

Frog Dissection

Name: _____

Modified from: <http://teachers.ocps.net/~menak/frogdissection.htm>

Period: _____ Date: _____

Purpose:

In this lab, you will dissect a frog in order to observe the external and internal structures of frog anatomy.

Materials:

- safety goggles, gloves
- preserved frog
- dissecting pins
- dissecting tray and paper towels
- forceps
- scissors
- dissecting needle
- dissecting probe

Background:

As members of the class **Amphibia**, frogs may live some of their adult lives on land, but they must return to water to reproduce. Eggs are laid and fertilized in water. On the outside of the frog's head are two external **nares**, or nostrils; two **tympani**, or eardrums; and two eyes, each of which has three lids. The third lid, called the **nictitating membrane**, is transparent. Inside the mouth are two internal nares, or openings into the nostrils; two **vomerine teeth** in the middle of the roof of the mouth; and two **maxillary teeth** at the sides of the mouth. Also inside the mouth behind the tongue is the **pharynx**, or throat.

In the pharynx, there are several openings: one into the **esophagus**, the tube into which food is swallowed; one into the **glottis**, through which air enters the **larynx**, or voice box; and two into the **Eustachian tubes**, which connect the pharynx to the ear. The digestive system consists of the organs of the **digestive tract, or food tube, and the digestive glands**. From the esophagus, swallowed food moves into the **stomach** and then into the **small intestine**. **Bile** is a digestive juice made by the **liver** and stored in the **gallbladder**. Bile flows into a tube called the common bile duct, into which **pancreatic juice**, a digestive juice from the pancreas, also flows. The contents of the common bile duct flow into the small intestine, where most of the digestion and absorption of food into the bloodstream takes place.

Indigestible materials pass through the large intestine and then into the **cloaca**, the common exit chamber of the digestive, excretory, and reproductive systems. The **respiratory system** consists of the **nostrils and the larynx**, which opens into two **lungs**, hollow sacs with thin walls. The walls of the lungs are filled with **capillaries**, which are microscopic blood vessels through which materials pass into and out of the blood. The **circulatory system** consists of the **heart, blood vessels, and blood**. The heart has two receiving chambers, or **atria**, and one sending chamber, or **ventricle**. Blood is carried to the heart in vessels called **veins**. Veins from different parts of the body enter the right and left atria. Blood from both atria goes into the ventricle and then is pumped into the arteries, which are blood vessels that carry blood away from the heart.

The **urinary system** consists of the frog's **kidneys, ureters, bladder, and cloaca**. The kidneys are organs that excrete **urine**. Connected to each kidney is a **ureter**, a tube through which urine passes into the **urinary bladder**, a sac that stores urine until it passes out of the body through the cloaca. The organs of the **male reproductive system** are the **testes, sperm ducts, and cloaca**. Those of the **female system** are the **ovaries, oviducts, uteri, and cloaca**. The testes produce **sperm**, or male sex cells, which move through **sperm ducts**, tubes that carry sperm into the cloaca, from which the sperm move outside the body. The **ovaries** produce eggs, or female sex cells, which move through oviducts into the uteri, then through the cloaca outside the body.

The **central nervous system** of the frog consists of the **brain**, which is enclosed in the **skull**, and the **spinal cord**, which is enclosed in the **backbone**. **Nerves** branch out from the spinal cord. The frog's **skeletal and muscular systems** consist of its framework of **bones and joints**, to which nearly all the **voluntary muscles** of the body are attached. Voluntary muscles, which are those over which the frog has control, occur in pairs of **flexors and extensors**. When a flexor of a leg, or other body part contracts, that part is bent. When the extensor of that body part contracts, the part straightens.

