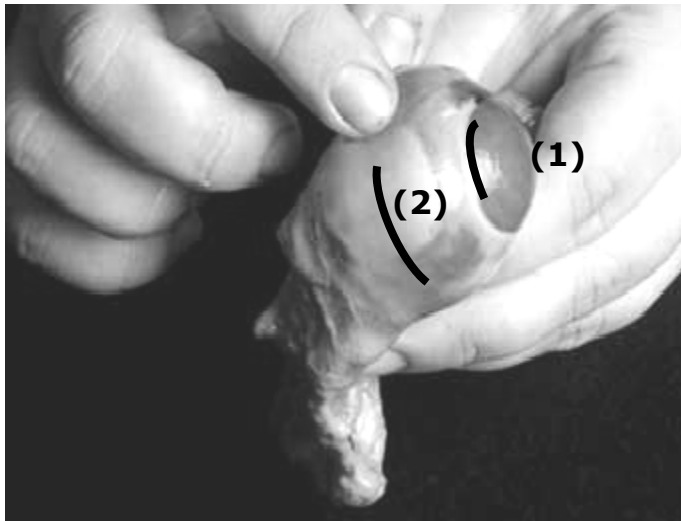


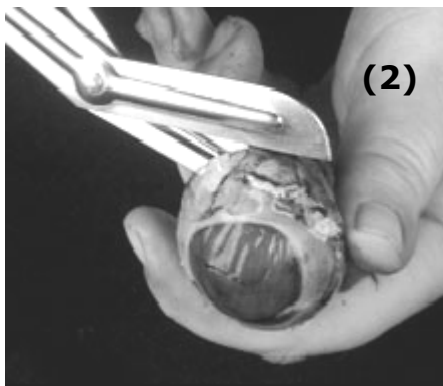
Name: _____

Here's a cow's eye from the meat company. The white part is the sclera, the outer covering of the eyeball. The blue is the cornea, which starts out clear but becomes cloudy after death.



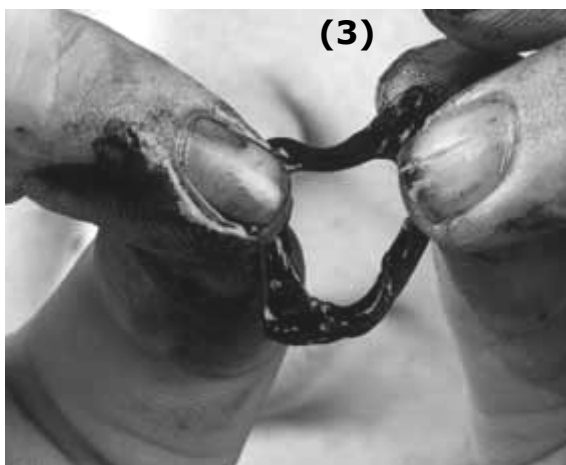
In the cow's eye dissection, we cut away all the fat and muscle so that we can see the eyeball.

A clear tough surface called the cornea covers the front of your eye and protects your eye. If you make a cut in the cornea **(1)**, a clear fluid oozes out. That's the aqueous_humor, which is made of protein and water. The aqueous humor helps give the eye its shape. Cut completely around the cornea and remove it. Rotate the eye and cut around the cornea. Be careful not to cut too deep or you may cut the lens. As the cornea starts to cut free, hold the cornea in the center and make the last cuts around it.

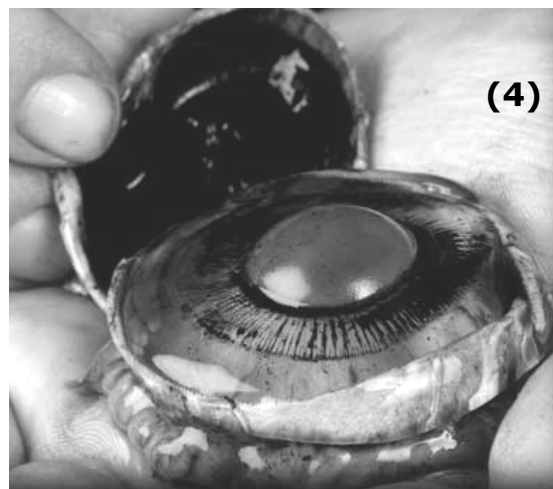


Now we are going to cut through the sclera and divide the eye in half, right around the middle **(2)**. The cornea will be on the front half of the eye. The cornea is made of many layers of tissue.

