

Frog Dissection

Study Guide & Diagrams

to accompany real, synthetic
or virtual dissection

Compiled by

G·A·S·A·
Gulfside Art & Science Academy

Why Do Students Dissect Frogs?

BY KAITLYN BOETTCHER

There are many surgeons who say that they first discovered their life's passion standing over a dissected frog in a middle or high school biology class. But, apart from inspiring the medical professionals of tomorrow, what is the purpose of dissection? And more importantly, why is everyone always dissecting those poor green amphibians?

There are many reasons that students in biology classes are asked to perform dissections, and they have a lot to do with understanding the body and the wider world. **In dissecting an animal, students see, touch, and explore the various organs in the body. Seeing these organs and understanding how they work within a single animal allows students to understand how these systems work within many other animals, including themselves.** While there are various aspects that may differ between humans and other animals, many of the organ systems in complex animals work in similar ways to those of humans.

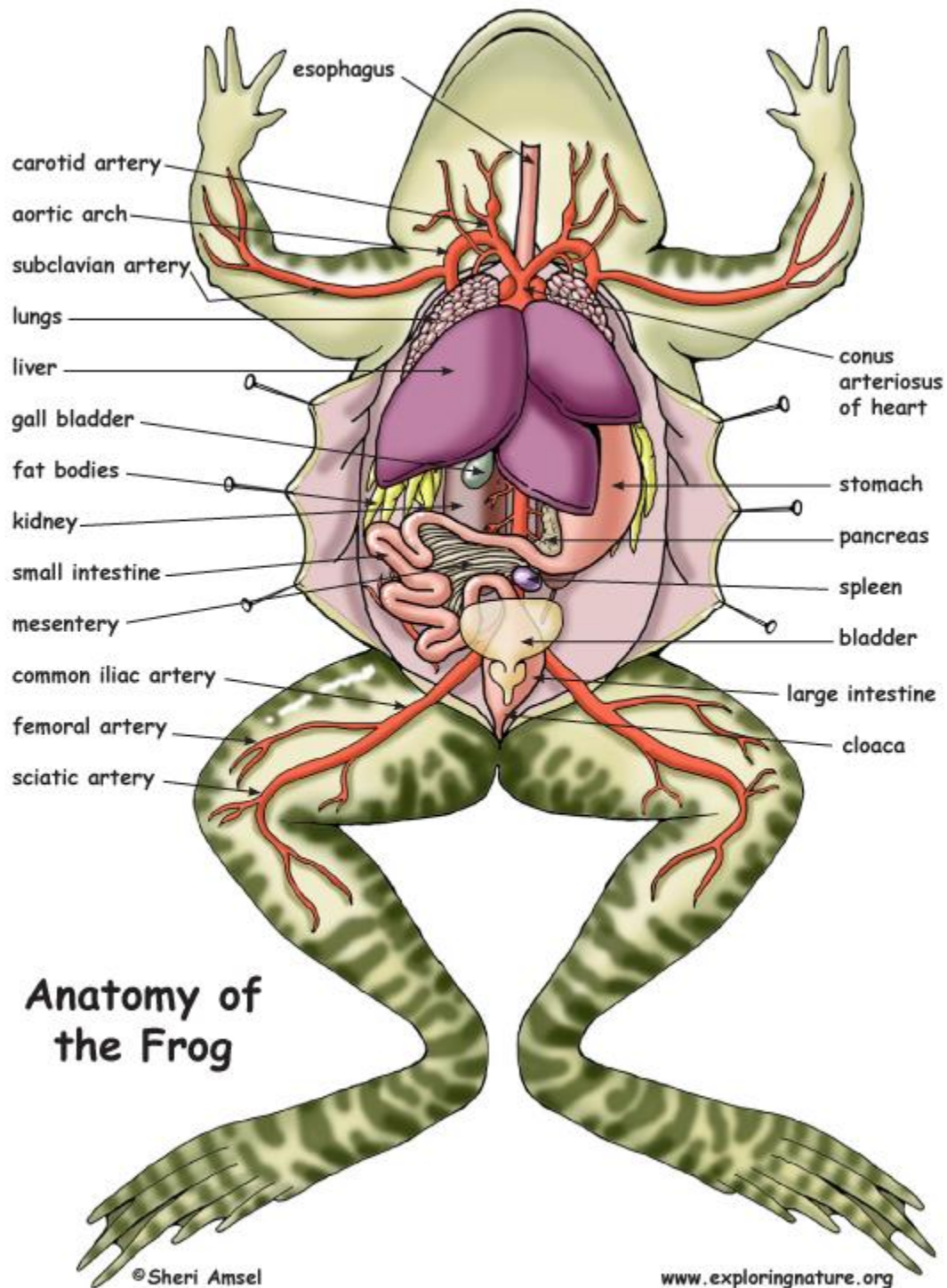
One reason frogs are often chosen to be dissected is that their bodies provide a good overview of the organ systems of a complex living thing. While the way their bodies work is nowhere near identical to a human's, there are many similarities. **The organs present in a frog, and the way they are laid out in the body, are similar enough to humans to provide insight for students about how their bodies work.**

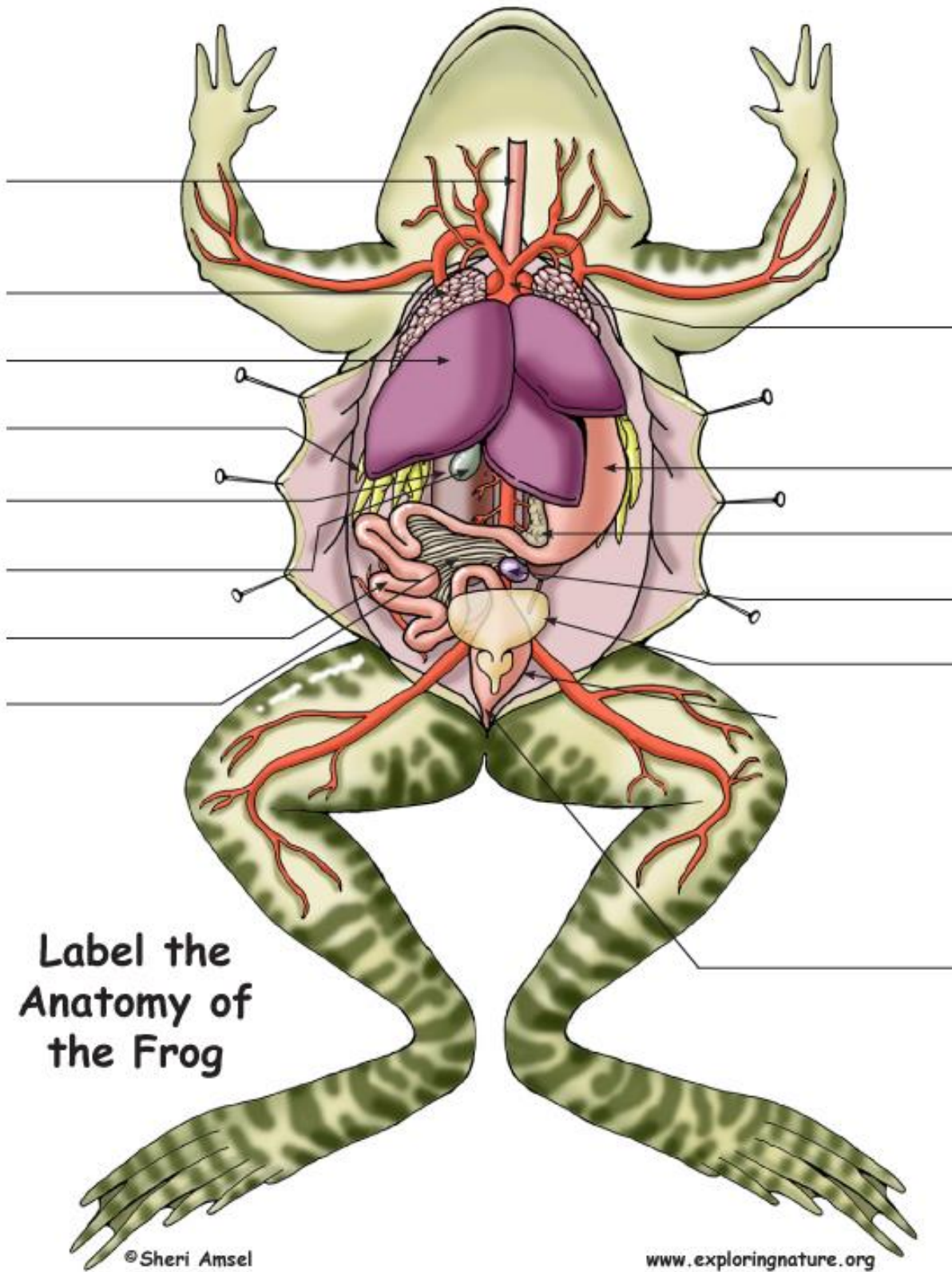
In addition to learning about themselves, students can learn about ecology and evolution through frog dissection. Certain body structures and adaptations can be seen in frogs that illustrate how they evolved over time and how they fill particular niches in the ecosystems they belong to. For example, the tongue of a frog has adapted to have great length, strength, and speed in order to effectively catch insects in flight. The role that this tongue allows the frog to fulfill—consuming insects as its primary food source—is important in the balance of many ecosystems the frog is a part of.

There are practical advantages in using frogs, too. **They're an appropriate size for dissection in the classroom and make the process manageable for students and teachers.** Also, frogs have a relatively short life span to begin with, and while some species are rare in some places, others are abundant and are therefore prime candidates for use in dissection. **Bullfrogs, for example, are an invasive species in much of the United States.** While they naturally help to control insect populations, they are also threatening native populations of other animals. This is especially the case when it comes to other frogs—bullfrogs are known to eat other frogs and drive other frog species out of their natural habitats. Bullfrogs, while not the only frogs used for dissection, are among the most common. **The use of these frogs serves a dual purpose, controlling their populations and providing a learning experience at the same time.**

While it is true that many people, for many different reasons, oppose dissection in the classroom, and offer alternatives like models or online options, dissection is still a valued educational tool thanks to its hands-on nature. It is thought that if students see and feel these organ systems for themselves, they will take more out of the lesson than if the teacher just lectured or assigned readings about it. Also, some teachers express the hope that by learning about their own bodies through dissection, students will come to respect how their bodies work, and think about how they treat them and what they put into them.

