16 LIGHT

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The world is largely known through the senses. The sense of sight is one of the most important senses. Through it we see mountains, rivers, trees, plants, chairs, people and so many other things around us. We also see clouds, rainbows and birds flying in the sky. At night we see the moon and the stars. You are able to see the words and sentences printed on this page. How is seeing made possible?

16.1 What makes Things Visible

Have you ever thought how we see various objects? You may say that eyes see the objects. But, can you see an object in the dark? It means that eyes alone cannot see any object. It is only when light from an object enters our eyes that we see the object. The light may have been emitted by the object, or may have been reflected by it.

You learnt in Class VII that a polished or a shiny surface can act as a mirror. A mirror changes the direction of light that falls on it. Can you tell in which direction the light falling on a surface will be reflected? Let us find out.

16.2 Laws of Reflection

Activity 16.1

Fix a white sheet of paper on a drawing board or a table. Take a comb and close all its openings except one in the middle. You can use a strip of black paper for this purpose. Hold the comb perpendicular to the sheet of paper. Throw light from a torch through the opening of the comb from one side (Fig. 16.1). With slight adjustment of the torch and the comb you will see a ray of light along the paper on the other side of the comb. Keep the comb and the torch steady. Place a strip of plane mirror in the path of the light ray (Fig. 16.1). What do you observe?

Fig. 16.1 : *Arrangement for showing reflection*

After striking the mirror, the ray of light is reflected in another direction. The light ray, which strikes any surface, is called the **incident ray**. The ray that comes back from the surface after reflection is known as the **reflected ray**.

A ray of light is an idealisation. In reality, we have a narrow beam of light which is made up of several rays. For simplicity, we use the term ray for a narrow beam of light.

Draw lines showing the position of the plane mirror, the incident ray and the reflected ray on the paper with the help of your friends. Remove the mirror and the comb. Draw a line making an angle of 90º to the line representing the mirror at the point where the incident ray strikes the mirror. This line is known as the **normal** to the reflecting surface at that point (Fig. 16.2). The angle

Fig. 16.2 : *Drawing the normal*

between the normal and incident ray is called the **angle of incidence (∠i)**. The angle between the normal and the reflected ray is known as the **angle of reflection (∠r)** (Fig. 16.3). Measure the angle of incidence and the angle of reflection. Repeat the activity several times by changing the angle of incidence. Enter the data in Table 16.1.
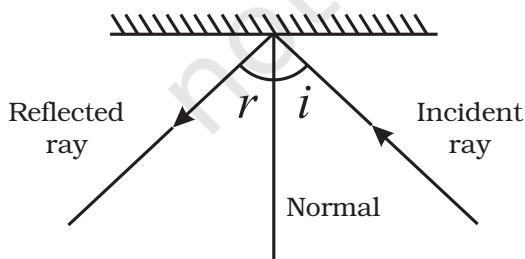

Fig. 16.3 : *Angle of incidence and angle of reflection*

Table 16.1 : Angles of Incidence and Reflection

S. No.	Angle of Incidence (∠i)	Angle of Reflection (∠r)
1.		
2.		
3.		
4.		
5.		

Do you see any relation between the angle of incidence and the angle of reflection. Are they approximately equal? If the experiment is carried out carefully, it is seen that the **angle of incidence is always equal to the angle of reflection**. This is one of the **laws of reflection**. Let us perform another activity on reflection.

What would happen if I threw the light on the mirror along the normal.

Activity 16.2

Perform Activity 16.1 again. This time use a sheet of stiff paper or a chart paper. Let the sheet project a little beyond the edge of the Table (Fig. 16.4). Cut the projecting portion of the sheet in the middle. Look at the reflected ray. Make sure that the reflected ray extends to the projected portion of the paper. Bend that part of the projected portion on which the reflected ray falls. Can you still see the reflected ray? Bring the paper back to the original