

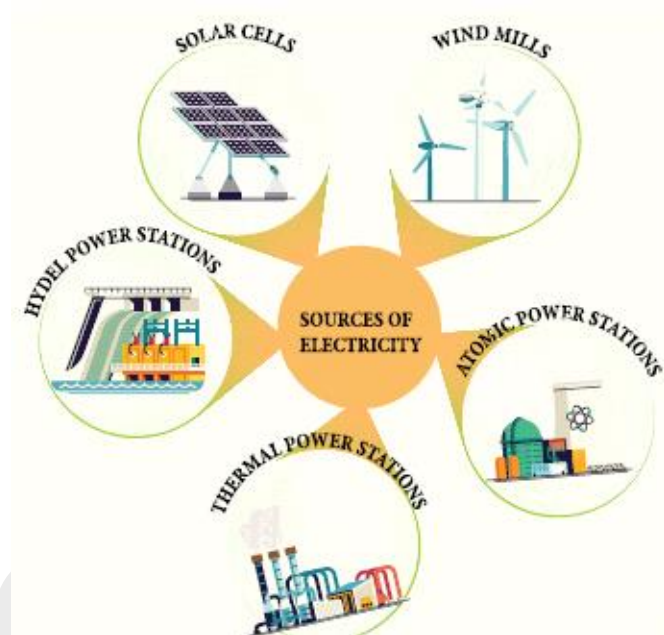
6th Science Lesson 8 Notes in English

8] Electricity

Introduction

- We use electricity in our day to day life.
- They used oil lamps for light, cooked on fires of wood or coal. By the advent of electricity, our day to day works are made easy and the world is on our hands.

Sources of Electricity



The Major Electric power stations in Tamilnadu are:

- Thermal stations (Neyveli in Cuddalore District, Ennore in Thiruvallur District), Hydel power stations (Mettur in Salem District, Papanasam in Tirunelveli District), Atomic power stations (Kalpakkam in Kanchipuram District, Koodankulam in Tirunelveli District), and Wind mills (Aralvaimozhi in Kanyakumari District, Kayatharu in Tirunelveli District).
- Apart from these Solar panels which are prevalent in many places are used to produce electricity.

Thermal Power stations

- In thermal power stations, the thermal energy generated by burning coal, diesel or gas is used to produce steam. The steam thus produced is used to rotate the turbine.
- While the turbine rotates, the coil of wire kept between the electromagnet rotates.
- Due to **electromagnetic induction electricity** is produced. Here heat energy is converted into electrical energy.



Hydel power stations

- In hydel power stations, the turbine is made to rotate by the flow of water from dams to produce electricity.
- Here **kinetic energy is converted into electrical energy**.
- Hydel stations have long economic lives and low operating cost.



Atomic power stations

- In atomic power stations, nuclear energy is used to boil water.



- The steam thus produced is used to rotate the turbine.
- As a result, electricity is produced. **Atomic power stations are also called as nuclear power stations.** Here nuclear energy is converted into mechanical energy and then electrical energy.

Wind mills

- In wind mills, wind energy is used to rotate the turbine to produce electricity.
- Here **kinetic energy is converted into electrical energy.**



Cell

- A device that converts chemical energy into electrical energy is called a cell.
- A chemical solution which produces **positive and negative ions is used as electrolyte.**
- Two different metal plates are inserted into electrolyte as electrodes to form a cell.
- Due to chemical reactions, one electrode gets positive charge and the other gets negative charge producing a continuous flow of electric current.
- Depending on the continuity of flow of electric current cells are classified in to two types. They are primary cells and secondary cells.

Primary Cells

- They cannot be recharged. So they can be used only once. Hence, the primary cells are usually produced in small sizes.

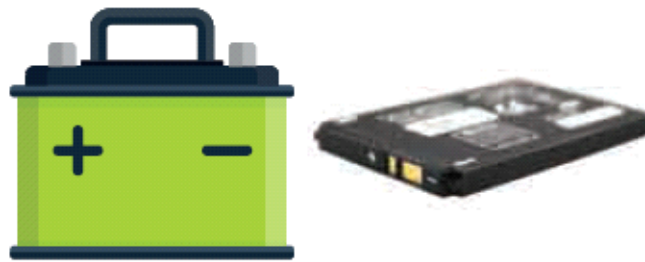
Examples

- Cells used in clocks, watches and toys etc., are primary cells.



