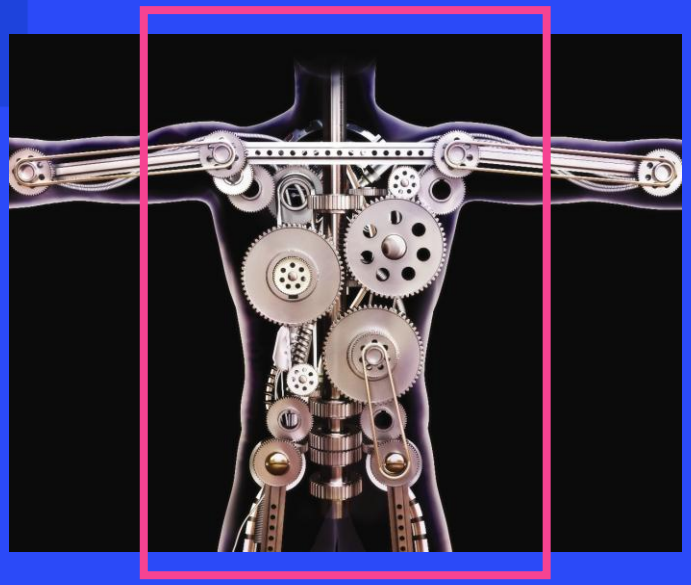


Structure and FUNction!

Organ Dissection for Next Generation Teachers

The Per•fect Contest! \per-fikt\ adj.

To enter:

1. Take a pic of yourself wearing your **Perfect shirt**.
2. Post and tag Carolina on social media by the end of the conference.
3. Winners will be chosen after the show via social.

Bonus points for creativity!

@CarolinaScience

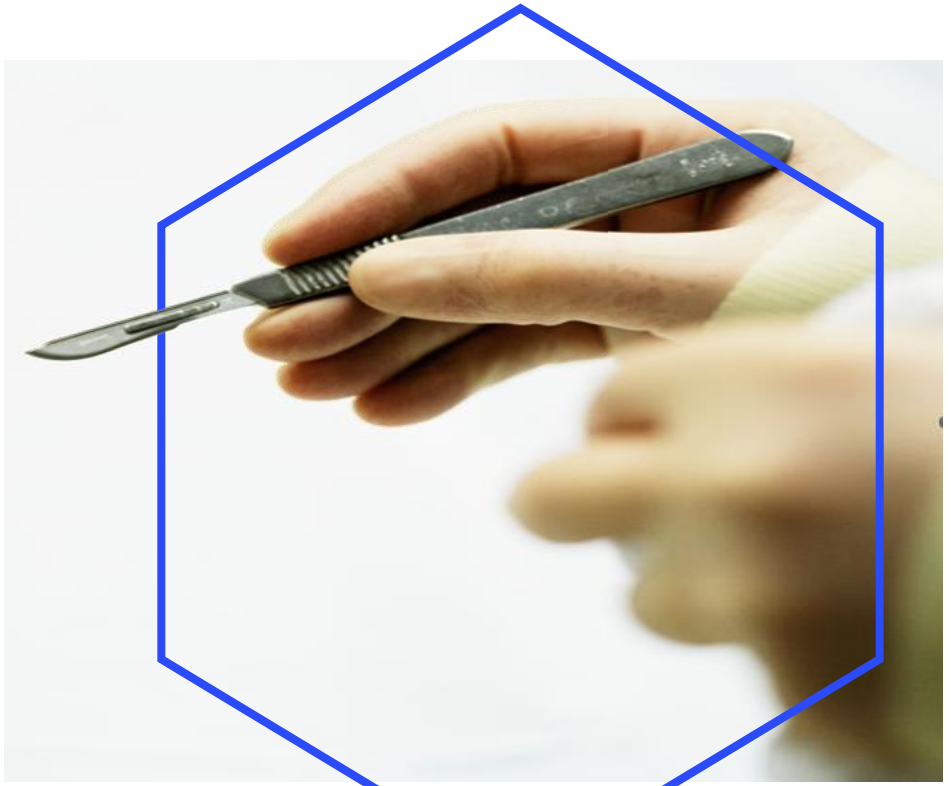
Carolina® Science

@carolinascience

CAROLINA UNLEASH LEARNING

Objectives

- Introduce the general structure, physiology, and interdependence of major mammalian organs.
- Dissect the bull testicle, sheep heart, and cow eye.
- Experience the quality of Carolina's Perfect Solution® specimens.



Building Toward 3-Dimensional Learning

Science and Engineering Practices	Disciplinary Core Ideas	Crosscutting Concepts
Developing and using models ▪ Develop and use a model based on evidence to illustrate the relationships between systems or between components of a system.	**LS1.A: Structure and Function** ▪ Multicellular organisms have a hierarchical structural organization, in which any one system is made up of numerous parts and is itself a component of the next level.	**Structure and function** ▪ The functions and properties of natural and designed objects and systems can be inferred from their components are shaped and used, and the molecular substructures of its various materials.

Explore Next Generation Dissections

1. NGSS Lead States, Next Generation Science Standards: For States, By States *(Washington, DC: The National Academies Press, 2013), retrieved from www.nextgenscience.org or ngss.nsta.org*

Carolina's Perfect Solution® Specimens

Quality

- Superior preservation
- Superior tissue color and texture

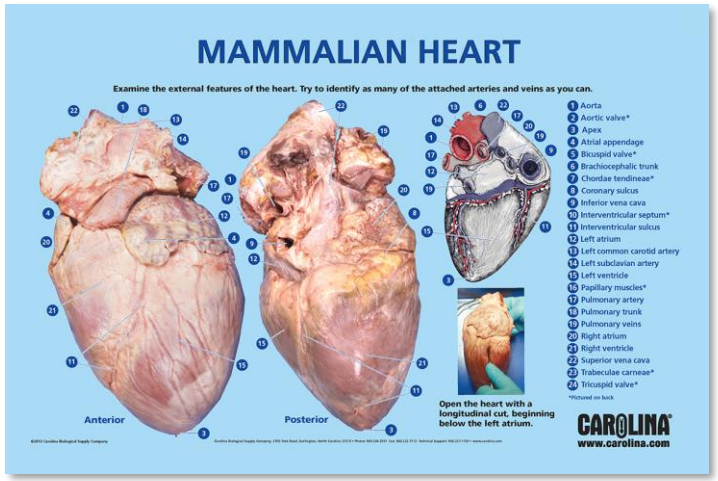
Safety

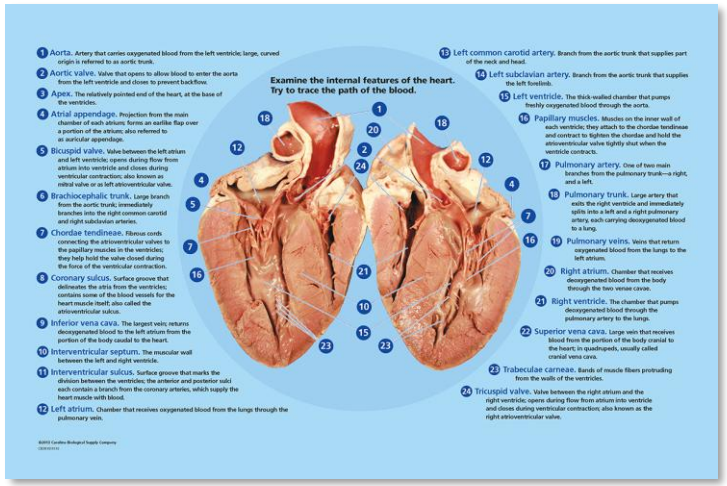
- No dangerous off-gassing
- No formalin odor

Dissection Preparation Tips

- **Organize your dissection area:**
  - Take out your dissection tray
  - Put blue absorbent pad under the dissection tray
  - Lay out your instruments
    - Scissors
    - Scalpel
- **Use appropriate personal protective equipment:**
  Apron, gloves, safety goggles

Carolina® Dissection Mats





- Clear, concise dissection instructions
- Detailed, color photographs
- Labeled internal and external structures with definitions
- Cost-effective
- Reusable—wipe clean

PLEASE DO NOT TAKE THESE MATS!

