CHAPTER 14: ELECTRIC CURRENT AND ITS EFFECTS

MODULE – 1 /2

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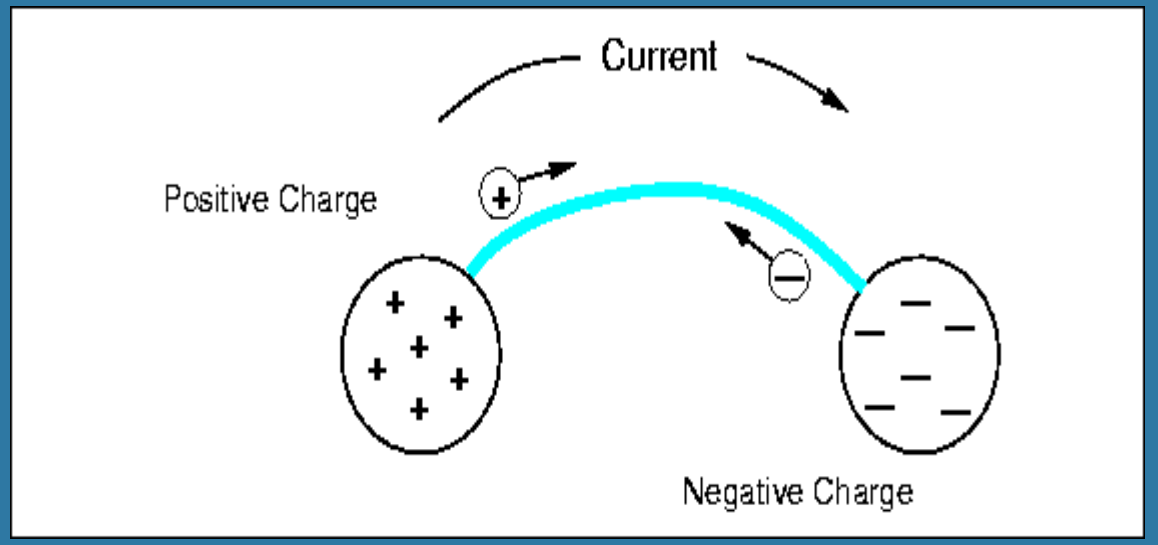
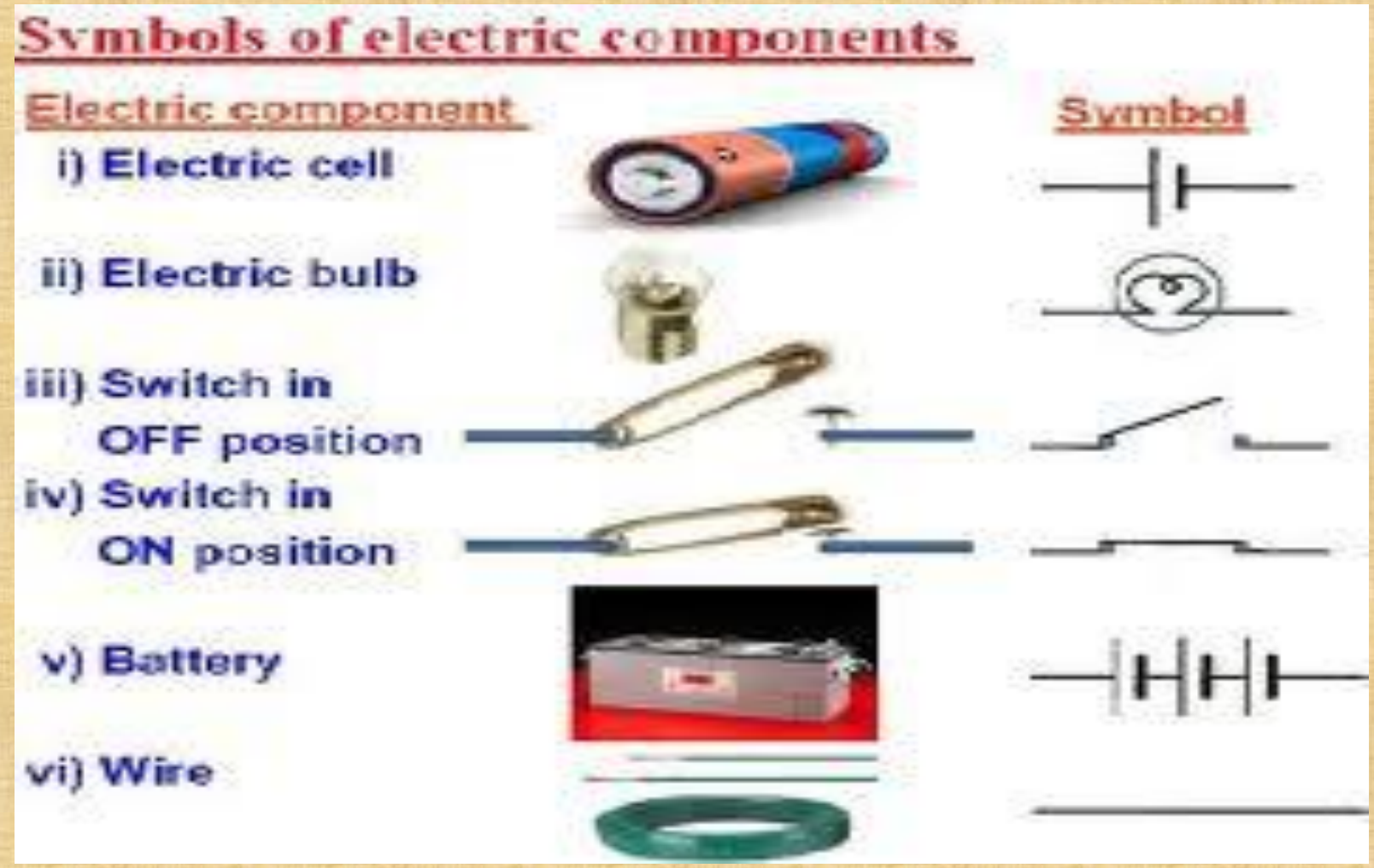
WHAT IS CURRENT ?

