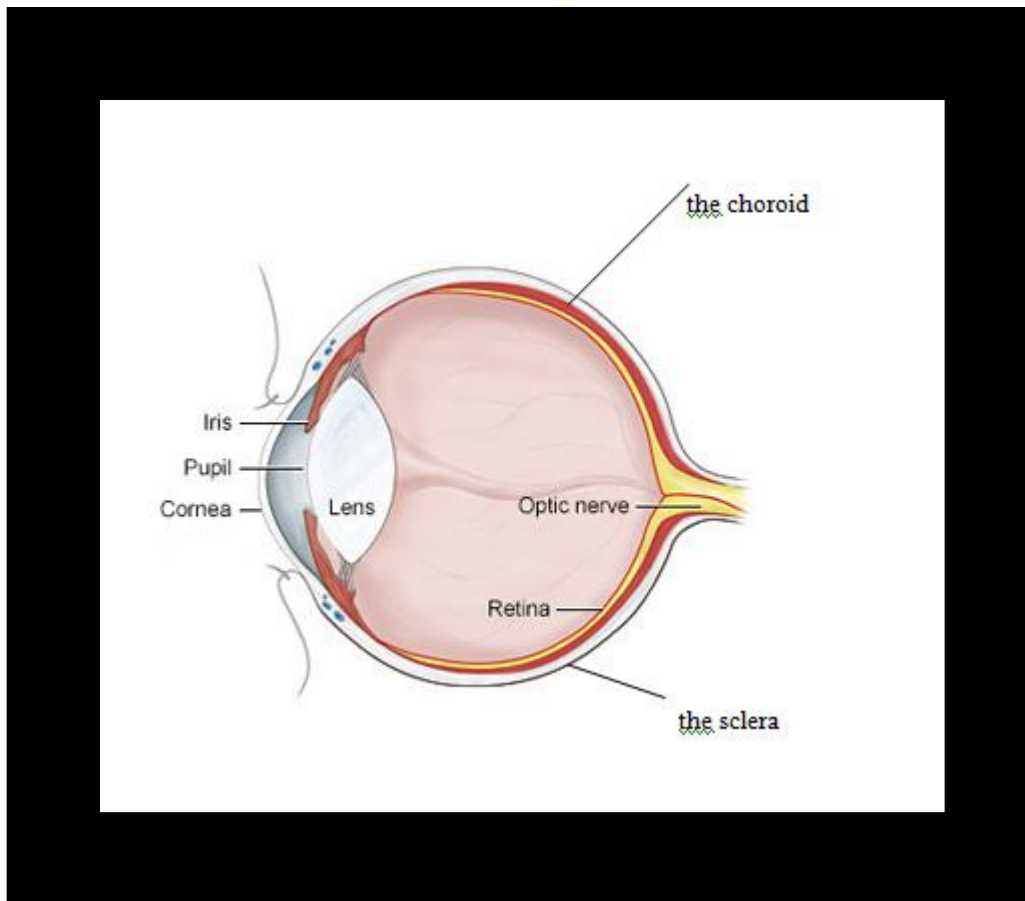


Sense Organs (Eye)



The eye is the sense organ of sight. The eye is shaped like a ball and is located in bony sockets in the skull. It is held in place by six muscles which are joined to the outside of the eyeball and attached to the skull. These muscles allow movement of the eyeball in the eye socket.

Parts of the Eye

The white of the eye is called **the sclera**. This is a tough outer layer that helps to protect the eye and maintain its shape. It forms the transparent cornea at the front of the eye.

The Cornea is a transparent covering at the front of the eye. It helps to bend light rays entering the eye.

The Iris is the coloured part of the eye. It contains muscles that control the size of the pupil so that less or more light enters the eye. It helps to bend light rays entering the eye.

The Pupil is the dark opening in the centre through which light enters the eye. In bright light, the pupil becomes small so that less light enters the eye. In dim light it gets larger so that more light enters the eye.

