

UNIT

7

HEAT

Learning Objectives

After completing this lesson, students will be able to:

- understand the nature and the effects of heat.
- differentiate the conducting powers of various substances.
- list out good and bad conductors of heat and their uses.
- explain conduction using kinetic theory.
- describe the experiments to show convection in fluids.
- understand the concept of radiation.
- define specific heat capacity and thermal capacity.
- describe the concept of change of state.
- define specific latent heat of fusion and specific latent heat of vaporisation.



Introduction

All substances in our surrounding are made up of molecules. These molecules are generally at motion and possess kinetic energy. At the same time each molecule exerts a force of attraction on other molecules and so they possess potential energy. The sum of the kinetic and potential energy is called the internal energy of the molecules. **This internal energy, when flows out, is called heat energy.** This energy is more in hot substances and less in cold substances and flows from hot substances to cold substances. In this lesson you will study about how this heat transfer takes place. Also you will study about the effect of heat, heat capacity, change of state and latent heat.

7.1 Effects of Heat

When a substance is heated, the following things can happen.

Expansion: When heat is added to a substance, the molecules gain energy and vibrate, and force other molecules apart. As a result, expansion takes place. You would have seen some space being left in railway tracks. It is because, during summer time, more heat causes expansion in tracks. Expansion is greater in liquids than solids and it is maximum in gases.



Figure 7.1 Gap in railway track

Change in State: When you heat ice cubes, they become water and water on further heating changes into vapour. So, solid becomes liquid and liquid becomes gas, when heat is added. The reverse takes place when heat is removed.