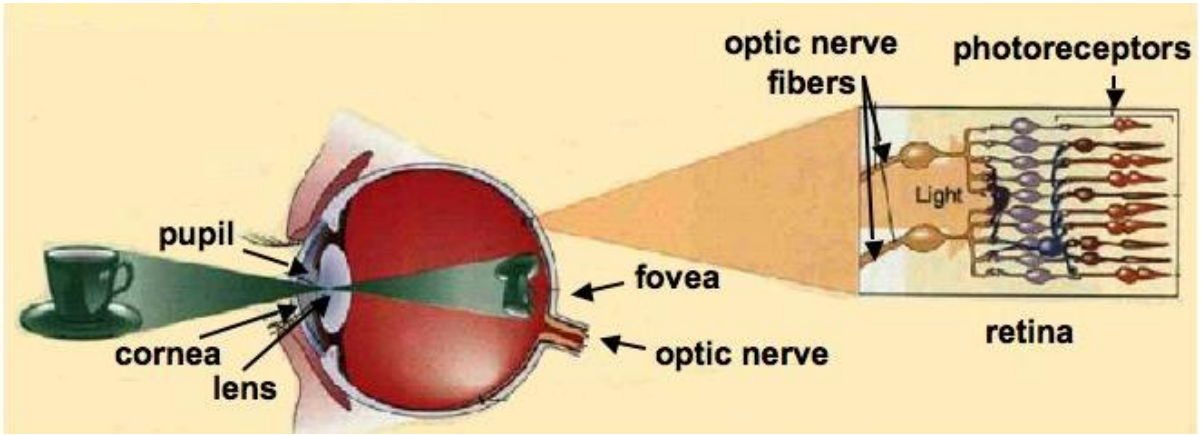
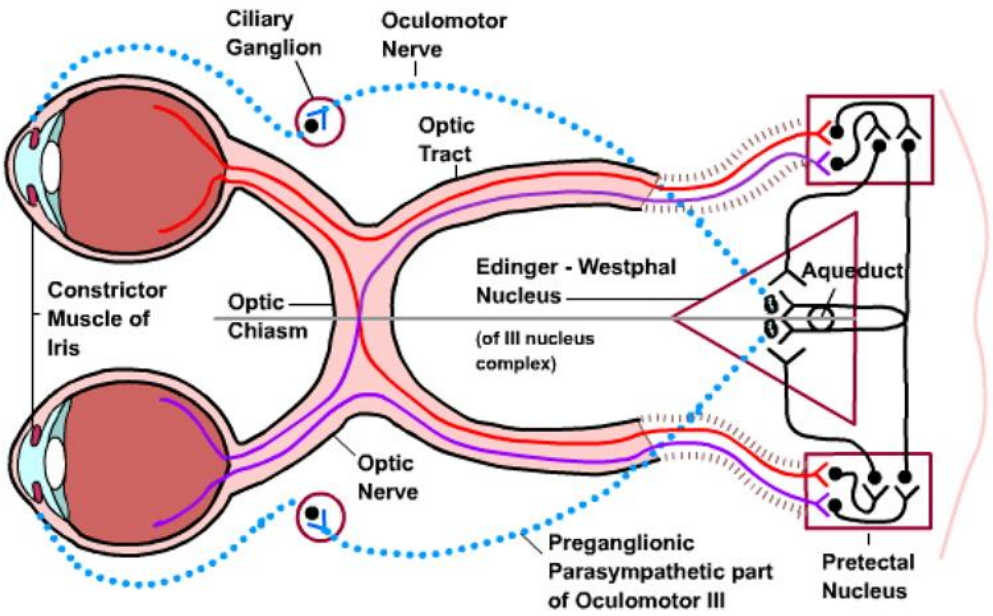
Mechanism of Vision

- Vision begins with light passing through the cornea and the lens, which combine to produce a clear image of the visual world on the retina.
- Images formed by the lens are upside down and backwards when they reach the retina.
- Two types of receptors on the retina:
- **Rods:** 125 million on a single retina. They are found primarily in the periphery of the retina and are used to see at low levels of light. They are extremely sensitive to all wavelengths of visible light but do not distinguish different color. In dim light only rods are activated where one can see objects but not as sharp images and are not able to distinguish their color (Nighttime vision).
- **Cones:** 7 million on a single retina. They are found primarily in the center (or fovea) of the retina. As amount of light increases, they are distinguish different color (Daytime vision). There are three types of cones which distinguish the three colors – blue, red, green.



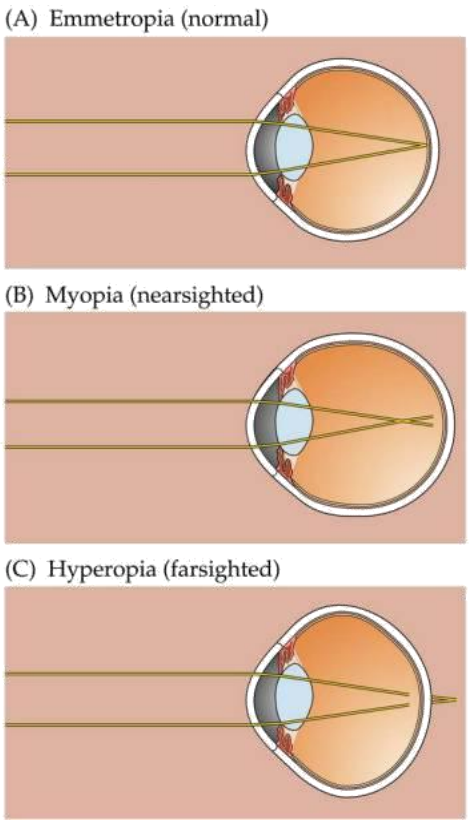
- Light stimulates rods and cones and sends impulse via optic nerve to brain areas for vision

- The optic nerve exits the eye just off center near the Fovea. The optic nerve exits is referred to as **the Blind Spot** due to the lack of the receptors in this area.
- The two optic nerves come together at the Optic Chiasm, where the information from the right eye crosses over to the left side of the brain and the information from the left eye crosses over to the right side of the brain.
- Information leaves the chiasm via the optic tract to areas of the visual cortex in the brain.



Common vision defects

Myopia: (nearsightedness) This is a defect of vision in which far objects appear blurred but near objects are seen clearly. The image is focused in front of the retina rather than on it usually because the eyeball is too long or the refractive power of the eye's lens too strong.



Hyperopia: (farsightedness) This is a defect of vision in which there is difficulty with near vision but far objects can be seen easily. The image is focused behind the retina rather than upon it. This occurs when the eyeball is too short or the refractive power of the lens is too weak.

Astigmatism: This defect is when the light rays do not all come to a single focal point on the retina, instead some focus on the retina and some focus in front of or behind it. This is usually caused by a non-uniform curvature of the cornea. A typical symptom of astigmatism is if you are looking at a pattern of lines placed at various angles and the lines running in one direction appear sharp whilst those in other directions appear blurred.