

# The External Structures of the Frog (5ec)

## Introduction

The newt and the salamander are excellent examples of the amphibians. Their relationship to the lower life forms is evident because of the presence of gills and their mostly aquatic existence. The frog, on the other hand, is quite well adapted to living on land. The advantage to studying the frog is that it is a good example of the vertebrates and its internal organs resemble that of higher animals. In this investigation you will examine the external structures of the frog.

**Purpose: To observe the characteristics that identify a frog as an amphibian**  
**Objectives:**

1. Examine the external structures of the frog
2. Relate the structures of the frog to their functions
3. Determine how the frog's characteristics enable it to live its particular lifestyle

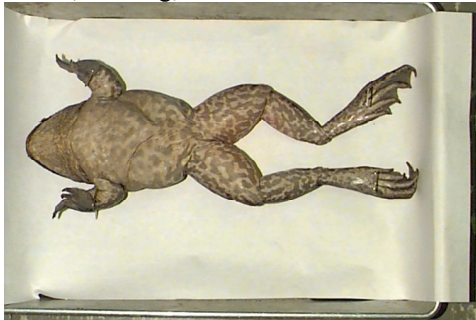
## Materials

Frog (*Rana pipiens*) Dissecting scissors Dissecting tray

## Procedure

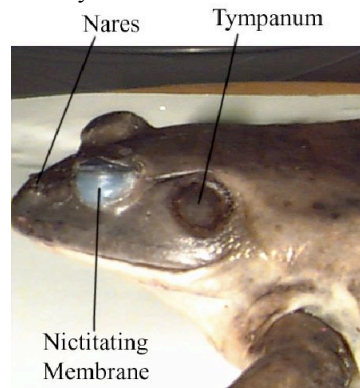
### Part A: Dorsal Structures

1. Spread out the frog on the dissecting pan, ventral side down. Locate the following structures: eyes, head, nostrils, tympanum, thumb (enlarged in the male), forearm, hind leg, and webbed hind foot



2. Identify the eyes, which have a non-moveable upper and lower lid, but can be covered with a nictitating membrane which serves to moisten the eye.

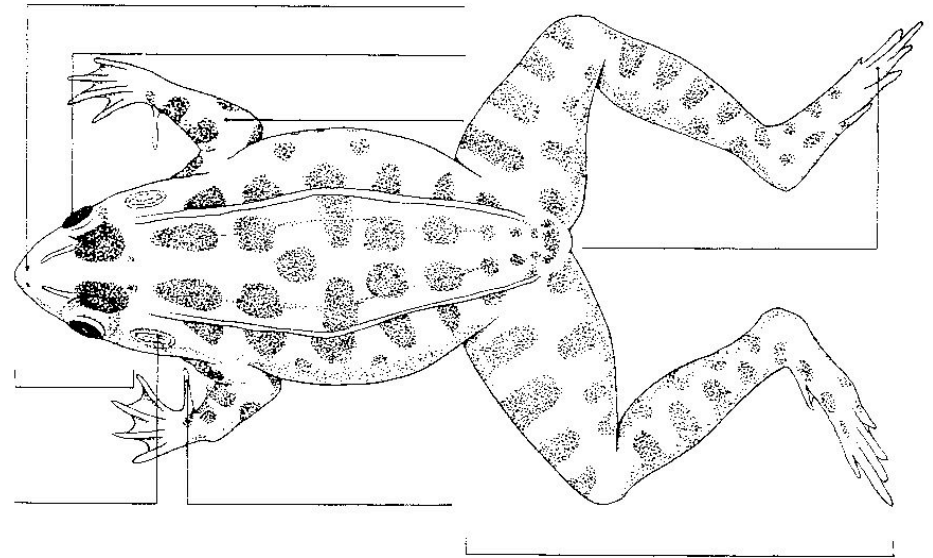
3. Locate the tympanum behind each eye.



4. Examine the external nares (nostrils). Insert a probe into the external nares and note that it protrudes from one of the paired small openings, the internal nares inside the mouth cavity.

5. Identify the paired appendages. The short forelimb consists of an upper arm (forearm) and a hand. The hand has four digits and a rudimentary vestigial thumb. The hind limb consists of a thigh, shank, and a foot. The foot has five digits and a rudimentary sixth digit.

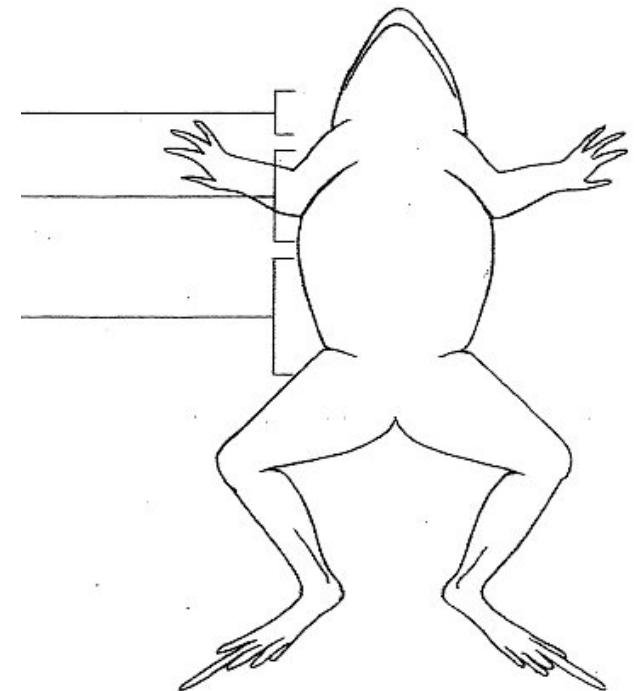
2. Label the structures you have identified on the drawing below



1. Turn over the frog to examine the ventral side. Label, on the drawing below, the following parts: throat, thorax, cloaca and abdomen. Also draw in any other markings or structures you may be better able to see from this side.

