PHROG PHAROAHS

A MINI-UNIT FOR FROG DISSECTION AND MUMMIFICATION

By
Pam Fazel

INTRODUCTORY ACTIVITIES

Alignment with Core Content

Hieroglyphs/Bioglyphs Activities

"This Old Pyramid"-Video Guide

Pyramid and Mummies Background Info

Body Systems and Heart Info

Physical Science	Life Science
I. Properties and Changes of Properties in Matter. SC-M- ✓ 1.1.1 A substance has characteristic properties ___ 1.1.2 Substances react chemically ___ 1.1.3 Chemical elements do not break down (Under normal laboratory reactions) Elements combine to form compounds	**I. Structure and Function in Living Systems. SC-M-** ✓ 3.1.1 The relationship between structure and function ✓ 3.1.2 All organisms are composed of cells ✓ 3.1.3 Cell functions sustain life ✓ 3.1.4 Specialized cells perform specialized functions

Pharoah Unit

Conceptual Understandings: Life Science

Academic Expectations: 2.2 Patterns of Change, 2.3 Systems, 2.4 Scale and Models, 2.5 Constancy, and 2.6 Change Over Time

Content Statements

Structure and Function in Living Systems

SC-M-3.1.1 ✓ Living systems at all levels of organization demonstrate the complementary nature of structure and function. Important levels of organization for structu function include cells, tissues, organs, organ systems, organisms (e.g., bacteria, protists, fungi, plants, animals), and ecosystems.

SC-M-3.1.2 ✓ All organisms are composed of cells, the fundamental unit of life. Most organisms are single cells; other organisms, including plants and animals are multicellular.

SC-M-3.1.3 ✓ Cells carry on the many functions needed to sustain life. They grow and divide, thereby producing more cells. This requires that they take in nutrients, they use to provide energy for the work that cells do and to make the materials that a cell or an organism needs.

SC-M-3.1.4 ✓ Specialized cells perform specialized functions in multicellular organisms. Groups of specialized cells cooperate to form tissues. Different tissues are, i grouped together to form larger functional units called organs. Each type of cell, tissue, and organ has a distinct structure and set of functions that serve organism.

Regulation and Behavior

SC-M-3.2.1 All organisms must be able to obtain and use resources, grow, reproduce, and maintain stable internal conditions while living in a constantly changing environment.

SC-M-3.2.2 Regulation of an organism's internal environment involves sensing the internal environment and changing physiological activities to keep conditions range required to survive. Maintaining a stable internal environment is essential for an organism's survival.

SC-M-3.2.3 Behavior is one kind of response an organism may make to an internal or environmental stimulus. A behavioral response requires coordination and communication at many levels including cells, organ systems, and organisms. Behavioral response is a set of actions determined in part by heredity an from experience.

Content Statements

Students will

- refine and refocus questions that can be answered through scientific investigation combined with scientific information.
- use appropriate equipment, tools, techniques, technology, and mathematics to gather, analyze, and interpret scientific data.
- use evidence (e.g., computer models), logic, and scientific knowledge to develop scientific explanations.
- design and conduct scientific investigations.
- communicate (e.g., write, graph) designs, procedures, observations, and results of scientific investigations.
- review and analyze scientific investigations and explanations of other students.

Applications/Connections

Applications/connections skills will be assessed only in the context of physical, Earth/space, and life sciences content.

Academic Expectations: 2.2 Patterns of Change, 2.3 Systems, 2.4 Scale and Models, 2.5 Constancy, and 2.6 Change Over Time

Content Statements

Students will

Science and Technology

- describe how science helps drive technology and technology helps drive science. Because perfectly designed solutions do not exist, technological solutions have intended benefits and unintended consequences.

Science in Personal and Social Perspectives

- describe the individual's roles and responsibilities in the following areas: changes in populations, resources and environments including ecological crises and environmental issues, natural hazards, science and technology in society, and personal and societal issues about risks and benefits.

History and Nature of Science

- demonstrate the role science plays in everyday life: past, present, and future. Science is a human endeavor. Men and women of various social and ethnic backgrounds engag in activities of science (to include careers in science). Scientists formulate and test their explanations of nature using observations, experiments, and theoretical and mathematical models. It is part of scientific inquiry to evaluate the results of scientific investigations, experiments, observations, theoretical models, and the explanations proposed by other scientists.

A

VIDEO
STUDY GUIDE

1. Name the most famous pyramid located at the giza plateau and its location in relation to Cairo.

2. Recall the kinds of tools and techniques the original builders might have used.

3. Describe how the stones were crafted so that they would fit together properly .

4. Speculate how the builders achieved such a high degree of accuracy in the pyramids' shape, slope, and geometric angle.

5. Identify the chambers found inside the pyramid and where each is located.

6. Appreciate how many workers it took and how long it took to build the pyramid. ***

7. Note how the research team uses both scientific evidence and practical knowledge to reconstruct a portion of the pyramid. ***

***These are things to pay attention to during the video.
You should answer questions 1-5 on paper.

VOCABULARY

CASING STONES--The smooth, carefully dressed stones that originally covered the outside of the pyramids.

COURSE-A single horizontal layer of stones within a pyramid.
CUBIT- About 21 inches, the official unit of measurement during the age of pyramid building. A cubit referred to the length of a man's arm, from the elbow to the tips of his fingers.
FULCRUM-The balancing point on which a lever pivots.
LEVER-A bar or pole used for moving or lifting stones. Levering works like a seesaw: the plank of the seesaw is the lever and the central support is the fulcrum. When you push down on one side, the other side goes up. To lift or move heavy stones, the fulcrum is usually positioned not in the middle of the lever, but closer to the stone one wants to lift. This reduces the amount of force needed to lift the stone.
PACKING STONES-The stones positioned between the outer casing stones and the internal step pyramid.
PLUMB BOB- A building device used to determine verticality, usually a string with a weight attached to one end.

UNIT ASSESSMENT

PRE-TEST

DISSECTION TEST

OPEN RESPONSE EXAMPLES

GROUP ASSESSMENT FORMS

1. The small round membrane on the head just in back of and lower than the eye is the:
   1. tongue. 2. eardrum. 3. nostril. 4. cloacal opening.

2. An enlarged finger on the foreleg is found:
   1. on the male only. 2. on the female only. 3. on both sexes.

3. The digits of the frog are webbed on the:
   1. forelegs only. 2. hind legs only. 3. both forelegs and hind legs.

4. Five functional digits are found on the:
   1. forelegs only. 2. hind legs only. 3. both forelegs and hind legs.

5. The hind leg is used primarily for:
   1. support. 2. movement. 3. clasping the female in reproduction. 4. none of these.

