

Hardware and Software

Learning Objectives

After completing this lesson, students will be able to:

- identify the software and hardware of a computer.
- distinguish the features of hardware and software.
- recognize different types of software.
- identify some Open source software and utilize them effectively.



Introduction

Computer is a device comprising both hardware and software. The functions of hardware and software combines together to make the Computer functional. A hardware device helps to enter input information. The software processes the input data and gives the output in the monitor, a hardware device. Thus a computer is like a human body, where human body is the hardware and soul is the software.



9.1 Hardware

Hardware is the parts of a computer which we can touch and feel. Hardware includes Input and Output devices, Cabinet, Hard Disk, Mother Board, SMPS, CPU, RAM, CD Drive and Graphics Card.



Figure 9.1 Hardware of a computer



Email existed before the World Wide Web.

9.2 Software

Hardware is lifeless without software in a computer. Software are programmed and coded applications to process the input information. The software processes the data by converting the input information into coding or programmed language. Touching and feeling the software is not possible but we can see the functions of the software in the form of output.

9.3 Types of Software

The software is divided into two types based on the process. They are:

1. System software (Operating System)
2. Application software

9.3.1 System software

System software (Operating system) is a software that makes the hardware devices process the data fed by the user and to display the result on the output devices like Monitor. Without the operating system, computer cannot function on its own. Some

of the popular operating system are Linux, Windows, Mac, Android etc.

9.3.2 Application Software

Application software is a program or a group of programs designed for the benefit of end user to work on computer. The application programs can be installed in the hard disk for the usage on a particular computer. This type of application program completes one or more than one works of the end user. The following are the examples of application program: Video player, Audio player, Word processing software, Drawing tools, Editing software, etc.



SYSTEM SOFTWARE V/S

APPLICATION SOFTWARE



Figure 9.2 System and Application Software

9.4 System and Application Software types

The operating system and application software are available in two forms. They are:

1. Free and Open source
2. Paid and Proprietary Software

9.4.1 Free and Open source

Free and open software is available at free of cost and can be shared to many end users. Free software is editable and customizable by the user and this leads to updation or development of new software. Examples of Free and Open source software are: LINUX, Open office, Geogebra etc.



TEXTBOOK EVALUATION

I. Choose the correct answer.

1. Find out the part that is not found in CPU?
a. Mother Board b. SMPS
c. RAM d. Mouse
2. Which of the following is correct?
a. Free and Open source
b. Free and Traditional software
c. Passive and Open source
d. Passive and Traditional source
3. LINUX is a
a. Paid Software
b. Licensed Software
c. Free and Proprietary software
d. Free and Open source software
4. Find out the Paid and Proprietary software from the given list
a. Windows b. MAC OS
c. Adobe Photoshop d. All the above



The Open Source Initiative (OSI) is an organization dedicated to promote Open Source Software.

9.4.2 Paid and Proprietary Software

There are softwares that need a license to use it. They have to be paid for using either permanently or temporarily. The license of the software would not be provided unless it is purchased. Similarly the end users are legally prohibited to steal the software program or to use the pirated version of the Paid and Proprietary Software. Some of the examples of Paid and Proprietary Software are: Windows, Microsoft office, Adobe Photoshop, etc.



5. _____ is an Operating System.
a. Android b. Chrome
c. Internet d. Pendrive

II. Match the following.

MAC OS	-	Free and Open source Software
Software	-	Paid and Proprietary Software
Hardware	-	Input Device
Keyboard	-	RAM
LINUX	-	Geogebra

III. Answer in brief.

1. What is Hardware and Software?
2. What do you mean by Operating System? How it Works?
3. What is Free and Open Source Software? Give any two examples?

PRACTICAL - TABLE OF CONTENTS

Sl. No.	Name of the Experiment	Time
1.	Density of the material of the body denser than water	40 minutes
2.	Laws of reflection of Sound	40 minutes
3.	Economic Biology	40 minutes
4.	Identification of Microbes	40 minutes
5.	Life Cycle of Mosquito	40 minutes

I. DENSITY OF THE MATERIAL OF THE BODY DENSER THAN WATER

Aim of the experiment:

To determine the density of the material of the body denser than water.

Apparatus required:

A metal bob, measuring cylinder and weighing balance.

Formula used:

Density of the material of the body denser than water, $\rho = M / V \text{ kg}/\ell$.

