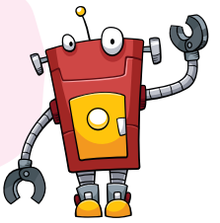
Input and Output Devices

Learning in this chapter

- Input, Output and Processing device
- Computer's Memory



What is Computer?

A computer is a machine that works on electricity. It can process data, store, retrieve data and perform calculations faster and efficiently than humans. Computer works very fast and give accurate result.

Meaning of Computer

Computer is derived from a Latin word "computare" which means "to calculate", "to count" or "to think together". So, more precisely the word computer means a "device that performs computation".

Definition of Computer

A computer is an electronic device that accepts data and instructions given by the user, process them accordingly and gives meaningful results.
A computer system performs three basic functions.

Working Cycle of a Computer

The computer system works with the help of hardware and software.
All the physical and mechanical equipment connected together that we can touch and see are called computer hardware.

The set of instructions or a collection of computer programs that enhance the capabilities of the hardware and tell the hardware how to perform a task is called a Software. Hardware and software are complementary to each other. A Computer hardware is of no use without software and software cannot be utilized without supporting hardware.

Let us now learn about the various hardware devices, which help the computer to perform various functions.

Input Devices

The devices that help us to enter information in the computer are called Input devices. Some common input devices are shown below.

Keyboard : Keyboard is the most commonly used input device. A keyboard is used to enter data and instructions into the computer by typing. A standard keyboard has 104 keys, which can be divided into four groups. Typing keys (Alphabet keys and Numeric keys), Function keys (F1 to F12), Navigation keys (Arrow keys, Home, End, Page Up, Page Down, etc) and Control keys (Ctrl, Alt, Windows logo key, and Esc.)

Do you Know? **Sir Christopher Latham Sholes** is regarded as the inventor of QWERTY keyboard layout.

Keyboard

Mouse : A mouse is a hand held pointing device with two buttons on its top. It lets you enter instructions into the computer by pointing and clicking. A mouse is also used to draw pictures.

Mouse

Do you Know? **Dr. Engelbart** is the inventor of the computer mouse.

Remember

- All input devices, output devices, and storage devices are also known as Peripheral devices.

Microphone

Microphone : It helps you to enter your voice or any other sound into the computer. Sound cards enable a computer to record sound input from a microphone connected to the computer.

Web Camera

Web Camera : A web camera is a device connected to the computer for capturing still pictures and live videos, which can then be broadcast anywhere around the world over the internet.

Scanner : It scans and inputs text and images printed on paper, and translate the information into a form that a computer understands. The most commonly used scanner is the flat bed scanner.

Flatbed scanner

Sheet fed scanner

Hand held scanner

Joystick : It inputs the physical movements of the stick into the computer.

Joystick

Remember

- Computer cannot understand our language. Input devices convert our inputs into a form that the computer can understand.

More Input Devices

Some more input devices are given below :

Touch Screen

A Touch Screen is a touch-sensitive computer display screen. Users can touch items (pictures, words, etc.) displayed on the touch screen to input data into the computer.

Touch Screen

Digital Camera

A Digital Camera takes pictures and stores them in its memory in a digital form. The pictures taken by a digital camera can be transferred into the computer by connecting it to the computer through a data cable.

Digital Camera

Digital Camcorder

Digital Camcorder

A Digital Camcorder is a device that can be used to record videos in a digital form and input them into the computer. Some digital camcorders can't take still pictures as well.

Touchpad

Touchpad is a touch sensitive surface provided in a laptop computer as a replacement for mouse. We can move our finger/s on the touchpad to move the pointer in the same direction.

Touchpad

Graphics Tablet

Graphics Tablet

A Graphics Tablet (also known as a digitizer) comes with a pen-like equipment known as a stylus. Using the stylus, we can draw images on the tablet and input them into the computer.

MIDI Keyboard

A Musical Instrument Digital Interface (MIDI) keyboard is a piano like musical instrument that can be connected to the computer for creating and entering musical notes into the computer.

