

# Frog Dissection Procedures



Life Science 7<sup>th</sup> Grade  
Mr. Simpson

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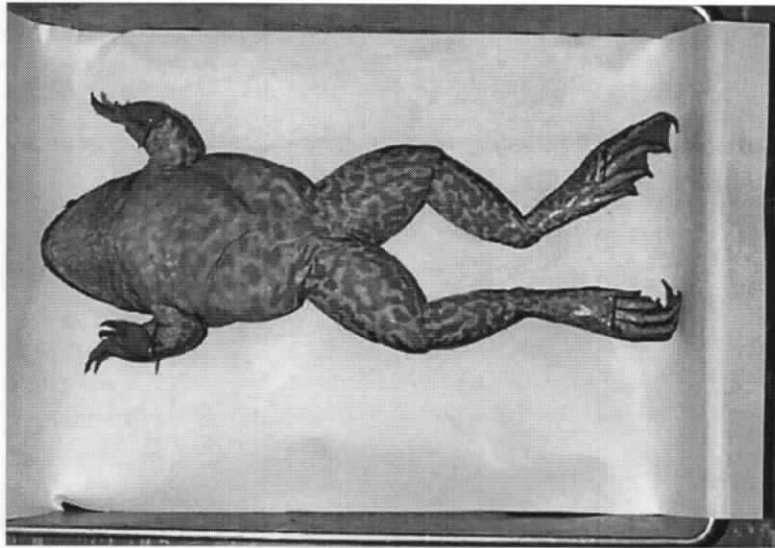
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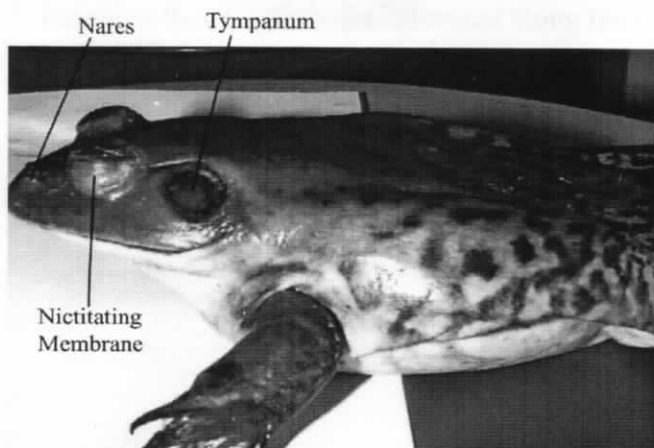
### I.) External Anatomy

1. Place the preserved frog in a dissecting tray.



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.



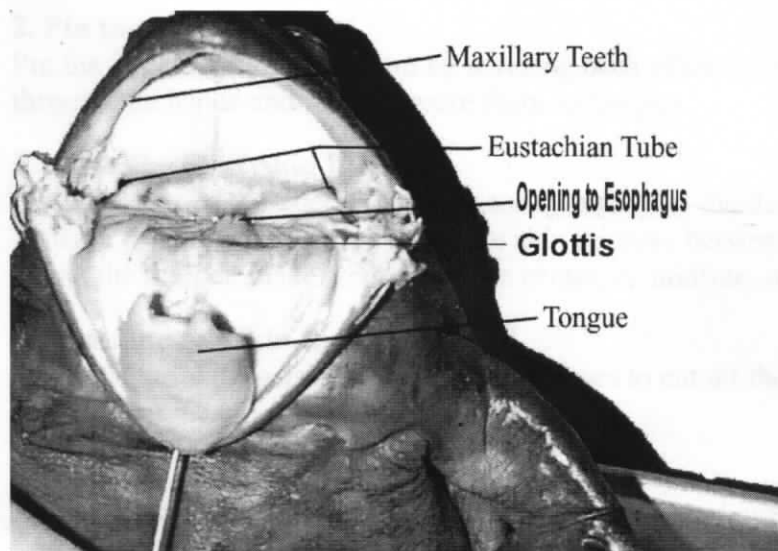
4. Examine the external nares (nostrils). Insert a probe into the external nares and note that it protrudes from one of the paired small openings, the internal nares inside the mouth cavity.

5. Identify the paired appendages. The short forelimb consist 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.

## 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 and posterior to the glottis and leads to the **stomach**.

## Setup for Internal Dissection

### Preparation:

This section explains the steps necessary to prepare your Specimen for the dissection process.

#### 1. Place Specimen in Pan

Rinse the Specimen with water then place it in the dissection pan. The Specimen should be lying on it's dorsal (back) side with the belly facing up.

## **2. Pin the Specimen**

Pin the Specimen for dissection by securing each of the four limbs to the pan. Place the pins through the hands and feet to secure them to the pan.

## **3. Begin the First Skin Incision**

Once the legs of the Specimen are securely pinned to the dissection tray begin the first skin incision by using the forceps to lift the skin midway between the rear legs of the Specimen. Using the scalpel, make a cut along the center, or midline, of the Specimen, bisecting it equally.

## **4. Continue the Skin Incision**

Continue the skin incision by using the scissors to cut all the way up the Specimen's body to the neck. Be very careful not to cut too deeply.

## **5. Make the Leg Incisions**

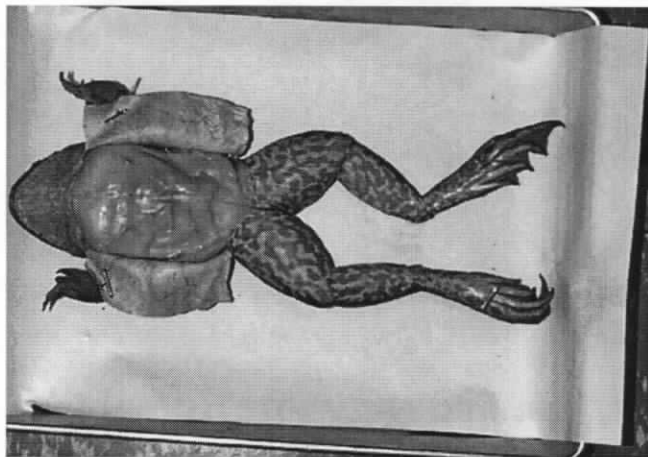
Still using the scissors, make horizontal incisions just above the rear legs and between the front legs of the Specimen.

