

SUBJECT:PHYSICS
TOPIC: HEAT

DIARY- LESSON PLAN

Pre- Content/Content / Post –content	Learning Outcome/Objectives	
	<u>General</u>	<u>Specific</u>
Pre Content: Students know that heat when added to substance becomes hot (during boiling of water), similarly if you take away heat from an object it becomes cold (as in refrigerator) Content: - Heat: Form Of Energy - Temperature: Need Of Measurement of temperature. - Thermometers: Clinical and Laboratory Thermometers, - Difference between them and proper use of thermometers - Transfer of heat :mode of transfer-conduction, convection and radiation - Conductors and Insulators - Formation of Sea Breeze and Land Breeze. Post Content: The student at the end of the chapter should be able to comprehend the following concepts. - List the types of heat transfer - Distinguish between hot and cold objects and understand the reason for them	Students will be able to: evolve the definition of Heat and Temperature. observe and appreciate the use of Clinical and Laboratory Thermometers. differentiate between Convection, Conduction and Radiation develop the definition of the terms Conductors and Insulators. explain the process of formation of Land Breeze and Sea Breeze. application of the concept in our daily life,	Students will be able to: develop the concept of Heat as a form of energy. appraise temperature as a degree of hotness and coldness differentiate between Clinical and Laboratory thermometer. list various modes of transfer of heat classify substances into Conductors and Insulators differentiate between the process of Land Breeze and Sea Breeze. correlate and apply in daily life situation.

Home Work / Assignments

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

AND PROGRESS

MONTH: APRIL

CLASS: VII

Teacher's Activity	Student's Activity	Teacher's Observation and Remedial action taken
Teacher will: Introduce the topic by asking thought provoking, imaginative and interesting questions to enhance the participation and the interest of the students. explain the concept that hotness and coldness are relative terms ask the students to measure the body temperature of their family members. explain the concept of how to use a Laboratory thermometer for measuring temperature explain an activity to show the different modes of heat transfer by- <u>Annexure 4 (A):</u> Conduction <u>Annexure 4 (B):</u> Convection and <u>Annexure 4 (C):</u> Radiation. explain the concept of Conductors and Insulators with examples explain the concept of Land Breeze and Sea Breeze	Students will: actively participate in the discussion and share their views. participate in the discussion and relate their experiences. actively participate in the activity and complete table 4.2 on page No. 37 (NCERT) comprehend how to use a Laboratory thermometer <u>Annexure 4 (a):</u> observe the activity and record their observation. <u>Annexure 4 (b):</u> observe the activity and record their observation <u>Annexure 4 (c):</u> observe the activity and record their observation. define Conductors and Insulators compare them both and draw their diagrams.	

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**- Improves expression and vocabulary
- **Art** – Creative skills will be developed

HOD

Coordinator

Vice-Principal

Principal

ANNEXURE-4(A) & (a)

Class: VII

Duration-30 minutes

Nature of activity: Individual

Learning Outcome: Students will be able to distinguish that there are three different modes by which heat is transferred from a hot body to a cold body. These are conduction, convection and radiation. Conduction takes place in solids whereas convection takes place in liquids and gases.

What we have to do?

To show that heat travels through solids by conduction.

What do we require?

A flat copper rod, wax, an iron stand, iron nails and a burner.

What do we need to know?

Conduction is the process of transfer of heat in a body from the hotter end to the colder end without any actual movement of the molecules of the material.

How will you proceed?

- **Teacher's Activity:** Teacher will arrange the materials for the individual and give instructions regarding the activity.
- **Student's Activity:**
 1. Take a flat copper rod and fix some small iron nails at equal gaps on it with the help of molten wax.
 2. This copper rod (along with its nails) is clamped to the iron stand.
 3. Place a burner at the free end of the copper rod.

What have you observed?

First Nail

Last Nail

Which drops at first? _____

What have you learned?

The heat is transferred in solids from the _____ end to its _____ end by the process of _____.

What more can we do?

- We can repeat this activity with any other metallic rods instead of copper as they are conductors.

ANNEXURE-4(B) & (b)

Class: VII

Duration-30 minutes

Nature of activity: Individual

Learning Outcome: The students will be able to distinguish that there are three different modes by which heat is transferred from a hot body to a cold body. These are conduction, convection and radiation. Conduction takes place in solids whereas convection takes place in liquids and gases.

