**Cow Eye**

Dissection of a cow eye.

<table>
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<tr>
<th>Grade Level Used</th>
<th>Duration (Prep/Activity):</th>
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<td>6-8</td>
<td>5 min/45 min</td>
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**Objectives**
- To understand the eye better by seeing each part.

**Standards**
Strand II: Content of Science
- Standard I: Physical Science
- Standard II: Life Science
  - K-4 Benchmark II, III
  - 5-8 Benchmark II, III
  - 9-12 Benchmark II, III

**Materials**
- One cow eye for every pair
- One single edged razor blade or scalpel
- Scissors
- Wax paper and paper towels
- Plastic garbage bag

**Preparations**
1. Briefly review the vocabulary, the parts of the eye, and what the kids are looking for.
2. Pass out one eye and scalpel per pair.

**Procedure**
**Focus Question:** What do the different parts of the eye look like and where are they located.

1. Examine the outside of the eye. See how many parts of the eye you can identify. You should be able to find the whites (or sclera) and the clear covering over the front of the eye (the cornea). You should also be able to identify the fat and muscle surrounding the eye.
2. Make the first incision where the sclera meets the cornea. Cut until the aqueous humor is released.
3. 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.
4. Once you have removed the cornea, place it on the board (or cutting surface) and cut it with your scalpel or razor. This is the clear film over our eyes.
5. With the cornea removed, the next step is to pull out the iris. Place one finger in the center of the eye. Find the iris and pull it back. It should come out in one piece.
6. It can be a bit tricky to remove the lens with the **vitreous humor** attached. It works best if you cut slits in the sclera. Be careful not to cut the lens.

7. After enough incisions have been made in the sclera, you should be able to remove the lens. Sometimes the vitreous humor will be removed along with the lens. The lens is transparent and a bit squishy. The vitreous humor is jelly like.

8. Hold up the lens and look through it. If the lens is too slippery, pat it dry and try again. Comment on how things look through the lens.

9. With the vitreous humor now removed, you should be able to turn the eye inside out.

10. The thin tissue on the back of the eye is the **retina**. Find the spot where the retina is attached. The shiny blue-green material is the **tapetum**.

11. Find the spot where all the retina's nerves collect. It is called the **blind spot**. This is where all the nerves go out the back of the eye, forming the **optic nerve**.

12. Return your attention to the outside of the eye. Locate the optic nerve. To see the separate fibers that make up the optic nerve, pinch the nerve with a pair of scissors or with your fingers.

13. Once the dissection is complete, properly dispose of the remains. They should be wrapped up in plastic and disposed of the same day. Also, if you used razor blades, they should be disposed of properly. (A blade is good for only one or two dissections.)
Follow-up Questions

1. Review what the different parts looked like and felt like and where they were.
2. Reiterate that things were upside down through the lens.

Teacher Background Information

Aqueous humor - 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.

**Keywords**
Cow eye, dissection, lens, retina, pupil

**Expected Results**
The kids should be able to follow the dissection and see each part of the eye. Most importantly, when they look through the lens, things should be upside-down.

**Pictures/Graphs/Additional Information**
1. Cow’s eyes can be ordered at a butcher shop or from a slaughterhouse. Try to get eyes with muscles and fat still attached. If possible pick up eyes the day of dissection so that they are fresh.
2. This lesson is from
3. This should be done after the Sight and Light lab, the Yogurt Cup Eye, and/or eye tricks.