Secondary Cells

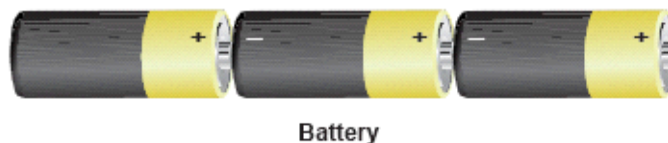
- A cell that can be **recharged many times** is called **secondary cell**.
- These cells can be recharged by passing electric current. So they can be used again and again. The size of the secondary cells can be small or even large depending upon the usage.
- While the secondary cells used in mobiles are in the size of a hand, the cells used in automobiles like cars and buses are large and very heavy.



- **Examples** Secondary Cells are used in Mobile phones, laptops, emergency lamps and vehicle batteries.

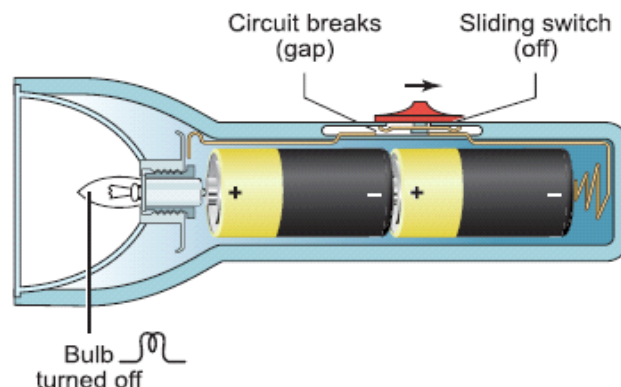
Battery

- Often, we call cells as 'batteries'. However only when two or more cells are combined together they make a battery. A cell is a single unit that converts chemical energy into electrical energy, and a **battery is a collection of cells**.



Electric Circuits

Inside view of torch



- An **electric circuit** is the continuous or unbroken closed path along which electric current flows from the positive terminal to the negative terminal of the battery. A circuit generally has:

A cell or battery

- A source of electric current

Connecting wires

- For carrying current

A bulb

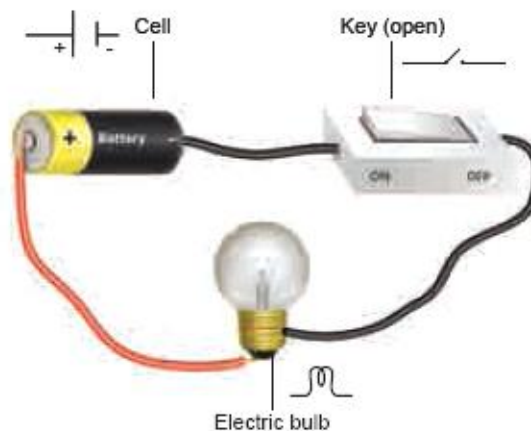
- A device that consumes the electricity

A key or a switch

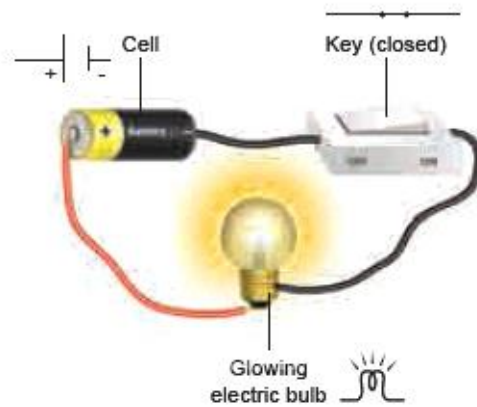
- This may be connected anywhere along the circuit to stop or allow the flow of current.

Open Circuit

- In a circuit if the key is in open (off) condition, then electricity will not flow and the circuit is called an open circuit. The bulb will not glow in this circuit.

