

Chapter 27 Study Guide

Study Tip

Have students work in pairs to write questions tied to Vocabulary terms and Key Concepts and then trade questions with other pairs to answer them.

Thinking Visually

Students' concept maps should include gastropods, bivalves, and cephalopods and the characteristics of each as described in the text. Examples may include any of those mentioned in the section on mollusks.

Chapter 27 Assessment

Reviewing Content

- | | | | |
|------|------|------|-------|
| 1. d | 4. c | 7. c | 10. c |
| 2. b | 5. b | 8. a | |
| 3. b | 6. b | 9. d | |

Understanding Concepts

11. A coelomate has a body cavity lined with mesoderm; an acoelomate does not.
12. Oxygen and nutrients are taken in through the skin and diffuse to internal cells; wastes are removed by diffusion or excreted through skin pores.
13. The pharynx takes food into the gastrovascular cavity. Inside the gut, digestion and absorption occur.
14. Flatworms have nerve ganglia, one or more long nerve cords, and short cords across the body; some have eyespots and other cells that detect and respond to stimuli. Cnidarians lack ganglia or nerve cords.
15. It causes schistosomiasis, characterized by clogged blood vessels and damage to lungs, liver, spleen, or intestines. Safe sewage disposal would limit outbreaks.
16. A tapeworm uses its scolex to attach to its host's intestinal wall; it lacks a digestive tract and absorbs nutrients from the intestine.
17. Segments called proglottids contain male and female reproductive organs. Proglottids release zygotes, which leave the host's body in feces.
18. Roundworms respire and excrete metabolic wastes through their body walls. Nutrients and wastes are transported through their bodies by diffusion.

Chapter 27 Study Guide

27-1 Flatworms

Key Concepts

- Flatworms are soft, flattened worms that have tissues and internal organ systems. They are the simplest animals to have three embryonic germ layers, bilateral symmetry, and cephalization.
- Turbellarians are free-living marine or freshwater flatworms.
- Flukes are parasitic flatworms that usually infect the internal organs of their hosts.
- Tapeworms are long, flat, parasitic worms that are adapted to life inside the intestines of their hosts.

Vocabulary

acoelomate, p. 683 • coelom, p. 683
pharynx, p. 684
flame cell, p. 684
ganglion, p. 685
eyespots, p. 685
hermaphrodite, p. 686
fission, p. 686
scolex, p. 688
proglottid, p. 688
testis, p. 688



27-2 Roundworms

Key Concepts

- Roundworms are unsegmented worms that have pseudocoeloms and digestive systems with two openings—a mouth and an anus.
- Parasitic roundworms include trichinosis-causing worms, filarial worms, ascarid worms, and hookworms.

Vocabulary

pseudocoelom, p. 689
anus, p. 689

27-3 Annelids

Key Concepts

- Annelids are worms with segmented bodies. They have a true coelom that is completely lined with mesoderm.
- Oligochaetes are annelids that typically have streamlined bodies and relatively few setae compared to polychaetes. Most oligochaetes live in soil or fresh water.
- Leeches are typically external parasites that suck the blood and body fluids of their host.
- Polychaetes are marine annelids that have paired, paddlelike appendages tipped with setae.

Vocabulary

septum, p. 694 • seta, p. 694
crop, p. 695 • gizzard, p. 695
closed circulatory system, p. 695
gill, p. 696 • nephridium, p. 696
clitellum, p. 696

27-4 Mollusks

Key Concepts

- Mollusks are soft-bodied animals that usually have an internal or external shell.
- The typical mollusk body plan has four parts: foot, mantle, shell, and visceral mass.
- Gastropods are shell-less or single-shelled mollusks that move by using a muscular foot located on the ventral side.
- Bivalves have two shells that are held together by one or two powerful muscles.
- Cephalopods are typically soft-bodied mollusks in which the head is attached to a single foot. The foot is divided into tentacles or arms.

Vocabulary

trochophore, p. 701
foot, p. 702
mantle, p. 702 • shell, p. 702
visceral mass, p. 702
radula, p. 702
siphon, p. 703
open circulatory system, p. 703

Thinking Visually

Create a concept map that shows the classes and main characteristics of mollusks. Include at least two examples of types of mollusks within each class.



CHAPTER RESOURCES

Print:

- Teaching Resources**, Chapter Vocabulary Review, Graphic Organizer
- Chapter Tests**: Levels A and B, Chapter 27 Test

Technology:

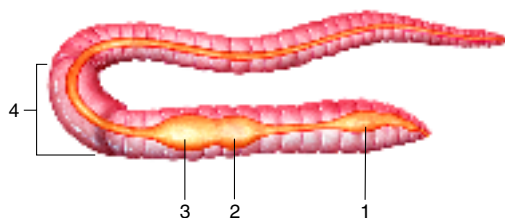
- Computer Test Bank**, Chapter 27 Test
- iText**, Chapter 27 Assessment

Chapter 27 Assessment

Reviewing Content

Choose the letter that best answers the question or completes the statement.

