



Edu Junior

Where Passion Meets Educations



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Where passion meets with educations

Chapter – 13

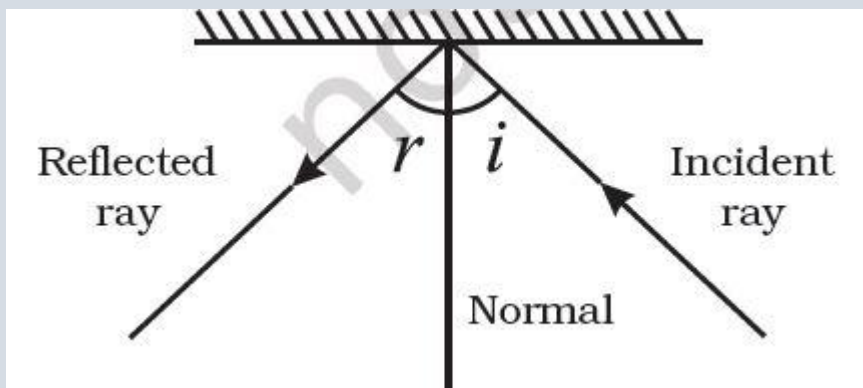
LIGHT

Laws of Reflection

When a light ray incident on the surface of an object is sent back into the same medium, it results in reflection. When reflection takes place, it follows certain rules which are known as the laws of reflection.

Draw lines showing the position of the plane mirror, the incident ray and the reflected ray on the paper. Draw a line making an angle of 90° 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. The angle between the normal and incident ray is called the angle of incidence ($\angle i$). The angle between the normal and the reflected ray is known as the angle of reflection ($\angle r$).

- The angle of incidence is always equal to the angle of reflection. This is one of the laws of reflection.
- The incident ray, the normal at the point of incidence and the reflected ray all lie in the same plane. This is another law of reflection.



Lateral Inversion

An image formed by a mirror the left of the object appears on the right and the right appears on the left. This is known as lateral inversion.

Regular and Diffused Reflection

When all the parallel rays reflected from a rough or irregular surface are not parallel, the reflection is known as diffused or irregular reflection. It is caused by the irregularities in the reflecting surface. On the other hand, reflection from a smooth surface like that of a mirror is called regular reflection.

Dispersion of Light

Splitting of light into different colours is known as dispersion of light. Rainbow is a natural phenomenon showing dispersion.

Multiple Reflections

When two mirrors are placed facing each other such that they are parallel to each other and an object is placed between the two, then the number of images formed are infinite. The phenomenon of multiple reflections of light is commonly seen when you visit a hair cutting saloon.

Instruments Based on Multiple Reflections

Kaleidoscope

This instrument works on the principle of multiple reflections. It consists of three strips of plane mirrors, placed at an angle inside a tube. One end of the tube must have provision for allowing light to enter. The other end should preferably be made of ground glass on which pieces of brightly-coloured bangles or beads are to be kept scattered. Due to angular placement of the mirrors, infinite number of designs will be formed based on how the pieces of bangles or beads arrange themselves.

Periscope

It is another instrument which uses the principle of multiple reflections. This instrument needs two plane mirrors that are placed at an angle of 45° to the vertical. The image formed by one mirror acts as the object for the other mirror.

The main use of periscopes is in submarines that remain under water. While the vessel is in the submerged state, the periscope is used to see things: above the surface of the water.

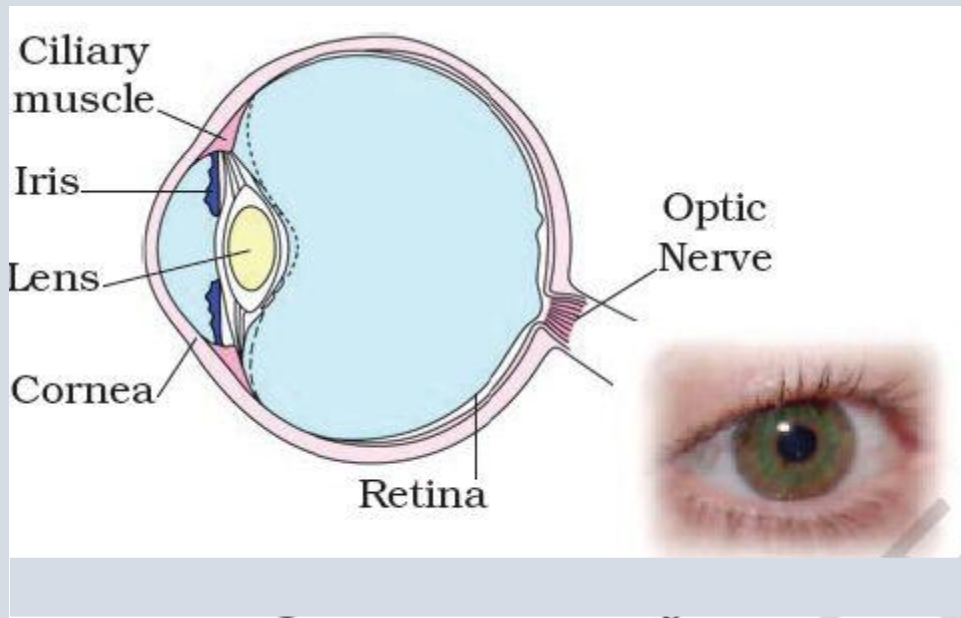
What is inside Our Eyes?

It is tough so that it can protect the interior of the eye from accidents. Its transparent front part is called cornea. Behind the cornea, we find a dark muscular structure called iris. In the iris, there is a small opening called the pupil. The size of the pupil is controlled by the iris. The iris is that part of eye which gives it its distinctive colour. The iris controls the amount of light entering into the eye. Behind the pupil of the eye is a lens. The lens focuses light on the back of the eye, on a layer called retina. The retina contains several nerve cells. Sensations felt by the nerve cells are then transmitted to the brain through the optic nerve. There are two kinds of cells–

(i) Cones, which are sensitive to bright light and

(ii) Rods, which are sensitive to dim light.

Cones sense colour. At the junction of the optic nerve and the retina, there are no sensory cells, so no vision is possible at that spot. This is called the blind spot.



Sometimes, particularly in old age, eyesight becomes foggy. It is due to the eye lens becoming cloudy. When it happens, persons are said to have cataract.

Care of the Eyes

- It is necessary that you take proper care of your eyes. If there is any problem you should go to an eye specialist. Have a regular checkup—
- If advised, use suitable spectacles.
- Too little or too much light is bad for eyes. Insufficient light can injure the retina.
- Do not look at the Sun or a powerful light directly.
- Never rub your eyes. If particles of dust go into your eyes, wash your eyes with clean water. If there is no improvement go to a doctor.

- **Always read at the normal distance for vision. Do not read by bringing the book too close to your eyes or keeping it too far.**

If food is deficient in some components, eyes may also suffer. Lack of vitamin A in foodstuff is responsible for many eye troubles. Most common amongst them is night blindness. One should, therefore, include in the diet components which have vitamin A.

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