- An electric current is the flow of charged particle through a point or region. These charged particles are either positively or negatively charged. Negatively charged electrons are drawn towards positively charged terminal.



SYMBOLS OF ELECTRIC COMPONENTS



- An electric component can be an element of an electric circuit that helps in its function.
- The cell is the source of current in the circuit and shown by symbol of a longer verticle line parallel to another shorter and thicker line , where both the ends are connected with wire. The longer line is termed as positive terminal and the shorter line is termed as negative terminal.
- An electric bulb is added to the circuit to detect the flow of the circuit.

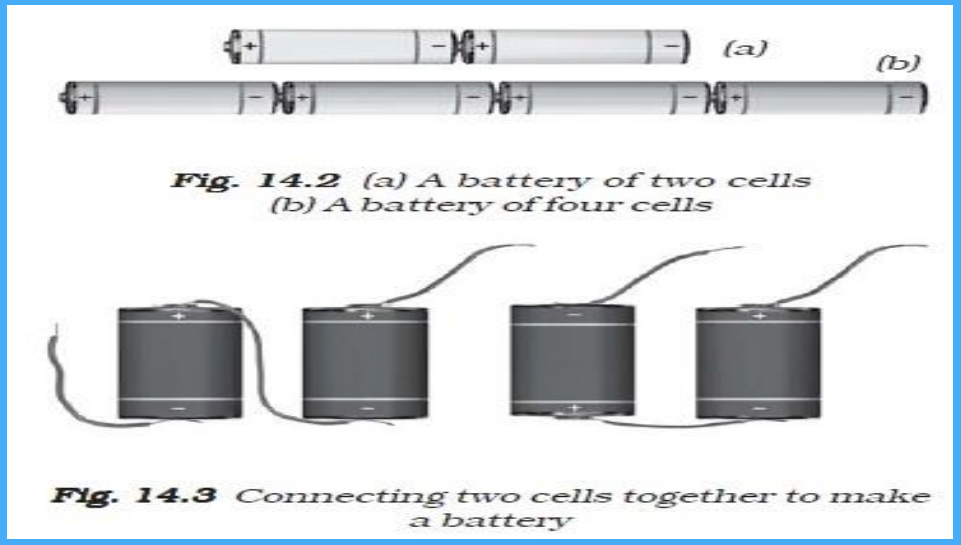
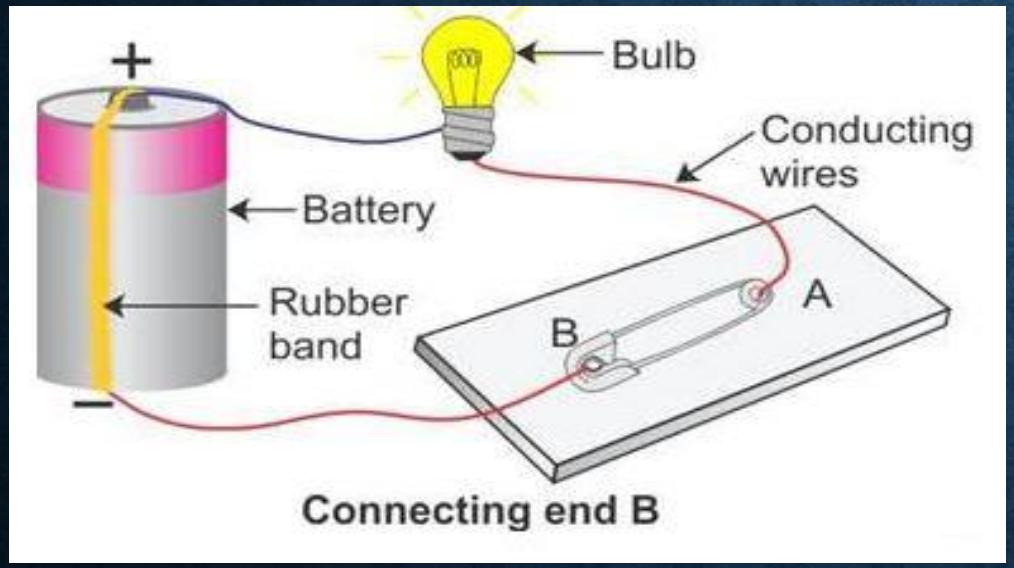


