

LAB

1

Laboratory
Activity

Earthworm Anatomy

Chapter

13

The earthworm is an invertebrate that has a segmented body and specialized body parts. Oxygen from the air moves into its body through its moist skin. Carbon dioxide moves out of its body through the skin. The earthworm has a series of enlarged tubes that act as hearts. The tubes pump blood through the blood vessels of an earthworm's body. The segmented body plan makes an earthworm's anatomy easy to study.

Strategy

You will observe the external parts of an earthworm.

You will dissect an earthworm.

You will identify the internal organs and organ systems of an earthworm.

Materials

earthworm (preserved)

paper towel

dissecting pan

hand lens

dissecting pins

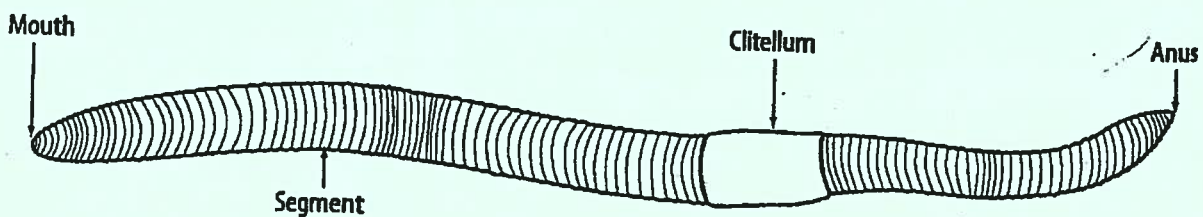
dissecting scissors

dissecting needle

Visit the Glencoe Science Web site at msscience.com for an alternate activity about earthworm anatomy.

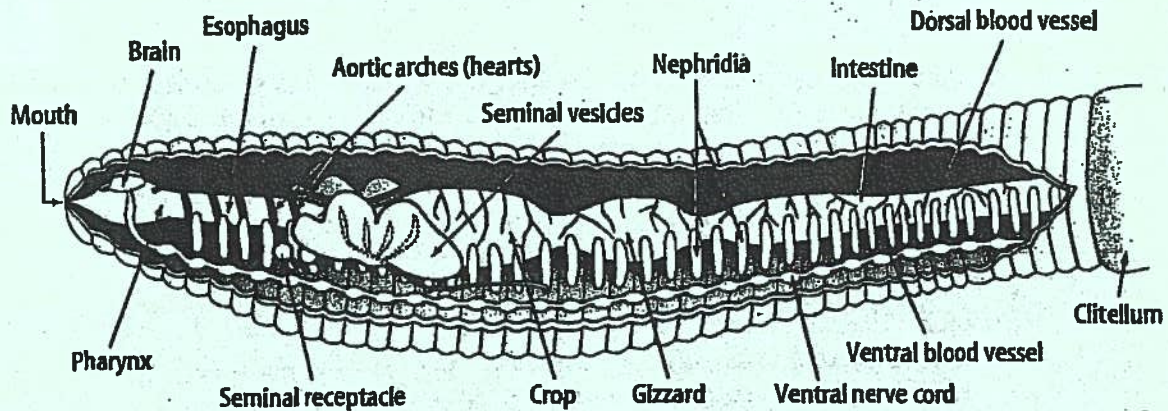
Procedure**Part A—External Structure**

1. Place a preserved earthworm lengthwise on a paper towel in the dissection pan with the darker side up. This is the dorsal or top side.
2. Examine the external structure and identify the parts shown in Figure 1.
3. Run your fingers lightly along the top, bottom, and sides of the earthworm. The bristles that you feel are setae. Examine the setae with a hand lens. Estimate the number of setae on each segment.
4. Locate the mouth. The part that hangs over the mouth is called the prostomium.
5. Find the thickened band circling the body. This is the clitellum. It forms a cocoon for depositing the eggs during reproduction.
6. Locate the anus. See Figure 1.

