**The System Unit**

 The main part, processing unit and devices, of a microcomputer is a system unit.

 The *system unit* is the actual computer; everything else is called a *peripheral* device.

System Case Types

* Desktop Case –designed to sit horizontally on the surface. It is wider than it is long.
* System Case Type
* Tower Case – designed to sit vertically on the surface. It is higher than it is wide

**3 Basic sizes of Tower Case**

* Full-Tower Case
* Midi – Tower Case
* Mini – Tower Case

**The Internal Components of a System Unit**

* **Motherboard** - The motherboard is the main circuit board of a microcomputer.  It is also known as the mainboard or system board.
* **CPU** - The CPU is the central electronic chip that determines the processing power of the computer.
* **Memory** - Memory is the part of the computer that temporarily stores applications, documents, and stem operating information.
* **Bus** - A bus is an electronic line that allows 1s and 0s to move from one place to another
* **Expansion Slots** -  Expansions slots appear on the motherboard.  They are sockets into which adapters are connected.
* **Ports and Connectors** - A port is a connector located on the motherboard or on a separate adapter.
* **Bays** - A bay is a space inside the computer case where a hard drive, floppy drive or CD-ROM drive sits
* **Power Supply** - A power supply changes normal household electricity into electricity that a computer can use.
* **Sound Components** - A sound card lets a computer play and record high quality sound.
* **Central Processing Unit-** The processor is the beating heart of a PC, it is responsible for carrying out all the calculations.

**CPU has the following functions**

* Does all of the mathematics, mainly addition
* Does all the logical comparisons of values
* Directs the flow of data in a computer
* Controls the operation of the parts of the computer
* All CPU’s are Microprocesor
* A microprocessor is a complete computer on a silicon chip
* A microprocessor does all of the functions of a computer
* stores data and instructions waiting to be used
* follows changeable instructions
* does input, processing, and output

**3 Basic parts of CPU**

1. The Arithmetic Logic Unit (ALU)

* does all of the mathematics in a computer
* does all of the logic comparisons of values
* some common logic comparison symbols

2. The Control Unit - directs the flow of information into the CPU and/or memory or storage

controls which instructions the CPU will do next

3. Registers - Used to store data and instructions inside the processor

Size of the registers can affect the speed and performance of the processor

**Speed of a CPU**

* **Cache** - Used by the central processing unit of a computer to reduce the average time to access memory. The cache is a smaller, faster memory which stores copies of the data from the most frequently used main memory locations.
* The speed of CPUs is measured in hertzs.
* A hertz is on cycle per second.
* Need to measure time to determine cycles per second
* All computers have a clock built into them for timing the cycles
* The clock is usually located in a small metal box on the motherboard.
* Today, many CPUs can complete over six (6) instructions per second.
* Speeds of modern CPUs
* Most computers have a CPU that can do more than 400 MHz.
* MHz stands for megahertzs
* A MHz is 1,000,000 cycles per second.
* Computers will soon be at speeds of over a gigahertz, 1,000,000,000 Hertzs.

**Memory**

1. ROM (Read-Only Memory)
* Stores instructions that are used by the CPU
* Tells the CPU how to be the kind of computer it is.
* Tells the CPU how to work with the different parts of the computer
* ROM can also hold programs that are directly accessed by the CPU.  One such program is the self-test when the computer is first turned on.
* The instructions in ROM can not usually be changed
* The instructions are built into the electronic circuits of the chips
* These instructions in ROM are called **firmware**
* To change the instructions in ROM you need to usually change the chips or do some other special process that is normally not available to an average user.
* The instructions in ROM are nonvolatile.  They stay in ROM even when the computer is turned off.
* Access to information is random access.
1. RAM (Random Access Memory)- Is the place in a computer where the operating system, application programs, and data in current use are kept so that they can be quickly reached by the computer's processor.

**Functions of RAM**

* Store data and instructions that are used by the CPU to perform some task. These instructions are usually loaded into RAM from a secondary storage device.
* RAM is also used to store instructions that tell the CPU how to work with its parts.  These instructions are usually called drivers.
* The instructions in RAM are constantly changing, depending on the needs of the CPU.
* The instructions in RAM are volatile. When the computer is turned off the information in RAM disappears.
* The information in RAM needs to be saved to secondary storage before the computer is turned off.
* Access to information is random access.

