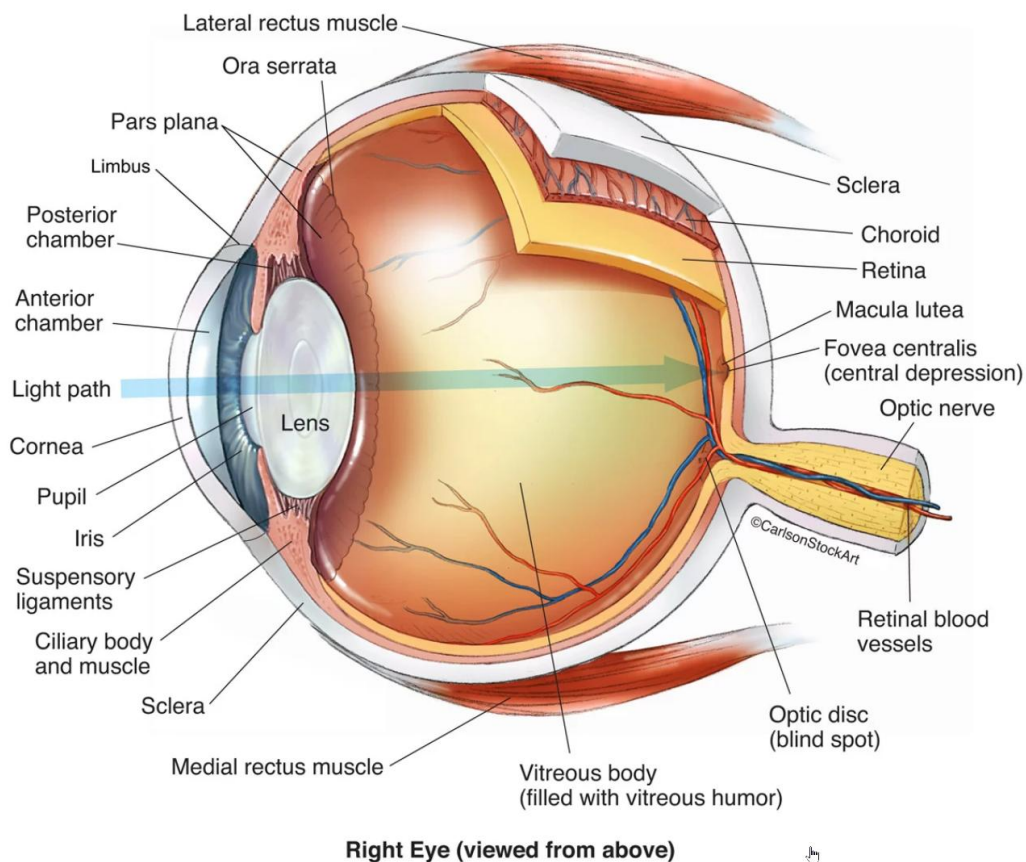


Sheep Eye Dissection Guide

Photo illustrated dissection guide

Examine how a mammalian eye collects light, focuses an image, and sends information to the brain. Follow the outside-to-inside sequence of the Mr. E Science sheep eye demonstration, then relate each visible structure to its function.



Cover illustration: Human eye cross-section for comparison with the sheep eye. Sheep lack the human macula and fovea and have a reflective tapetum lucidum.

Using this guide

Read the guide and watch the video before beginning. During the lab, identify structures with your partners and explain their functions before requesting the teacher's check. Follow the assigned lab sheet for observations and drawings.

Video: <https://www.youtube.com/watch?v=ALitsUWAxo4>

The photographs are from the Mr. E Science dissection video. On-screen word lists identify terms discussed in the demonstration; use the descriptions in this guide to locate each structure. In the on-screen word lists, "Scelera" should read "sclera."

Prepare and orient the eye

Materials and safe handling

Preserved sheep eye, dissecting tray, scissors, forceps, blunt probe, teacher-approved scalpel, protective eyewear, gloves, protective clothing, paper towels, and assigned recording materials.

Keep the eye supported in the tray and fingers out of the cutting path. Use shallow, controlled cuts. Have your teacher demonstrate and supervise the initial opening; do not puncture an eye held in your palm. Follow classroom directions for preservative handling, storage, and disposal. Keep hands away from your face and wash them after cleanup.

