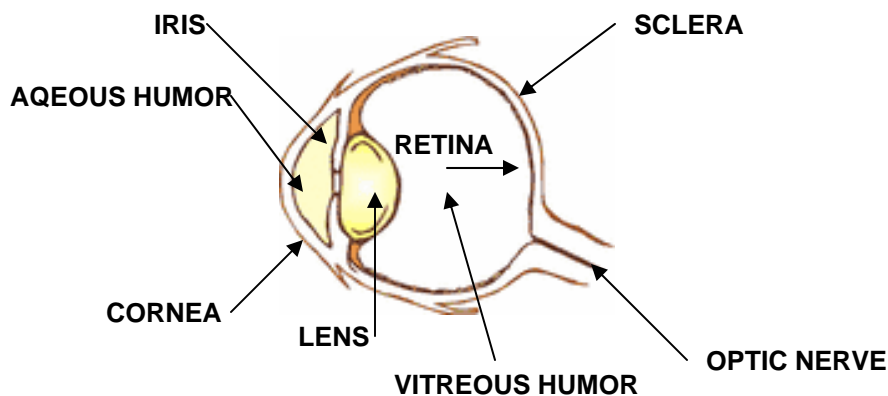


Name _____ Date _____

The Human Eye

You use your five senses to understand the world around you and to figure out what's going on. One of your five senses is sight, and it is with your eyes that you see the world. Eyes are constantly working, from the time you wake up in the morning to the time you go to sleep. Let's take a closer look at the human eye!

The eye is about 2.5 cm in length, weighs about seven grams and is shaped roughly like a ball. It sits in a special place in your skull called the *eye socket*. When you look in the mirror you can see several parts of your eye. The white part is called the *sclera*. The sclera is very tough and covers most of your eye. If you look very carefully you can see little red threads, which are tiny blood vessels bringing oxygen to the sclera. If you rub your eyes a lot, some of the tiny vessels break, and that is why your eye sometimes looks a little pink. The sclera covers the colored part of your eye as well, but here it is clear, and has a different name: the *cornea*. The cornea is very important because it lets light come into your eye. It also helps the eye to focus as light passes through. The colored part of your eye is called the *iris*. In the middle of your iris is the black *pupil*. Light first travels through the cornea, and then into the pupil. There are tiny muscles attached to the iris that help control the amount of light that can get through. In very bright light, the pupil will get smaller, and when it is darker, the pupil will get bigger, just like a camera lens. Between the iris and the cornea is the *anterior chamber*. Anterior means "front". The anterior chamber is filled with a clear liquid called the *aqueous humor*. The aqueous humor provides oxygen, proteins and glucose (sugar) to the eye.



After light passes through the pupil, it passes through the *lens*. The lens is roughly the shape of a squished ball, and it is completely clear. The lens's job is to focus the stream of light coming through the pupil onto the back of your eye, which is called the *retina*. The lens is attached to a muscle called the *ciliary muscle*. This muscle causes the lens to actually change shape as you focus on things! When you look at something very close to you, the lens gets thicker, and when you look at something far away, the lens gets thinner!

Between the lens and the retina is a gel-like clear material called the *vitreous humor*. The vitreous humor is important because it gives the eye its shape.

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The Human Eye, *continued*

The back of the eye is like a movie screen for the images you see. The retina is made up of very specialized cells called *rods* and *cones*. There are about 120 million rods and about 7 million cones in each eye! Rods cannot sense things in color, but they can see black and white and different shades of gray. After the sun has set, when you can no longer see anything in color, the rods are working very hard. Rods also allow you to see the shape of different objects. There are three different types of cones that work in bright light: red, blue, and green. Together, these cones process the light waves that come into the eye and let you see the many different colors you do. The rods and cones send all the information they gather through the optic nerve at the back of the eye. The brain then uses the nerve signals to put together a picture of the outside world. The place in the retina where the optic nerve exits is called the *blind spot*. This is because there are no rods or cones in this area, and if an image is projected onto this part of the retina, you cannot see it.

The eye also has a couple of ways to protect itself. The biggest protection for the eye is the *eyelid*. The eyelid helps to keep the eye clean and moist. Opening and closing the eyelid is called blinking, and you can do it when you want to and without even thinking about it. This means that blinking is both a *voluntary* (it sounds like the word *volunteer*) and *involuntary* action. Your eyelids will shut automatically to stop things from getting into your eye. Don't forget your *eyelashes*! They form a team with your eyelids to keep dirt and dust out of your eye. But what happens when a piece of dust does get in your eye? That's when *tears* come in to play. Tears come from glands called *lacrimal glands* which are located just above the outer corner of your eyes. Every time you blink a small amount of tears is released into your eye to keep it moist. Tears also help to wash away bacteria and dust from the surface of your eye. Tears drain out of your eye by entering the *lacrimal duct* or *tear duct*.