Frog Dissection Diagram and Labeling

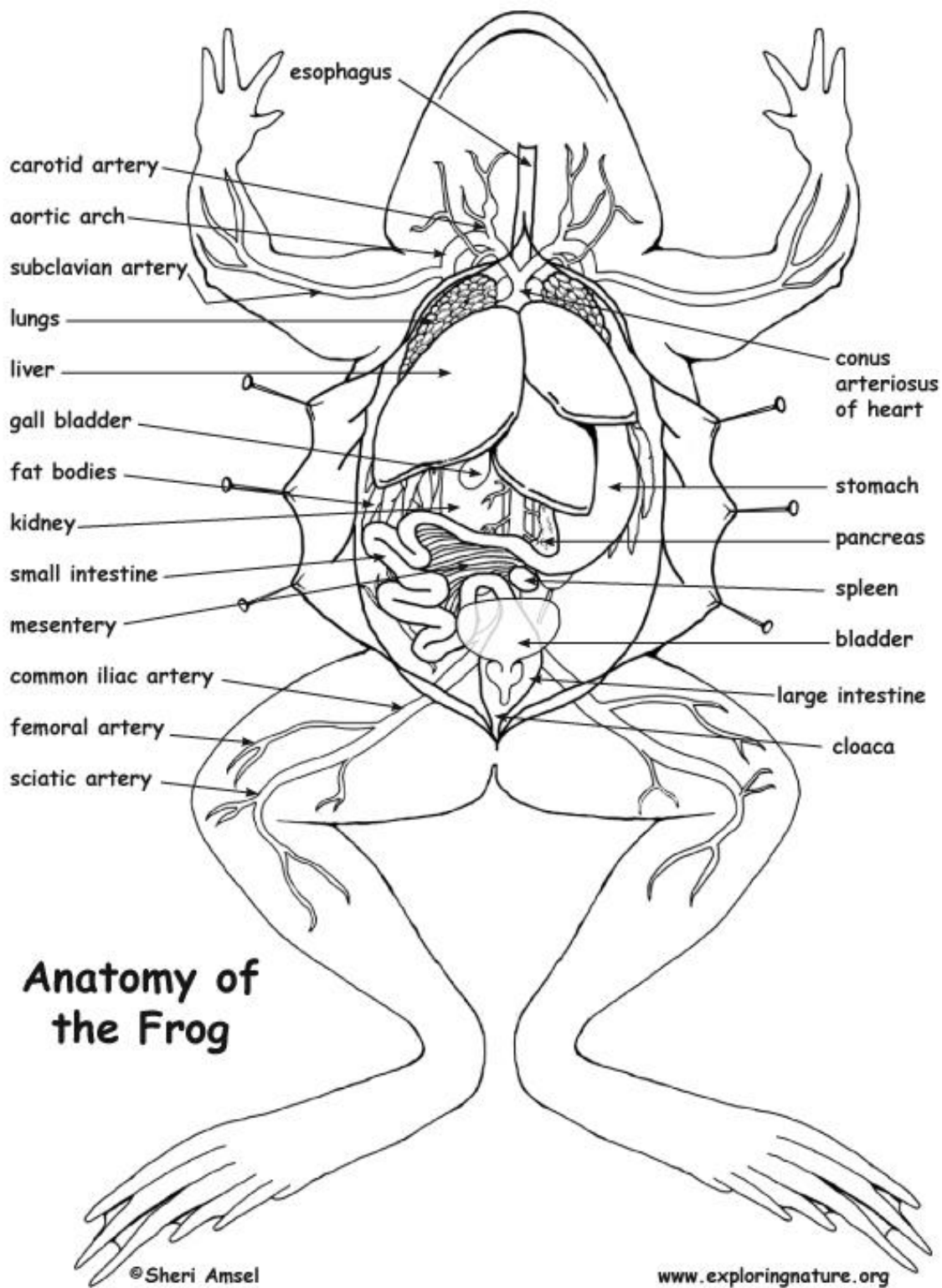


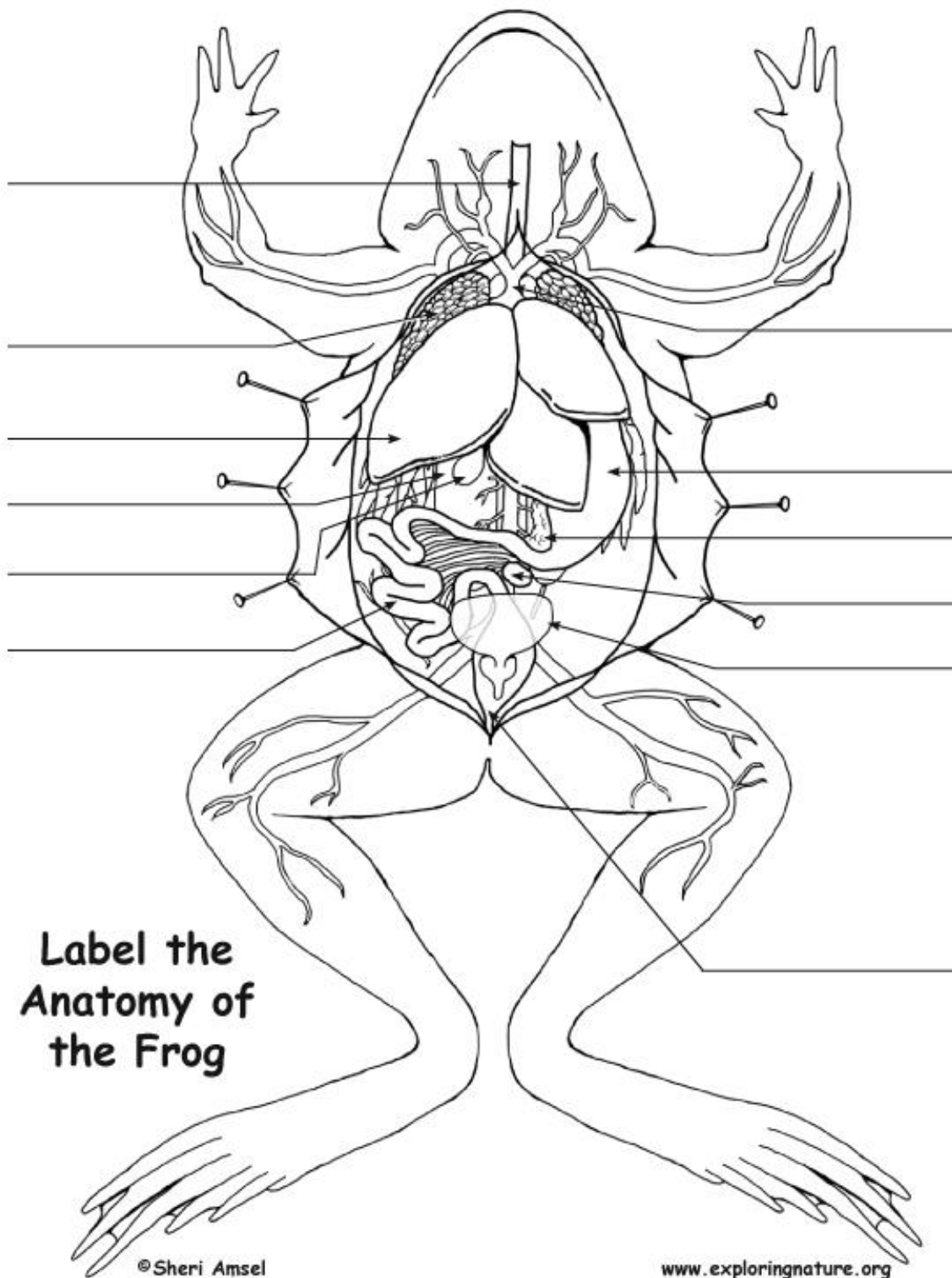


**Label the
Anatomy of
the Frog**

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**Label the
Anatomy of
the Frog**

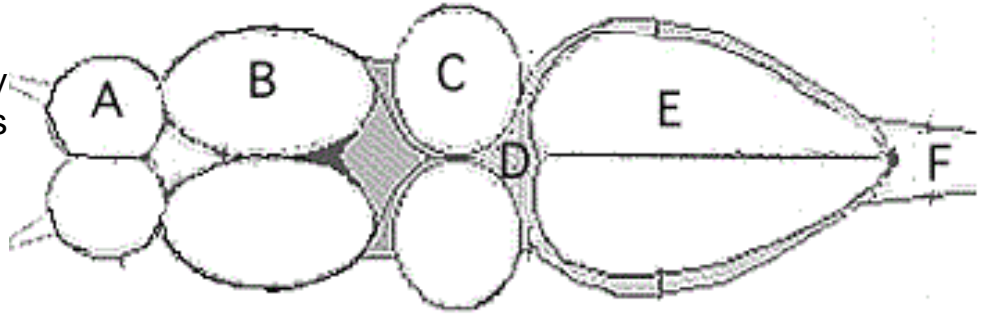
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Name: _____