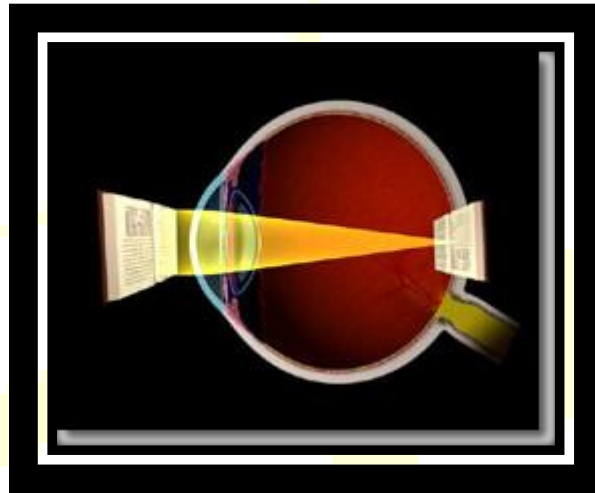
The Lens is a transparent bi-convex lens that bends light rays entering the eye. It focuses images upside down on the retina at the back of the eye. It can also change its shape so that the eye can focus on objects that are near or far away.

The Retina is the inner layer of the eye. It has cells that are sensitive to light. Cells called rods allow us to see in dim light and objects appear black and white. Other cells called cones allow us to see in bright light and objects can be seen in different colours. The blind spot is an area on the retina where there are no light sensitive cells. This is where the optic nerve leaves the eye.

The optic nerve receives nerve messages from the retina and takes these messages to the brain.

The Choroid is the middle layer of the eye. It contains blood vessels that supply the eye with nutrients. The choroid forms the iris at the front of the eye.

How the Eye See Objects



- A. Light is reflected from the book. The light passes through the pupil of the eye.
- B. The lens inside the eye bends the light rays and focuses them on the retina where an upside down image is formed.
- C. Light sensitive cells in the retina send messages along the optic nerve to the brain.
- D. The brain changes the image around so that the book is seen right side up

Protecting the Eyes

The eyes are protected in the following ways:

- The bony sockets of the skull protect the eye
- The eyebrow prevents sweat from running into the eye.

- The eyelid can cover the eye to prevent objects from entering it
- The eyelash traps dust particles that would enter the eye
- Tears wash the surface of the eye.