External landmarks

The **cornea** marks the anterior, or front, surface. The cornea is the anterior landmark. The **optic nerve** marks the posterior landmark, or back, surface. The cornea is transparent in life but often cloudy after preservation, hiding the **iris** and **pupil** until the eye is opened.



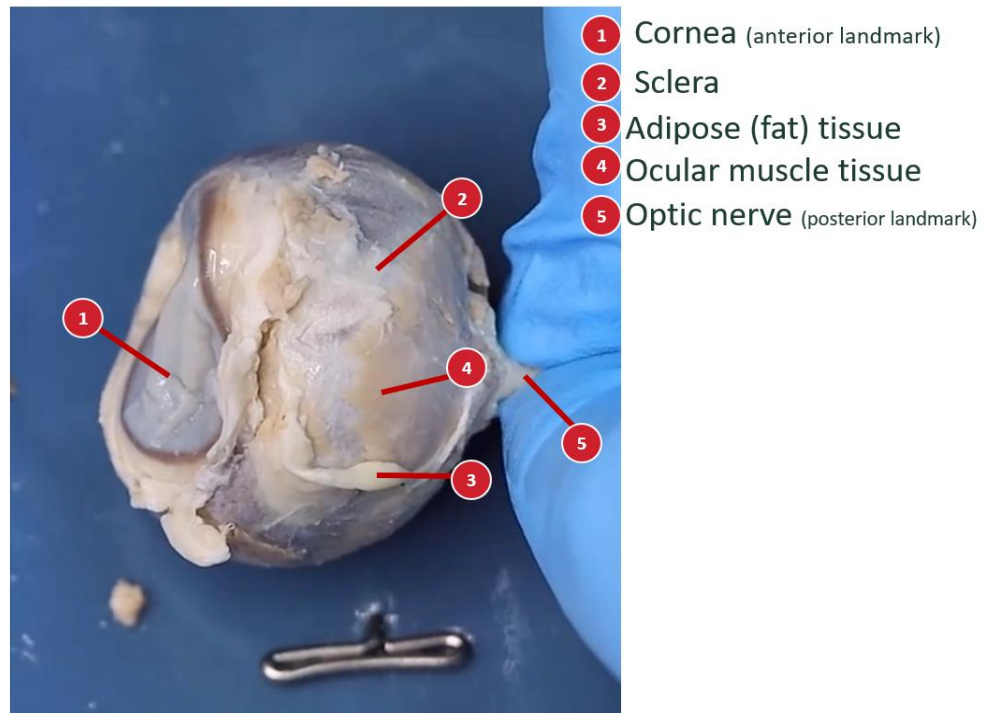
Figure 1 & 2. External surface after trimming. Confirm the cornea and optic nerve on your own specimen before cutting.

Examine before trimming

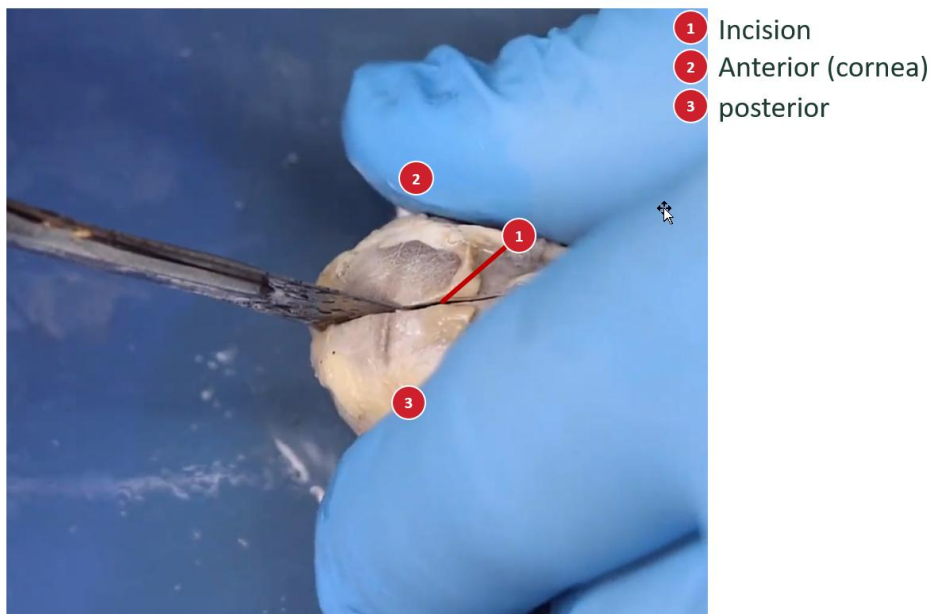
Locate the tough **sclera**, external eye **muscles**, and surrounding adipose tissue, fat. The sclera protects and supports the eyeball. Muscle is usually fibrous and darker than the pale, lobulated fat. External muscles move the eye in its socket; fat cushions it. Identify these tissues before removing excess material.