Study and Removal of the Frog's Brain

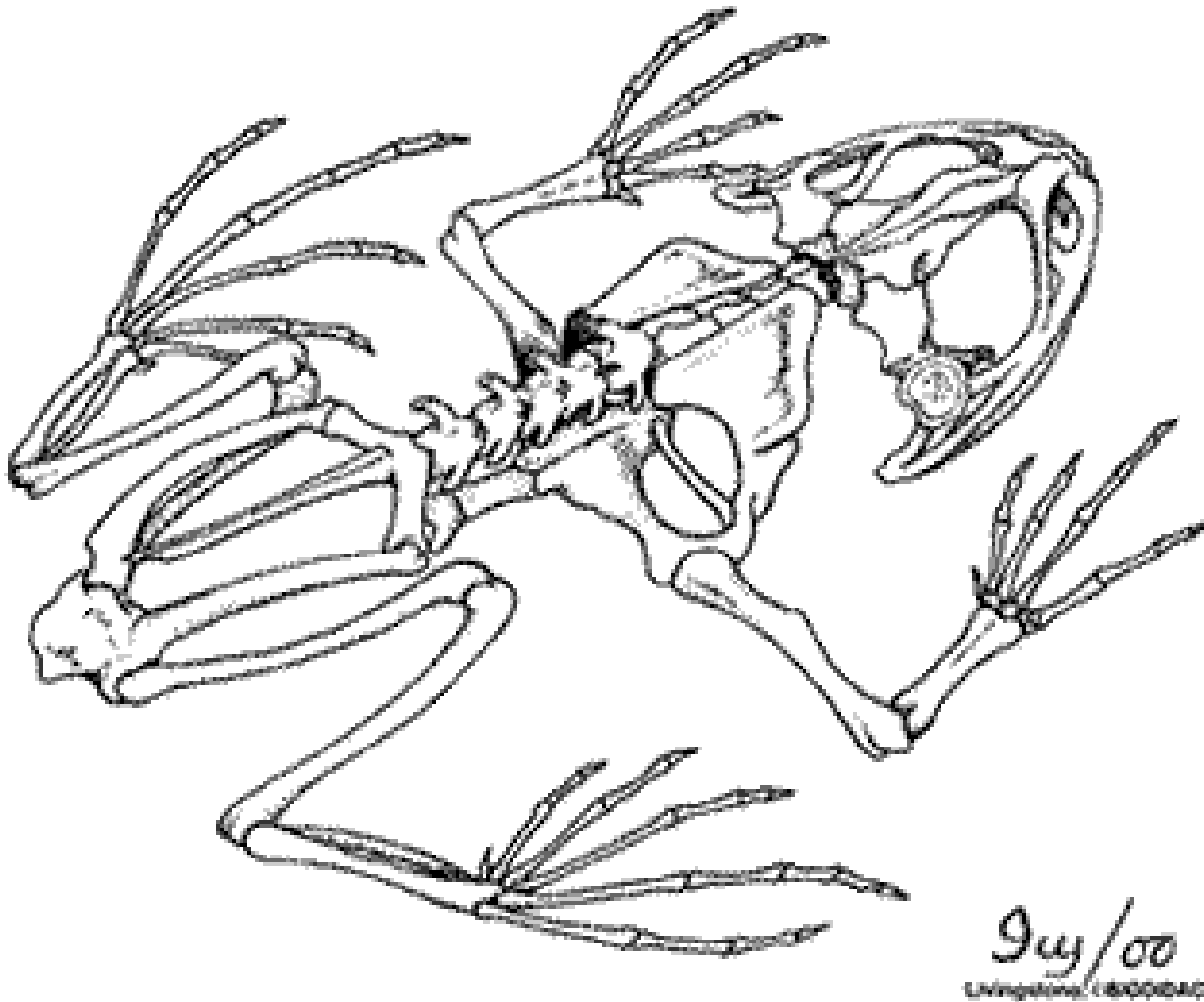
Starting at the most anterior part of the head, the olfactory nerves connect to the nostrils and then to the **olfactory lobes** (A) where odors are processed. Just posterior to the olfactory lobes are two oval structures, the **cerebrum** (B), and it is the frog's thinking center. Posterior to the cerebrum are the **optic lobes** (C), which function in vision. The ridge just behind the optic lobes is the **cerebellum** (D), it is used to coordinate the frog's muscles and maintain balance. Posterior to the cerebellum is the **medulla oblongata** (E) which connects the brain to the **spinal cord** (F).



Brain Part	Function	Letter
Cerebellum		
Cerebrum		
Olfactory Lobe		
Optic Lobe		
Medulla Oblongata		

Removal of the Frog's Brain:

Turn the frog dorsal side up. Cut away the skin and flesh on the head from the nose to the base of the skull. With a scalpel, scrape the top of the skull until the bone is thin and flexible. Be sure to scrape AWAY from you, carefully chip away the roof of the skull to expose the brain. To receive extra credit for removing the brain, you must present it to me on a paper towel with all structures above visible.



FROG BONES

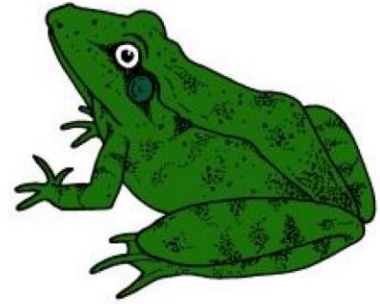
The lower leg of the frog is a muscular leg that the frog uses for jumping. There are 3 main sets of bones in the lower leg. The **femur** is found in the upper thigh, and the **tibiofibula** is found in the lower part of the leg. The foot and ankle are made of the **tarsals** and **metatarsals** (toes).

To expose the frog's leg bones you must remove the thigh muscle - the **biceps femorus** and the calf muscle - the **gastrocnemius**. You can leave the Achilles tendon intact (this tendon connects the muscle to the bone). The tarsals and metatarsals do not need to be exposed. To receive extra credit, clean your bones by removing the surrounding muscle. Bring the two bones on a paper towel. Good Luck!

****Label the leg bones: Femur, Tibiofibula, tarsals, metatarsals, pelvic girdle****

Name: _____ Date: _____

Frog Dissection: External Anatomy



1. Observe the dorsal and ventral sides of the frog.
Dorsal side color _____ Ventral side color _____
2. Examine the hind legs. How many toes are present on each foot? _____
Are they webbed? _____
3. Examine the forelegs. How many toes are present? _____
Are the toes webbed? _____
4. Use a ruler to measure your from the tip of the head to the end of the frog's backbone. Compare the length of your frog to other frogs

Your Frog (cm)	Frog 2	Frog 3	Frog 4	Frog 5	Average Length

5. Locate the frog's eyes, the **nictitating membrane** is a clear membrane that attached to the bottom of the eye. Use tweezers to carefully remove the nictitating membrane. You may also remove the eyeball.
What color is the nictitating membrane? _____ What color is the eyeball? _____
6. Just behind the eyes on the frog's head is a circular structure called the **tympanic membrane**. The tympanic membrane is used for hearing. Measure the diameter (distance across the circle) of the tympanic membrane.
Diameter of tympanic membrane = _____ cm
7. Feel the frog's skin. Is it scaly or is it slimy? _____

Anatomy of the Frog's Mouth

Procedure: Pry the frog's mouth open and use scissors to cut the angles of the frog's jaws open. Cut deeply so that the frog's mouth opens wide enough to view the structures inside.

1. Locate the **tongue**. Play with the tongue. Does it attach to the front or the back of the mouth? _____
(You may remove the tongue). Draw a sketch of the tongue, paying attention to its shape.
Tongue Sketch:

2. In the center of the mouth, toward the back is a single round opening, the **esophagus**. This tube leads to the stomach. Use a probe to poke into the esophagus.

3. Close to the angles of the jaw are two openings, one on each side. These are the **Eustachian tubes**. They are used to equalize pressure in the inner ear while the frog is swimming. Insert a probe into the Eustachian tube.

To what structure does the Eustachian tube attach? _____

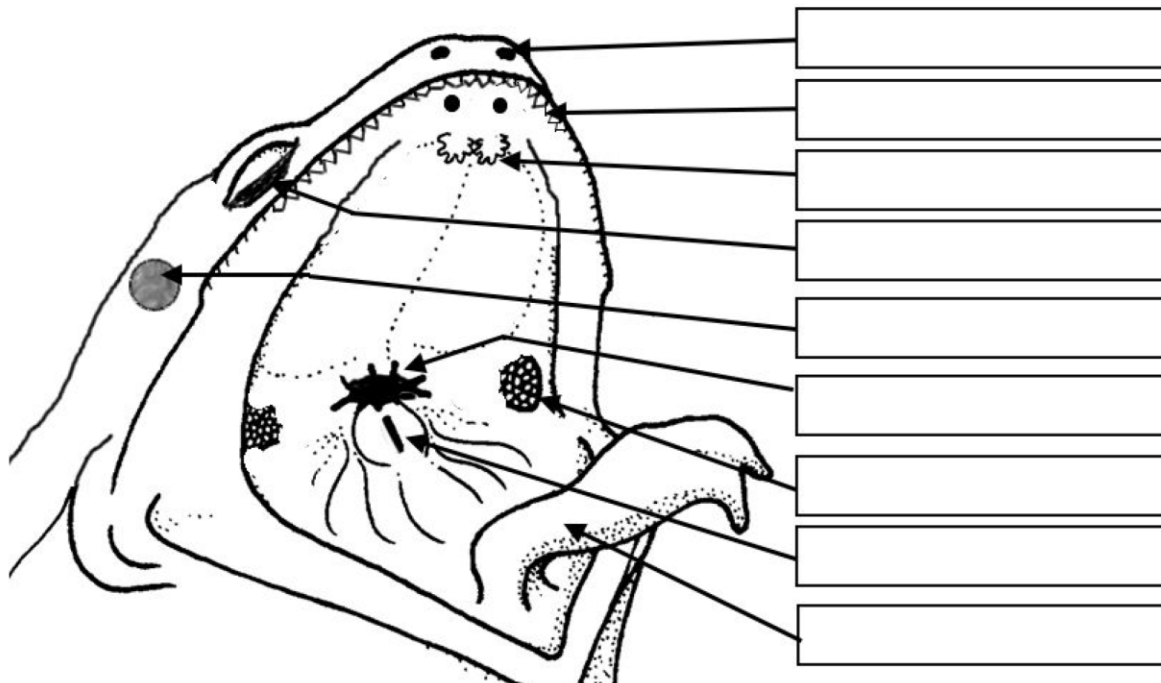
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4. Just behind the tongue, and before you reach the esophagus is a slit like opening. (You may need to use your probe to get it to open up). This slit is the **glottis**, and it is the opening to the lungs. The frog breathes and vocalizes with the glottis. Use your probe to open the glottis and compare that opening to the esophagus.

