



Student Guide

Tips for Success

- ▶ Login to your account on the Student Portal, then leave the page open so you can access the *Background Information* and *Concept Slides* if/when needed.

Identify your work:

You will work with a collaborative team of scientists (your lab group). Doing so will increase the reliability of your results. You will complete the Conclusions and Discussion questions independently. Doing so will enable you to reflect on your personal development and process as a whole.

Your Name:

Group or Lab Partner(s):

Baseline Observation:

Briefly explain what you currently understand about meiosis, gamete (sperm and ova) formation, and human chromosomes. Doing so will allow you to evaluate your work over time.

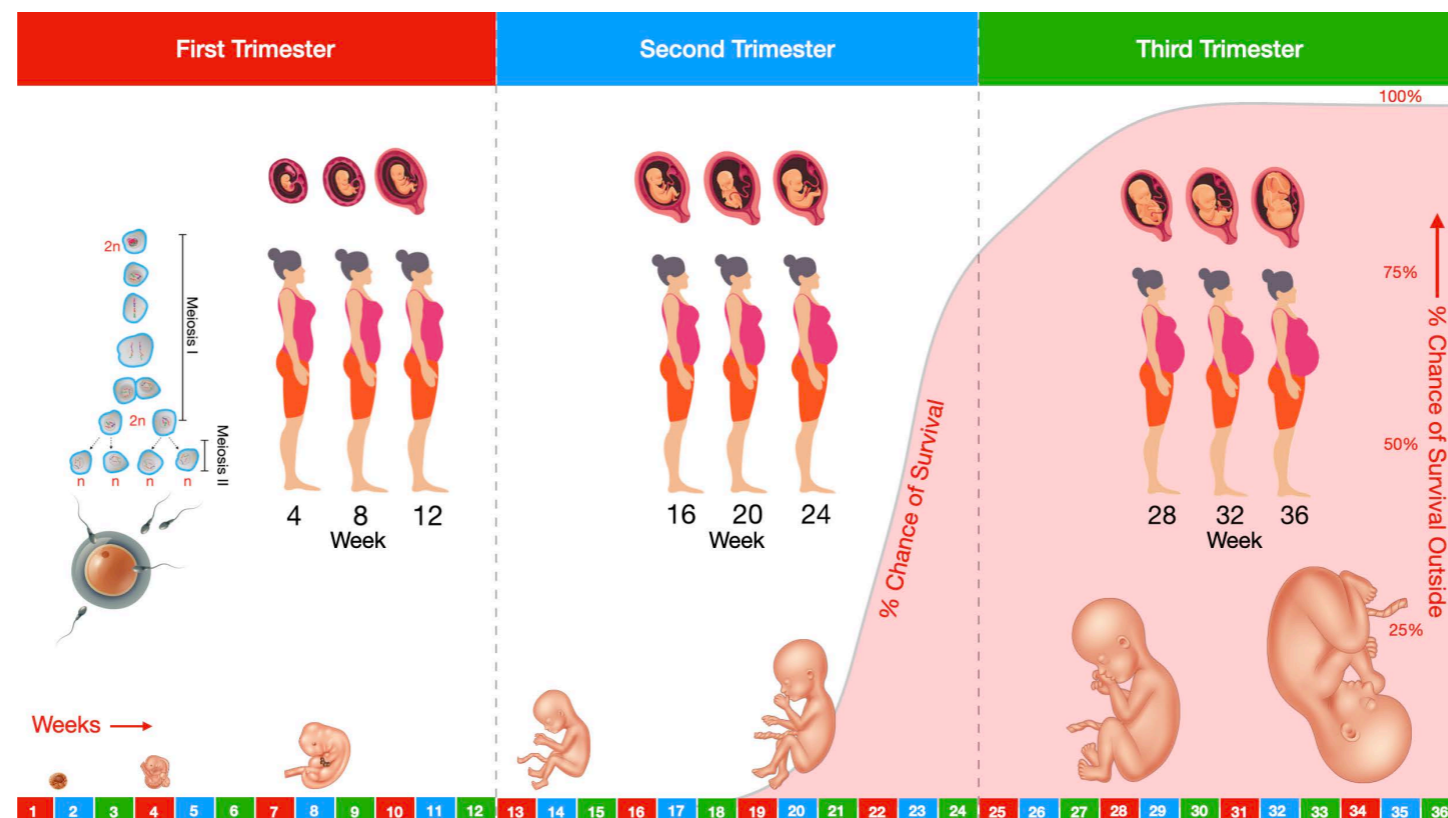
Background Research:

