

Frog Dissection Pre-lab

Why dissect a frog?

Frogs and humans are vertebrates with similar organ systems. Although all of the internal organs are not the same in frogs and humans, it is helpful to learn about anatomy through dissection. We will be looking at each body system, and exploring individual organs of the frog. We will make comparisons of the frogs' anatomy to our own.

The frogs that we will use in our lab were bred for the scientific purpose of learning anatomy. The companies that provide frogs make sure that the frogs are not an endangered species. The supply companies also use safe solutions to preserve the specimens. We still need to use gloves and wash our hands while working with preserved specimens.

Computer simulated dissections will be used in this lab by individuals who choose not to participate in the actual dissection.

The frogs gave their lives so that we can learn more about them and more about ourselves. In order to best use this opportunity to learn and show respect for the frog, we must follow all directions that are given to us and follow all safety procedures.

Digestive System: similar to humans

- adult frogs are carnivores
- frog has a large mouth with a tongue (attached at the front) used to capture insects
- has two sets of teeth (two on top, two below)
- swallowing of prey aided by its eyes (pressure pushes insects down to stomach)
- order of digestive system:
1) mouth; (2) pharynx; (3) esophagus; (4) stomach; (5) small intestine; (6) large intestine; (7) cloaca (anus)
- frogs have a liver and pancreas too

Circulatory System:

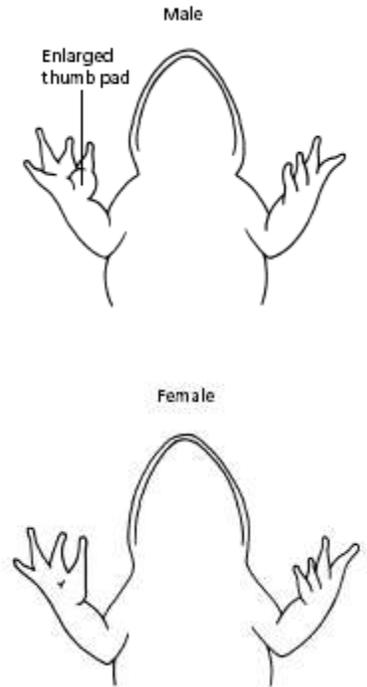
- frogs are amphibians (thus, they are cold blooded)
- frogs have arteries, veins, capillaries, heart, and blood
- frog heart has 3 chambers: 2 atriums, 1 ventricle (human heart has 4 chambers: 2 of each)
- this causes there to be some mixing of oxygenated and de-oxygenated blood

Respiratory System:

- frogs exchange O₂ and CO₂ in their lungs, just like humans do
- frogs have 2 lungs for gas exchange, and nostrils for breathing
- O₂ can also diffuse directly through the frog's skin; that is why their skin is moist

Dissection Safety Rules

1. Conduct yourself in a responsible and safe manner at all times during the dissection.
2. Wear safety glasses while you are dissecting even if you wear glasses or contact lenses. Contact lenses can hold chemicals in the eye(s) increasing the potential damage in the event of an accidental splashing of chemicals into the eye(s).
3. The frog has been preserved with a safe chemical and the classroom windows will be cracked open to allow fresh air in the room. However, if you need to take a break or the odor is beginning to bother you, notify the teacher.
4. Avoid contact with preservative chemicals. Keep your hands covered with the plastic gloves at all times. Rinse the frog completely before dissection.
5. Use the proper procedures described in the tutorial to pin the frog to the dissecting pan. Do not dissect the frog while holding it.
6. Handle the scalpel with extreme care. It is sharp enough to cut through skin.



7. Always cut away from your body and away from others.
8. Never remove frogs/frog parts from the classroom. Properly dispose of dissected materials.
9. Store the frog in the labeled Ziploc bag at the end of each dissection period.
10. Clean up the work area and return all equipment to the proper place when the dissection is completed.
11. Wash off the plastic gloves with soapy water and place them in the designated area of the classroom.
12. Carefully wash your hands for a minimum of 15 seconds before returning to your seat.

Dissecting Equipment

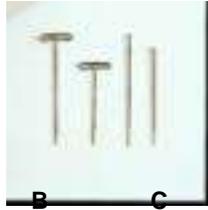
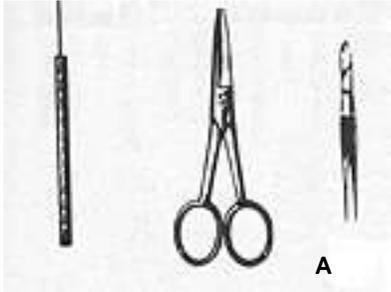


Figure 1: Basic Dissecting Tools Figure 2: Dissecting Pins Figure 3: Dissecting Pan Figure 4: Scalpel

Figure 1 shows the dissection equipment you will use in this investigation.

- A. **Teasing or Dissection needle** which used to pull apart muscle tissue,
- B. **Dissecting scissors** which is used to cut through tissue, and
- C. **Forceps**, which is used to lift and move cut tissue.

Figure 2 shows different types of **dissecting pins**. Dissecting pins are used to hold the frog in place in the dissecting tray. They are also used to hold back the skin and muscles so you can observe the internal organs.

Figure 3 shows a **dissecting pan**. The dissecting pan holds the frog as you dissect it. You will use the dissecting pins to secure the frog to the dissecting pan. At the end of the dissection, you will remove and discard in the trashcan the tissues from the pan and then rinse the pan off with water.

Figure 4 shows a **scalpel**. The scalpel is used for cutting through tissues.

Pre-lab Questions

Directions: Read the Frog Dissection Pre-lab Resource Sheet. Then complete the pre-lab questions. Have your parents sign this paper when you are finished. This paper must be completed and signed by you and your parents **before** you will be permitted to begin the frog dissection.