Think About It 1: Why might the iris and pupil be difficult to see through a preserved cornea?

External View



Opening the Eye



Open the eye

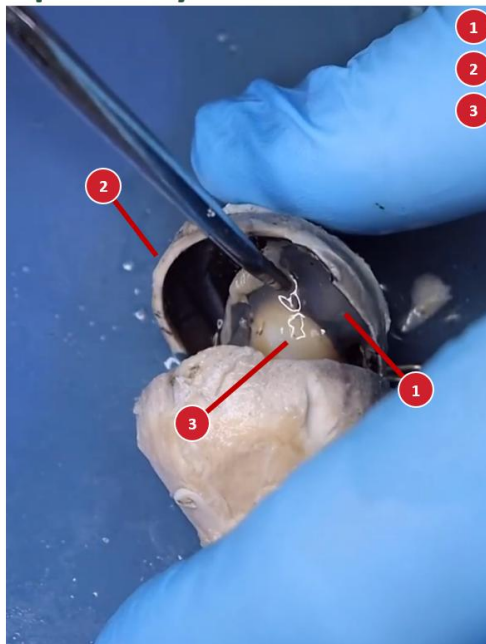
Trim the outside

1. Lift excess fat and connective tissue with forceps or a blunt probe, then trim with scissors. Identify the external **ocular muscles** before trimming them back, following the demonstration. Preserve the optic nerve. Although the sclera is tough, careless cutting can still damage it.

Separate anterior and posterior sections

2. Locate the **cornea** and **optic nerve** again. The video places the opening

Opened Eye



- 1 Vitreous humor (jelly)
- 2 Sclera (cut edge)
- 3 Lens

in the **sclera** approximately one-third of the way from the cornea toward the posterior end. Have your teacher confirm the cutting line.

3. With the eye stabilized in the tray, Use your scalpel to make the small opening incision. Continue around the eyeball with shallow scissor cuts or shallow scalpel cuts as demonstrated in the video. Keep fingers out of the cutting path and avoid the lens and other internal tissues.

4. Gently separate the smaller anterior section from the larger posterior section. Observe released fluid and the jellylike **vitreous humor**. Keep both sections in the tray, inner surfaces upward. Begin with the posterior section, which retains the optic nerve. The two cut sections are not the same as the anatomical chambers. The small **anterior chamber** contains **aqueous humor**

and the much larger posterior **vitreous chamber** contains the jelly like **vitreous humor** and lies behind the lens.