## **6. Separate the Skin & Muscle**

Once you have finished the incisions between the front and rear legs of the Specimen you need to separate the skin flaps from the muscle below. To do this:

Pick up the flap of skin with the forceps, and

Use a scalpel to help separate the skin from the muscle below.



## **7. Pin Skin Flaps**

Once the skin flaps have been cut pin them to the dissection tray using several pins.

## **8. Begin the First Muscle Incisions**

This section will describe the procedures for making the incisions through the Specimen's abdominal muscles.

Now that the skin has been removed, begin the abdominal muscle incision by using the

forceps to lift the muscle midway between the rear legs of the Specimen. Next use the scalpel to start the incision in the direction of the chin.

## **9. Continue the Muscle Incision**

Using the scissors, carefully continue the incision up the midline of the Specimen, but do not cut too deeply as to damage the organs.

## **10. Turn Scissors Blades**

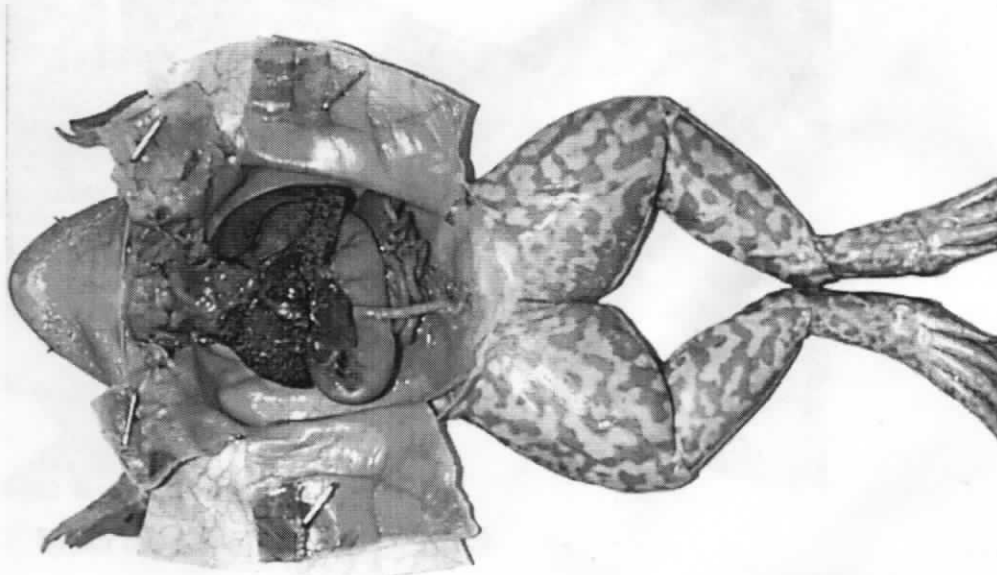
This is very important. When you reach a point just below the front legs, turn the scissors blades sideways to cut through the bones in the chest. This should prevent damage to the heart or other internal organs. When your scissors reach a point just below the Specimen's neck you have cut far enough.

### 11. Make the Second Muscle Incisions

Next, using the scissors, make horizontal incisions through the muscle between both the front legs and above the back legs.

### 12. Separate Muscle & Organs

To finish opening up the Specimen's body cavity therefore exposing the abdominal region, use the forceps to hold the muscle flaps while separating the muscle from the tissues below with a scalpel.

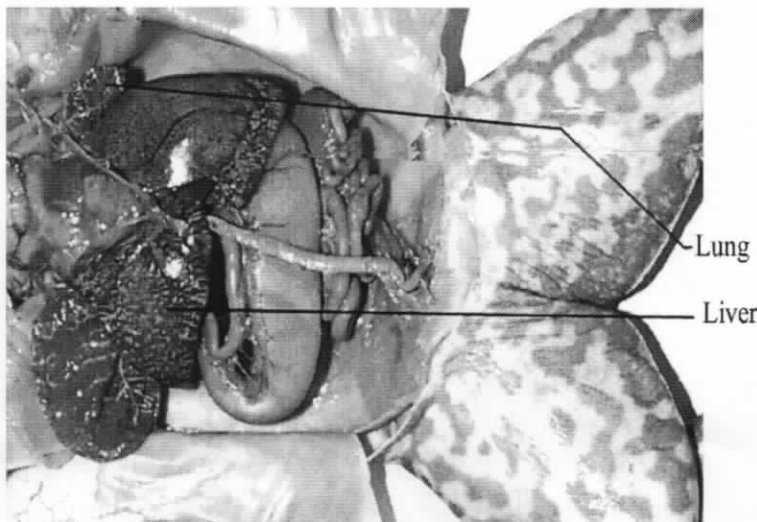


### 13. Pin the Muscle Flaps

Once the muscle flaps have been separated from the underlying tissue, they must be pinned back. This will allow easy access to the Specimen's internal organs.

## IV.) Respiratory System and Liver

1. Insert a probe into the **glottis**, and observe its passage into the **trachea**. Enlarge the glottis by making short cuts above and below it. When the glottis is spread open, you will see a fold on either side; these are the **vocal cords** used in croaking.

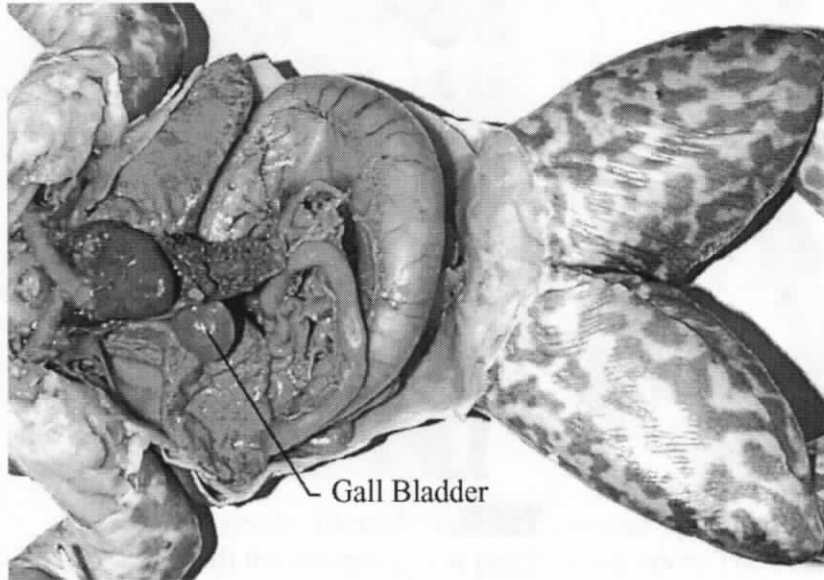


2. Identify the **lungs**, two small sacs on either side of the **midline** and partially hidden under the **liver**. Trace the path of air from the **external nares** to the **lungs**.

