

## Chapter 9-6: The Eye

Sight is one of the most dominant of the human senses. Over 70 percent of the body's receptors are the photosensitive cells of the eyes, and it has been estimated that a third of all the fibers that carry impulses to the central nervous system come from the eye.

In this plate, we will discuss the anatomy of the eye and show how some of its parts function. The structures diagramed in this plate contribute to vision directly or serve accessory purposes.

Notice that this is a diagram of a cross section through the eye. As you encounter the structures in the reading below, color them.

The wall of the eyeball consists of three layers that are often referred to as tunics. The first is the fibrous tunic, which contains the **sclera (A)**, also known as the "white of the eye." The sclera gives the eyeball its shape, and can be seen around most of the eyeball's surface. A continuation of the sclera is the **cornea (B)**. The cornea is a transparent structure that bulges out and contains no blood vessels; it helps focus light on the retina. The **limbus (C)** is the area where the cornea meets the sclera.

The middle layer of the eyeball is the vascular tunic, which contains many blood vessels and includes the **iris (D)**, which is the colored part of the eye that can be seen through the cornea. Muscular movements within the iris cause it to open and close, increasing and decreasing the size of the opening to the eye, called the **pupil (E)**. In this way, the iris regulates the amount of light entering the pupil.

Another portion of the vascular tunic is the **ciliary body (F)**. This structure is continuous with the iris, and the same color or a close variation should be used for them both. The ciliary body contains the ciliary muscle, which controls eye movements. Surrounding the eyeball is the **choroid (G)**, which contains an extensive capillary network that supplies blood to the retina. In this diagram, you can also see the **lens (H)**.

We will now examine the chambers of the eyeball. We will also see the nerve layer of the eye and how it relates to the other structures. Continue your coloring as you read about these structures below.

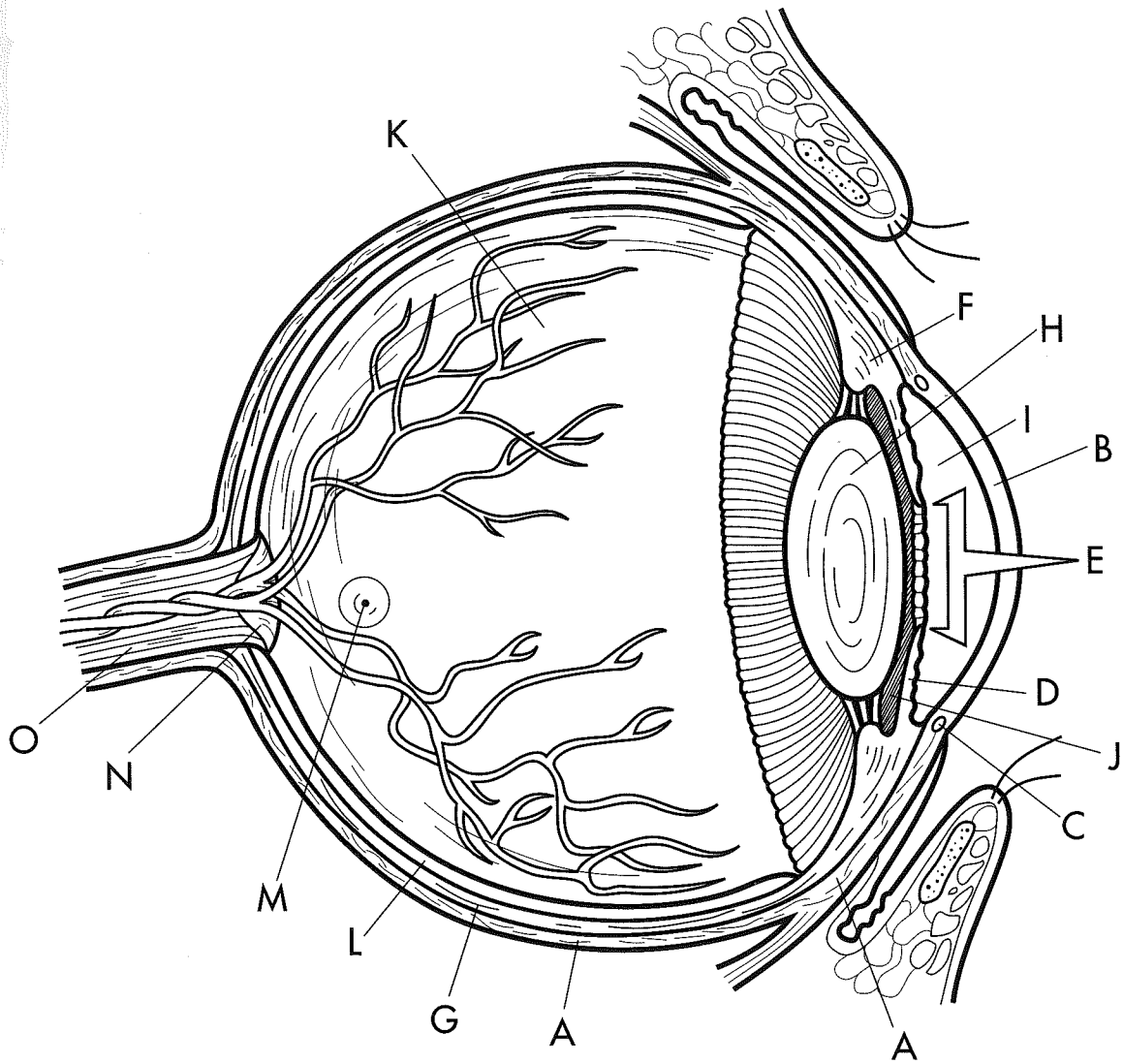
The eye has three main chambers; the first is the **anterior chamber (I)**. The anterior chamber is the space between the iris and the cornea. It contains a fluid material called aqueous humor. The **posterior chamber (J)** exists between suspensory ligaments and the iris; this chamber also contains aqueous humor.

The **vitreous chamber (K)** is quite large and contains a clear, gelatinous mass known as the vitreous body. The vitreous body helps maintain the shape of the eye and gives support to the retina, and is sometimes called the vitreous humor.

We will finish with a brief examination of the pathway of light through the eye.

In order for vision to occur, a light image must be formed on the **retina (L)**, and the light image must be converted into an action potential to be interpreted by the brain. The lens changes shape according to the distance of the object being viewed. This is because as the image is formed on the retina, the lens bends the light rays and focuses them behind itself, at a specific point called the **fovea (M)**. The fovea contains photoreceptor cells called cones. Transduction of the light signal is performed by two types of photoreceptor cells, rods and cones; rods are found primarily toward the edge of the retina, and are absent in the fovea. Rods and cones are associated with bipolar cells, which in turn stimulate ganglion cells.

The cells of the retina form a network that comes together at the **optic disk (N)**, which contains a blind spot, where there are no photoreceptors. The optic disk penetrates the wall of the eye and forms the **optic nerve (O)**, which carries impulses to the brain.



The Eye

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|-----------------|---------------------------|---------------------------|
| ○ Sclera .....A | ○ Ciliary Body .....F     | ○ Vitreous Chamber .....K |
| ○ Cornea .....B | ○ Choroid.....G           | ○ Retina .....L           |
| ○ Limbus .....C | ○ Lens .....H             | ○ Fovea.....M             |
| ○ Iris .....D   | ○ Anterior Chamber .....I | ○ Optic Disk .....N       |
| ○ Pupil.....E   | ○ Posterior Chamber.....J | ○ Optic Nerve .....O      |