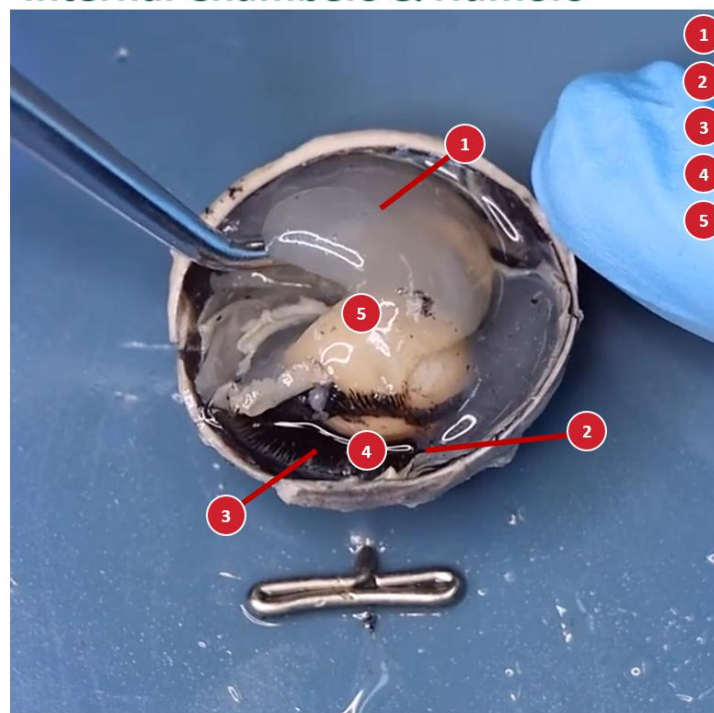
Inside the posterior section

Vitreous humor and retina

5. Observe the **vitreous humor**, the clear gel filling the large space behind the lens. Preservation can alter its clarity and texture. Gently move it aside to examine the thin **retina**. The retina may appear cream-colored, wrinkled, or partly detached.

The **retina** contains rods and cones. Rods are especially sensitive in dim light; cones contribute to color vision and detail. These individual cells require a microscope to see. Retinal circuits send signals toward the brain through the optic nerve.

Internal Chambers & Humors



- 1 Vitreous humor (jelly)
- 2 Aqueous humor (watery)
- 3 Ciliary body
- 4 Anterior chamber
- 5 Vitreous chamber

Optic disc and wall layers

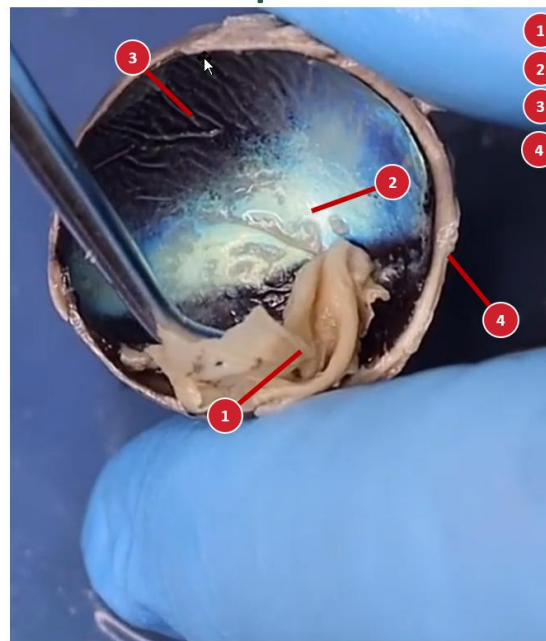
6. Follow the retina toward its attachment near the optic nerve. The **optic disc** is the region where nerve fibers leave the eye. It lacks photoreceptors and corresponds to the blind spot.

Posterior Interior



- 1 Retina
- 2 Sclera (cut edge)

Retina and Tapetum Lucidum



- 1 Retina (folded back)
- 2 Tapetum lucidum
- 3 Choroid (dark region)
- 4 Sclera (cut edge)

7. Gently lift a small area of retina to see the **choroid** beneath it. This vascular, pigmented layer nourishes the outer **retina** and absorbs stray light. Its reflective **tapetum lucidum** returns light through the retina, improving sensitivity in dim light. Humans do not have this reflective layer.

8. Lift only a small patch of **choroid** to expose the firm sclera. The posterior wall's order, from inside outward, is **retina, choroid, sclera**. Record these relationships before removing tissue.

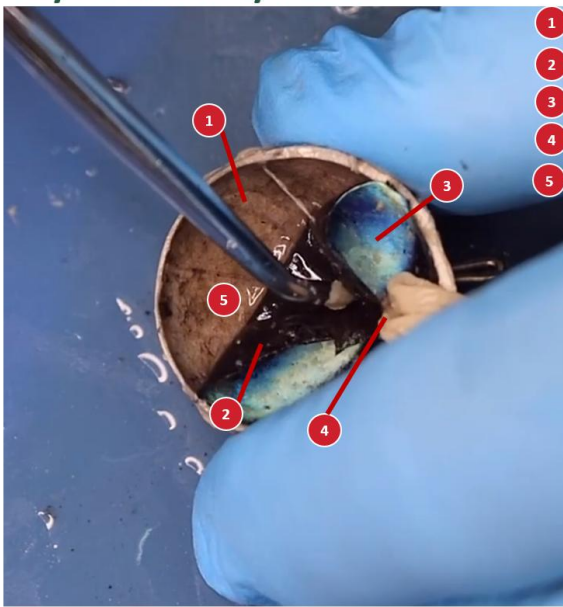
Think About It 2: Why is the optic disc a blind spot?