What we have to do?

To show that liquids transfer heat by convection.

What do we require?

A round bottom flask containing water, potassium permanganate, a spatula, a burner and an iron stand.

What do we need to know?

The process of transfer of heat in a liquid or gas by the actual movement of particles of the liquid or gas is called convection.

How will you proceed?

- **Teacher's Activity:** Teacher will arrange the materials for the individual and give instructions regarding the activity.
- **Student's Activity:**
 1. Take a round –bottom flask and fill it two-third with water.
 2. A small crystal of potassium permanganate is dropped gently using a spatula at the bottom of the flask.
 3. The crystal dissolves slowly and forms a purple coloured solution around itself.
 4. Heat the water by using a burner and observe the movement of the purple-coloured solution.

What have you observed?

What have you learned?

When the hot water at the bottom of the flask near the flame gets heated, it _____ and becomes _____ and rises _____. The cold water present on the surface moves _____ towards the source of heat. This mode of heat transfer in liquids is known as _____.

Extended learning worksheet

Answer the following questions:

1. Why are convection currents seen in liquids and gases and not in solids?

2. What materials would you use to make a handle for cooking utensil? Justify your answer.

3. What determines the direction of flow of heat between two objects in contact?

_____.

4. Fill in the blanks

- a) If a hot iron spoon is put in water at room temperature, heat flows from the _____ to _____ end. As a result, the temperature of _____ increases while the temperature of _____ decreases.

5. Name the mode of heat transfer in each of the following cases:

- a) In a vessel of boiling water.
- b) A vessel kept on a hot stove becomes hot.
- c) Warm breeze from the land flows towards the sea.
- d) A spoon kept in a hot tea cup becomes warm.

6. Write true or false:

- a) Convection is the primary mode of heat transfer in solids.
- b) The rate of conduction of heat is different in different materials.
- c) The sun's heat reaches us by radiation.
- d) All bodies absorb radiant heat.
- e) Light coloured clothes absorb more heat than dark coloured clothes.

ANNEXURE-4(C) &(c)-LIGHT AND DARK

Subject	Science
Class	VII
Chapter/Unit	Heat
Topic	Modes of heat transfer
Time	30 minutes
Nature of Activity	Individual

What will I learn (Learning Outcome)?

To study the radiation from different surfaces.

Skills: Analysing and Applying

What I have to do?

To study radiation from different surfaces.

What do I require?

Two metal tins with lids, two thermometers, black paint.

What do I need to know?

The transfer of heat from one body to another without the help of an intermediate medium and without heating the medium through which it passes is called radiation. The amount of heat radiated by a body depends on its temperature, color and nature of its surface.

➤ Teacher's Activity

Teacher will

1. explain that heat can be transferred in three different ways- conduction, convection and radiation.
2. arrange the materials for the individual .
3. give instructions regarding the activity.

How will I proceed?

➤ Student's Activity

1. Take two tins with tight fitting lids and make holes in the lids to hold thermometers.
2. Remove any labels that the tins may have. Paint one tin black and leave the other one shiny.
3. Pour equal quantities of boiling water into the two tins.
4. Note the temperature with the help of thermometers after five minutes.

What have I observed?

S. No.	Temperature of the surface	Black surface	Shiny surface
1	At the beginning of the experiment		
2	After 5 minutes		

What have I learnt?

The temperature drop in the black tin is _____ than in the shiny tin. This is because a black surface _____ more heat quickly than a shiny surface, does, that is, a black surface is a _____ radiator while a shiny surface is a _____ radiator.

What am I curious to learn?

- Let us place the set up in the sunlight and see the difference in temperature after thirty minutes to show that a black surface absorbs more heat than a white surface.

Let me evaluate myself

Q1. What are the three ways of transferring of heat?

Ans. _____

Q2. Can the transfer of heat by convection occur in solids? Justify your answer.

Ans. _____

Q3. On what factors does the heat radiated by a hot body depends?

Ans. _____

Q4. When we come out in the sun, we feel warm. How does the heat from the sun reach us?

Explain the mode of transfer of heat.

Ans. _____

Q5. Have you wondered that the color of the school uniform in summers is light whereas in the winters it is dark? Explain the reason behind this.

Ans. _____
_____.