

Frog Dissection Alternative Assignment

PART 1: The External Anatomy of the Frog

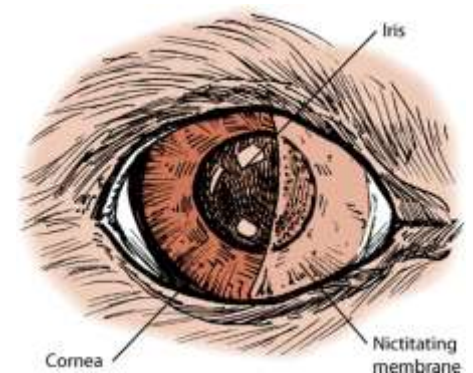
1. What is the shape of the head from the dorsal aspect?

2. What are the main differences between the forelimb and hindlimbs?

3. They have three eyelids: an upper, a lower, and the transparent nictitating membrane. You might observe the remains of this structure in your neighbor's eye which is the small white semilunar fold.
 - a. What might be the function of the third eyelid?



4. The skull cavity in which the eyeball rests is called the orbit. In a human, the orbit is enclosed posteriorly by bone; in the frog, the orbit is an open hole which allows the eyeball to sink into the oral cavity. The golden-flecked iris surrounds the central opening, the pupil. The muscular iris constricts and dilates to regulate the size of the pupil and thereby controls the amount of light admitted to the sensory elements of the eye. Note a tightly drawn circular region of skin called the tympanic membrane (or "ear drum") directly behind the eye.
 - a. Compare the frog eye to a human eye.



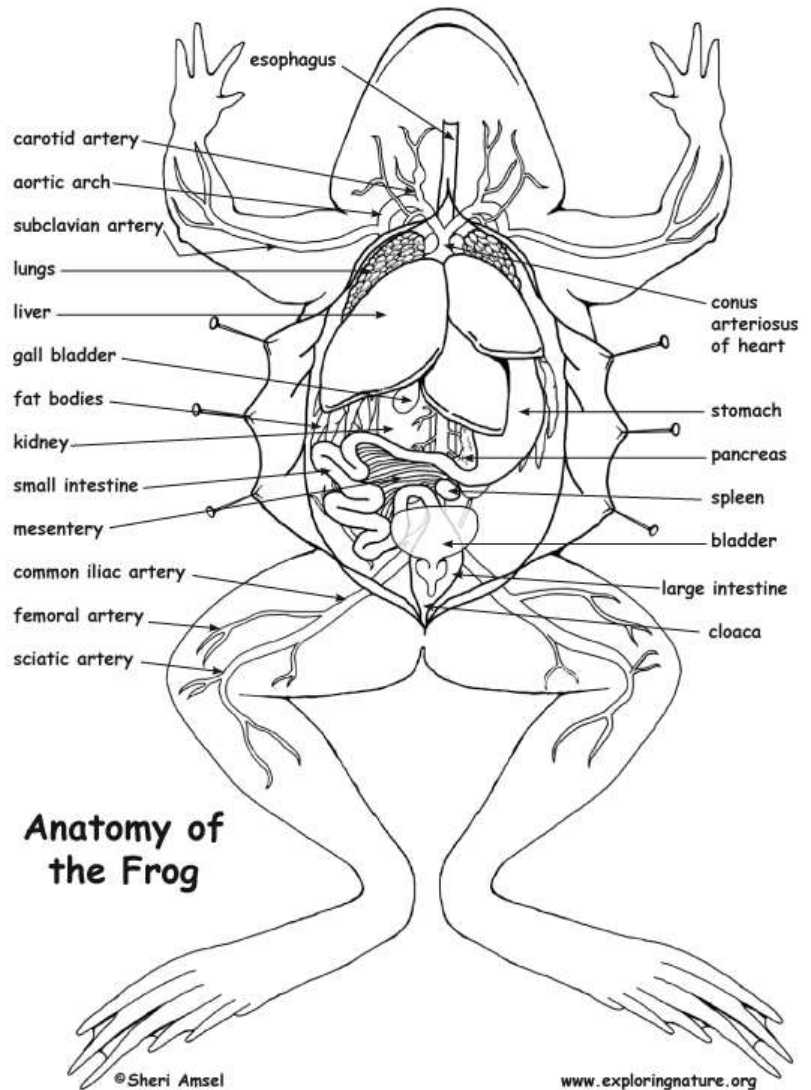
5. There is no external ear in frogs; they possess only a middle ear and an internal ear. Note the hump in the frog's back. It represents the protrusion of the pelvic girdle. Note the cloacal opening at the posterior end of the body.
 - a. What part of the "ear" is missing in a frog that humans have?

PART 2: The Internal Anatomy of the Frog

(You will need to look up some answers for this section).

6. **Fat Bodies** - Spaghetti shaped structures that have a bright orange or yellow color. Usually they are located just on the inside of the abdominal wall.
 - a. Why do frogs need to have fat in their body?

7. **Peritoneum** -- A spider-web like membrane that covers many of the organs.
 - a. Why would you want organs to be covered by a membrane?
(This is what would happen if you did not have skin covering your muscles...)



