

Sec: _____ Name: _____

Experiment: The Mammalian Eye
(B. Science 10-35-49)

Purpose: To learn the anatomy and physiology of the eye.

Materials: cow eyeball dissection kit

Methods:

Part A: External Anatomy.

One fifth of the eye can be seen externally. Use your own eye to locate and label the following:

1. **Eyelids.** Suggest a function for these.
2. Openings of the lacrimal (tear) ducts. These ducts are in the eyelid and drain tears into the nasal passages. Of what use are tears to the eye?

3. **Pupil & iris.** Cover one eye for 30 seconds. Then quickly remove your hand and observe what happens to the pupil. Explain the importance.

4. **Eyelashes and eyebrows.** Suggest a role for these structures.

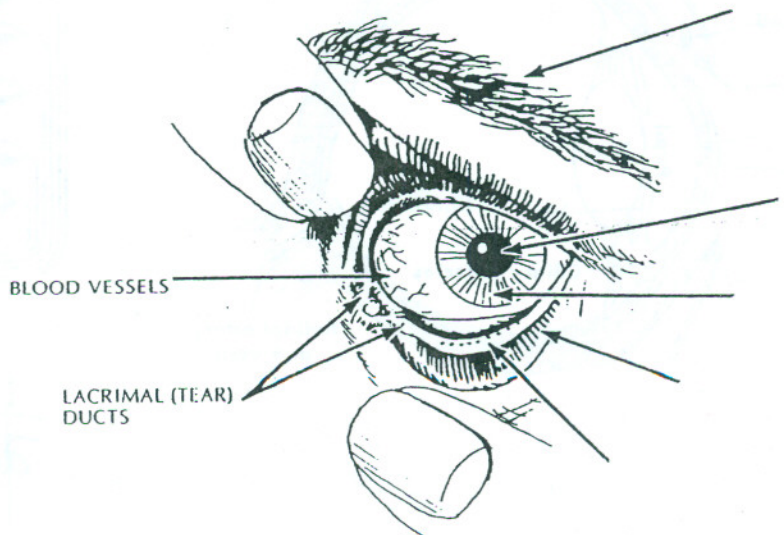
Part B: Internal Anatomy: Use cow eyeball, locate and label the following.

1. Carefully cut away the excess tissue from around the eyeball. Much of this is connective tissue, also for tear glands, be ready for a **quiz** of bold words.
2. Locate the six ocular muscles attached to the eye near its anterior end. These are the **superior** and **inferior rectus muscles**, the two **lateral rectus muscles**, and the **superior** and **inferior oblique muscles**. Describe a function for each of these muscle pairs.
3. Expose the **optic nerve**. What is the relationship of this nerve to the eye and brain?
4. The eyeball is made up of three tissue layers. The outer layer, the **sclera**, is opaque over most of the surface of the eye. At the anterior end of the eye, however, the sclera is transparent and forms the **cornea**. In preserved eyes the cornea may be cloudy. Nevertheless, it is usually transparent enough to see the pigmented iris and circular opening, the **pupil**. The **iris** surrounds the pupil.
5. Observe the dissected eye to see the inside surface of the eye, the **retina**. What appearance does the retina have?

Results:

Part A:

1. eyelid: _____
2. tears: _____
3. importance: _____
4. role: _____



Part B:

2. superior rectus:

inferior rectus:

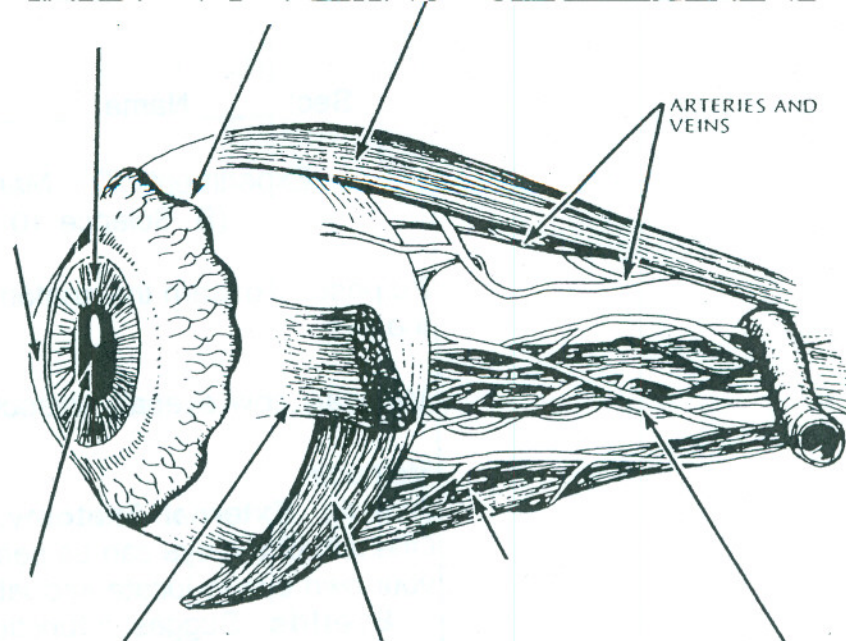
lateral rectus:

