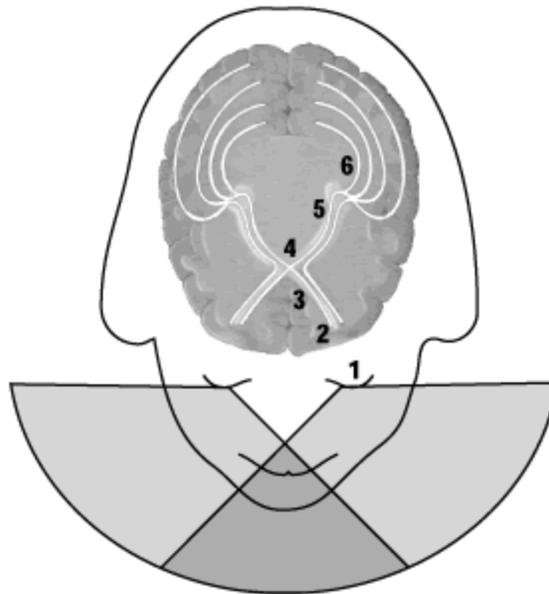


BLIND BABIES FOUNDATION (BBF)

Serving children with visual impairments and their families since 1949

Pediatric Visual Diagnosis Fact Sheet™

HOW THE EYE AND THE BRAIN WORK TOGETHER

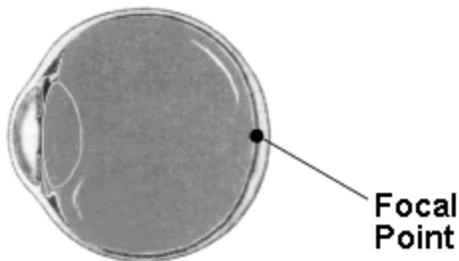


1. Light rays enter the eyes by passing through the cornea, the aqueous, the pupil, the lens, the vitreous, and then striking the light sensitive nerve cells (rods and cones) in the retina.
2. Visual processing begins in the retina. Light energy produces chemical changes in the retina's light sensitive cells. These cells, in turn, produce electrical activity.
3. Nerve fibers from these cells join at the back of the eye to form the optic nerve.
4. The optic nerve of each eye meets the other at the optic chiasm. Medial nerves of each optic nerve cross, but lateral nerves stay on the same side. The overlap of nerve fibers allows for depth perception.

5. Electrical impulses are communicated to the visual cortex of the brain by way of the optic nerve.
6. The visual cortex makes sense of the electrical impulses, and either files the information for future reference or sends a message to a motor area for action.

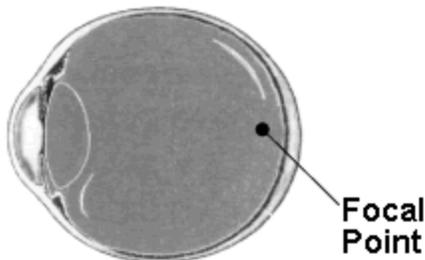
Nearsightedness (Myopia), and Farsightedness (Hyperopia)

Near and farsightedness are the result of varying-shaped eyeballs that cause light to focus in front of or behind the retina.



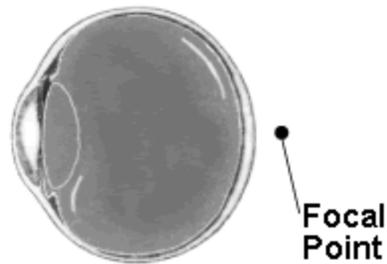
Perfect Vision:

Light is focused from near and far objects exactly on the retina.