Inside the anterior section

Lens and attachments

9. Turn to the anterior section. Move vitreous material gently aside. Locate the lens and inspect its attachments before lifting it out. The lens bends light and changes shape for focusing in the living eye; preservation may make it cloudy and firm. The ridged ciliary body surrounds the lens. Fine **suspensory ligaments**, or zonular fibers, connect it to the lens capsule. They may be difficult to see. The **ciliary muscle** is part of the ciliary body; the visible

Layers of the Eye Wall



- 1 Sclera (exposed inner surface)
- 2 Choroid (lifted layer)
- 3 Tapetum lucidum
- 4 Blind spot
- 5 Vitreous chamber

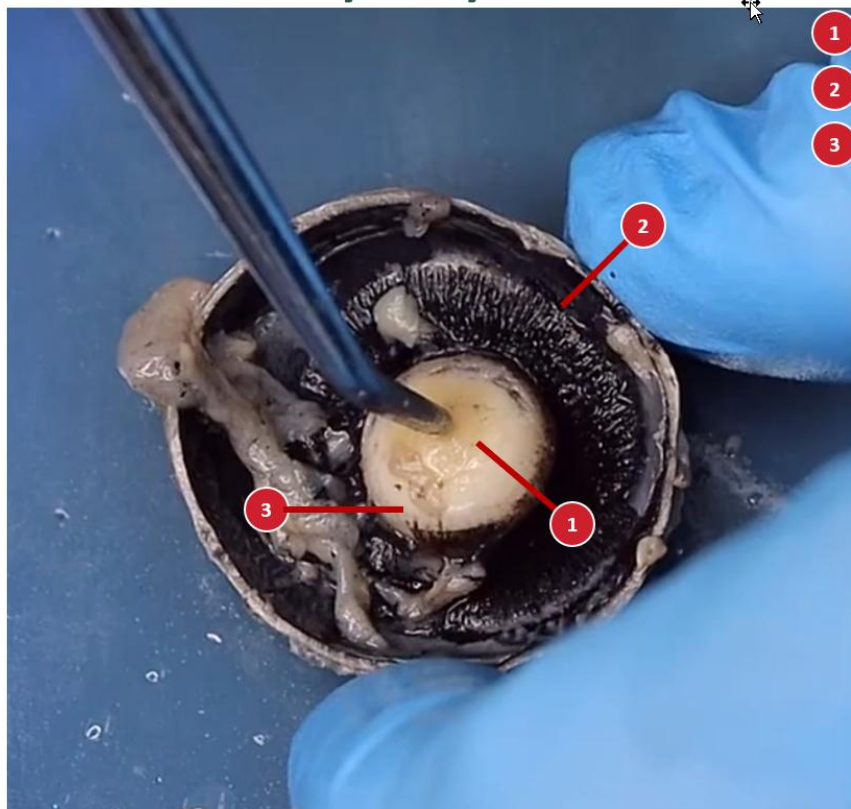
ridges are not exposed muscle fibers.

Changes in muscle activity alter ligament tension and lens shape. The ciliary epithelium produces aqueous humor.

