



Learning Objectives

At the end of this lesson, students will be able to:

- ◆ state the laws of refraction.
- ◆ list the properties of light.
- ◆ explain the scattering of light and its various kinds.
- ◆ understand the images formed by concave and convex lens.
- ◆ analyze the ray diagram of concave and convex lens.
- ◆ understand the working of human eye and optical instruments
- ◆ solve numerical problems



INTRODUCTION

Light is a form of energy which travels in the form of waves. The path of light is called ray of light and group of these rays are called as beam of light. Any object which gives out light are termed as source of light. Some of the sources emit their own light and they are called as luminous objects. All the stars, including the Sun, are examples for luminous objects. We all know that we are able to see objects with the help of our eyes. But, we cannot see any object in a dark room. Can you explain why? If your answer is 'we need light to see objects', the next question is 'if you make the light from a torch to fall on your eyes, will you be able to see the objects?' Definitely, 'NO'. We can see the objects only when the light is made to fall on the objects and the light reflected from the objects is viewed by our eyes. You would have studied about the reflection and refraction of light elaborately in your previous classes. In this

chapter, we shall discuss about the scattering of light, images formed by convex and concave lenses, human eye and optical instruments such as telescopes and microscopes.

2.1 PROPERTIES OF LIGHT

Let us recall the properties of light and the important aspects on refraction of light.

1. Light is a form of energy.
2. Light always travels along a straight line.
3. Light does not need any medium for its propagation. It can even travel through vacuum.
4. The speed of light in vacuum or air is, $c = 3 \times 10^8 \text{ ms}^{-1}$.
5. Since, light is in the form of waves, it is characterized by a wavelength (λ) and a frequency (ν), which are related by the following equation: $c = \nu \lambda$ (c - velocity of light).

