Instructions:
① Click on the following: virtual frog dissection (URL: www.mhhe.com/biosci/genbio/virtual_labs/BL_16/BL_16.html)
② Watch the modules indicated for each topic (including any video clips) and then check (✔) the box to indicate you have (a) watched and (b) understand the module.
③ Answer the questions in the space provided (point form is fine).

INTRODUCTION ❑ Why Dissect? ❑ Natural History ❑ Dissection Tools

1. Why dissect? _____

2. What 5 tools are needed for a dissection? What are they used for?
   ① _____
   ② _____
   ③ _____
   ④ _____
   ⑤ _____

EXTERNAL ANATOMY ❑ Orientation ❑ Head ❑ Legs ❑ Skin ❑ Cloaca

3. What three sets of terms (6 in total) are used to locate different body parts? What do they mean?
   ① _____
   ② _____
   ③ _____

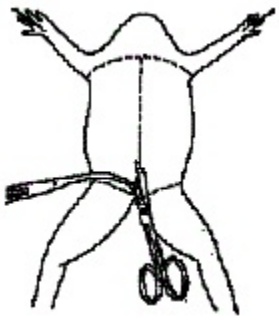
4. What other organ does the skin function as? _____

5. (a) How many toes are present on each forelimb? Are they webbed? _____
   (b) How many toes are present on each hindlimb? Are they webbed? _____

INTERNAL ANATOMY ❑ Initial Cut ❑ Circulatory System ❑ Nervous System ❑ Digestive System ❑ Reproductive System ❑ Muscular System ❑ Respiratory System ❑ Excretory System ❑ Skeletal System

6. (a) Watch the "Opening the Body for Dissection" video (part of the "Initial Cut" module).
   (b) Number the following steps (from ① to ⑧) so they are in the correct order.

___ Pin the frog onto the dissecting pan.
___ Use tweezers to pull the skin back.
___ Use tweezers to lift the muscle tissue away from the body cavity.
___ Place the frog in the dissecting pan ventral side up.
___ Use scissors to make 5 shallow cuts through the muscle tissue (see diagram).
___ Pin the skin flaps to the dissecting pan.
___ Pin the muscle tissue flaps to the dissecting pan.
___ Use scissors to make 5 shallows cuts through the skin (see diagram).

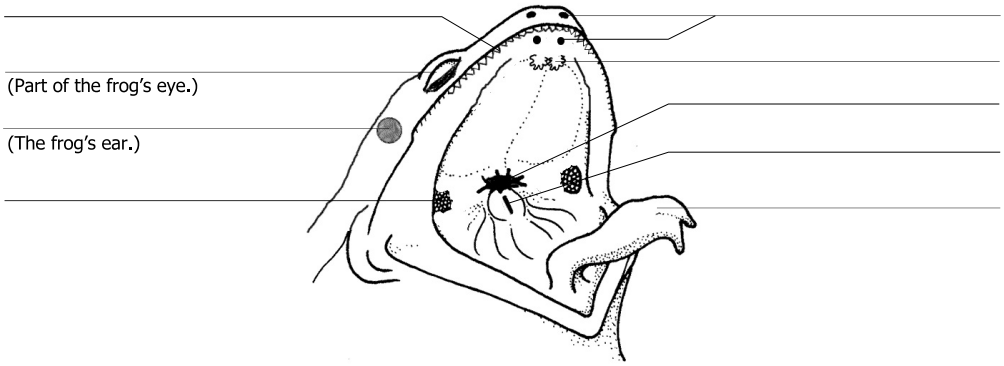


7. When dissecting, why are shallow cuts made? _____

_____

_____

8. (a) Watch the "Cutting the Jawbone" video (part of the "Digestive System" module).
   (b) Label each of the structures indicated on the frog's mouth.



You may find the following link useful ☞ frog external anatomy photo gallery

9. (a) Watch the modules outlined below.
   (b) **Check the box** to indicate that you found/saw the organ. (During the module, some organs may need to be moved/removed in order to view the others.)

DIGESTIVE SYSTEM

❑ **Liver** - This brown colored organ is the largest organ in the body cavity and is composed of three parts, or lobes - the right lobe, the left anterior lobe, and the left posterior lobe. However, the liver is not primarily an organ of digestion but rather it secretes a digestive juice called bile which is needed for the proper digestion of fats. Bile empties into the gall bladder which then empties into the duodenum.

❑ **Stomach** - This long thick tube curves from underneath the liver. The stomach is the first organ in the frog where chemical digestion of food takes place. Its upper end connects to the esophagus while the lower end connects to the small intestine. The **pyloric sphincter valve** regulates the exit of food from the stomach.

❑ **Gall bladder** - This small green sac is located under the lobes of the liver. The gall bladder stores bile and then releases it into the duodenum via the bile duct.

❑ **Pancreas** - This organ is located along the inner edge of the stomach. The pancreas produces several different chemicals, including insulin, that aids in digestion and the proper breakdown of sugar. On preserved frogs it may not be easy to find the pancreas as the gland breaks down.

❑ **Small Intestine** - This organ is where the absorption of digested nutrients occurs (follows from the stomach). The first straight portion of the small intestine is called the duodenum, and the curled portion is the ileum. A membrane called the **mesentery** holds the ileum together.