MIDI Keyboard

3D Scanner

3D Scanner

A 3D Scanner is a special type of scanner that can be used to scan real-world objects. Data obtained from scanning is input into a computer and can be used for making physical models of these objects.

Trendy Bytes

Apple Inc. has developed a touch sensitive keyboard that can also be used to give both typed and touch based inputs into the computer.

Activity

Match each input device to its function correctly :

1. MIDI Keyboard	a. is provided in a laptop as a replacement of the mouse.
2. Joystick	b. enables input of hand-drawn images into the computer.
3. Touchpad	c. is used to create and enter musical notes into the computer.
4. Graphics Tablet	d. is used to play games on the computer.

Output Devices

Any computer device that shows us the result or output of processing is called an Output device. Some common output devices are given as follows.

Monitor

A monitor, also known as Visual Display Unit (VDU) is the main output device of the computer. It displays output in the form of text, pictures, videos, animation, etc. The output that we get on a monitor is called the soft copy. There are three types of monitors :

CRT Monitor

1. Cathode Ray Tube (CRT) Monitor : CRT monitors are generally large, very heavy, not expensive, consume more electricity and produce heat.

LCD monitor

2. Liquid Crystal Display (LCD) Monitor : LCD monitors occupies less space and lighter than CRT monitors. They consume less electricity and have a limited viewing angle. LCD monitors are expensive than CRT.

LED Monitor

3. Light-Emitting Diode (LED) Monitor : LED monitors look more or less same as LCD monitors. They have better picture quality and are much in demand the LCDs. These monitors provide higher contrast and better viewing angle than LED monitor.

Printer

A printer helps us to print output on paper in the form of text and picture. The printed copy is called the hard copy. Inkjet printers and Laser printers are the most common types of printers available these days.

1. Dot Matrix Printer : The Dot Matrix Printer works like a type writer and creates characters by striking pins against an ink ribbon. Each pin makes a dot and combination of dots form characters and illustrations. It is very noisy and do not produce high-quality output. It gives output only in black and white. Dot Matrix printers are not so common now a days.

Dot Matrix Printer

2. Inkjet Printer : The Inkjet printer sprays droplets of ink on paper to form the text and graphics. They are the most common type of computer printer used by consumers. It can give output both in black and white and in colour.

Inkjet printer

3.The Laser Printer : A Laser Printer uses laser beams and dry ink to print. It is used mainly in publishing houses. It prints very fast and gives high quality output. It works like a photocopier. A Laser Printer cost more than Inkjet Printer.

Laser Printer

Speakers

Speakers

Speakers give us output in the form of sound. Speakers always come in pairs. Sometimes they are accompanied with a bass unit for enhanced music quality.

Headphones

Headphones also give out the sound output. They can be described as our private speakers. We can wear them on our ears and listen to the music without causing any disturbance to others.

Headphones

Projector

Projectors

LCD and LED projectors are output devices that help to show visual output onto a big screen. This is done so that a number of people can view it at the same time.

Plotter

Plotters are output devices that help to print large drawings and maps on big sheets of paper.

Different output devices give us output in different forms. For example, a monitor shows output in visual form (images, animation, videos, etc.), speakers give sound output. Printers, on the other hand, print output on paper.

Plotter

Remember

- Output given by the computer is in a form that humans cannot understand. Output devices convert the output in a form that we can understand.

Activity

Identify these devices as Input or Output. Write the function of each device :

