



# Unit 1

# Central Processing Unit



## Part 1 : The Central Processing Unit

# STARTER

## KNOWING WHAT YOU KNOW

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# Learning Objectives

In this lesson

We will learn:

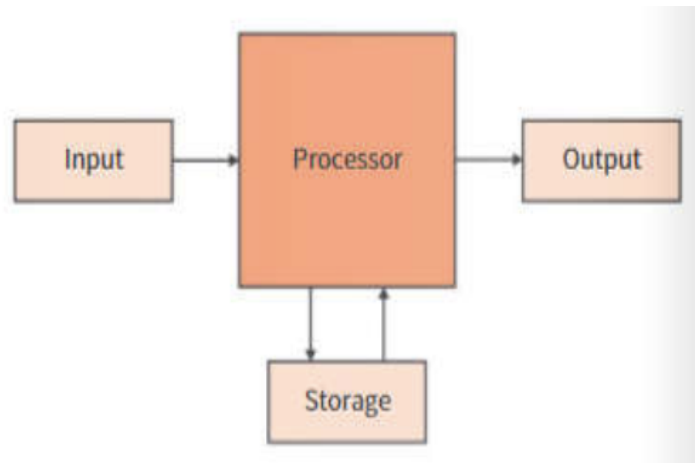
- What happens inside a processor
- About the parts of a computer's central processing unit (CPU)

# Computer Systems

Whenever you are using a computer, you are using a system.

A **Computer System** is a set of equipment that works together to help you do useful work.

A computer system must always have input devices and output devices. It also has storage devices.



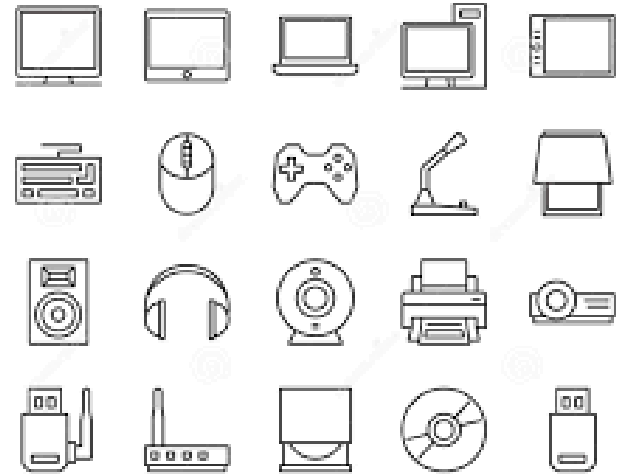
# Computer System

Quick Check:

Name a few Input devices that you know.

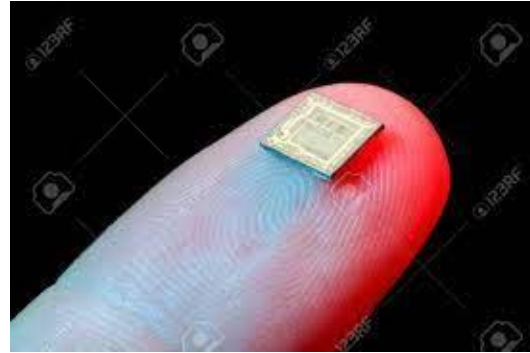
What about output devices?

Any storage devices that you know?

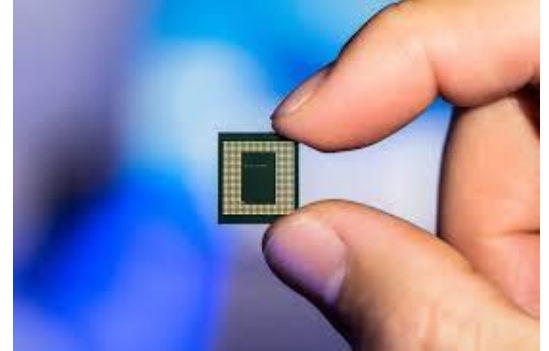


# The Processor

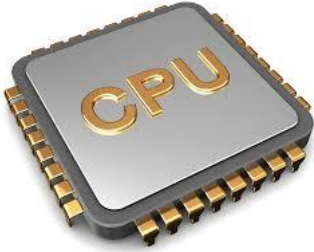
At the centre of our computer system is a processor. A **processor** does all the work of a computer.



Processors are small enough to fit in our finger. Modern processors are so small that they are called, **microprocessors**.



# The central processing unit



The CPU or Central Processing Unit is another name for the microprocessor at the centre of our computer system.



The Central Processing Unit has three (3) important parts: **the control unit, the arithmetic and logical unit and the clock.**





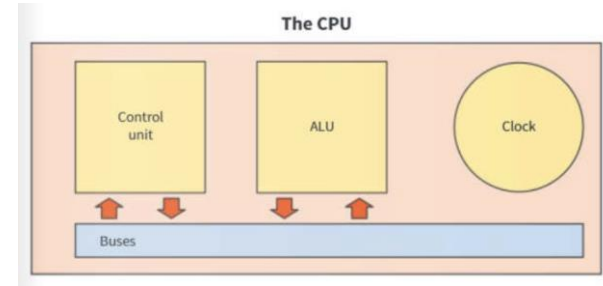
# The central processing unit

The **control unit** manages the work done by the CPU.

