

DISSECTION OF A FROG

In this activity you will dissect a frog so you can observe the digestive, respiratory and circulatory system.

Purpose: To exam the external and internal anatomy of the frog.

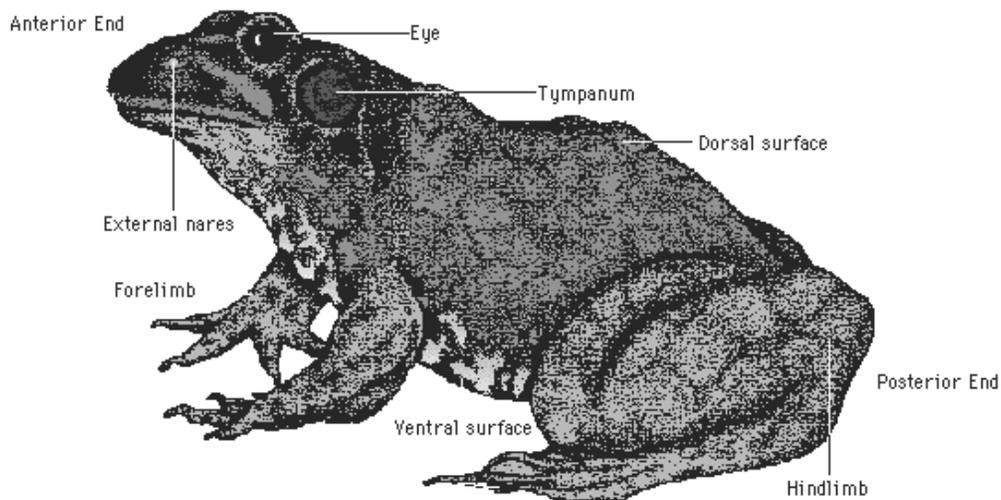
Materials:

preserved frog	dissecting kit
dissecting tray	hand lens
scalpel	

Procedure:

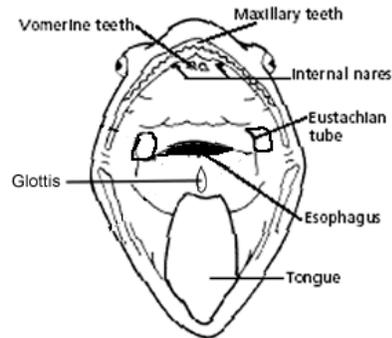
External Anatomy

1. Put on your lab apron, gloves, and eye glasses or goggles.
2. Place a moistened paper towel in the bottom of the dissecting pan to prevent the frog from drying out. Add water to the pan periodically to keep the animal moist.
3. Spread out the frog on the dissecting pan, ventral side down. *Measure the length of your frog, by using a piece of string from the nose of the frog to the anus, then measure the length of the string to get your actual measurement. Record your measurements.*¹ *Describe the appearance of your frog.*² *Is the frog's skin scaly or slimy?*³ Locate the following structures: eyes, nostrils, tympanum, thumb (enlarged in males), forearm, and hind leg. *Count the number of digits on the forelegs and on the hind legs. How many did you find on each?*⁴ *Are the toes webbed? Describe how they look.*⁵



4. ***Draw a proper biological drawing of the external dorsal view of the frog. Label the structures that are noted above.*** Be sure to mention whether it is male or female by the enlarged thumb structure. Include the correct number of toes on the fore and hind legs.
5. Turn the over frog to examine the ventral side. Locate the throat, thorax, and abdomen. *Describe the appearance of the ventral side.*⁶

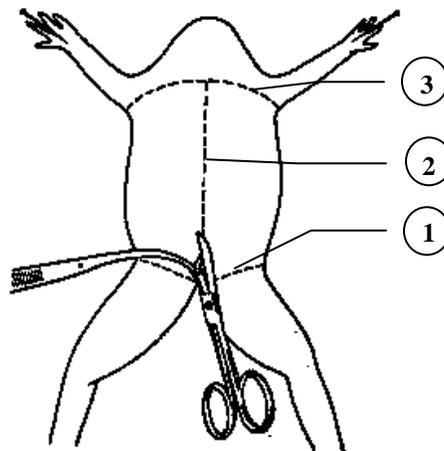
6. Locate the mouth of the frog. With the frog's ventral side up, pry open the lower jaw. Cut the jawbone at the corners of the mouth on either side so that it will remain open. Be careful when using scissors.
7. Locate and identify the following parts: tongue, point of attachment of the tongue, vomerine teeth, maxillary teeth, internal nares (nasal tubes), eye bulges, and glottis. *Describe the position of the vomerine teeth?*⁷ *Describe the appearance of the tongue.*⁸



8. *Draw a proper biological drawing of the frog's mouth. Label the structures that are noted above.*

