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EYE DEFECTS

**Myopia (short-sightedness)**: this is a defect of vision in which far away objects appear blurred but near objects are seen clearly. Myopia is caused due to:

* High converging power of lens
* Eye-ball being too long

Due to high converging power of the eye lens, the image is formed in front of the retina and a person cannot clearly see the distant objects. In another case, if the eyeball is longer than the retina at a larger distance from the eye lens, the image is still formed in front of the retina even though the eye lens has correct converging power.

Myopia can be corrected by wearing glasses/contacts with concave lenses. These help to focus the image on the retina. This is because when a concave lens of suitable power is used for the myopic eye, the concave lens first diverge the parallel rays of light coming from distant objects. Therefore, a virtual image is first formed at a far point of the myopic eye. Now, since the rays of light appear to be coming from the eye’s far point, they are easily focused by the eye lens and image is formed on the retina. Concave lens is used for myopic eye so as to decrease the converging power of the eye lens.

**Hypermetropia (long-sightedness)**: this is a defect of vision in which near objects appear blurred but far away objects are seen clearly. The near-point of the hypermetropic eye is more than 25cm away. Hypermetropia is caused due to:

* Low converging power of eye lens
* Eye-ball being too short

In the case of hypermetropia, the image of an object is formed behind the retina.

Hypermetropia can be corrected by wearing glasses/contacts with convex lenses. This is because when a convex lens of suitable power is placed in front of the hypermetropic eyes, then the convex lens first converge the diverging rays of light coming from a nearby object at the near point of the eye at which the virtual image of the nearby image is formed. Since the light rays now appear to be coming from the eye’s near point, the eye lens can easily focus and form the image on retina. Convex lens is used for hypermetropia so as to increase the converging power of the eye lens.