

SCIENCE
ACTIVITY-1(A)
HEAT

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.

Teacher's Activity: Teacher will arrange the materials for the individual and give instructions regarding the activity.

How will you proceed?

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.

ACTIVITY-1(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.

Teacher's Activity: Teacher will arrange the materials for the individual and give instructions regarding the activity.

How will you proceed?

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.