8. **Heart** - At the top of the liver, the heart is a triangular structure. The left and right atrium (collects blood as it returns to the heart) can be found at the top of the heart. A single ventricle (pushes blood all over the body) located at the bottom of the heart. The large vessel extending out from the heart is the conus arteriosus. The ventricles are much larger than the atriums.
 - a. What is the reason for the difference between them?

9. **Lungs** - The lungs are located underneath and behind the heart and liver in a frog. They are two spongy organs.
- Why are lungs “spongy”? Why do they need to be stretchy? (*You will need to look this up*).
 - How do gasses move through the cells that line the lungs? (*NB pg. 25*) Draw what this looks like.
 - What gas is most important for getting into the lungs? (*NB pg. 53*)
 - What process creates this gas? (*NB pg. 47*)
 - What type of organism does this process? (*NB pg. 47*)
 - What organelle does this process take place in? (*NB pg. 47*)
 - How does this gas move through the body to the cells that need it? (*NB pg. 53*)
 - What process is this gas used in (inside the cells)? (*NB pg. 53*)
 - What organelle does this process? (*NB pg. 53*)
 - How does this gas move through the body to get back to the lungs? (*NB pg. 53*)
10. **Stomach** - Curving from underneath the liver is the stomach. The stomach is the first major site of chemical digestion. Frogs swallow their meals whole. The bottom of the stomach is where it turns into the small intestine. The pyloric sphincter valve regulates the exit of digested food from the stomach to the small intestine.
- What is a frog’s diet? (*You will need to look this up online*).
 - What polymer is digested in the stomach? (*NB pg. 7*) What does the polymer look like? (*NB pg. 11*)

- c. What enzyme is used to break it down? *(NB pg. 7)*
- d. How does HCl help this enzyme? *(NB pg. 7)*
- e. What monomer is it broken down into? What does the monomer look like? *(NB pg. 9)*
- f. Describe the internal structure of the stomach. *(You might need to look up an image online).*
- g. What function does this structure in the stomach serve? *(NB pg. 7)*

11. **Liver** - The largest structure of the body cavity. This brown colored organ is composed of three lobes. The right lobe, the left anterior lobe, and the left posterior lobe. The liver is not primarily an organ of digestion, it does secrete a digestive juice called bile.

- a. What is the function of bile in digestion? *(NB pg. 7)*

12. **Gallbladder** - Underneath the liver, there will be a small green sac. This is the gallbladder, which stores bile.

- a. What is the function of the gallbladder? *(NB pg. 7)*
- b. Why is it okay to get it removed?
- c. What changes to diet need to occur if it is removed?

13. **Small Intestine** - Leading from the stomach. The first straight portion of the small intestine is called the duodenum, the curled portion is the ileum. The ileum is held together by a membrane called the mesentery. There are blood vessels running through the mesentery, they will carry absorbed nutrients away from the intestine. Absorption of digested nutrients occurs in the small intestine.

- a. What makes protease? *(NB pg. 7)*

- b. What does protease break down?
- c. Why does it need to be added to the small intestine if this digestion occurred in the stomach as well?
- d. What makes amylase? *(NB pg. 7)*
- e. What polymer does amylase break down? *(NB pg. 7)* What does it look like? *(NB pg. 9)*
- f. What is the monomer it is broken down into? *(NB pg. 7)* What does it look like? *(NB pg. 9)*
- g. What makes lipase? *(NB pg. 7)*
- h. What polymer does lipase break down? *(NB pg. 7)* What does it look like? *(NB pg. 9)*
- i. What is the monomer it is broken down into? *(NB pg. 7)* What does it look like? *(NB pg. 9)*
- j. What possible adaptation for digestion does the inner lining of the small intestine offer?

14. **Large Intestine** - At the end of the small intestine, it will widen into the large intestine. The large intestine leads to the cloaca, which is the last stop before solid wastes, sperm, eggs, and urine exit the frog's body. (The word "cloaca" means sewer).

- a. What is the main function of the large intestine?

15. **Esophagus** - Return to the stomach and follow it upward, where it gets smaller is the beginning of the esophagus. The esophagus is the tube that leads from the frog's mouth to the stomach. The esophagus is a muscle.

- a. Which direction do you want the muscle to contract in?

16. **Kidneys** - flattened bean shaped organs located at the lower back of the frog, near the spine. They are often a dark color. The kidneys filter wastes from the blood.

a. When a human's kidneys stop working or are not working well they do on: *(You might need to look this up online)*

b. What waste product do the kidneys get rid of? *(NB pg. 53)*

c. What process is this waste product from? *(NB pg. 53)*

PART 3: Coloring

Color the following structures in the color given. Use the letters to help you identify which structure is which.

Color all 4 diagrams for all structures present in the diagram.

- Fat Body_A = yellow
- Liver_B = Purple
- Small Intestine_E = dark blue
- Large intestine_D = dark blue
- Cloaca_C = brown
- Gallbladder_F = green
- Stomach_G = orange
- Pancreas_H = pink
- Heart_J = red
- Lungs_M = blue
- Spleen_P = gray
- Kidney_S = black