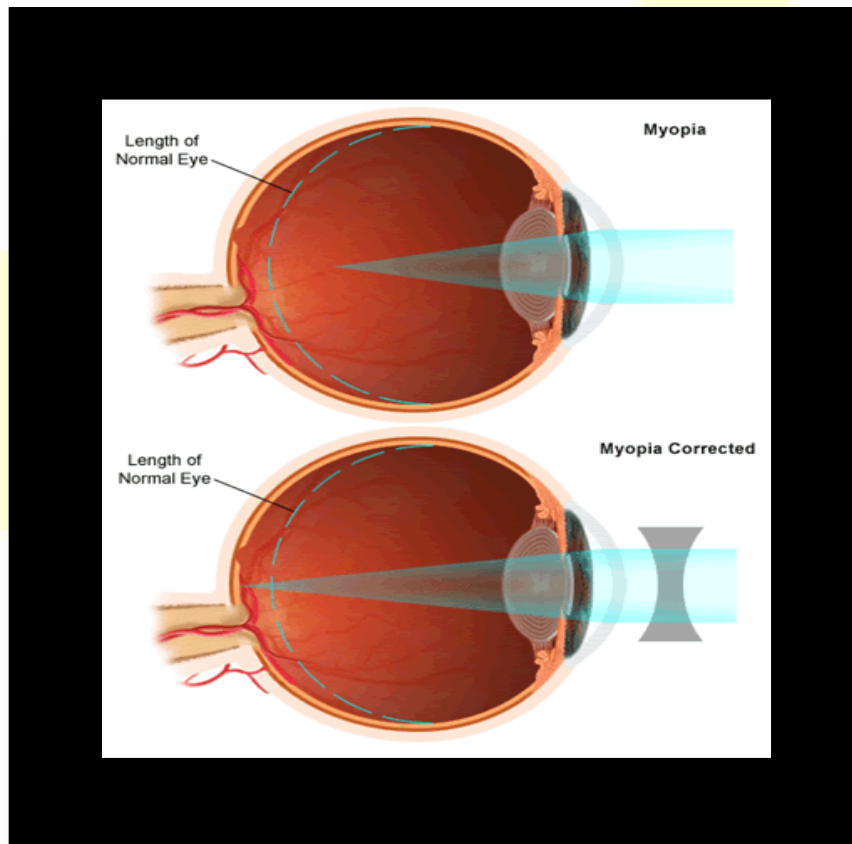
Caring for the Eye

- Do not rub the eye with dirty hands
- Rest the eyes when reading, watching television, sewing or using the computer
- Do not wear prescription glasses that do not belong to you
- If harmful chemicals get into the eye, remove it by washing with a lot of water
- Use a clean cloth to remove solid objects from the surface of the eye
- Use proper lighting when reading or doing close-up work
- Do not read in a moving vehicle
- Visit the optician or eye specialist at least once every two years

Eye Problems

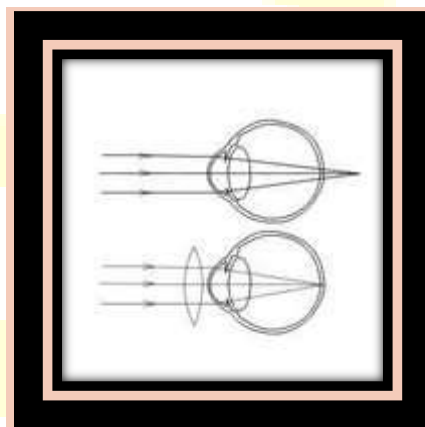
Near sightedness/short sightedness

This occurs when the lens focuses the image before it reaches the retina. This usually happens when the eyeball is too long or the lens is too curved. This condition can be corrected by the use of eyeglasses with concave lenses that causes light rays to spread out before they reach the eye.



Far sightedness/Long sightedness

This occurs when light rays have not focused by the time they reach the retina. This happens when the eyeballs are too short or the lens are not curved enough. This condition can be corrected by wearing eyeglasses with convex lenses that bend the light rays before they enter the eyes.



Other Eye Problems

Glaucoma	pressure in the eyes
Pink eye or conjunctivitis	infection of the eye tissues and eyelid
Astigmatism	irregular cornea or lens that causes blurred vision
Defective eye muscles	causes crossed eyes
Colour blindness	inability to see shades of red and green
Night blindness	poor night vision
Cataracts	white spots in the lens that blocks vision

Some of these problems can be corrected by surgery, medication, eye glasses, eye exercise and nutrition.

The Visually Challenged

Someone who is visually challenged may have limited vision or no vision at all. A visually challenged person is more dependent on their other senses to help them to cope with their loss of vision. Although they cannot see, there are many things they can learn to do such as:

- Use a guide dog or a cane to go from one place to another without assistance
- Read, using Braille which is a system of raised dots that they can feel with their fingers
- Use the computer, the cell phone or a telephone
- Make craft items
- Identify currency
- “Read” specially made watches by feeling its hands and face
- Do household chores and take care of themselves



Optical Illusions

Optical illusions occur as a result of how the brain interprets what we see. An illusion makes the brain perceive something different from what is really there, so what we see is not the same as what actually exists in reality.

Below is one type of optical illusion:



Another type of optical illusion is a mirage. A mirage is formed when light rays are bent or refracted in the air. Light from the sky can be refracted and appear as pools of water on the ground when the air near the surface of the ground is hot. This especially affects people who are in the desert; many times they think they see things that are not really there.

Optical Instruments

Optical instruments are instruments that assist the eye. Some of these are:

Periscope: this can be used to see around corners and over walls.



Telescope: makes distant objects appear near and bigger.



Binoculars: made up of two telescopes mounted side by side that makes far objects appear near.



Microscope: this is used to make very tiny objects that cannot be seen with the naked eye look larger.



Hand lens: makes objects appear larger



Camera: this is used to record images on film. Digital cameras record images electronically and do not use films.



All optical instruments use lenses, while some use both lenses and mirrors to reflect or refract light.