superior oblique:

inferior oblique:

3. relationship:

5. appearance:

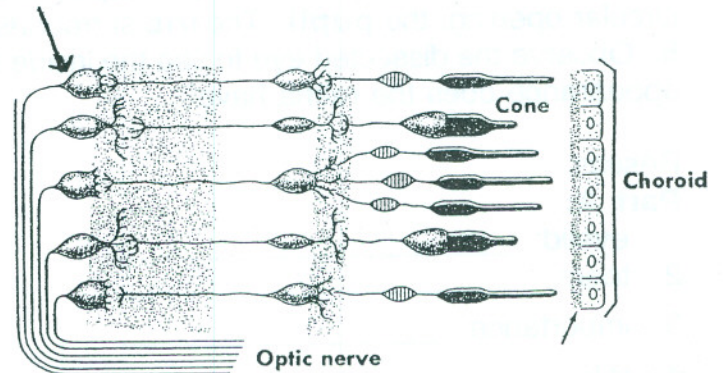
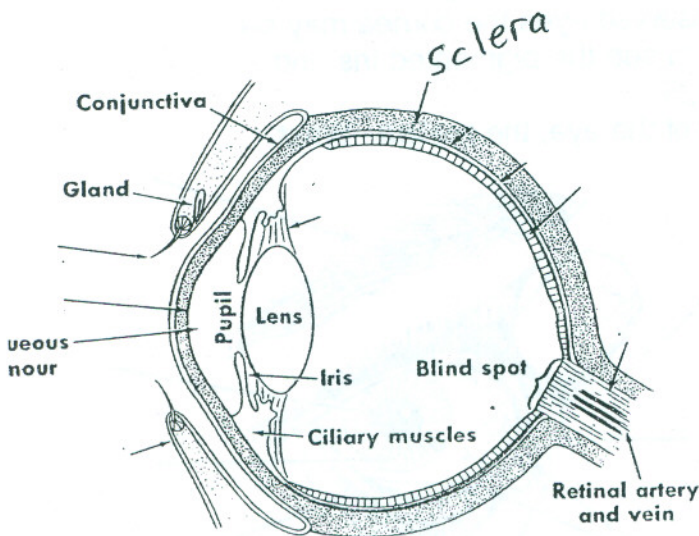


OPTIC NERVE

Results: How the eye sees things: Label the parts printed in bold:

(Lower left photo) The light enters the eyeball through the **cornea**. This can be covered by the **eyelid**, which contains the **eyelash** to protect eye, and the **lacrimal gland** to make tears. The pupil is surrounded by the **iris** which contains the pigment giving your eye color. The light travels through the **pupil**, which adjusts the amount of light entering eye by getting bigger or smaller, and on through the **lens**. The lens has **ligaments** attached to it which are attached to **ciliary muscles**. The lens is used to focus the light rays on the back of the retina by the ciliary muscles contracting, (making lens thinner), or by relaxing, (making lens thicker). Once the light rays are past the lens it travels through the center of the retina containing **vitreous humor** fluid. The back & sides of the eye is the **retina**.

(Lower right photo) The first part the light rays hit as it travels to the retina are the **nerve cells**, which all hook up to the **optic nerve**. The light travels through the nerve network and is absorbed by the **rods** and **cones** of the eye. The rods and cones are specialized dendrites that convert the light into nerve impulses. If light is not absorbed by the rods and cones it reflects off the **pigment layer** on back of eye and is able to be absorbed again. That's why eyes reflect light when you shine a light on them.



light
direction