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Excercises

1. Suppose you are in a dark room. Can you see objects in the room? Can you see objects outside the room? Explain.
Answer:
We can see any object, when light reflected by that object reaches our eyes. But in the dark room, no light is reflected by the object so we are unable to see objects in dark room. If there is light present outside the room, then we can see the objects outside the room.

2. Differentiate between regular and diffused reflection. Does diffused reflection mean the failure of the laws of reflection?
Answer:

	Regular reflection	Diffused reflection
1.	When all the parallel rays reflected from a plane surface are parallel, the reflection is known as regular reflection	When all the parallel rays reflected from a plane surface are not parallel, the reflection is known as diffused or irregular reflection
2.	It takes place from a smooth or regular surface	It takes place from a rough surface
3.	Images are formed by regular reflection.	Images are not formed by irregular reflection.

The diffused reflection is not due to the failure of laws of reflection but caused by irregularities in the reflecting surface.

3. Mention against each of the following whether regular or diffused reflection will take place when a beam of light strikes. Justify your answer in each case.
(a) Polished wooden table
(b) Chalk powder
(c) Cardboard surface
(d) Marble floor with water spread over it
(e) Mirror
(f) Piece of paper
Answer:
(a) Regular reflection
A polished surface is an example of a smooth surface. A polished wooden table has a smooth surface. Hence, reflections from the polished table will be regular.

(b) Diffused reflection
Chalk power spread on a surface is an example of an irregular surface. It is not smooth. Therefore, diffused reflection will take place from chalk powder.

(c) Diffused reflection
Cardboard surface is also an example of an irregular surface. Hence, diffused reflection will take place from a cardboard surface.

(d) Regular reflection
Marble floor with water spread over it is an example of a regular surface. This is because water makes the marble surface smooth.

Hence, regular reflection will take place from this surface.

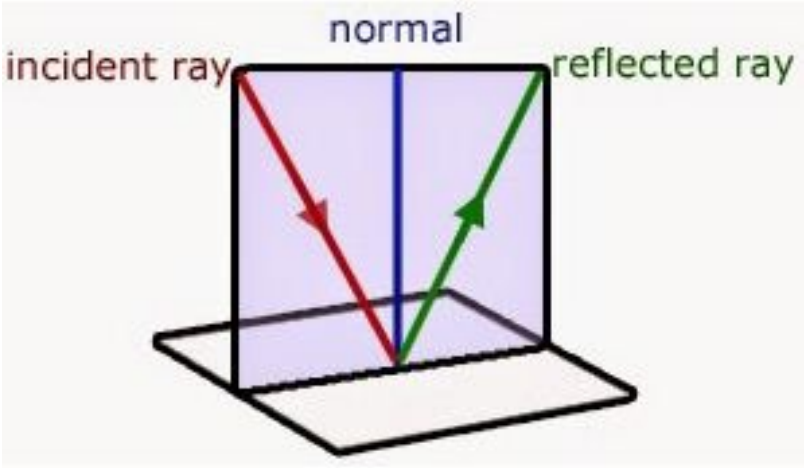
(e) Regular reflection
Mirror has a smooth surface. Therefore, it will give a regular reflection.

(f) Diffused reflection
Although a piece of paper may look smooth, but it has many irregularities on its surface. Due to this reason, it will give a diffused reflection.

4. State the laws of reflection.
Answer:
Laws of reflection are:

1. The angle of reflection is always equal to the angle of iincidence.
2. The incident ray, the reflected ray and the normal to the reflective surface at the point of incidence all lie in the same plane.

5. Describe an activity to show that the incident ray, the reflected ray and the normal at the point of incidence lie in the same plane.
Answer:
Place a plane mirror on the table. Take a paper sheet and make a small hole in its centre. Make sure that the light in the room is not bright. Hold the sheet normal to the table. Take another sheet and place it on the table in contact with the vertical mirror. Draw a normal line on the second sheet from the mirror. Now, light a torch on the mirror through the small hole such that the ray of light falls on the normal at the bottom of the mirror. When the ray from this hole is incident on the mirror, it gets reflected in a certain direction. You can easily observe the incident ray, reflected ray and the normal to the mirror at the point of incidence on the sheet placed on the table. This shows that the incident ray, the reflected ray, and the normal to the surface at the point of incidence all lie in the same plane.



6. Fill in the blanks in the following.
(a) A person 1 m in front of a plane mirror seems to be _____ m away from his image.
(b) If you touch your _____ ear with your right hand in front of a plane mirror, it will be seen in the mirror that your right ear is touched with your _____.
(c) The size of the pupil becomes _____ when you see in dim light.
(d) Night birds have _____ cones than rods in their eyes.
Answer:
(a) A person 1 m in front of a plane mirror seems to be 2 m away from his image.

(b) If you touch your left ear with your right hand in front of a plane mirror, it will be seen in the mirror that your right ear is touched with your left hand.
(c) The size of the pupil becomes large when you see in dim light.
(d) Night birds have less cones than rods in their eyes.

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