Chapter 8

Electricity

LESSON PLAN

SPECIFIC OBJECTIVES

Students will learn about

- brief history of electricity and electrostatics
- commonly used electrical terms
- electrical energy
- electric power
- household consumption of electrical energy
- supply of electricity to a house
- earthing (grounding) of appliances
- hazards of electricity
- static electricity
- charged and uncharged bodies – charging by friction
- electrostatic attraction and repulsion
- electroscope and gold leaf electroscope
- atmospheric electricity
- Franklin's experiment and how is lightning caused
- lightning conductor

Teaching Aids

Pictures/models showing electric circuit in which electric current flows, current flow through a resistor; a chart showing power ratings of few common electrical devices/appliances/gadgets; a schematic diagram showing household electric circuit and different parts used in it; few pictures showing static electricity; essential materials used to make gold leaf electroscope; few diagrams showing atmospheric electricity.

Teaching Strategy

- The teacher should ask the students to study the introduction of electricity and static electricity or electrostatics. He/She should ask the students to study commonly used electrical terms, i.e., electric current, electric potential difference, resistance and resistor.

- The teacher should teach the students about electrical energy, its SI unit and related formulae.
- Students should be asked to study electric power, its SI unit and related formulae. They should also be asked to study about various multiples of watt.
- Students should be taught by the teacher about power rating of electrical appliances. They should also be asked to learn Table 8.1 showing power ratings of some common electrical devices and asked to practice numerical problems related to it.
- Students should be asked to learn household consumption of electrical energy, related formulae and also be asked to practice related numerical problems.
- Students should be asked to perform activity 1 showing to estimate monthly consumption of electricity in your home. They should be asked to learn question-answer and something more given at page 130. They should also be asked to solve check point 1 given at page 130.
- The teacher should ask the students to learn supply of electricity to a house. He/She should ask the students to learn live, neutral and earth wires. He/She should ask the students to study colour code of line wires. He/She should also ask the students to learn Table 8.2 showing important facts about three wires of a supply line.
- Students should be asked to study a schematic diagram of a household electric circuit with the given diagram and matter. They should be asked to study electric meter, switch, plugs and sockets, fuse and Miniature Circuit Breaker (MCB). They should be asked to study earthing (grounding) of appliances; hazards of electricity; safety rules for the safe use of electricity at home. They should also be asked to learn question-answer related to overloading and ISI mark given at page 134.
- The teacher should ask the students to solve check point 2 given at page 135. He/She should ask the students to study static electricity; charged and uncharged bodies–charging by friction. He/She should also ask the students to perform activity 2 showing electrification by rubbing given at page 135; activity 3 showing that charges develop on both the bodies when rubbed vigorously with each other given at page 136.
- The teacher should ask the students to study electric charges, i.e., positive and negative charges. He/She ask the students to learn question-answer related to electric charges given at page 136. He/She should also ask the students to study electrostatic attraction and repulsion and related activities 4 and 5 given at page 137.
- Students should be asked to learn question-answer related to attraction between charged and uncharged body given at page 137; repulsion is the sure test of electrification; conservation of electric charge; activity 6 showing that equal and opposite charges are produced on rubbing two bodies given at page 138; explanation of charging on rubbing and related something more given at page 139.
- The teacher should ask the students to study methods of charging a conductor, i.e., charging by conduction and charging by induction and its related activities 7 and 8 given at pages 139–140. He/She should ask the students to learn Table 8.3 showing the differences between charging by conduction and charging by induction given at page 140. He/She should also ask the students to solve check point 3 given at page 141.
- Students should be asked to study electroscope and its related activities 9 and 10 given at page 141. They should also be asked to study gold leaf electroscope, its uses and related

activities 11, 12 and 13 given at pages 142–143. They should be asked o study atmospheric electricity, Franklin's experiment and how is lightning caused with illustration also. They should also be asked to study lightning conductor, its illustration and related something more given at page 145. They should be asked to solve check point 4 given at page 146.

- Students should be asked to study wrapping it up and know these terms to recap the whole chapter. They should also be asked to answer the questions given in test yourself and discuss the think zone given in it.

Boost UP

- The teacher should call each student of the classroom one-by-one and ask each one to tell the definition of current electricity and static electricity.
- The teacher should ask the students to define electric current and to tell its SI unit. He/She should also ask the students to define potential difference and resistance, and to tell their SI unit and related formulae.
- The teacher should ask each student of the class to define electrical energy and electric power, and to tell their SI units and related formulae.
- The teacher should ask the student to tell the answer of the questions related to household consumption of electrical energy and supply of electricity to a house.
- Students should be asked to tell the colours of all the three wires, i.e., live, neutral and earth wires.
- Students should be asked to answer the questions related to colour code of line wires, parts of household circuit, i.e., electric meter, switch, plugs and sockets, fuse and MCBs. They should also be asked to tell the answer of questions related to earthing of appliances, hazards of electricity, static electricity, charged and uncharged bodies – charging by fiction, electrostatic attraction and repulsion; electroscope, gold leaf electroscope, atmospheric electricity, lightning conductor.

Expected Learning Outcomes

Students will be able to know the

- definition of electricity and static electricity.
- definition of commonly used electrical terms.
- details of electrical energy and electric power.
- household consumption of electrical energy.
- supply of electricity to a house.
- earthing of appliances.
- hazards of electricity.
- static electricity.
- charged and uncharged bodies – charging by friction.
- electrostatic attraction and repulsion.
- electroscope and gold leaf electroscope.
- atmospheric electricity.

- Franklin's experiment.
- how is lightning caused.
- lightning conductor.

Evaluative Questions

The teacher should ask the following questions to evaluate the students.

1. Define electricity.
2. What is the SI unit of electric current?
3. What is meant by resistor?
4. Establish the relationship between voltage, current and time.
5. How many watts equal to 1 kilowatt?
6. What is meant by 1 kW h?
7. Which wire is also called phase wire?
8. Name the safety device which limits the current in an electric circuit.