Inside the Computer / Computer Architecture

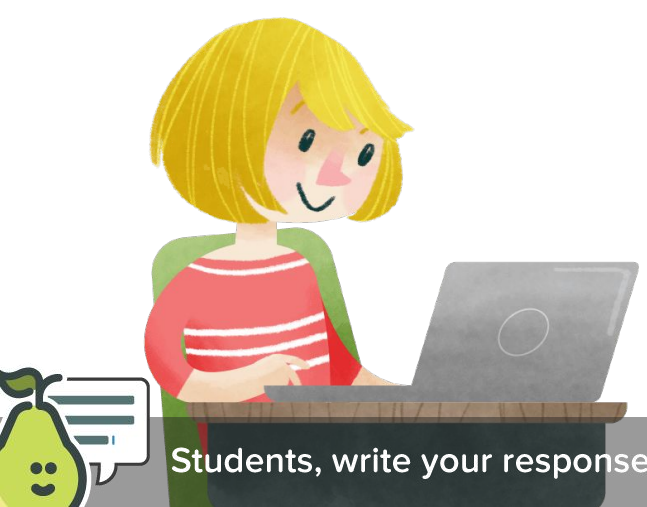
Unit 6

Objectives of today's class

- to review the ***basic components of a computer system*** and understand how they work
- create a mind-map that explains how the main components of a computer system work
- to learn vocabulary related to computer parts and talk about them efficiently (what is their function, how they work, etc.)
- to learn how to talk about processes
- to practice speaking

Students, follow the instructions on the slide

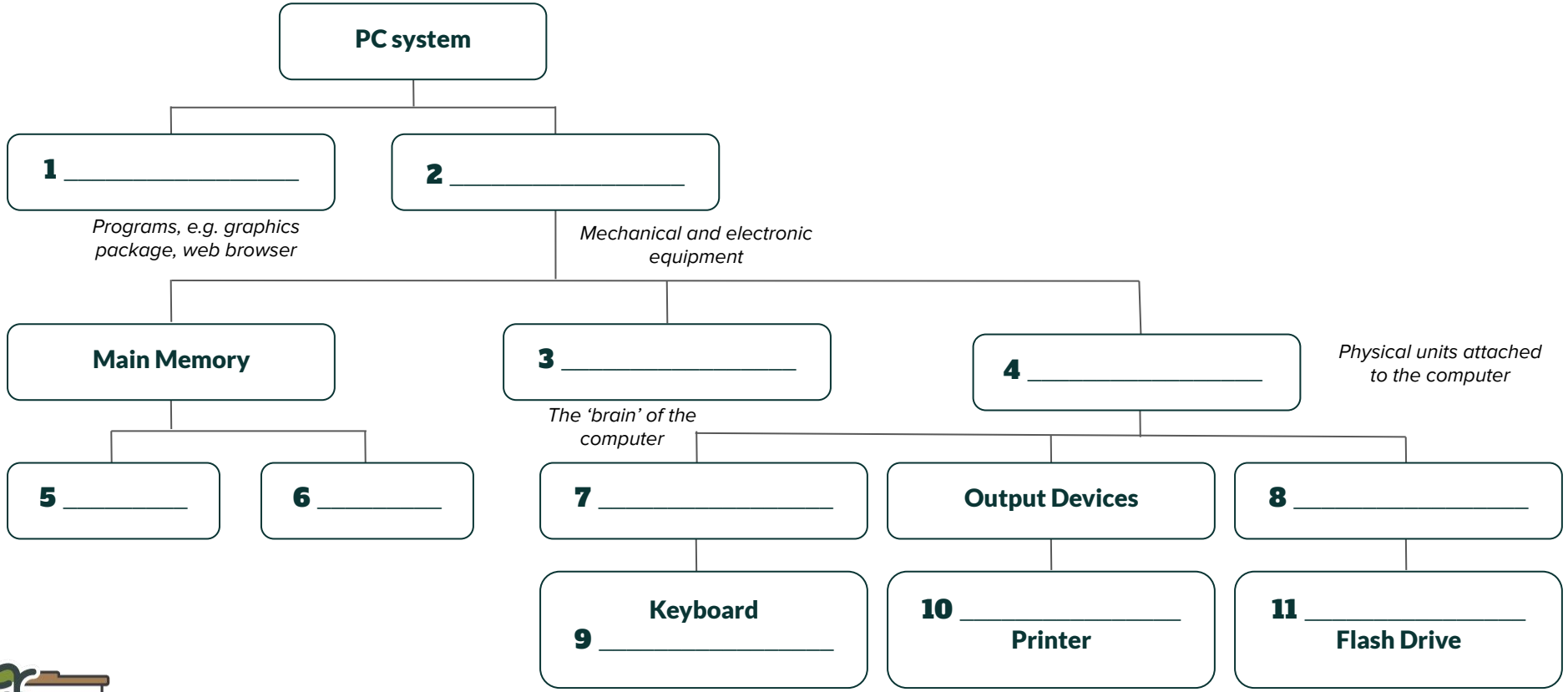
What are the basic components of a computer system and how do they work?



Basic Components of a PC

Look at the diagram below and complete it with the missing information.