Internal Anatomy:

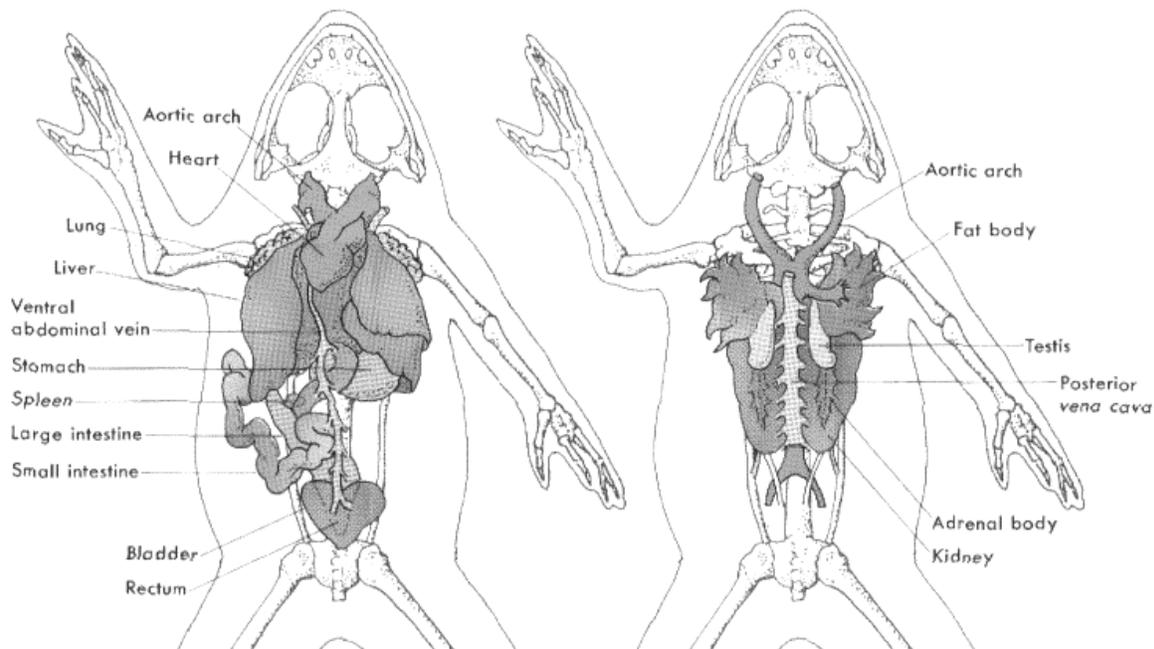
9. Stretch your frog on the dissecting pan ventral side up. Remember when cutting with scissors, keep the scissors pointing up.
10. Pinch a fold of skin on the frog's ventral side and make an incision laterally from just above the left and right leg along the line marked 1. Then continue your incision along the **midventral line** from posterior to anterior along the line marked 2.
11. Carefully continue to make a lateral incision along the clavicle (shoulder), along the line marked 3. Remember that you are only cutting the skin.
12. Use forceps and a scalpel to peel the skin from the body. Proceed carefully, cutting the skin from the muscles wherever it does not come off freely.
13. When the frog is completely skinned, spread the frog out in the dissecting pan, ventral side up. *Describe the texture of the skin of the frog.*⁹



The Respiratory and Circulatory Systems

Air is drawn into the mouth by expansion of the throat. The external nares close, then the throat muscles contract and air is forced into the lungs through the **glottis**. Air is expelled as the nares remain closed, the throat expands, and the air enters the mouth again from the lungs. The glottis closes, the nares open, and the throat contracts, forcing the air out through the nares.

14. Using scissors cut the ventral muscle wall from the anus to the throat. Follow the same incision instructions in 10-12. Be careful not to cut too deeply or you will damage the internal organs. Try to make your lateral cuts towards the dorsal side so that you are able to pin the frog's skin and muscle to the dissecting pan.
15. If you have a female frog, the body cavity may be filled with masses of black egg if this is the case, remove them and proceed with the investigation.
16. Locate the right and left lung and the heart. The three chambered heart is covered by a membranous sac called the **pericardium**. Describe the pericardium.¹⁰
17. Lift the stomach and locate the spleen. The spleen filters the blood, taking out improperly functioning red blood cells. Describe the colour and structure of the spleen.¹¹