Storage Device
How a Computer Stores Information

1. The computer stores information as a string of zeros (0) and ones (1)

* The standard string length is eight 0's or 1's in a row
* This standard length is called a byte
* A byte equals one character
* A character is a letter, number, or symbol - it is about any thing that can be typed on a keyboard
* There are 256 standard characters used by almost all computers

2. Information size measurements

* Kilobyte (KB) - One kilobyte equals about 1024 bytes 1KB is about 140 words, about a half page of typed double-spaced text (words only)
* Megabyte (MB) -One megabyte equals about 1000 KB , One megabyte equals about 1,000,000 bytes One megabyte equals about 500 pages of text, or one large book
* Gigabyte (GB) -One gigabyte equals about 1000 MB, One gigabyte equals about 1,000,000 KB , One gigabyte equals about 1,000,000,000 bytes, One gigabyte equals over 1,000 books of text

**Some Common Storage Device**

* HDD- Stores all the computer's information and retains the information when the computer is turned off. The hard drive is the primary device that a computer uses to store information.  The hard drive stores programs, data files, saves files, and organizes files.  The hard drive is located inside the computer case.  The hard drive, magnetically stores data on stacks of rotating disks called platters.
* FDD- The floppy drive stores and retrieves information on a floppy disk.
* Compact Disc Read-Only-Memory- CD-ROM is a device that reads information stored on a compact disc.  CD-ROM stands for Compact Disc Read Only Memory.  One CD is equal to the space in over 40 floppy disc.
* Removable Hard Disk -A zip disk is a removable disk that holds a large amount of information. A zip disk can be used to achieve, protect and transfer large amounts of data.
* A **flash drive** (or **Flashstick**) is a storage device that uses flash memory rather than conventional spinning platters to store data.
* Add On Cards- It is a card that is pluggable on the motherboard card slots.
* VGA (Video Graphic Array)- It is an item of personal computer hardware whose function is to generate and output images to a display. It operates on similar principles as a sound card or other peripheral devices.
* Sound Card- A **sound card** (also known as an audio card) is a computer expansion card that facilitates the input and output of audio signals to/from a computer under control of computer programs.
* Ethernet Card- A **network card**, **network adapter**, **LAN Adapter** or **NIC** (network interface card) is a piece of computer hardware designed to allow computers to communicate over a computer network.
* Modem- A contraction of the words “modulator-demodulator”. It is typically used to send digital data over a phone line. It is used to connect to the internet.
* Wireless Router- A **wireless router** is a network device that performs the functions of a router but also includes the functions of a wireless access point. It can function in a wired LAN, a wireless only LAN, or a mixed wired/wireless network.
* Computer Power Supply- **Power supply** is a reference to a source of **electrical power**. A device or system that supplies electrical or other types of energy to an output load or group of loads is called a **power supply unit** or **PSU**. The term is most commonly applied to electrical energy supplies, less often to mechanical ones, and rarely to others.
* Cooling Fan- A **computer fan** can be any fan inside a computer case used for cooling purposes, and may refer to fans that draw cooler air into the case from the outside, expel warm air from inside, or move air across a heat sink to cool a particular component. The use of fans and/or other hardware to cool a computer is sometimes referred to as active cooling.
* Data Cable Connectors- connects data cable into the motherboard
* CMOS -Complimentary Metal-Oxide Semiconductor is a small lithium battery powered, RAM (Random Access) chip mounted on your Motherboard and contains your computers clock and calendar **as well as a small amount of memory used for basic configuration information,** like the number and sizes of drives installed as well as your BIOS password (if one is used). In fact when you first switch on your computer, this is the chip you are accessing.
* **Basic Input/Output System**. -It is used to identify and initiate component hardware. This is to prepare the machine so other software programs stored on various media can load, execute, and assume control of the PC. This process is known as booting, or booting up, which is short for **bootstrapping**.
* Auto Voltage Regulator- is a hardware device used to maintain a specific voltage to electronic devices.