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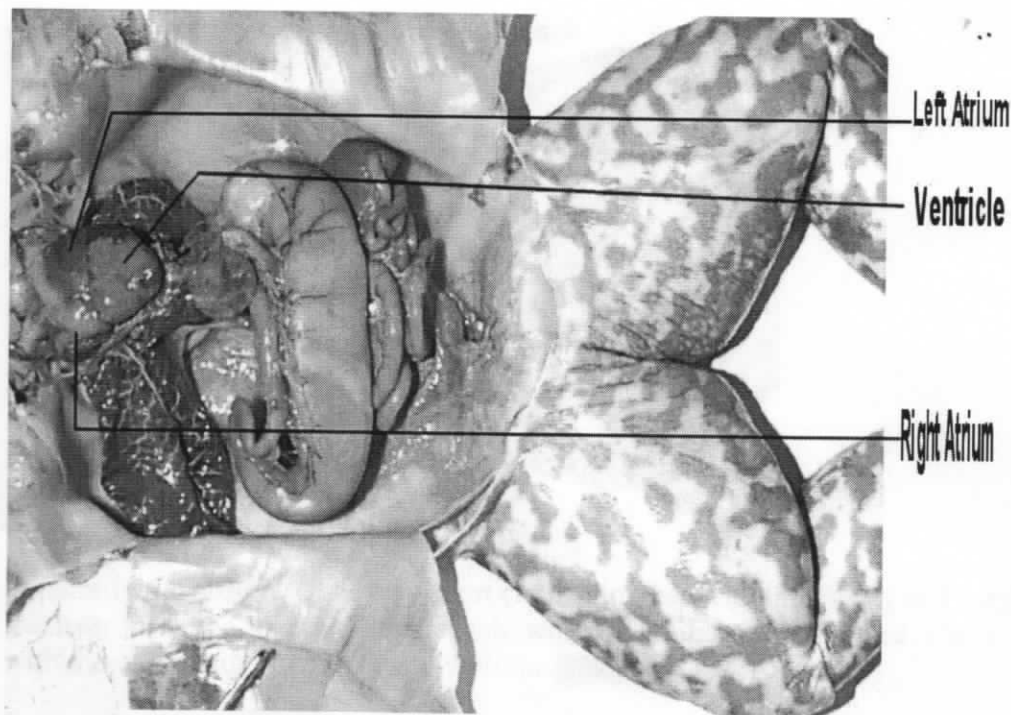


3. Locate the liver, the large, prominent, dark-brown organ in the mid ventral portion of the trunk.



4. Under the liver, find the gallbladder.

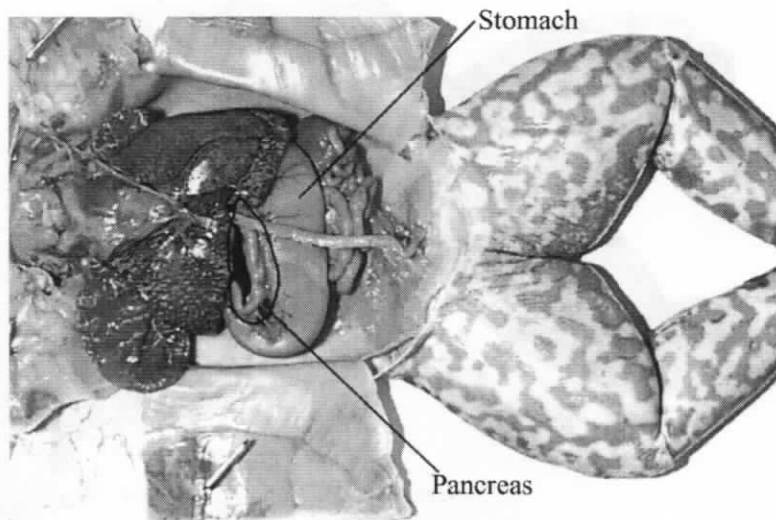
## V.) Circulatory System



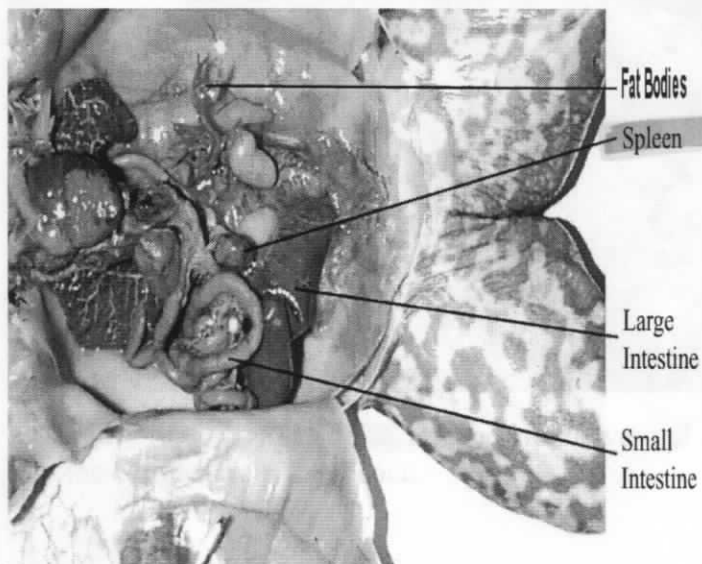
1. Lift the liver gently. Identify the heart, covered by a membranous covering (the pericardium). With forceps, lift the covering, and gently slit it open. The heart consists of a single, thick-walled ventricle and two (right and left) anterior, thin-walled atria.
2. Locate the three large veins that join together beneath the heart to form the sinus venosus. (To lift the heart, you may have to snip the slender strand of tissue that connects the atria to the pericardium.) Blood from the sinus venosus enters the right atrium. The left atrium receives blood from the lungs.
3. Find the conus arteriosus, a single, wide arterial vessel leaving the ventricle and passing ventrally over the right atrium. Follow the conus arteriosus forward to where it divides into three branches on each side. The middle artery on each side is the systemic artery, which fuses behind the heart to become the dorsal aorta. The dorsal aorta transports blood through the body cavity and gives off many branches. The posterior vena cava begins between the two kidneys and returns blood to the sinus venosus.