- When an instruction arrives at the CPU, it goes to the control unit.
- The control unit works out what the instruction means.
- The control unit makes sure that the other parts of the CPU do the work.

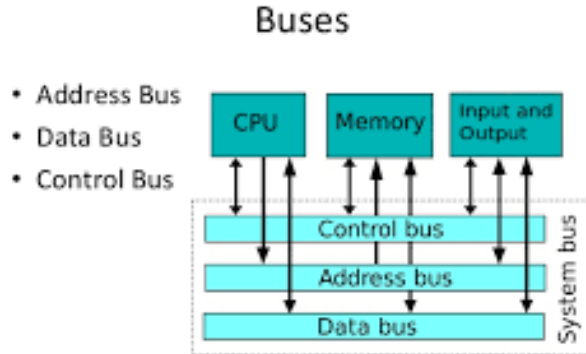
The **arithmetic and logic unit (ALU)** does all the calculations in the CPU. ALU carries the instruction from control unit.

The **clock** sends out regular electrical pulses just like the tick of a clock. The clock in the CPU ticks around 3 billion times every second. Every time CPU clock ticks, Control unit send instructions to ALU.



# The central processing unit

## Buses



The three parts of a CPU are joined by connections called buses. They are high speed connections that carry data around inside the CPU. Unlike the regular bus, the CPU bus carry data at very high speed.

# PLENARY

## KNOWING WHAT YOU LEARNED

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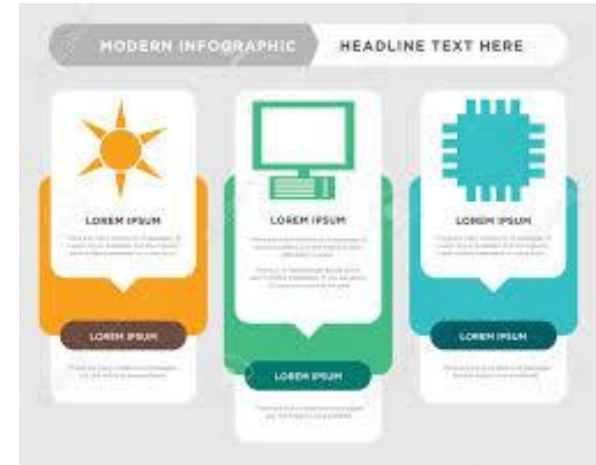
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# Extension Activity 1.1 : Introduction of a CPU

## Design a infographic (Poster, Leaflet, etc)

The infographic should contain the following:

- What is a Central Processing Unit.
- The three main parts of a CPU.
- Search on changes you could make to a CPU to make a computer work faster. Say at least one way of doing it.



# PLENARY FEEDBACK

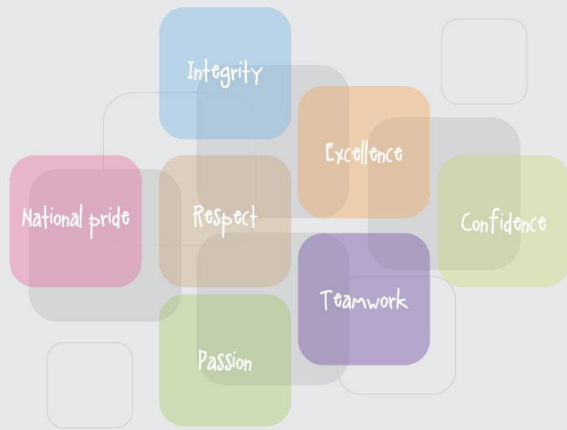
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## Part 2 : The Fetch-Execute Cycle

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# Learning Objective

- Recognise what a computer memory is.
- Explain what happens when a computer carries out an instruction.

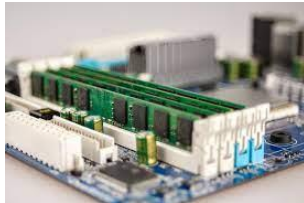


# Memory and the CPU

The computer's memory is very close to the CPU. It is joined to the CPU by buses. Usually the word "PROCESSOR" is associated with both the CPU and the memory. Memory is sometimes called memory unit, **IAS(Immediate Access Store)** or **RAM (Random Access Memory)**

Memory holds:

- The instruction that tell the computer what to do.
- The data values that the computer needs.
- The result of the CPU' work



## LEARNING OBJECTIVES:

- Recognise what a computer memory is.
- Explain what happens when a computer carries out an instruction.

# How does memory work and storage

Memory is made of microscopic electrical circuits. The circuits can be on and off. Everything inside the memory is stored using these on/off signals.

