

UNIT

3

LIGHT



Learning Objectives

After the completion of this lesson, students will be able to:

- ◆ acquire knowledge about various types of mirrors.
- ◆ understand image formation in spherical mirrors.
- ◆ know about the applications of spherical mirrors.
- ◆ acquire knowledge about laws of reflection.
- ◆ compare regular and irregular reflections.
- ◆ understand the working principle of kaleidoscope and periscope.
- ◆ understand refraction and dispersion of light.



Introduction

Lofty mountains covered with greenish vegetation, magnificent trees reaching the clouds, beautiful streams drifting down the valleys, bluish sea water roaring towards the coast and the radiant sky in the morning being filled with golden red color, all give delight to our eyes and peace to our mind. But, can we see them all without light? No, because, we can see things around us only when the light reflected by them reaches our eyes. What is light?

Light is a form of energy and it travels in a straight line. You have studied in your lower classes, how it is reflected by the polished surfaces such as plane mirrors. This reflecting property of light is applied in various devices that we use in our daily life. In this lesson, you will study about types of mirrors like spherical mirrors and parabolic mirrors. You will also study about the laws of reflection and the laws of refraction and some of the optical instruments, such as periscope and kaleidoscope, which work on these principles.

3.1 Mirrors

We use mirrors in our daily life for various purposes. Mainly, we use them for beautifying us. The mirror is an optical device with a polished surface that reflects the light falling on it. A typical mirror is a glass sheet coated with aluminium or silver on one of its sides to produce an image. Mirrors have a plane or curved surface. Curved mirrors have surfaces that are spherical, cylindrical, parabolic and ellipsoid. The shape of a mirror determines the type of image it forms. Plane mirrors form the perfect image of an object. Whereas, curved mirrors produce images that are either enlarged or diminished.



Do You Know? Method of coating a glass plate with a thin layer of reflecting metals was in practice during the 16th century in Venice, Italy. They used an amalgam of tin and mercury for this purpose. Nowadays, a thin layer of molten aluminium or silver is used for coating glass plates that will then become mirrors.