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DISSECTION MANUAL FOR THE FETAL PIG

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****IMPORTANT****

BEFORE YOU LEAVE, YOU MUST:

- 1 DISPOSE OF ANY EXCESS SKIN OR OTHER PARTS IN THE TRASH**
- 2 WRAP YOUR PIG IN A MOIST PAPER TOWEL**
- 3 PLACE YOUR PIG IN A ZIP LOCK BAG.**
- 4 LABEL THE BAG WITH ALL OF YOUR NAMES AND CLASS PERIOD
PLACE YOUR PIG IN THE BOX DESIGNATED BY THE TEACHER.**
- 5 CLEAN UP YOUR AREA, TRAY, AND EQUIPMENT. MAKE SURE THAT
ALL ARE DRY. NO ONE WILL BE DISMISSED FROM YOUR
GROUP UNTIL YOUR AREA IS CLEAN AND DRIED!**

Fetal Pig Dissection

Day 1

Objectives:

1. Enhance observation, investigation and identification skills
2. Identify important external structures of the fetal pig.
3. Identify major structures associated with a fetal pig's digestive, respiratory, circulatory, urogenital, & nervous systems.
4. Compare the functions of certain organs in a fetal mammal with those of an adult mammal.

Background:

Mammals are vertebrates having hair on their body and mammary glands to nourish their young. The majority are placental mammals in which the developing young, or fetus, grows inside the female's uterus while attached to a membrane called the placenta. The placenta is the source of food and oxygen for the fetus, and it also serves to get rid of fetal wastes. The dissection of the fetal pig in the laboratory is important because pigs and humans have the similar levels of metabolism and have similar organs and systems. Also, fetal pigs are a byproduct of the pork food industry so they *aren't* raised for dissection purposes, and they are relatively inexpensive.

The fetuses are removed from the sow and embalmed with a preservative, which is injected through the umbilicus. Following this, the arterial and venous systems are injected under pressure with latex, a rubber-like compound. Arteries (red) are injected through the umbilicus; veins (blue) are injected through one of the jugular veins at the base of the throat. Usual dissection for a fetal pig development from fertilization until birth is 112 to 115 days. The pigs to be dissected have developed for at least 100 days and will be 7 to 13 inches in length. The pigs are most convenient to work with because they have pliable bones and no food in the gastrointestinal cavity.

Materials:

- preserved fetal pig
- dissecting pan
- dissecting kit containing- dissecting scissors, dissecting needle probes, forceps and scalpel
- string
- large trash plastic bag
- metric ruler
- paper towels
- goggles

***Wear your eye cover at all times. Watch your time and be sure to clean up all equipment and working area each day before leaving.

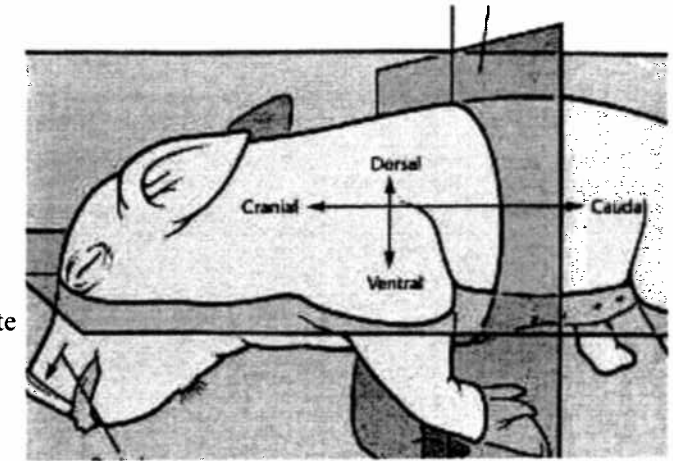
Fetal Pig Dissection–

Day 1 ~ External Anatomy:

A. External Anatomy

1. Obtain a fetal pig from your instructor, and rinse it under running water. This will help reduce the preservative odor that can be irritating.

