

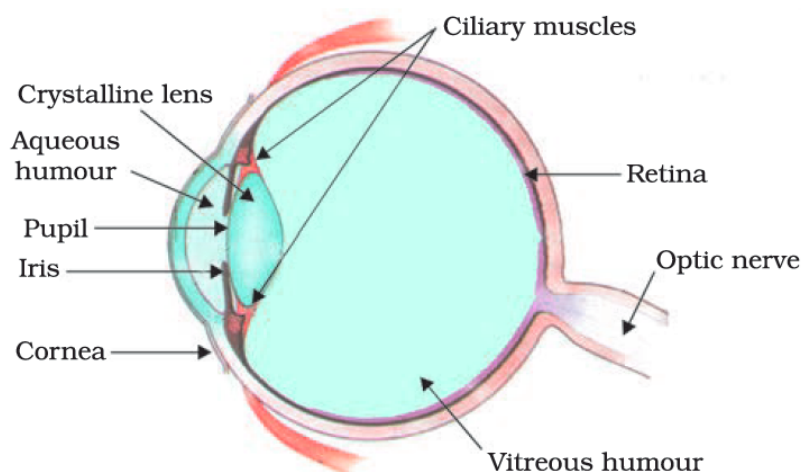
CHAPTER - 10 THE HUMAN EYE AND THE COLOURFUL WORLD

Human eye:

The human eye makes use of light to allow us to view the world around us. Its structural design includes a lens.

The human eye is like a camera. Its lens system forms an image on a light-sensitive screen called the retina. Light enters the eye through a thin membrane called the cornea.

The eyeball is approximately spherical in shape with a diameter of about 2.3 cm. The crystalline lens merely provides the finer adjustment of focal length required to focus objects at different distances on the retina. We find a structure called iris behind the cornea. Iris is a dark muscular diaphragm that controls the size of the pupil. The pupil regulates and controls the amount of light entering the eye. The eye lens forms an inverted real image of the object on the retina.



Accommodation:

The ability of the eye lens to adjust its focal length is called accommodation. Focal length can be changed with the help of ciliary muscles.

Far point

The maximum distance at which object can be seen clearly is far point of the eye. For a normal adult eye, its value is infinity.

Near point

The minimum distance at which objects can be seen most distinctively without strain.

- For a normal adult eye, its value is 25 cm.
- Range of human vision 25 cm to infinity.

Myopia (Near sightedness)

A myopic person can see nearby objects clearly but cannot see distant objects clearly. The image of distant object is formed in front of the retina.

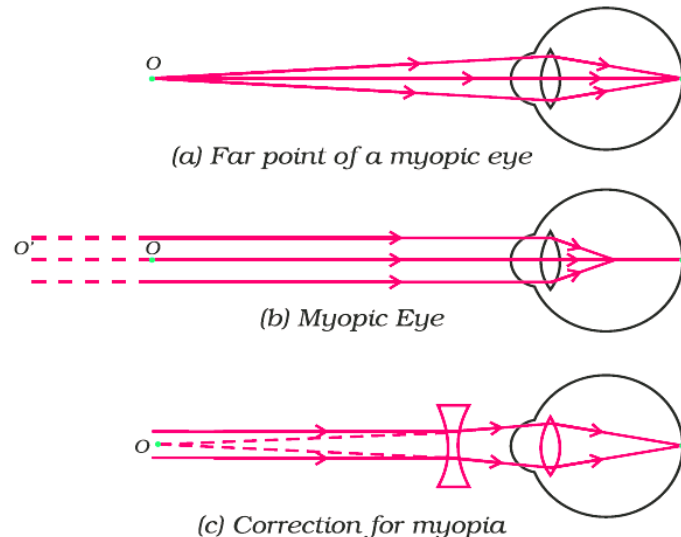
Causes of Myopia

- Excessive curvature of eye lens
- Elongation of eye ball

Correction

This defect can be corrected by using a concave lens of suitable power.

A concave lens of suitable power will bring the image back on to the retina and thus the defect is corrected.



Hypermetropia (Far sightedness)

Affected person can see far objects clearly but cannot see nearby objects clearly.

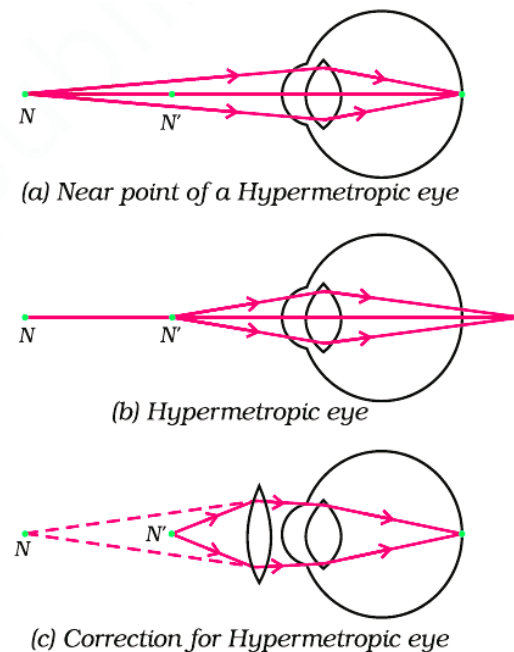
- The near point of the eye moves away.
- Image is formed behind the retina.

Causes of Hypermetropia

- Focal length of the eye lens becomes too long.
- Eye ball becomes too small.

Correction

Use of convex lens of suitable power can correct the defect.



Presbyopia (Old age Hypermetropia)

- It is the defect of vision due to which an old person cannot see the nearby objects clearly due to loss of power of accommodation of the eye.
- The near-point of the old person having presbyopia gradually recedes and becomes much more than 25 cm away.



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