Comparing the frog to the human body:

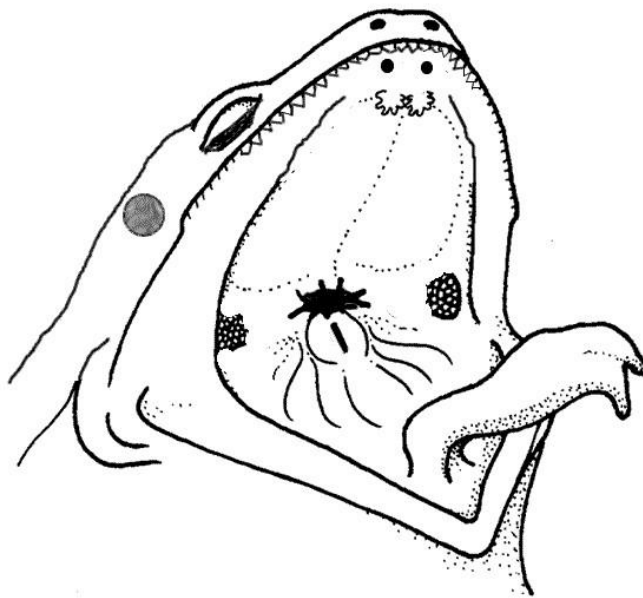
List 5 similarities between the frog and the human body.

List 3 differences between the frog and the human body.

External Anatomy:

Label each of the following structures. They are important adaptations for this organism.

- Internal Nares
- Esophagus
- Glottis
- Vomerine Teeth
- Maxillary Teeth
- Eardrum (tympani)
- Tongue
- Nostrils
- Eyes



Answer the following questions about the external anatomy of a frog:

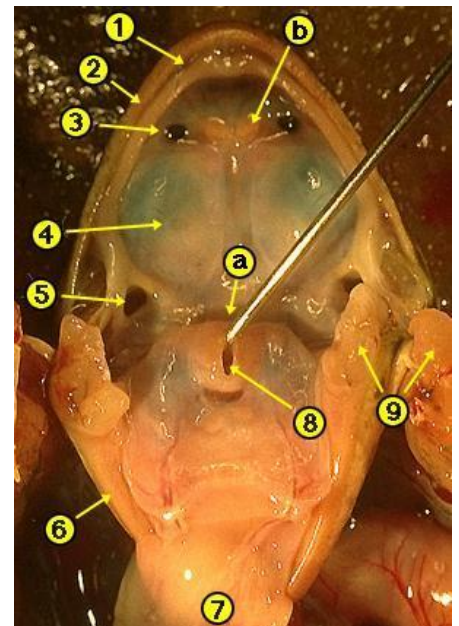
1. How do you think the pigment spots are helpful for the frog?
2. Look at the diagram from the previous page. Why do you think the frog's back legs are longer than its front legs?
3. Notice the frog's eyes located on top of the head. Why do you think they are positioned this way, instead of on the sides of the head?
4. What purpose do you think the third (lower) transparent eyelid is for?
5. Notice the frog's external eardrum just behind the eyes. Does the frog have cartilage around the outside of its ears like humans do?

The Mouth:

-Look at the diagram below and answer the questions that follow.

1. Maxillary teeth
2. Upper jaw
3. Internal nares (nostrils)
4. Eye socket
5. Eustachian tube
6. Lower jaw
7. Tongue
8. Glottis
- a. Esophagus
- b. Vomerine teeth