6. The forelegs of the frog are _____ the hind legs.
   1. shorter than 2. the same length as 3. longer than

7. The internal nares open into the:
   1. mouth. 2. cloaca. 3. stomach. 4. esophagus.

8. The third clear eyelid is an extension of the:
   1. lower eyelid. 2. upper eyelid. 3. eardrum. 4. tongue.

9. The cloacal opening is found:
   1. in the mouth. 2. in the nares. 3. under the eardrum. 4. at the tail.

10. The elbow joint is found on the:
    1. mouth. 2. toes. 3. foreleg. 4. hind leg.

11. The largest internal organ is the:
    1. kidney. 2. heart. 3. lung. 4. liver

12. Which one of the following organs is part of the frog circulatory system?
    1. stomach 2. heart 3. cloaca 4. nostrils

13. The cloaca receives all of the following except:
    1. bile. 2. urine. 3. digestive waste. 4. sperm.

14. The testes are attached by a membrane to the:
    1. kidneys. 2. lungs. 3. liver. 4. ovaries.

15. Sperm are produced by the:
    1. ovaries. 2. kidneys. 3. urinary bladder. 4. testes.

16. The three-chambered muscular organ is the:
    1. kidney. 2. heart. 3. lung. 4. liver.

17. The hollow sac-like organ with small chambers is the:
    1. kidney. 2. liver. 3. lung 4. spleen.

18. The organs with ducts that lead to the small intestine are the:
    1. heart and liver. 2. stomach and spleen. 3. liver and pancreas. 4. large intestine and kidney.

19. Fibrous cords that connect muscles to bones are called:
    1. ligaments. 2. tendons. 3. muscles. 4. ducts.

20. Which one of the following organs is part of the frog respiratory system?
    1. liver 2. esophagus 3. lung 4. heart

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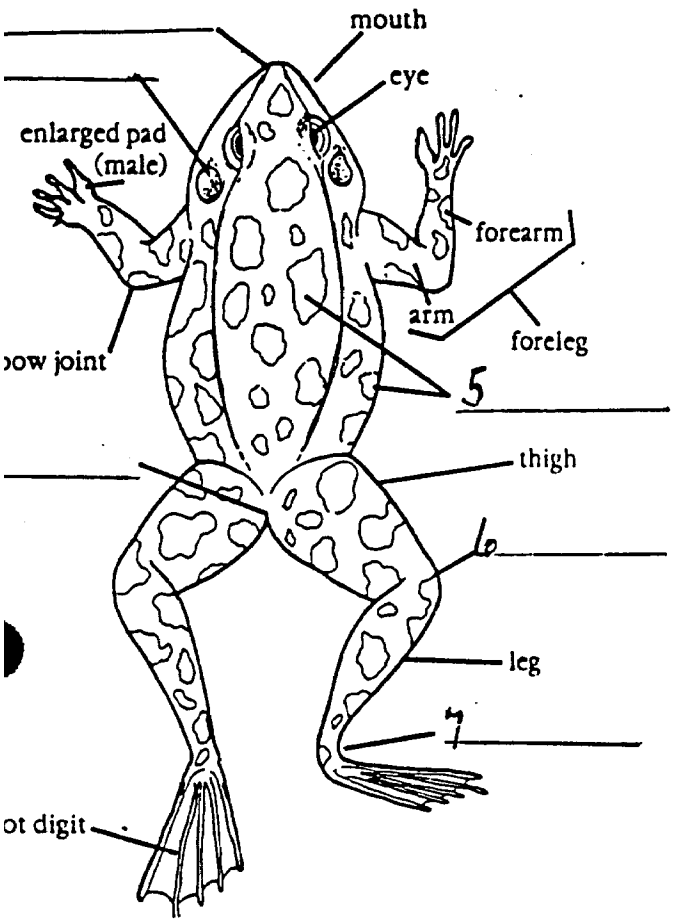
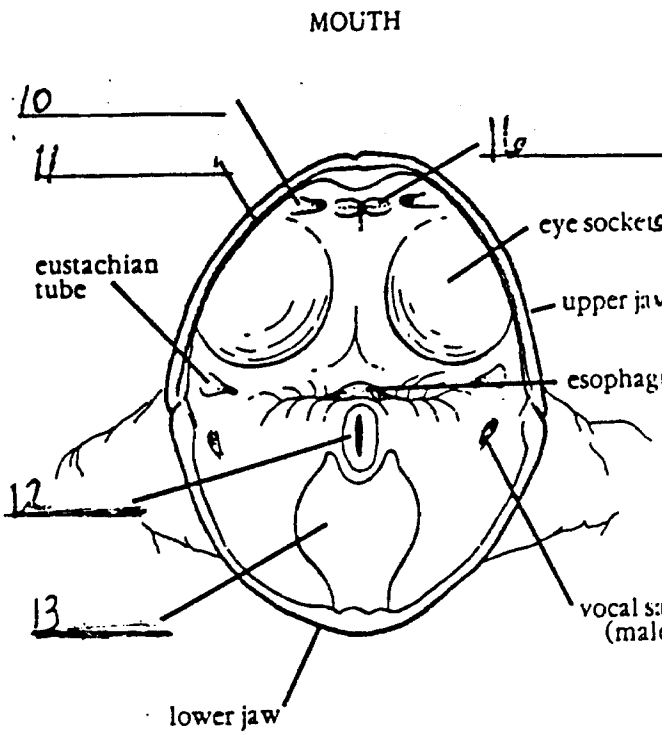
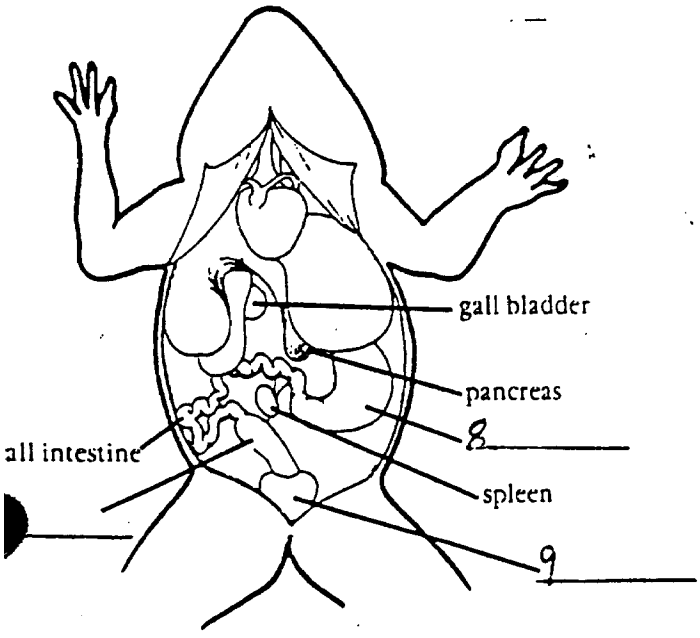
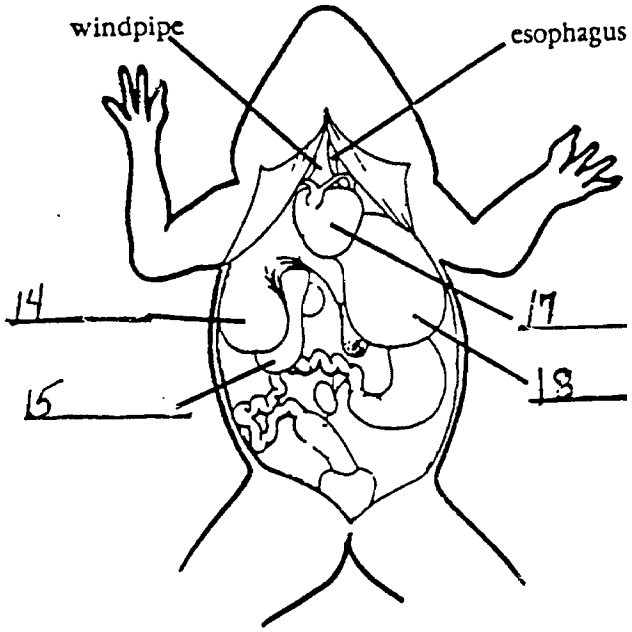
FROG DISSECTION TEST









