

FROG DISSECTION (pre-lab activity)

NAME _____

Use the websites listed in the box below to help you find the function of the following organs in a frog. (After identifying the organs you may explore the websites and practice online dissection of a frog)

- nares
- nictitating membrane
- tympanum
- vomerine teeth
- maxillary teeth
- tongue
- esophagus
- stomach
- small intestine
- liver
- gall bladder and bile
- pancreas
- large intestine
- cloaca
- lungs
- heart
- kidneys
- urinary bladder
- fat bodies
- How do the frog's powerful hind legs help it to fit into a life both in water and on land?

Web Resources

Net Frog (good site for online dissections)

<http://curry.edschool.virginia.edu/go/frog/Frog2/home.html>

101 Science (great site for definitions) <http://www.101science.com/Deuterostomes.htm>

Frog Guts http://www.froguts.com/flash_content/index.html#loaderdone

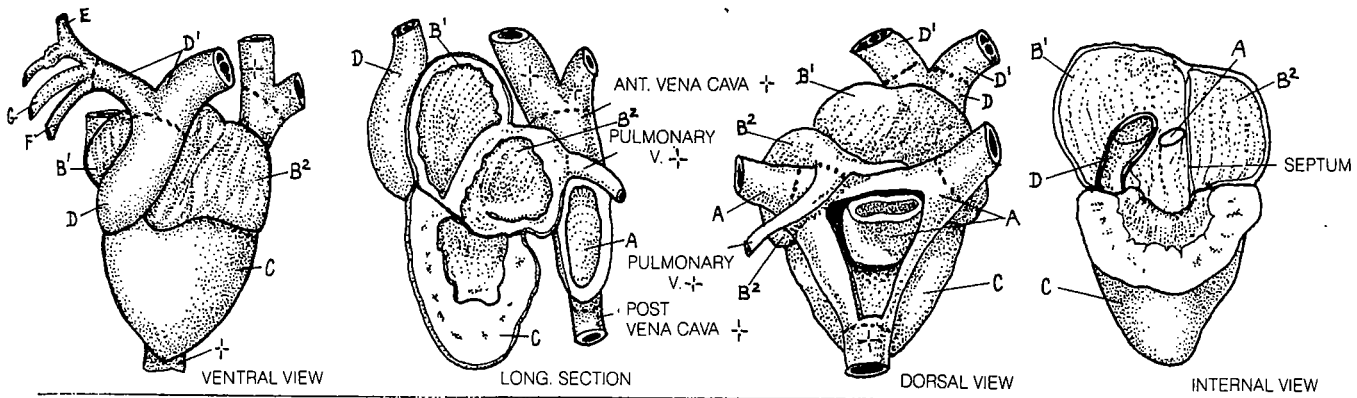
Basic Frog Dissection http://www.batesville.k12.in.us/bhs/science/basic_frog_dissection.htm

Basic Frog Facts http://www.batesville.k12.in.us/bhs/science/basic_frog_facts.htm

Build a Virtual Frog <http://froggy.lbl.gov/cgi-bin/dissect?game>

Frog Dissection Photos http://www.dewaynejackson.com/mcdonough/frog_dissection.htm

FROG: V HEART AND ARTERIAL SYSTEM.



HEART*

SINUS VENOSUS_A

ATRIUM: RIGHT_B/LEFT_{B²}

VENTRICLE.

CONUS ARTERIOSUS.

ARTERIES*

TRUNCUS ARTERIOSUS.

