

Name: _____ Period: _____

Earthworm Dissection

Introduction: The earthworms are segmented worms and are members of the phylum Annelida. The word “annelida” means “ringed” and refers to a series of rings or segments that make up the bodies of the members of this phylum. The adult worm may have more than 100 of these segments. The earthworm is well adapted to its terrestrial way of life. Its streamlined body helps it to burrow through the soil and it secretes a covering of mucus to help it slide through the soil. The wet and slimy coating of mucus is also necessary for the exchange of gases that occurs through the skin of the earthworm. As the earthworm moves through the soil, a muscular pharynx aids in sucking in the dirt in its path. As this dirt moves through the worm internally, organic matter is digested and used as a source of food.

Materials:

Forceps	Dissection needles	Earthworm per pair
Scalpels	Hand lens	(ethanized in 70% isopropyl alcohol for 5 minutes)
Scissors	Dissecting Tray	
T-Pins	Ruler	

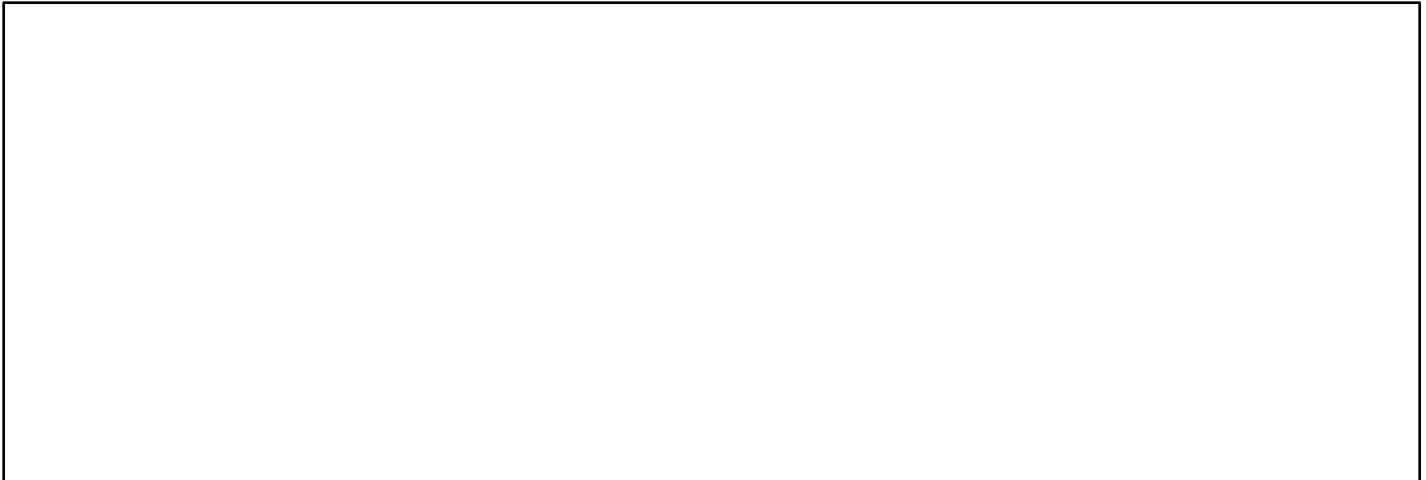
External Observations:

1. Find the **anterior** (front) end of the earthworm by locating the fleshy bump over its mouth, called the **prostomium**. The **posterior** (back) end has a small hole where solid waste is expelled, called the **anus**. The length of the worm is made up of many tiny segments, each separated by a thin wall called a **septum**.
2. About one-third of the way back from the mouth you should see a thicker and smoother section of the worm. This is called the **clitellum**, and it is involved in reproduction.
3. Notice that the earthworm has a rounded **dorsal** (back) surface and a flatter **ventral** (belly) surface. Usually the dorsal surface is darker than the ventral surface (though sometimes this is obscured in the preservation process). Lightly rub your finger along the ventral side toward the posterior end of the worm. You should feel a roughness caused by tiny bristles called **setae**. Using a **magnifying glass**, try to see the setae.
4. With your magnifying glass look for tiny **pores** on each segment. Liquid wastes are expelled through these pores. Near the front end of the worm you should see some larger pores that can be easily seen without magnification. These are **genital pores** and are important in reproduction.
5. In the box below, draw a diagram including measurements of your earthworm. Indicate which end is the anterior (front) and which is the posterior (back) end.



Internal Observations:

1. Place the worm in the dissecting pan with the dorsal surface facing up. Stretch out the worm's body and pin it to the dissection pan using dissecting pins. Place one pin through the first segment and a second pin through the last segment. Pin the worm firmly to the dissection tray.
2. Starting about one inch posterior to the clitellum, make a small slit with scissors and begin to cut upwards toward the anterior end. Be careful not to cut too deep. The major internal organs lie just inside and the body wall of the earthworm is very thin. Be careful as you move toward the anterior end, as the major organs are located anterior to the clitellum.
3. As you make your incision, fold back the skin flaps and pin them to the tray. Continue to cut open the worm and pin back the skin flaps until you have worked all the way up to the tip of the anterior end, where the mouth is located. Continue in this manner until the upper half of the worm has been opened and pinned back as seen in the diagram to the right.
4. In the box below draw a rough diagram of what you observe:



5. In your diagram, label the following structures:
 - Aortic arches (aka hearts)
 - Pharynx
 - Crop
 - Gizzard
 - Intestine
 - Ventral Nerve Cord
 - Mouth
 - Anus
6. Further observe the circulatory system of the earthworm:
 - a. To find the aortic arches, locate the region in between the pharynx and the crop. You should be able to find 5 pairs of aortic arches that lie on top of the esophagus.
 - b. Find the dorsal blood vessel that runs the entire length of the body.
 - c. Gently move aside the intestine to locate the ventral blood vessel.
 - d. Look for any smaller blood vessels that branch out from the dorsal blood vessel.
 - e. Answer the questions that following regarding the circulatory system.

7. Once you have observed all items indicated. Clean up as instructed. Your specimen must be discarded in one of the tubs up front!

Analysis Questions:

1. In this dissection, you observed the circulatory system of an earthworm, a very simple organism. This organism has a circulatory system as does the complex human. What is the function of the circulatory system in both an earthworm and a human?
2. The worm's circulatory system is much simpler than a human's. What might be some advantages to having a circulatory system like that of the earthworm?
3. What do you think the purpose of the aortic arches are?
4. How is the circulatory system of the earthworm similar to that of a human's?
5. How is the circulatory system of the earthworm DIFFERENT compared to that of a human's?
6. You did not observe any respiratory system in the earthworm because Annelida organisms do not have them. Instead, they respire through their skin using diffusion of gases and also active transport of water and some salts. How is this respiratory "similar" to that of a humans in structure and/or function? How is it different?

