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Input and Output Devices

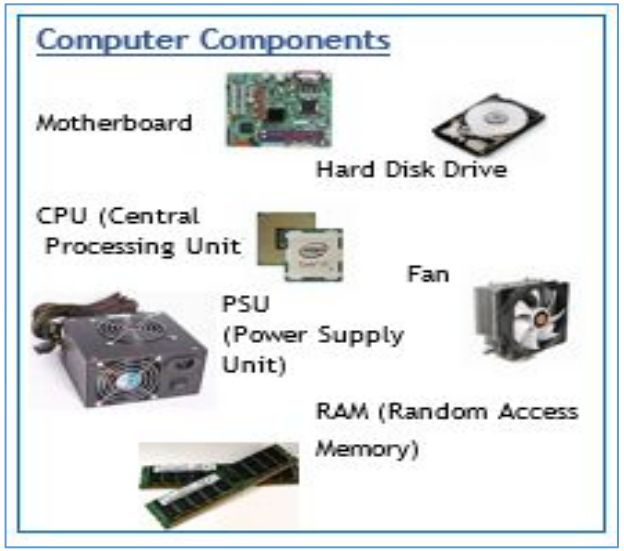
What is an output device?	What is an input device?	What is a storage device?
An output device is a piece of computer hardware used to display or output data which has been processed or stored in a computer	An input device is anything can be used to enter data into a computer	A storage device is used to permanently record or store data
Printer, Speaker	**Keyboard, Mouse**	**CD, Hard Drive**

CPU

Stands for Central Processing Unit

Think of it as the Brain of the Computer System

It processes all of the data and instructions that make the computer system work.



Secondary Storage Devices

Secondary storage is not directly accessible by the CPU - Central Processing Unit. It is non-volatile, meaning it will keep data even if there is no power.

Hard Disk Drive

A hard disk drive (HDD), hard disk, hard drive, or fixed disk is an electro-mechanical data storage device that stores and retrieves digital data using magnetic storage with one or more rigid rapidly rotating platters coated with magnetic material.

SSD

Solid state drives (SSDs) use electrical circuits to persistently store data. They have fast read and write access, and are generally robust, energy efficient and portable forms of storage. However, they are usually more expensive than other forms of storage.

Optical Disk

Optical discs make use of a laser to etch bumps (pits) into the surface of a disc. Another laser is then able to read these, along with the lands which correspond to un-etched bits of data, and read them as a binary string. A pit is a 0 and a land is a 1. They are a very cheap, lightweight way of storing data, but are susceptible to damage by scratching. They also have a limited storage capacity, with CDs able to store up to 800 MB and a Blu-Ray up to 50 GB. The other disadvantage is the need to have specialist hardware to read and write the discs, as well as most being unable to be re-written.

Cloud Storage

Cloud storage is a cloud computing model in which data is stored on remote servers **accessed from the internet, or "cloud".**

Software

Computer software refers to the programs and other operating information used by a computer.

The main piece of software on a computer is the

Operating System

The part of the operating system we see on screen is known as the User Interface.

- Graphical User Interface (GUI).
  The most popular type of system. They combine menu driven interfaces with icons.
- Command Line Interface (CLI).
  Users need to learn the commands to make it work.
- Menu Driven Interface.
  A list of options organised under various headings or menus

Most used Operating Systems (OS)

- Microsoft – Windows
- Apple – IOS
- Google - Android

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Binary (Base 2)

The only thing that computers understand is Binary

8	4	2	1
0	1	0	1

0101 = 5

01011111= 95

1	=	ON
0	=	OFF

128	64	32	16	8	4	2	1
0	1	0	1	1	1	1	1

Odd numbers

Convert these binary numbers into denary:

1)	1010	6)	1011
2)	1010	7)	0001
3)	0110	8)	1011
4)	0111	9)	1001
5)	0100	10)	0011

Convert these denary numbers into binary (4 bits):

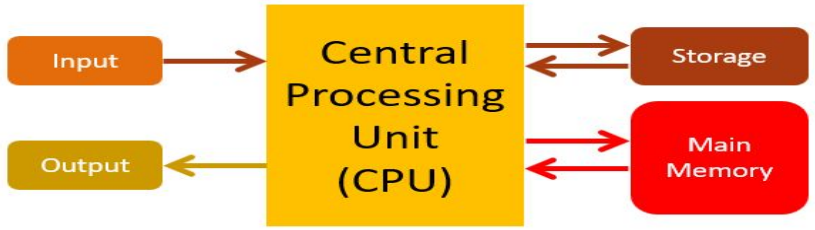
11)	14	16)	6
12)	2	17)	11
13)	10	18)	15
14)	4	19)	2
15)	3	20)	12

The ones and zeros in binary represent 'bits. Each '1' or '0' is one 'bit'.

Computer System

A basic, **complete,** and **functional** computer. It will include all the **hardware** and **software** required to make it functional.

Components of a Computer



Fetch - Decode - Execute Cycle

Computer has a list of instructions in memory to carry out.

- CPU **Fetches** top instruction from the list
- Instructions is passed to **Decoder** to **interpret**
- **Decoder** passes on the instruction
- Instruction is **Executed** or carried out
- CPU **Fetches** top instruction from the list…

Processor Speed

The most common measure of **CPU** speed is the **clock speed**, which is measured in **MHz** or **GHz**. The higher the **clock speed**, the more operations the **CPU** can **execute per second**.

- One cycle per second = **1 Hertz (Hz)** = 1 instruction carried out each second
- 1 **Kilohertz** (**KHz**) = **1024** cycles per second
- 1 **Megahertz** (**MHz**) = **1,048,576** cycles per second
- 1 **Gigahertz** (**GHz**) = **1,073,741,824** cycles per second (Approximately 1 Billion!)

How fast is your computer's processor?

RAM vs ROM

RAM is alternatively referred to as main memory, **RAM** is **volatile** and allows information to be stored and retrieved on a computer. When opened programs are stored in **RAM**.

ROM is a type of **non-volatile** memory. **ROM** contains **BIOS**, which allows the computer system to start-up.

Future and emerging technologies

The pace of change in the field of technology and every part of society it touches makes it difficult to predict where things will be in even 10 years

- Wireless charging
- Driverless cars
- Domestic robots
- 3D printers
- RFID – Radio Frequency ID
- NFC – Near Field Communications