CAROTID ARCH:

INT. CAROTID A._E

PULMOCUTANEOUS ARCH_F

PULMONARY A._{F¹}

CUTANEOUS A._{F²}

SYSTEMIC ARCH_G

OCCIPITOVERTEBRAL A._{G¹}

SUBCLAVIAN A._{G²}

DORSAL AORTA_H

COELIACOMESENTERIC A._I

COELIAC A._J

HEPATIC A._{J¹}

MESENTERIC A._{J²}

UROGENITAL A._K

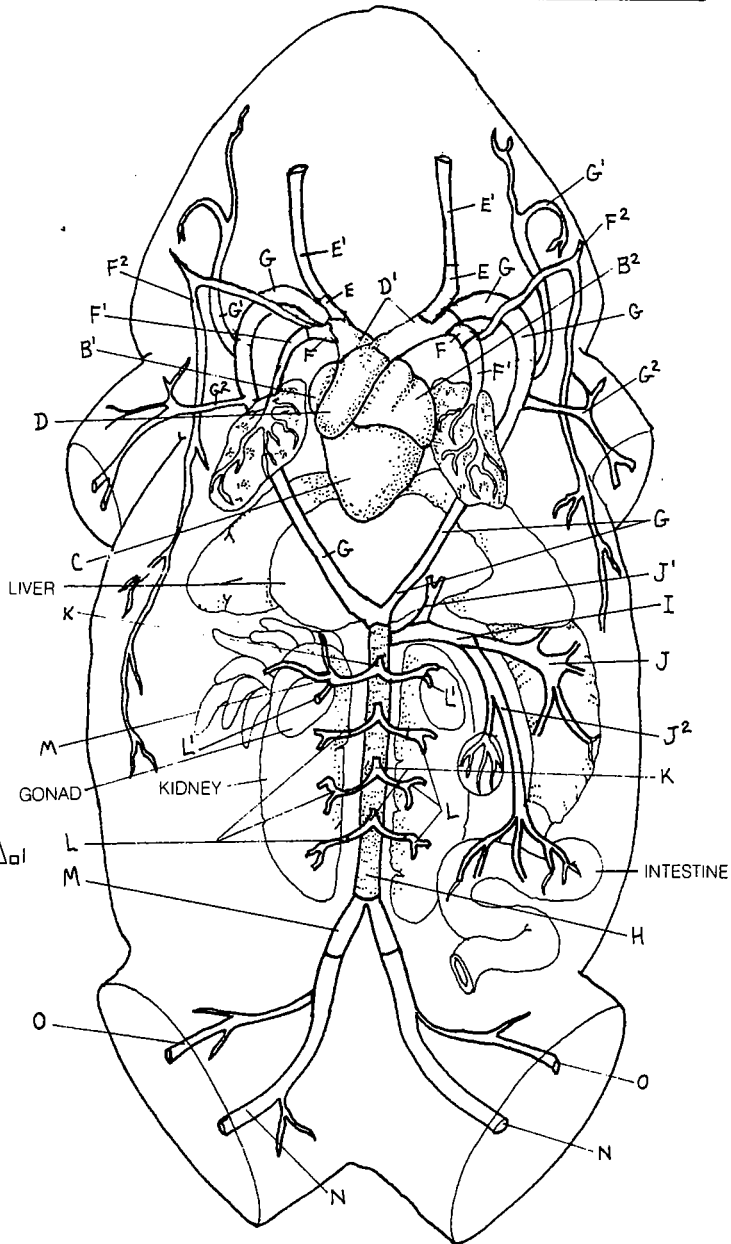
RENAL A._L

GENITAL A._{L¹}

COMMON ILIAC A._M

SCIATIC A._N

FEMORAL A._O

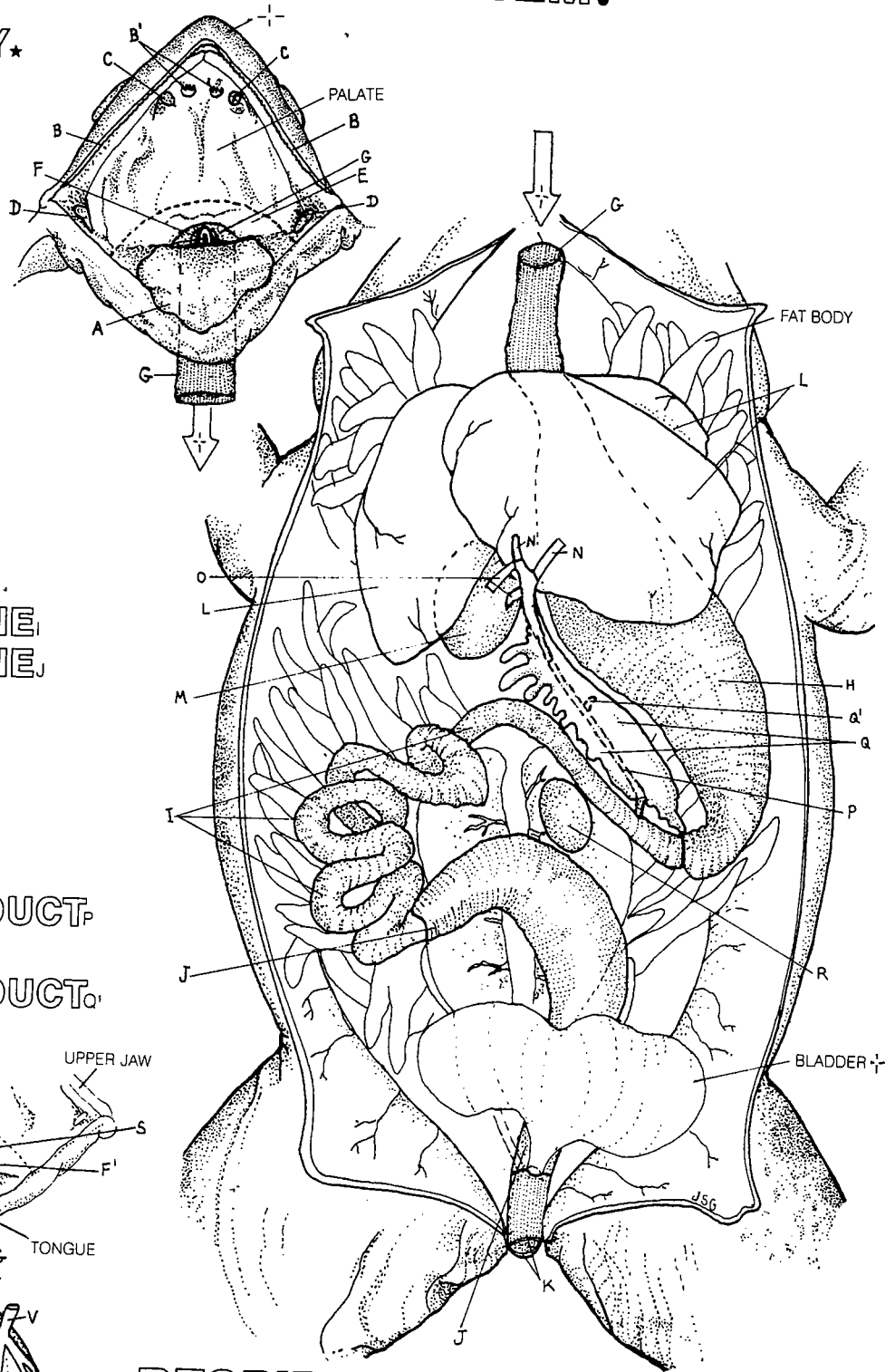


VENTRAL VIEW

FROG: VII

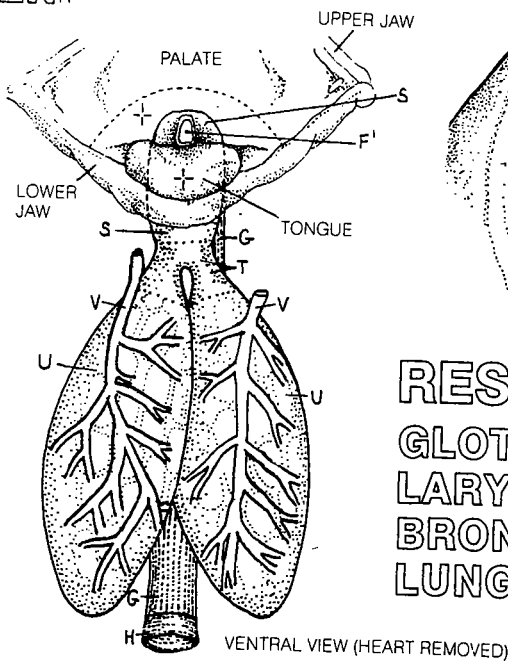
DIGESTIVE SYSTEM.