Where, M = Mass of the body in water (kg) and V = volume of the body (ℓ)

Procedure:

- Take a metal bob. Weigh the bob in weigh balance. Let the mass of the bob be M .
- Take a measuring cylinder and fill about half of it with water. Note the reading of water level in the measuring cylinder. Let it be V_1 .
- Suspend the bob in the measuring cylinder so that it is completely immersed in water. Note down the level of water in the measuring cylinder. Let it be V_2 .
- The difference in the two readings of the measuring cylinder i.e., $V_1 - V_2$ is the volume of the metal bob.



- Find out the ratio of mass of the bob in air to the volume of the metal bob. This gives you the density of material of the bob. The ratio of mass of a body to its volume is equal to the density of the material of which the metal bob is made.

Observation:

S. No	Reading of water level in measuring cylinder before immersing the metal bob (V_1 ml)	Reading of water level in measuring cylinder after immersing the metal bob (V_2 ml)	Volume of the metal bob ($V_1 - V_2$) = V ml

Calculation:

Mass of the metal bob in air, $M =$ _____ $\times 10^{-3}$ kg

Volume of the metal bob, $V =$ _____ $\times 10^{-3}$ ℓ

Density of the material of the metal bob, $\rho = M / V =$ _____ kg/ ℓ .

Result:

The density of the material of the body denser than water is found to be _____ kg/ ℓ .

II. SOUND



Aim:

To verify the laws of reflection of sound.

Apparatus required:

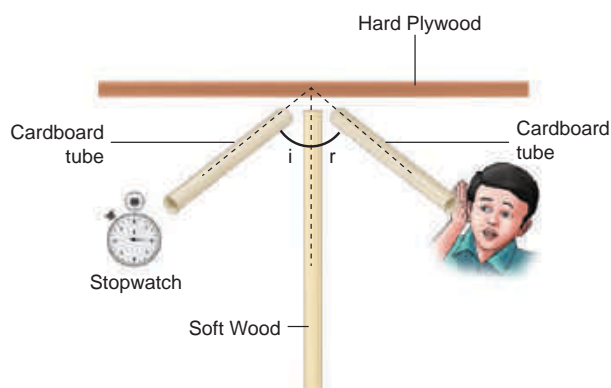
Stop clock, two identical pipes made of card board or chart paper, card board, etc.,

Procedure:

Arrange two identical cardboard pipes on a table near a wall. Keep an alarm clock near the open end of the pipes. Try to hear the sound of alarm clock through the other pipes as shown in figure.

Adjust the angle of pipes, so that you get maximum sound. Repeat the experiment with

different angle of incidences. Find out the angle of reflection and tabulate it. From the table you can realize that the angle of incidence is equal to angle of reflection.



S. No	Angle of incidence (i)	Angle of reflection (r)

Result:

From the above observation and table the laws of reflection of sound is verified.

III. ECONOMIC BIOLOGY

Aim:

To identify the plants and animals of economic importance.

Observation:

To observe the following using specimen/photograph/picture/model.

- Biofertilizer** – *Rhizobium*
- Medicinal plants** – Nilavembu, *Aloe vera*
- Mushroom** - *Agaricus bisporus*
- Indigenous cattle breed** - Umblachery
- Indian major carp** - *Catla catla*
- Type of Honey bees** - Queen bee, Worker bee



Answer the following:

- Draw a neat labelled sketch
- Write its economic importance

IV. IDENTIFICATION OF MICROBES

Aim:

To identify the different types of microbes (Bacteria and Virus).



Observation:

To observe the following with the help photograph/picture/permanent slide using a compound microscope/model/biovisual chart.

- Escherichia coli*
- Vibrio cholerae*
- Lactobacillus*
- Retrovirus (HIV)*

Answer the following:

- Draw a neat labelled diagram.
- Write the shape of the bacteria and virus observed.
- Mention the structural details of the bacteria and virus.
- Indicate its microbial importance/disease caused.

V. LIFE CYCLE OF MOSQUITO

Aim:

To study the life cycle of mosquito.



Requirement:

A chart/formalin preserved bottle jar specimen/permanent slides showing the different stages of development in mosquito (*Anopheles/Culex/Aedes*)

Observation:

- a. Observe the chart/specimen showing the different stages of development.
- b. Permanent slides (each stage of development) under low power of compound microscope.

Answer the following questions as required from your observation

- a. What is the sequence of development?
- b. Draw the various stages of development and name them.
- c. Identify the main characteristics of each stage.
- d. Which of these stages require water for development?
- e. What is the purpose of studying the life cycle of mosquito?
- f. Point out two differences you observe between the male and female mosquito.