FROG DISSECTION TEST PART 2

1. The teeth found near the center of the roof of the mouth are the :
   a. oviducts b. glottis c. incisors d. vomerine

2. Only four functional digits are found on the:
   a. hands b. forelegs only c. both forelegs and hindlegs. d. feet

3. Males can be distinguished from females during the mating season by the presence of:
   a. an eyefold b. eggs c. enlarged finger pad d. nostrils

4. The eardrum is called the:
   a. eustachian tube b. glottis c. nares d. tympanum

5. The chambered muscular organ in the center of the chest is the:
   a. kidney b. liver c.lung d. heart

6. The flat elongated organs on the back body wall are the:
   a. lungs b. ovaries c. pancreas d. kidneys

7. The large three-lobed brownish organ below and around the heart is the:
   a. large intestine b. testes c. liver d. gall bladder

8. The opening at the tail end of the frog is the:
   a. cloacal b. eustachian c. glottis d. internal nares

9. The thin, white coiled tubes along the sides of the female frog are called:
   a. ovaries b. oviducts c. testes d. kidneys

10. The short appendage for support is the:
    a. eustachian tube b. hind limb c. forelimb d. spleen

11. The testes are found attached to the:
    a. liver b. lungs c. pancreas d. kidneys

12. The Achilles tendon is found in the:
    a. elbow b. ankle c. hand d. knee

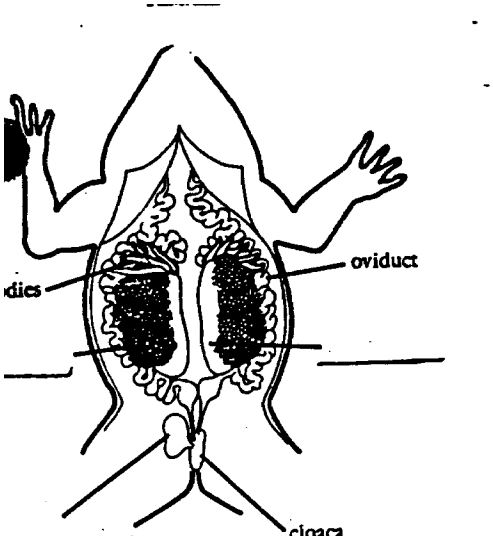
13. The short tube with a large diameter that opens into the cloaca is the:
    a. large intestine b. liver c. stomach d. pancreas

14. The following tubes all open into the back of the mouth except:
    a. eustachian b. esophagus c. bile ducts d. trachea

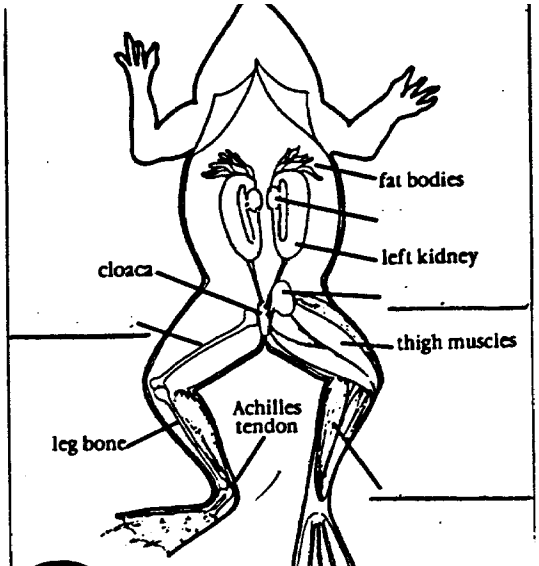
15. The tongue of the frog is attached near the:
    a. back of the mouth b. front of the mouth c. glottis d. esophagus

OPEN RESPONSE QUESTION:

Compare and contrast a three-chambered heart like the one that you removed from your "phrog phroah" to the four-chambered heart that beats in your own body.



eproduction



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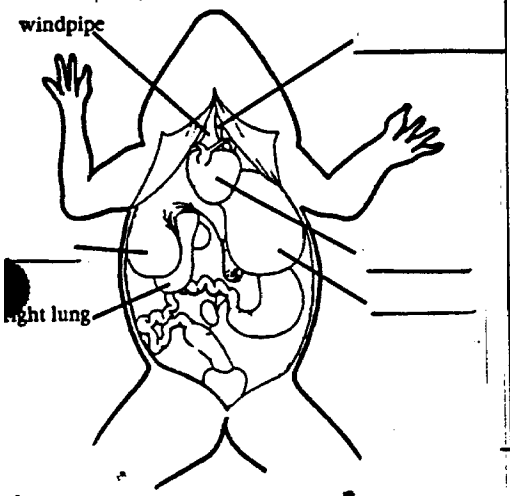
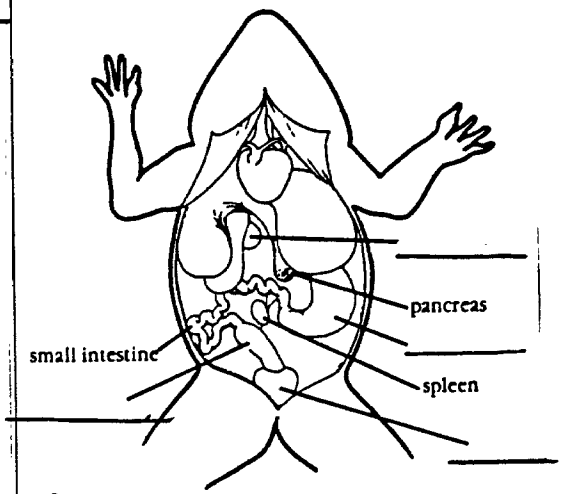