## VI.) Digestive System





1. Identify the **esophagus**, a very short connection between the **mouth** and the **stomach**. Lift the left liver lobe, and identify the stomach, which is whitish and J-shaped. The stomach connects with the esophagus anteriorly and with the **small intestine** posteriorly.
2. Find the **small intestine** and the **large intestine**, which enters the **cloaca**. The cloaca lies beneath the pubic bone and is a general receptacle for the intestine, the reproductive system, and the urinary system. It opens to the outside by way of the **anus**. Trace the path of food in the digestive tract from the mouth to the cloaca.
3. As you lift the small intestine you will see the **pancreas**, a thin, yellowish ribbon, between the small intestine and the stomach.

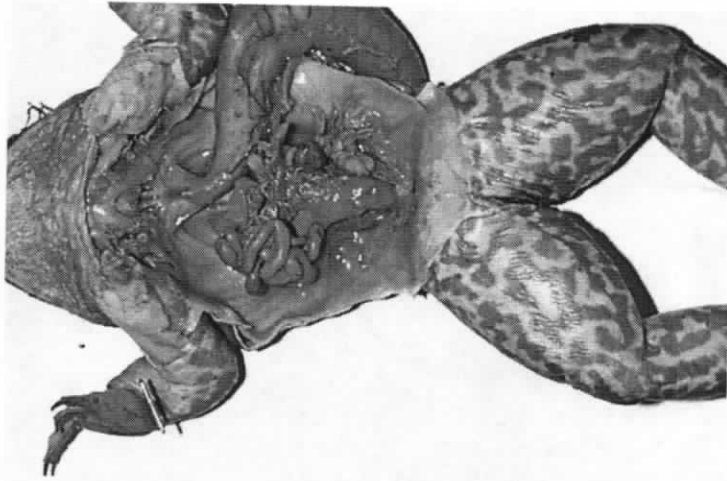


4. Locate the **fat bodies** near the stomach.

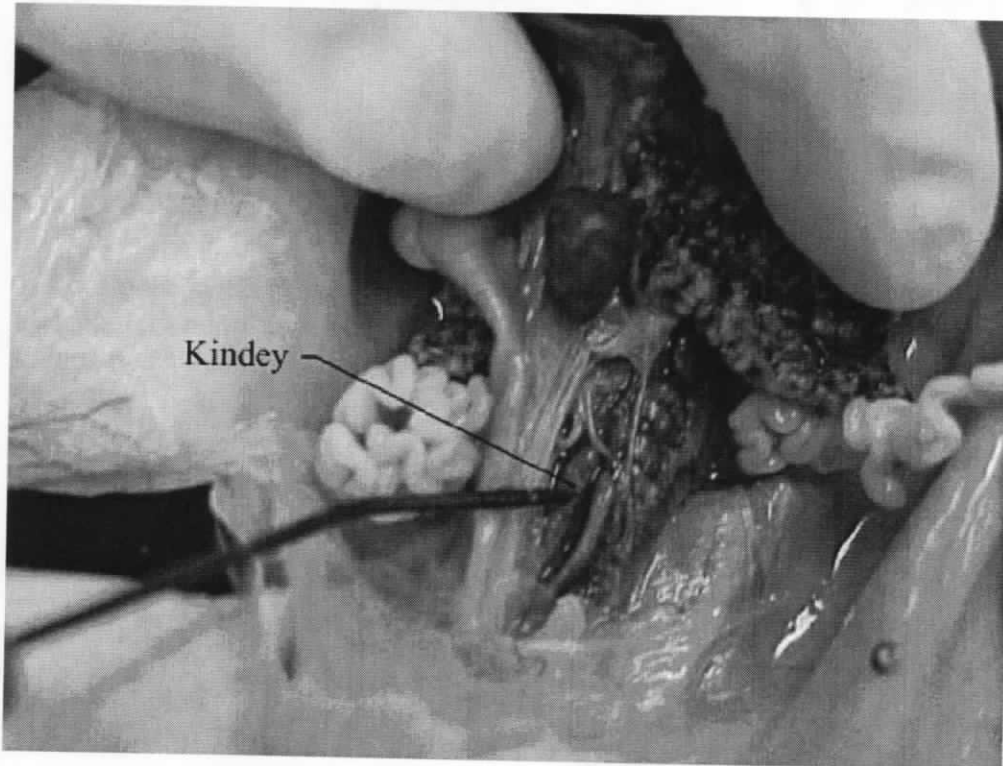
## System

## VII.) Urogenital

The urogenital system consists of both the urinary system and the reproductive system.