Open the *Introduction* and *Concept Slides* via the *Student Portal*. As you read through the information, think critically, asking questions and evaluating the claims - not simply accepting what you read. Take note of any information that will help you answer the **Focus Questions** at the end of this .

Human Prenatal Development: Week 28 and Beyond

By the 28th week of human prenatal development, the fetus has reached a critical threshold. At this point, medical advances have made survival outside the womb increasingly likely—typically above 80% and approaching 95% with proper care. This is due to significant advances in the development of key organ systems, particularly the lungs and brain.

The third trimester becomes a time of intense preparation: the fetus gains weight rapidly, bones harden, brain tissue increases in complexity, and the body stores fat to regulate temperature after birth. These final months also allow essential systems, like digestion and circulation, to mature fully.



Background Research (continued):

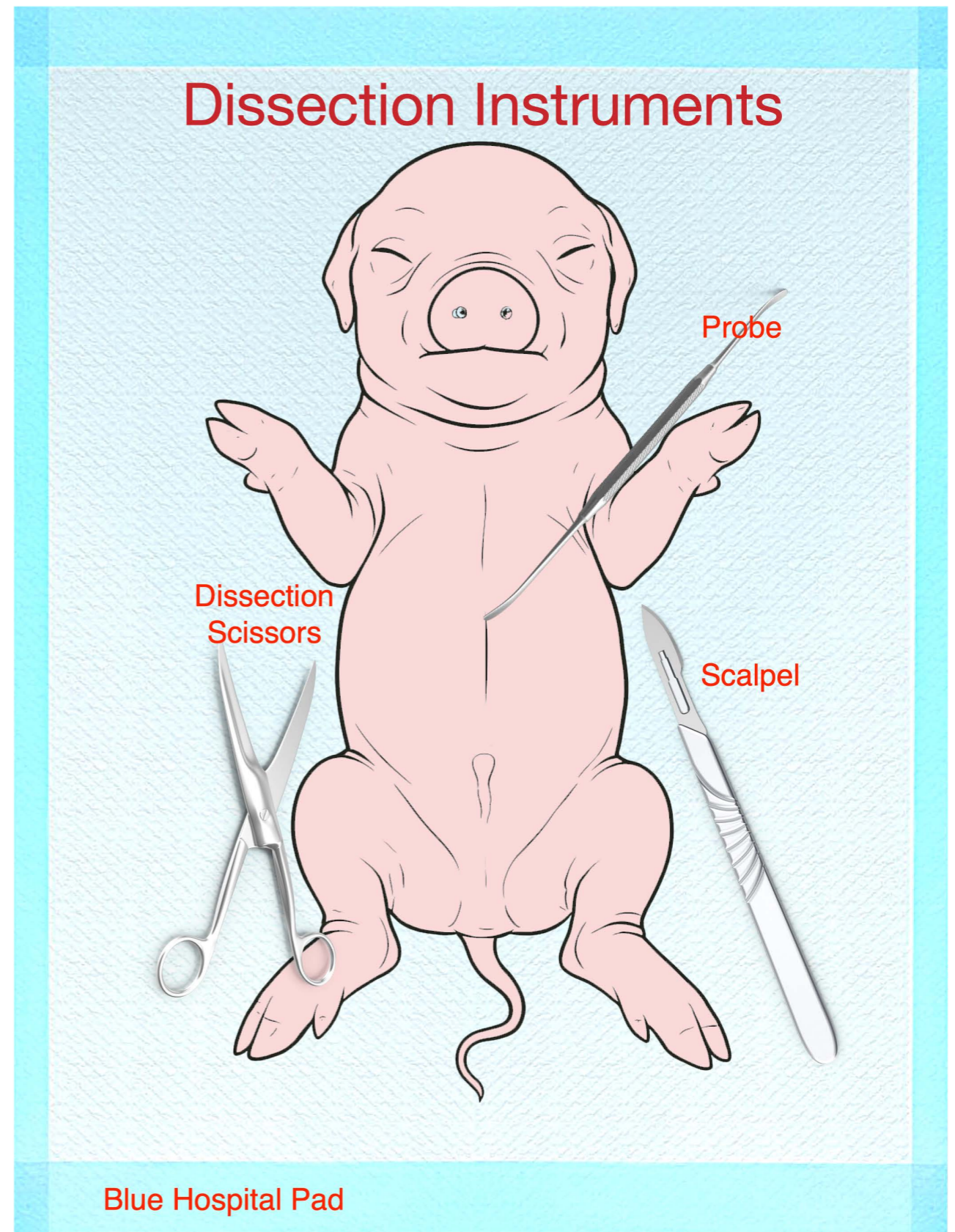
Fetal Pig Dissection: Ethical Exploration of Anatomy