irculation



Digestion

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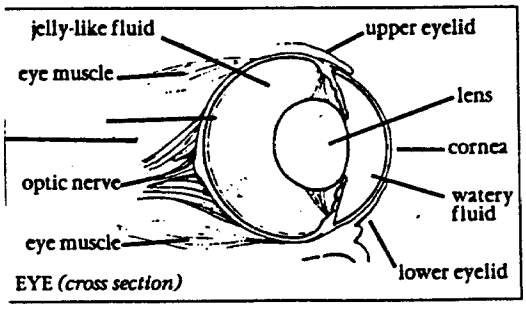
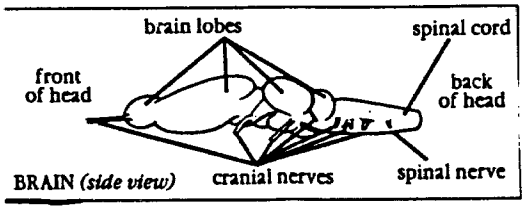
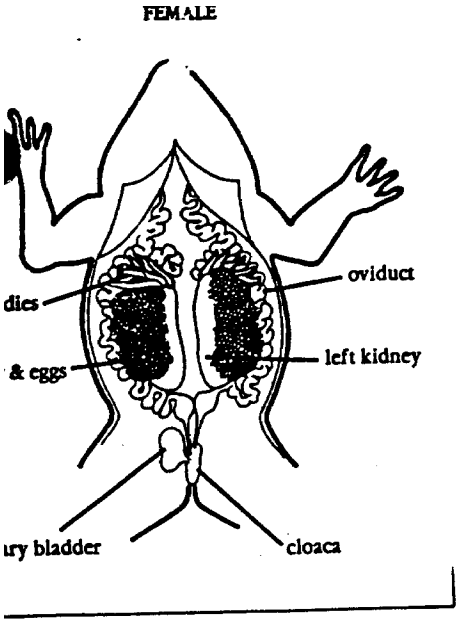
&
erves

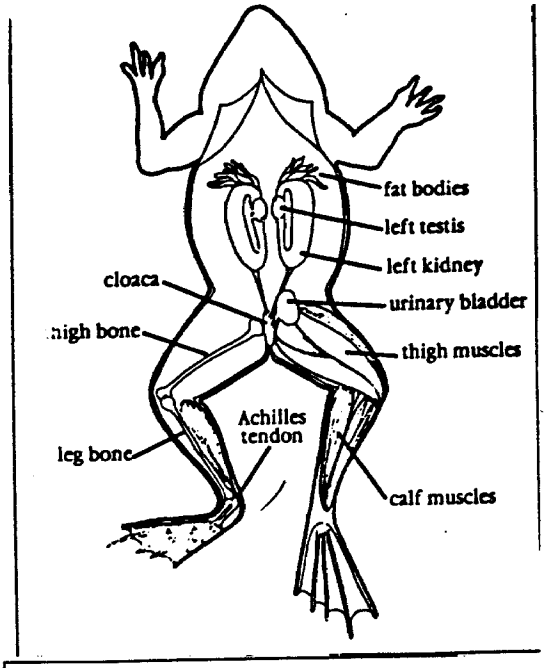


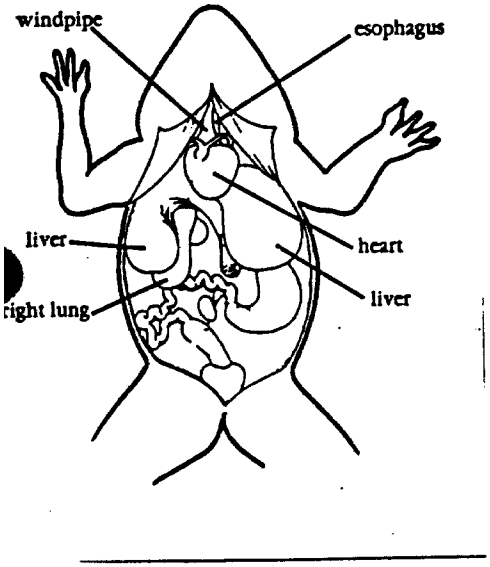
EYE *(cross section)*

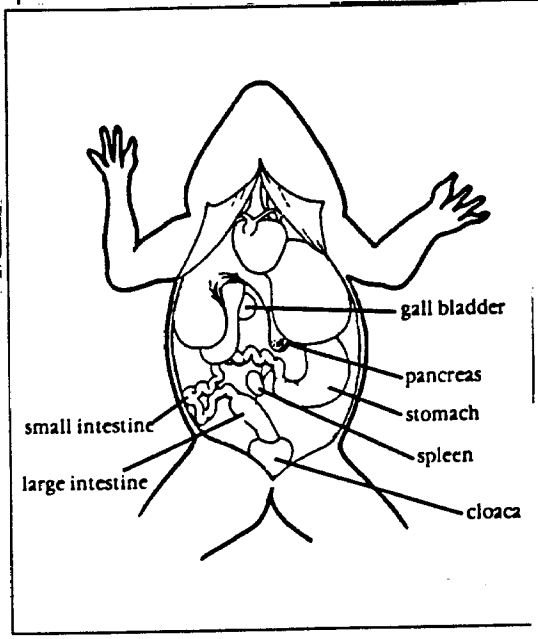


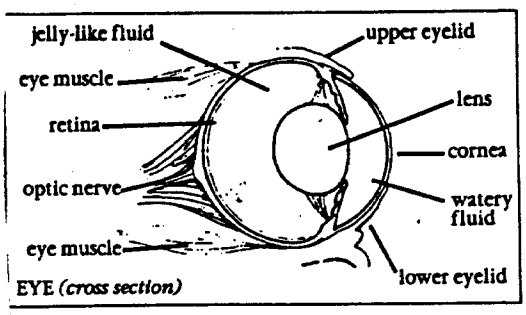
BRAIN *(side view)*

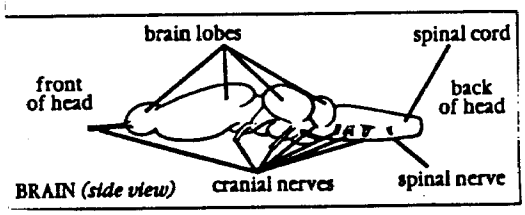

FEMALE
oviduct
left kidney
cloaca


fat bodies
left testis
left kidney
cloaca
urinary bladder
thigh muscles
Achilles tendon
leg bone
calf muscles


windpipe
esophagus
liver
heart
liver


gall bladder
pancreas
stomach
small intestine
spleen
large intestine
cloaca


jelly-like fluid
upper eyelid
eye muscle
lens
retina
cornea
optic nerve
watery fluid
eye muscle
lower eyelid
EYE (cross section)


brain lobes
spinal cord
front of head
back of head
BRAIN (side view)
cranial nerves
spinal nerve

External Structures of the FROG

I: HEAD - Front end of the frog.