2. Lay the pig on its side in the dissecting pan and locate dorsal (top), ventral (bottom), & lateral (more to the side) surfaces. Also locate the anterior (front) and posterior (back) ends.



B. Observe the external anatomy of your fetal pig and answer the questions below..

- Are any of your pig's external structures *different* from those of humans? If so, identify them.
- Are any of your pig's external structures *similar* to those of humans? If so, name them.
- How does your fetal pig compare to others in the class? How is it similar? How is it different? What might account for these differences?

Length (Cm)	Approximate age (days)
1.1	21
1.7	35
2.8	49
4.0	56
22.0	100
30.0 +	Full term 112-115

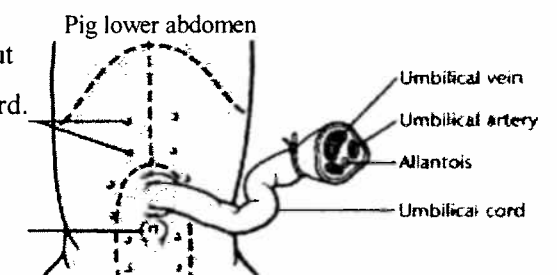
C. Observe the external anatomy of your fetal pig as described:

1. Measure your pig's length from the tip of its snout to the base of its tail and record. Use the length/age chart to determine the age of your fetal pig & record: Fetal pig length in cm: _____ Age of fetal pig: _____

2. Examine the pig's **head**, locate eyelids and ears and external nostrils.

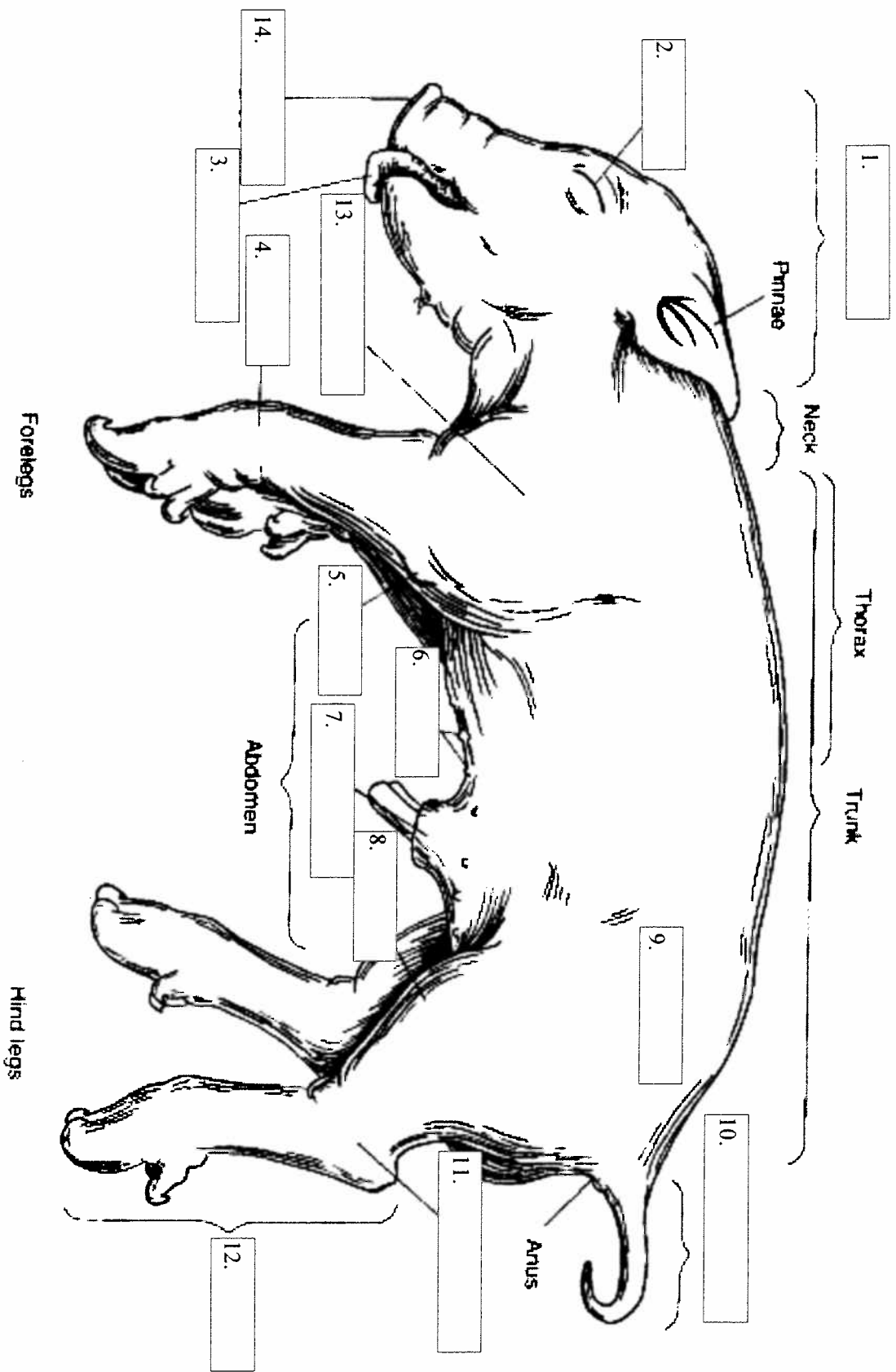
3. Study the pig's **appendages** and examine the pig's toes. Count and record the number of toes and the type of hoof the pig has. Number of toes: _____
Hooves: _____

