Teach, *continued*

Teaching Key Ideas

Experience with Leeches Ask if any students have ever had a leech attach itself to their body while they were swimming or wading in a pond or stream. Did the leech hurt as it attached? (Usually there is no sensation.) Did the wound bleed after the leech was removed? (If the leech was fully attached and feeding, the wound would most likely bleed because leeches use anticoagulants to facilitate feeding. The bleeding stops soon after the leech is removed.)

LS **Intrapersonal**

Close

Formative Assessment

What are three key general characteristics of all annelids?

A. segments, coelom, well developed organs (Correct!)

B. parapodia, marine habitat, live in protective tubes (Incorrect. These are characteristics of polychaetes.)

C. setae, sensory cells, consume soil (Incorrect. These are characteristics of earthworms.)

D. suck blood, secrete anticoagulants, used in medicine (Incorrect. These are characteristics of leeches.)

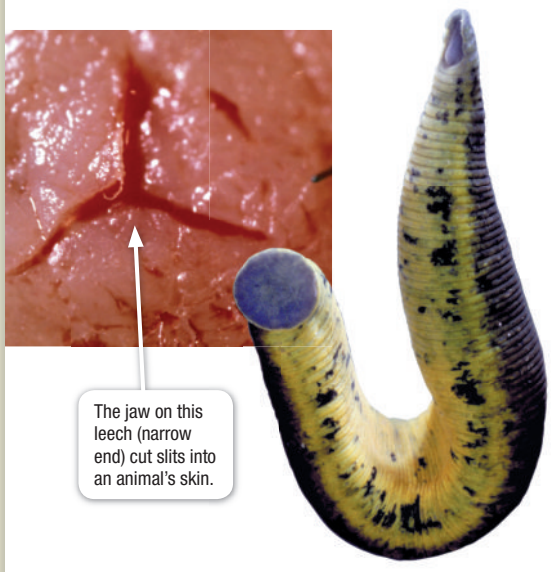


Figure 11 Most species of leeches are small, 2.5 to 5.0 cm (1 to 2 in.) long, but leeches are able to expand to five or six times their normal size when feeding.

Leeches Most leeches live in calm bodies of fresh water, but some species live among moist vegetation on land. When people hear the word *leech,* they usually associate it with bloodsucking, and for a good reason. A leech has suckers at both ends of its body. The body of a leech is flattened, and its segments are not separated internally, unlike other annelids. Leeches lack both setae and parapodia. By attaching the front sucker and then pulling the rest of the body forward, leeches can crawl along the ground. Aquatic leeches can also swim by undulating their body.

Most leeches are predators or scavengers. Only a small minority are parasites. **Figure 11** shows a parasitic leech, which attaches to a vertebrate host and cuts or digests a hole in the host's skin. The leech then secretes chemicals, called *anticoagulants,* into the host's blood. These chemicals keep the blood from clotting. Leeches also secrete an anaesthetic that prevents the host from feeling their presence. If undisturbed, a leech can ingest 10 times its own weight in blood.

Medical Use of Leeches For many centuries, people believed that an excess amount of blood was the cause of a wide range of illnesses, from a fever or headache to severe heart disease. A standard treatment for these conditions was bloodletting by using leeches. Physicians applied leeches to a patient's body and allowed the leeches to suck out the patient's "bad blood." Although doctors no longer believe in bad blood, leeches are making a comeback in the field of healthcare. For example, the strongest anticoagulant that leeches produce, called *hirudin,* is now being produced through genetic engineering. The synthetic hirudin is used in the treatment of some heart conditions. Other medical uses of leeches are discussed in the Why It Matters "Creepy Leeches."

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Reading Check ***Explain how the chemicals that a leech's sucker secretes help a parasitic leech feed longer on its host.***

Section 2 Review

KEY IDEAS

1. **Explain** how you could determine that a wormlike organism is an annelid.
2. **Describe** the major features of an earthworm's digestive system.
3. **Compare** the external appearance of marine annelids, earthworms, and leeches.

CRITICAL THINKING

4. **Recognizing Patterns** The gizzard of annelids that live in an aquatic environment is smaller and less muscular than that of terrestrial annelids, such as earthworms. How do the differences between the gizzards represent adaptations in aquatic and terrestrial feeding?
5. **Applying Information** Why do you see so many earthworms above ground after a long rainy period?

ALTERNATIVE ASSESSMENT

6. **Drawing Skills** Draw a "new" species of annelid. Label your "new" annelid's body parts. Make sure that the annelid that you invent has both the fundamental annelid traits as well as some adaptations to a particular environment.

Answers to Section Review

1. Annelids have segments, and most have external bristles.
2. Ingested soil is stored in the crop. The gizzard grinds the soil. In the intestine, food molecules pass across the walls of the intestine and into the blood. Wastes pass out through the anus.
3. Marine annelids have a head region with sensory structures; their segments usually have a pair of parapodia. Earthworms lack parapodia and a head region; they usually have setae on each segment. Leeches lack setae and parapodia; their bodies are generally flat.
4. Aquatic annelids trap and ingest particles that float in water. These particles are smaller than the particles of soil ingested by terrestrial annelids.
5. Oxygen and carbon dioxide can pass through the earthworm's skin only if it is moist. Usually when an earthworm is above ground, its skin becomes too dry for gas exchange to take place. After a rainy period, the skin would remain moist enough for gases to pass through.
6. Student drawings will vary but should include the key characteristics of annelids.