5. The frog has two sets of teeth. The **vomerine teeth** are found on the roof of the mouth. The **maxillary teeth** are found around the edge of the mouth. Both are used for holding prey, frogs swallow their meals whole and do NOT chew. Run your finger over both sets of teeth and note the differences between them.

6. On the roof of the mouth, you will find the two tiny openings of the **nostrils**, if you put your probe into those openings, you will find they exit on the outside of the frog.

7. Label the structures

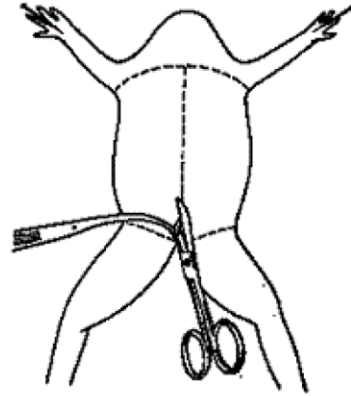


8. Complete the table.

Structure	Function	Location
Vomerine Teeth		
Eustachian Tubes		
Tympanic Membrane		
Esophagus		
Glottis		
Tongue		

Name: _____

Student Guide to the Frog Dissection



Dissection Instructions

1. Place the frog in the dissecting pan ventral side up.
2. Use scissors to lift the abdominal muscles away from the body cavity. Cut along the midline of the body to the forelimbs.
3. Make transverse (horizontal) cuts near the arms and legs.
4. Lift the flaps of the body wall and pin back.

*If your specimen is a female, the body may be filled with eggs. You may need to remove these eggs to view the organs.

Locate each of the organs below. Check the box to indicate that you found the organs.

1. Fat Bodies --Spaghetti shaped structures that have a bright orange or yellow color, if you have a particularly fat frog, these fat bodies may need to be removed to see the other structures. Usually they are located just on the inside of the abdominal wall.

2. Peritoneum A spider-web like membrane that covers many of the organs; you may carefully pick it off to get a clear view

3. Liver--The largest structure of the 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. Bile is needed for the proper digestion of fats.

4. Heart - at the top of the liver, the heart is a triangular structure. The **left and right atrium** can be found at the top of the heart. A single **ventricle** located at the bottom of the heart. The large vessel extending out from the heart is the **conus arteriosis**.

5. Lungs - Locate the lungs by looking underneath and behind the heart and liver. They are two spongy organs.

6. Gall Bladder --Lift the lobes of the liver, there will be a small green sac under the liver. This is the gall bladder, which stores bile. (hint: it kind of looks like a booger)

7. Stomach--Curving from underneath the liver is the stomach. The stomach is the first major site of chemical digestion. Frogs swallow their meals whole. Follow the stomach to where it turns into the small intestine. The **pyloric sphincter valve** regulates the exit of digested food from the stomach to the small intestine.

8. 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**. Note the blood vessels running through the mesentery, they will carry absorbed nutrients away from the intestine. Absorption of digested nutrients occurs in the small intestine.

9. Large Intestine--As you follow the small intestine down, 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)

10. Spleen--Return to the folds of the mesentery, this dark red spherical object serves as a holding area for blood.

11. 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 frogs mouth to the stomach. Open the frogs mouth and find the esophagus, poke your probe into it and see where it leads.

STOP! If you have not located each of the organs above, do not continue on to the next sections!

Removal of the Stomach: Cut the stomach out of the frog and open it up. You may find what remains of the frog's last meal in there. Look at the texture of the stomach on the inside.

What did you find in the stomach?

Measuring the Small intestine: Remove the small intestine from the body cavity and carefully separate **the mesentery** from it. Stretch the small intestine out and measure it. Now measure your frog. Record the measurements below in centimeters. Frog length: _____ cm Intestine length _____ cm

Urogenital System

The frog's reproductive and excretory system is combined into one system called the urogenital system. You will need to know the structures for both the male and female frog

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. Often the top of the kidneys have yellowish stringy fat bodies attached.

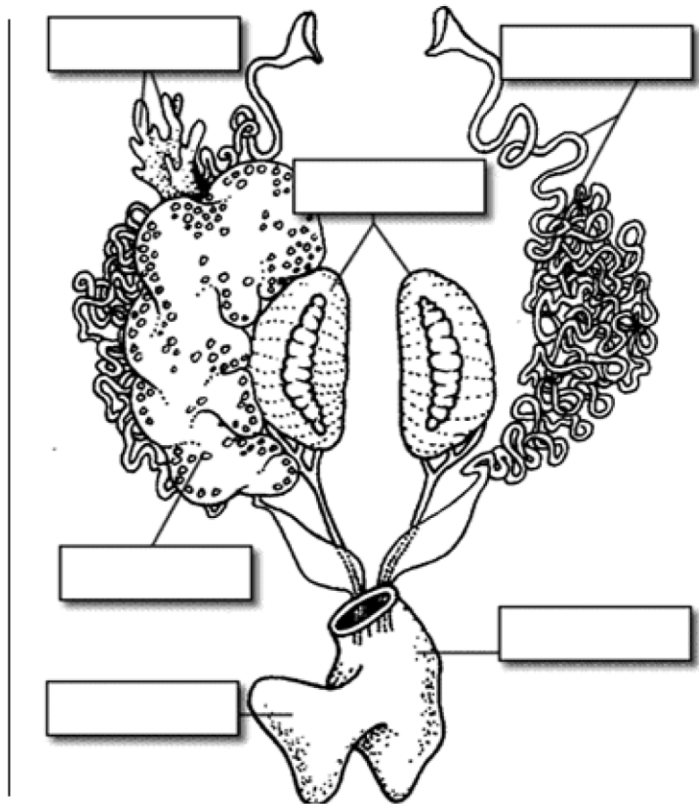
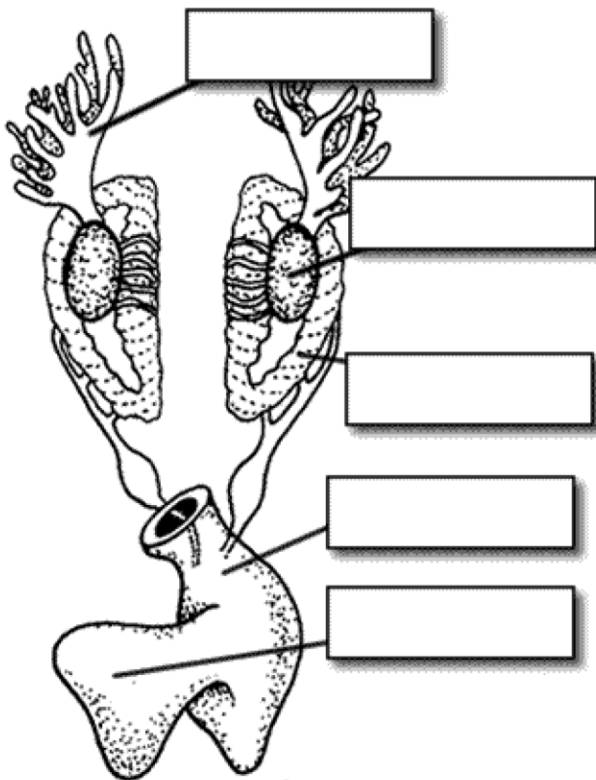
Testes - in male frogs, these organs are located at the top of the kidneys, they are pale colored and roundish.

Oviducts - females do not have testes, though you may see a curly structure around the outside of the kidney, these are the oviducts. Oviducts are where **eggs** are produced. Males can have structures that look similar, but serve no actual purpose. In males, they are called vestigial oviducts.

Bladder - An empty sac located at the lowest part of the body cavity. The bladder stores urine.

Cloaca - mentioned again as part of the urogenital system - urine, sperm and eggs exit here.

Label the parts of the urogenital system.



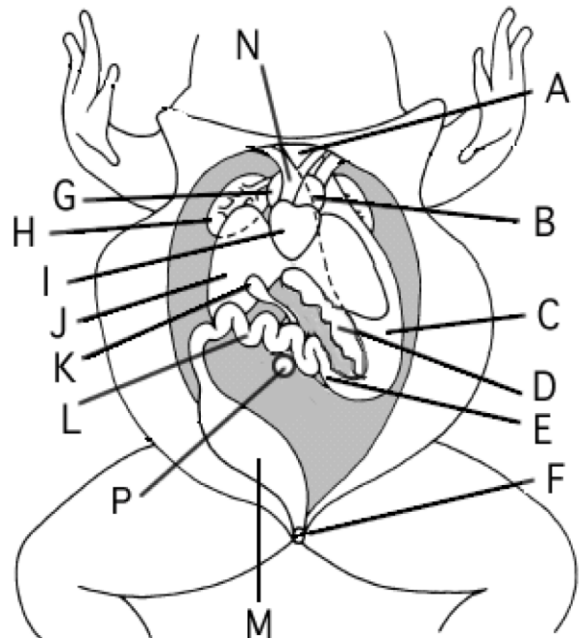
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Post Lab Questions