A. mouth - a large opening at the front of the head end of the frog.

B. nostrils - the 2 small openings just above the mouth.

C. eyes - the 2 large eyes protrude from the head just in the back of the nostrils.

D. eardrum - a round membrane just in back of and lower than the eye on each side. The ear has no outer structure.

II. TRUNK - the portion of the body behind the head. (NO NECK)

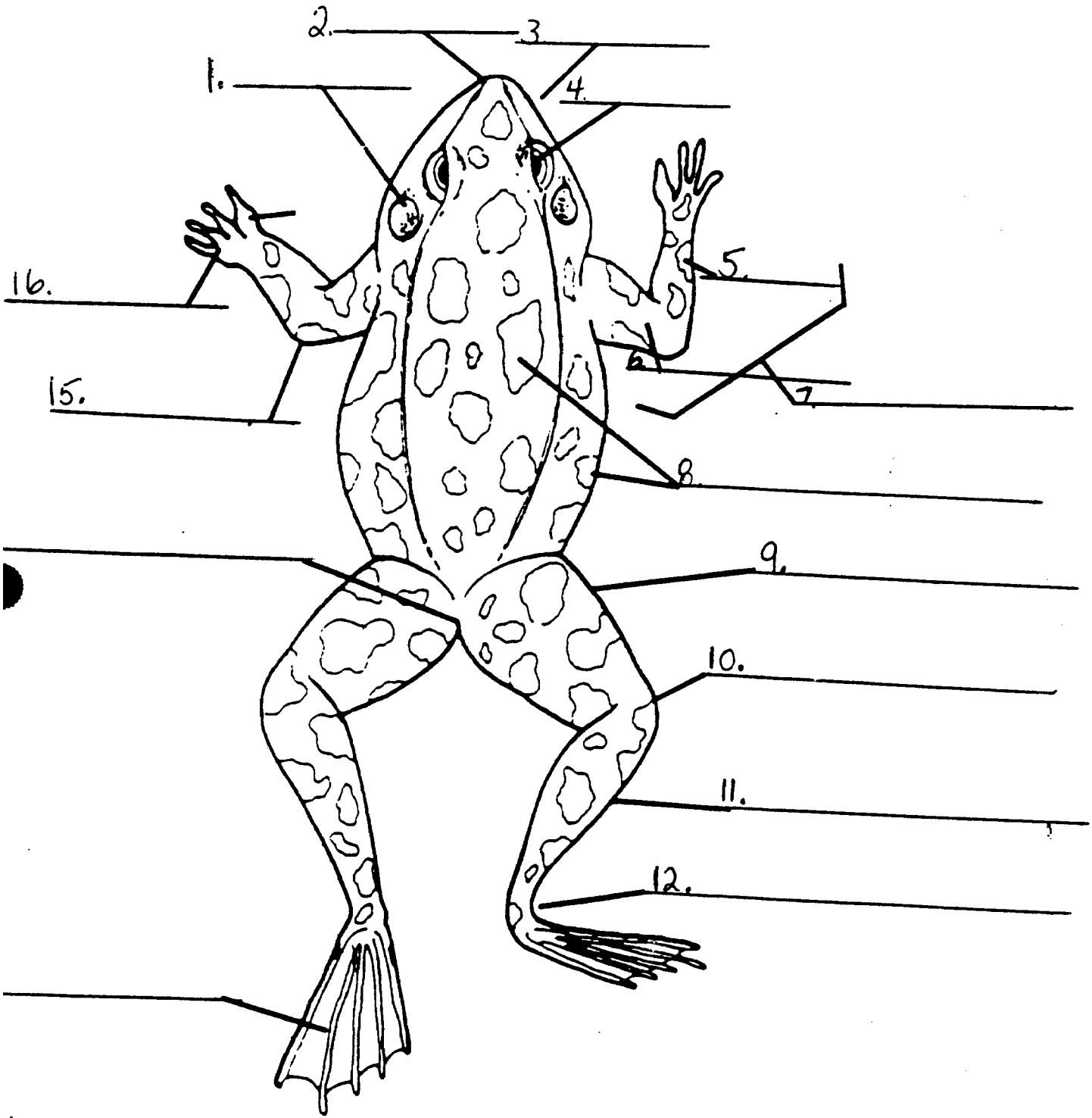
A. cloacal opening - the hole at the tail end of the frog.

III. APPENDAGES - parts that extend from the trunk of the frog.

A. forelegs - short extensions from the front end of the trunk that provide support. Each consist of the upper arm, forearm, & hand.

B. elbow joint - formed where the upper arm meets the lower forearm.

C. hand digits - 4 fingers on the hand and a nonfunctional thumb on the inside of the hand. The male's gets enlarged.



lse the following words:

earm	foot digits	Knee joint	cloacal opening
outh	foreleg	pigment spots	eye
nigh	nostril	eardrum	ankle joint.
			leg

D. hind legs - longer extensions from the tail end of the trunk that are used for movement. Each hind leg has a thigh, leg, & foot.