4. Locate the umbilical cord using scissors, cut across the cord about 1 cm from the body. Examine the 3 openings in the umbilical cord. The largest is the umbilical vein, which carries blood from the placenta to the fetus. The two smaller openings are the umbilical arteries which carry blood from the fetus to the placenta.



Fetal Pig Dissection-

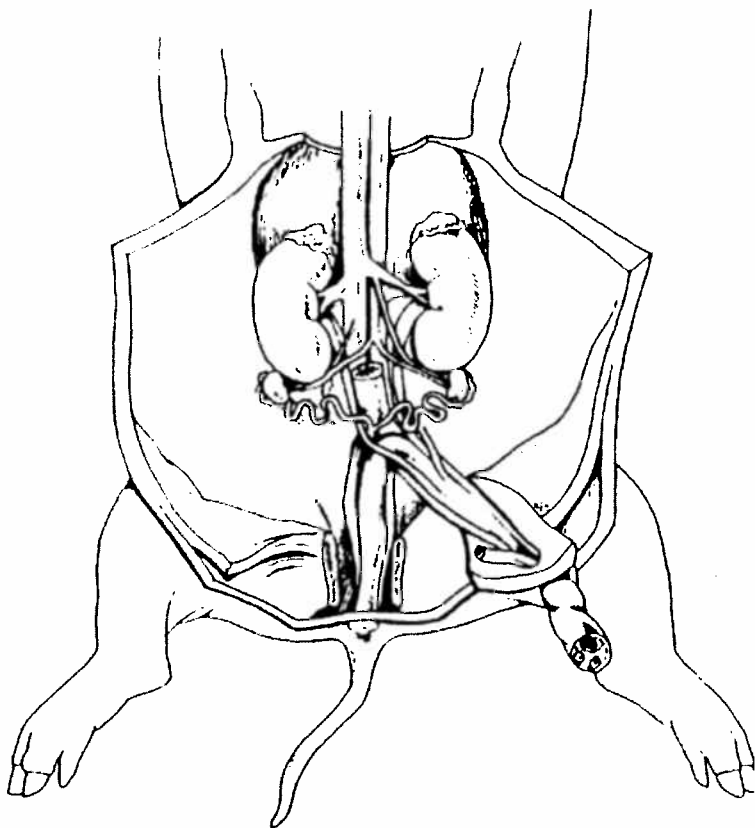
Day 1 ~ External Anatomy – Pig Diagram



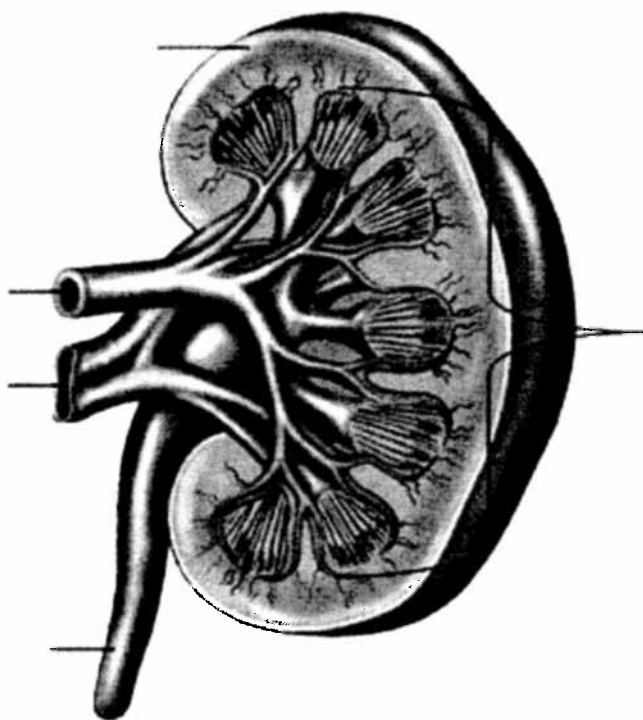
C. Observe the external anatomy of your fetal pig and use the diagram below to locate each structure listed:

foot	teats or mammary papillae	ankle	elbow	umbilical cord	shoulder	wrist
tongue	nares (nostrils)	eye	tail	head	knee	hip

2. Label the diagram of the pig urinary system.



3. Label the diagram of the internal structures of the pig kidney.



Pig Dissection

Title: The Urinary System Lab

Purpose: To dissect and observe the structures of the pig urinary system

Materials: shirt, gloves, paper towels, scalpel, forceps, scissors, probes, pig, colored pencils, rubber bands

Dissection of the Pig Urinary System

Procedure:

1. Identify the structures of the pig urinary system. Use your textbook as a reference.
2. Push the intestines to one side until you locate the kidneys.