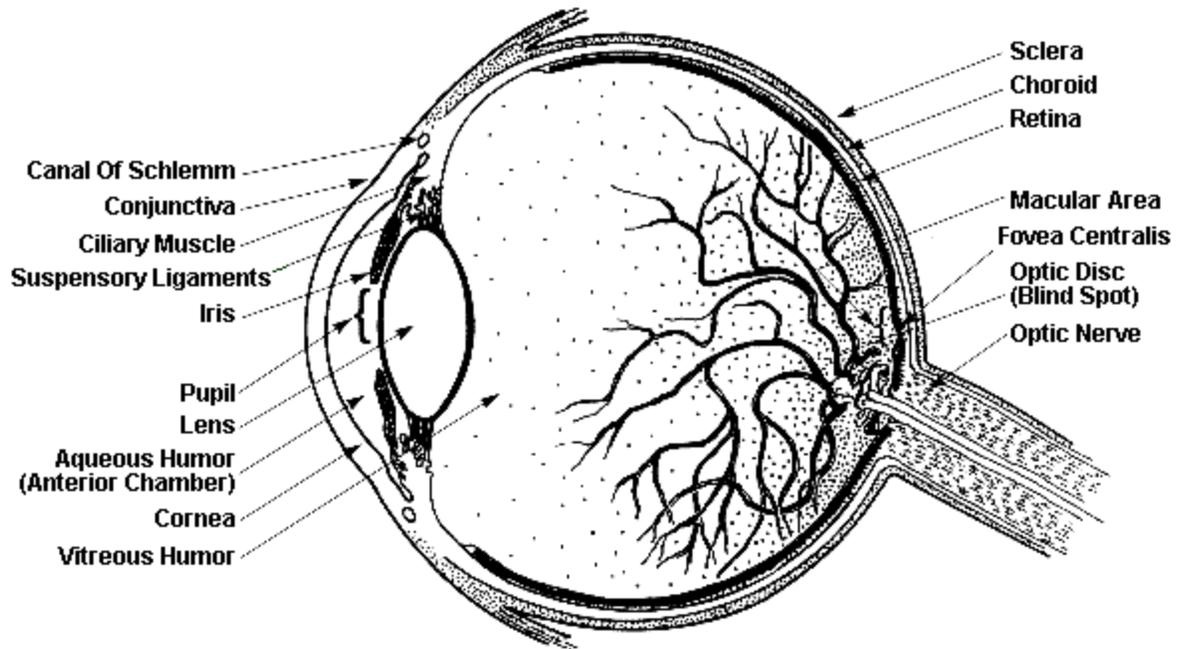
Near-Sighted:

Light from near objects focuses behind the retina.



Far-Sighted:

Light from far objects focuses in front of the retina.



Aqueous - a clear watery fluid that fills the space between the cornea and the vitreous. It is responsible for nourishing the cornea, iris, lens, and maintaining the intraocular pressure.

Canal of Schlemm - is responsible for moving the aqueous from the front chamber in the eye through aqueous veins into the bloodstream.

Ciliary Body - is made up of ciliary muscle which helps the accommodation of the lens and controls the intraocular pressure of the eye. It is also where the aqueous is made.

Cones - light sensitive receptor cells mostly found in the central part of the retina. It is responsible for sharp visual acuity and the discrimination of color.

Conjunctiva - a transparent mucous membrane that covers the outer surface of the eyeball except for the cornea. It also lines the inner surface of the eyelid.

Cornea - the clear cone over the front part of the eye. It is responsible for most of the optical power of the eye.

Choroid - a layer of the eye found between the retina and the sclera. It contains major blood vessels and provides nourishment to the outer layers of the retina.

Fovea - is located in the center of the macula. It provides the sharpest vision.

Iris - a colored circular muscle that gives us the color of our eyes. It is responsible for controlling the amount of light that gets into the eye.

Lens - is responsible for bringing rays of light into focus on the retina. It is a clear oval structure suspended behind the iris which can contract and expand as needed to provide additional focusing power.

Macula - a small central area of the retina responsible for fine central visual acuity.

Optic Nerve - carries the light impulses for sight from the retina to the brain.

Retina - the most active area of the eye where the rods and cones are found. These receptors pick up the bits and pieces of the visual signals and transport them to the optic nerve for transmission to the brain.

Rods - light sensitive receptor cells mostly found in the peripheral part of the retina. They

are responsible for night vision.

Sclera - the protective outer layer of the eye.

Vitreous - a clear jello-like substance between the lens and the retina that provides the structural support to the eye.

Article is used courtesy of Blind Babies Foundation.

Main BBF Office:

Blind Babies Foundation

5016 Mission St.

San Francisco, CA 94112

Website: <http://blindbabies.org>