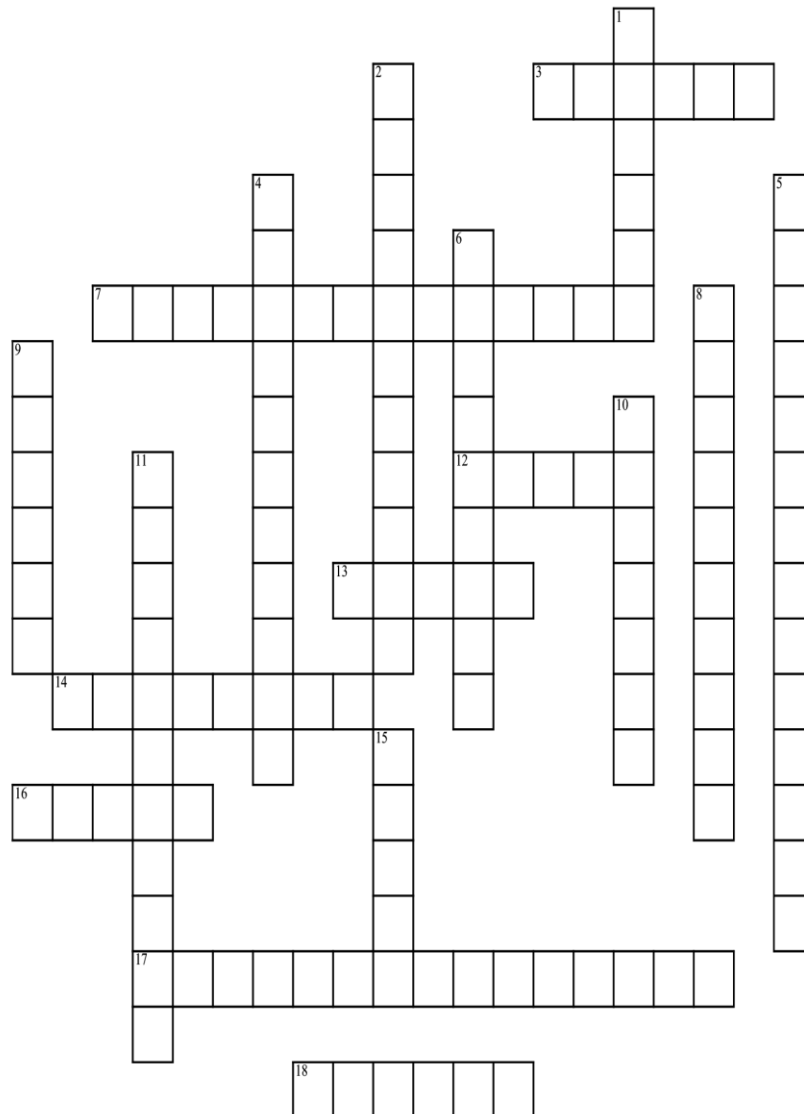
1. The membrane holds the coils of the small intestine together: _____
2. This organ is found under the liver, it stores bile: _____
3. Name the 3 lobes of the liver: _____, _____, _____
4. The organ that is the first major site of chemical digestion: _____
5. Eggs, sperm, urine and wastes all empty into this structure: _____
6. The small intestine leads to the: _____
7. The esophagus leads to the: _____
8. Yellowish structures that serve as an energy reserve: _____
9. The first part of the small intestine(straight part): _____
10. After food passes through the stomach it enters the: _____
11. A spiderweb like membrane that covers the organs: _____
12. Regulates the exit of partially digested food from the stomach: _____
13. The large intestine leads to the _____
14. Organ found within the mesentery that stores blood: _____
15. The largest organ in the body cavity: _____

Label the Diagram

- A. _____
- B. _____
- C. _____
- D. _____
- E. _____
- F. _____
- G. _____
- H. _____
- I. _____
- J. _____
- K. _____
- L. _____
- M. _____
- N. _____



Frog Dissection



Across

3. Where the urine emptys.
7. Where nutrients from food is absorbed into blood stream.
12. What keeps the animal alive?
13. Take in oxygen.
14. What makes insulin?
16. Acts like a filter and produces bile.
17. Wide opening that leads to esophagus.
18. What recycles red blood cells and make white blood cells?

Down

1. What catches food?
2. Collects oxygen depleted blood as it comes back to heart.
4. What stores bile?
5. Absorbs water from waste materials before they leave the body.
6. The entry to the stomach.
8. Collect oxygen rich blood flowing back from lungs.
9. What filters the blood and removes nitrogen waste?
10. The mechanical breakdown of food.
11. Holds pancreas and spleen.
15. What holds the food and prevents animals from escaping?

FROG DISSECTION STUDY GUIDE WITH ANSWERS

Materials:

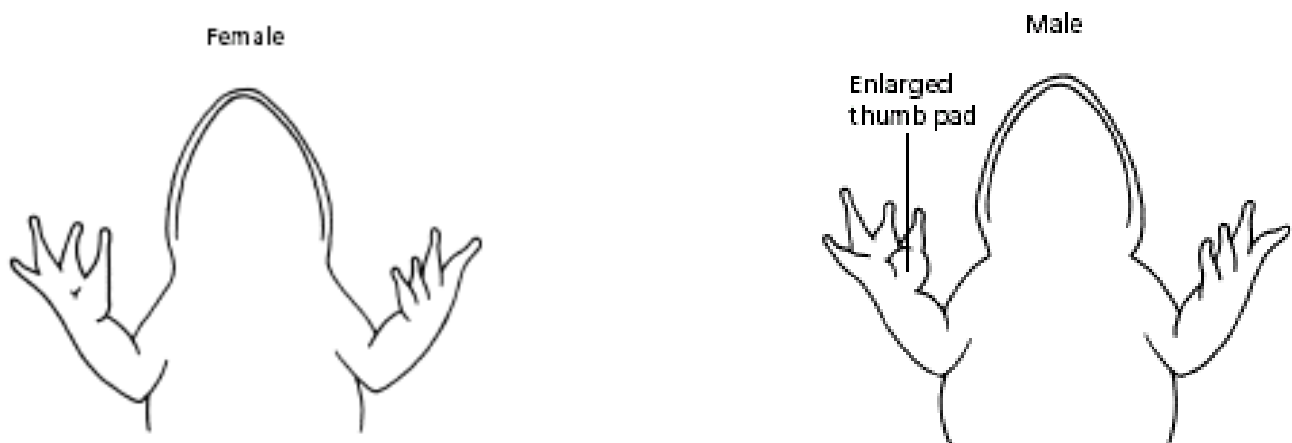
Dissecting pins, forceps, scissors, paper towel, dissecting probe, preserved frog, dissection tray.

Purpose:

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

SEXING YOUR FROG:

Place a frog on a dissection tray. To determine the frog's sex, look at the hand digits, or fingers, on its forelegs. A male frog usually has thick pads on its "thumbs," which is one external difference between the sexes, as shown in the diagram below. Male frogs are also usually smaller than female frogs. Observe several frogs to see the difference between males and females.



Is your frog male or female? **Explain:**

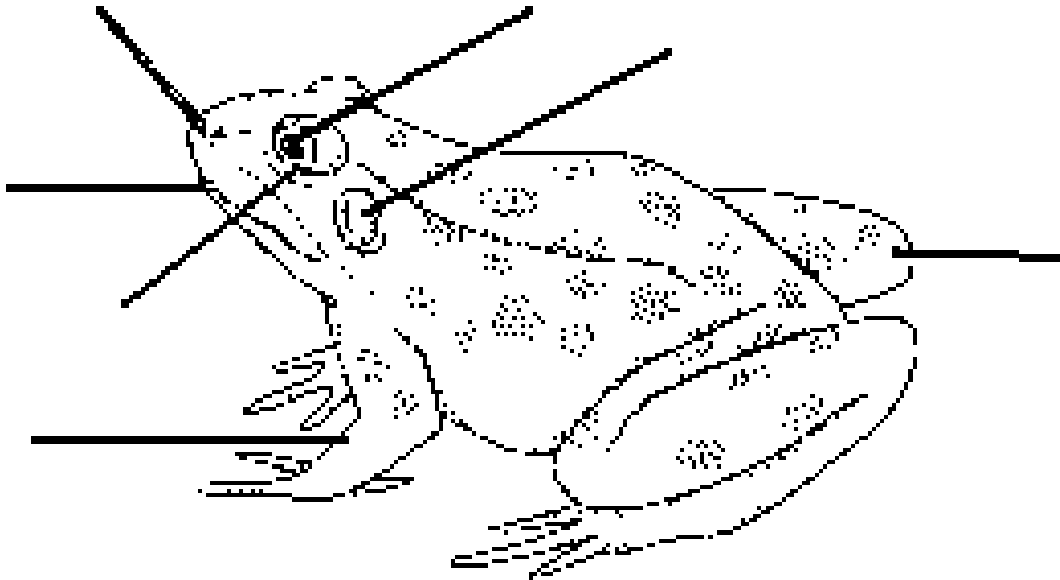
PROCEDURE AND OBSERVATIONS: EXTERNAL ANATOMY

1. Place the frog on its belly (ventral side) in the dissecting pan
2. Examine the hind legs and front legs of the frog. The hind legs are strong and muscular and are used for jumping and swimming. The forelegs provide balance and cushion the frog when it lands after jumping. Notice the difference between the toes of the hind legs and those of the front legs. How many toes are on the front legs_____. How many are on the hind legs_____. **Label the hind and front legs on Figure 1.**
3. Locate the large, bulging eyes. The frog has 3 eyelids. The 2 outer ones are the color of the frog's body. They do not move. Locate the third eyelid. It is a transparent membrane that protects the eye while permitting the frog to see under water. It is called a **NICTITATING MEMBRANE**. Label the **eye** and the **nictitating membrane on Figure 1.**
4. Behind each eye find the circular eardrum called a **TYMPANUM**. They locate the two openings into the nasal cavity. The nasal openings, are also called **EXTERNAL NARES**, found toward the tip of the snout will close when the frog is under water. **Label the mouth, tympanum, and the external nares on Figure 1.**
5. Feel the frog's skin. It is smooth, moist and thin. The frog can breathe directly through its skin as well as with its lungs. Turn the frog onto its ventral side and notice the color difference.

Why does each side's color help protect the frog from predators?

Coloration acts as camouflage

Figure 1. External Anatomy of the Frog:



INTERNAL MOUTH STRUCTURES:

6. Place the frog on its dorsal side in the dissecting pan and cut the corners of the mouth. **CAUTION:** Be careful when using scissors.

7. Locate the **TONGUE**. Is it attached to the front or the back of the mouth? Front

 In a live frog, the tongue is sticky and is used to catch insects. Pull on the tongue. Notice that it is still flexible.

8. Feel the inside of the upper jaw (**maxilla**) and the lower jaw (**mandible**). The teeth you feel are the **MAXILLARY TEETH**. Locate the 2 **VOMERINE TEETH** on the upper jaw. They are located toward the front of the upper jaw and between the internal nares (internal nostril openings).