3. Carefully remove the thin, filmy, transparent connective tissue called the **peritoneum**.
4. Identify the kidney. Next identify the **hilum**, which is the indentation on the medial border where the renal artery, renal vein, and ureter enter and exit.
5. Identify and observe the following external structures:
 - **Adrenal glands (on top of kidney)**
 - **hilum**
 - **renal artery***
 - **renal vein***
 - **ureter***
 - **urinary bladder***
 - **urethra***
6. Carefully remove one of the kidneys by cutting the renal artery, renal vein, and ureter.
7. Cut the kidney in half by making a cut parallel to the transverse plane so that you have an anterior and a posterior section of kidney.
8. Identify and observe the following internal structures:
 - **Renal cortex***
 - **Renal medulla***
 - **Renal artery**
 - **Renal vein**
 - **Ureter***

Conclusion Questions:

1. Next to each structure listed, write its function.

Kidney-

Renal artery-

Renal vein-

Ureter-

Urinary bladder-

Urethra-

Renal cortex-

Renal medulla-

Pig Dissection

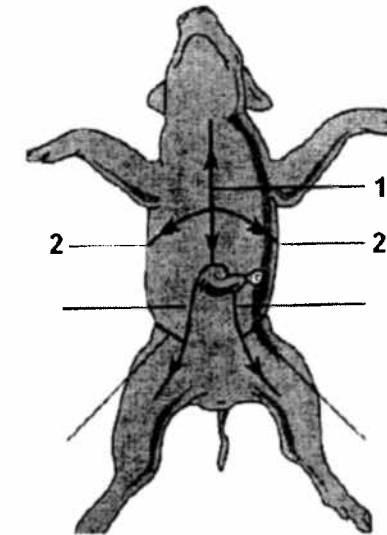
Title: The Cardiovascular System Lab

Materials: shirt, gloves, paper towels, scalpel, forceps, scissors, probes, pig, colored pencils, rubber bands