- BUCCAL CAVITY★
- TONGUE_A
- MAXILLARY TEETH_B
- VOMERINE TEETH_{B'}
- INTERNAL NOSTRIL_C
- AUDITORY ORIFICE_D
- PHARYNX_E
- GLOTTIS_F
- ESOPHAGUS_G
- STOMACH_H
- SMALL INTESTINE_I
- LARGE INTESTINE_J
- CLOACA_K
- LIVER_L
- GALL BLADDER_M
- HEPATIC DUCT_N
- CYSTIC DUCT_O
- COMMON BILE DUCT_P
- PANCREAS_Q
- PANCREATIC DUCT_R
- SPLEEN_S



RESPIRATORY SYSTEM.

- GLOTTIS_{F'}
- LARYNX_G
- BRONCHUS_T
- LUNG_U
- PULMONARY VESSELS_V



FROG: VIII UROGENITAL SYSTEM.

URINARY SYSTEM ★

KIDNEY,

ARCHINEPHRIC DUCT,

BLADDER.

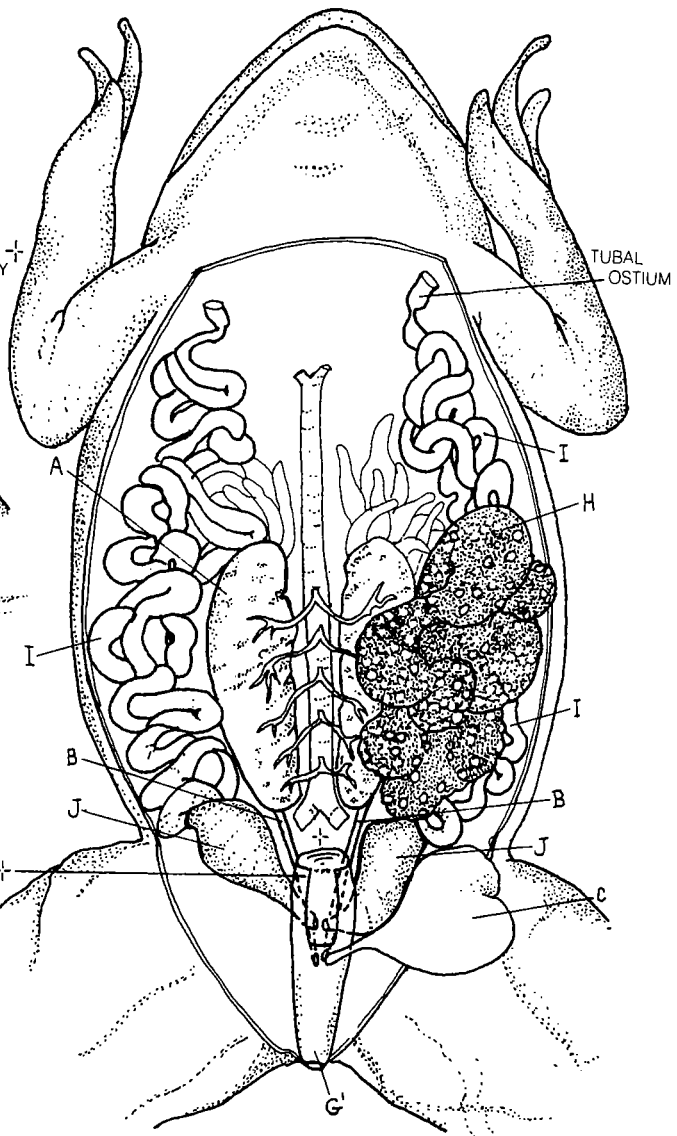
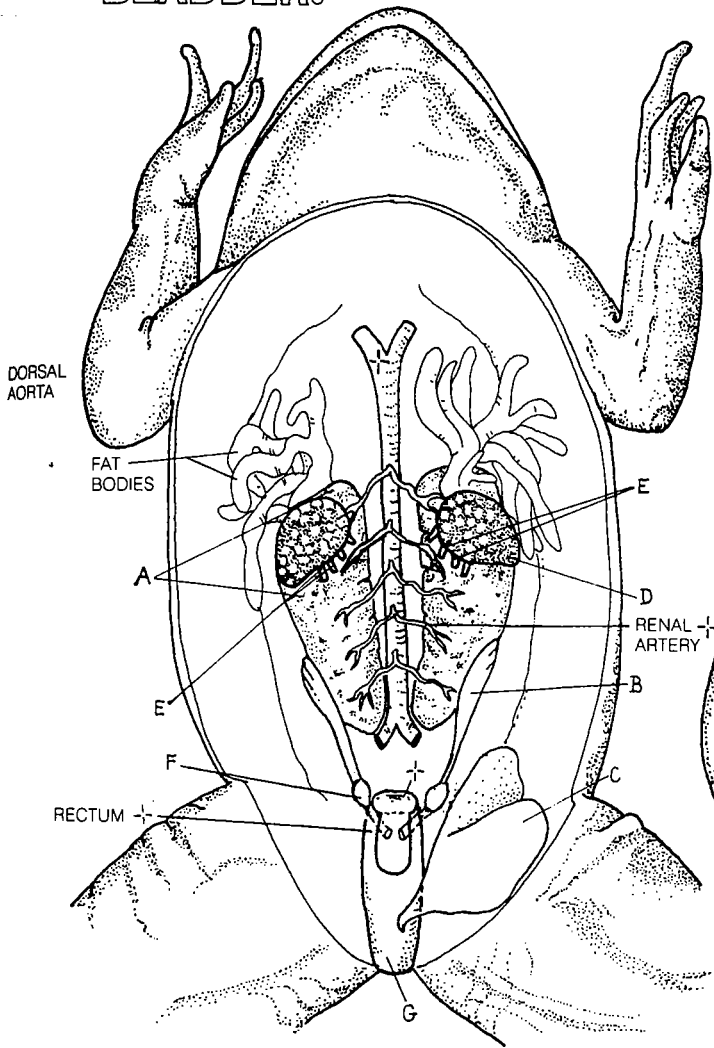
FEMALE REPRODUCTIVE SYSTEM ★

