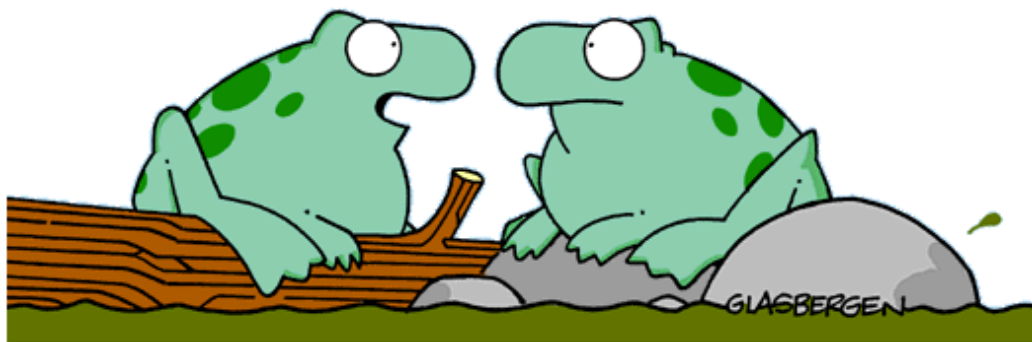


Rana pipens
"leopard frog"

Frog Dissection Manual

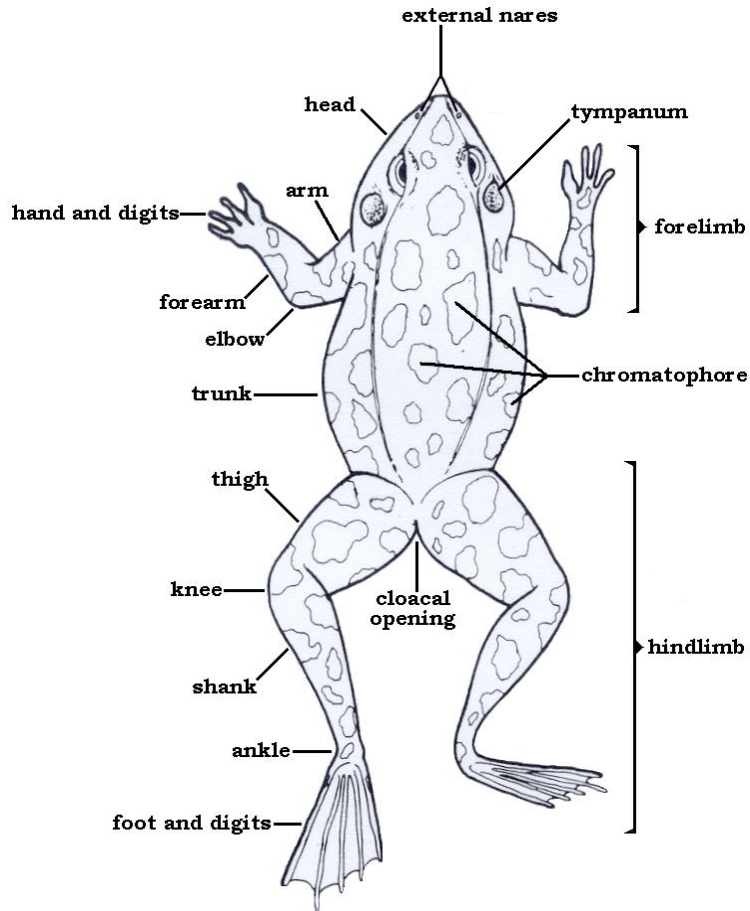


**"Looks aren't everything. It's what's inside you
that really matters. A biology teacher told me that."**

Frog Dissection Manual

External Anatomy

1. Place the frog on the dissecting pan. Do not pin it down.
 2. Use these descriptions and the picture to identify each of the following external structures.
- A. Head** – the anterior end of the frog extending to and including the eardrums
mouth – the large opening at the anterior end of the head made up of a **maxilla** and **mandible**
maxilla – the upper jaw bone
mandible – the lower jaw bone
external nares (i.e. nostrils) – two small openings on the dorsal surface of the head near the tip
eyes – two eyes protrude from the head just posterior to the external nares
nictitating membrane – an extension of the lower eyelid that can come up to protect the eye
tympanum (i.e. eardrum) – round membranes just posterior and ventral to the eyes
- B. Trunk** – the posterior end of the frog extending from the head to the hindlimbs
cloacal opening – the hole at the posterior end of the frog (it's the anus but has more functions)
- C. Appendages** – the limbs that extend from the trunk including the **forelimbs** and **hindlimbs**
forelimbs – short extensions from the anterior end of the trunk
arm – the uppermost section of the forelimb extending from the shoulder to the elbow
forearm – the middle section of the forelimb extending from the elbow to the wrist
hand – the lowermost section of the forelimb extending outward from the wrist
hindlimbs – long extensions from the posterior end of the trunk
thigh – the uppermost section of the hindlimb extending from the hips to the knee
shank – the middle section of the hindlimb extending from the knee to the ankle