1.  Input/output : _____

2.  Input/output : _____

3.  Input/output : _____

4.  Input/output : _____

Processing Devices

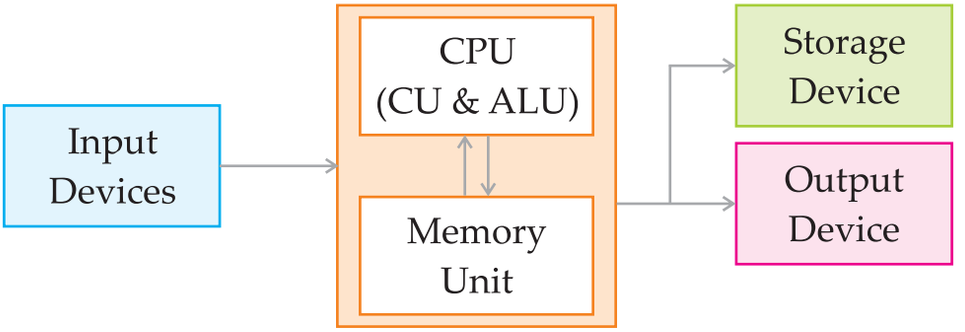
Processing means manipulation or doing work on the input data in order to produce useful output or information. All the devices of the computer that help it to process data are called Processing devices.

CPU – The Main Processing Device

The Central Processing Unit or CPU is the main processing device of the computer. It has three main parts– CU (Control Unit) and ALU (Arithmetic Logic Unit) and MU (Memory Unit)

- The ALU does all the arithmetic and logical computations on the input data.
- The CU controls the flow of data between the various input, output, processing, and memory and storage devices.
- The MU stores information temporarily or permanently according to your need.

The CPU uses the computer's memory to process data and store intermediate results of the processing. It retrieves the final result of processing from the memory and sends them to an output device for display and to a storage device for storage when we tell it to do so.



The arrows show the transfer of data between the various units of the computer system.

Computer's Memory

Any physical device capable of storing information temporarily or permanently can be considered as computer's memory. Most modern personal computers have two types of memory– Internal Memory, also known as the Primary or Main memory and External Memory, also known as the Secondary memory or Auxiliary memory.

Bits and Byte

A computer can understand only two states – ON (represented by1) and OFF (represented by 0). These two digits – 0s and 1s are called Binary digits or Bits The data is stored in the computer memory in the form of bits, and is measured in Bytes.

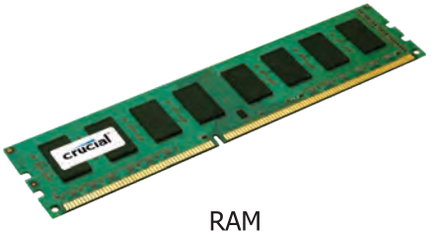
Memory Size

8 bits	=	1 Byte	
1024 Bytes	=	1 Kilobyte	(1KB)
1024 KB	=	1 Megabyte	(1MB)
1024 MB	=	1 Gigabyte	(1GB)
1024 GB	=	1 Terabyte	(1TB)

Internal Memory

The Internal Memory of a computer is again of two types called RAM (Random Access Memory) and ROM (Read Only Memory).

RAM (Random Access Memory) : The RAM or Random Access Memory is the main working memory of the computer. The RAM lies inside the system unit and is in the form of an electronic chip.



RAM

The CPU uses the RAM to temporarily store inputs, currently running software programs and the results of processing (output).
The RAM can transfer data to the CPU at a very high speed and allows it to write and rewrite on it any number of times.

Remember

- All the data stored on the RAM gets erased when the computer is turned OFF. RAM is therefore, called a volatile memory or temporary memory. We cannot save anything on the RAM.

ROM (Read Only Memory) : The ROM or Read Only Memory is a special type of memory chip that contains the startup instructions for the computer. Instructions store on ROM do not get erased when the computer is turned OFF. So ROM is called non-volatile memory.

ROM

External Memory

The External memory or the Secondary memory of the computer is made up of various storage devices that help us to save information/data for a long period of time.

Hard Disk Drive (HDD) : The Hard Disk can store any kind of data (text, graphics, audio, video, etc.) All the programs that run on a computer are also stored on its hard disk. Internally, a hard disk has a number of round magnetic disk on which data is stored.

CD

Compact Disk (CD) : A Compact Disk or CD is a circular disc with a shiny surface. Data is stored only on one side in a spiral track beginning at the centre and ending at the outermost edge of the disc. We need a CD drive or DVD drive to read data from a CD. It can store up to 700 MB of data and measures 4.7 inches in diameter.