Opening the Thoracic Cage

Procedure:

1. You will be identifying the structures of the pig cardiovascular system. Use your textbook as a reference.
2. Find the **sternum** of the pig and locate the **xiphoid process** by tracing the bottom of the rib cage.
3. Using the scalpel make an incision from the xiphoid process to just below the chin. (Be careful not to cut too deep and damage internal organs)
4. Using scissors and your first incision as a guide, penetrate the chest cavity below the xiphoid process and cut through the sternum just below the chin **(1)**. (Be careful not to cut too deep and damage internal organs)
5. Carefully spread apart the walls of the thoracic cage and locate the **diaphragm** at the caudal end of the incision.
6. Make a cut just superior to the diaphragm laterally and dorsally toward the spine on both sides **(2)**.



7. Spread apart the walls of the thoracic cage to expose the internal organs.
8. Identify the heart.
9. Remove CT surrounding the heart using your forceps. (Be careful not to remove major blood vessels coming off of the heart)

Identification of Structures of the Heart

Procedure:

1. Identify the **pericardial sac**
 2. Using your forceps and scalpel, make an incision through the pericardial sac from the apex (bottom) to the base (top).
 3. Peel the pericardial sac dorsally.
 4. Identify the following structures externally:
 - **right and left atria***
 - **right and left ventricle***
 - **superior and inferior vena cava***
 - **aorta***
 - **brachiocephalic artery***
 - **subclavian artery***
 - **common carotid artery**
 - **pulmonary trunk**
 - **internal and external jugular vein**
- (Note- arteries and veins have been color coded for you)

5. Without removing the heart, use the scalpel to make an incision into the heart from the apex (bottom) to the base (top), dividing the heart into dorsal and ventral halves (Do **not** cut entirely through the base of the heart!)
6. Carefully spread the two halves apart and remove any latex that will prevent your from identifying the following structures:
 - **right and left atria***
 - **right and left ventricle***
 - **bicuspid and tricuspid valves***

Conclusion Questions:

1. Next to each structure listed, write its function.

Heart-

Right atrium-

Left atrium-

Right ventricle-

Left ventricle-

Superior vena cava-

Inferior vena cava-

Aorta-

Brachiocephalic artery-

Subclavian artery-

Common carotid artery-

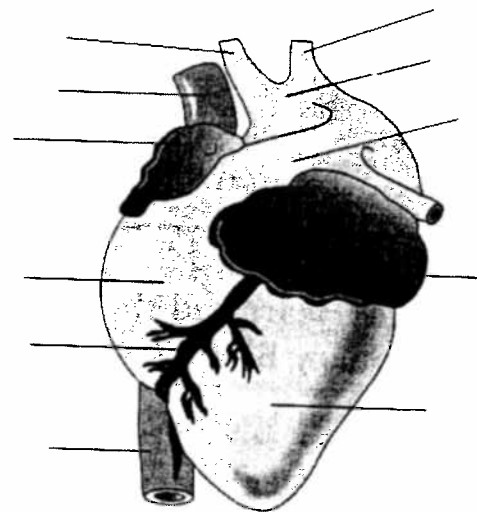
Pulmonary trunk (vein)-

Internal and External Jugular vein-

Bicuspid (mitral) valve-

Tricuspid valve-

2. Label the diagram of the pig heart.



Conclusion Questions:

1. Next to each structure listed, write its function.

Mouth-

Esophagus-

Stomach-

Small intestine-

Large intestine-

Rectum-

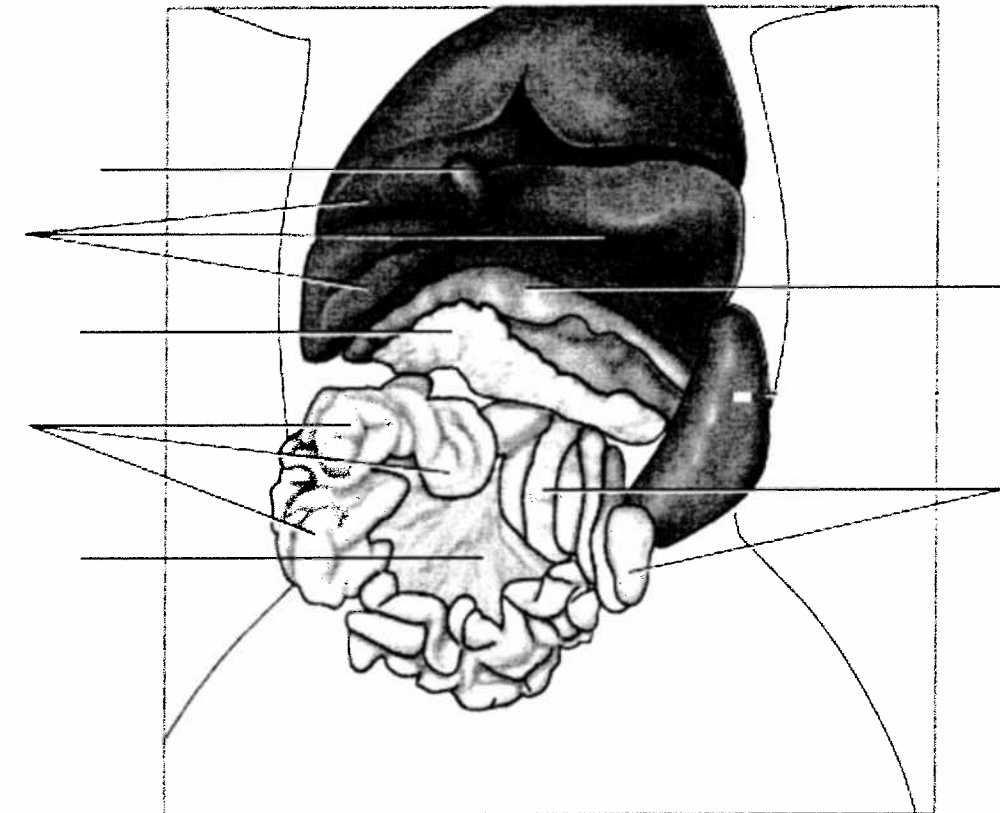
Anus-

Mesentery-

Liver-

Pancreas-

2. Label the diagram of the pig digestive system.



Pig Dissection

Title: The Digestive System Lab

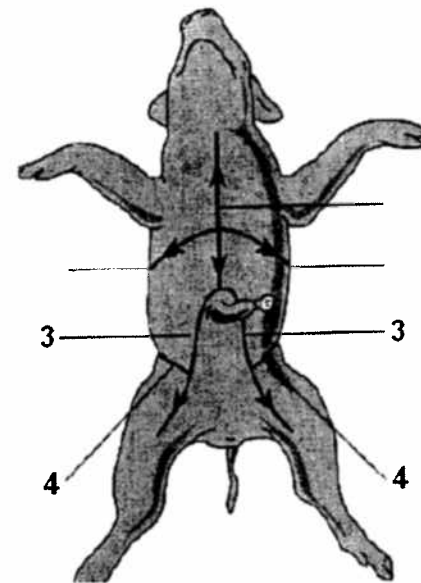
Purpose: To dissect and observe the structures of the cat digestive system

Materials: shirt, gloves, paper towels, scalpel, forceps, scissors, probes, cat, colored pencils, rubber bands