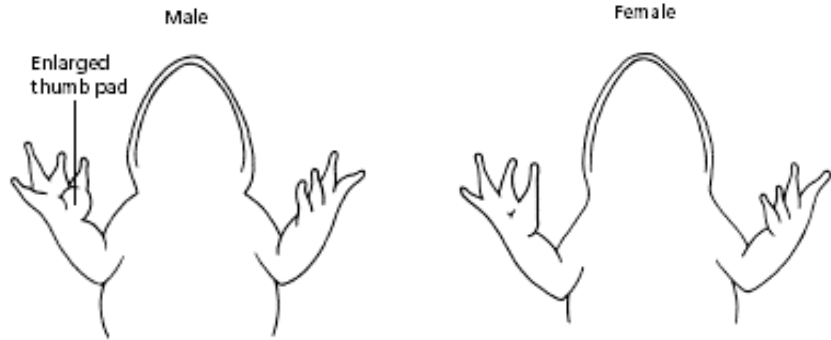
2. Count the number of digits on the forelegs and on the hind legs. How many do you find?

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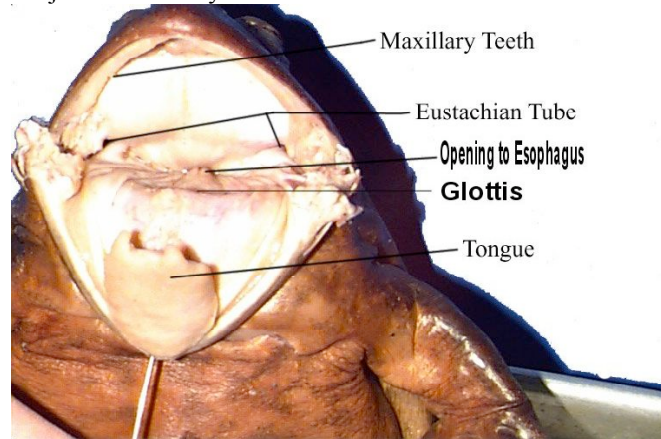
Identify  
YOUR  
Frog.

My frog  
is a  
\_\_\_\_\_



## II.) Mouth Anatomy

1. Open your frog's mouth very wide, cutting the angles of the jaw if necessary.



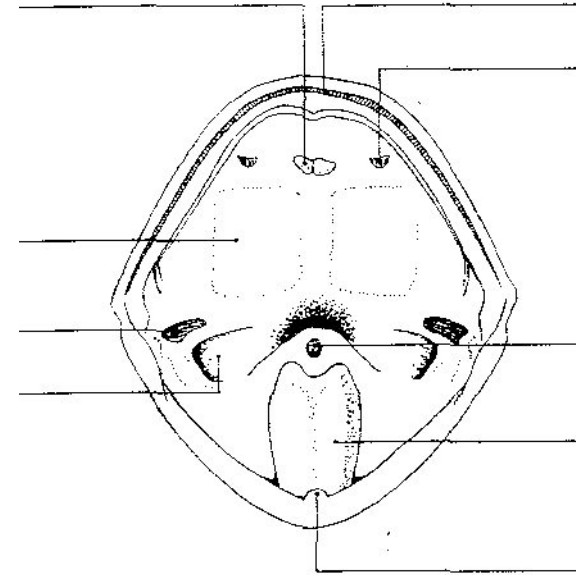
2. Identify the tongue attached to the lower jaw's anterior end.
3. Find the Eustachian tube opening into the angle of the jaws. These tubes lead to the ears. Eustachian tubes equalize air pressure in the ears.
4. Examine the maxillary teeth located along the rim of the upper jaw. Another set of teeth, the vomerine teeth, is present just behind the mid portion of the upper jaw.

5. Locate the glottis, a slit through which air passes in and out of the trachea, the short tube from the glottis to the lungs.
6. Identify the esophagus which lies dorsal & posterior to the glottis and leads to the stomach

### Questions:

1. Are any maxillary teeth also felt along the lower jaw edge?  
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2. Compare the frog's tongue to a human's. How are the tip ends different? How do the points of attachment to the lower jaw differ? \_\_\_\_\_
3. Compare the frog's teeth to the human's. How do the number of teeth differ? Estimate the number of maxillary teeth in the frog: \_\_\_\_\_ How does their locations differ?  
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1. With the frog's ventral side up, pry open the lower jaw.
2. **CAUTION:** always be careful when using scissors. With the dissecting scissors, cut the jaw bone at the corners of the mouth on either side so that it will remain open. Dissecting pins can be used to hold open the mouth as wide as possible.
3. Using your dissecting manual as a guide, locate and identify the following parts, and label the diagram below. Be sure to find: tongue, point of attachment of the tongue, vocal sac openings of Eustachian tube, internal nares, vomerine teeth, maxillary teeth, palate and glottis.



### Questions continued:

4. Why is the point of attachment of the frog's tongue considered an advantageous adaptation?  
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5. Does the frog chew its food with the vomerine teeth? What do they use them for?  
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6. Which structures provide evidence that the frog has a partially aquatic life?  
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7. What are some of the major amphibian characteristics that the frog exhibits?  
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