What are the maxillary teeth and vomerine teeth used for? To hold onto prey

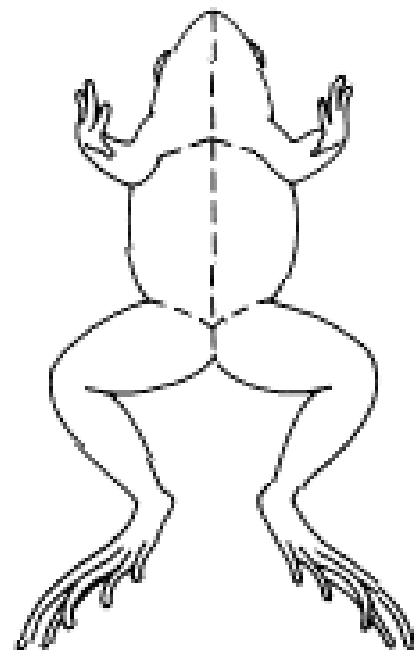
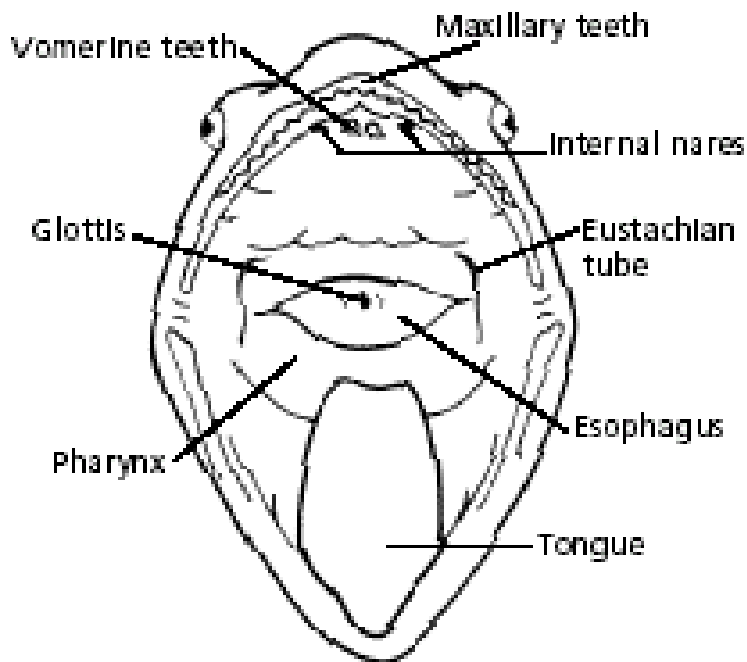
9. Push carefully on the eyes observe how they fill a space in the mouth. The eyes help hold the prey as a frog is swallowing it.

10. Locate a vertical opening toward the back of the mouth. This is the **GLOTTIS**. It is the opening to the trachea (windpipe) that leads to the lungs.

11. Find the **GULLET** (throat) it leads to the opening of the esophagus. On both sides of the gullet, near the cut jaws are opening to the **EUSTACHIAN TUBES**. Use your probe.

Where does the eustachian tube lead? **To the tympanic membrane**

What is its purpose? **Equalize pressure of the inner ear**



Incisions for Dissection

LOCATE and label THE FOLLOWING on Figure 2.

1. **Vomarine Teeth:** Used for holding prey
2. **Internal Nares (nostrils)** breathing
3. **Eustachian Tubes:** equalize pressure in inner ear
4. **Glottis :** Tube leading to the lungs
5. **Gullet:** Opening leading to the esophagus
6. **Tongue:** Front attached, aids in grabbing prey
7. **Tympanic Membrane:** eardrum, located behind eyes
8. **Nictitating Membrane:** clear eyelid, protects the eye
9. **Maxillary Teeth:** Used for holding prey
10. **Eye:** vision

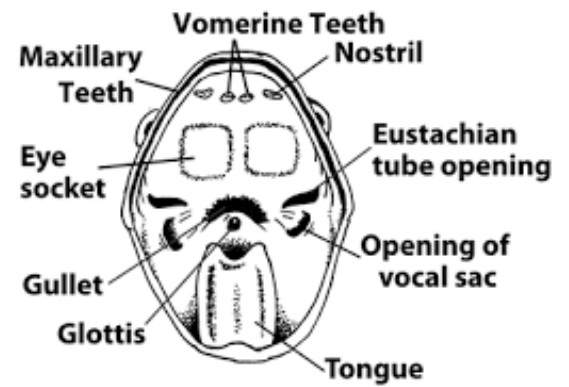
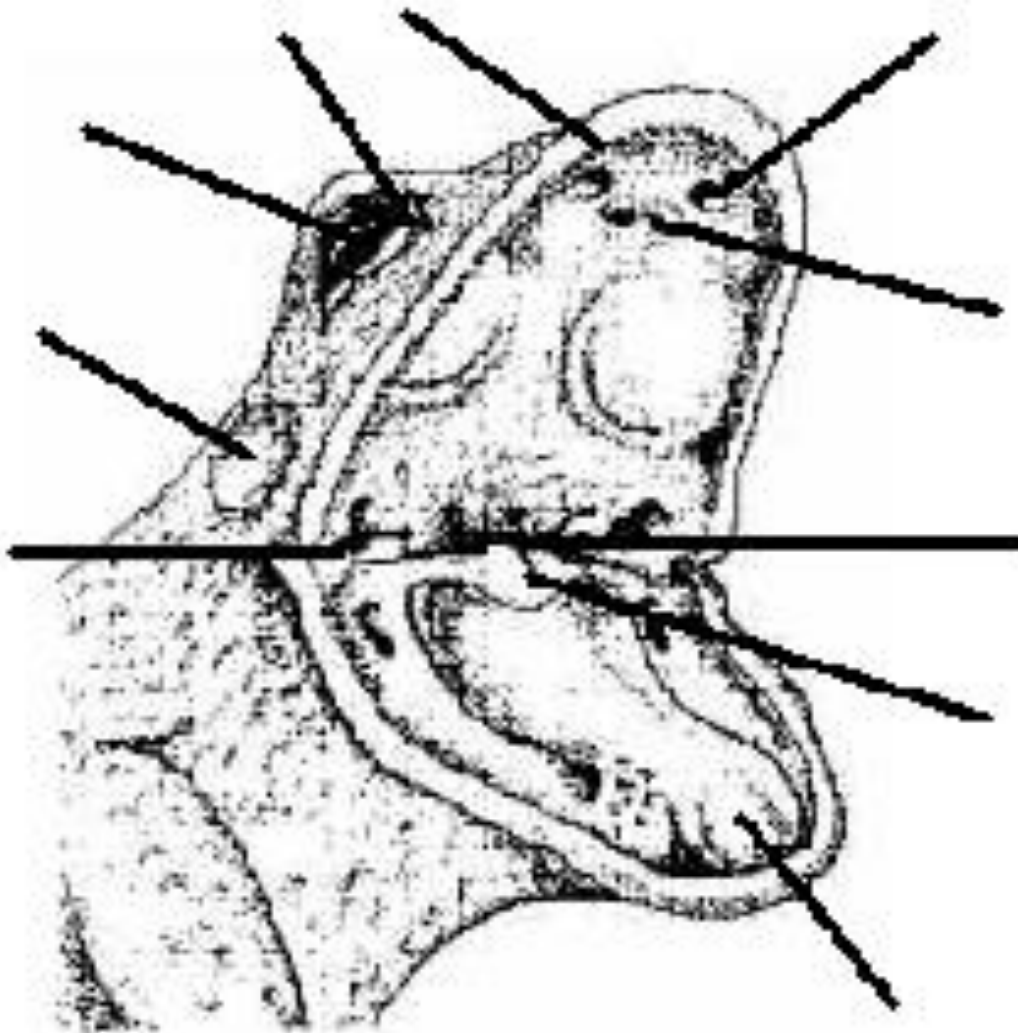
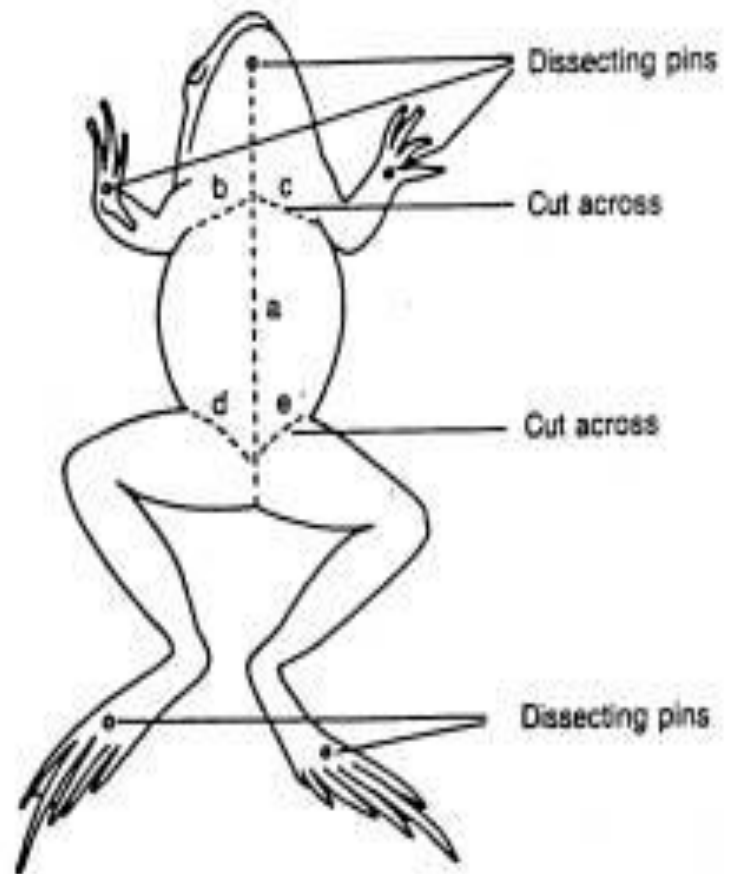


Figure 2:



DISSECTING THE FROG:

1. Place the frog on its dorsal side and secure it in place with dissecting pins through each of the legs.
2. With your scissors make a cut (**through the skin only**) along the midline of the belly from the pelvis to the throat.
3. Now make transverse cuts through the skin below each of the fore limbs and above each of the hind legs. If needed you may pin the skin back. Notice the blood vessels under the skin.

