

SUBJECT:PHYSICS
TOPIC: ELECTRIC CURRENT AND ITS EFFECTS

DIARY- LESSON PLAN

Pre- Content/Content / Post –content	Learning Outcome/Objectives	
	<u>General</u>	<u>Specific</u>
Pre Content: Students know that how do objects move? Teacher will ask questions and motivate the students and introduce the lesson by recalling everyday Teacher will ask questions and motivate the students and introduce the lesson. Content: • Electric current and circuit • Heating effect of current • Magnetic effect of current • Electromagnet • Electric bell Post-content: The student at the end of the chapter should be able to comprehend the following concepts. • How to construct an electric circuit • Discuss the heating and magnetic effect and its applications. • Elaborate that a current carrying coil of an insulated wire wrapped around a piece of iron is called an electromagnet. • Uses of electromagnet	Students will be able to: • recall the term electric circuit • apply the concept of heating effects of electric current • apply the concept of magnetic effects of electric current. • explain the concept of electromagnet • interpret the working of an electric bell • application of the concept in our daily life	Students will be able to: • develop the definition of electric current • list the components of an electric circuit • identify the symbols of the components • identify different devices used to produce heat. • appraise the practical importance of these devices • discuss the terms short circuiting and overloading • identify the safety precautions required in the use of electricity. • discuss about a coiled wire carrying current behaves like a magnet. • distinguish between an electromagnet and a permanent magnet • identify the uses of electromagnet in daily life. • discuss the construction and working of an electric bell. • correlate and apply in daily life situations

Home Work / Assignments

- Worksheets and assignments.
- Question answers from text-book

AND PROGRESS

MONTH: DECEMBER
CLASS: VII

Teacher's Activity	Student's Activity	Teacher's Observation and Remedial action taken
Teacher will: take up the brainstorming session and previous knowledge of the students will be tested by asking the different types of questions based on electricity. Explain how to make an electric circuit <u>Annexure 14 (A):</u> demonstrate an activity to show the heating effect of electric current <u>Annexure 14 (B):</u> demonstrate an activity to show the magnetic effect of electric current. <u>Annexure 14 (C):</u> demonstrate an activity to show how to make an electromagnet. Explain and discuss the working of an electric bell. Give real life situations to understand the importance of electricity and the working of various appliances	Students will: participate in the interactive session and brainstorming session. follow the instructions and construct an electric circuit and draw a circuit diagram for the same <u>Annexure 14 (a):</u> perform the activity and record their observations. <u>Annexure 14 (b):</u> perform the activity and record their observations. <u>Annexure 14 (c):</u> follow the instructions given by the teacher and record their observations. understand the principle behind the working of an electric bell apply their knowledge to solve the questions	

Teaching Aids – Active Inspire boards, ICR, Materials required for activities, worksheets and textbook, Activity Kits

Methodology / Innovative Methods: Activity based teaching, Know to Unknown, Discussions, Activity method, brainstorming sessions.

Interdisciplinary Links –

- **English** – It will improve the power of expression while explaining the activity and also vocabulary.
- Linked with real –life

HOD

Coordinator

Vice-Principal

Principal

ACTIVITY-14(A) & (a)

ELECTRIC CURRENT AND ITS EFFECTS

Class: VII

Duration-30 minutes

Nature of activity: Group

Learning Outcome: Students will be able to examine that the when current flows through a wire it generates heat, which is known as heating effect of electric current. More the amount of heat flow, more will be the heating effect.

What we have to do?

To observe the heating effects of electric current.

What do we require?

1.5 V cell, Cell holder, Switch, Nichrome wire, a candle.

What do I need to know?

A closed circuit allows the current to flow through it.

Teacher's Activity: The teacher will arrange ten kits. Each kit will have the following things – one 1.5 V cell, Cell holder, switch, Nichrome wire and a candle for each of the ten groups. Teacher will give instructions regarding the activity.

How will you proceed?

Student's Activity:

1. Take about 20 cm long Nichrome wire. Wrap it over a candle uniformly so that each turn is separate from the other. Now you have made a coil with the candle as its core.
2. Connect one end of this wire with the positive terminal of the battery and complete the electric circuit.
3. Insert the switch in a plug. The electric circuit is closed now.
4. Observe the candle for 5 minutes. Does it start melt around the wire?

What have you observed?

Melting of the wax	After 1 min	After 5 min

What have you learned?

- Electric current produces _____ effect in the wire which causes the wax to melt. More the current flows through the wire _____ will be the _____ effect.

What more can we do?

- The activity can be repeated with wires of different lengths and materials.
- The activity can be repeated with batteries of 1.5 V, 3V, 4.5V and report their observations.
- Discussions may be initiated with students on the following points:
 - Does the heat produced in the wire depend on its length?
 - Does the heat produced on the material of the wire?
 - Does the heat produced depend the number of cells used?

ELECTRIC CURRENT AND ITS EFFECTS

ACTIVITY-14 (B) & (b)

Class: VII

Duration-30 minutes

Nature of activity: Group

Learning Outcome: Students will be able to verify that when current flows through a wire it behaves like a magnet and this effect is known as magnetic effect of electric current. The magnet generated by this process is known as an electromagnet and its strength can be increased by increasing the number of turns of the wire.