E. foot digits - 5 webbed toes & a nonfunctional 6th toe on the inside.

IV. SKIN

A. pigment spots - dark colorings on the skin.

V. MOUTH

A. maxillary teeth - teeth on the outer edge of the upper jaw.

B. vomerine teeth - found in the rear near the center.

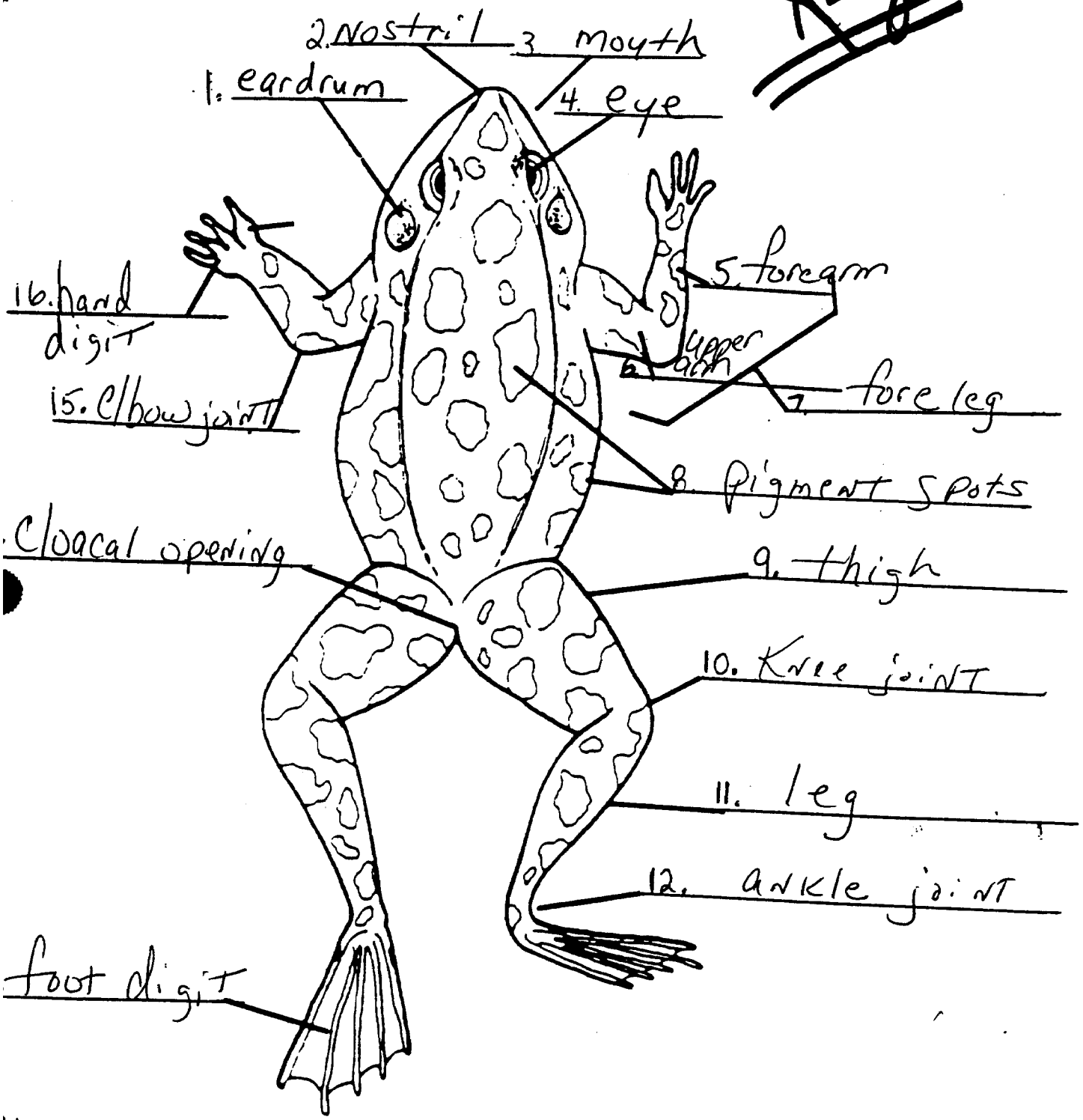
C. throat - area in the back of the mouth.

D. esophagus - the opening of this tube is seen in the back of the throat.

E. glottis - the opening for the windpipe in the middle of the throat.

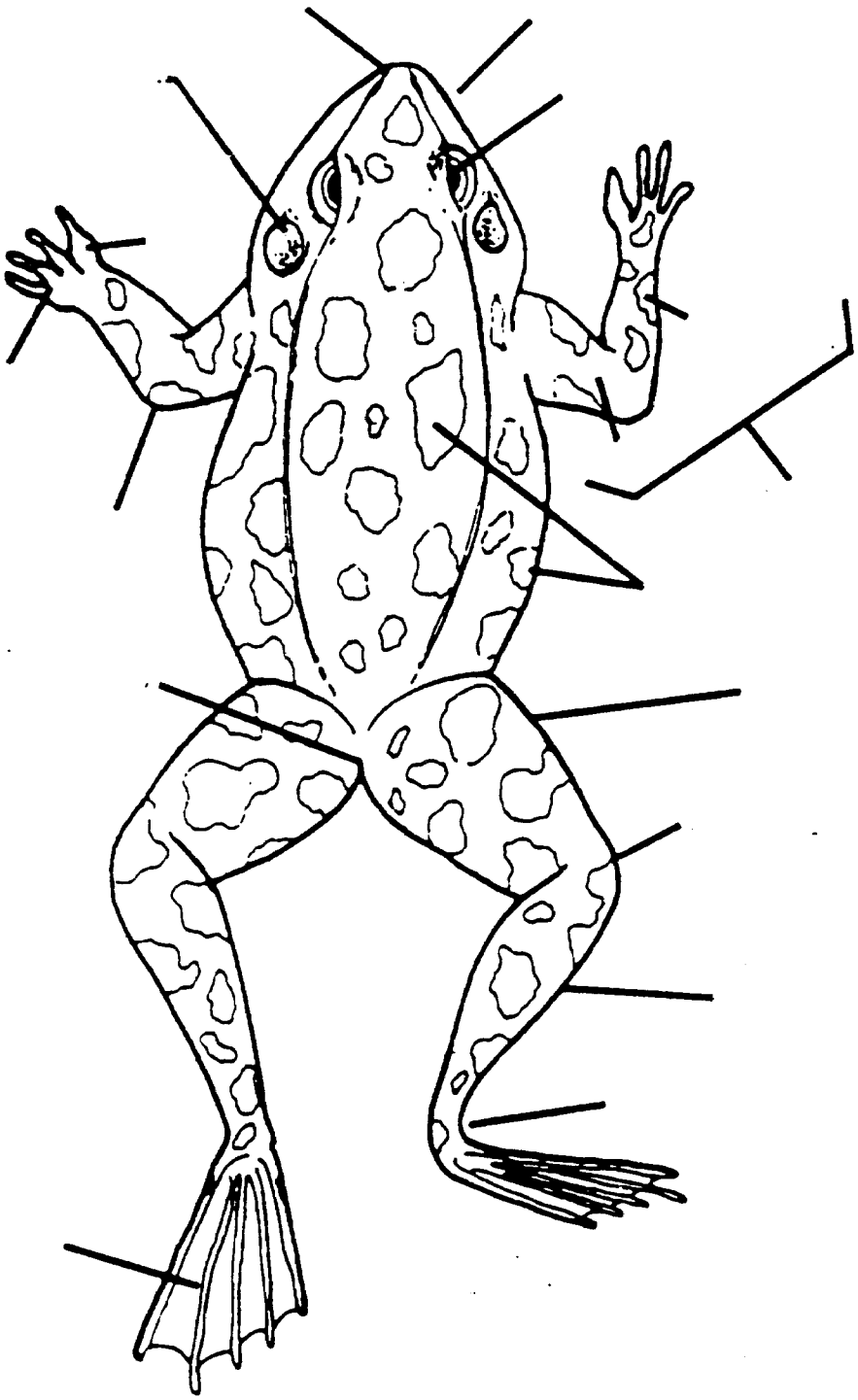
F. tongue - found near the bottom of the mouth cavity.