foot – the lowermost section of the hindlimb extending outward from the ankle
digits – the fingers and toes; note: there are four finger digits but five toe digits
- D. Skin** – the outer covering of the head, trunk, and appendages; it is smooth and moist
epidermis – the outer layer of the skin containing pigment granules for coloration
dermis – the skin layer under the epidermis containing **chromatophores** (i.e. pigment cells)



Internal Anatomy

Materials

frog dissecting pan scissors forceps probe

Structures Inside the Mouth

1. Open the mouth using your fingers or forceps.
2. Use the scissors to cut the back of the mouth where the mandible attaches to the maxilla.
3. When done, you should be able to easily open the mouth to examine these internal mouth structures.

mandible – the lower jaw

maxilla – the upper jaw

maxillary teeth – a row of teeth found on the margin of the maxilla

vomerine teeth – two small patches (bumps) of teeth found on the roof of the mouth in the center of the anterior area

internal nares – the nostril openings on the roof of the mouth just lateral to the vomerine teeth

eye sockets – on the roof of the mouth where the eyes bulge inward

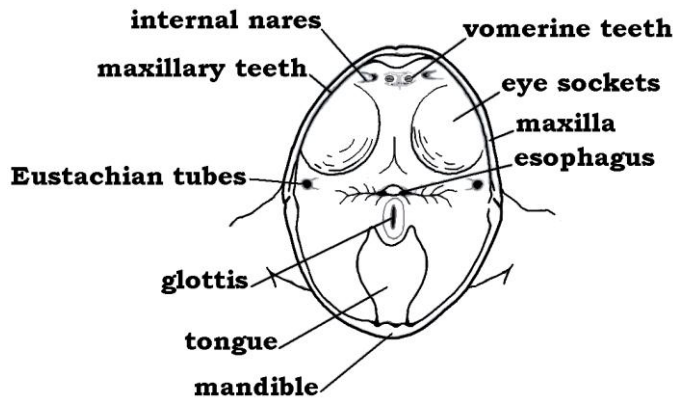
Eustachian tubes – the openings for these tubes are found on each side of the roof of the mouth near the hinge of the jaws

esophagus – the opening for this tube is at the back of the mouth (it leads down the throat to the stomach)

glottis – this is the opening for the trachea; it is just anterior to the opening of the esophagus on the floor of the mouth

tongue – found on the floor of the mouth; hinged at its anterior end

buccal cavity – the inside cavity of the mouth



Structures of the Hindlimbs

1. Remove the skin from one of the hindlimbs.
2. Remove the thigh muscles from the femur and the calf muscles from the tibiofibula.