OVARY/EGGS_H

OVIDUCT

UTERUS,

CLOACA_{G'}



MALE REPRODUCTIVE SYSTEM ★

TESTIS,

EFFERENT DUCTS,

ARCHINEPHRIC DUCT,

SEMINAL VESICLE_F

CLOACA_G

RECTUM +



Frog Dissection, Laboratory 1
External Anatomy

Name _____

Date _____

1. Wear your gloves. Examine the skin of the frog. Describe what it looks like and how it feels.
2. Describe the color on the belly of the frog and compare this to the color on its back. Why do you think the frog is colored in this way? HINT: Think of predators both above and below the water, and what they would see from each vantage point.
3. How long in centimeters are the hind legs of the frog? _____ cm
4. How long in centimeters are the front legs of the frog? _____ cm
5. Which pair of legs is longest? Based on your observations, why do you think the frog's back legs are different than its front legs?
6. Notice the frog's eyes located on top of the head. Why do you think they are positioned this way, instead of on the sides of the head?
7. Use the forceps to pull down the membrane in front of the eye. This is the third eyelid. What do you think its function is?
8. Notice the frog's external eardrum just behind the eyes. Does the frog have cartilage around the outside of its ears like humans do?

9. Draw a picture of the frog's head and label the following structures:

- *Eyes*
- *Eardrums*
- *Mouth*
- *Nostrils*

10. Pull back the lower jaw of the frog. Notice that the tongue is attached at the front of the mouth and the end is forked. How is this important for the frog?