We need these for future workshops.

CAROLINA
UNLEASH LEARNING

Safety Issues

- **Personal protective equipment**
  Apron, gloves, safety goggles
- **Dissection tools**
  Be diligent with sharp tools

Safety Tip
If you are not using an instrument, set it down!

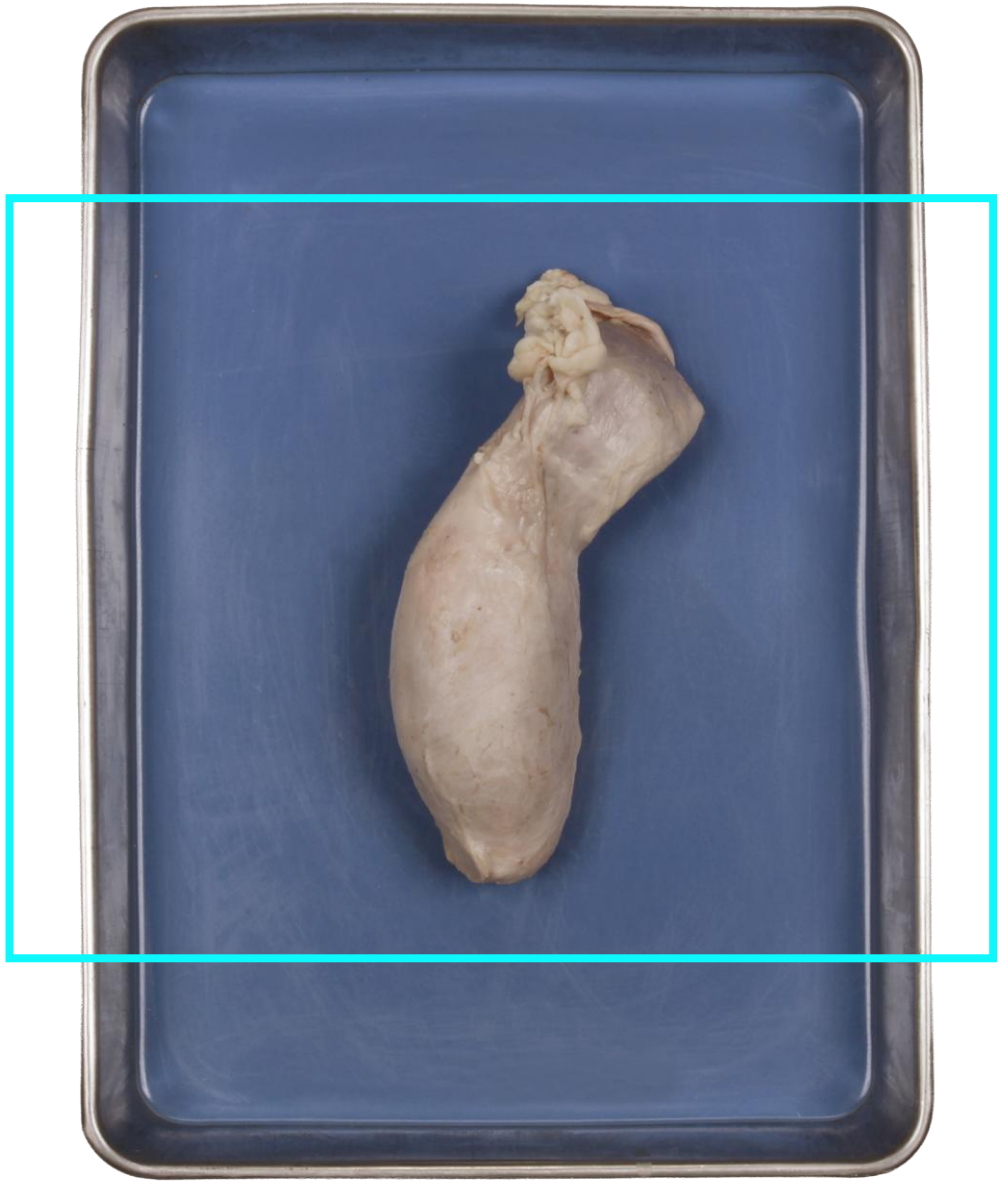
Teacher Tip

1. At the anterior of the specimen, locate an area where there is excess plastic.
2. Force any fluid out of the area to prevent spills.
3. Cut a small hole in the excess plastic. This will allow the fluid to drain to the bottom of the bag.
4. Continue to cut around the anterior of the specimen until you can easily remove the specimen from the bag.
5. Keep bag upright until we come over to collect the fluid and bag.

Workshop “Organ”ization

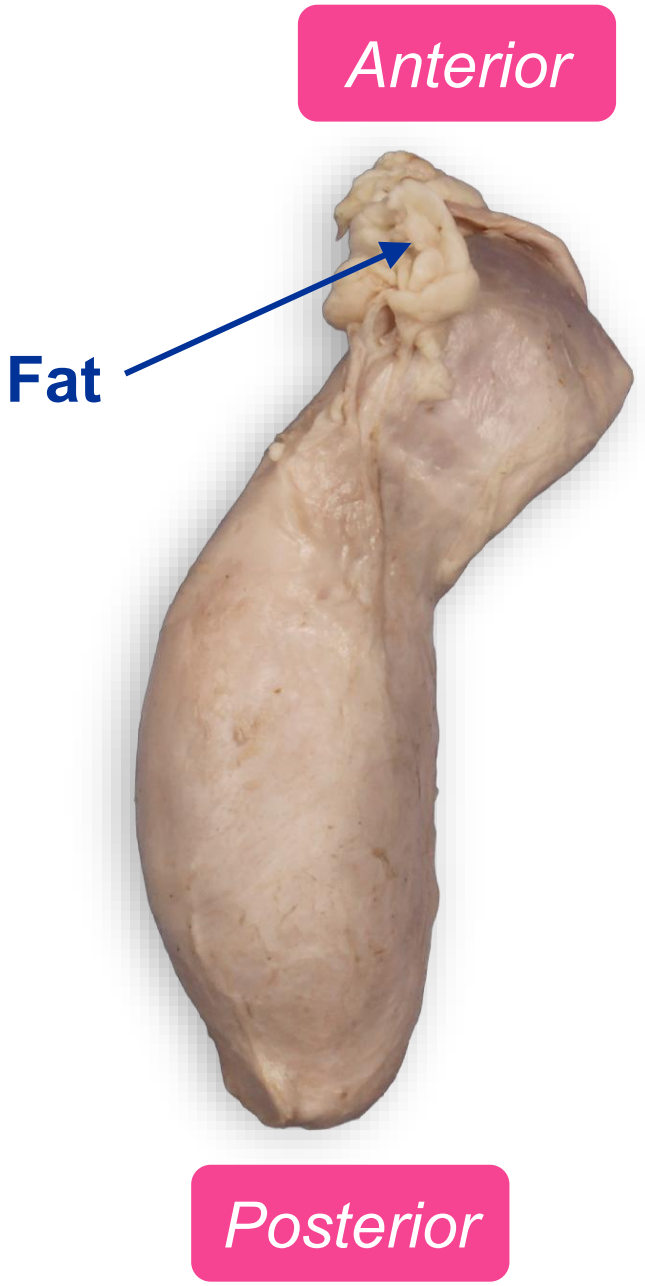
Procedure:

1. Dissect the bull testicle.
2. Dissect the sheep heart.
3. Time permitting, dissect the cow eye.



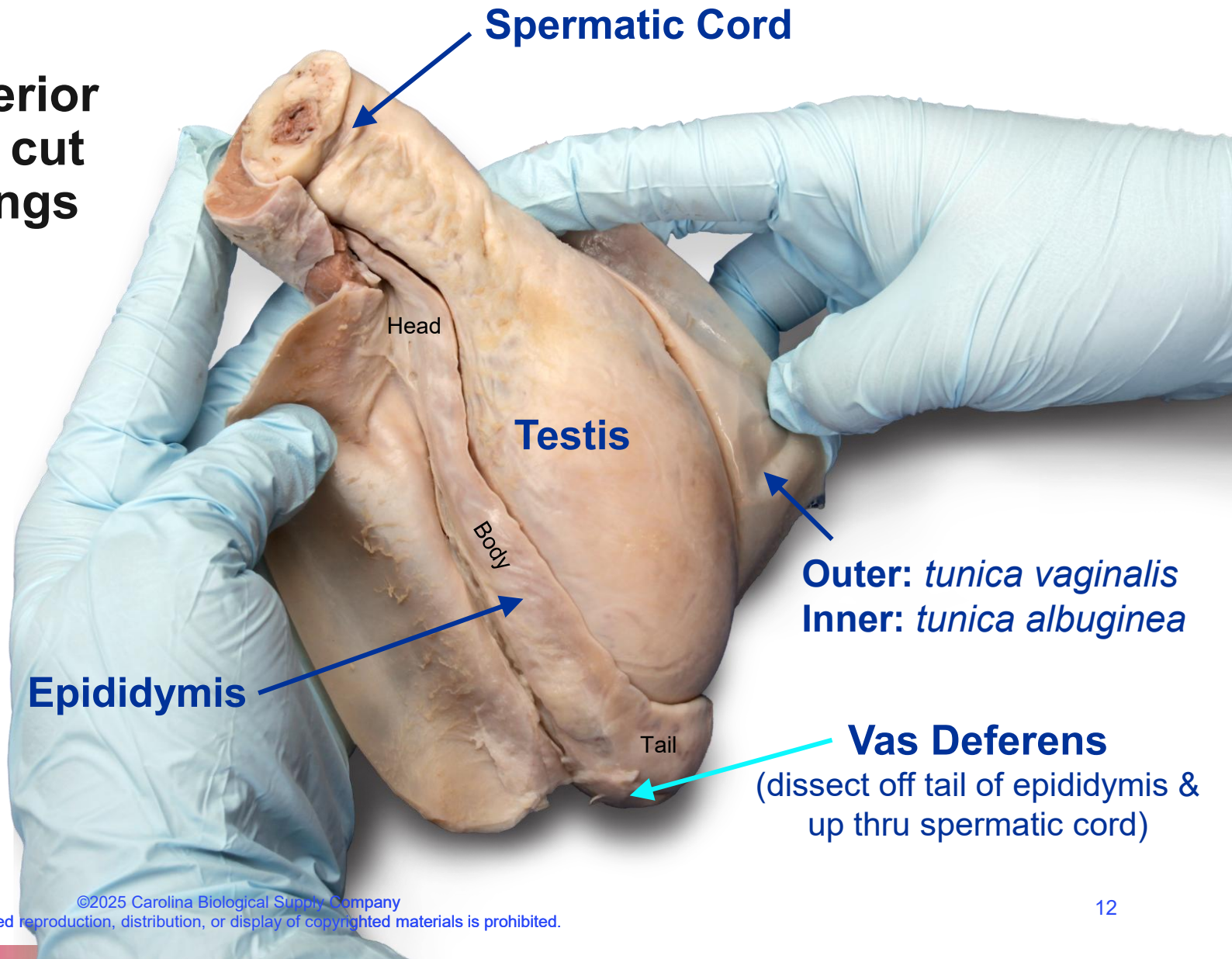
Bull Testicle: External Anatomy

1. Peel away fat, if necessary.
2. Locate the anterior (cord) and posterior ends of the specimen.



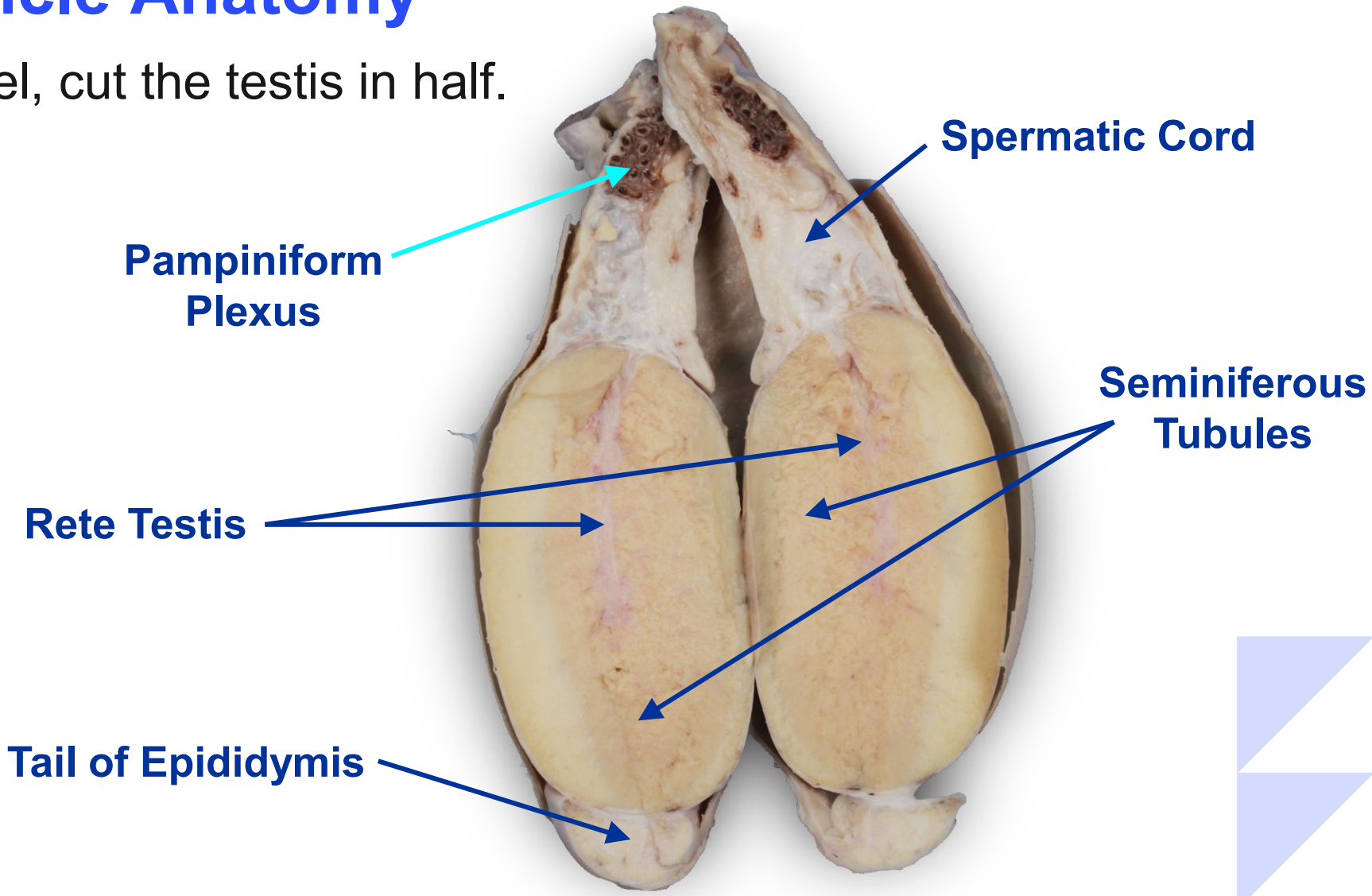
Bull Testicle Anatomy

1. With scissors, at the anterior end, make a longitudinal cut through the outer coverings (tunic) over the testicle.
2. Peel them back to reveal more structures.



Bull Testicle Anatomy

With a scalpel, cut the testis in half.



Dissection Preparation Tips

- **Put your bull testicle on the blue pad.** *Someone will come around and collect it for you.*
- **Place the sheep heart on the tray.**
- **We will dissect together!**

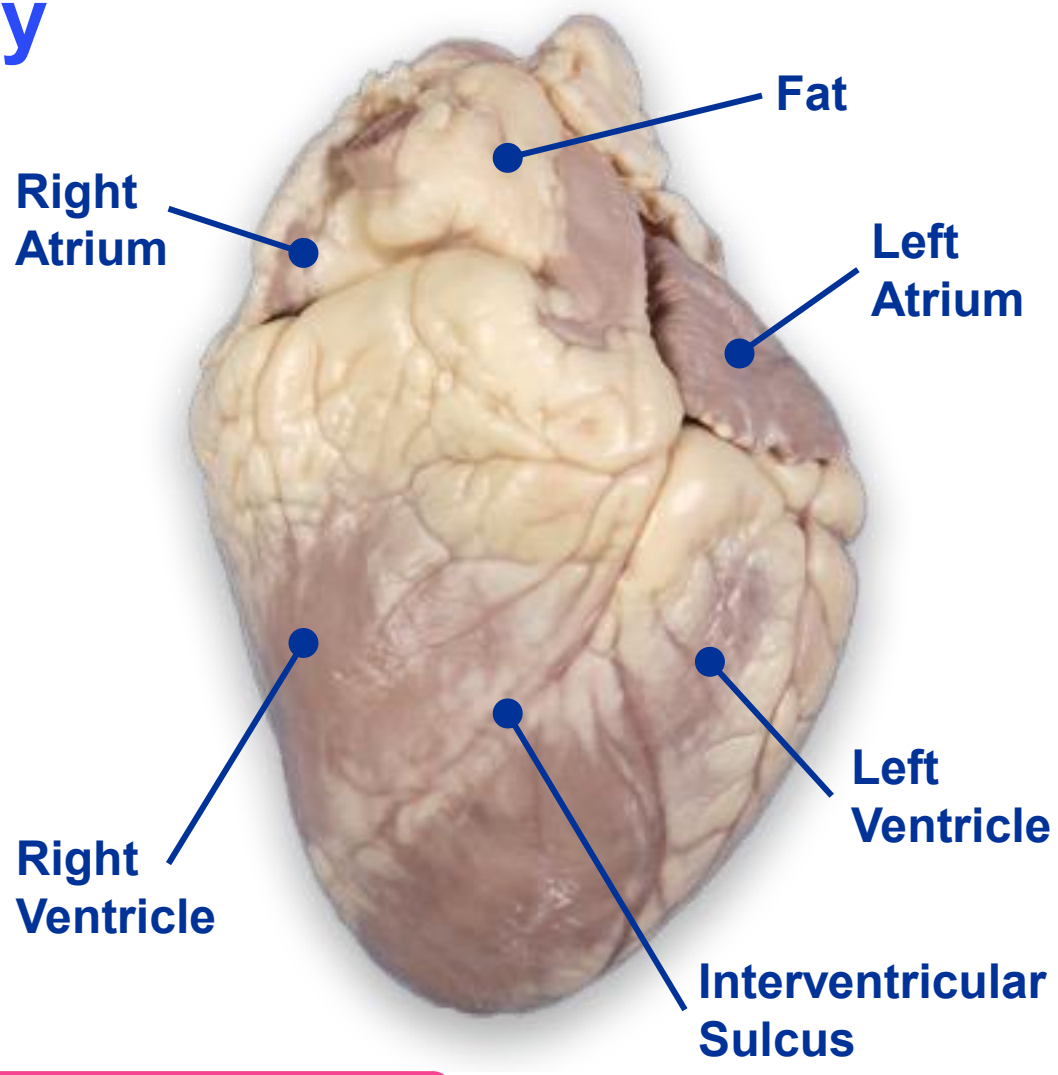
Workshop “Organ”ization

Procedure

1. Dissect the bull testicle.
2. Dissect the sheep heart.
3. Time permitting, dissect the cow eye.

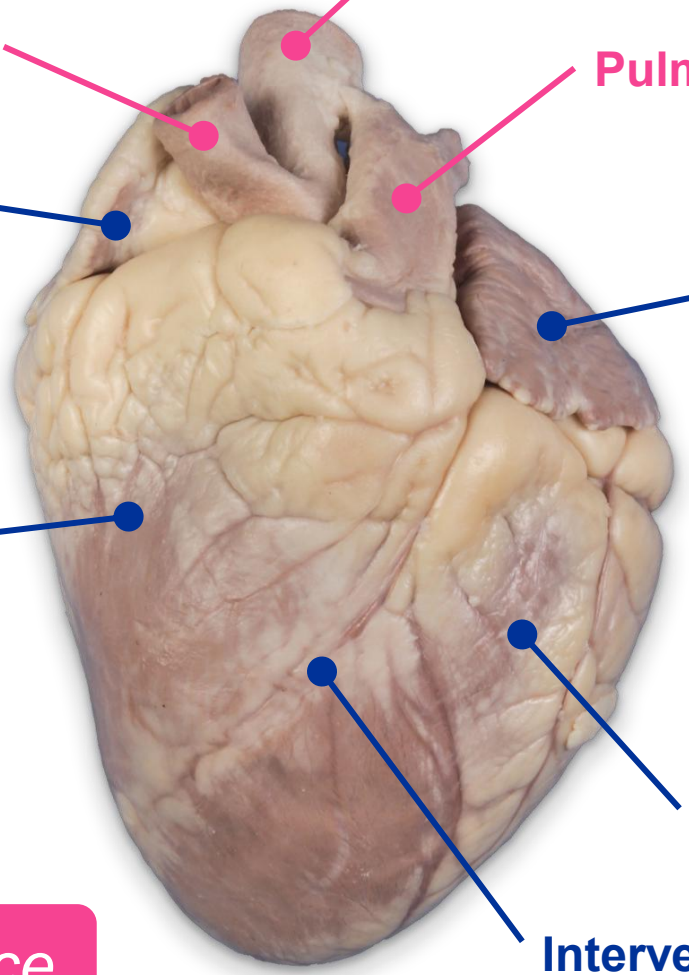
Sheep Heart: External Anatomy

1. **Correctly orient the heart.**
   Hint: Find the interventricular sulcus first, then each atria.
2. **Locate all structures on the anterior and posterior surfaces.**
3. **As needed, trim the fat from around the blood vessels with scissors.**



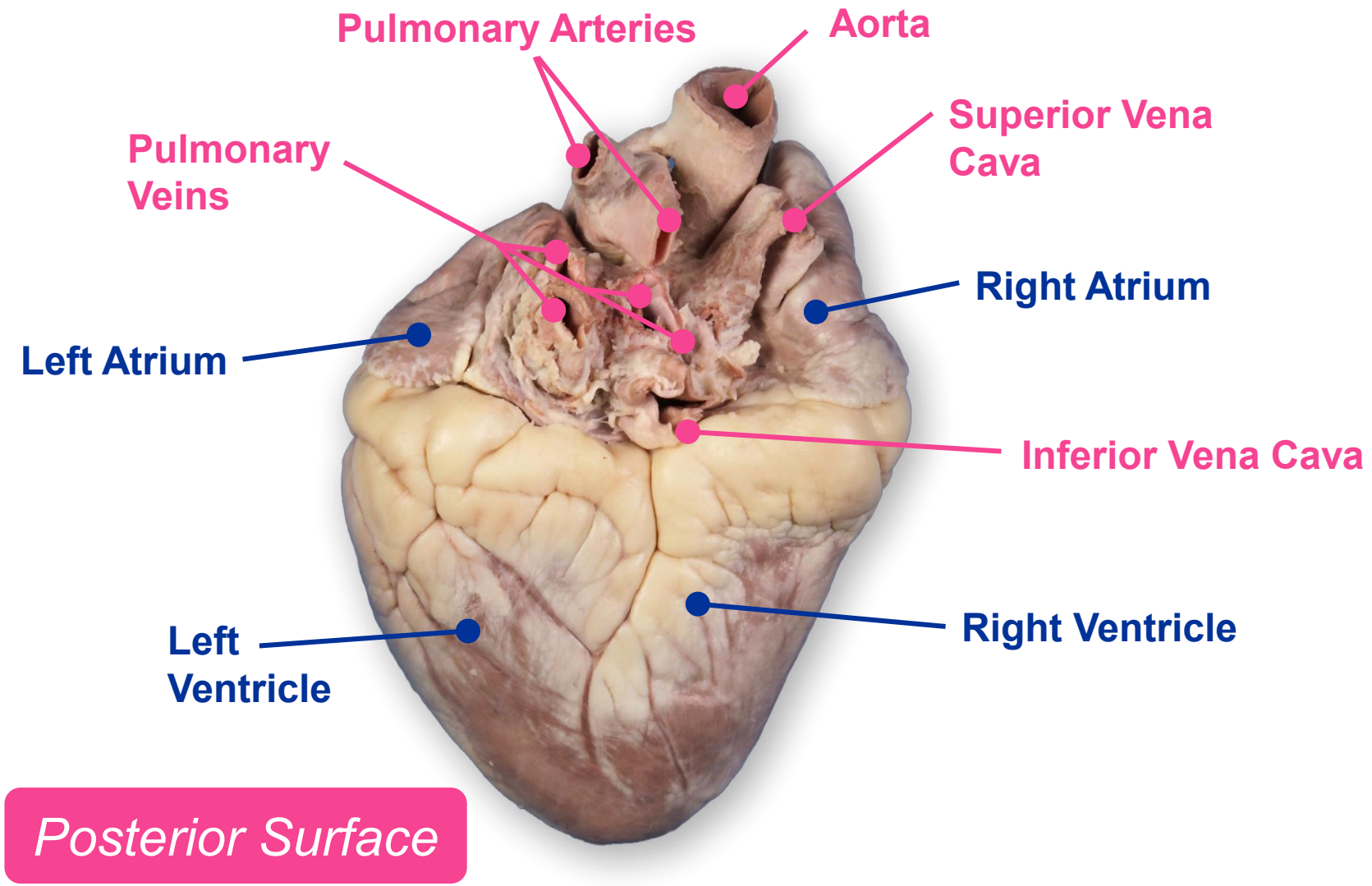
Anterior Surface

Sheep Heart: External Anatomy



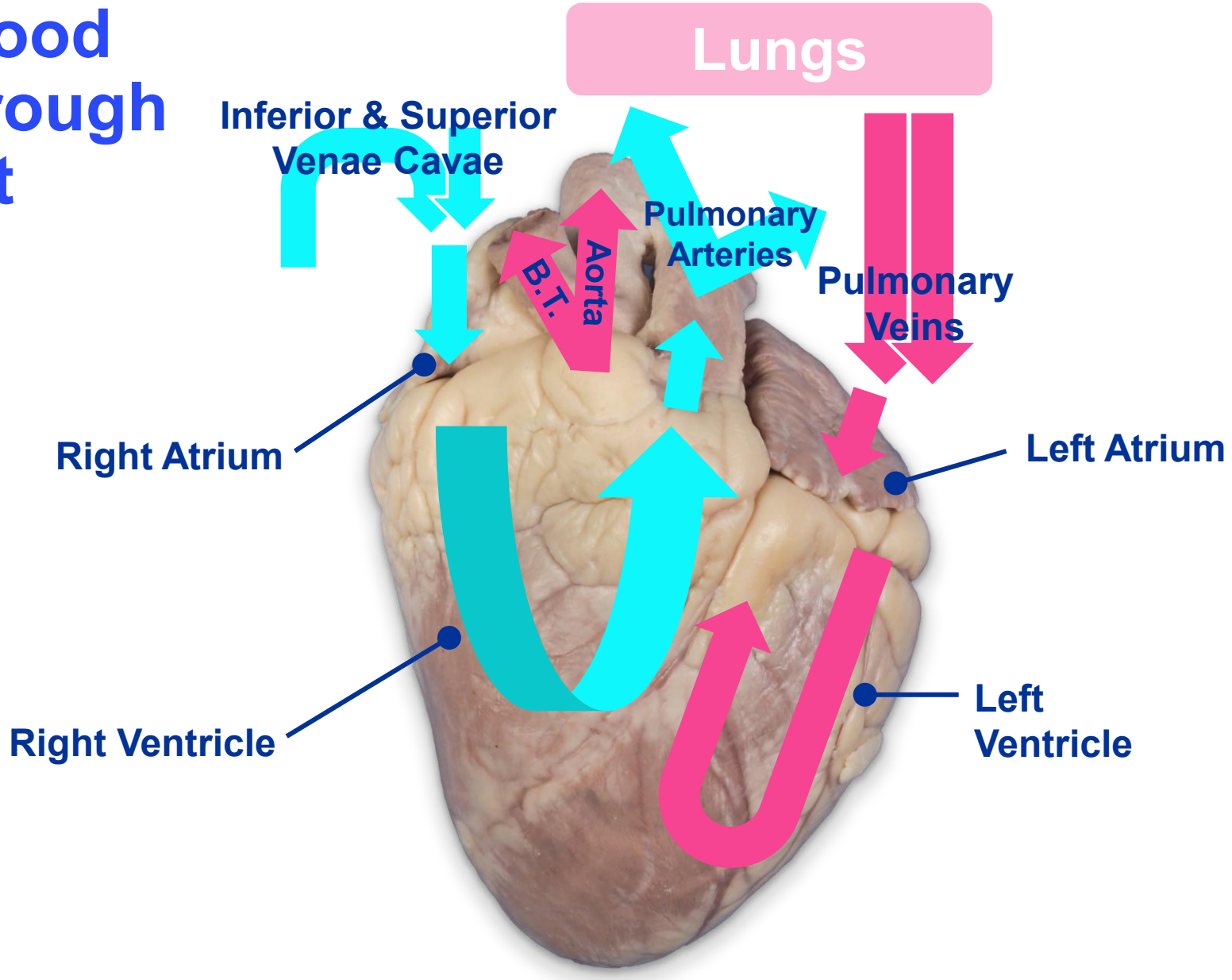
Anterior Surface

Sheep Heart: External Anatomy

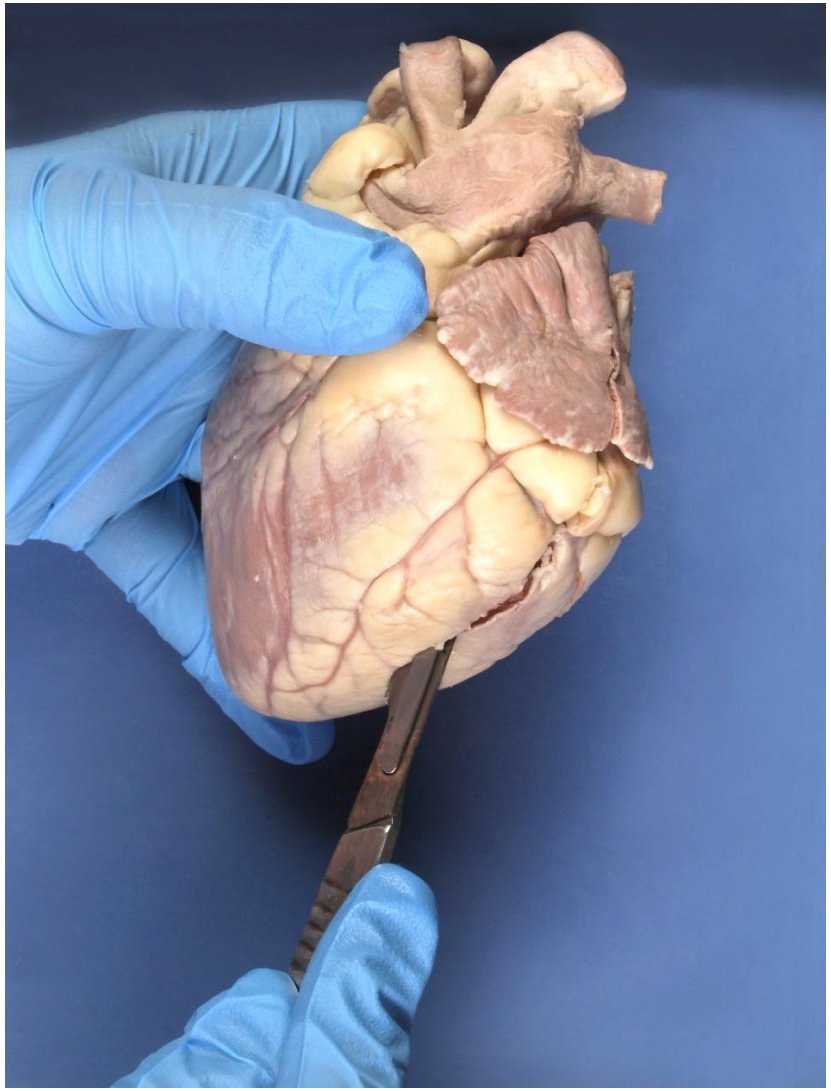


Posterior Surface

Trace Blood Flow Through the Heart

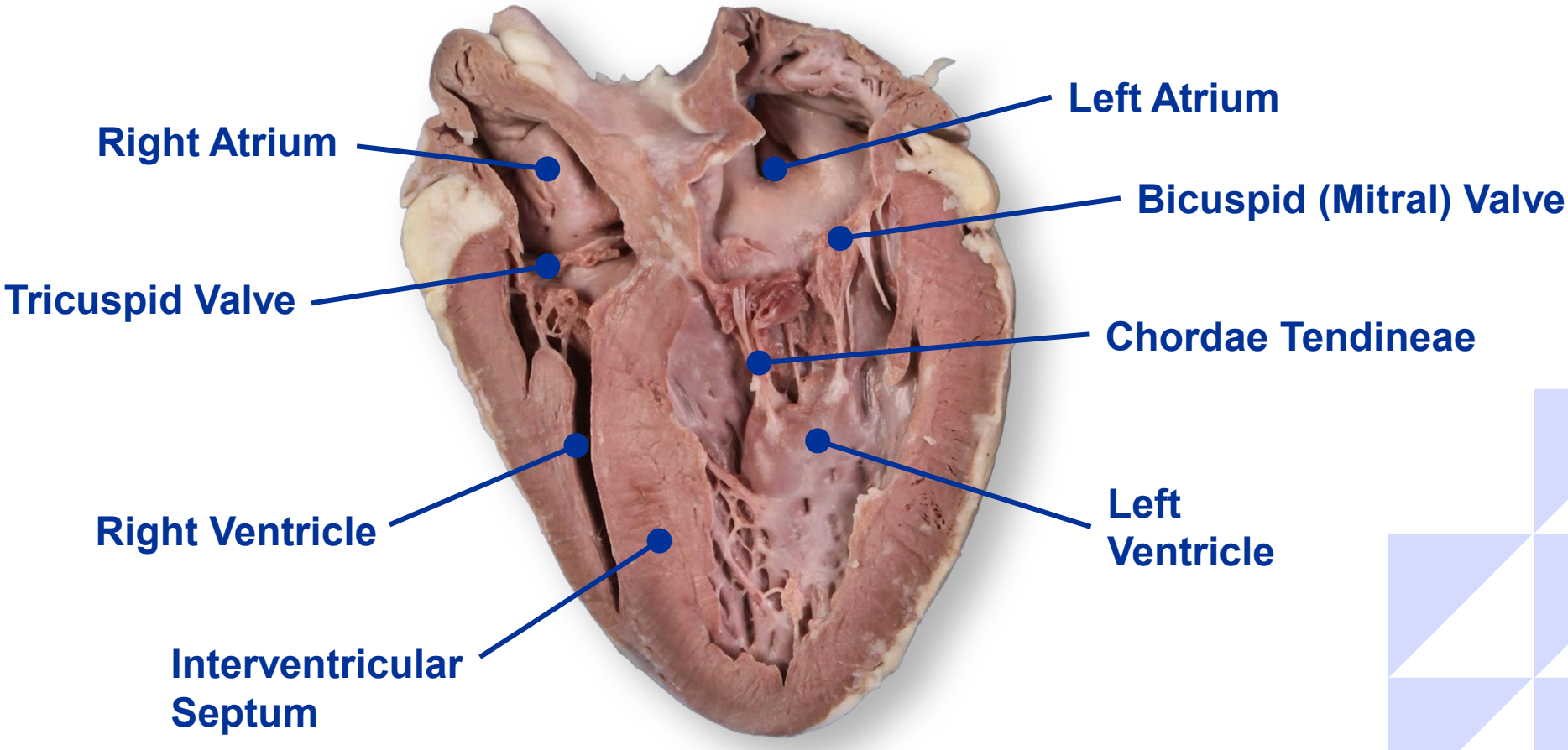


A Knife in the Heart!

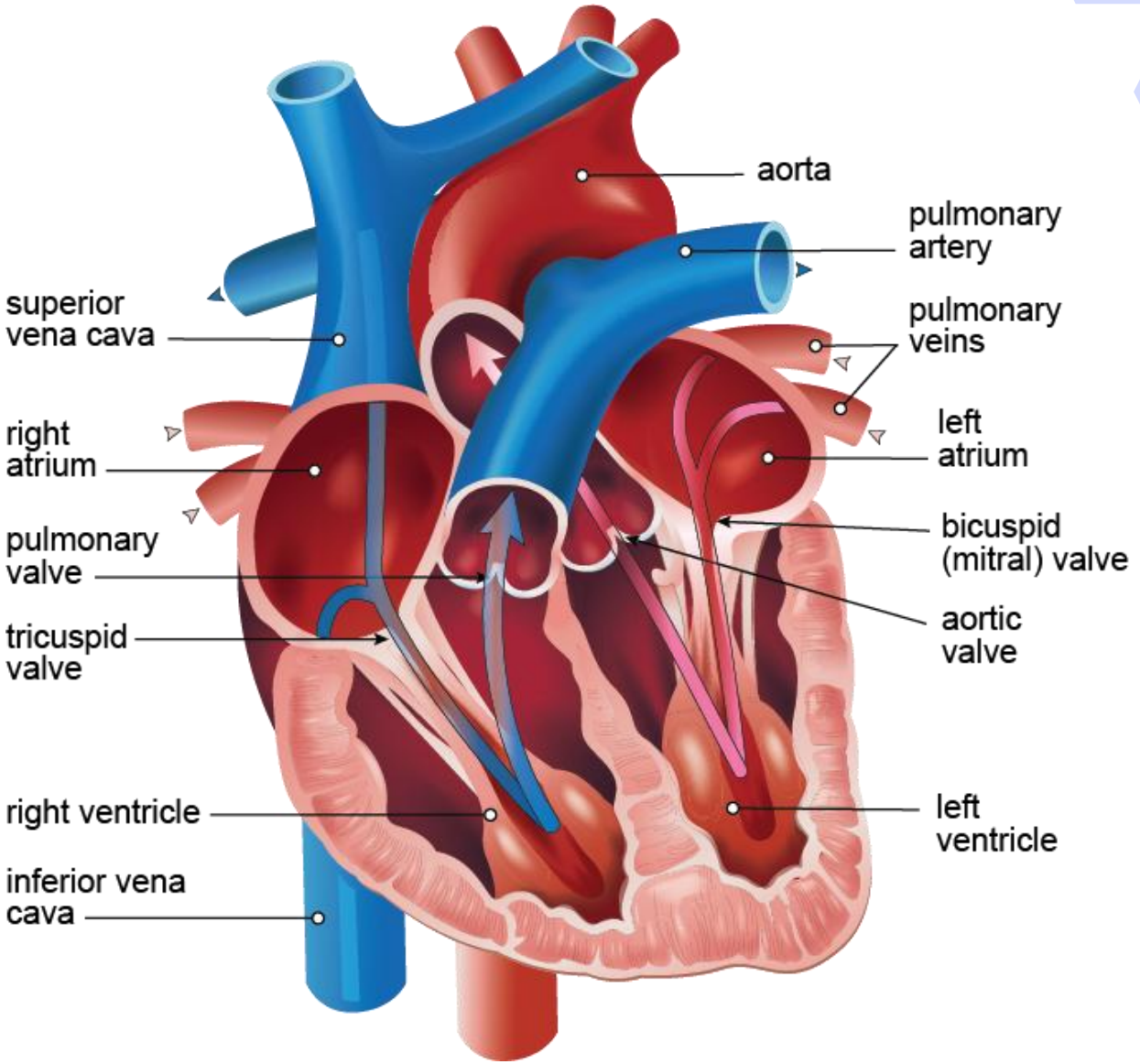


Cut the heart in half, across the atria and ventricles, as shown.

Sheep Heart: Internal Anatomy



Blood Flow



Workshop “Organ”ization

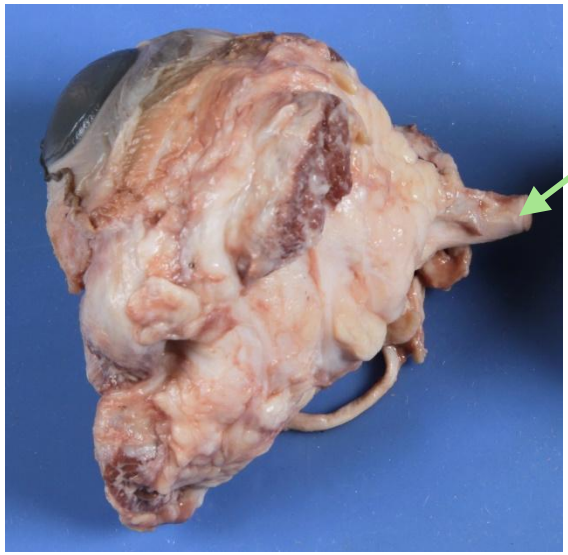
Procedure

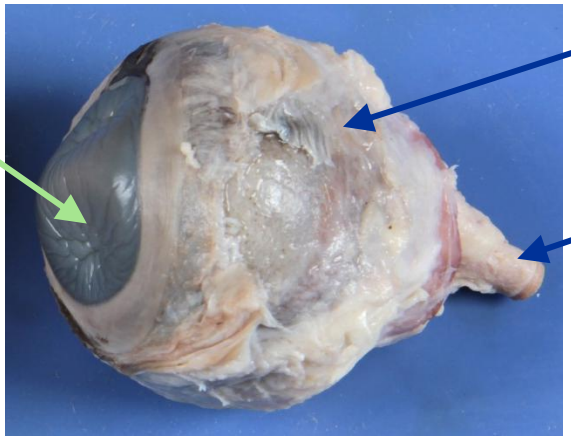
1. Dissect the bull testicle.
2. Dissect the sheep heart.
3. Time permitting, dissect the cow eye.

Dissection Preparation Tips

- **Set your white tray with the sheep heart on it to the side.** *Someone will come around and collect your waste.*
- **Put your red tray on the blue pad.**
- **Place the cow eye on the tray.**
- **We will dissect together!**

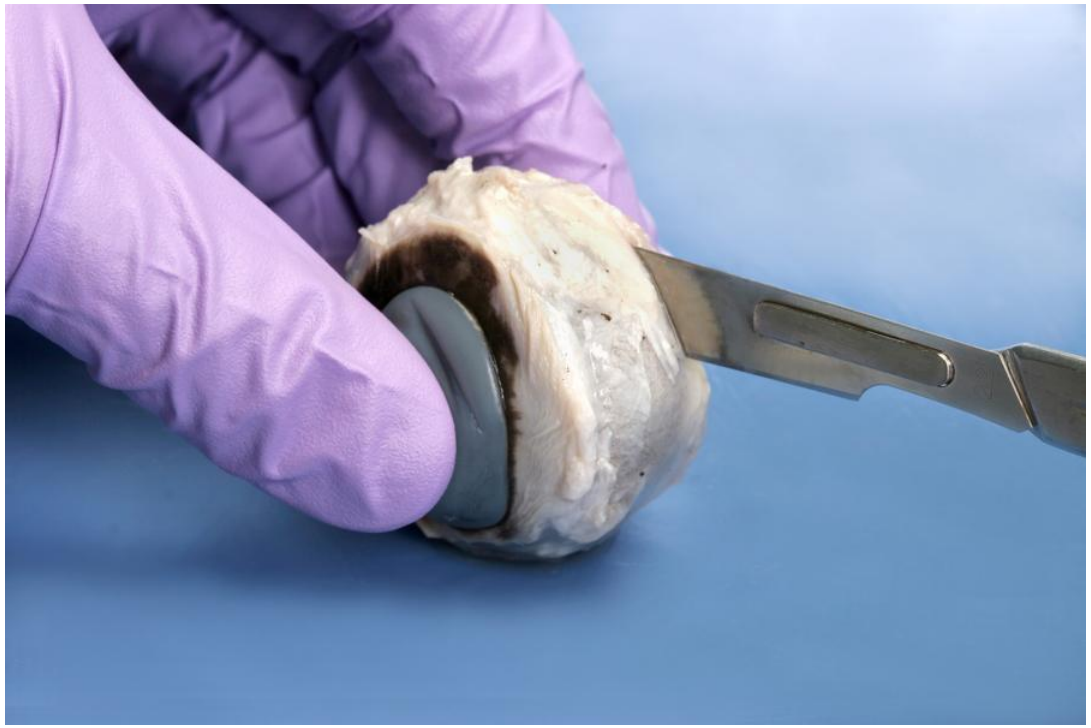
Cow Eye: External Anatomy





1. **Use scissors to remove fat from the eye.** *Hint: "Pull and flatten, then cut."*
2. **Do not cut the optic nerve!**

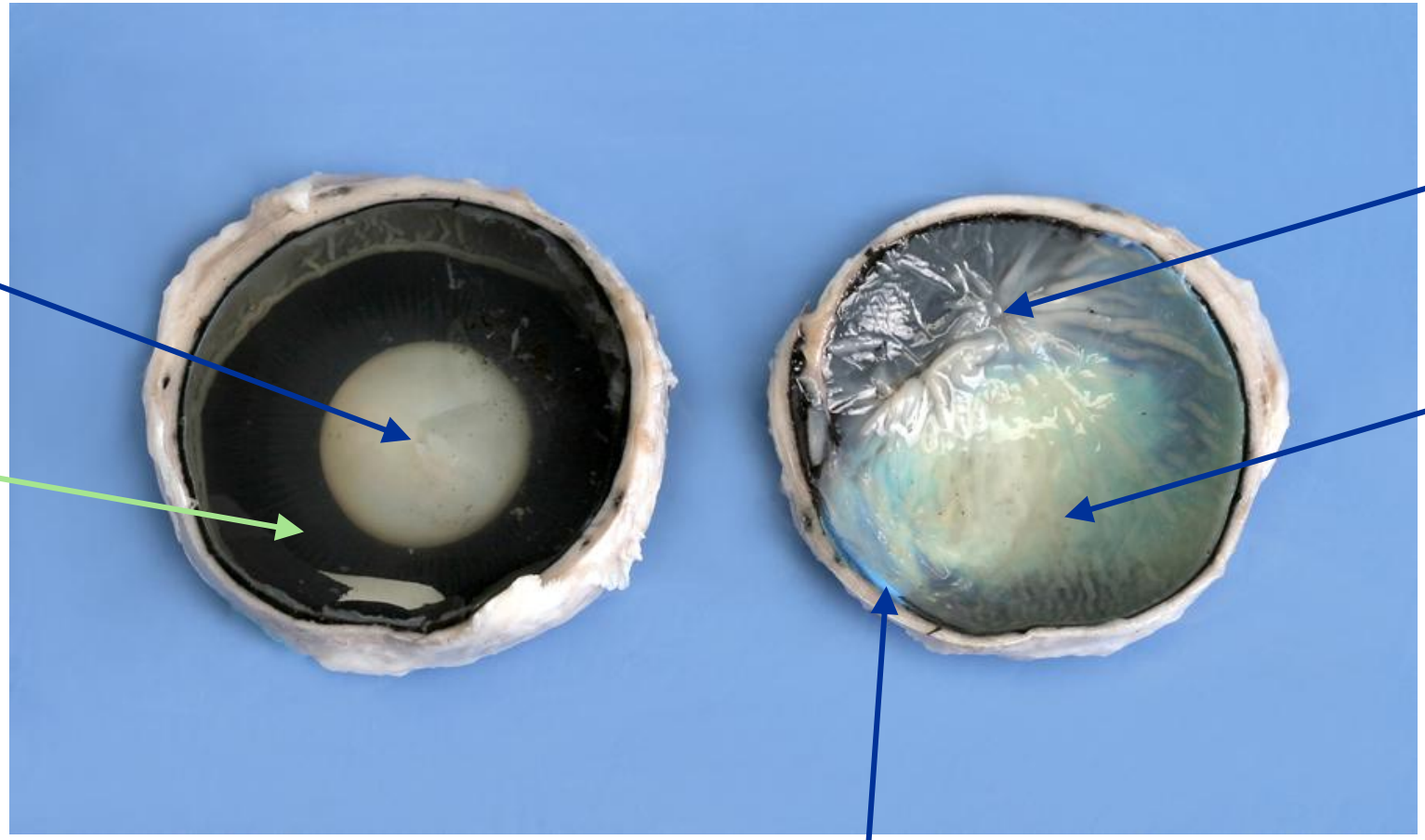
It’s Eye Opening!



Cut a cross section, as shown.

Teacher tip: You may wish to start the incision with a scalpel and allow your students to finish with scissors.

Cow Eye: Internal Anatomy



Lens

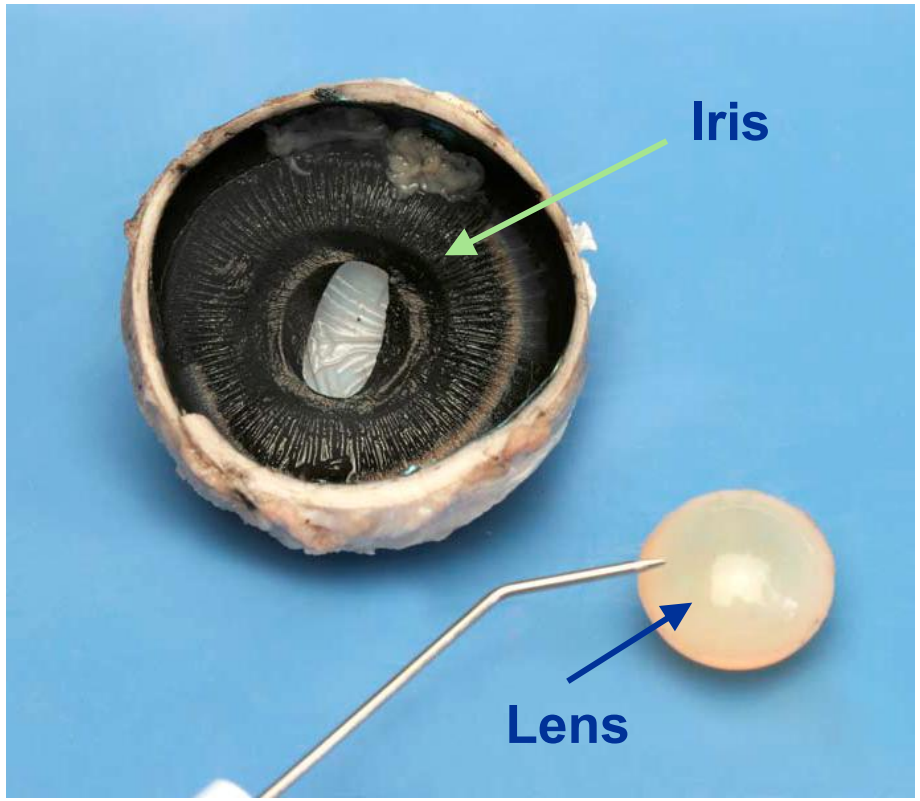
Vitreous humor
(gelatinous material)

Blind spot

Retina
(tan, thin layer)

Tapetum
(colorful, iridescent area)

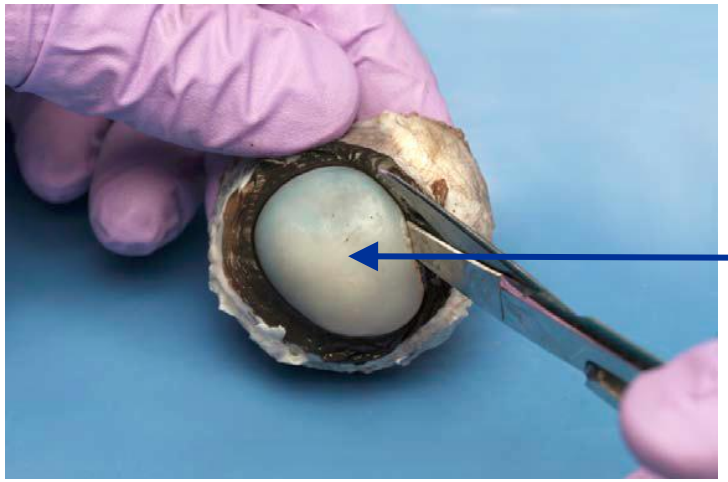
Cow Eye: Internal Anatomy

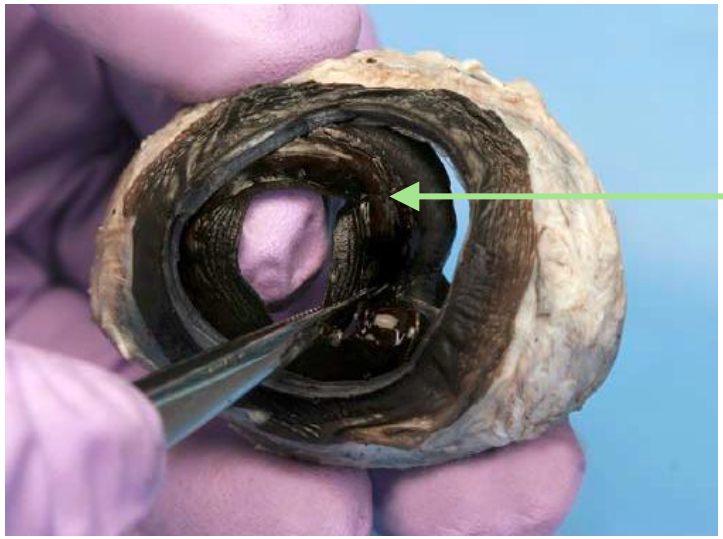


Remove the vitreous humor and the lens.

Teacher tip: Let the lens dry. Test its magnifying abilities by placing it over some printed text.

Cow Eye: Internal Anatomy





1. Carefully cut through the thick cornea.
2. Tease the iris away from the inner surface of the eye.

Cow Eye: Internal Anatomy

Student Data and Artifacts

	Testicle	Heart	Eye
Major Function			
Description			
Specialized Tissues			
Associated Organs			
System			

Student Data and Artifacts

Describe how each organ has a role in controlling or affecting the function of the other organs studied.

Discuss the interdependence of organ systems.

Create a model of an organ or organ system to show its main functions.

Cleanup Instructions

STOP!

- **KEEP GLOVES ON!**
- **Separate trash from animal material/waste.**
- **Carolina employees will come and collect ONLY animal waste. Place in buckets.**
- **All other trash goes in trash bags.**
- **Wipe off tools, mats and tables.**

Join us on social media to stay up to date with new kits and free lessons!

YouTube @CarolinaScience

@CarolinaScience

LinkedIn Carolina® Science

@carolinascience

CAROLINA UNLEASH LEARNING