## Memory and Storage

Data is stored in memory as electrical signals. But if the electricity is turned off, all the data will be lost. This is why you must always save your work before you turn the computer off.

### LEARNING OBJECTIVES:

- Recognise what a computer memory is.
- Explain what happens when a computer carries out an instruction.



# How does memory work and storage



## LEARNING OBJECTIVES:

- Recognise what a computer memory is.
- Explain what happens when a computer carries out an instruction.

# How does memory work and storage

When you save your work, it is copied from memory to storage. Here are some examples of storage:

- The hard disk of your computer
- A flash memory drive
- The storage on your school network
- Cloud storage on the internet

## LEARNING OBJECTIVES:

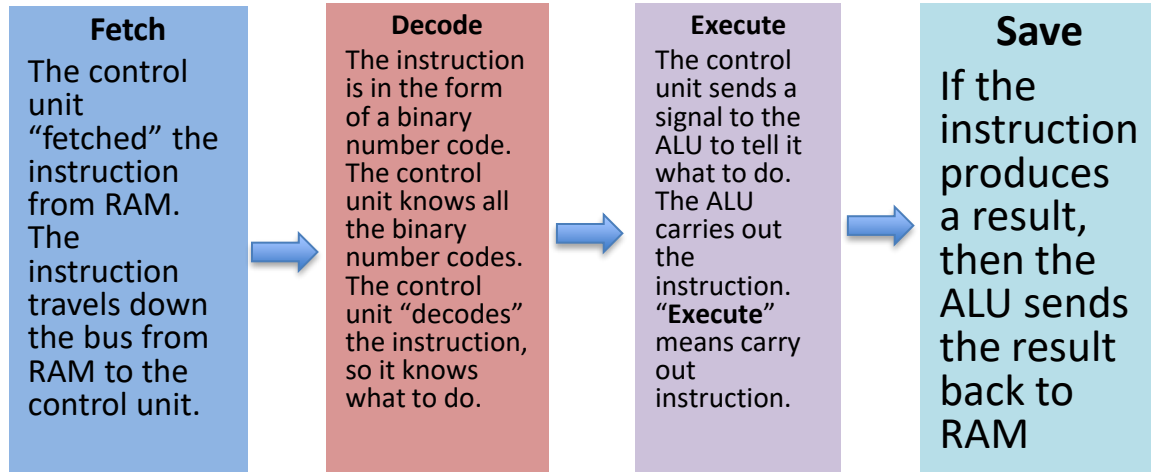
- Recognise what a computer memory is.
- Explain what happens when a computer carries out an instruction.

These Storages are also called **Secondary Storage**



# The Fetch – Execute Cycle

The CPU carries out instructions millions or even billion of times a second. It always follow the following steps:



## LEARNING OBJECTIVES:

- Recognise what a computer memory is.
- Explain what happens when a computer carries out an instruction.

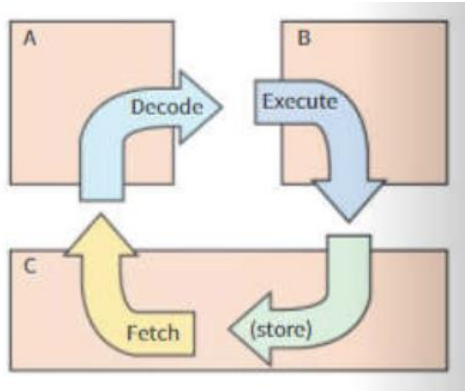
# PLENARY

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# Activity 1. 2 -The Fetch-Execute Cycle



## PART 1:

The parts of the fetch-execute cycle happens in different places:

In Memory

In the Control Unit

In the ALU

Draw the diagram of the fetch-execute cycle. Instead of the letters A, B and C, put the name of the place where each part of the cycle happens.

|                   | advantages | disadvantages |
|-------------------|------------|---------------|
| RAM               |            |               |
| Secondary Storage |            |               |

## PART 2 :

Complete a table with the advantages and disadvantages of RAM and Secondary Storage

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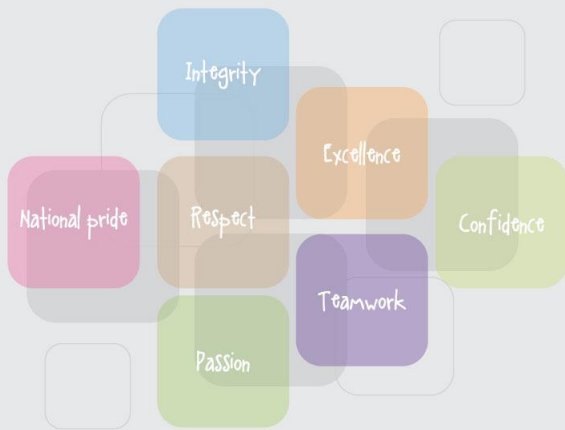
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THANK YOU

Vietnam Australia International School