

Mollusks, Worms, Arthropods, Echinoderms

section 2 Segmented Worms

What You'll Learn

- the characteristics of segmented worms
- the structures of an earthworm
- why segmented worms are important

● Before You Read

Where can you find worms in your community?

Study Coach

Create a Quiz Write a quiz question about the information you read on each page. Be sure to write the answers.

● Read to Learn

Segmented Worm Characteristics

The worms that you see crawling on sidewalks after it rains are called annelids (A nuh ludz). They have tube-shaped bodies that are divided into many segments. On the outside of each segment are bristlelike structures called **setae** (SEE tee). Segmented worms use these structures to hold on to the soil and to move.

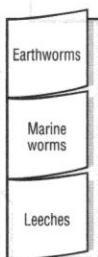
Segmented worms have bilateral symmetry and a body cavity that holds the organs. They also have two body openings—a mouth and an anus. Annelids are found in freshwater, salt water, and moist soil.

Earthworm Body Systems

Earthworms are the most well-known annelids. They have a front end, a back end, and more than 100 body segments. Except for the first and last segments, each body segment has four pairs of setae. Earthworms move by using their setae and two sets of muscles in the body wall. When an earthworm contracts one set of muscles, some of the segments bunch up and the setae stick out. This holds the worm to the soil. When the earthworm contracts the other set of muscles, the setae are pulled in and the worm moves forward.

FOLDABLES™

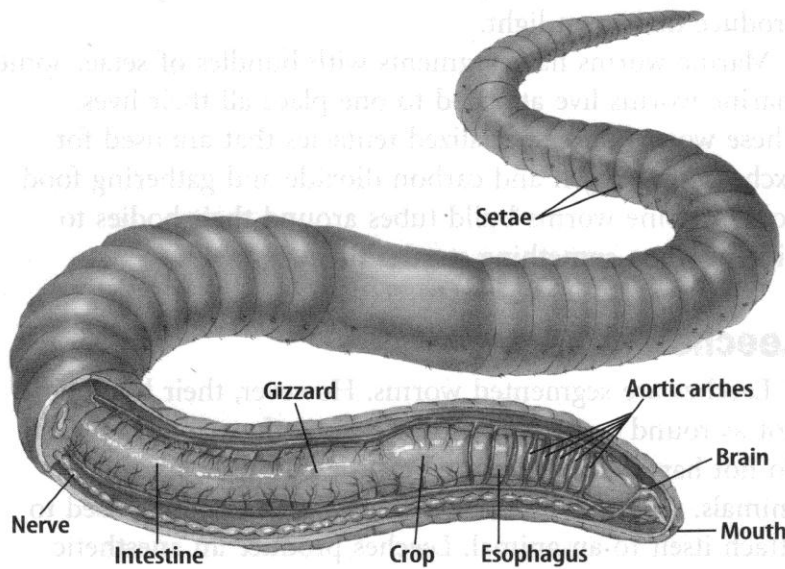
B Identify Make a three-tab Foldable using notebook paper, as shown below. Write notes on the characteristics of earthworms, marine worms, and leeches.



How do digestion and excretion happen in earthworms?

The figure below shows the parts of an earthworm. As the earthworm burrows through the soil, it takes soil into its mouth. It gets energy from the leaves and other organic matter found in the soil. ✓

The soil that the worm takes in moves to the **crop**, which is a sac used for storage. Behind the crop is a muscular structure called the **gizzard**, which grinds the soil and the bits of organic matter. The ground material passes to the intestine. There the organic matter is broken down and nutrients are absorbed by the blood. Wastes leave the body through the anus. The wastes pile up at the openings to their burrows. The piles are called castings. Castings help fertilize the soil.



What kind of circulatory system do earthworms have?

Earthworms have a closed circulatory system. There are two blood vessels located along the top of the body and one along the bottom. They meet in the front end of the earthworm, where they connect to heartlike structures called aortic arches. These structures pump blood through the body. Smaller vessels go into each body segment.

Earthworms have no lungs or gills. They exchange oxygen and carbon dioxide through their skin. The skin is covered with a thin film of watery mucus. If the mucus layer is removed, the earthworm could suffocate.

✓ Reading Check

1. **Analyze** From what does an earthworm get energy?

Picture This

2. **Sequence** Highlight the names of the four digestive structures of the worm. Number the structures 1 to 4 to show the order in which food moves from the mouth to the intestine.

✓ Reading Check

3. Define What is a hermaphrodite?

✓ Reading Check

4. Explain why leeches are sometimes used on people after surgery.

How do earthworms respond and reproduce?

Earthworms have a small brain located in the front segment. Each segment has nerves that join to form a nerve cord that connects to the brain. Earthworms respond to light, temperature, and moisture.

Earthworms are hermaphrodites (her MA fruh dites). That means they produce eggs and sperm in the same body. A worm cannot fertilize its own eggs. It needs to receive sperm from another earthworm in order to reproduce. ✓

Marine Worms

There are more than 8,000 species of marine worms, or polychaetes (PAH lee keets). This is more than any other kind of annelid. Marine worms float, burrow, build structures, or walk along the ocean floor. Some polychaetes produce their own light.