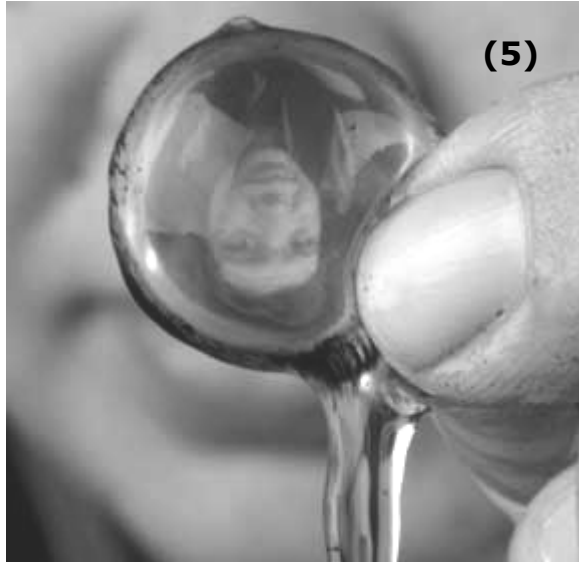
If you look at your eye in a mirror, you'll see a colored circle with a black spot in the middle. The colored circle is the iris. The black spot in the middle of the iris is the pupil, a hole through the iris that lets light into the eye. In dim light, the pupil opens wide, letting lots of light in. Remove the iris **(3)**.



With the cornea and the iris out of the way, you can see the lens **(4)**. It looks gray in this photo, but it's really clear. The clear goo around the lens is the vitreous humor. The eyeball stays round because it's filled with this clear goo.