What we have to do?

To observe how the strength of an electromagnet depends upon the number of turns of the wire.

What do we require?

10 cm long three iron bolts, enamelled copper wire, a battery of two cells, a switch, shoe nails about 100 g, plastic pipe (10cm), and paper.

What do I need to know?

When electric current is passed through a coil it produces magnetism and it is known as an electromagnet.

Teacher's Activity: The teacher will arrange ten kits. Each kit will have the following things – 10 cm long three iron bolts, enamelled copper wire, a battery of two cells, a switch, shoe nails about 100 g, plastic pipe (10cm), and paper for each of the ten groups. Teacher will give instructions regarding the activity.

How will you proceed?

Student's Activity:

1. Make three electromagnets with 20, 40, and 60 turns. For this wind the enamelled copper wire tightly around the iron bolt in the form of a coil.
2. Rub the free ends of the wire of each electromagnet with the sand paper to remove the enamel coating.
3. Connect the electromagnet with 20 turns to a battery of 2 e end of the bolt and switch.
4. Place some shoe nails near the end of the bolt and switch on the current. What happens? Do the nails cling to the bolt? Count the number of nails attracted by this electromagnet.
5. Switch off the current. Now the coil loses most of its magnetism. A few nails may still cling to the electromagnet.
6. Repeat this activity with the other electromagnets of 40 and 60 turns with the same set –up.
7. Wind 60 turns of the enamelled copper wire around a plastic pipe instead of an iron bolt and observe if it acts as an electromagnet. Note the number of iron nail it attracts.

What have you observed?

- The electromagnet _____ its magnetism when the electric current is switched off.
- Number of nails attracted by the electromagnet having 40 turns is _____ than the number of nails attracted by the electromagnet having 20 turns. Also the number of nails attracted by the electromagnet having 60 turns is _____ than the number of nails attracted by the electromagnet having 40 turns.

What have you learned?

- A current carrying coil of wire wrapped around a piece of iron works as an _____ and its strength depends upon _____ wire and the core used to make the electromagnet.

What more can we do?

- Repeat this activity by replacing the battery of two cells by a battery of three cells and find out if there is any change in the strength of the electromagnet.

Extended learning worksheet

Answer the following questions:

1. Name three electrical appliances in which heating effect of current is desirable.

_____.

2. Name three electrical appliances in which heating effect of current is undesirable.

_____.

3. Why do we use iron for making electromagnet and not steel?

_____.

4. What is the common name of the magnet made by using current?

_____.

5. Name any two device where electromagnets are used.

_____.

6. Which of the two is used to load heavy iron girders on to a ship- an electromagnet or a permanent magnet?

_____.

ANNEXURE -14(C) & (c) -OERSTED CONCEPT

Subject	Science
Class	VII
Chapter/Unit	Electric current and its effects
Topic	Magnetic effect of electric current
Time	30 minutes
Nature of Activity	Individual

What will I learn (Learning Outcome)?

- To make an electromagnet.

Skills:

- Observing, Understanding, Applying

What I have to do?

- To make a model of an electromagnet.

.What do I require?

- Long iron nail, dry cell, switch, copper wire, steel pins.

What do I need to know?

A coil of wire acts as a magnet when current flows through it. If the coil is wound around a soft iron core such as an iron nail, the magnetic effect increases several times.

A coil wound around an iron core which acts as a magnet as long as an electric current flows through the coil, is called an electromagnet.

➤ Teacher's Activity

Teacher will

1. explain that a coil of wire acts as a magnet when current flows through it and this is known as magnetic effect of electric current. A coil wound around an iron core which acts as a magnet as long as an electric current flows through the coil, is called an electromagnet.
2. arrange the materials for the individual
3. give instructions regarding the activity.

How will I proceed?

➤ Student's Activity

1. Wind some insulated copper wire around an iron nail.
2. Connect the ends of the wire to a dry cell through a switch.
3. Switch 'ON' the circuit and bring steel pins near the nail and observe.
4. Now switch 'OFF' the circuit and observe again.

What have I observed?

Observation	Switch 'ON'	Switch 'OFF'
Position of the steel pins		

What have I learnt?

- When current is flowing through the wire the steel pins are _____ and when the current stops flowing the steel pins _____. So, we can make an electromagnet by utilizing the _____ effect of electric current.

What am I curious to learn?

- Let us carry out an activity of making an electric bell.
- To repeat this activity by replacing the battery of two cells, by a battery of three cells and find out if there is any change in the strength of the electromagnet.

Let me evaluate myself

1. Name three electrical appliances that utilize the magnetic effect of electric current.

Ans. _____.

2. Mention any two uses of electromagnet.

Ans. _____.

3. Why do we use iron for making electromagnet and not steel?

Ans. _____.

4. An electromagnet is made by winding an insulated copper wire on an iron cylinder. Why should the copper wire be insulated?

Ans. _____.

5. Which of the two is used to load heavy iron girders on to a ship- an electromagnet or a permanent magnet?

Ans. _____.