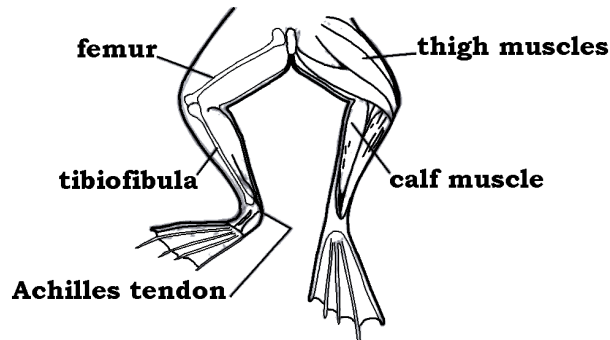
thigh muscles – the muscles of the thigh (uppermost section of the hindlimb)

calf muscles – the muscles of the shank (middle section of the hindlimb)

femur – the bone running through the thigh

tibiofibula – the bone running through the shank

Achilles tendon – the tendon that connects the calf muscles to the foot (white in color)

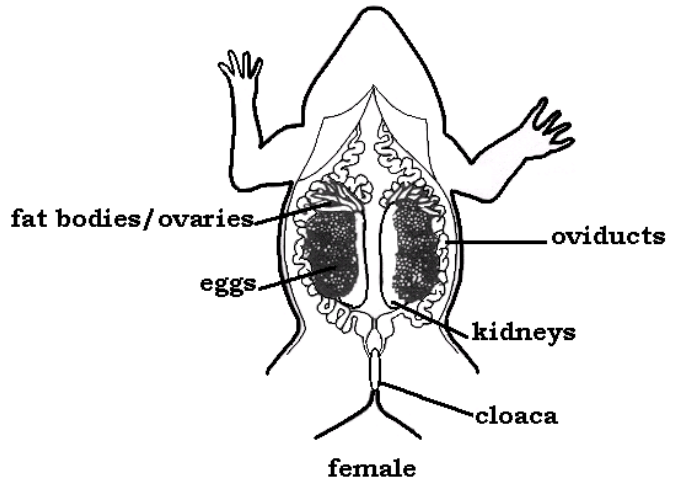
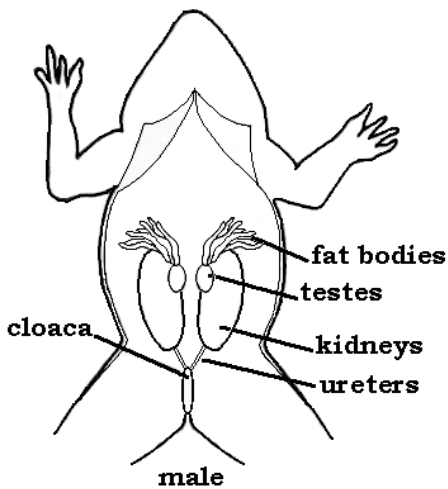
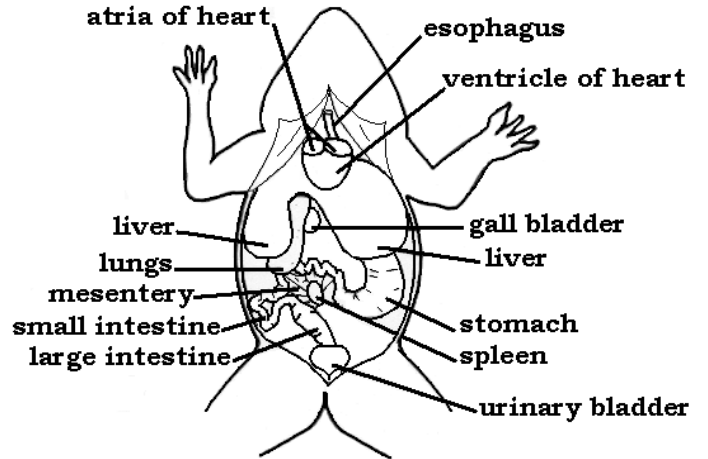
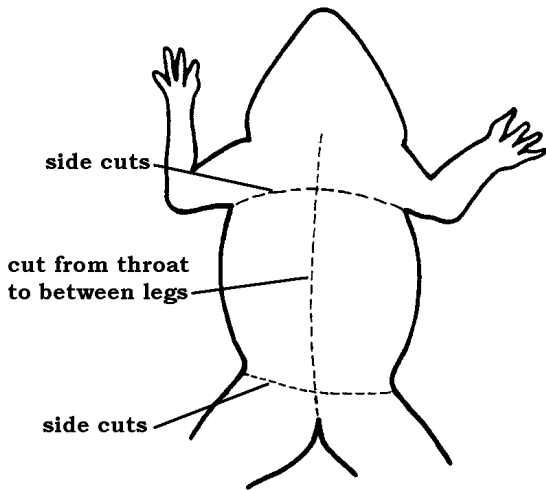