The fetal pig dissection provides a culminating hands-on opportunity to explore mammalian anatomy in a way that few models or diagrams can replicate. Because pigs share many anatomical similarities with humans—especially in organ systems like the digestive, respiratory, and circulatory systems—students can directly apply their conceptual understanding of prenatal development to real internal structures. For many students, this is the first chance to see a heart, liver, or intestines in a real organism, deepening their appreciation for the complexity of life.

Lab safety and ethical awareness are essential.

Students are expected to handle specimens with care and respect, recognizing that this dissection is both a privilege and a serious scientific responsibility. Proper use of dissection tools, awareness of classmates, and a focus on learning objectives are vital.

In the context of the *Human Prenatal Development* CELL, dissections are never done for spectacle—they are a thoughtful extension of learning, reinforcing not only anatomical content but also the scientific habits of **precision, observation, and respect for life**. Through this experience, you should strengthen both your knowledge and your sense of ethical responsibility in science.



Response to Your Research

1. In your own words, explain what knowledge we hope to gain by performing a fetal pig dissection. How does this relate to the *Human Prenatal Development* unit as a whole?

2. List and briefly explain three new/interesting facts you have learned from your background research.

Experiment-Materials:

Chromebook/Laptop (or printed version)

Fetal pig*

Blue hospital pad (or dissection tray)

Dissection scissors

Dissection probes

Scalpel (careful!)

Exam gloves

Safety glasses or goggles (recommended)

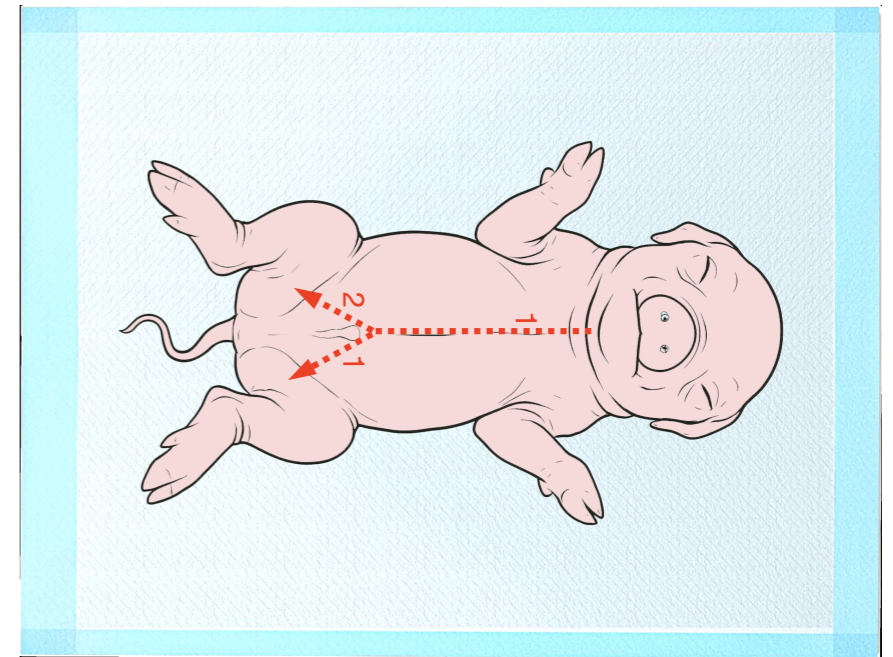
*The fetal pigs you are studying are at a stage of development similar to a human fetus in the later part of pregnancy, when most organ systems are already formed and continuing to mature. Your specimens represent development that is nearly complete—but not yet independent. This stage roughly corresponds to the third trimester of human prenatal development.