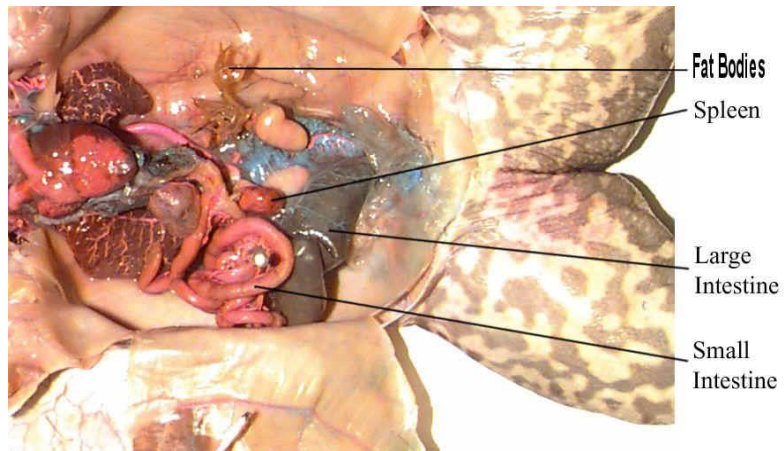
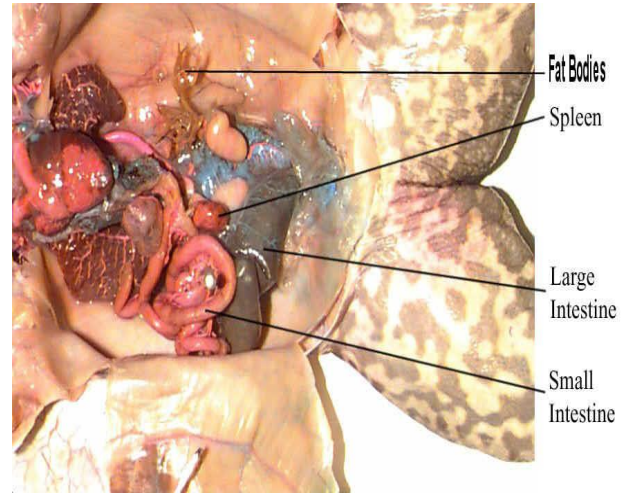
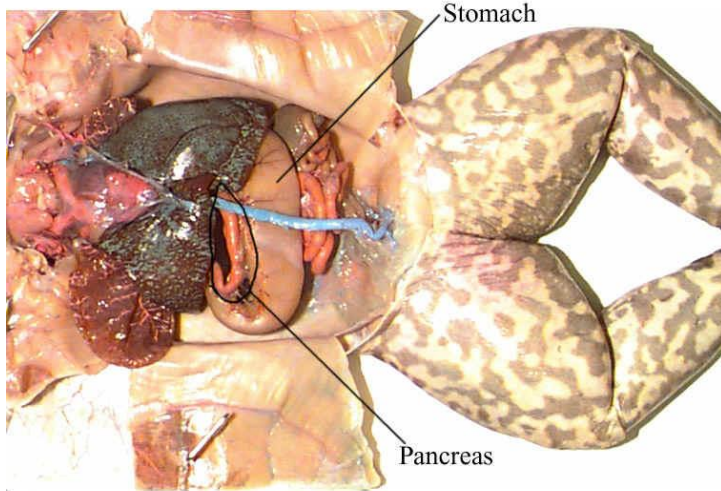
6. Notice that the tongue is attached at the front of the mouth. How is this important for the frog?



7. Notice the small set of teeth that lines the upper jaw and the two larger teeth on the roof of the mouth. What do you think these are used for (Hint: Frogs don't chew their food)?

Internal Anatomy:

-Use the following diagrams to answer the questions that follow.



Digestive System

8. What is the largest organ in the frog's body that you see? What is its function?

9. What is the function of the liver?

10. What is the function of the gall bladder?

11. The stomach leads into which part of the intestines? What is the function of this organ?

Circulatory, Respiratory, Urinary, Nervous, Muscular and Skeletal Systems

12. How many chambers does the frog's heart have?

13. Does the frog have an open or a closed circulatory system (blood flowing *open* in the body or flowing *closed* in vessels)? Why do you think so?

14. Do you have an open or a closed circulatory system?

15. What is the function of the lungs?

Read the following paragraph about the respiration of a frog.

An extensive network of blood vessels runs throughout the frog's skin. Oxygen can pass through the membranous skin, thereby entering directly into the blood. When a frog submerges beneath the water, respiration takes place through the skin. Oxygen is obtained directly from the water.