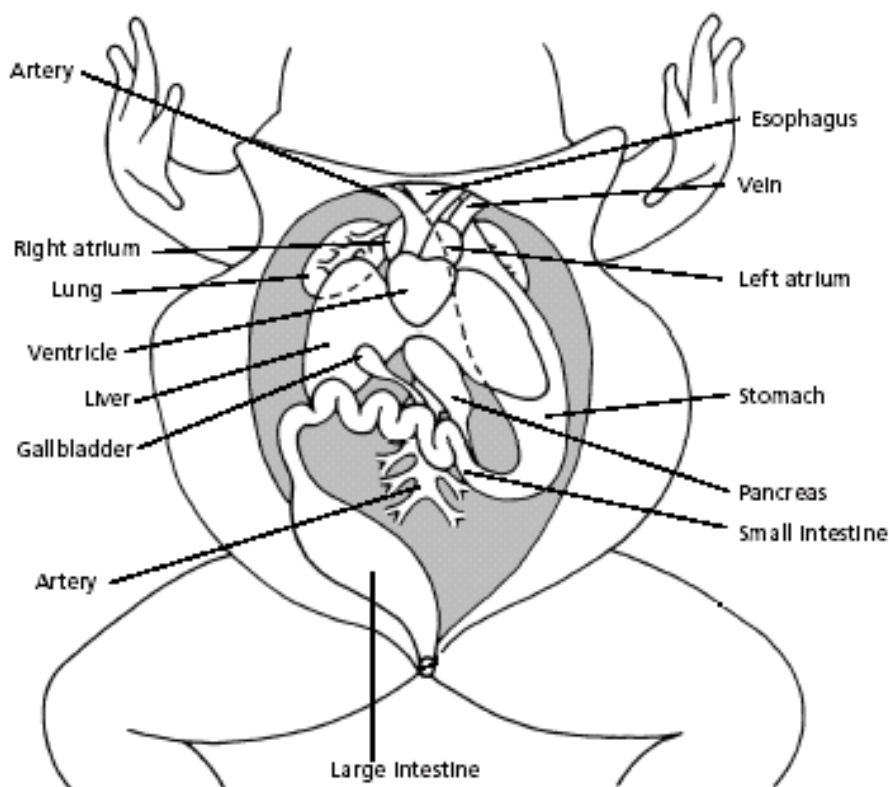


Why are there so many blood vessels? **Closed- circulation, double-looped circulation, allows blood to reach all parts of the frog's body**

4. Notice the abdominal muscles. Now cut through the muscle layer and repeat the incisions you made in step 2 and 3. BE CAREFUL NOT TO CUT TOO DEEP AND DAMAGE THE UNDERLYING ORGANS.
5. You will have to cut through the sternum (breastbone). Open and re-pin the frog.
6. If your frog is female, the body cavity may be full of black eggs. You may have to remove one side in order to continue your dissection.

INTERNAL ANATOMY:

The digestive system consists of the organs of the digestive tract and the digestive glands. Swallowed food moves from the mouth down the **esophagus** and into the **stomach** and then into the **small intestine**. Bile is a digestive juice made by the **liver** and stored in the **gall bladder**. Bile flows into a tube called the **bile duct**. Digestive enzymes from the **pancreas** flows into this duct. Both bile and pancreatic enzymes flow into the small intestine. Most digestion and absorption of food into the bloodstream takes place in the small intestine. Indigestible materials pass through the **large intestine** and then into the **cloaca**, the common exit chamber of the digestive, excretory, and reproductive systems.



- 1. Stomach:** First site of chemical digestion, breaks down food
- 2. Liver:** Makes bile (aids in digestion)
- 3. Gall bladder:** Stores bile
- 4. Esophagus:** Tube that leads to the stomach
- 5. Pancreas:** Makes insulin (aids in digestion)
- 6. Small Intestine** (duodenum and ileum): absorb nutrients from food
- 7. Mesentery:** Holds coils of the small intestine together
- 8. Large Intestine:** Collects waste, absorbs water
- 9. Spleen:** Part of circulatory system, stores blood

- 10. Cloaca:** Where sperm, eggs, urine, and feces exit.
- 11. Artery;** take blood away from the heart
- 12. Vein:** take blood toward the heart
- 13. left atrium** pumps blood into the ventricle
- 14. Right atrium** pumps blood into the ventricle
- 15. Lung:** organ for oxygen and carbon dioxide exchange

1. Locate and label the largest organ in the abdominal cavity it is the reddish brown **LIVER**. How many lobes does the liver have? **3**

2. Locate the greenish sac attached to the liver. This is the **GALL BLADDER**. What is stored in the gall bladder? What does bile digest? **Bile, helps digest food!**

3. Beneath and to the right of the liver is a j shaped **STOMACH**. With your scissors open the J of the stomach to observe what the frog may have eaten. **Was there anything in the stomach? What do you think the frog ate?**

4. The stomach attaches to the small intestine. The straight part of the small intestine is called the **DUODENUM** and the coiled section is the **ILEUM**. The coils of the ileum are connected by thin transparent membranes with blood vessels. This tissue is called the **MESENTERY**. Mesentery helps keep your intestine from knotting up. **After cutting the small intestine away from the large intestine, measure how long your small intestine is in cm and inches.**

_____ cm. _____ inches.

Name the two sections of the small intestine: **1. Duodenum 2. Ileum**

5. The small intestine widens to form the **LARGE INTESTINE**. The large intestine is a straight tube leading to the anus. The lower portion of the large intestine is called the **cloaca**. Waste, urine and sex cells are expelled here.

6. In the mesentery along the inner curve of the stomach locate the pinkish **PANCREAS**. In the mesentery find a reddish spherical structure call the spleen. The **spleen** filters out worn out red blood cells and platelets from the blood.

7. The respiratory system consists of the nostrils, trachea and bronchi which opens into two **lungs**. Locate the **LUNGS**, 2 reddish brown saclike structures.

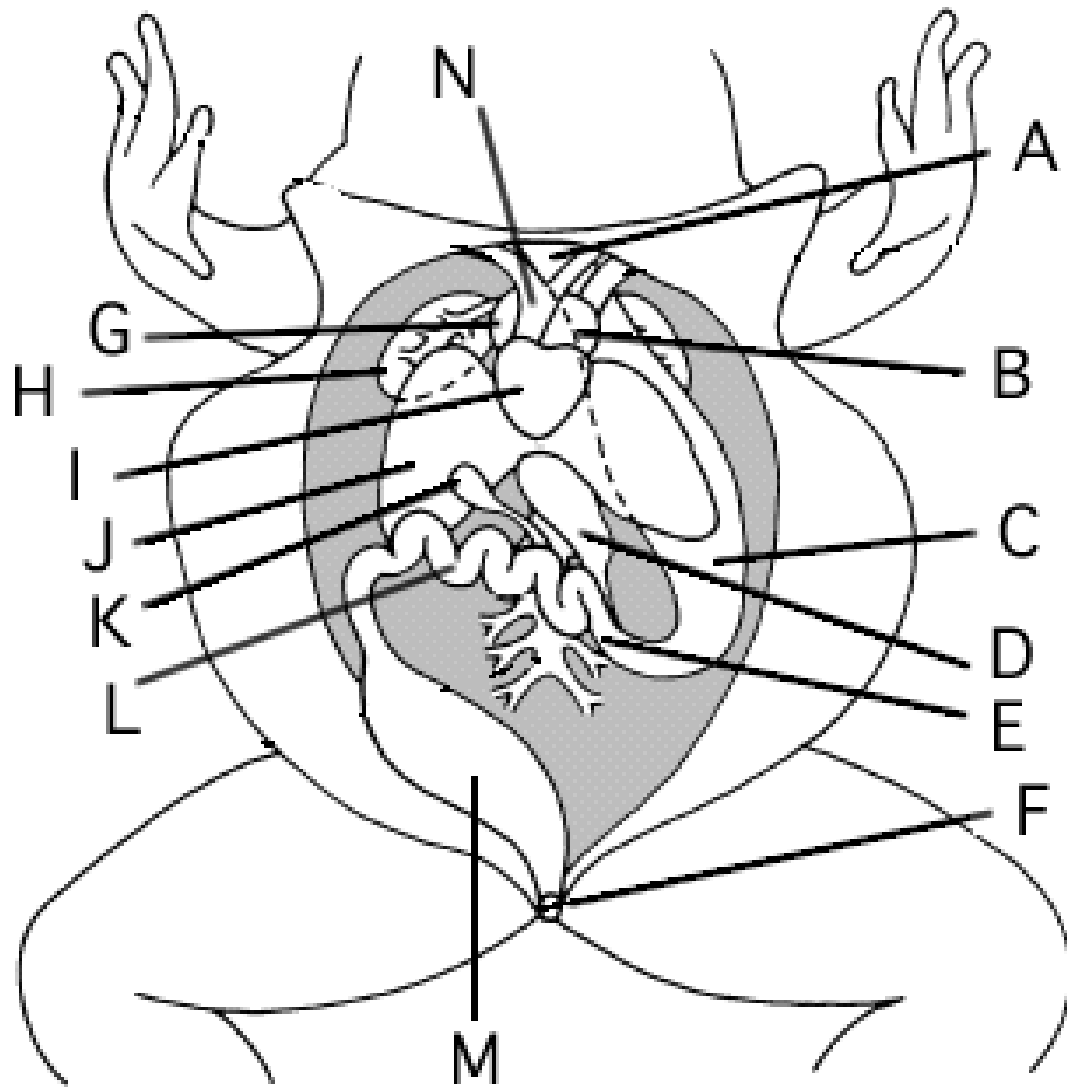
8. The circulatory system consists of the heart, blood vessels, and blood. The heart has two receiving chambers, or **ATRIA** (singular: atrium), and one sending chamber, or **ventricle**. Blood is carried to the heart in vessels called veins. Veins from different parts of the body enter the right and 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 heart is located between the lungs. Compare the thickness of the atria and the ventricle.