11. Notice the small set of teeth that lines the upper jaw. Feel around on the roof of the mouth for two larger teeth. What do you think these are used for (Hint: Frogs don't chew their food)?

12. Pull back the lower jaw of the frog. Draw the inside of the mouth and label the following structures:

- *Tongue*
- *Esophagus*
- *Teeth*
- *Eye sockets*

13. Now that you've gotten to know your frog, you and your partner should name the frog:

_____. Please list your name, your partner's name, and your frog's name on the tag provided and pin it to your tray.

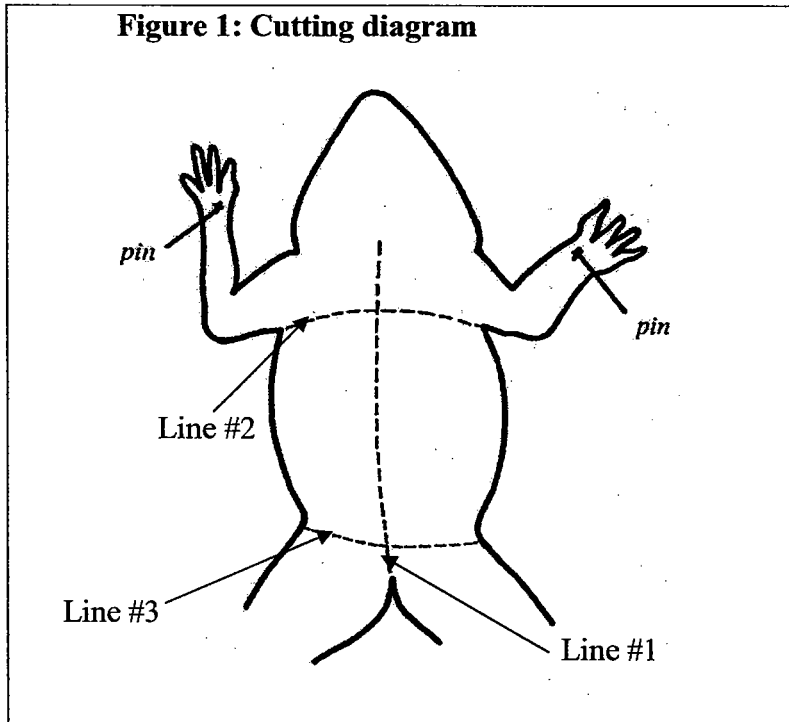


Name _____

Frog Dissection, Laboratory 2
Digestive System

Date _____

14. Wear your gloves. Lay the frog on its back in your tray. Stretch the legs out and push pins through each of the frog's feet to keep the frog in place.
15. Use the forceps to pinch an area of skin just above the groin. Pull the skin up and use the scissors to make the first incision through the skin.
16. Next, use the scissors to continue the incision through the skin up to the frog's throat, (follow dotted Line #1 as seen in Figure 1 below). Lift the skin with the forceps as you cut so that you only cut the skin, and not the organs below.



17. Now cut a horizontal incision between the front legs (follow dotted Line #2 in Figure 1). Next do the same between the back legs (Line #3 in Figure 1). You should now be able to fold the skin back over the frog's sides and pin it out of the way.
18. Note the muscle layer under the skin. Describe how the muscles look. Are all the strands going in the same direction?

19. Using the same technique as above, cut through the thin muscle layer so that you can reveal the internal organs. When your scissors reach the rib cage, cut through it carefully, holding the scissors horizontally to avoid damaging the heart below.
20. Now that the internal cavity is exposed, describe what you see.
21. Make a drawing of the frog and label the following structures from the digestive system:
- *Stomach*
 - *Small intestine*
 - *Large intestine*
 - *Liver*
 - *Pancreas*
 - *Gall bladder*
22. What is the largest organ in the frog's body that you can see? What is its function?
23. What is the function of the pancreas?
24. What is the function of the gall bladder?
25. Remove the stomach, small intestine and large intestine as one unit. Measure it from top to bottom. How long is it in centimeters?
26. Cut the stomach open from top to bottom. Describe what you see. Did you find any food in the stomach?