Key

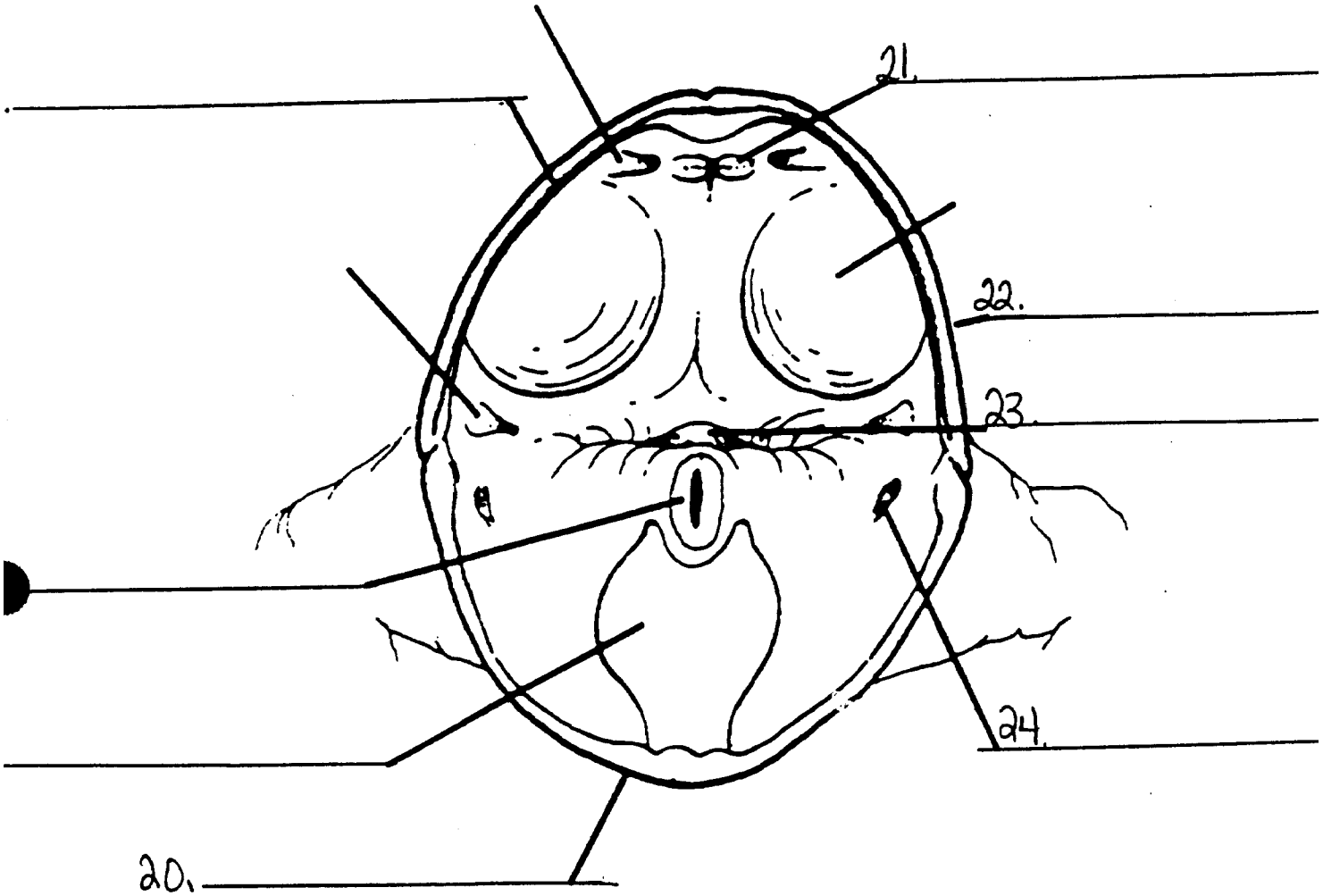


Use the following words:

forearm	foot digits	Knee joint	cloacal opening
mouth	foreleg	pigment spots	eye
thigh	nostril	eardrum	ankle joint
			leg