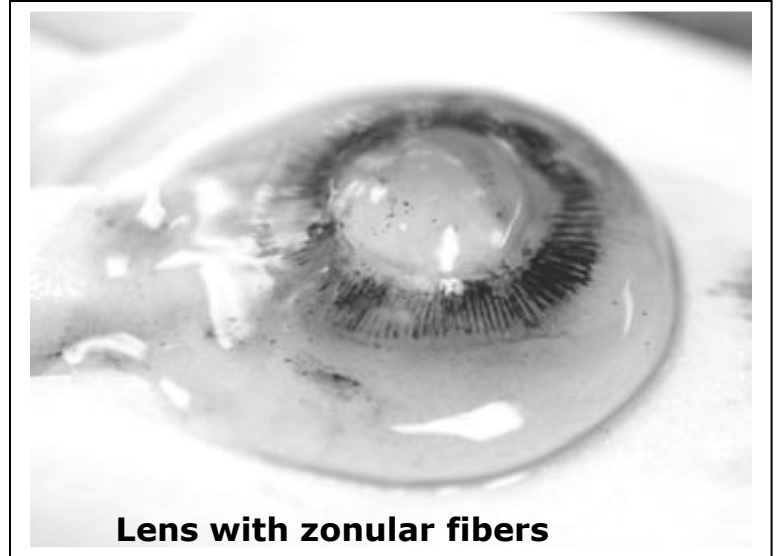


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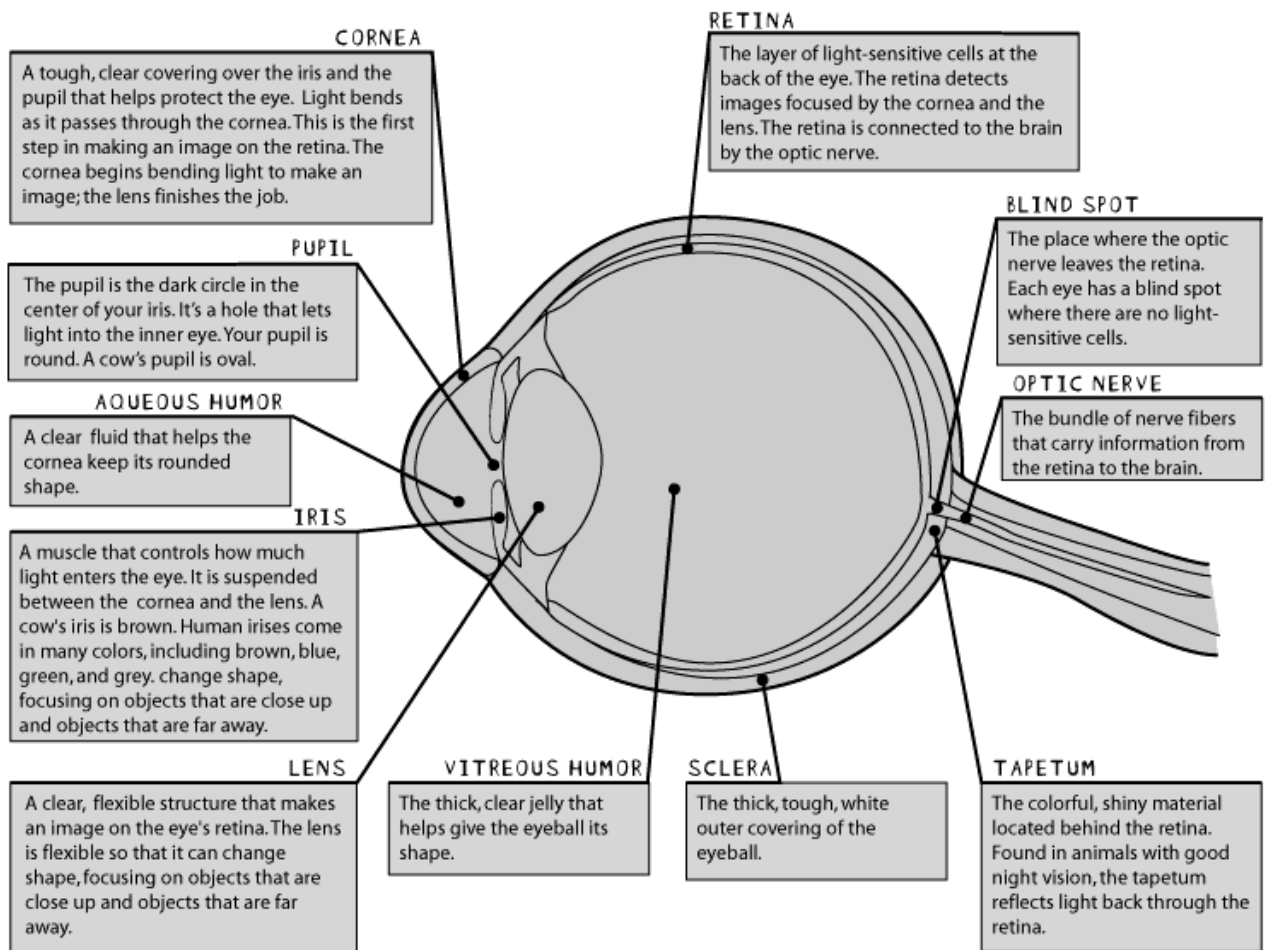


(5)

If you look through the lens, everything on the other side looks upside down and backward (5).