**Closed Circuit**

- In a circuit if the key is in closed (on) condition, then electricity will flow and the circuit is called a closed circuit. The bulb will glow in this circuit.

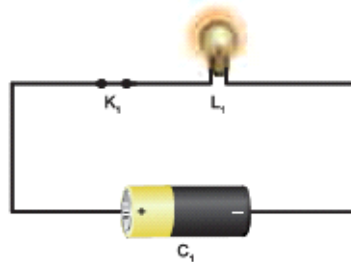


Types of Circuits

1. Simple Circuit
2. Series Circuit
3. Parallel Circuits

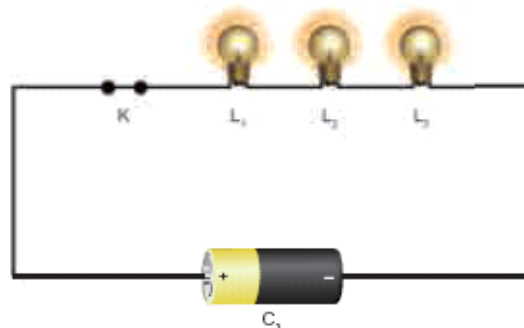
1. Simple Circuit

- A circuit consisting of a cell, key, bulb and connecting wires is called a simple circuit.



2. Series Circuit

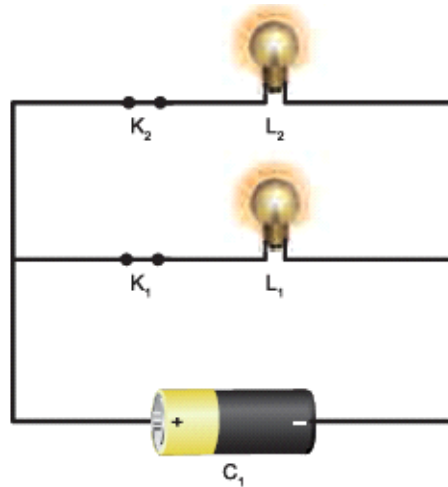
- If two or more bulbs are connected in series in a circuit, then that type of circuit is called series circuit. If any one of the bulbs is damaged or disconnected, the entire circuit will not work.



3. Parallel Circuit

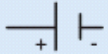
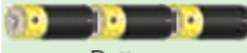
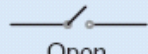
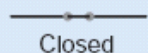
- If two or more bulbs are connected in parallel in a circuit, then that type of circuit is called parallel circuit.

- If any one of the bulb is damaged or disconnected the other part of the circuit will work. So parallel circuits are used in homes.



Symbols of Electric Components

- In the circuits discussed above, we used the figures of electric components. Using electric components in complicated circuits is difficult. So, symbols of the components are used instead of figures.
- If these symbols used in electric circuits, even complicated circuits can be easily understood.

Sl.no.	Electric component	Figure	Symbol	Remarks
1	Electric cell	 Cell		Longer terminal refers positive and shorter terminal refers negative.
2	Battery	 Battery		Two or more cells connected in series
3	Switch-open	 OFF ON	 Open	Switch is in off position
4	Switch-closed	 OFF ON	 Closed	Switch is in on position
5	Electric bulb			The bulb does not glow
				The bulb glows
6	Connecting wires			Used to connect devices.

Conductors

- The rate of flow of electric charges in a circuit is called electric current.
- The materials which allow electric charges to pass through them are called conductors.** Examples: Copper, iron, aluminum, impure water, earth etc.,



Insulators (Non-Conductors)

- The materials which do not allow electric charges to pass through them are called insulators or non-conductors.
- Examples: plastic, glass, wood, rubber, china clay, ebonite etc.,



More to know:

- **Electric Eel** is a kind of fish which is able to produce electric current.
- This fish can produce an electric shock to safeguard itself from enemies and also to catch its food.
- Ammeter is an instrument used in electric circuits to find the quantity of current flowing through the circuit. This is to be connected in series.



- **Thomas Alva Edison (February 11, 1847 – October 18, 1931)** was an American inventor. He invented more than 1000 useful inventions and most of them are electrical appliances used in homes. He is remembered for the invention of electric bulb.