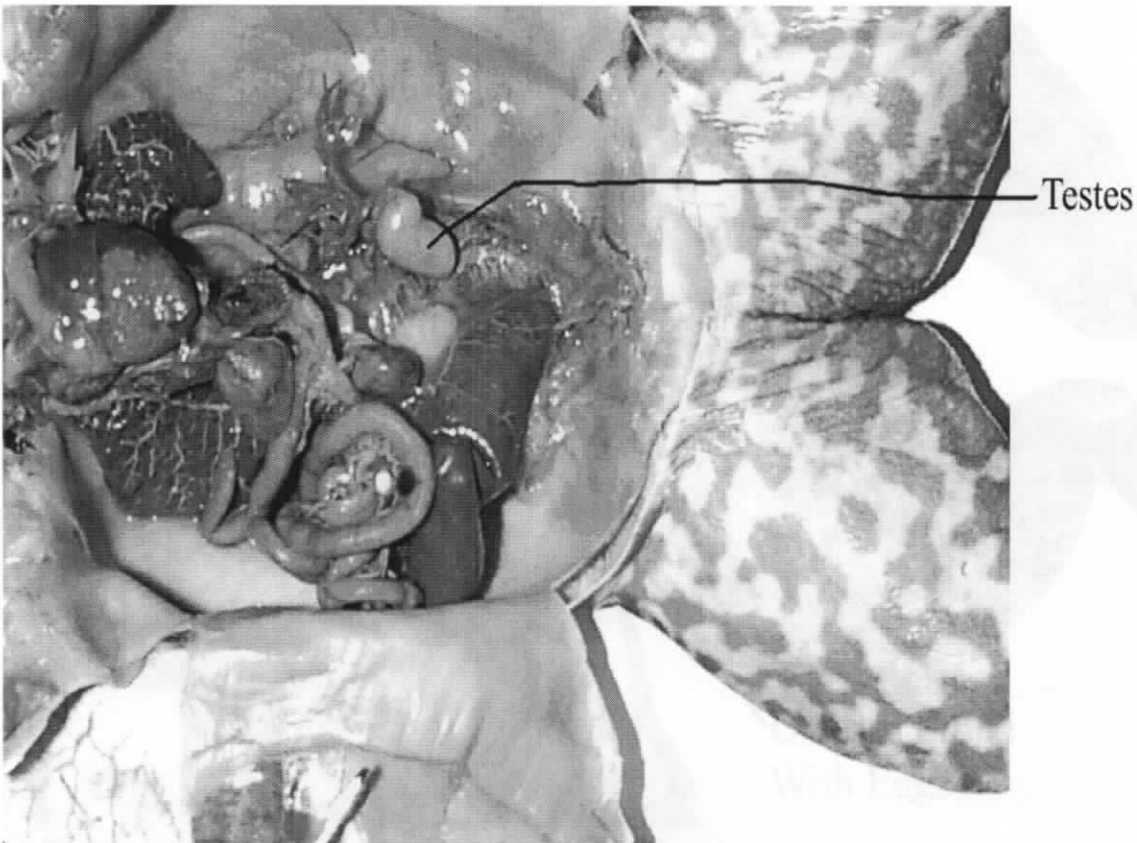


1. Identify the kidneys, which are long narrow organs lying against the dorsal wall.



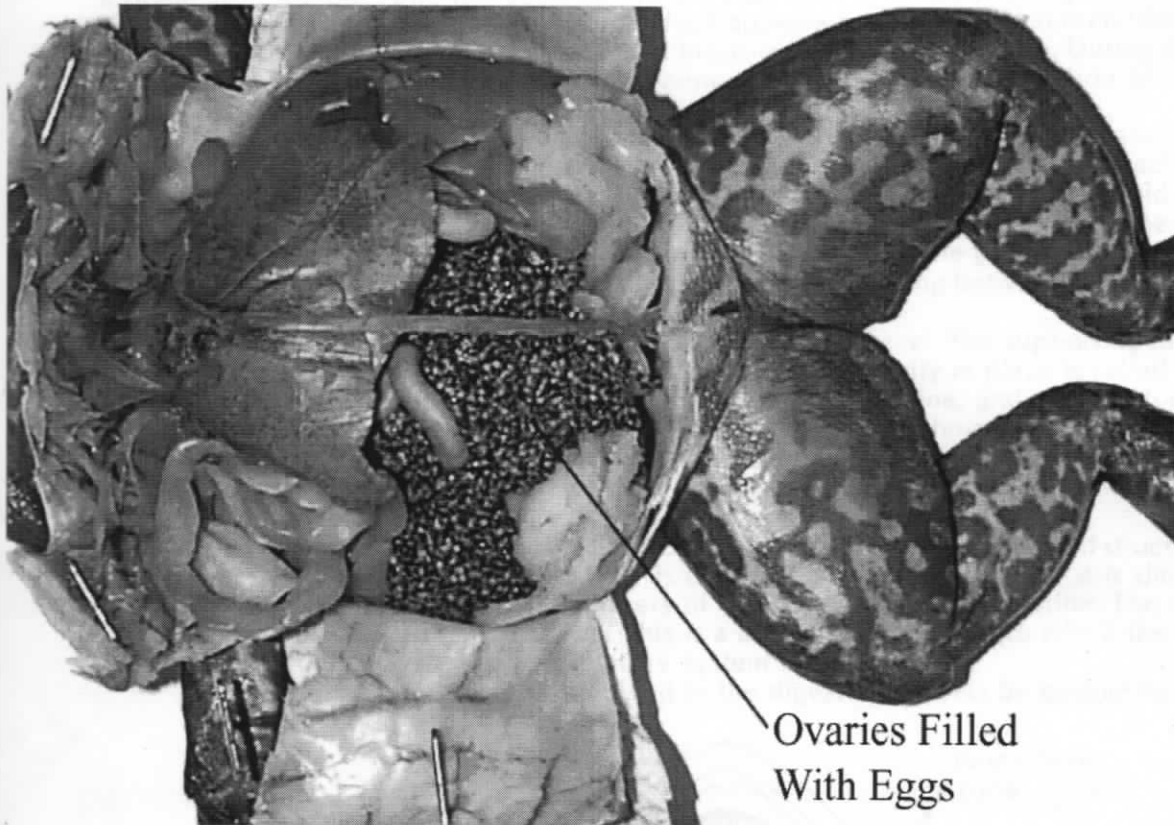
2. Identify the urinary bladder, attached to the ventral wall of the cloaca. In frogs, urine backs up into the bladder from the cloaca.

## VIII.) Male Anatomy



1. Locate the **testes** in the male frog. They are yellow or tan-colored, bean-shaped organs near the anterior end of each kidney. Several small ducts, the **vasa efferential**, carry sperm into the kidney ducts that also carry urine from the kidneys. Fat bodies, which store fat, are attached to the testes.

## IX.) Female Anatomy



Ovaries Filled  
With Eggs

1. Locate the **ovaries** in the female frog. They are attached to the dorsal body wall. Fat bodies are attached to the ovaries. Highly coiled **oviducts** lead to the cloaca. The **ostium** (opening) of the oviducts is dorsal to the liver.

## **X.) Cleanup**

1. Dispose of all frog parts properly in the container marked Animal Waste. Do not leave any of parts in the trash cans or sink.
2. Rinse and dry all equipment used, including the dissecting pan.

In all dissection directions, the terms right and left are used. This terminology always refers to the right and left of the animal being dissected.

The heart will be used as a point of reference. Just posterior to it are the rather large lobes of the liver. These are a reddish-brown color. How many lobes are there to a frog's liver? On the dorsal side of the liver, locate the greenish **gallbladder**. The green color results from a pigment in the **bile**. Bile is a secretion of the liver that is stored in the gallbladder. With the aid of a hand lens, locate the bile duct which appears as a thin, light-colored tube leading from the gallbladder to the part of the small intestine next to the **stomach**. During digestion, bile empties from the duct into the **duodenum**, identified as the first portion of the small intestines.

