

**Part A – The Human Eye & Defects in Eye**

Based on NCERT (Curiosity) Grade 10 Science | Chapter 8 | Reprint 2026–27 | Pages 130 – 138

**1 THE HUMAN EYE****Ciliary muscles**  
(change the shape of lens)**Iris**  
(controls pupil size)**Cornea**  
(transparent front surface)**Pupil**  
(opening)**Lens**  
(focuses light)**Sclera**  
(white outer layer)**Retina**  
(light-sensitive layer)**Optic nerve**  
(carries signals to brain)**Parts of the Eye and their Functions**

| Part                   | Function                                                         |
|------------------------|------------------------------------------------------------------|
| <b>Cornea</b>          | Provides a transparent front surface and bends (refracts) light. |
| <b>Iris</b>            | Controls the size of the pupil.                                  |
| <b>Pupil</b>           | Opening through which light enters.                              |
| <b>Lens</b>            | Focuses light on the retina (by changing its shape).             |
| <b>Ciliary muscles</b> | Change the shape of the lens (for near and distant objects).     |
| <b>Retina</b>          | Contains light-sensitive cells (rods and cones).                 |
| <b>Optic nerve</b>     | Carries signals to the brain.                                    |
| <b>Sclera</b>          | White, tough outer layer (gives shape and protection).           |

**Remember**

- The image formed on the retina is real, inverted and smaller than the object.
- The eye works like a camera.

**2 POWER OF ACCOMMODATION**

- The eye lens can change its focal length by changing its curvature with the help of ciliary muscles.
- This process is called the **power of accommodation**.
- It helps us to see objects at different distances (near and far).

**How it works?**

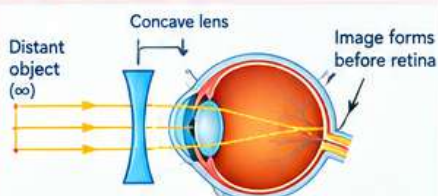
- For distant objects** – ciliary muscles relax, lens becomes thinner (less curved).
- For near objects** – ciliary muscles contract, lens becomes thicker (more curved).

For distant object  
(thinner lens)For near object  
(thicker lens)

Ciliary muscles relax / contract

**3 DEFECTS OF VISION AND THEIR CORRECTION****(a) MYOPIA**

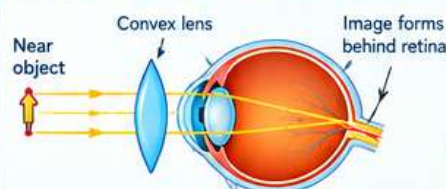
- Distant objects appear blurred.
- Image is formed in front of the retina.
- Corrected with a concave lens (diverging lens).

**Ray diagram (Myopia)**

Concave lens diverges the rays, so the image is formed on the retina.

**Correction:** Concave lens (diverging lens)**Example:** Difficulty in seeing distant objects (e.g., signboards, stars).**(b) HYPERMETROPIA**

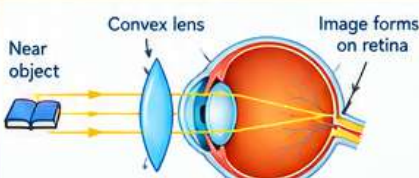
- Near objects appear blurred.
- Image is formed behind the retina.
- Corrected with a convex lens (converging lens).

**Ray diagram (Hypermetropia)**

Convex lens converges the rays, so that the image is formed on the retina.

**Correction:** Convex lens (converging lens)**Example:** Difficulty in seeing near objects (e.g., reading, writing).**(c) PRESBYOPIA**

- Age-related difficulty in seeing nearby objects (reduced accommodation).
- Corrected with suitable converging lenses (bifocal or progressive lenses).

**Ray diagram (Presbyopia)**

Convex lens helps to focus the image on the retina.

**Correction:** Convex lens (bifocal / progressive)**Example:** Common in old age; difficulty in reading small print.**QUICK FACTS**

- The eye lens is flexible and transparent.
- Iris controls the size of the pupil.
- Pupil is the opening for light.
- Retina has rods (dim light) and cones (colour vision).
- Myopia, hypermetropia and presbyopia are common vision defects.

**COMMON MISTAKES**

- Thinking the image is formed behind the retina in myopia (it is formed in front).
- Confusing concave and convex lenses (for correction).
- Believing presbyopia is a disease (it is an age-related change).
- Thinking only myopia is correctable (all three defects have corrections).

**KEY TAKEAWAY**

- The eye forms a real, inverted image on the retina.
- Power of accommodation helps us to see near and far objects.
- Myopia, hypermetropia and presbyopia are corrected using lenses.
- Regular eye care and proper lighting help maintain good vision.