- The muscular tube found near the mouth of the digestive cavity in flatworms is called a(an)
 - proglottid.
 - scolex.
 - anus.
 - pharynx.
- The head of an adult tapeworm is called a
 - flame cell.
 - scolex.
 - cuticle.
 - mantle.
- The body cavity of a roundworm is called a
 - coelom.
 - pseudocoelom.
 - gizzard.
 - crop.
- What are the clusters of nerve cells in roundworms called?
 - flame cells
 - proglottids
 - ganglia
 - radulae
- In the earthworm, waste created by cellular metabolism is eliminated by the
 - crop.
 - nephridia.
 - gizzard.
 - flame cell.
- The digestive organ in which an earthworm stores food is number
 - 1.
 - 2.
 - 3.
 - 4.



- In earthworms, the clitellum is used in
 - digestion.
 - excretion.
 - reproduction.
 - respiration.
- The tongue-shaped structure that some mollusks use for feeding is the
 - radula.
 - sinus.
 - mantle.
 - proglottid.
- Mollusks eliminate nitrogen-containing wastes through simple tube-shaped organs called
 - gills.
 - nephrons.
 - radulae.
 - nephridia.

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- A mollusk with a shell consisting of two parts is a member of the class
 - Cephalopoda.
 - Annelida.
 - Bivalvia.
 - Gastropoda.

Understanding Concepts

- Distinguish between coelomates and acoelomates.
- Describe how respiration, circulation, and excretion are accomplished in the flatworm.
- Explain how feeding and digestion occur in planarians.
- How is the nervous system of a flatworm more complex than the sensory cells and nerve net of a cnidarian?
- How does the *Schistosoma* fluke affect humans? What step can be taken to limit the number of outbreaks of schistosomiasis?
- What adaptations do tapeworms have for their parasitic life cycle?
- How do tapeworms reproduce?
- Describe how respiration, circulation, and excretion are accomplished in roundworms.
- Outline the life cycle of the *Trichinella* roundworm.
- How does the roundworm *Ascaris* cause malnutrition?
- Evaluate the potential impact the research on *C. elegans* will have on scientific thought.
- List three adaptations for feeding in annelids.
- Explain the process by which earthworms move.
- What is a hermaphrodite? Give an example.
- Compare respiration in aquatic and land-dwelling annelids.
- What evidence exists to indicate that annelids and mollusks may be closely related?
- Compare the various feeding behaviors exhibited by the three classes of mollusks.
- Describe the path of blood in an open circulatory system.
- Distinguish between respiration in aquatic mollusks and that in land-dwelling mollusks.
- Explain how many two-shelled mollusks reproduce.
- Why can mollusks be used to measure water quality?



If your class subscribes to the iText, your students can go online to access an interactive version of the Student Edition and a self-test.

(Continued from page 710)

- Students should outline the life cycle of *Trichinella* roundworm, as detailed on page 691 of the text.
- By absorbing the host's digested food
- It will lead to a better understanding of how eukaryotes became multicellular and may also shed light on how genes make multicellular organisms both similar and different.
- Sample answer: sharp jaws; pharynx covered with mucus to which food particles stick; mucus bag for catching food particles
- By contracting longitudinal and circular muscles alternately and using its setae to prevent slipping
- A hermaphrodite such as an earthworm is an animal that produces both sperm and eggs.
- Aquatic annelids respire through gills. Land-dwelling annelids respire through their moist skin.
- A free-swimming larval phase called a trochophore is characteristic of both mollusks and annelids.
- Gastropods use a radula to eat algae and soft plant tissues or bore through the shells of prey. Cephalopods have tentacles that grab prey. Bivalves are filter feeders.
- In an open circulatory system, blood is pumped by a simple heart through vessels, flows out of the vessels, and moves through saclike sinuses. It then goes to the gills, where gas exchange occurs, and back to the heart.
- Aquatic mollusks respire with gills inside their mantle cavity, and land mollusks respire using a mantle cavity lined with blood vessels.
- Sexually, by external fertilization; eggs develop into free-swimming larvae
- Filter-feeding bivalves concentrate pollutants in their tissues; this concentration can be measured.