Under the lobe of the liver to the left is the whitish stomach. In many cases it is only slightly larger in diameter than the small intestines. Its lower end has a constricted area, the **pylorus** which controls the opening of the stomach into the intestine. Why should there be a valve at the junction of the stomach and intestine? When food passes from the stomach into the intestine, the secretion of the gallbladder and those of the **pancreas** are added. The pancreas is a flat, narrow structure, usually pinkish in color, lying between the inner surface of the stomach and the part of the small intestine next to it.

How are the stomach and large intestines held in place? The supporting membrane that holds the digestive tract and other organs of the body cavity in place is called a **mesentery**. Attached to the mesentery, just anterior to a large intestine, and slightly dorsal to it, is a small, reddish, pea-shaped organ, the **spleen**. Look for attachments of the spleen to the digestive tract. Is there any evidence that would indicate that the spleen is a part of the digestive system? The spleen is actually part of the circulatory system and is involved in the storage and filtration of blood.

Return now to the large intestine, which is a relatively short, pear-shaped structure opening to the exterior through the **anus**. Why is it called the large intestine if it is shorter than the small intestine? Compare the diameters of the large and small intestine. The intestines open into a chamber called the **cloaca**. This is a common chamber into which the digestive system, reproductive system, and excretory system open.

Review all of the structures involved in the digestive process by examining Figure 6.

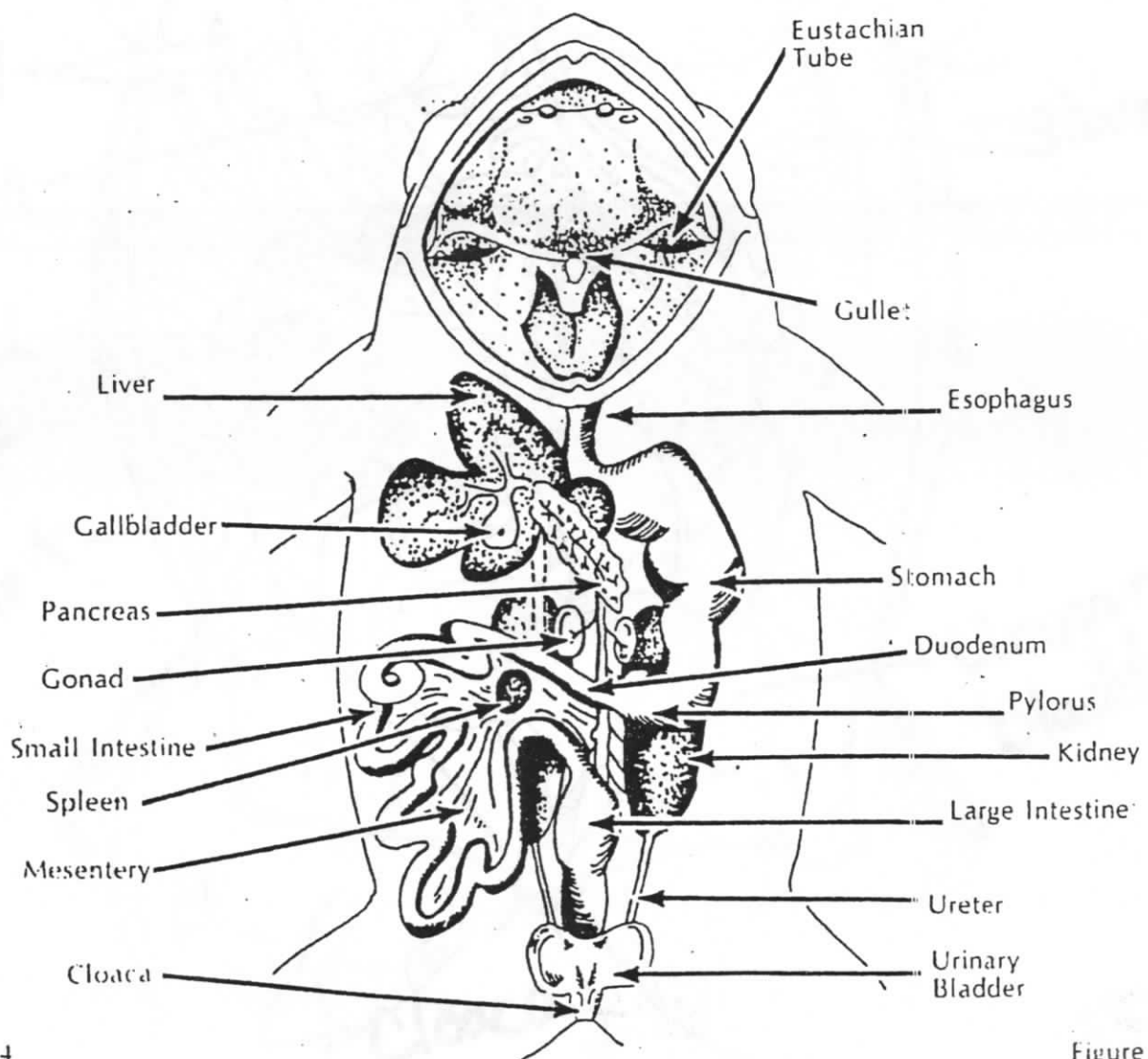
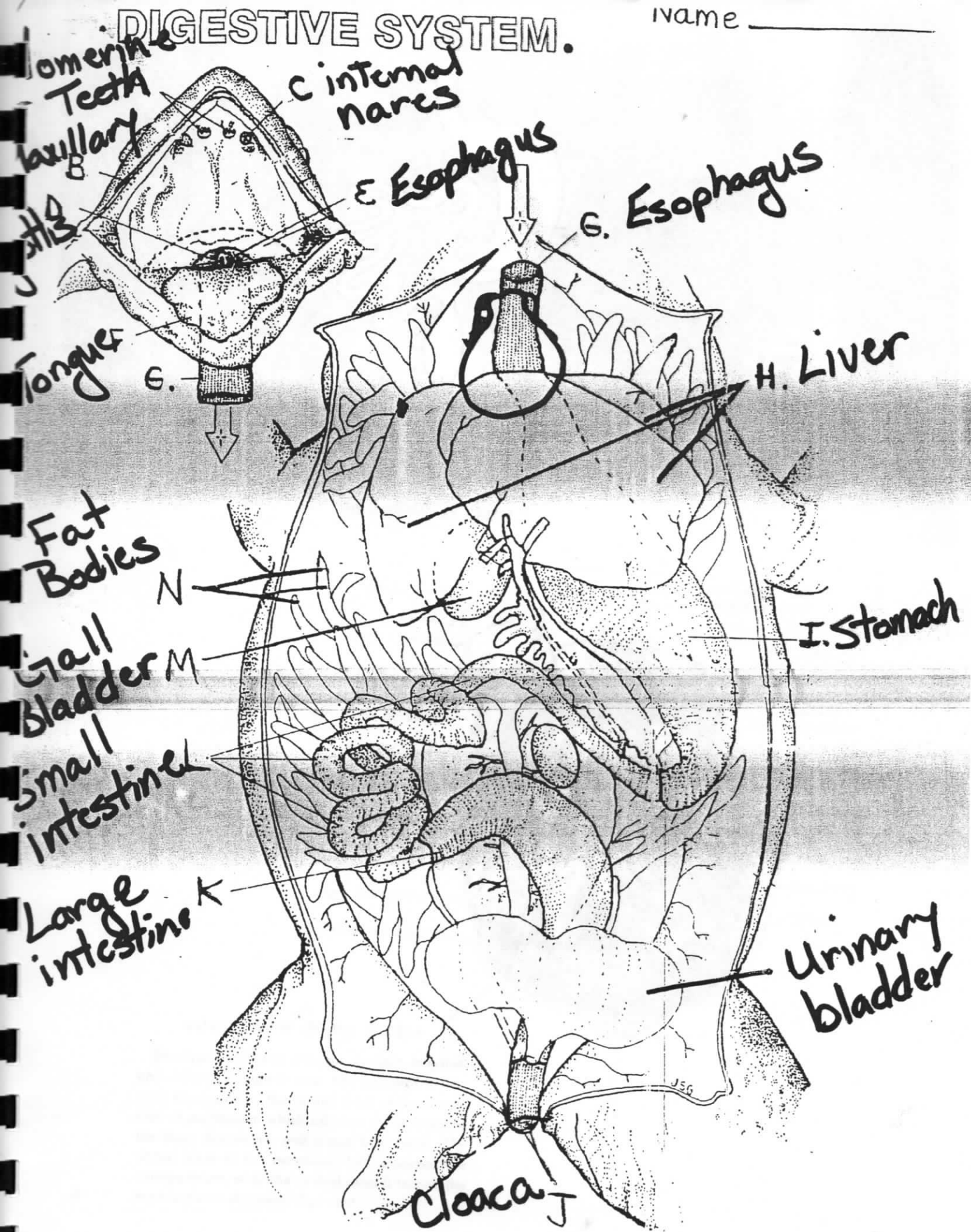