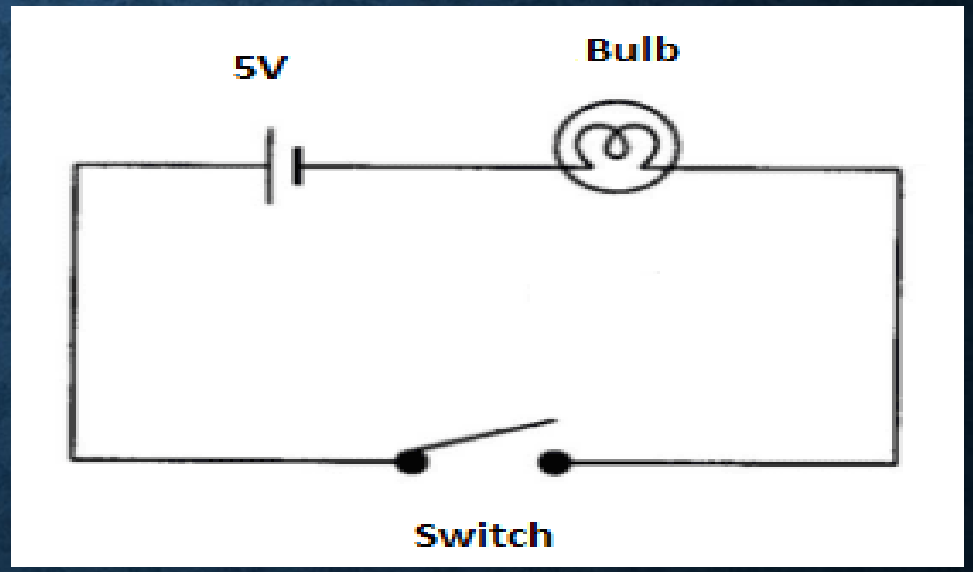
Fig. 14.2 *(a) A battery of two cells (b) A battery of four cells*

Fig. 14.3 *Connecting two cells together to make a battery*

- A battery can be defined as the combination of two or more cells. In a battery, the negative terminal of one cell is connected to the positive terminal of the another cell and so on.
- Batteries are used in several devices like toys, torch, remote etc.
- The wire in circuit is shown by the symbol of a long line.
- Heavy batteries are used in automobiles.