❑ **Large Intestine** - As you follow the small intestine down it widens into this organ. The cloaca, located in the lower part of the large intestine, is the last stop before wastes, sperm, eggs, or urine exit the frog's body via the **anus.** (The word "cloaca" means sewer.)

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

RESPIRATORY SYSTEM

❑ **Lungs** - This pair of spongy organs are located underneath and behind the heart and liver. The lungs (in addition to the frog's skin) are where oxygen moves into the bloodstream and carbon dioxide moves out. The lungs are attached to the trachea via tubes called bronchi.

❑ **Nostrils** - This is where air passes into or out of the frog's mouth and then the lungs. The nostrils lead to the inside of the mouth.

❑ **Glottis** - This is an opening within the frog's mouth that leads to a short tube, called the trachea. The trachea connects the mouth to the lungs.

CIRCULATORY SYSTEM

- ❑ **Arteries** - These are large blood vessels that carry blood away from the heart.
- ❑ **Veins** - These are the blood vessels that bring blood back to the heart.
- ❑ **Capillaries** - These are the smallest blood vessels (microscopic) and connect arteries to veins. This is where the blood releases oxygen and nutrients to all body cells and picks up wastes and carbon dioxide from the body cells.
- ❑ **Heart** - This is the triangular structure located between the lungs. It consists of three parts: the **left atrium** and **right atrium** found at the top of the heart and a single **ventricle** located at the bottom of the heart. The large vessel that extends out from the heart is the **conus arteriosus** which supplies blood to the body.

REPRODUCTIVE SYSTEM

- ❑ **Testes** - In male frogs these bean-shaped organs are located at the top of the kidneys. Sperm formed here pass along the sperm duct to the cloaca where the sex cells leave the male's body.
- ❑ **Ovaries** - In female frogs these organs are also located at the top of the kidneys. Eggs formed here pass along a twisted tube, called the oviduct, on their way out of the female's body by way of the cloaca.

EXCRETORY SYSTEM

- ❑ **Kidneys** - These dark, flattened, bean shaped organs are located at the lower back of the frog, near the spine. Kidneys, the main organ involved in removing wastes produced by body cells, are often compared to filters because they cleanse the blood of unwanted wastes. Often **fat bodies** are attached to the kidney.
- ❑ **Uretors** - These are long tubes that leave each kidney. The uretors carry liquid waste to the urinary bladder.
- ❑ **Bladder** - This sac-like structure is located at the lowest part of the body cavity. The bladder stores urine.
- ❑ **Cloaca** - Located in the lower part of the large intestine, this is the last stop before wastes, sperm, eggs, or urine exit the frog's body.

NERVOUS SYSTEM

- ❑ **Brain** - This organ is the main centre of the nervous system. The brain receives messages from the sense organs and sends messages along the spinal cord to all body parts by way of connecting nerves.
- ❑ **Olfactory Lobes** - These are the two lobes that control the sense of smell.
- ❑ **Cerebrum** - Located directly behind the olfactory lobes are the two largest lobes of the brain.
- ❑ **Optic Lobes** - Located directly behind the cerebrum are the two lobes that control the sense of sight.

OTHER (not a module but mentioned briefly in other modules)

- ❑ **Fat Bodies** - These spaghetti shaped structures have a bright orange or yellow color. The fat bodies are used to store energy that can be used for hibernation or breeding. If you have a particularly fat frog, these fat bodies may need to be removed to see the other structures.
- ❑ **Peritoneum** - This is a spider web like membrane that covers many of the organs.
- ❑ **Spleen** - This dark red, spherical object is located within the folds of the mesentery. The spleen serves as a holding area for blood where harmful particles can be filtered out for the immune system.

10. On a separate sheet of paper, briefly explain how a 3 chamber frog heart works. Refer to the "Circulatory System" module for assistance. Be sure to include a labelled diagram.

11. What is the purpose of the muscular system? What are the muscles attached to?

    _____

    _____

12. What two regions make up the frog's skeletal system? How many bones are in each system?

    ① _____

    ② _____

POST LAB QUESTIONS

(i) Complete the crossword puzzle. The answers can be found in the previous questions.

(ii) Place the letter from the frog diagram that matches each description in the space provided. Some descriptions will not have a letter (i.e. ✘)

DOWN

F 1. located at the bottom of the frog's heart

___ 2. found at the top of the frog's heart on the left

✘ 3. membrane that covers many of the organs

✘ 4. pair of organs that filters wastes from the blood

___ 5. valve that regulates the exit of partially digested food from the stomach

___ 6. opening to the outside where wastes, sperm, or urine ext.

___ 8. where nutrients are absorbed

___ 10. tube that leads from the frog's mouth to the stomach

___ 13. the largest organ in the body cavity

___ 14. pair of organs where gas exchange occurs

___ 17. organ that is the first major site of chemical digestion

ACROSS

___ 7. the small intestine leads to this organ

___ 9. organ located near the stomach that makes insulin

___ 11. found at the top of the frog's heart on the right

___ 12. stores bile and then releases it into the duodenum

✘ 15. membrane that holds the coils of the small intestine together

✘ 16. receives and sends messages to all parts of the body

___ 17. dark red spherical object that serves as a holding area for blood

✘ 18. yellowish structures that serve as an energy reserve

___ 19. large vessel that extends out from the heart and supplies blood to the body