

Electricity And Circuits

12

UNIT-VI : HOW THINGS WORK

IN THIS CHAPTER

- *Introduction*
- *Electric cell*
- *Electric switch*
- *Electric circuit*
- *Conductors*
- *Insulators*

Introduction

We use many devices which work on electricity — electric bulbs, fluorescent tubes, televisions, C.D. player, electric motors, ovens etc..

A power station provides us with electricity, there are many ways to generate electricity such as thermal power, hydro – power, nuclear energy, by all these electricity is generated.

However, the supply of electricity may fail or it may not be available at some places. In that condition we use a torch.

Electric Cell

Electricity to the bulb in a torch is provided by an electric cell. Electric cells are also used in alarm clocks, wrist watches, transistor radios and many other devices.

An electric cell produces electricity from the chemicals stored inside it. When the chemicals in the electric cell are used up, the electric cell stops producing electricity. The electric cell are then replaced with a new one.



Cell



Activity Time

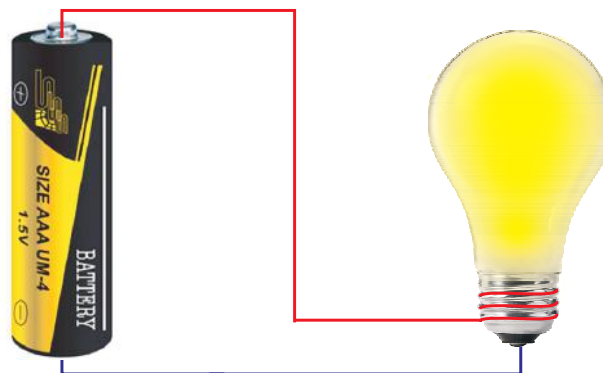
Bring a cell from the market, and look at this carefully. There will be a '+' sign close to one end of each cell and a '-' sign close to the other. These signs stand for the positive and negative terminals of the cell. The protruding metal cap at one end of the cell is its positive terminal. The flat metal base is its negative terminal. Though cells come in many shapes and sizes, every cell has two terminals.



Lighting up a Bulb with an Electric Cell

The bulb will light up when any one terminal of the bulb is connected to the positive end of the cell and other end is connected to the negative end of the cell.

Take four electric wires, fix two wires at two ends of a cell and other two wires at a bulb, as shown in figure. When we attach wire of cells to wires of bulb, then bulb will glow.



An Electric Switch

A switch is a key which is used to break the circuit. Although, switches are made of insulating materials, yet we should not touch a switch with wet hand.

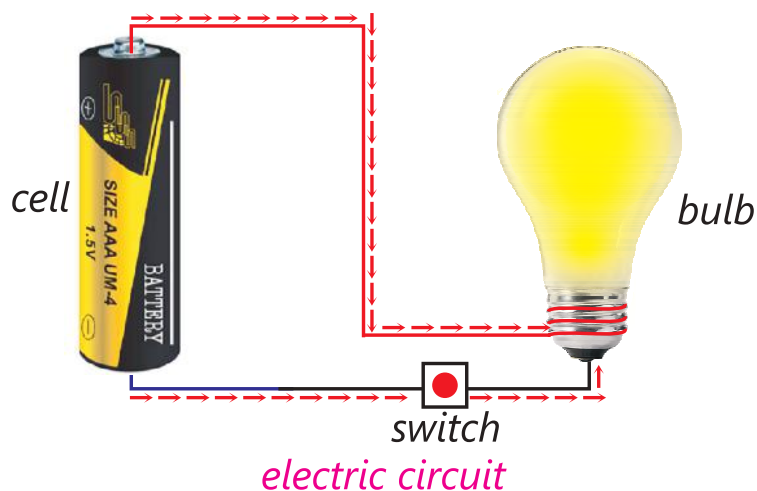


Switch

An Electric Circuit

The figure given alongside shows the diagram of an electric circuit. All components are connected in a line, one after the other. This circuit contains a single cell, a bulb and a switch. The components are connected together by wire leads.

The passage of electricity through the circuit is called current or flow of current. In an electric circuit, the direction of current is taken to be from positive to negative terminal of an electric cell. When the terminals of the bulb are connected with that of the electric cell by wires, the current passes through the filament of the bulb, this makes the bulb glow.



Conductors and Insulators

The materials which allow electric current to pass through them, are called conductors of electricity.

Iron, copper, aluminium etc. are the conductors of electricity.



Aluminium



Iron



Copper

Some conductors

The materials which do not allow electric current to pass through them are called insulators. Rubber, wood, plastic etc. are the insulators of electricity.



Rubber



Glass



Wood

Some insulators

Do You Know ?

Certain substances called semi-conductors behave both like conductors and insulators at varying temperature. At very low temperatures, they are insulators and at high temperatures, they behave as conductors e.g. silicon and germanium.

Conductors and insulators are important for us. Switches, electrical plugs and sockets are made of conductors on the other hand, rubber and plastic are used for covering electrical wires, plug, tops, switches and other parts of electrical appliances, which people might touch.

Know the Keywords :

Filament : Very thin wire in a bulb.

Conductors : Substances that conduct electricity.

Insulators : Substances that do not conduct electricity.

Electric cell : A device that converts chemical energy into electric energy.

Switch : A key used to break a circuit

Electric circuit : A complete pathway for the flow of electric current.

Point to Remember

- An electric cell produces electricity from the chemicals stored inside it.
- The materials which allow electric current to pass through them, are called conductors of electricity.
- The materials which do not allow electric current to pass through them are called insulator.

EXERCISE TIME

A. Answer the following questions :

1. Write at least four uses of electricity.
2. Describe the terminals of a cell.
3. What do you mean by electric circuit ?
4. Define the structure of switch. What is the use of it ?
5. What are conductors and insulators ?

B. Write 'T' for true and 'F' for false statements :

1. Rubber is insulator of electricity.
2. The flow of electric charge is called electric current.
3. Human body is good conductor of electricity.
4. Switch is used to flow the current in the circuit.
5. Electricity is not useful for us.

C. Encircle of odd one :

1. copper, aluminium, glass, mercury
2. wood, bulb, current, light
3. rubber, safety pins, paper sheet, plastic.

D. Tick (✓) the correct option :

1. One of the following materials is an insulator :
(i) leather (ii) steel (iii) copper
2. The stopping and starting of current flow in a circuit can be controlled by a :
(i) cell (ii) bulb (iii) switch
3. An electrical appliance that keeps electrical circuit off and on is called :
(i) switch (ii) bulb (iii) battery



Creative Work

- Take a discarded electric cell and find out what all it has inside it with.