready on the board
- Student devices with browser access to the lesson interactive

Inside the machine that runs your game

HOW THE LESSON RUNS

4 min	introduction	Start
3 min	content	Hardware, software, storage and memory
3 min	content	The CPU, and input and output
7 min	activity	Tour the machine: the first three stops
5 min	content	Storage against memory, then change one thing
12 min	activity	Hands-on: Sort hardware, software and jobs
3 min	content	Make sense
2 min	content	Reflect
1 min	summary	What you covered

TEACHING MOVES

- Put the four new ideas on the board one at a time before the tour: hardware against software, storage against memory, the CPU, and input and output.
- Define hardware as physical parts whether students can see them or not, so CPU, RAM and the hard drive still count.
- Before students open their game, ask them to predict whether the file leaves storage or a copy moves into memory.
- The tour runs over two steps and has five stops: name input and output devices, find the saved file, open and run the game, write the two storage and memory lines, and make one tiny change from the two suggested options.
- After the two copybook lines, ask about the CPU and about hardware against software aloud and write one strong answer for each on the board, with nothing extra for students to write, so those labels are practised before the sort.
- Circulate during the tour and listen for the storage-versus-memory mix-up rather than checking every copybook; finishing the two stems is enough writing.
- Keep the make-change stop on the two suggested options so edit time stays under three minutes. If edit access fails, let them describe the change instead.
- The prompts at the end of the sort give one more pass at the CPU and at hardware against software.
- Use the whole class to discuss any confusion over memory and storage, including cloud saves still living on storage somewhere.
- Link every explanation back to a game students have already created.

WHAT TO WATCH FOR

- Confusing memory with storage; remind students that storage keeps files when the power is off.
- Thinking the CPU stores data; explain that it only carries out the instructions.
- Placing the operating system as hardware; discuss it as software that manages the machine.
- Thinking hardware only means parts you can hold; CPU, RAM and the hard drive are hardware even inside a closed case.
- Thinking a cloud-saved game has no storage; storage is still a drive, just not inside the classroom PC.

DIFFERENTIATION

- Support: Point students back to the layers diagram on the board during the tour.
- Support: Stem starters on the two storage/memory lines reduce writing load for weaker writers.
- Extension: Challenge students to explain how a faster CPU would change gameplay.
- Support: Allow pair work on the sort task to talk through each decision.