Experiment-Protocol

Fetal Pig Dissection

Work in groups at a bench.

1. Place the **blue hospital pad** on the bench, the blue side down.
2. Position the fetus on the pad on its back, belly-side up. Lab members will need to hold the fetus' legs gently apart to expose the chest and **abdomen** for dissection.
3. Use the scalpel to carefully cut through the skin, beginning under the chin down the chest and abdomen and then to the right side of the umbilical cord to the top of the leg.
4. Next, use the scalpel to cut from the mid-line above the **umbilical cord** down to the top of the other leg.
5. Wipe off the scalpel and return it to the distribution center.
6. Once the scalpel is removed from the bench and returned to the distribution center, group members can now pull the incision of the abdomen open to expose the internal organs of this compartment.
7. You may be able to find the **umbilical vein** by gently pulling up on the umbilical cord and looking for an attachment from it to the liver. The umbilical vein and arteries connect the fetal liver to the placenta, which, in turn, interacts with the mother to transport nutrients to the fetus and metabolic waste products from the fetus to the mother.
8. Detach the umbilical vein by tearing it with a probe or cutting through it with the dissection scissors.



Experiment-Protocol (Continued)

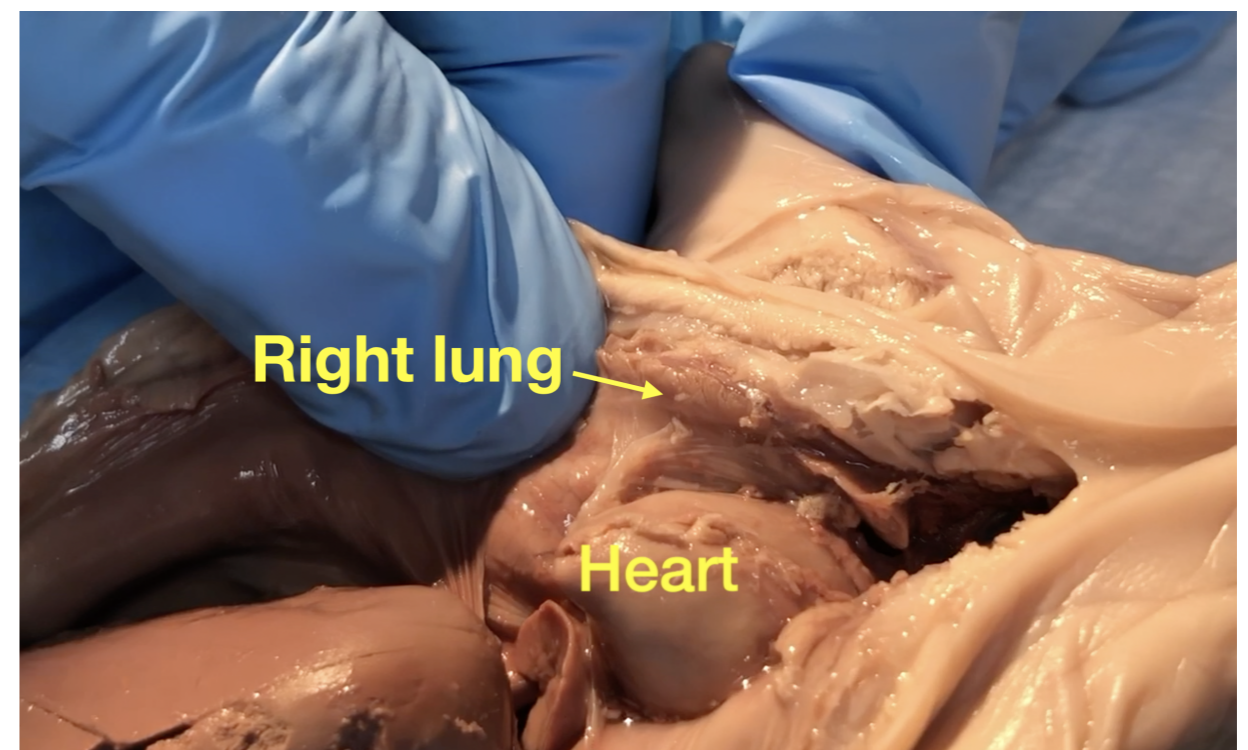
9. Continue to gently pull on the umbilical cord, which will expose the **intestine** in the lower abdomen. We will return the the intestine later.