Some people wear glasses; do you know why? Sometimes people have trouble seeing and glasses help them. When you have your eyes tested, the doctor asks you to read letters from different lines of an eye chart. If you have normal vision, you have 20/20 vision. This means that you can read line twenty at twenty feet away. If your vision is 20/200, this means that you can read the same letter at 20 feet that a normal eye can read at 200 feet! A person with 20/200 eyesight is legally blind in the United States. There are many other degrees of vision between 20/20 and 20/200, and some people even have better than 20/20 vision. People wear glasses for different reasons. Some people cannot see things very far away, and they are called *nearsighted* (*myopic*). In these people, the image is focused *in front* of the retina. Some people have trouble seeing things that are close, and these people are called *far-sighted* (*hyperopia*). In these people the image is focused behind the retina. Glasses help to bend the light enough so that the image is always focused on the retina.

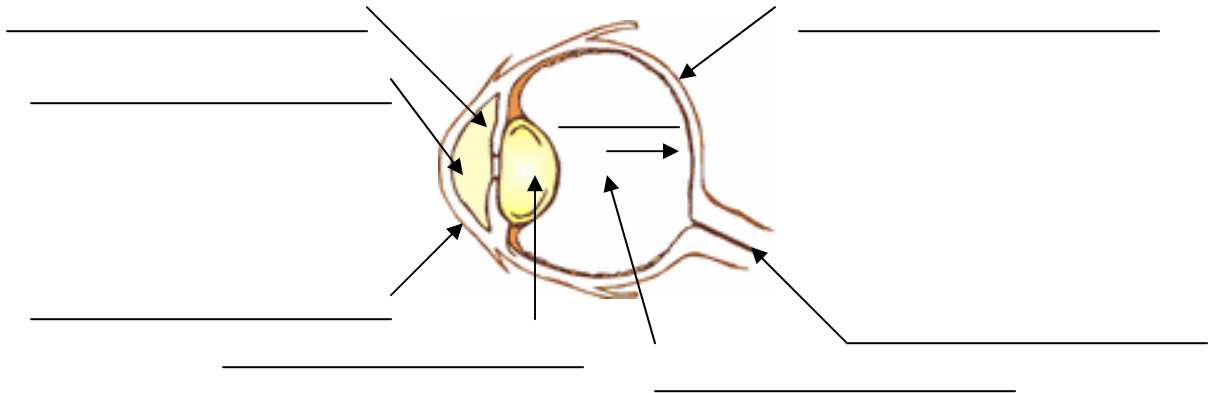
Your eyes do a very important job. They help you see the colors and shapes of things around you. The eyes you have now will be with you forever, so make sure you take good care of them!



Name _____ Date _____

Answer the questions about eyes.

1. Label the different parts of the eye.



2. What parts of the eye does light travel through?

3. What is between the *cornea* and *iris*?

4. What is the *lens*'s job?

5. What are *rods* and *cones*, and what do they do?

6. What is the *blind spot*?

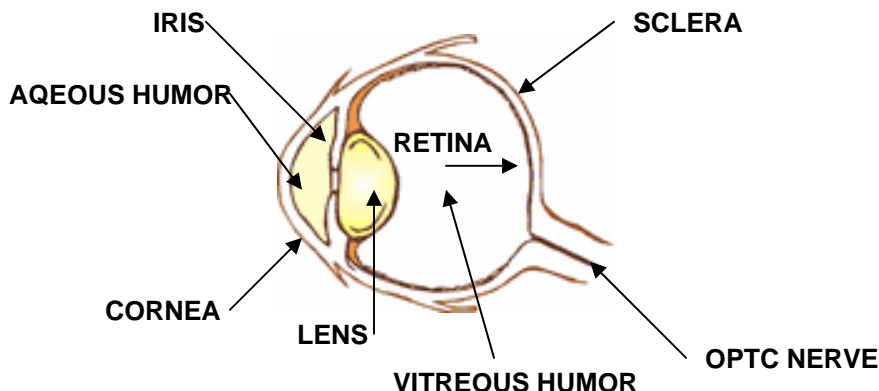
7. How does the eye protect itself?

8. What does it mean if somebody is *nearsighted*?

Name _____ Date _____

Answers to The Human Eye:

1.



2. Light travels through the cornea, aqueous humor, pupil, lens and vitreous humor.
3. The aqueous humor is between the cornea and the iris.
4. The lens's job is to bend light and focus the image onto the retina.
5. Rods and cones are two different types of cells found in the retina. Rods can see black and white and different shades of gray, but they can't see color. When you see things at night, your rods are the cells that are working. Cones sense colors. There are three different types of cones: red, blue and green cones. They work together to sense all the colors.
6. The blind spot is the part of the retina where the optic nerve exits. Any image that falls on the blind spot cannot be seen.
7. The eye protects itself using eyelids, eyelashes and tears. Eyelids blink to help keep things out of the eye and also to keep the eye moist. With each blink a small amount of tears is released onto the eye to wash away dust and bacteria.
8. If somebody is nearsighted it means that they have trouble seeing things far away. The image in their eye is focused in front of the retina.