The Digestive System

18. Look at the bottom of the stomach. You may reach a constriction at the end of the stomach before the large intestine. This is the **pyloric sphincter** which regulates the amount of food that passes into the small intestine. Describe the pyloric sphincter¹². The large intestine or colon ends in the rectum which opens into the **cloaca**. The digestive, reproductive and excretory systems all open in the cloaca.
19. Locate the liver. Lift the lobes of the liver and try and find the gallbladder. The gallbladder stores bile that is secreted from the liver. Bile aids in the digestion of fats. Describe the shape of the gallbladder.¹³
20. Locate the pancreas, it produces digestive enzymes. It is found lying in a membrane between the stomach and the duodenum. Describe the structure of the pancreas.¹⁴

21. ***Draw a proper biological drawing of the internal anatomy of the frog. Please identify and label the following: right and left lung, heart, stomach, small intestine, large intestine, liver, pancreas, gall bladder.***
22. Remove the stomach of the frog. Remember the stomach is the J-shaped organ. Carefully using scissors cut the stomach open. *Describe the contents of the stomach¹⁵ and describe the texture of the interior walls of the stomach.¹⁶*
23. When you are finished, wrap your frog in a paper towel and dispose of the tissue according to the teacher's instructions.
24. Wash the work area and your hands thoroughly.

Discussion Questions:

1. After examining both external and internal anatomy of the frog. What is the sex of your frog? Name two ways that help you identify it.
2. Since a frog does not chew its food, what does the position of the teeth suggest about how the frog uses them?
3. Compare the tongue of a human to the tongue of a frog. Why is the frog's tongue attached differently?
4. How does the location of the gallbladder facilitate its function?
5. Frogs have a cloaca. What do mammals have instead? Explain how this structure is different from that of mammals.
6. The inside of the stomach has long ridges of muscle. Why would you expect this to be there?

DISSECTION OF A FROG LAB

Read the Dissection booklet and follow the instructions to dissect your frog.

The booklet contains dissection instructions and, from time to time, an italicized instruction with a small superscript numeral. When you come to such a sentence, write the numeral in your notebook and respond to the statement or question. These will end up as your detailed set of dissection notes.

Observations:

Answer all questions in italics.

Biological drawing of external anatomy of the frog

Biological drawing of mouth of the frog

Biological drawing of internal anatomy of the frog

Discussion Questions:

1. After examining both external and internal anatomy of the frog. What is the sex of your frog? Name two ways that help you identify it.
2. Since a frog does not chew its food, what does the position of the teeth suggest about how the frog uses them?
3. Compare the tongue of a human to the tongue of a frog. Why is the frog's tongue attached differently?
4. How does the location of the gallbladder facilitate its function?
5. Frogs have a cloaca. What do mammals have instead? Explain how this structure is different from that of mammals.
6. The inside of the stomach has long ridges of muscle. Why would you expect this to be there?

Dissection of a Frog - Marking Sheet

Shared Work

Whole Group Observation Questions	1. Length of your frog	0	1				
	2. Dorsal Side description	0	1	2			
	3. External Skin Texture	0	1	2			
	4. Number of digits on forelegs and hind legs	0	1	2			
	5. Structure of toes – Webbed or not	0	1	2			
	6. Ventral Side description	0	1	2			
	7. Position of vomerine teeth	0	1				
	8. Tongue description	0	1	2			
	9. Internal Skin Texture Description	0	1	2			
	10. Pericardium description	0	1	2			
	11. Spleen colour and structure	0	1	2			
	12. Pyloric Sphincter description	0	1	2			
	13. Gallbladder description	0	1	2			
	14. Pancreas description	0	1	2			
	15. Contents of stomach	0	1	2			
	16. Texture of internal stomach	0	1	2			
Inquiry							/30

Name: _____

Group Member 1	Title Page (C)	0	1				
	Typing Observation Questions 1-6 (C)	0	1	2	3	4	5 6
	Dorsal View Diagram	0	1	2	3	4	5
	Discussion Question 1 (I)	0	1	2	3		
	Discussion Question 5 (I)	0	1	2			
	Communication	0	1	2			
Communication							/9
Inquiry							/10

Name: _____

Group Member 2	Lab Formatting (C)	0	1	2			
	Typing Observation Questions 7-10 (C)	0	1	2	3	4	
	Frog Mouth Diagram	0	1	2	3	4	5
	Discussion Question 2 (I)	0	1	2			
	Discussion Question 3 (I)	0	1	2	3		
	Communication	0	1	2	3		
Communication							/9
Inquiry							/10

Name: _____

Group Member 3	Typing Observation Questions 11-16 (C)	0	1	2	3	4	5 6
	Internal Anatomy Diagram	0	1	2	3	4	5 6
	Discussion Question 4 (I)	0	1	2			
	Discussion Question 6 (I)	0	1	2			
	Communication	0	1	2	3		
Communication							/9
Inquiry							/10

Total Marks

	Group Member 1	Group Member 2	Group Member 3
Inquiry	/40	/40	/40
Communication	/9	/9	/9