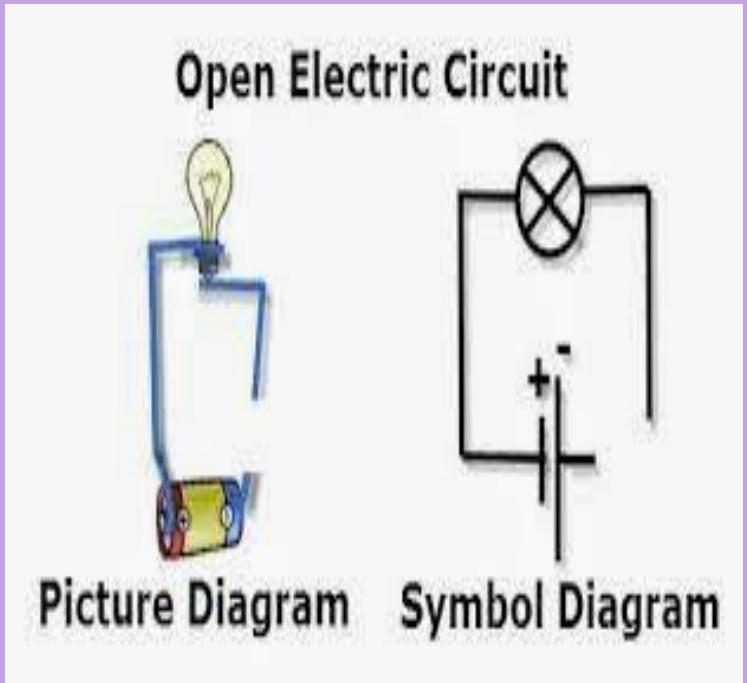
SIMPLE ELECTRIC CIRCUIT





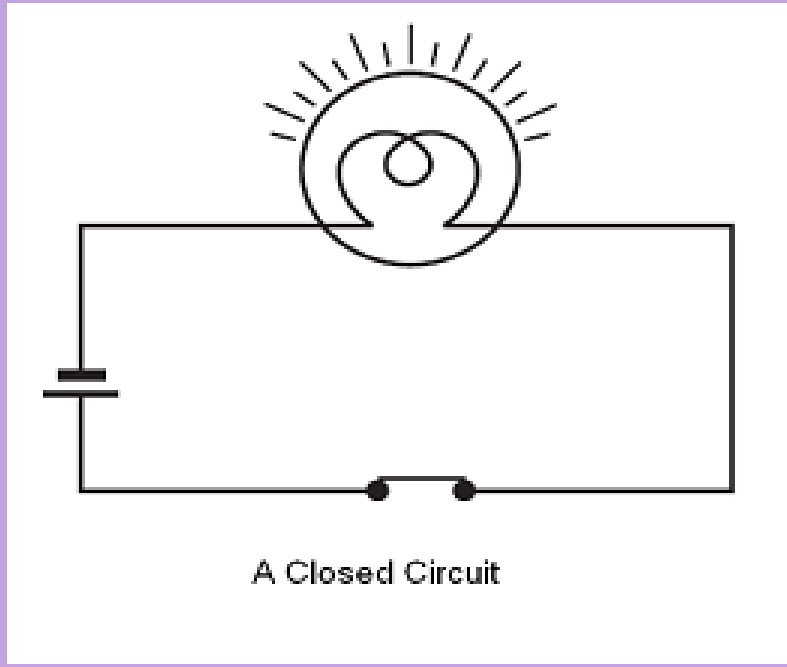
- An electric circuit can be made by using a cell, bulb, connecting wire and a switch.
- An electric circuit can be drawn on the paper with the help of symbols that are used for representing the electronic components. Such a representation of electronic circuit using its symbols is called an electric circuit diagram.
- The electric circuit diagram consists of a switch or key that can be placed anywhere in the circuit.
- Simple electric circuit can be of two types:-

OPEN ELECTRIC CIRCUIT



- When the key is in switch off condition or open the circuit is said to have open electric circuit. The circuit is incomplete so the bulb attached to it does not glow.

CLOSED ELECTRIC CIRCUIT



A Closed Circuit

- When the key is switched on or closed, the circuit is said to be closed or complete. As the circuit is complete, the bulb starts glowing.

What happens when the filament of a bulb breaks?

When the filament of a bulb breaks, the circuit becomes incomplete. Hence, the bulb does not glow.

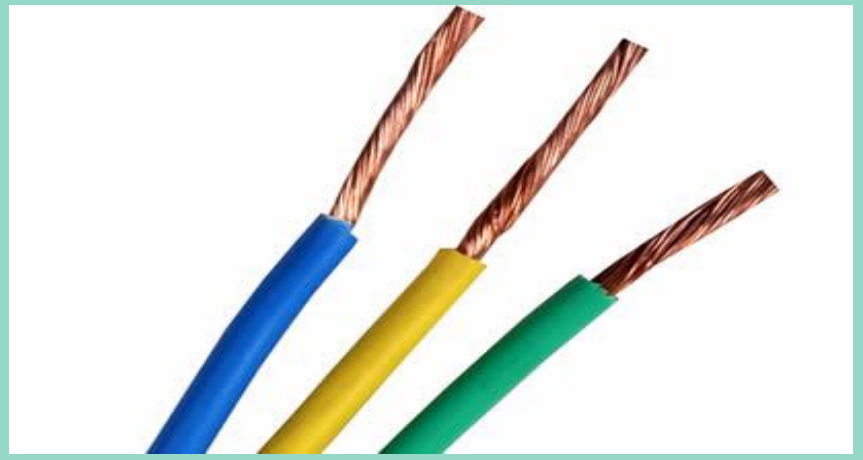
PROPERTIES OF ELECTRIC CURRENT

Heating effects of electric current :

When electric current passes through a wire, the wire gets heated up. This is known as the heating effect of electric current.