Frog Dissection, Laboratory 3
Circulatory, Respiratory
& Reproductive Systems

Name _____

Date _____

27. Wear gloves. Carefully remove the liver around the heart. Now examine the frog's heart. How many chambers does it have?

28. Does the frog have an open or a closed circulatory system (blood flowing *open* in the body or flowing *closed* in vessels)? Why do you think so?

29. Do you have an open or a closed circulatory system?

30. Examine the lungs of the frog. Describe what you see.

31. Do the frog's lungs seem small or large in relation to its body size? HINT: Think of how big your lungs are in relation to your body size.

32. Make a labeled drawing of the heart and lungs.

33. Remove the heart and lungs and view the reproductive organs. Is your frog a male or a female? How do you know?

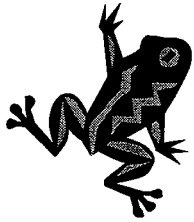
34. What are the male reproductive organs called? _____

35. What type of reproductive cells are produced by the male organs? _____

36. What are the female reproductive organs called? _____

37. What type of reproductive cells are produced by the female organs? _____

38. Draw and label the reproductive system of your frog, including any fat bodies you may see.



Frog Dissection, Laboratory 4
Excretory, Nervous & Skeletal Systems

Name _____

Date _____

39. Wear gloves. Locate the kidneys and the urinary bladder of your frog. What organ system do these organs belong to (digestive, reproductive, excretory or skeletal)?

40. Draw your frog below and label the kidneys, urinary bladder and cloaca.

41. What is the function of the kidneys?

42. Describe where urine goes after the kidneys and how exits the body.

43. Remove the skin covering one hind leg. Note that the muscle fibers form separate bundles. Draw the leg muscle bundles below:

44. Remove the muscles from the hind leg. All you should have left now is the skeletal system of the frog's leg. Note the tissues that join the bones together at the joints. These are called ligaments.

45. Draw the bone structure of your frog's leg, including ligaments:

46. Remove the kidneys and the reproductive tissues so that the spine is visible. The small bones that make up the spine are called _____.

47. Is the frog a vertebrate or an invertebrate animal? How do you know?

48. Unpin the frog's legs and turn it over, with its back facing up. Remove the skin and muscles from the top of the head, exposing the skull. Using the forceps or the scissors, carefully chip or cut away the skull starting between the eyes and working back toward the skull cap. Observe the small round lobes of the brain. Draw what you see.

49. Is a frog's brain more or less advanced than a human brain?

50. Is a frog's brain more or less advanced than a worm's brain?

51. Carefully remove one eyeball from your frog and examine it. Open the eyeball and remove the hard, round lens of the eye. The lens of the eye focuses light onto the back of the eye where the image is received and sent to the brain.

Introductory activity

Examine a living adult frog and a tadpole, complete the data table, and answer the questions.

DATA TABLE		
Trait or Information	Tadpole	Adult
Limbs present?		
Tail present?		
Mouth present?		
Nature of skin (color and texture)		
General size		
Respiratory organ type		
Diet		
Habitat		

1. Explain how hind leg musculature aids in adult frog survival.

2. Correlate the type of respiratory organ in an adult and a tadpole with their differing habitats.

3. Correlate the type of appendages in an adult and a tadpole with their differing habitats.

4. Correlate mouth size in an adult and a tadpole with their diets.

5. Explain how eyes may aid in the survival of both stages.

6. Predict how skin color and texture aids in adult frog survival.

Sketch the following organs and write one sentence about their functions:

Liver Lungs

Heart Pancreas

Gall Bladder Stomach

Small Intestine

Male frog: Spleen Female frog: Ovaries

Kidneys Oviducts

Testes Spleen

Assessment

Answer the following questions:

1. In amphibians, gas exchange occurs mainly through this organ: _____.
2. How does the three-chambered heart equip amphibians for life on land?

3. What may have been the selective pressures that caused the evolution of amphibians?

4. How might being able to jump have been a factor in the success of frogs on land?