

## Laboratory Activity

# Parts of the Eye

Your eye is one of the most complex organs of your body. Much could be learned about eye functions if you could look inside a human eye and study its parts. This is not very practical, but you can study a cow eye. Cow eyes are very much like human eyes. Cow eyes have another advantage—they are bigger than human eyes.

### Strategy

You will dissect a preserved cow eye. You will identify the most important parts of the eye. You will describe the functions of these eye parts.

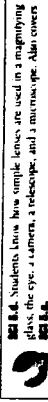
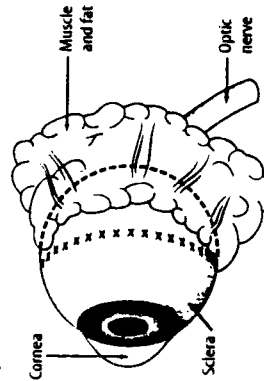
### Materials

cow eye (preserved)  
dissecting pan  
scalpel

### Procedure

1. Cut away all of the muscle and fat that surround the rear ball part of the eyeball. Use a scalpel to start cutting the muscle and fat from the front toward the back of the eye. Remove only small portions of tissue at a time. **WARNING: Use care when cutting to avoid injury.** Do not remove the optic nerve as you trim the eyeball of fat and muscle. (The optic nerve can be seen as a white, round, pencil-thick bundle of nerves surrounded by a dark-colored layer of muscle tissue at the back of the eye.) Use the dash line shown in Figure 1 as a guide to how much muscle and fat must be removed.

Figure 1

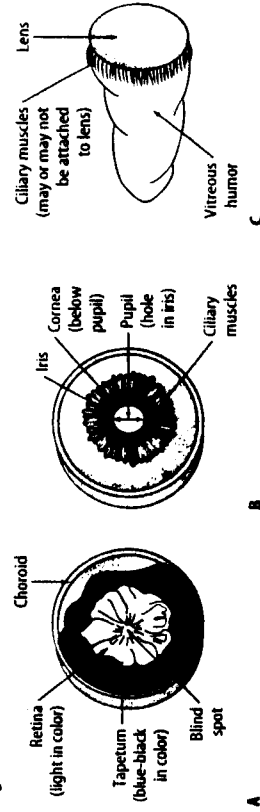


2. You are now ready to cut into the eye. Cut in a circular pattern into the eye at the position marked in Figure 1 with X marks. You must cut through a tough outer layer called the sclera.
3. Cut the eye in half, separating the front from the back. A jellylike material will probably fall out as the eye is cut in half. This is the vitreous humor, a transparent jelly that fills the inside of the eye. The lens is a marble-shaped structure that may also fall out of the eye.
4. Place the front portion of the eye with the outside facing down. Use Figure 2B to help you identify the ciliary muscles, iris, pupil, and cornea. Hold the front portion of the eye up to the light and observe the cornea. The cornea will not be completely transparent, but it is transparent in a living eye. Place the back portion of the eye with the inside facing up. Examine the back portion of the eye Figure 2A. You should have the cut surface facing up. You should notice a thin, wrinkled, whitish tissue on the inside along the back. This is the retina. The retina in a living eye is smooth. **NOTE:** The retina can be removed for closer examination. Observe that it attaches to the back of the eye. This is the blind spot leading to the optic nerve.

## Laboratory Activity 1 (continued)

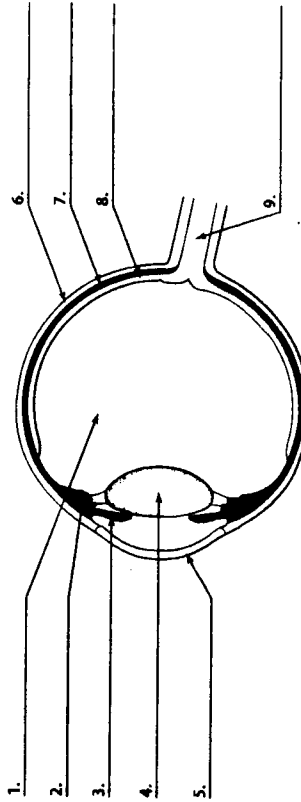
6. At the back of the eyeball is a bluish layer called the tapetum. This layer acts as a reflective surface and is found only in certain animals. Push the tapetum aside at its cut edge to find the choroid layer directly below.
7. Examine the solid, round, yellowish structure (Figure 2C) that fell out when you opened the eyeball. This is the lens. It is covered with a layer of fine muscle fibers that control the shape of the lens. Hold it up to the light. The lens does not appear completely transparent now, but it is transparent in a living eye. **WARNING: Wash your hands thoroughly after handling the eye.**
8. Correctly label Figure 3 in Data and Observations, which shows the side view diagram of the eye.
9. Record the parts of the eye you identified and their functions in Table 1. You may use reference books and your textbook to complete the table.

Figure 2



## Data and Observations

Figure 3



**Laboratory Activity 1 (continued)**

2. List the following eye parts in the order that light passes through them: vitreous humor, retina, lens, cornea, pupil.

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

3. Explain why it is important that the lens and cornea be transparent in a living eye.

**Strategy Check**

- \_\_\_\_\_ Did you dissect a preserved cow eye?
- \_\_\_\_\_ Can you identify the most important parts of the eye?
- \_\_\_\_\_ Can you describe the function of each part you examined?

**Laboratory Activity 1 (continued)**

**Table 1**

Structure of the Eye	
Part	Function
10.	
11.	
12.	
13.	
14.	
15.	
16.	
17.	
18.	
19.	

**Questions and Conclusions**

1. Give a possible difference between what you observed in a preserved eye compared with a living eye for the following parts:

- a. retina \_\_\_\_\_
- \_\_\_\_\_
- \_\_\_\_\_
- b. lens \_\_\_\_\_
- \_\_\_\_\_
- \_\_\_\_\_
- c. cornea \_\_\_\_\_
- \_\_\_\_\_
- \_\_\_\_\_
- d. vitreous humor \_\_\_\_\_
- \_\_\_\_\_
- \_\_\_\_\_