The heat produced during the flow of the current depends upon the following factors :--

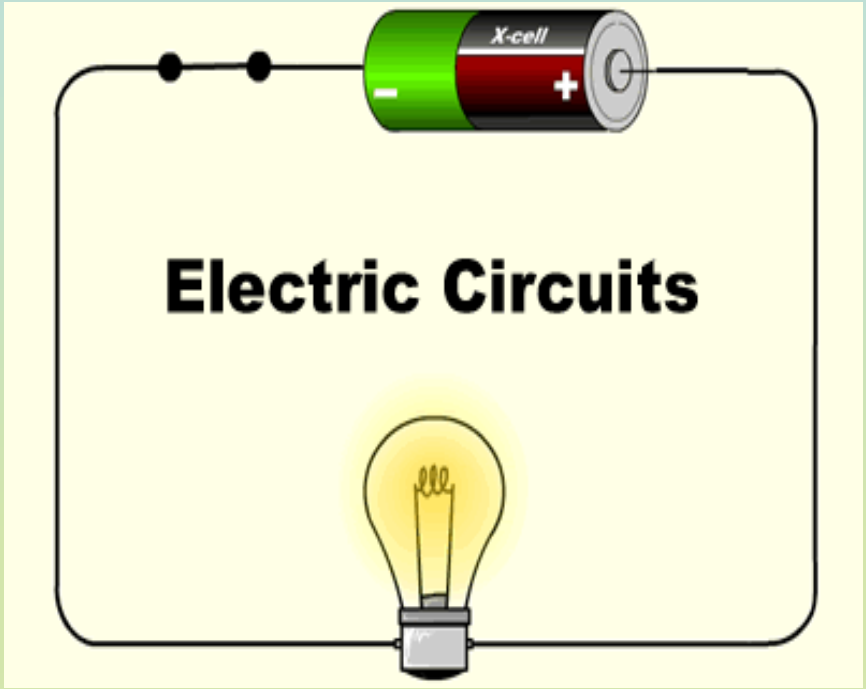
1. The material of the wire
2. The length of the wire
3. The thickness of the wire



Activity : 1

This activity is done to see the heating effect of electric current. To perform the activity , an electric cell, a bulb, a switch, and a connecting wire is required.

A simple circuit is made from using the above equipment . At first when the switch is in 'OFF' position and the bulb does not glow , the bulb is touched .



It is felt that the temperature of the bulb

is normal. Now the switch is put in 'ON' position and let bulb glow for some time, the bulb is touched again . It is felt that the temperature of the bulb has changed.

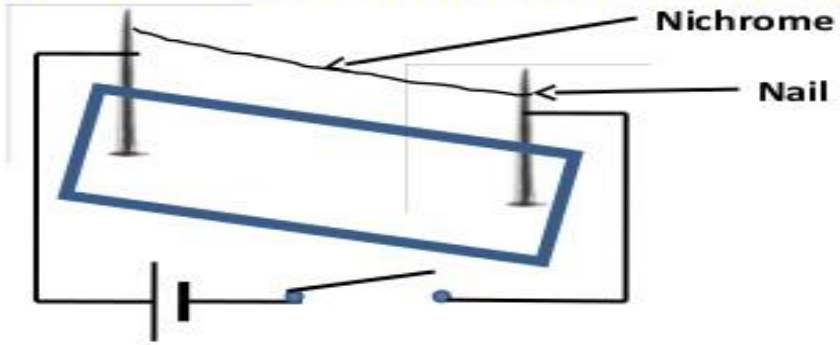
Activity : 2

3) Heating effect of electric current :-

When electric current flows through a wire, the wire gets heated. This is called the heating effect of electric current.

Activity :-

Make an electric circuit as shown in the figure. Take a 10 cm long nichrome wire and tie it between the two nails. Switch on the current. After a few seconds touch the wire. The wire feels hot. Then switch off the current. After a few seconds touch the wire again. It does not feel hot. This shows that when electric current flows through a wire, it gets heated.



- The above activities shows that the electric current has heating property . This effect of the electric current is used in many electronic appliances such as:

  - Electric heater
  - Electric iron
  - Geysers
  - Induction
  - Toaster
  - Hair dryer etc.

All these elements produce a high amount of heat when electricity passes through them. However the amount of heat produced depends upon the requirement of the device. This is so because they contain a coil of wire known as **element**.

Depending upon the amount of heat required by such appliances different types, sizes and length of wire are used in them. Some wires can break down or melt as they get heated.