1. What is the purpose of this lab? _____

2. What safety guidelines will be practiced when doing this lab?
3. Which type of dissection, computer-simulated or firsthand experience, would you most prefer to do and why? There is no right or wrong answer to this question. Your answer to this question will help me place you in the appropriate group.

4. List the scientific name and purpose of the tools you will use during the dissection.

Tool	Purpose of Tool

INTRODUCTION:

1. One advantage (or benefit) of dissecting a frog is that we are able to (**COMPLETE THE SENTENCE**)

Use the following words to complete questions 2-5

Backbone

Amphibia (Am-fib-ee-ah)

Dorsal (Door-sull)

Human

2. By dissecting a frog, we can **compare** its internal (or inside) structure and organization of organs to the internal structure of a _____.
3. The **topside** of a frog is also known as the _____ side.
4. All **vertebrates** have a _____
5. Frogs are member of the class _____, which means double life.

INTERNAL (INSIDE) ANATOMY

Use the following words to complete questions 1-5

Dorsal (Door-sull)

Pins

Esophagus (E-sof-a-gus)

Tweezers

Epiglottis (Ep-i-glot-is)

Stomach (Stum-ay-k)

Scissors

Liver

Small Intestines

Large Intestines

Initial Cut

1. Before cutting, the frog's _____ side should be facing down on the dissection pan, and the _____ area should be facing up. Then, you pin the arms and legs to the dissection pan.
2. After you cut, use the _____ to open the skin flaps, and then hold down the skin flaps using _____
3. To see inside the mouth, use the _____ to cut the jawbones.
4. In the back of the frog's throat are two slits or openings; one leads to the _____, while the other leads to the _____.

Digestive System

5. List 4 organs that are part of the digestive system
 - 1.
 - 2.
 - 3.
 - 4.
6. The function of the digestive system is to (**COMPLETE THE SENTENCE**)

Use the following words to complete questions 7-14

Skin

Heart

Arteries (Art-er-rees)

Lungs

Three

Testes (Test-ees)

Blood Vessels

Fat Bodies

Trachea (Tray-key-ah)

Veins (Vanes)

Ovaries (Oh-var-ees)

Respiratory System

7. Unlike humans, frogs are also able to breath or exchange gas through their _____
 8. Air enters the mouth through the frog's nostrils and passes through the _____ down to the lungs.
 9. Amphibians have two _____, which move oxygen into the blood and remove carbon dioxide from it.
- ### Circulatory System
10. The circulatory system includes a _____, which pumps blood, and _____ in which blood flows.
 11. _____ bring blood back to the heart, while _____ take blood away from the heart.
 12. Unlike a human heart, which has four chambers or open spaces, the frog heart has only _____, which means it is less efficient or does not work as well as a human heart.

Reproductive System

13. Sperm cells are **produced (made by)** the _____, while egg cells in females are produced by the _____.
14. _____ are used to store energy for either **mating (sexual reproduction)** or **hibernation (periods of long sleep)**.
15. Frog sexual reproduction is different from human reproduction because frogs _____
16. How can you determine if you have a male or female frog?

Use the following words to complete questions 1

Blood

Contracting

Bladder

Relaxing

Kidneys (Kid-knees)

Excretory System

17. The main organs of the excretory system are the _____, and their function is to filter or clean the _____.

18. Liquid waste from the kidneys is **temporarily (for a short time)** stored in the urinary _____.

Muscular System

18. Muscles are able to move bones by _____ and _____ or **by shortening and lengthening**.

Instructions for following page:

Use your glossary to find the functions of the following organs.

***Please color code the parts. You may use your own key – simply change or correct the color indicated.

- A. Esophagus (yellow) _____

- C. Stomach (purple) _____

- D. Pancreas (orange) _____

- F. rectum (black) _____

- H. Lung (dark blue) _____

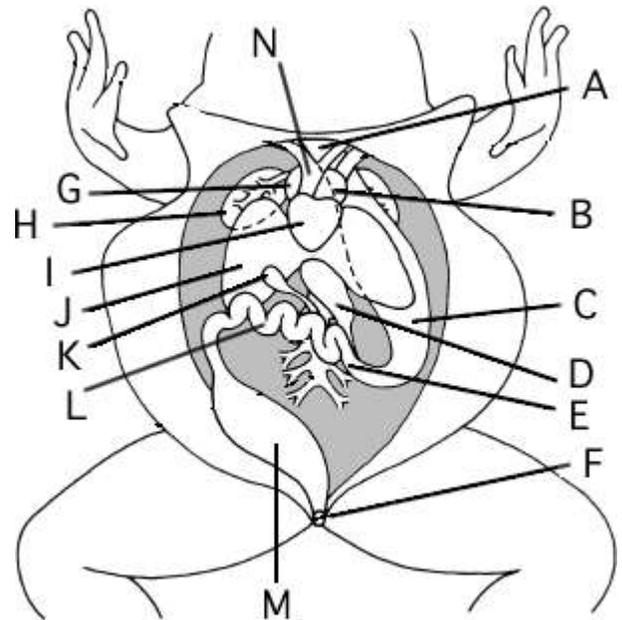
- I. Heart (red) _____

- J. Liver (brown) _____

- K. Gallbladder (lt. green) _____

- L. Small Intestine (Dark green) _____

- M. Large Intestine (lt. blue) _____



I give my permission for my son/daughter to participate in the firsthand dissection of the frog.

_____ (Parent signature)

My son/daughter prefers to complete the computer-simulated dissection of the frog.

_____ (Parent signature)

I have read the safety guidelines and description of the dissecting equipment that I will be using during this investigation. I agree to abide by all rules. I understand that my behavior will not only affect my personal safety but the safety of all of the members of my group.

_____ Student Signature