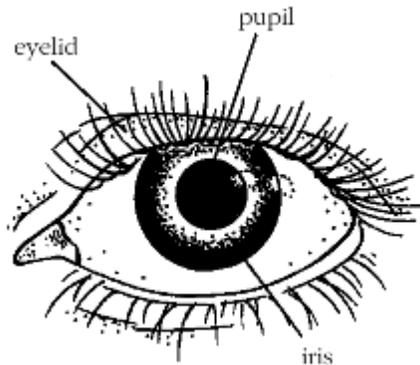


## The Eye and How We See

Prevent Blindness America. (2003c). *The eye and how we see*. Retrieved July 31, 2003, from <http://www.preventblindness.org/resources/howweseesee.html>



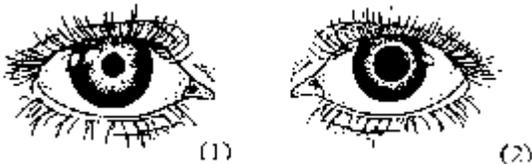
Your eyes are wonderful sensory organs. They help you learn about the world in which you live.

Your eyes see all sorts of things—big or small, near or far, smooth or textured, and even colors and dimensions.

Your eyes constantly send information by way of the optic nerve to your brain. Your brain processes the data in a fraction of a second, and the result is that you see something.

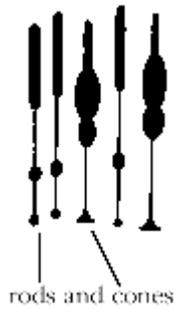
It requires many parts for your eyes to see properly. And your eyes don't work alone.

### Light and Dark



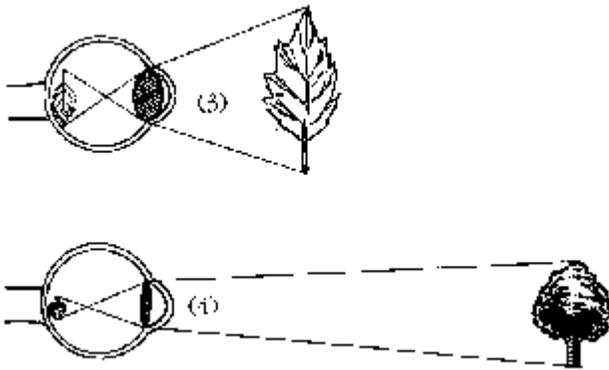
To control the amount of light entering the eye, the pupil changes in size. It shrinks in bright light since your eye doesn't need as much light to see in these conditions (1). Your pupil enlarges in dim light because it needs as much of the available light as possible to see (2). The pupil is only an opening in the iris; it looks black because the eye is dark inside. The whole front of the eye, including the pupil, is covered with a protective layer called the cornea.

### Color



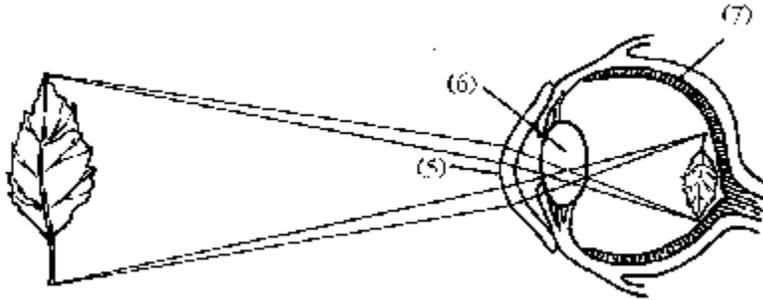
Rods and cones in the retina line the back of the eye and work together to help you see well. Cones allow you to see colors, fine detail and function best in bright light. Rods function best in dim light and are important for side (peripheral) vision.

### Near and Far



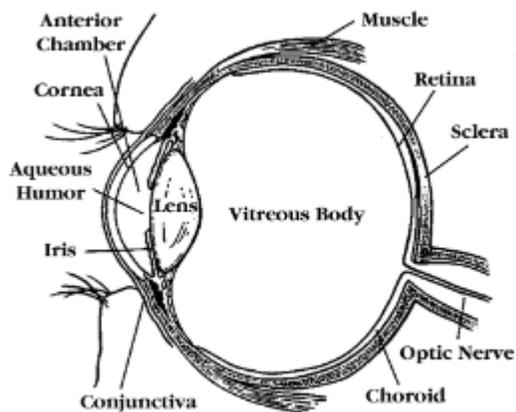
Muscles around the eye adjust the shape of the lens to focus on an object either nearby or far away. The lens gets thicker when focusing for near objects (3), and thinner for distant objects (4). The size of the image reflected on the retina changes, too.

## Upside Down



Light reflected from an object passes through the cornea (5), moves through the lens, which focuses it (6), and then reaches the retina at the very back (7), where it meets with a thin layer of color-sensitive cells called the rods and cones. Because the light criss-crosses while going through the cornea, your retina "sees" the image upside down. But your brain "reads" it right side up.

## Inside the Eye



Think of the eye in the shape of a ping-pong ball. The outside of the ball represents the outer globe of the eyeball or the outer protective layer. This outside layer is covered in sclera. The eyeball sits inside of the eye socket and a thick membrane lining called the conjunctiva covers the inner surface of the eyelid and part of the outer surface of the eyeball. At the top and bottom of the eyeball are muscles that hold the eyeball and move it inside the socket. At the front of the outside layer is the cornea where light enters the eye. Just past the cornea is a space called the anterior chamber of the eye. The back of anterior chamber is formed by the iris, the colored part of the eye, that admits light through an opening called the pupil. In the space between the cornea and iris is a liquid called the aqueous humor. Directly behind the iris is a biconvex structure called the lens. The center of the inside of the eye, the space between the lens and

the retina, or the inside of the ping pong ball, is the vitreous. The vitreous maintains the shape of the eyeball. The posterior two thirds of the eye is lined with the retina. Between the retina and the sclera is a vascular layer called the choroid. The very back of the eye has a small nerve similar to a chord, called the optic nerve.

Many different parts of the eye must work together to see properly. Also, muscles are attached to the outer walls of the eyeball to hold it in place. The picture above shows these main parts. If anything goes wrong, such as an eye disease or eye injury, you might not be able to see well again even after your eye heals.

### **Vision Vocabulary**

**Aqueous Humor:** A clear, watery fluid that fills the front part of the eye between the cornea, lens and iris.

**Choroid:** The middle layer of the eyeball, which contains veins and arteries that furnish nourishment to the eye, especially the retina.

**Conjunctiva:** A mucous membrane that lines the eyelids and covers the front part of the eyeball.

**Cornea:** The transparent outer portion of the eyeball that transmits light to the retina.

**Iris:** The colored, circular part of the eye in front of the lens. It controls the size of the pupil.

**Lens:** The transparent disc in the middle of the eye behind the pupil that brings rays of light into focus on the retina.

**Optic Nerve:** The important nerve that carries messages from the retina to the brain.

**Pupil:** The circular opening at the center of the iris that controls the amount of light allowed into the eye.

**Retina:** The inner layer of the eye containing light-sensitive cells that connect with the brain through the optic nerve.

**Sclera:** The white part of the eye that is a tough coating which, along with the cornea, forms the external protective coat of the eye.

**Vitreous Body:** A colorless mass of soft, gelatin-like material that fills the eyeball behind the lens.

For more information about your eyes, contact Prevent Blindness America  
or the Prevent Blindness affiliate near you.

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URL: <http://www.preventblindness.org/resources/howweseesee.html>



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The Eye and How We See