Do you Know?

Compact Disk-Read Only Memory (CD-ROM) is the most common type of CD. Other types of CDs are CD-R and CD-RW.

Digital Versatile Disk (DVD) : A Digital Versatile Disk or DVD is an optical storage medium that has become very popular for storing videos. A DVD looks and works similar to a CD but it has a very high storage capacity. Information can be read from a DVD using a DVD drive. To

DVD

write information on a DVD we need a DVD writer.

Do you Know? A Blue Ray Disk is similar to a DVD. It is used for storing full length movies.

USB Flash Drive : The USB Flash drive is a small portable storage device. It is also known as a pen drive, thumb drive or key chain drive. It is integrated with a USB connector (USB stands for Universal Serial Bus) and can be plugged through the USB port into any computer having a USB drive.

USB

USB Connector

Memory Cards

Card Reader

Memory Card : A Memory card is a storage medium for portable cameras and music medium for portable devices, like mobiles, digital cameras and music players. These devices transfer image and music files into a computer by using memory card reader that can be connected to a computer through a USB cable.

POINTS to Recall

- Hardware parts like keyboard, mouse, joystick, scanner, webcam and microphone that help us to enter data into the computer are called input devices.
- Monitor, printer, headphones, speakers and plotters that convey the output of processing to the user are called output devices.
- Any device that processes data in a computer is known as a processing device.
- The CPU (Central Processing Unit) is the main processing device of the computer.
- Memory devices like RAM and ROM make up the computer's internal or main memory.
- Storage devices like hard disk, CD, DVD and pen drive make up the external or secondary memory of the computer.

TERMS to Learn

- Peripheral Device : Any device that inputs or outputs information to or from a computer.
- Bit : The smallest unit of information.
- Byte : A group of 8-bits which represent one character of keyboard.

Multiple Choice Questions :

A. Tick (✓) the correct answer :

1. Which of these is not an input device?
   (a) Mouse ◯ (b) Monitor ◯ (c) Keyboard ◯
2. Which device helps to input physical movements of an electronic stick into the computer?
   (a) Scanner ◯ (b) Printer ◯ (c) Joystick ◯
3. Which of these serves as both an input and output device?
   (a) Scanner ◯ (b) Headphones ◯ (c) Touch screen ◯
4. Which of these stores instructions for the computer to boot-up?
   (a) RAM ◯ (b) ROM ◯ (c) Hard disk ◯
5. Which of these is called the main working memory of the computer?
   (a) RAM ◯ (b) ROM ◯ (c) Hard disk ◯
6. _____ is not a secondary storage device.
   (a) DVD ◯ (b) RAM ◯ (c) Flash Drive ◯

B. Fill in the blanks with the help of given hints :

HINTS: Hard disk, 700 MB, Data cable, 4 inches, Blue ray, Memory card, Output

1. The devices that show the output of processing are called _____ devices.
2. A digital camera can be connected to the computer through a _____.
3. A _____ disk is like a DVD and used for storing full-length movies.
4. The _____ is a storage devices used in mobile devices like mobile phones, digital cameras, tablets, etc.
5. The _____ is the main storage device of a computer.
6. A CD can store up to _____ of data and it's _____ in diameter.

C. Write (T) for True and (F) for False statements :

1. Keyboard and mouse are examples of output devices. ☐
2. Graphics tablet is also known as a digitizer. ☐
3. Digital camcorder is a type of video camera. ☐
4. ALU stands for Arithmetic Logic Utility. ☐
5. RAM is a type of volatile memory. ☐
6. Hard Disk Drive is the main storage device of computer. ☐

D. Read the clues and name the device :

1. I can scan the printed images and input them into the computer. _____

2. I am an output device that lets you hear sound from a computer. _____
3. I can print the output on paper. _____
4. I am both an input and output device. _____
5. I let you input your voice into the computer. _____