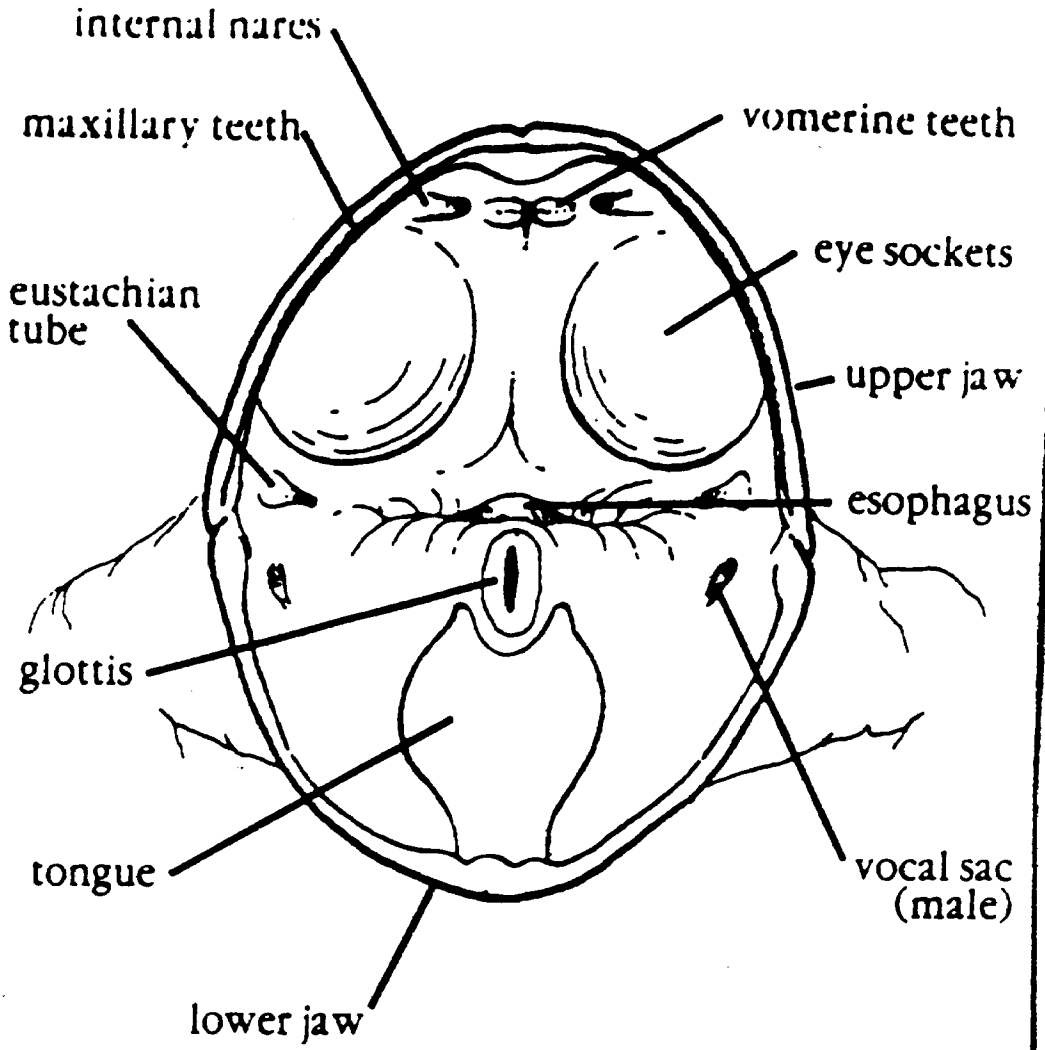
MOUTH



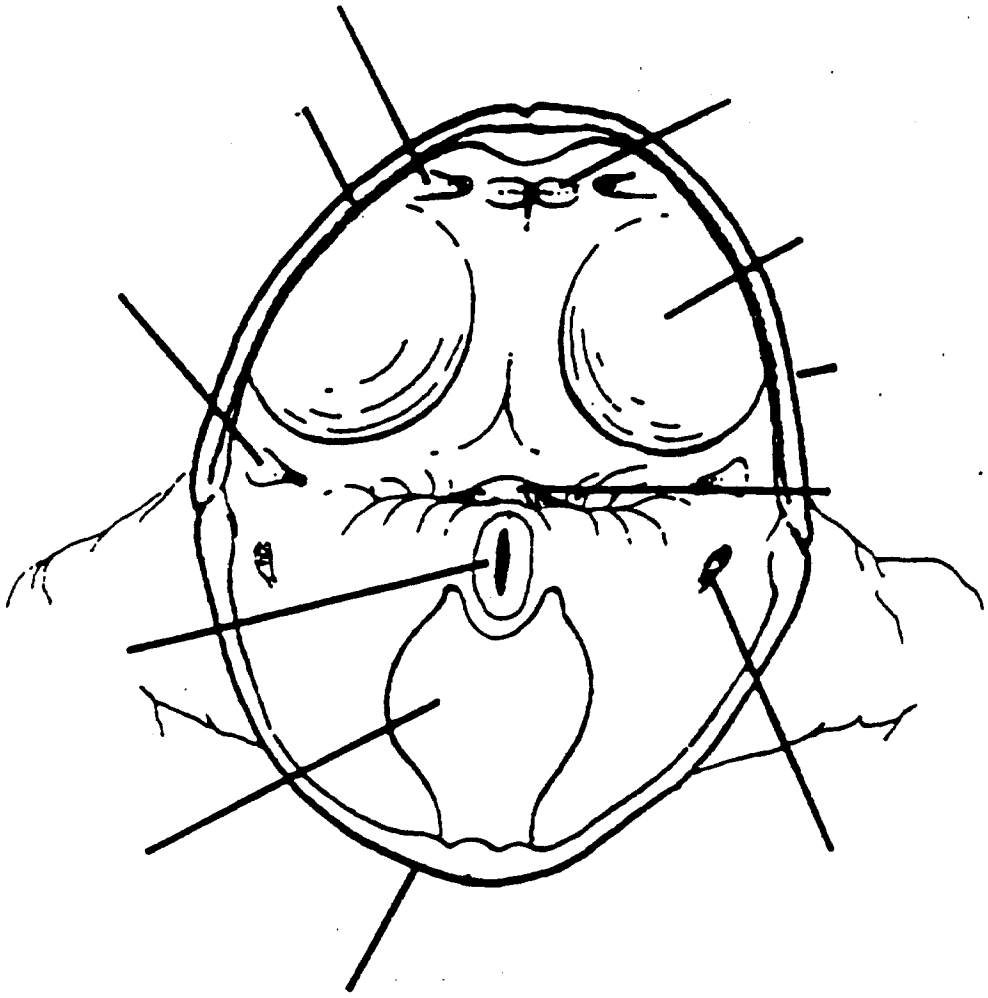
use these words:

upper jaw
lower jaw
vomerine teeth
maxillary teeth
esophagus
vocal sac
tongue
glottis

MOUTH


internal nares
maxillary teeth
vomerine teeth
eye sockets
eustachian tube
upper jaw
esophagus
glottis
tongue
vocal sac (male)
lower jaw

MOUTH



OPEN RESPONSE QUESTIONS

1. Identify the muscular organ in the body of the frog that helps to transport blood throughout the body. Compare and contrast this organ to the same one that is found in your own body.

2. Specialized cells perform specialized functions in multicellular organisms. Choose a group of specialized cells present in your frog and describe how they have organized into more complicated structures. Give examples of these structures and describe the system that they form.

GROUP EVALUATION GUIDE

	NAME	NAME	NAME	NAME
1. CAME TO GROUP PREPARED	____	____	____	____
2. COMPLETED INDIVIDUAL TASKS	____	____	____	____
3. WAS A GOOD LI STENER	____	____	____	____
4. DISAGREED IN AN AGREEABLE WAY.	____	____	____	____
5. SHARED RESPONSIBILITY.	____	____	____	____

RANK YOUR TEAM MEMBERS ON EACH OF THE ABOVE GROUP SKILLS. PLACE A SCORE OF 0-5 IN THE BLANK UNDER THEIR NAME. DO NOT RANK YOURSELF.

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5. SHARED RESPONSIBILITY.	____	____	____	____

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