

# Deuterostome Lab

## Learning Objectives

- State the phyla of the organisms discussed in the lab activities
- Use the characteristics of symmetry, coelom, embryo tissue layers, and patterns of development to differentiate between the different organisms
- Describe the general characteristics of echinoderms
- Identify and locate external and internal structures of a starfish
- State the common characteristics of all chordates
- Be able to identify the chordate characteristics on a model or picture
- Identify and locate external and internal structures of a frog

## Echinoderms

### Procedure

Access the page “Reading: Echinoderms.”

### Questions

1. Skip viewing the slide of the different developmental phases of the sea stars
2. Dissect the starfish following the directions on the website. Remember the oral end (with mouth) is actually on the underside of the starfish.
3. On the oral side make sure you find the **mouth**.
4. Also on the oral side in the center region of each leg look for the **tube feet**. Tube feet are used for locomotion powered by the water vascular system. How many rows of tube feet does your starfish have?
5. Try to differentiate between the **spines** and the **skin gills**. The spines are longer and used for protection. The skin gills are smaller and used for gas exchange.
6. Find the **sieve plate/madrepore** on the aboral side. This is the water entrance point for the water vascular system used for movement.
7. The starfish has plates located underneath the skin for protection and support. What material comprises these plates?
8. The starfish has a two part stomach, the upper **pyloric stomach** and the lower **cardiac stomach**. Can you differentiate between the two stomachs on your specimen?





## 8. Internal Organs

- a. The most prominent organ is the **liver**, dark brown in color, and taking up most of the abdominal cavity
- b. Identify the **lungs**, two small pouches on opposite sides of the frog midline. They may be partially hidden by the liver.
- c. Lift up the liver and underneath locate the **gallbladder**.
- d. Identify the **heart** covered by the protective **pericardium**. Frogs have a three chambered heart with two atria and one ventricle. Try to locate these different areas of the frog heart.
  - i. How is it a disadvantage to have a 3 chambered heart?
  
- e. The **stomach** is a j-shaped organ located underneath the left lobe of the liver. It connects to the **esophagus** bringing food from the mouth and the **small intestine** used for nutrient absorption.
- f. The small intestine connect to the **large intestine** which carry any undigested material to the **cloaca**. Frogs have one opening to the outside environment and the cloaca receives materials from the intestine, the urinary system and the reproductive system.
- g. Find the **pancreas**, a yellow ribbon located between the stomach and the small intestine.
- h. Locate the **spleen**, shaped similarly to a pea and located near the stomach.
- i. You will be able to see the yellow, finger like, **fat bodies**, which the frog uses to store fat.
- j. The **kidneys** of the frog are long and narrow and located along the back body wall.
- k. Try to find the **mesonephric ducts**, thin white tubes that carry urine from the kidney to the cloaca.
- l. If your frog is female, the abdominal cavity will be filled with black and white eggs. The eggs are stored in the **ovaries**.
- m. If you have a male frog, locate the **testes**. The testes are shaped like a bean and located at the top of the kidneys. They are yellow/tan in color.
  - i. Do you have a male or female frog?

## Review Questions

Answer the review questions below. The phyla we viewed today were the echinodermata and the chordata.

1. Which phyla observed today were deuterostomes?
  
  
  
  
  
  
  
  
  
  
2. Which phyla exhibited cephalization?

3. Which phyla were coelomates?
4. What does the name “echinodermata” mean?
5. What type of symmetry does the echinoderm larva display?
6. Give an example of an echinoderm example other than a starfish.
7. What unique system does the starfish use for movement?
8. Give an example of a chordate that is not a vertebrate.
9. State the four common characteristics shared by all chordates.
10. Name the two types of teeth found in frogs.
11. Frogs have small lungs that are inefficient. What other structure do frogs use for gas exchange?

12. Frogs have one opening to the outside environment, the cloaca. What three areas transfer material outside through the cloaca?

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