Computing—How Computers Work Name_____

Device	What is it?	Input, Output or Storage ?	What it is used for ?
	Monitor	Output	Displaying images and text.
	Mouse	Input	Navigating and selecting items on a screen.
	Optical Storage: Blu-ray, CD or DVD	Storage	Storing files e.g. documents, movies and audio.
	USB Flash Memory Stick	Storage	Backing up or transferring data from one computer to another.
	Keyboard	Input	Typing.
	Printer	Output	Printing.
	Hard Disk Drive	Storage	Storing applications and files.
	Speakers	Output	Audio.
	Scanner	Input	Scanning to store digitally/electronically.
	Sim Card	Storage	Storing mobile phone contacts.
	Webcam	Input	Using video calling over the Internet.
	Headphones	Output	Listening to audio

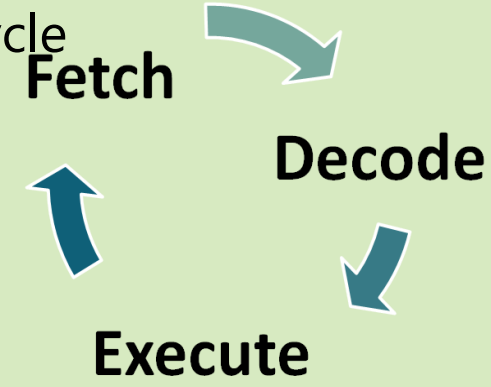
Key Terms

Hardware	Objects that you can touch, like a keyboard, mouse, monitor etc.
Application Software	You cannot 'touch' software. Software refers to the programs that run on a computer. Examples of software: Windows, MS Word, MS Excel, Publisher etc.
Input Devices	An **input device** is computer hardware, which is used to enter data for processing. Examples of **input devices** include keyboard, mouse, image scanner, digital cameras and joysticks.
Output Devices	An **output device** is any hardware **device** used to send data from a computer to another **device** or user. Typical examples of **output devices** are monitors, projectors, headphones, speakers and printers.
Storage Devices	A piece of computer equipment on which information can be stored.

Key terms

CPU	The central processing unit, is a large chip inside the computer. It is known as the brains of the computer.
RAM (Random Access Memory)	RAM is both readable and writable. You can add, change and delete data stored in RAM. It is volatile. When the computer is switched off, all the data stored in RAM is lost. It is fast to read/write.
ROM (Read only Memory)	ROM is read-only. ROM is non-volatile memory, which means it does not need power to keep the data inside it.
Hard Drive	The hard drive (sometimes called the hard disk) is the main storage device in your computer. If you have files and folders on your computer, they are stored on the hard drive. The operating system is also stored on the hard drive.
BIOS (basic input output system)	Contains all the basic code for controlling your computer hardware (such as keyboards, mice, monitors and hard drives).

The Fetch-Decode-Execute Cycle



FETCH

Instructions are loaded into memory (RAM) before the processor starts running the program. Each instruction is the fetched from memory (in order) and put into the appropriate registers. The control unit can then access the instruction for the next stages.

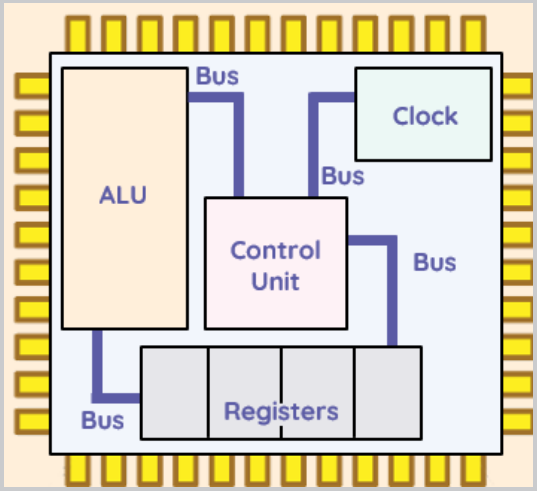
DECODE

The binary representation of an instruction needs to be decoded before it can be run. This is the process the control unit uses to work out what the other components need to do. Each processor will have slightly different encodings for instructions.

EXECUTE

Once the instruction is understood, the instruction will be executed. The control unit will tell the other components what they need to do in order for the instruction to work.

The CPU Key Terms



The Control Unit	The control unit runs the show. It understands the instructions and tells the other components what each instruction needs from them. It manages the instructions and controls the other components.
Arithmetic logic unit (ALU)	The ALU is the calculator of the CPU. It handles mathematical and logical operations that are required as part of an instruction. It manages calculations and logic.
Clock	The CPU contains an internal clock that is used to regulate the number of cycles carried out per second and synchronise the other components. It manages the cycles per second.
Registers	These are very small, very fast memory locations located inside the CPU. There are a few key registers. **(MAR)** Memory address register stores memory addresses used when searching for data in RAM. **(MDR) Memory data register** Stores the data when fetched from memory. **Current instruction register (CIR)** Holds the binary representation of the instruction to be executed. **Program counter (PC)** This register counts up as each instruction is executed, keeping track of how many instructions are in a program. **Accumulator (Acc)** Stores important data being used in calculations.