

UNIT

2

MOTION

Learning Objectives



After completing this lesson, students will be able to:

- list the objects which are at rest and which are in motion.
- understand distance and displacement.
- determine the distance covered by an object describing a circular path.
- classify uniform motion and non-uniform motion.
- distinguish between speed and velocity.
- relate accelerated and unaccelerated motion.
- deduce the equations of motion of an object from velocity – time graph.
- write the equations of motion for a freely falling body.
- understand the nature of circular motion.
- identify centripetal force and centrifugal force in day to day life.

Introduction

Motion is the change in the position of an object with respect to its surrounding. Everything in the universe is in motion. Even though an object seems to be not moving, actually it is moving because the Earth is moving around the Sun. You may see objects moving in your surrounding. Cars along the road, trains along the track and aeroplanes in the sky are all moving. These movements are one type of motion. You may see the fan rotating in the ceiling. This is another type of motion. When you are playing in swing, it moves to and fro. This is also a type of motion. Motion is described in terms of distance, speed, acceleration and time. In this lesson we will study about different types and equations of motion, displacement, velocity and acceleration.

2.1 Rest and Motion

Activity 1

Look around you. You can see many things: a row of houses, large trees, small plants, flying birds, running cars and many more. List the objects which remain fixed at their position and the objects which keep on changing their position.

In physics, the objects which do not change their position are said to be at rest, while those which change their position are said to be in motion. For example, a book lying on a table and the walls of a room are at rest. Cars and buses running on the road, birds and aeroplanes flying in air are in motion. Motion is a relative phenomenon. This means that an