Iris and pupil

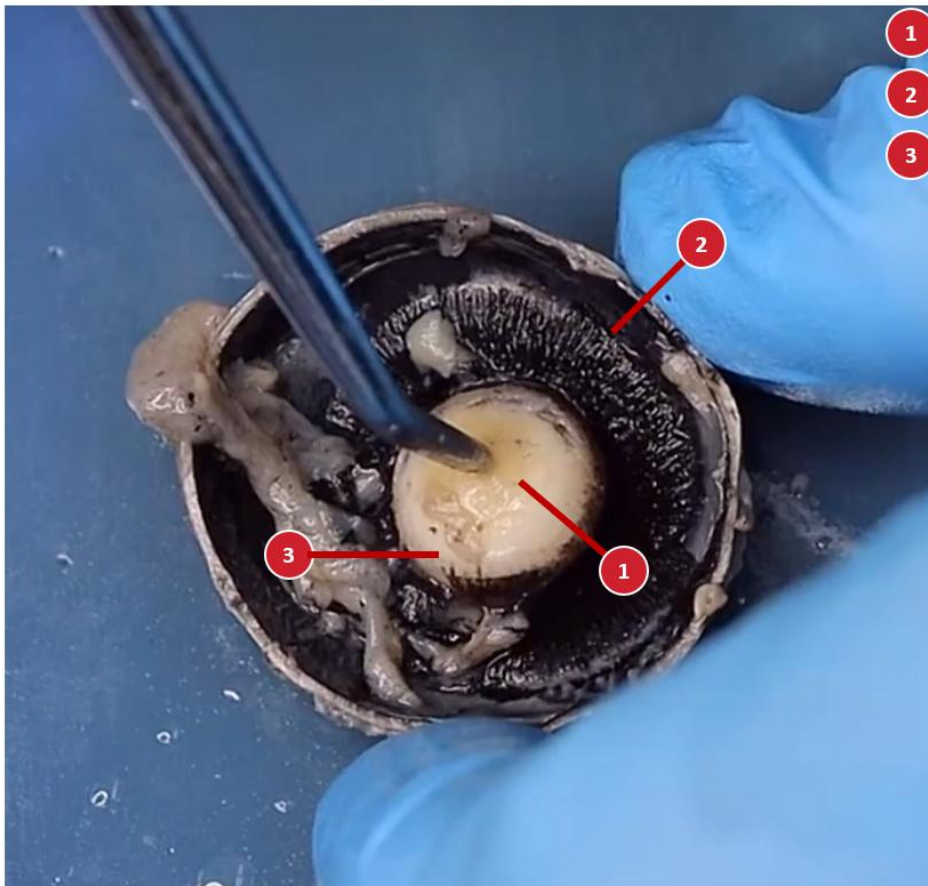
10. After observing attachments, gently remove the lens. Find the iris, the pigmented tissue surrounding the pupil. The pupil is an opening, not a solid structure. The cornea lies beyond it toward the front of the eye. Observe the sheep's elongated pupil and compare it with the round human pupil.

Lens and Ciliary Body



- 1 Lens
- 2 Ciliary muscle (body)
- 3 Suspensory ligaments (very thin filaments)

Lens and Ciliary Body



1 Lens

2 Ciliary muscle (body)

3 Suspensory ligaments
(very thin filaments)

Think About It 3: How do the functions of the iris and lens differ?

Trace the light pathway

Name the spaces correctly

The anterior chamber lies between the cornea and iris. The small posterior chamber lies behind the iris and in front of the lens and its attachments. Both contain watery aqueous humor. The vitreous chamber, also called the posterior cavity, is the large gel-filled space behind the lens. The video's broad use of "posterior chamber" for this large space should be read as vitreous chamber.

From light to nerve signals

Light passes through the cornea, aqueous humor, pupil, lens, and vitreous humor to reach the retina. The cornea and lens refract, or bend, the light. The retina converts light into signals that are processed by retinal neurons and carried through the optic nerve to the brain.

Complete the investigation

Identify the external landmarks and the major structures in both opened sections. If drawings are assigned, use colored pencils and straight leader lines. Record structures that are not visible rather than drawing them as observations. Have your teacher check the required structures before cleanup.

Store or dispose of the specimen as directed. Put tissue and fluid in designated containers, clean tools and the work surface, remove gloves, and wash your hands.

Sources and image notes

Ted Ehrheart, Mr. E Science sheep eye video and supplied transcript; photo review collection dated September 7, 2026. David Hall and Peter Reinthal, An Illustrated Dissection Guide to the Mammalian Eye, revised 2001, supplied reference. Photographs are from the supplied Mr. E Science collection. No reference-guide artwork is reproduced.

Think About It answers

1. Preservation can cloud the cornea, obscuring the structures behind it.
2. The optic disc has no rods or cones.
3. The iris regulates the pupil opening and light entry; the lens helps focus light on the retina.