10. Locate the **liver**, which is the largest organ in the abdomen, usually reddish-brown in color.

11. Next, open the **chest cavity (thoracic cavity)** by carefully cutting through the **ribcage** from the top of the abdomen to above the shoulders (below). Lab partners should help once the cut has been made, to pull apart the incision. This must be done firmly as the ribs may need to be broken to get a good view of the chest cavity.



12. Once the chest is open and exposed, you will immediately see the heart (right). At this stage of fetal development, the heart is fully capable of pumping blood throughout the entire fetal circulation, providing essential nutrients and oxygen to every cell in the developing fetus. It also removes waste like urine, urea, ammonia, and carbon dioxide from the fetus and transports it to the placenta for removal.

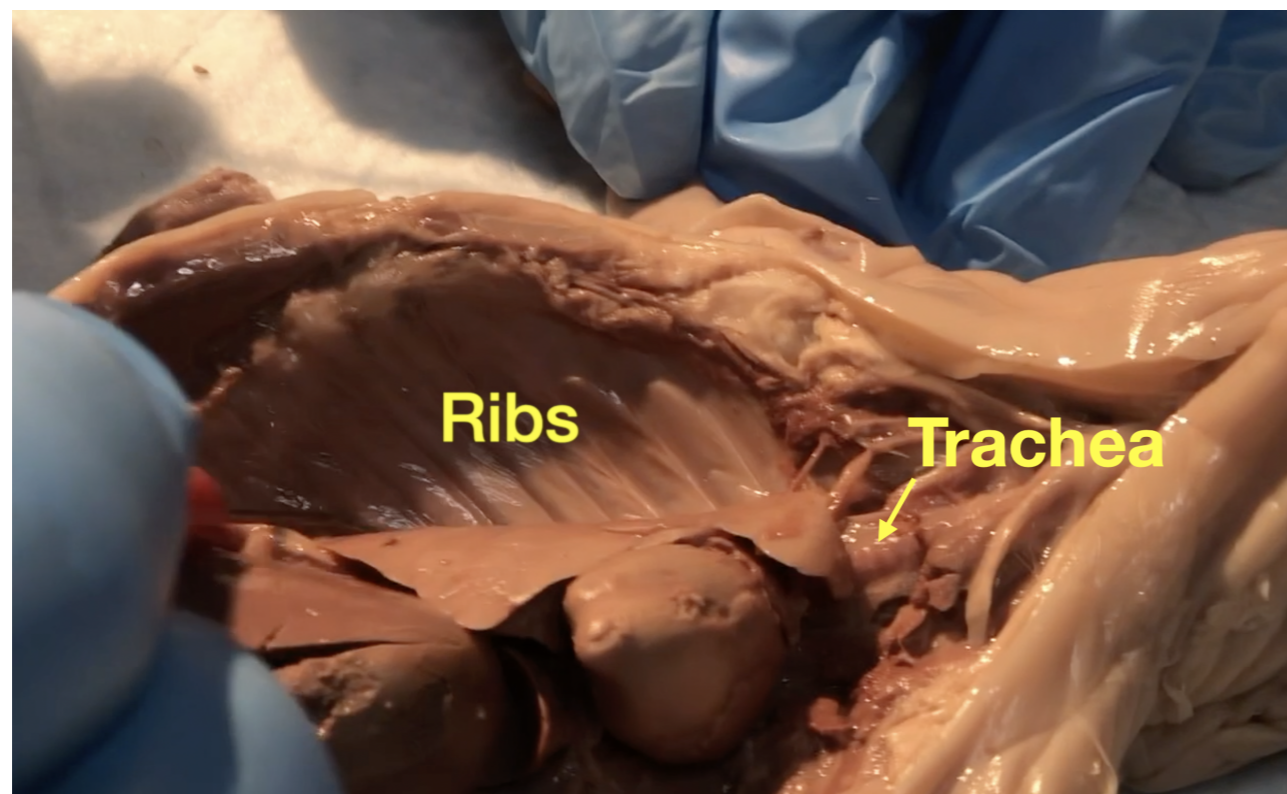
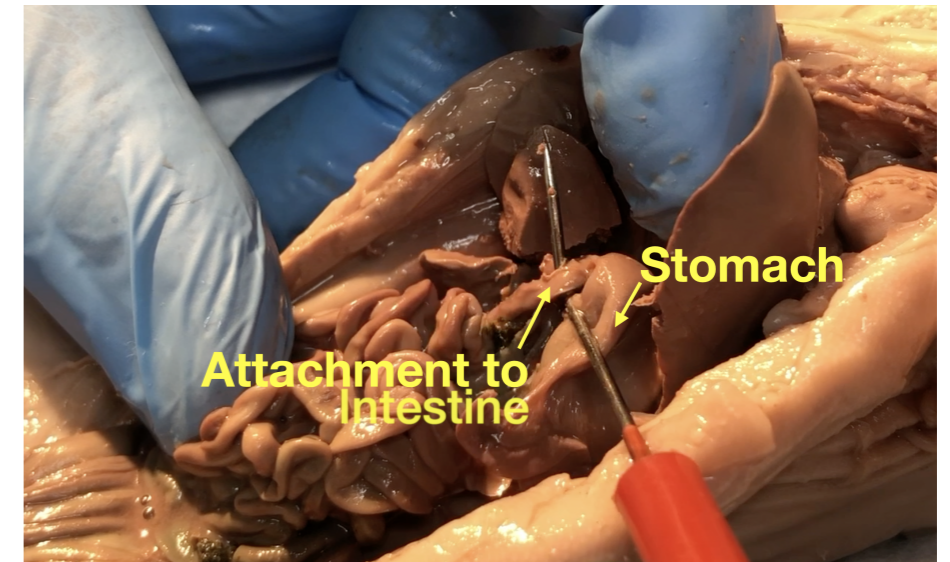


Experiment-Protocol (Continued)

13. To the left and right of the heart you may see the lungs. They are difficult to see sometimes as they are not filled with air as they will be after the pig is born and takes its first breaths. At that time, the lungs will occupy a much greater volume of the chest cavity.

14. Return to the abdomen and lift the liver to expose the large **stomach** and see if you can find its attachment to the intestine. Notice again how large the liver is in the fetus.

15. Finally, return to the chest and find the **ribs** and the **windpipe (trachea)** just above the heart and running up into the throat (below) It is easily identified by its cartilaginous rings that hold it open to carry air in and out of the lungs once the animal is born.



Experiment-Protocol (Continued)

16. If you still have lab time remaining once you have gotten to this point, refer to the illustration on this page to explore other anatomical structures. Use the space below to list the structures you were able to find and any observations you wish to record.