E. Write the full form of the following abbreviations :

a. RAM : _____
b. CRT : _____
c. HDD : _____
d. DVD : _____

F. Very Short Answer Questions :

1. Define Bits.

_____

2. Write two names of following :
   (a) Input devices : _____ _____
   (b) Output devices : _____ _____
   (c) Storage devices : _____ _____

G. Short Answer Questions :

1. Write the functions of the following Input/output devices (in not more than 1 sentence) :
   (a) Webcam

   _____

   (b) Touch screen

   _____

   (c) Keyboard

   _____

   (d) Printers

   _____

   (e) Monitor

   _____

2. Write any two differences between RAM and ROM.

   _____

   _____

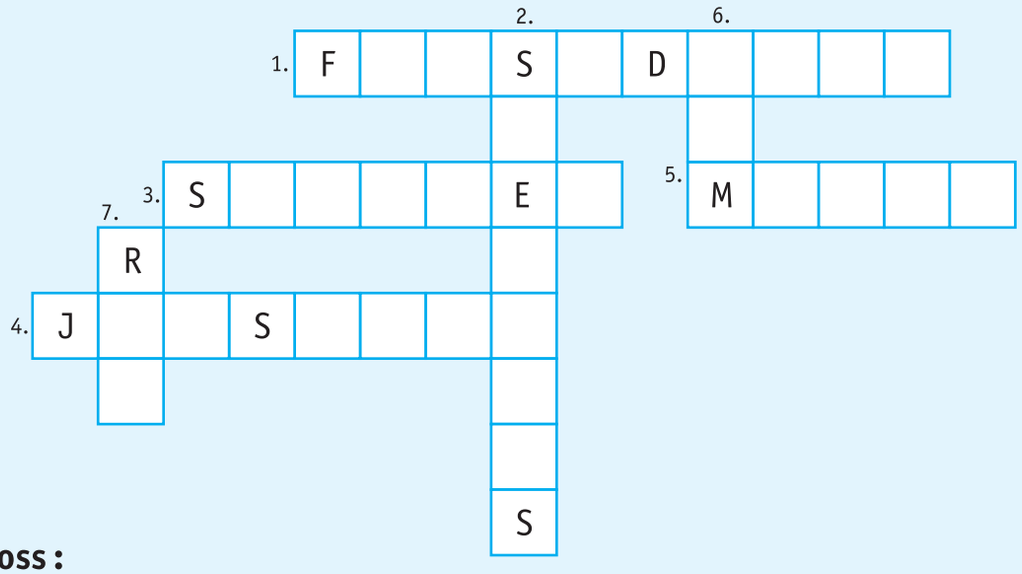
3. Write any two differences between Internal memory and External memory.

   _____

   _____

Activity Time

A. Fill in the crossword with the help of given clues.



Clues :

Across :

1. The other name of Pen Drive.
3. It reads the text or pictures printed on a paper.
4. Input device often used to control video games.
5. Pointing device used to point and select items on computer.

Down :

2. They are used to play sound.
6. The data stored in this memory is lost when the computer is turned off.
7. It is the non-volatile memory of computer.

B. Aditi wants hardware parts to assemble a basic computer for herself. So arrange the Input, Output and Storage parts in the table given below.

Input Devices	Output Devices	Storage Devices
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____

Lab Time

1. Visit the computer lab of your school and identify and recognise the secondary storage.
2. Ask your teacher to show you the inside of the CPU box. Note the hard disk and CD drives. Also see the ROM chip and the RAM and discuss about them.

Practical 1 : With the help of your teacher make a presentation memory of the computer. Give below are a few slides you could use.

Memory of the computer

Types of Memory
1. Primary
2. Secondary

Primary Memory
RAM ROM

Secondary Memory
CD/DVD Hard disk Pen Drive

Practical 2 : Printing a Scanned document.

1. Make sure that you have printer attached to the computer and it is switched ON.
2. Go to the location where you have saved the scanned image.
3. Right click on the image and click on the Print option.
   ... The Print pictures dialog box appears.
4. In the dialog box, choose the print settings as required and click on the Print button.
   ... The scanned image will be printed on paper.