Dissection of the Pig Digestive System

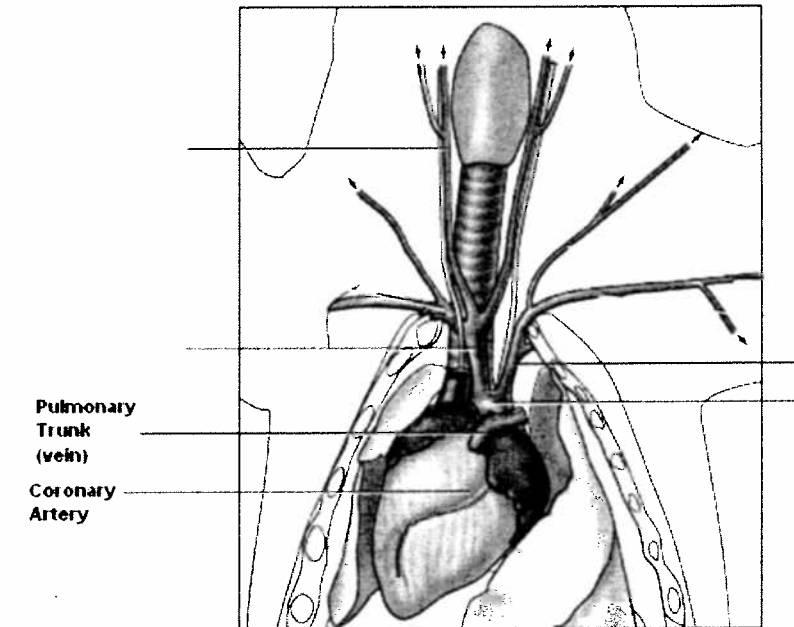
Procedure:

1. Identify the structures of the cat digestive system. Use your textbook as a reference.
2. Using scissors, continue your incision from the cardiovascular system from the **xiphoid process** to the pelvic region just above the **genitalia**. Cut around the umbilical cord. **(3)**
3. At the pelvic region, make cuts laterally and dorsally toward the spine on both sides. **(4)**

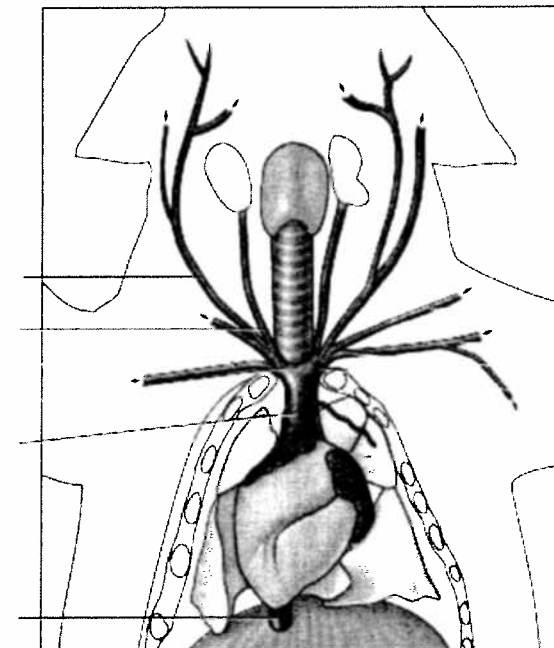


4. Carefully peel back the abdomen and observe the following structures:
 - esophagus (behind the trachea)*
 - liver*
 - gall bladder*
 - stomach*
 - pancreas*
 - small intestine*
 - large intestine*
 - mesentery*
 - rectum*
 - anus

3. Label the arteries of the pig cardiovascular system.



4. Label the veins of the pig cardiovascular system.



Pig Dissection

Title: The Respiratory System

Purpose: To dissect and observe the structures of the respiratory system.

Materials: shirt, gloves, paper towels, scalpel, forceps, scissors, probes, pig, colored pencils, rubber bands

Dissection of the Pig Respiratory System

Procedure:

1. Identify the structures of the pig respiratory system. Use your textbook as a reference.
2. Using the cranial incision from the cardiovascular system, carefully spread apart tissues surrounding the larynx
3. Using the probe and forceps, carefully remove the connective tissue surrounding the larynx.
(Do not cut the larynx!)
4. Gently free the cartilaginous larynx anteriorly until it is free of its muscle attachments **(Do not pull out the larynx!)**
5. Observe the following structures:
 - Larynx
 - trachea*
 - primary bronchi*
 - lungs*
 - diaphragm*

Conclusion Questions:

1. Next to each structure listed, write its function.

Nose-

Larynx-

Trachea-

Left and Right primary bronchi-

Lungs-

Diaphragm-

2. Label the diagram of the pig respiratory system.