Lens with zonular fibers



Name: _____

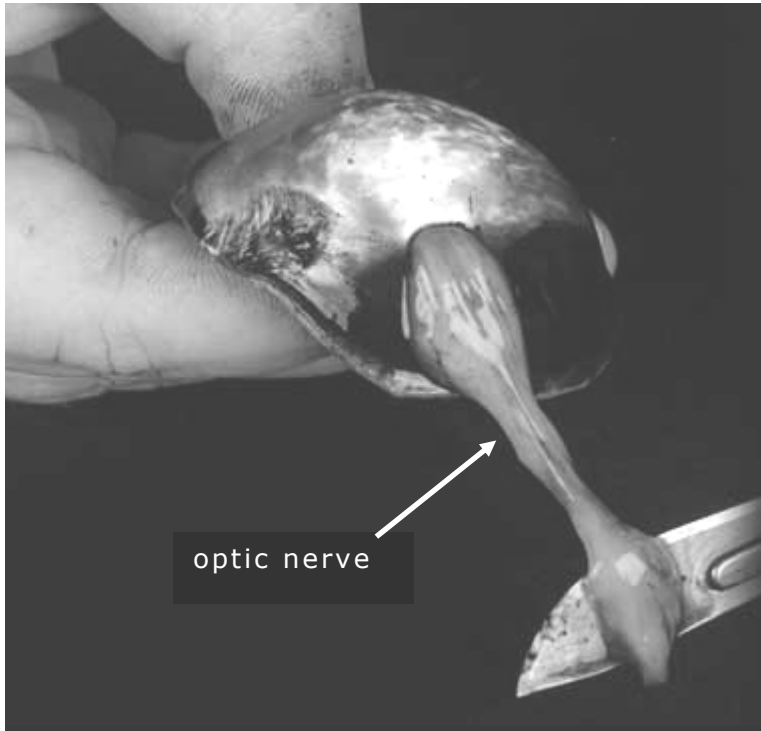


Here, the lens works like a magnifying glass, making the words look bigger. The lens of the cow's eye (like the lens of your eye) is shaped like the lens of a magnifying glass. It's thicker in the middle than it is at the edges.



Here's the back of the eye with the lens and vitreous humor removed. It's shaped like a bowl. On the inside of the bowl is a thin film with red blood vessels running through it. The retina contains light-sensitive cells that detect light.

Name: _____



The retina is attached to the back of the eye at just one spot. It's called your blind spot. Because there are no light-sensitive cells at that spot, you can't see anything that lands in that place on the retina. At the blind spot, all the nerves from the retina join to form the optic nerve.



At the back of the eye, you can see the optic nerve, which carries messages from the retina to the brain. You see the world because your lens makes a picture on your retina, the retina sends a message to your brain, and your brain turns that message into a mental picture of the world!

Name: _____



Here's the inside of the back of the eye again. Behind the retina is a layer of shiny, blue-green stuff called the tapetum. This layer assists night vision by reflecting light back through the retina. You don't have a tapetum, but cats and cows (and other animals) do. A cat's eyes shine in the headlights of a car because of the tapetum.

GLOSSARY

Aqueous humor - A clear fluid that helps the cornea keep its rounded shape.

Blind spot - The area where the optic nerve leaves the retina. Each eye has a blind spot where there are no photoreceptor cells.

Blood vessels - Tiny arteries and veins that carry blood to the retina.

Ciliary body - Muscles that control the shape of the lens for near and far vision.

Cones - One type of photoreceptor cells in the retina. They are responsible for daylight and color vision.

Cornea - A clear, tough covering over the iris and the pupil that helps protect the eye and begins focusing the light.

Fovea - A dimple in the retina where cones are concentrated and vision is most acute.

Iris - A muscle that controls the amount of light that enters the eye. It is suspended between the cornea and the lens.

Lens - A clear, flexible structure that adjusts the eye's focus, allowing us to see objects both near and far. It is responsible for about 20 percent of our focusing.

Optic nerve - The bundle of nerve fibers that carry information from the retina to the brain.

Retina - The layer of light-sensitive cells lining the inner eyeball. It detects images focused on the back of the eye by the lens and the cornea. The retina is connected to the brain by the optic nerve.

Rods - One type of photoreceptor cells in the retina. They respond to dim light.

Sclera - The thick, tough, white outer covering of the eyeball.

Suspensory ligaments - Fibers that connect the ciliary body to the lens.

Tapetum - The colorful, shiny material located behind the retina. Found in animals that have good night vision, it reflects light back through the retina.

Vitreous humor - The thick, clear jelly that helps give the eyeball its shape.

Name: _____

Dissection Worksheet

1. Examine the surface of the eye and make 3 observations

- 1. _____
- 2. _____
- 3. _____

2. Identify:

- olfactory nerve
- blood vessels
- exterior muscles and tissue

3. List the three layers you sliced through.

- _____
- _____
- _____

4. Separate the lens from the ciliary bodies. Make two observations about the lens.

- a. _____
- b. _____

5. Match the following structure of the cow eye with their function and/or description.

- | | | |
|-----------------|------------|-----------|
| a. tapetum | b. lucidum | b. retina |
| c. ciliary body | d. lens | |
| e. sclera | f. iris | |

- _____ Contains the photoreceptors for vision.
- _____ The colored portion of the eye.
- _____ This structure changes shape to focus light on the retina.
- _____ The opening in the iris through which light passes.
- _____ The iridescent portion of the choroid layer found in nocturnal animals.
- _____ Consists of muscles, which control and shape the lens.
- _____ The white of the eye.