16. How is this adaptation important?

17. What is the function of the kidneys?

18. Describe where urine goes after the kidneys and how it exits the body.

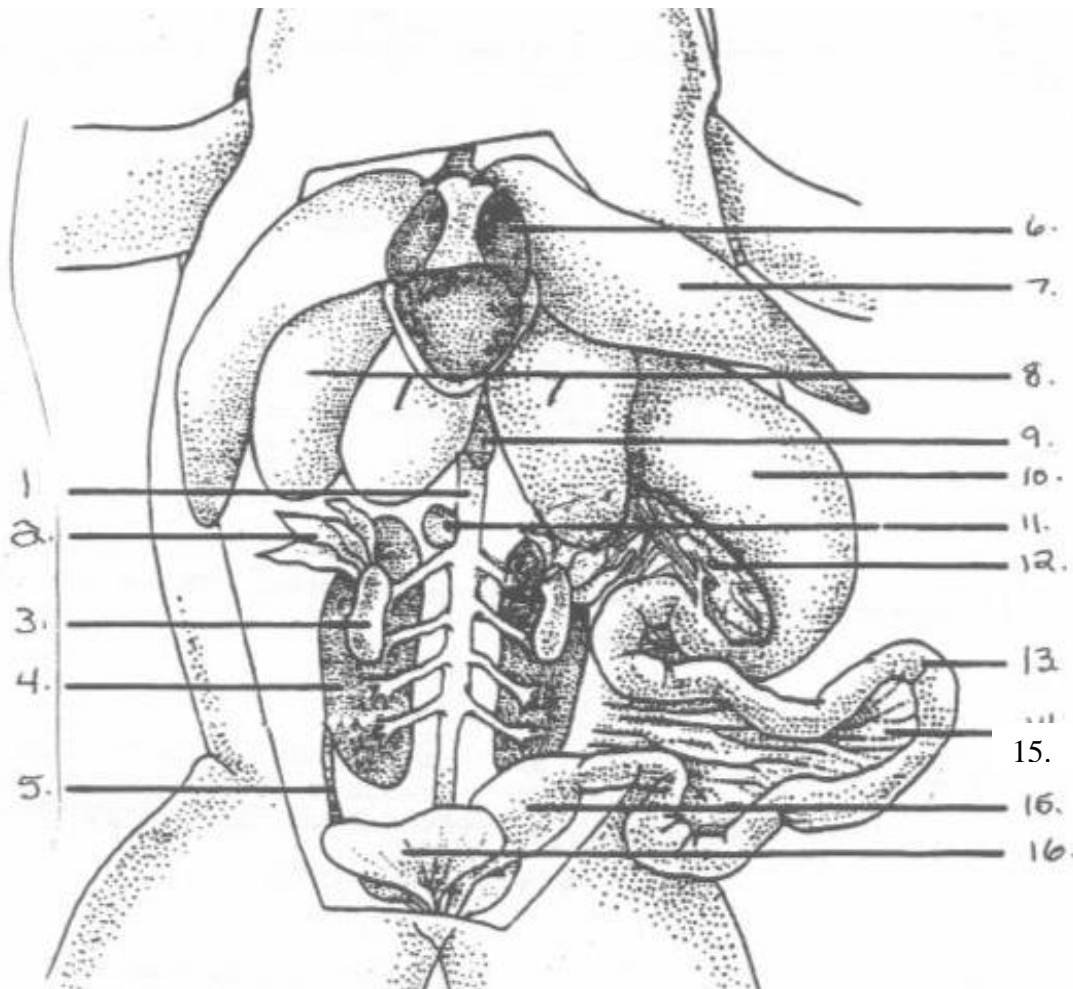
19. Is the frog's brain more or less advanced than a humans'? Explain why you think this.

20. What connects muscles to bones at joints? What type of muscles are these (frog has control over)?

Label: Frog Anatomy

Color each organs of the frog a different color.

Using the word bank below, place the number beside the correct name of the organ.



___ Fat Bodies

___ Lungs

___ Stomach

___ Gall Bladder

___ Mesentary

___ Testis

___ Heart

___ Pancreas

___ Ureters

___ Kidney

___ Posterior Vena Cava

___ Urinary Bladder

___ Large Intestine

___ Small Intestine

___ Liver

___ Spleen