Marine worms have segments with bundles of setae. Some marine worms live attached to one place all their lives. These worms have specialized tentacles that are used for exchanging oxygen and carbon dioxide and gathering food. Some marine worms build tubes around their bodies to hide in when something startles them.

Leeches

Leeches are segmented worms. However, their bodies are not as round or as long as those of earthworms. They also do not have setae. They feed on the blood of other animals. A sucker on each end of a leech's body is used to attach itself to an animal. Leeches produce an anesthetic (an us THE tihk) that numbs the wound so the animal won't feel the bite. After it attaches itself, the leech cuts into the animal and sucks out blood. They also can survive by eating aquatic insects and other organisms.

Leeches and Medicine

Sometimes leeches are used after surgery to keep blood flowing to the surgical site. As the leeches feed on the blood, chemicals in their saliva prevent the blood from clotting. Other chemicals dilate the blood vessels, improving blood flow and helping the wound heal more quickly. Scientists are studying ways to use the chemicals that leeches produce to treat people with heart disease and arthritis. ✓

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Value of Segmented Worms

Different kinds of segmented worms are helpful to other animals in a variety of ways. Earthworms help aerate, or add air, to soil by burrowing through it. By grinding and partially digesting soil and plant material, earthworms speed up the return of nitrogen to the soil for plants to use. ✓

Scientists are developing drugs based on the chemicals in the leeches' saliva. They hope the drugs will prevent blood clots. Marine worms are food for many fish, invertebrates, and mammals.

Origin of Segmented Worms

Some scientists hypothesize that segmented worms evolved in the sea. The fossil record for segmented worms is limited because of their soft bodies. The tubes of marine worms are the most common fossils of the segmented worms. Some of these fossils date back about 620 million years.

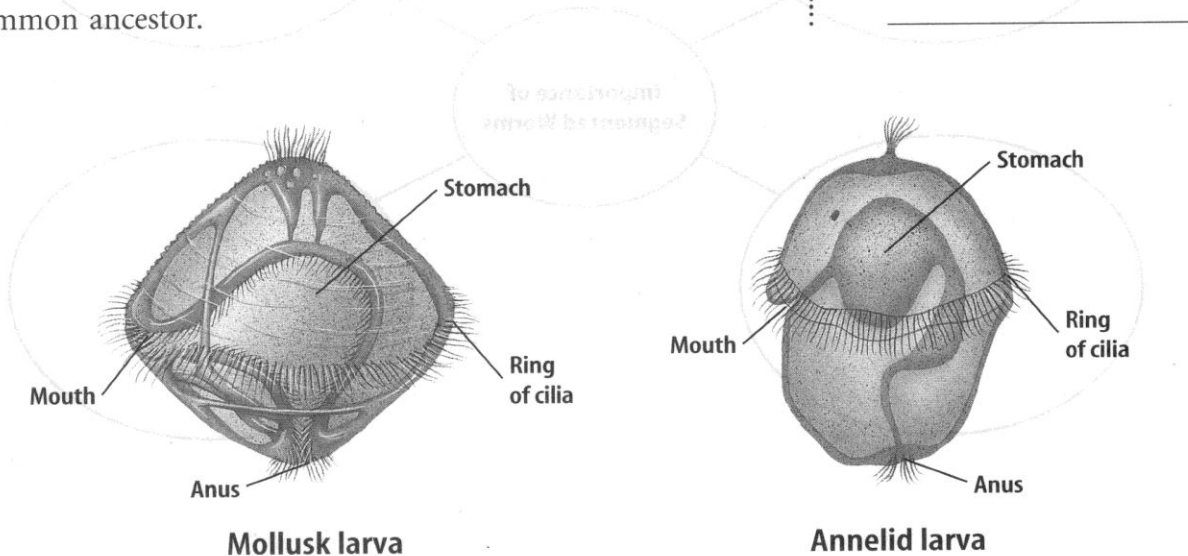
There are similarities between mollusks and segmented worms. Scientists use these similarities to suggest that mollusks and segmented worms could have a common ancestor. These groups were the first animals to have a body cavity with space for body organs. Mollusks and segmented worms have a one-way digestive system with a separate mouth and anus. Their larvae, shown in the figure below, are similar. This provides the best evidence that they have a common ancestor.

✓ Reading Check

5. **Describe** how earthworms help aerate the soil.

Picture This

6. **Identify** Look at the figure. What do the similarities between the two larvae suggest?



● After You Read

Mini Glossary

crop: storage sac to which ingested soil moves

gizzard: muscular structure behind the crop, which grinds the ingested soil and organic matter

setae (SEE tee): bristlelike structures on the outside of each body segment of earthworms and marine worms; used to hold on to the soil and to move

1. Review the terms and their definitions in the Mini Glossary. Choose one of the terms and write a sentence explaining its role in the earthworm's body.

2. Complete the web diagram below by describing the importance of segmented worms to people and other organisms.