Figure 6

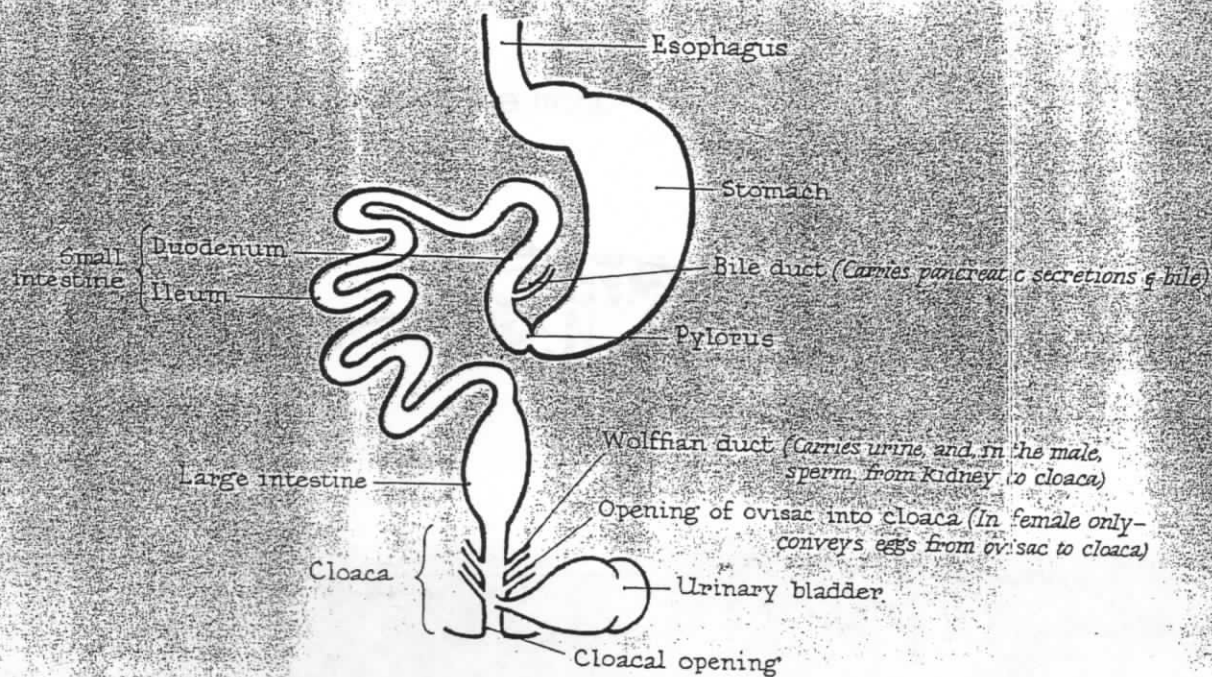


# DIGESTIVE SYSTEM.

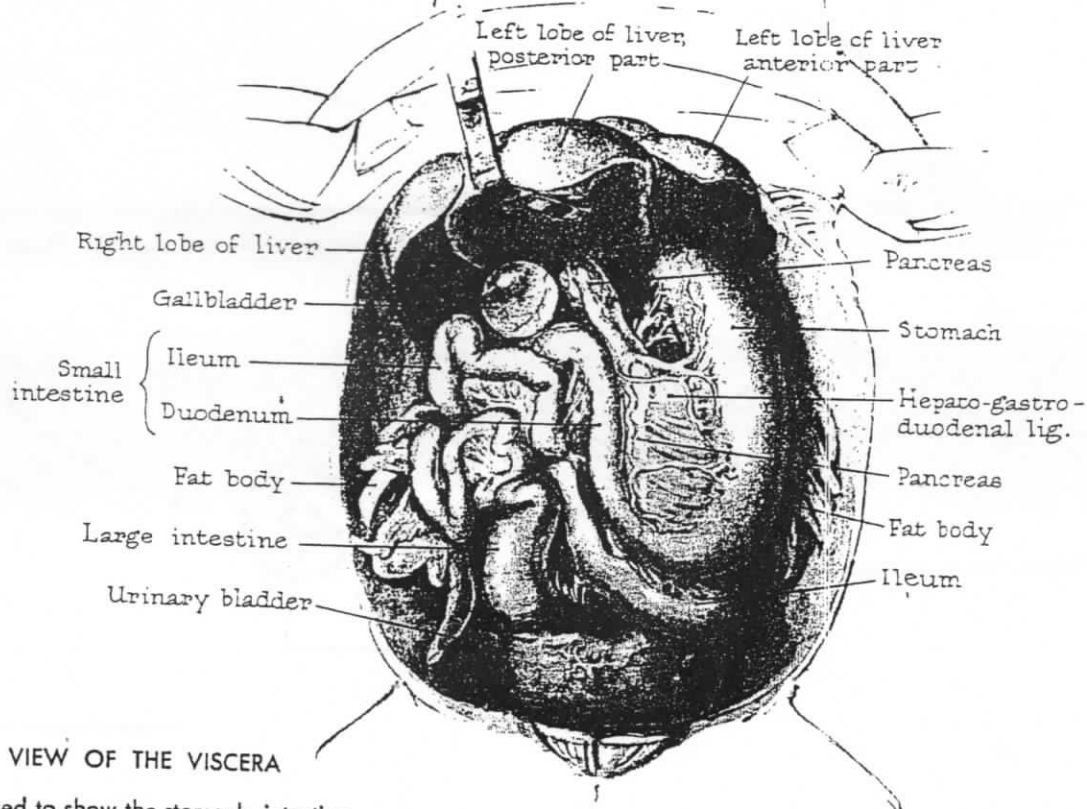
Name \_\_\_\_\_







### THE ALIMENTARY CANAL



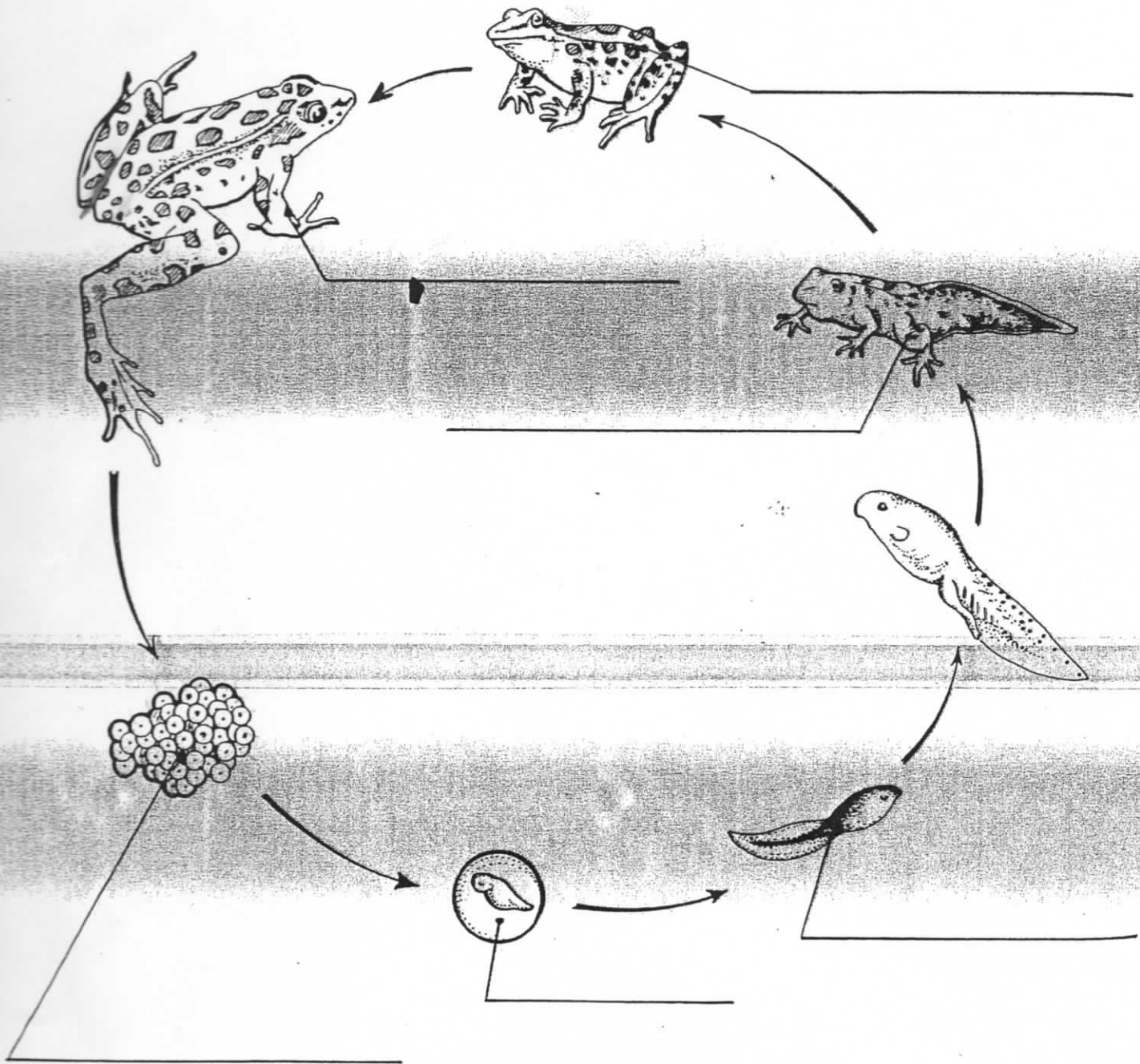
### VENTRAL VIEW OF THE VISCERA

The liver is raised to show the stomach, intestine, and urinary bladder in situ. The pancreas is partially concealed by the ventral sheet of the double fold of peritoneum which attaches the stomach to the liver, duodenum, and dorsal body wall. The dorsal sheet of this peritoneal fold is termed the *mesogastrium*, while the ventral sheet is termed the *hepato-gastro-duodenal ligament*.

# Life Cycle of a Frog

Name \_\_\_\_\_

Label the steps in the life cycle of the frog.



## WORD BANK

ADULT

JUVENILE

TADPOLE (2)

SPAWN

TADPOLE FROG

EMBRYO