Figure 1

Laboratory Activity 1 (continued)

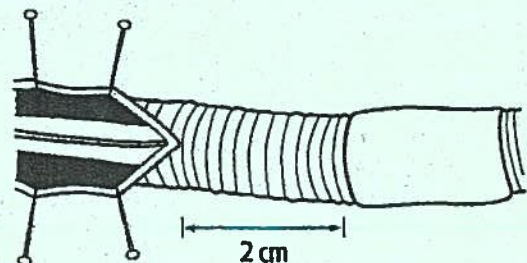
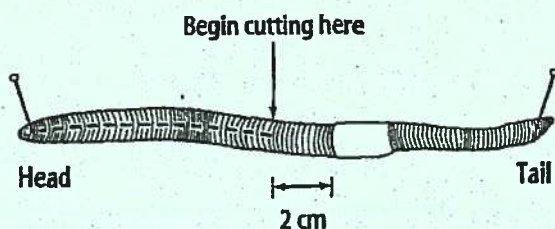
Figure 2



Part B—Internal Structure

1. Read the following procedure carefully and study Figures 1 and 2 before you begin to cut. Identify structures to be cut before you begin. Record the organs found in each system in Table 1. **WARNING: Always be careful with all sharp objects.**
2. With the dorsal side up, pin both ends of the worm to the wax in the dissecting pan.
3. With scissors, begin about 2 centimeters in front of the clitellum and cut forward through the body wall just to the left of the dorsal blood vessel. Use care to cut through only the body wall. See Figure 3.
4. Separate the edges of the cut. Observe the space between the body wall and the intestine. This is the body cavity or coelom.
5. Observe the partitions between segments from the body wall to the intestines. Use a dissecting needle to break these partitions. Then pin down the sides of the body wall.
6. Observe the tubelike digestive system. Identify the pharynx in segments 4 and 5. It is used to swallow food.
7. Follow the esophagus to segment 15.
8. Locate the large thin-walled crop. Food is stored in the crop until it is digested.
9. Locate the gizzard just behind the crop. Food is broken down by a grinding action here. The intestine extends from the gizzard to the anus. Digestion of food occurs in the intestine.
10. Each earthworm has both male and female reproductive organs. Alongside the esophagus in segments 9 and 10 are two pairs of seminal receptacles. The seminal receptacles receive sperm from another worm. In front of the receptacles in segments 10, 11, and 12 are seminal vesicles where sperm is stored.

Figure 3



Laboratory Activity 1 (continued)

- Circulatory
- Use a hand lens to find the small ovaries where eggs are produced. They are located under the seminal vesicles.
 - Locate the dorsal blood vessel. Carefully remove the white seminal vesicles from the left side of the body. Find the aortic arches, which branch from the dorsal blood vessel and pass around the esophagus. They join the ventral blood vessel below the esophagus. These aortic arches contract and function as hearts. The ventral blood vessel carries blood toward the skin and intestine.
 - Use a hand lens to observe the small white tubes along each side of the digestive tract. These tubes are excretory organs called

nephridia. They are found in all segments except the first three and the last. They remove the waste from the body cavity.

- Find the double nerve ganglion, or brain, of the earthworm near segment 2. The brain connects with the ventral nerve cord, which extends the length of the body. The nerve cord is a white line on the ventral body wall.

Nervous

- WARNING:** Give all dissected materials to your teacher for disposal. *Always wash your hands after a dissection procedure.*

Data and Observations

Table 1

Systems and Organs of an Earthworm	
System	Organs
Digestive	1.
Reproductive	2.
Circulatory	3.
Excretory	4.
Nervous	5.

Earthworm Anatomy

Draw the earthworm. Label the visible anatomy.

Name _____

Date _____

Class _____

Laboratory Activity 1 (continued)

3. Describe the function of the following organs.

- a. pharynx _____
- b. crop _____
- c. gizzard _____
- d. aortic arches _____
- e. dorsal blood vessel _____
- f. ventral blood vessel _____
- g. clitellum _____
- h. nephridia _____
- i. seminal vesicles _____
- j. intestine _____
- k. ganglia _____

4. Why is it said that the earthworm has a "closed" circulatory system?

Organ systems

For the picture below, color code the organ systems for the earthworm using the following key:

Circulatory System - Red
Reproductive System - Blue
Digestive System - Green
Nervous System - Yellow

