

Eye

Introduction

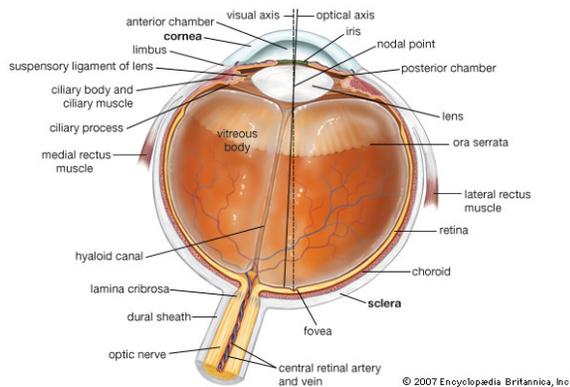


Figure 1: The lens of a human eye focuses light on the retina.

Humans and other animals use their eyes to see. When people see an object, they actually see light reflecting, or bouncing, off that object. This light enters the eye. The eye changes the light into electrical signals, which travel through the optic nerve to the brain. The brain interprets, or reads, these signals as an image, or picture, of the object.

The Human Eye

Humans have two eyes. Each eyeball sits in a socket, or opening, in the skull. The skull bone protects the eye on the sides and back. The eyelid protects the front of the eye. By blinking, eyelids also move tears across the eye. Tears keep eyes moist. Eyelashes catch dust and other particles that could enter the eye. Six muscles hold the eyeball in place and move it up, down, and sideways.

The eyeball is filled with a clear jelly. Three coats, or layers, surround this jelly. The outer coat consists of the sclera, or white part of the eye, and the cornea. The cornea is the window of the eye, through which light passes.

The middle coat holds the eye's main blood supply. The iris, or colored part of the eye, makes up the front part of this coat. Light passes through an opening, called the pupil, in the center of the iris. The iris opens and closes to allow more or less light through the pupil. Behind the iris sits the lens. The lens focuses light onto the inner coat of the eye. The muscle that holds the lens in place also adjusts its shape. To focus on objects that are near, the lens thickens. To focus on objects that are far away, the lens flattens.

The inner coat of the eye is called the retina. Cells called rods and cones are built into the retina. These cells collect light. As the cells collect light, they trigger electrical signals. These signals travel through the optic nerve to the brain.

Problems with the Eyes

When the eyeball is too long from front to back, a person cannot see faraway objects clearly. This condition is called nearsightedness. Similarly, farsighted people have trouble seeing nearby objects. Their eyeballs are too short. Glasses, contact lenses, or surgery can correct these problems. Blindness happens when the eye's lens becomes cloudy or when the retina is damaged.

Eyes of Other Animals



Figure 2: A gecko narrows its pupils to protect its eyes from bright light. Geckos and other animals that are active at night often have slit-shaped pupils.

Vertebrates, or animals with a backbone, each have two eyes similar to human eyes. But there are differences, which depend on the animal's habitat and behavior. For example, the pupils of animals active at night are often shaped like slits. This allows the pupils to close almost completely to protect the eyes from bright light.

Invertebrates, or animals without a backbone, have various other kinds of eyes. Some mollusks, including octopuses, have large eyes that are similar to vertebrate eyes. Other mollusks and spiders have simple eyes called ocelli. Insects have compound eyes. These are made up of many lens-like parts. Worms and some protozoans merely have eyespots that are sensitive to light.

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