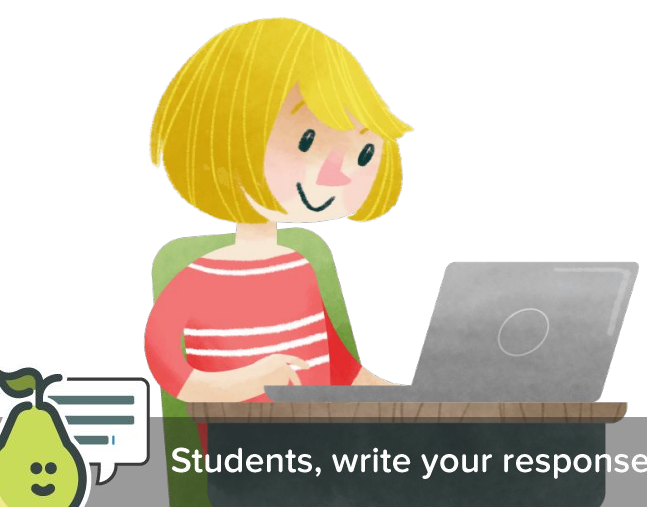
Audio Included



Students, draw anywhere on this slide!

Brainstorming ideas

How does a computer carry out instructions or perform operations?



Students, write your response!

Teamwork

Work in groups / teams.

1

Each team will receive a short text in which they will find information about different computer parts along with an explanation of how they work.

2

Working in teams, extract information from the text and create a visual representation (a mind-map) of the most important information from the text.

3

Once each group has completed the task, we will come back to the main session and each group will have to present their work.

Students, follow the instructions on the slide

Vocabulary check

Based on the information you could hear / read, explain the differences between the terms below.

volatile *vs.* **non-volatile memory**

control unit *vs.* **arithmetic logic unit**

program counter *vs.* **instruction register**

ROM *vs.* **PROM**

read *vs.* **write operation**

access time *vs.* **cycle time**

primary *vs.* **secondary memory**

block *vs.* **page**

asynchronous *vs.* **synchronous protocol**

transfer time *vs.* **bandwidth**

Vocabulary extension

Match the following terms to their definitions.

1	microprocessor chip	_____
2	registers	_____
3	accumulators	_____
4	control bus	_____
5	address bus	_____
6	data bus	_____
7	clock	_____
8	RAM	_____
9	ROM	_____

a. Used to send address details between the memory and the address register

b. Consists of an arithmetic-logic unit, one or more working registers to store the data being processed, and accumulators for storing the results of calculations

c. A group of signal lines used to transmit data in parallel form from one element of a computer to another

d. Groups of bistable devices used to store information in a computer system for high-speed access.

e. An electronic circuit, usually a quartz crystal that generates electronic pulses at fixed time intervals to control the timing of all operations in the processor

f. Used for storing part of the operating system and application software known as ‘firmware’; can only be read: cannot be written or altered in any way.

g. Used to store numeric data during processing

h. A group of signal lines dedicated to the passing of control signals

i. Used for the temporary storage of application programs and data; can be written to and read from

Vocabulary extension

Using the information from the text and the previous exercise, complete the gaps in the text below.

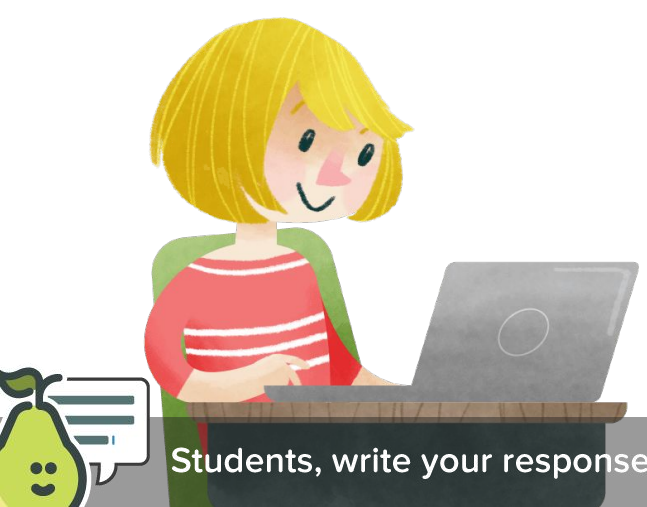
adaptor boards	*registers*	*microprocessor*	*clock*	*conductive*
buses	*system board*	*accumulators*	*input and output devices*	

The processor consists of a (**1**)_____, which is a circuit board on which are mounted (**2**)_____ chips, memory chips and other components linked together by (**3**)_____ lines or channels in the form of control, address and data (**4**)_____. In addition, a processor has (**5**)_____ which connect a system board to (**6**)_____ . The system board also consists of electronic devices, such as an electronic (**7**)_____ for controlling the speed of operation: (**8**)_____ which store numeric data during the course of processing: and various (**9**)_____, including sequence control register, address register, and function register.

Students, draw anywhere on this slide!

Compare the two sentences below. What is the difference between them?

The processor is carrying out instructions.
Instructions are being carried out.



How the CPU performs operations

Put the following operations in the correct order. Then transform the sentences in the passive voice to explain how operations are performed by the processor.

- ☐ The processor decodes the value of the IR to figure out which operation to perform in the next stage.
- ☐ The processor increments the PC.
- ☐ The CPU fetches an instruction from memory.
- ☐ The processor carries out the instruction.
- ☐ The program counter stores the address of the instruction to be fetched.
- ☐ The processor stores information returned by the memory in the instruction register.

Students, draw anywhere on this slide!

Grammar practice

Transform the sentences below from the active voice into the passive voice.

1. Charles Babbage built the first computer.

2. The committee will present an award for the best processor design later this year.

3. The microprocessor calculates the time taken to travel between the units.

4. I don’t know whether the mechanic has repaired your computer or not.

5. The processor is carrying out instructions at this moment.

6. They have been developing the Cyborg D423 robot for over ten years.

That’s all for today! Thank you for your attention and see you all next week!

As always, feel free to rate today’s lesson and leave a message if you prefer:

You can write your feedback here, if you prefer: