

A dramatic photograph of a shark breaching the ocean surface. The shark's head is at the top, with its mouth wide open, revealing rows of sharp, white teeth. Water is splashing around the shark's head, creating a dynamic and powerful scene. The background is a deep blue ocean under a clear sky.

Carolina Biological Supply Company

Shark Dissection: *A Jawsome* Experience!

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Objective

Perform a shark dissection, exploring both the internal and external anatomy, focusing on how structure relates to function.



Building Toward 3-Dimensional Learning

Scientific and Engineering Practices	Disciplinary Core Ideas	Crosscutting Concepts
Developing and using models <ul style="list-style-type: none">Develop a model for conducting a dissection on several species of vertebrates.	LS 1: From molecules to organisms: Structures and processes <ul style="list-style-type: none">The process of a dissection preserves organ and tissue structure for comparison and analysis.	Structure and function <ul style="list-style-type: none">Examine the structures of different components and their interconnections to reveal a systems function.¹

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.

Learning Context



- **Advanced Placement® Biology**— Evolution explains the diversity and unity of life
- **Marine Science/Oceanography**— Comparative anatomy, structure and function
- **Anatomy and Physiology**— Comparative anatomy structure and function
- **Animal Science**—Comparative anatomy structure and function
- **High School and Middle School Life Science**—Body structure and functions

Safety

- **Personal protective equipment:
Gloves, glasses, and lab aprons**
- **Dissection tools:
New tools = sharp scalpels**



- **Safety tip:
If you are not using an
instrument, set it down**

Taxonomy

	Human	Shark
Domain	Eukarya	Eukarya
Kingdom	Animalia	Animalia
Phylum	Chordata	Chordata
Class	Mammalia	Chondrichthyes
Order	Primates	Squaliformes
Family	Hominidae	Squalidae
Genus	Homo	Squalus
Species	<i>Homo sapiens</i>	<i>Squalus acanthias</i>

Prepare to Dissect



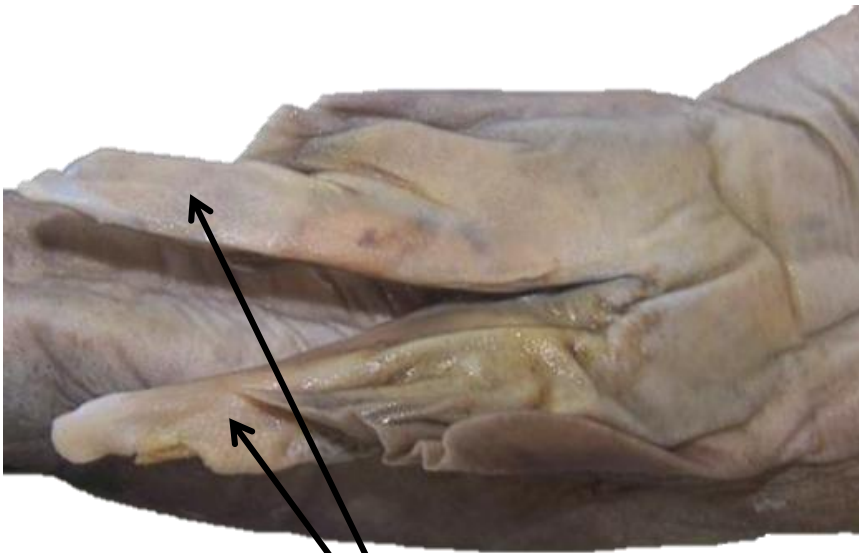
Teacher Tip

- Hold bag upright.
- Cut below the seal.
- Allow fluid to drain into the bag before removing specimen.
- **Keep bag upright until we collect fluid.**



Determining Gender

Male

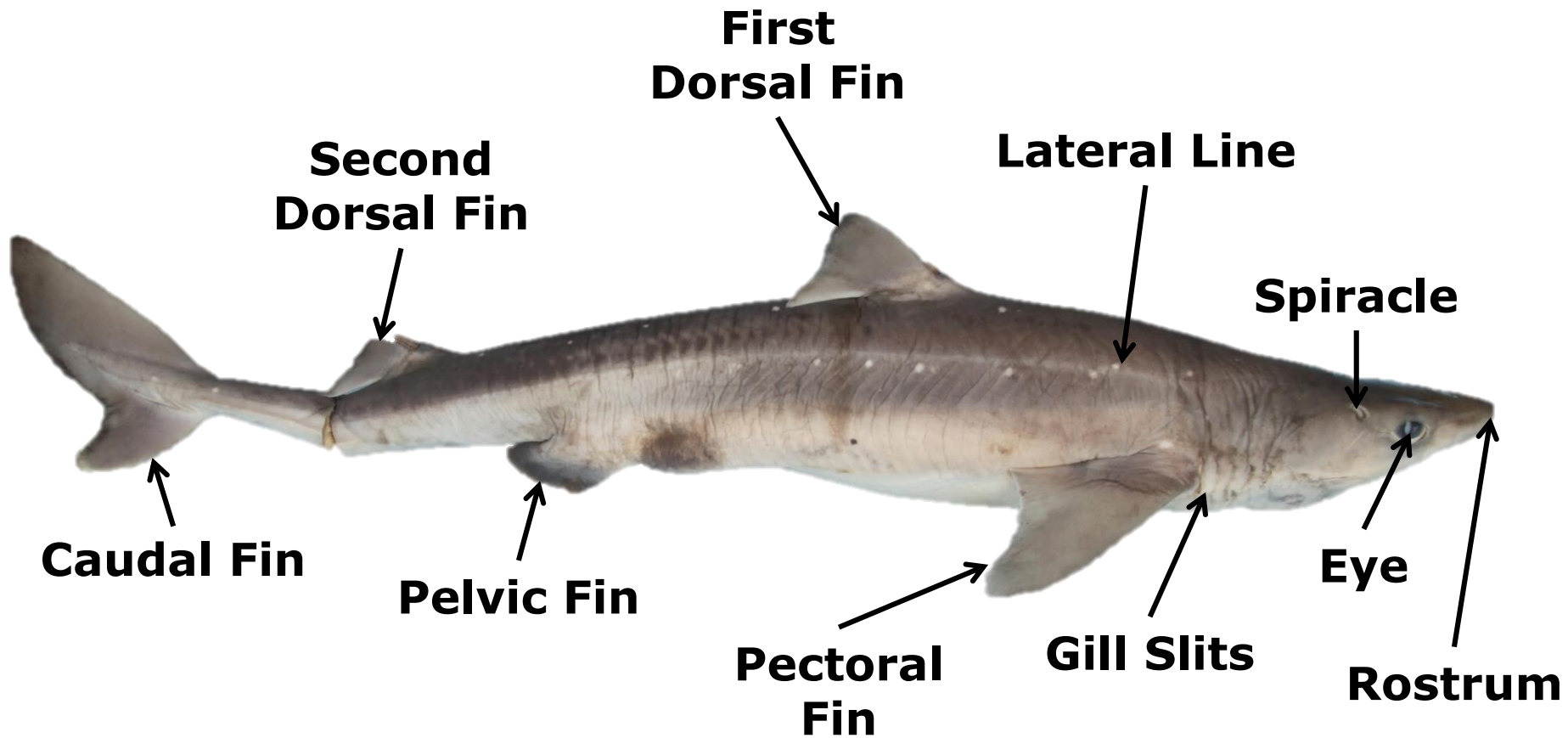


Claspers

Female

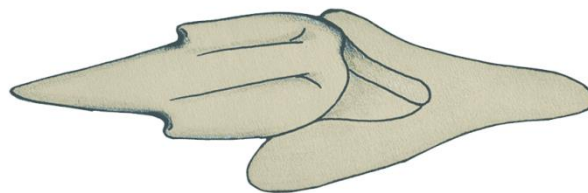
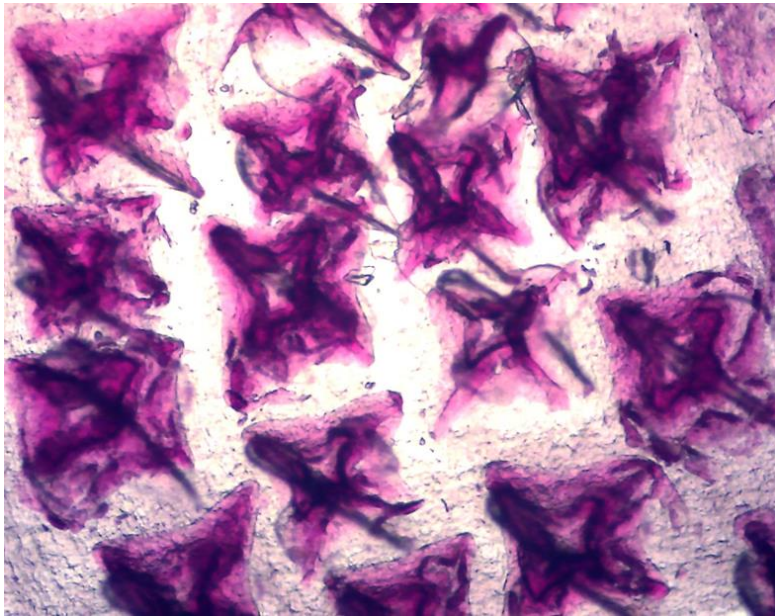


External Anatomy

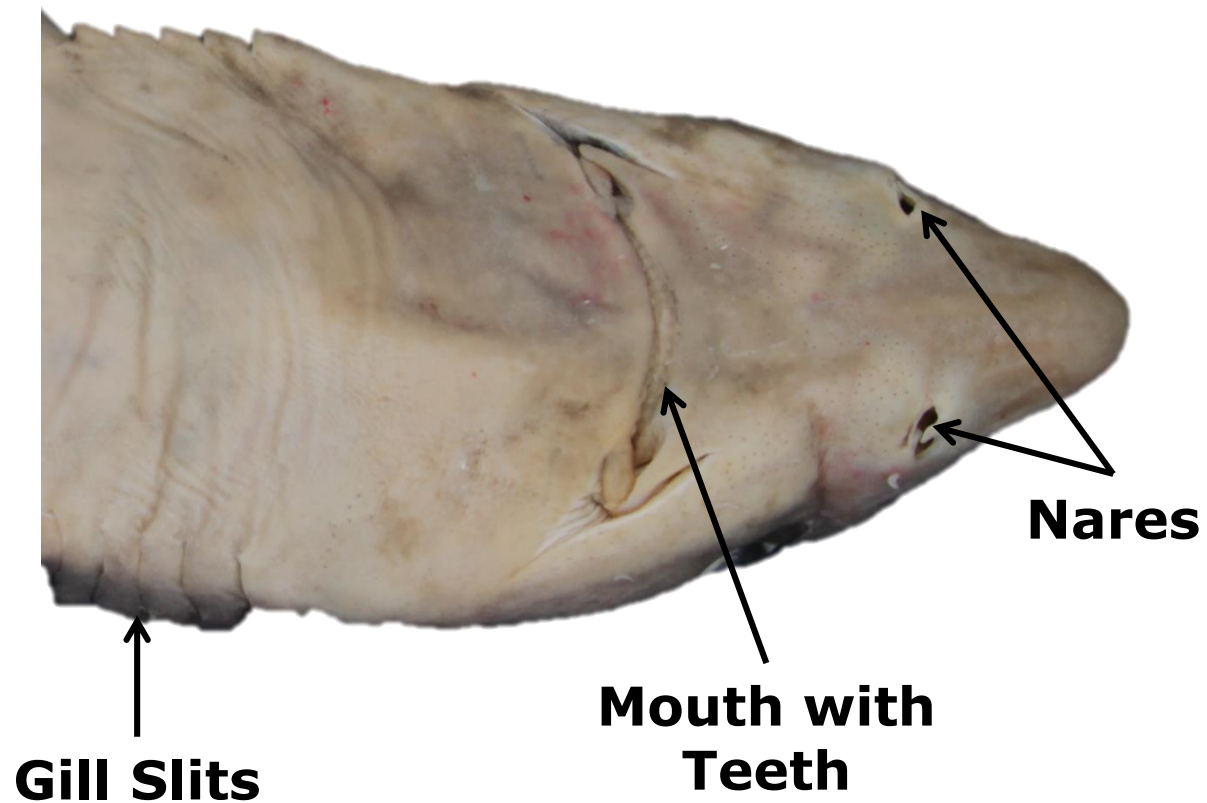


External Anatomy

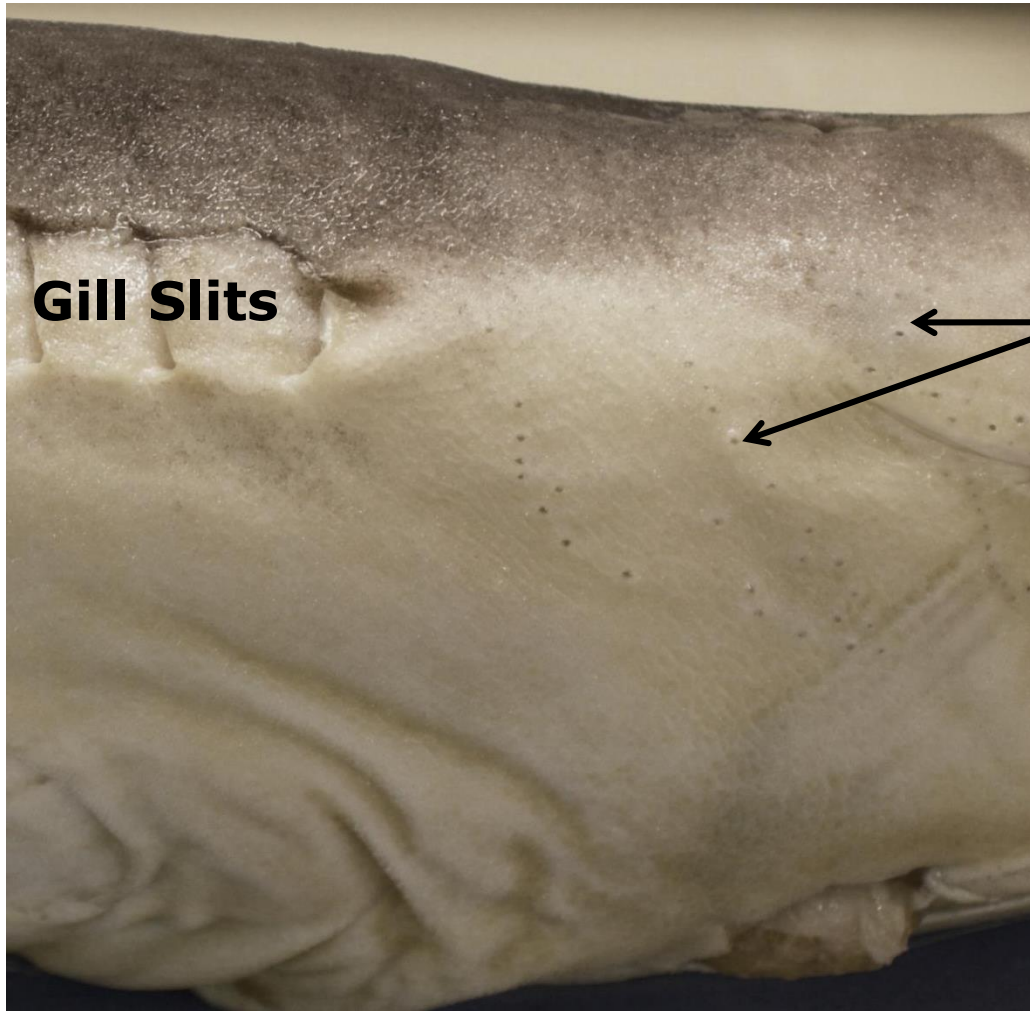
Placoid Scales



External Anatomy



External Anatomy



Sensory organs:

- Eyes
- Nares
- Ampullae of Lorenzini
- Lateral line

Making the Cut: Mouth and Gills



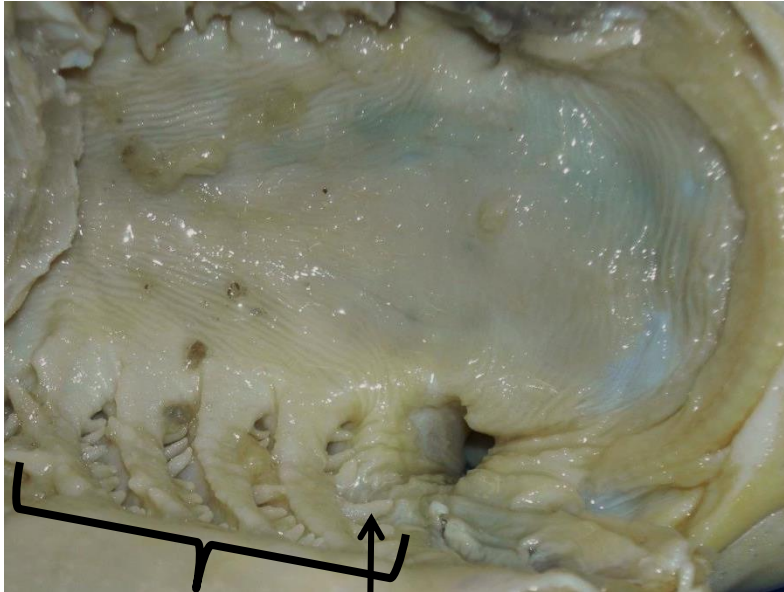
- Cut from the corners of the mouth to the last gill slit.
- Cut across to expose the *pharynx* and the *gills*.

ATTENTION:
BE VERY CAREFUL!
THE TEETH ARE
SHARP!

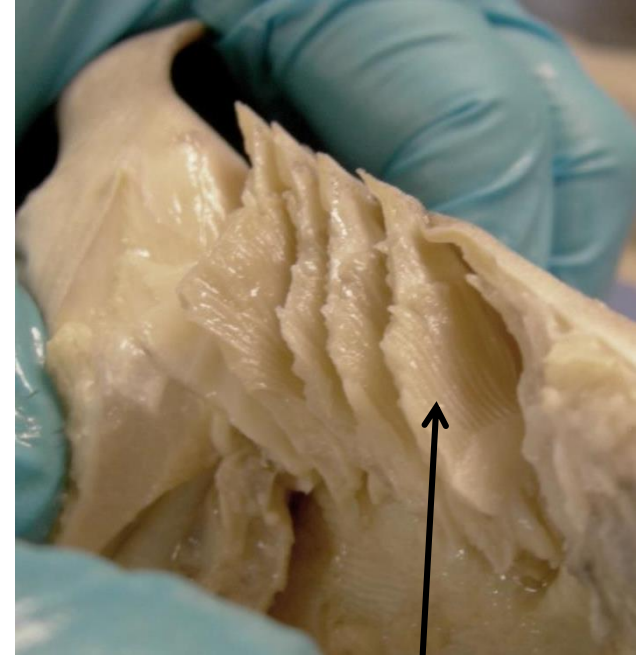
Internal Anatomy: The Mouth



Gills

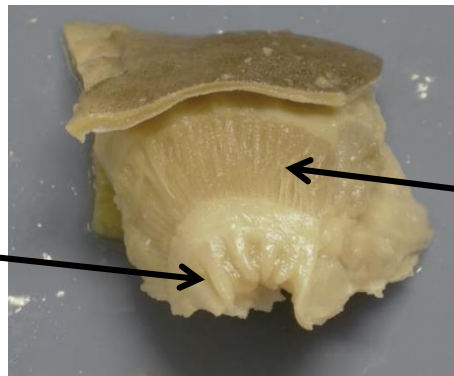


**Internal
Gill Slits**

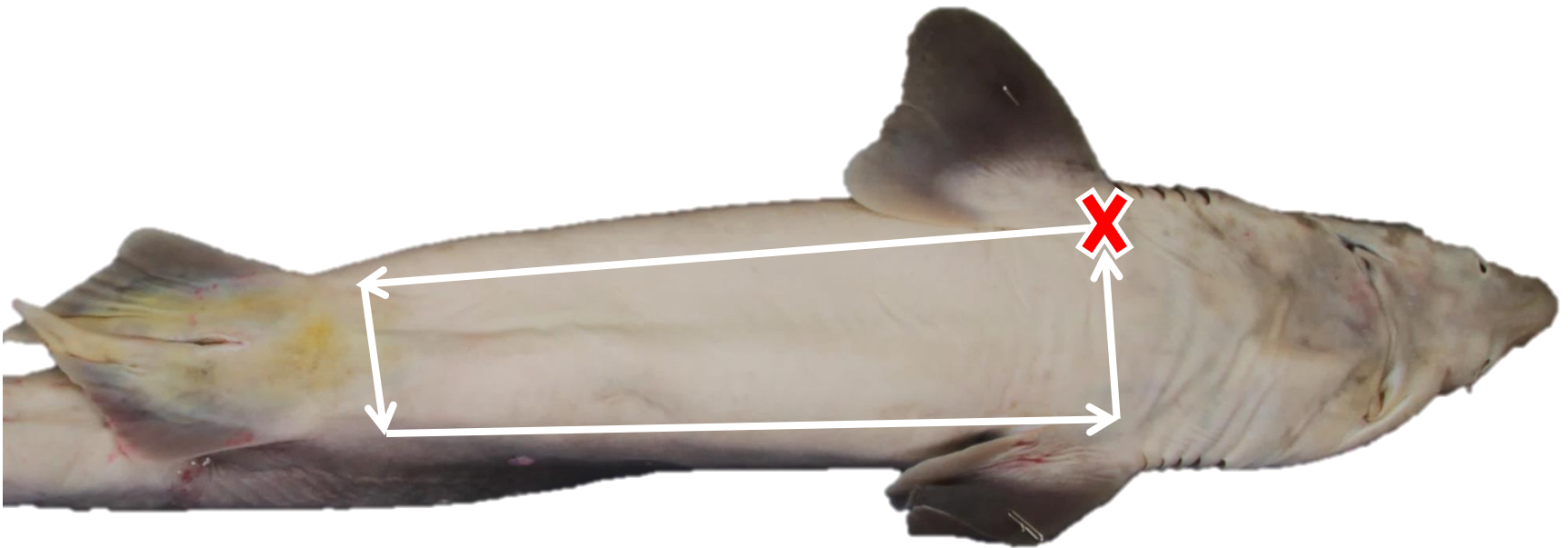


**Gill
Lamellae**

**Gill
Rakers**



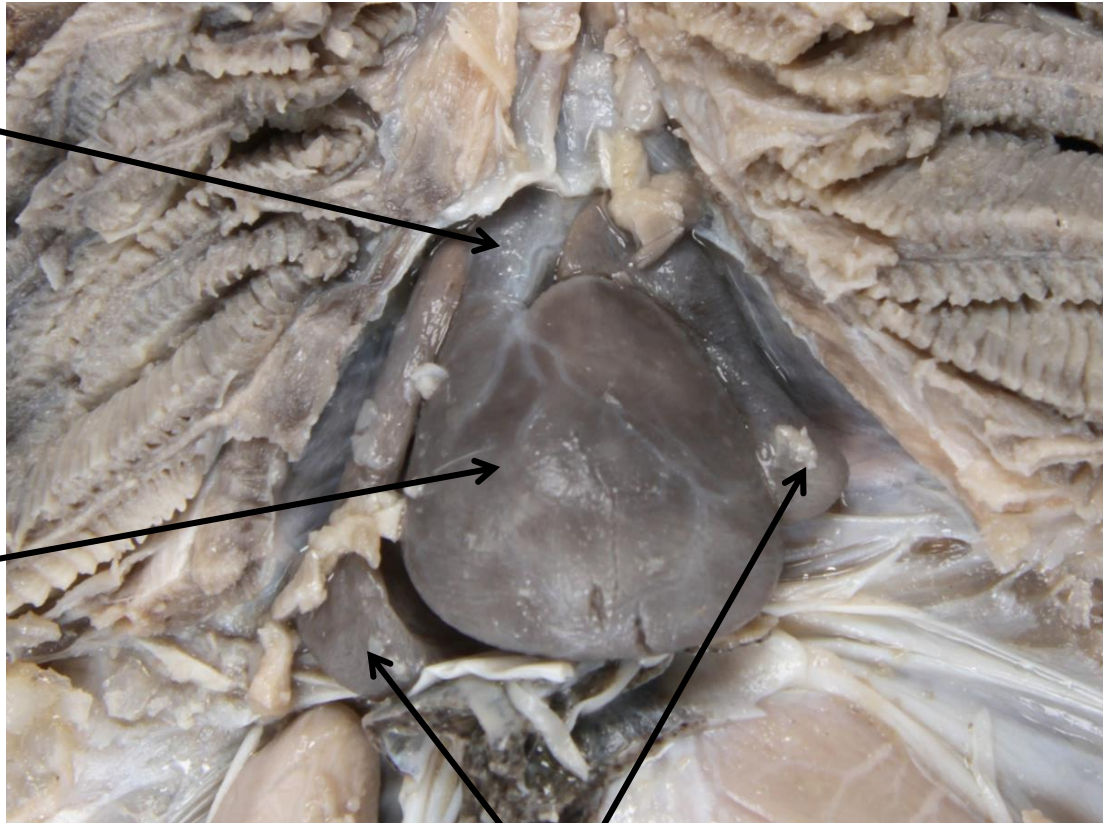
Making the Cut



- **Begin your incision at the "X."**
- **Remove the body wall to expose the *pericardial* and *pleuroperitoneal* cavities.**

Pericardial Cavity (heart)

**Conus
Arteriosus**

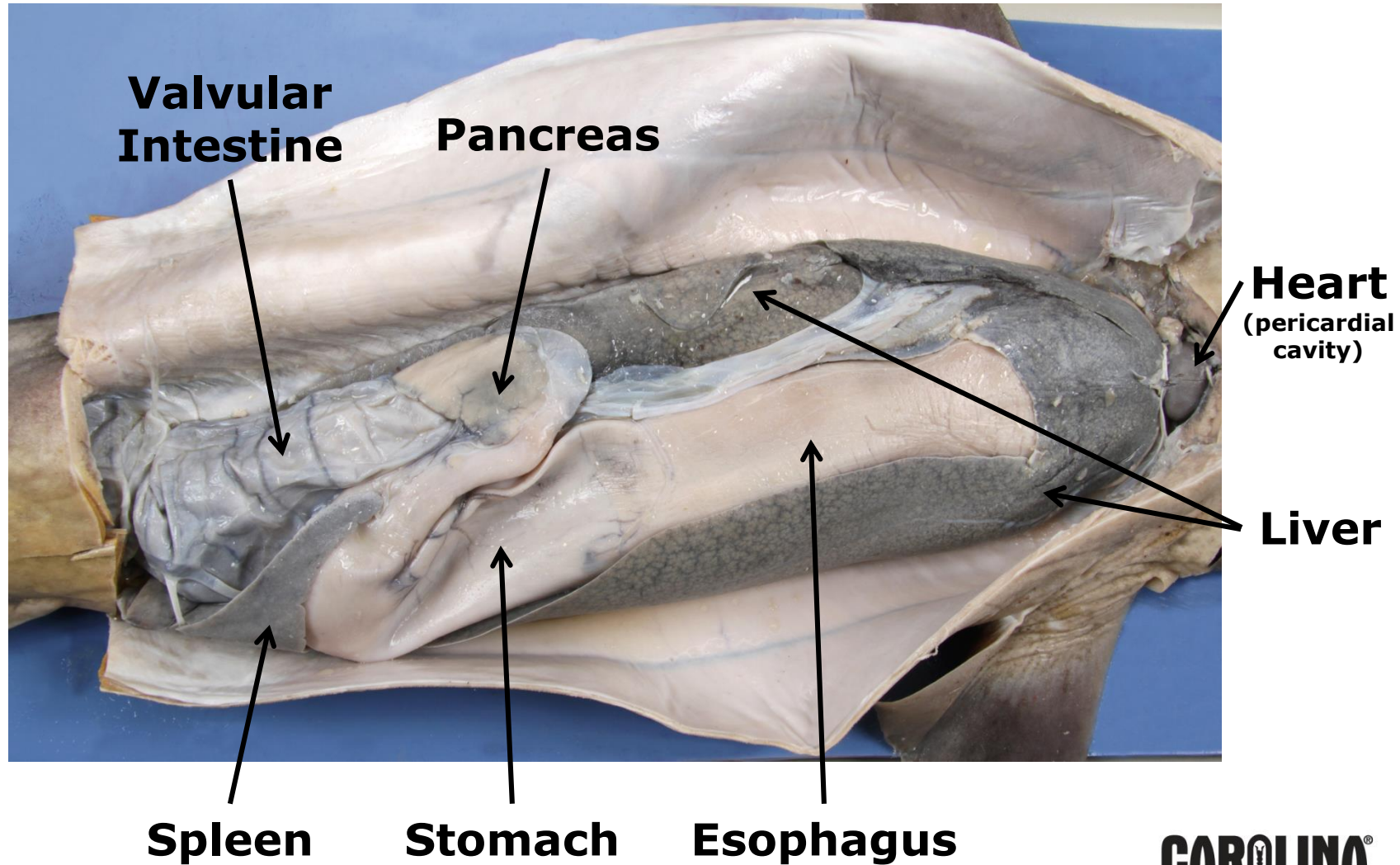


Ventricle

**Sinus
Venosus
(not shown)**

Atrium

Pleuroperitoneal Cavity



Liver



- **Remove the 3 lobes of the liver.**
- **Cut a piece of the liver and place it into a cup of water.**

Does it float?

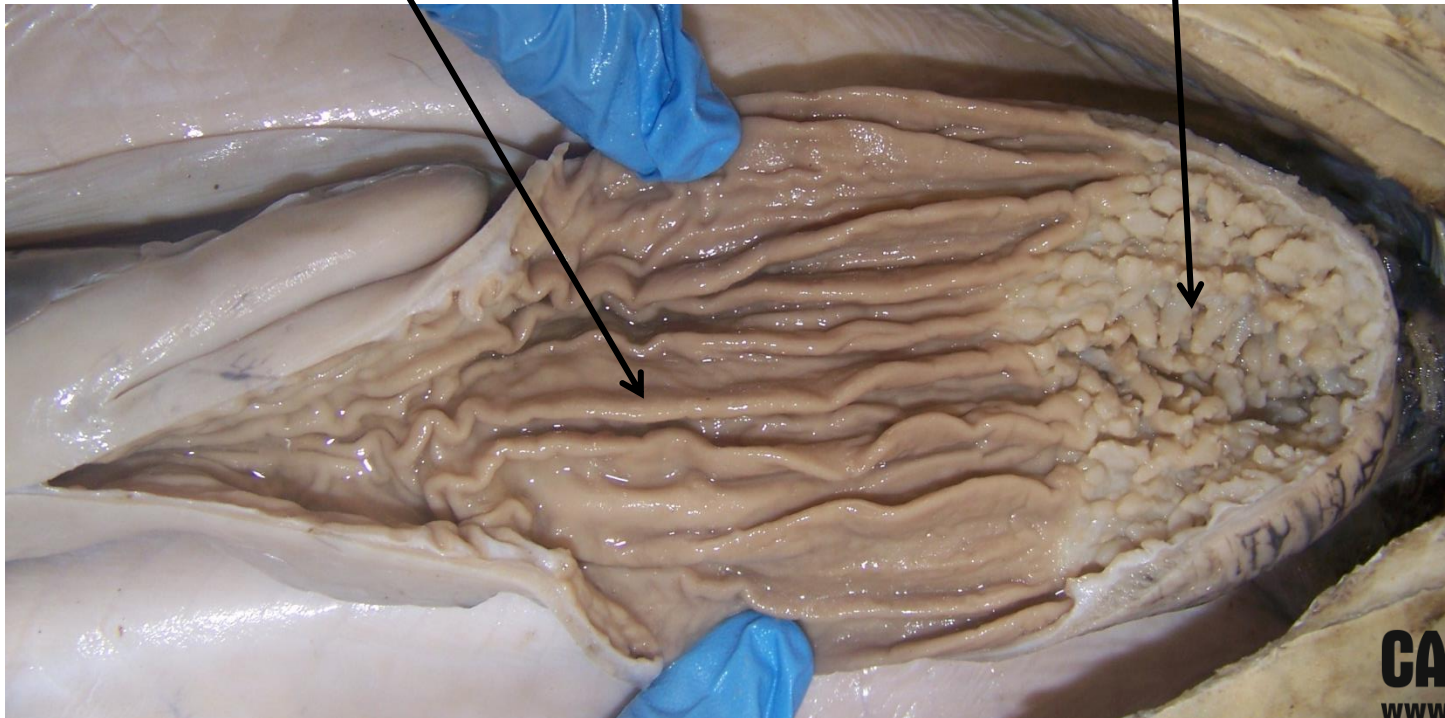
How does this relate to function?

Esophagus and Stomach

Make a longitudinal incision starting at the bottom of the “J” shape toward the heart.

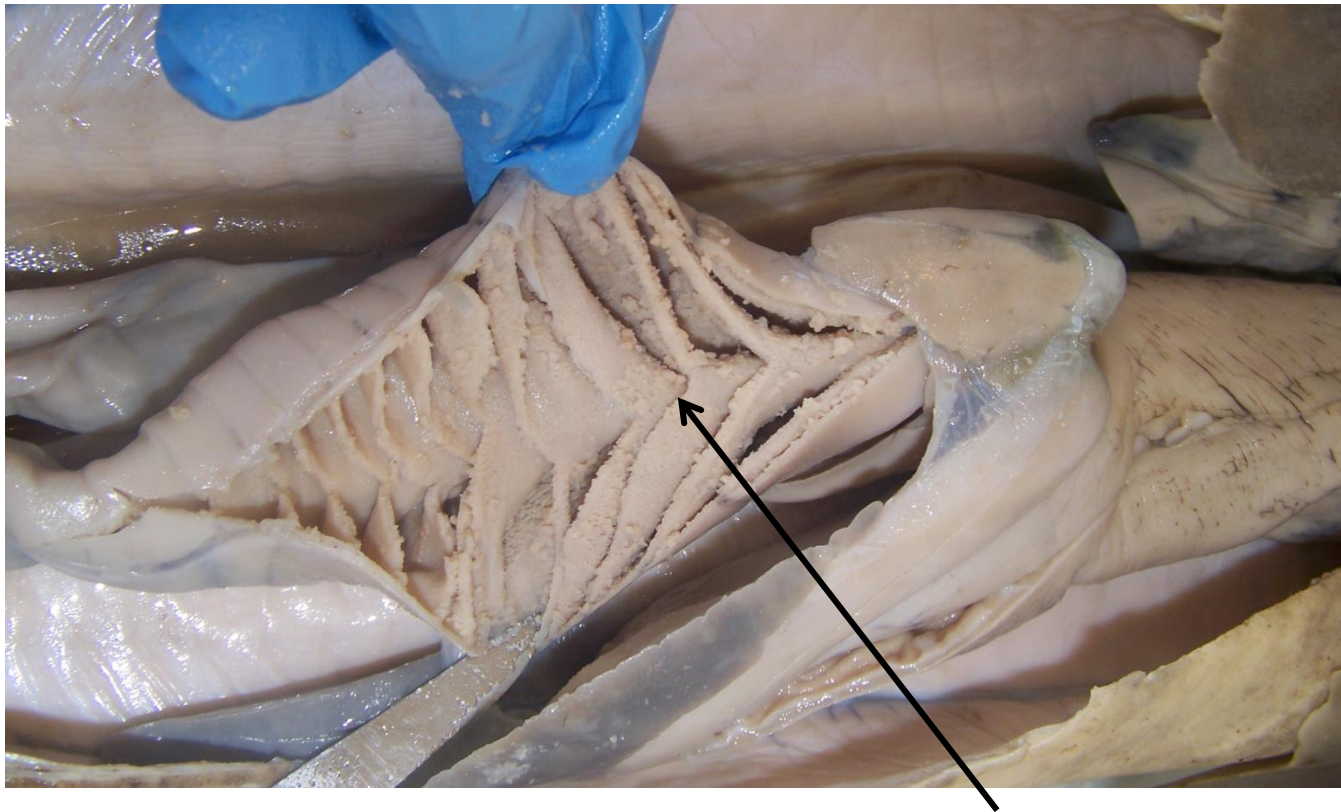
**Rugae of the
Stomach**

**Papillae of the
Esophagus**



Valvular Intestine

Make a shallow, longitudinal incision down the surface of the valvular intestine.

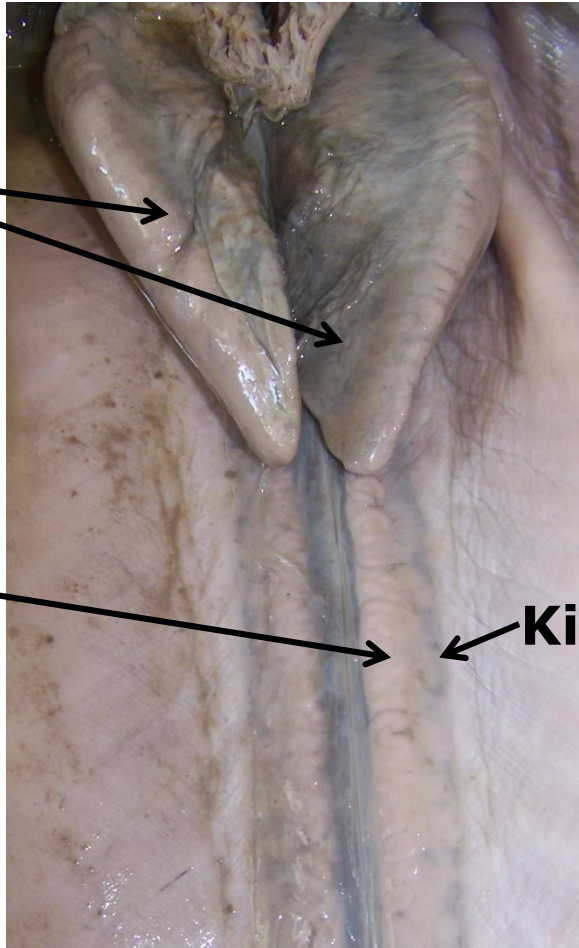


What is the purpose of the spiral valve?

Urogenital System

Remove the digestive tract.

Testes

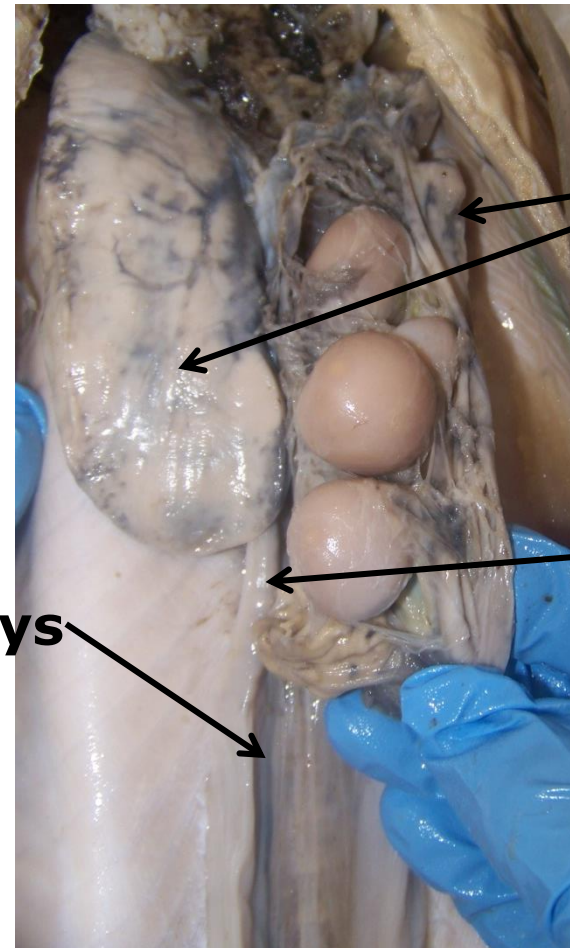


**Ductus
Deferens**

Kidneys

Male

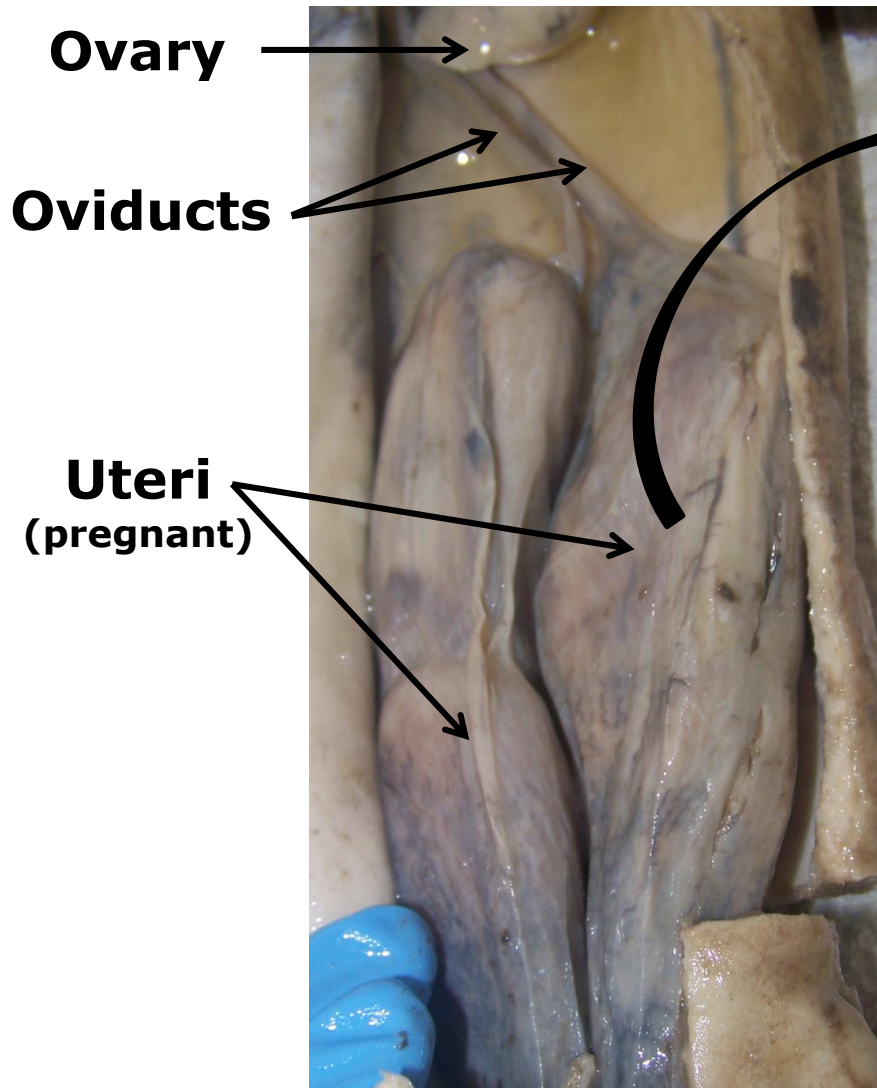
Ovaries



Oviduct

Female

Female Urogenital System



Cleanup Instructions

- **KEEP GLOVES ON!**
- **STAY AT YOUR TABLE.**
- **Separate animal waste, tools, and trash.**
- **Only place animal waste in buckets.**
- **All other trash goes in trash bags.**
- **Put scalpel and scissors into CLEANING bucket.**



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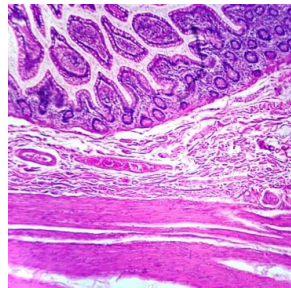
Carolina® Flip Charts



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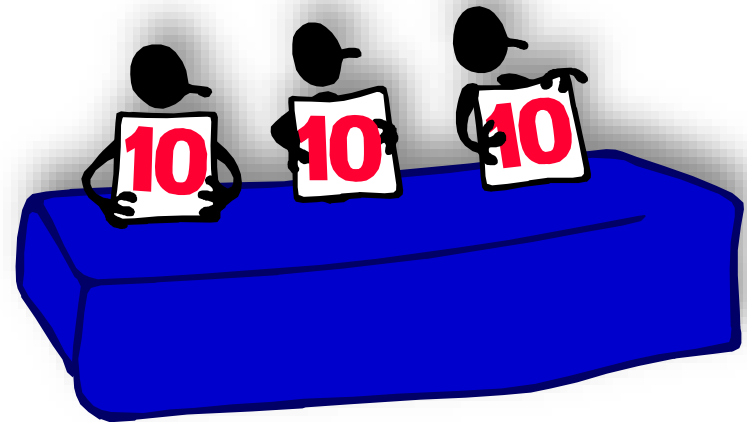


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