Why is the ventricle so much thicker than the atria?

Thicket because it needs to pump blood through the entire body

LABEL (Place the letter next to its corresponding body part):

- 1. LIVER _____
- 2. GALL BLADDER _____
- 3. STOMACH _____
- 4. SMALL INTESTINE (ileum, duodenum) two letters _____
- 5. CLOACA _____
- 6. MESENTERY draw in label
- 7. PANCREAS _____
- 8. LARGE INTESTINE _____
- 9. SPLEEN draw in label
- 10. HEART B G I
- 11. LEFT ATRIUM _____
- 12. RIGHT ATRIUM _____
- 13. VENTRICLE _____
- 14. ESOPHAGUS _____
- 15. LUNG _____
- 16. ARTERY _____



Kidneys: Filter Blood

Ureters: Carry urine from kidneys to bladder

Testes: Make sperm

Oviducts: eggs travel through these

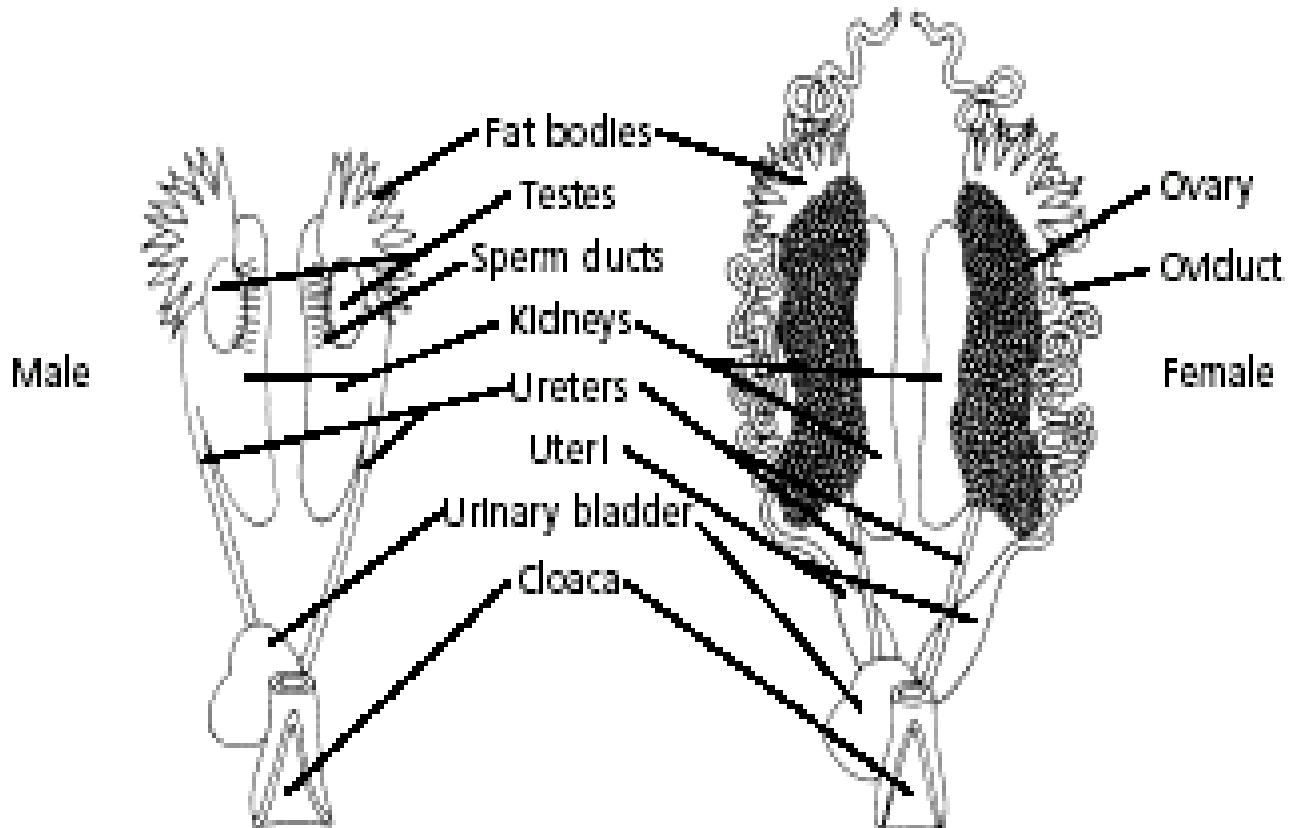
Ovary: makes egg (usually not visible on frog)

Urinary Bladder: Stores Urine

Cloaca: Where sperm, eggs, urine, and feces exit.

****The reproductive system and urinary system collectively is call the urogenital system.**

Urinary and Reproductive Systems of the Frog



9. The urinary system consists of the FROG'S **KIDNEYS**, **URETERS**, **URINARY BLADDER**, AND **CLOACA**. The kidneys are organs that filter wastes from the blood and excrete urine. Connected to each kidney is a ureter, a tube through which urine passes into the urinary bladder. The urinary bladder is a sac that stores urine until it passes out of the body through the cloaca. **LABEL THE KIDNEYS, URETERS AND URINARY BLADDER ON FIGURE 3.**

10. The reproductive system in the Female consists of **OVARIES** which produce egg and the **OVIDUCTS** which carry eggs to the cloaca. In the male it consists of **TESTIS** which produce sperm, sperm ducts which transport sperm to the cloaca. **LABEL THE TESTIS, OVARY, OVIDUCTS AND EGGS ON FIGURE 3.**

11. Closely examine the kidneys notice there is a light colored band of tissue running through the middle of each kidney. This tissue is the adrenal gland.

12. 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.

13. 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.

14. Fat bodies are orange/yellow in color and are stored food.

Post-Lab Questions:

1.) How does the liver aid in digestion? **Produces Bile, which digests food**

2.) Name the three chambers of the frog's heart:

- **Left atrium**
- **Right atrium**
- **Ventricle**

3.) Compared to the frog's body, its lungs are quite small. Does the size of a frog's lungs affect its ability to take in oxygen? **Explain your answer:**

No, a frog takes in oxygen through the capillaries in the mouth lining and absorbs oxygen through its thin, skin

4.) What is the purpose of the fat bodies? Why are these structures important to the frog?

They store excess food in the form of fat, which gives the frog energy during hibernation

They also aid in mating

5.) Give two reasons that might explain why the small intestine is so long

1. Allows a large surface area to digest food

2. Takes food a long time to travel through the length of the small intestine, giving enzymes more time to digest food

6.) What roles do the kidneys play in excretion?

Collect Nitrogen wastes from the blood and produces urine

7.) Through which organ is the liquid waste eliminated from the frog?

Cloaca

8.) Describe the pathway an egg takes as it exits the body of the female frog

Ovaries, down the oviducts, into the cloaca, and out of the frog

9: Describe the pathway that sperm travel from the testes out of the frog

Testes, through the vasa efferentia, into the kidneys, down the ureters, into the cloaca, out of the frog

10.) If you were asked to dissect a tadpole, what differences would you find from what you saw in the adult frog?

-Small mouth, gills, two-chambered heart, no legs, tails

11.) Describe where and how a frog might live during the change from tadpole to adulthood?
Explain your reasoning

Near the water's edge where air breathing would be the easiest as lungs developed, and where emerging frogs could climb onto land

12.) Compare and Contrast fish and amphibian body structures: (Hint: It may be easier to make a Venn Diagram: You can use the back of the lab if needed)

Similar characteristics:

- **both are vertebrates , have protective coloration (camouflage), bony endoskeleton, closed circulatory system, dorsal nerve chord, fertilize eggs externally,**

Frogs Only

- **three-chambered heart, two pairs of legs, external organs for hearing, lungs as adults, undergo metamorphosis, live on both land and water, have smooth thin skin (No scales)**

Fish Only

- **two-chambered heart, fins, no external organs for hearing, gills, do not undergo metamorphosis, live only in water, have scales**

CROSSWORD ANSWERS

This crossword contains the following questions and answers:

What filters the blood and removes nitrogen waste? Kidney

The entry to the stomach. Esophagus

Acts like a filter and produces bile. Liver

What makes insulin? Pancreas

What catches food? Tongue

What holds the food and prevents animals from escaping? Teeth

The mechanical breakdown of food. Stomach

Take in oxygen. Lungs

Holds pancreas and spleen. Mesenteries

What recycles red blood cells and make white blood cells? Spleen

Where nutrients from food is absorbed into blood stream. Small Intestine

Absorbs water from waste materials before they leave the body. Large intestine

What keeps the animal alive? Heart

Collects oxygen depleted blood as it comes back to heart. Right atrium

Collect oxygen rich blood flowing back from lungs. Left atrium

What stores bile? Gall Bladder

Where the urine empties. Cloaca

Wide opening that leads to esophagus. Eustachian Tubes

Frog Dissection Study Guide Credits:

<https://www.exploringnature.org/db/view/Frog-Dissection-Diagram-and-Labeling>

<https://studylib.net/doc/8905169/frog-dissection-lab-sheet>

https://wordmint.com/public_puzzles/209771

<https://www.biologycorner.com/worksheets/frog-dissection.html>

ANSWER KEY CAN BE PURCHASED HERE \$2.50: <https://www.teacherspayteachers.com/Product/Frog-Dissection-Answer-Key-3838758>

https://www.biologycorner.com/worksheets/frog_external.html

https://www.biologycorner.com/worksheets/frog_brain_leg.html

<https://www.mentalfloss.com/article/49855/why-do-students-dissect-frogs>

GENERAL ANSWERS:

<https://betterlesson.com/community/document/2591188/frog-dissection-lab-answer-key-doc#>



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