Internal Anatomy

Structures of the Coelom

1. Place the frog on its back.
2. Using the forceps, lift the skin of the lower abdomen and make a cut with the scissors.
3. Insert the scissors into the slit and make a cut from near the cloacal opening to below the lower jaw.
4. Make shallow cuts to the sides just posterior to the forelimbs and anterior to the hindlimbs.
5. Make similar cuts through the body wall if the previous cuts did not already do so.
6. Cut off the flaps to reveal the organs inside the coelom.
7. Remove the following organs and lay them on your tray for identification.
8. **Note: leave the stomach, small intestine, and large intestine attached to each other when you remove them.**

heart (atria and ventricle) – in the center at the anterior end between the forelimbs; atria – red brown, ventricle - white
liver – on both sides of the heart; contains three lobes (sections); largest organ in body; brownish to greenish
gall bladder – under the liver and attached to it; small round sac; yellow-green and slightly transparent
esophagus – attached to back of throat and stomach; cut as high up as you can; do not separate from stomach; white
stomach – widest part of digestive tract; very muscular; white
small intestine – extends from stomach to large intestine; smaller diameter than large intestine; white
large intestine – extends from small intestine to cloaca; larger diameter than small intestine; white
cloaca – the very end of the digestive tract; cut as low down as you can; white
mesentery – the connective tissue holding the different areas of the small intestine together; very thin but strong; clear
spleen – round body similar in size to the heart; found in the mesentery; makes red blood cells; dark reddish brown
lungs – to the right and left of the heart underneath the liver; spongy sacs; color varies – dark gray to reddish brown
kidneys – long, flat structures along the dorsal surface of the coelom near the posterior end of the cavity; dark brown
fat bodies/ovaries – yellow or brown wormlike structures in the mid abdominal area (ovaries are too small to see)
fat bodies/testes – yellow or brown wormlike structures in the mid abdominal area (testes will be small, oval and white)



Frog Dissection Answer Sheet

External Anatomy – Grade: _____ (identify these structures to your teacher using the frog)

head	cloacal opening
trunk	chromatophores
external nares	hindlimb
tympanum	thigh
forelimb	shank
arm	foot and digits
forearm	knee
hand and digits	ankle
elbow	

Structures Inside the Mouth – Grade: _____ (identify these structures to your teacher using the frog)

internal nares	Eustachian tubes
maxillary teeth	glottis
vomerine teeth	tongue
eye sockets	mandible
maxilla	buccal cavity
esophagus	

Structures of the Hindlimbs – Grade: _____ (identify these structures to your teacher using the frog)

thigh muscles	femur	Achilles tendon
calf muscles	tibiofibula	

Structures of the Coelom – Grade: _____ (identify these structures to your teacher using the frog)

atria of the heart	lungs
ventricle of the heart	spleen
liver	kidneys
gall bladder	fat bodies
esophagus	cloaca
stomach	
small intestine	
large intestine	
mesentery	