HOMEWORK GUIDE

Section:	Questions:
Section 27-1	1, 2, 11-17, 32, 44
Section 27-2	3, 4, 18-21, 39, 42
Section 27-3	5-7, 22-25, 35, 40
Section 27-4	8-10, 26-34, 36-38, 41, 43, 45

Critical Thinking

32. Planarians move with cilia and use muscle cells to twist and turn; earthworms move by alternately contracting longitudinal and circular muscles; and scallops move rapidly by flapping their shells. They are similar in that they all have muscle cells for movement, and different in the specific ways that they move.
33. The snail would be unable to move.
34. They both take in material—soil in the case of the earthworm and water in the case of the clam—that contains both food and substances that are not food. A clam is a filter-feeder; an earthworm is not. Food enters an earthworm's body through the mouth; it enters a clam's body through the incurrent siphon.
35. Earthworms aerate soil with their tunnels and enrich soil with their castings.
36. The siphon must remain above the seabed for respiration and feeding.
37. When an irritating grain of sand is converted into a pearl, the sand is no longer an irritant.
38. Sample hypothesis: The glands secrete a substance that promotes brooding behavior. If the surgically altered octopi are treated with chemicals from the glands, they will resume brooding and then die after brooding is finished.
39. There are fewer cells and fewer, less complex organs in a small organism than in a larger, more complex organism.
40. The earthworm would die from a lack of oxygen, which it must take in through moist skin.
41. Leeches feed by sucking blood from their hosts. The chemical keeps the blood flowing freely while a leech feeds.
42. An inspector would look for *Trichinella* cysts in the pork muscle.
43. A mollusk's respiratory system is responsible for the intake of oxygen from the environment and the expelling of carbon dioxide from the body. In aquatic mollusks, these functions are accomplished through gills; in land mollusks, these functions occur through diffusion through

Critical Thinking

32. **Comparing and Contrasting** Which structures are used for locomotion in the planarian, earthworm, and scallop? How are they similar? How are they different?
33. **Predicting** What would happen to a land snail if its foot stopped producing mucus?
34. **Comparing and Contrasting** In what ways are the feeding habits of the earthworm and the clam similar? In what ways are they different?
35. **Applying Concepts** Why do people purchase earthworms to put in their gardens?
36. **Inferring** Although many bivalves live buried in sand or mud, the openings to their siphons remain above the surface. Why is this important for a bivalve?
37. **Predicting** In order for an oyster to produce a pearl, a grain of sand or other irritant must get inside its shell. The mantle then secretes a substance that forms a protective covering over the irritant. Why is this an advantage for the oyster?
38. **Formulating Hypotheses** Female octopi usually die after brooding their eggs (tending and protecting eggs until they hatch). However, if certain glands near the brooding octopus's eyes are surgically removed, the octopus stops brooding, resumes feeding, and has a lifespan longer than the normal three to four years. Develop a testable hypothesis to explain what might happen if the surgically altered octopi were treated with chemicals from the glands.
39. **Inferring** Why is it easier to study cell differentiation in a small organism such as *Caenorhabditis elegans* than in larger, more complex organisms?
40. **Predicting** During heavy rains, earthworms often emerge from their burrows. What might happen to an earthworm if it did not return to its burrow when the ground dried out?
41. **Inferring** Researchers have identified a chemical in leeches that suppresses blood clotting. Why is this chemical important in leeches?
42. **Applying Concepts** Suppose you are a meat inspector. You are checking uncooked pork to see whether it is contaminated with *Trichinella*. What would you look for?
43. **Comparing and Contrasting** Compare and contrast the functions of a mollusk's respiratory and circulatory systems. Then, explain how these two systems are interrelated in the function of delivering oxygen to the body as a whole.

certain blood vessels. The circulatory system carries the oxygen to all parts of the body and carries carbon dioxide from body cells to the gills or blood vessels for diffusion into the environment.

44. Cross-fertilization is more likely to produce new, and possibly beneficial, combinations of genes.

44. **Connecting Concepts** The nudibranch shown below is a hermaphrodite. Hermaphrodites rarely fertilize their own eggs. Explain why fertilization of another individual is more advantageous than self-fertilization. (Hint: See Section 1 in Chapter 26.)



Writing in Science

Imagine that you are a healthcare worker in an area in which *Ascaris lumbricoides* infections are common. Write a short explanation of the disease that you might distribute to people in the area to help prevent new cases. Your explanation should include the cause of the disease, how the disease is transmitted, and steps that people can take to prevent the spread of the disease. (Hint: Review Figure 27-10 to recall how the disease is spread.)

Performance-Based Assessment

Worm Autobiography You are a reporter for a local newspaper and are working on the children's activity section. You decide to feature different animals as if each one were writing its autobiography. The first feature is entitled "A Day in the Life of an Earthworm." Include in your autobiography how the worm performs each of the life functions, its habitat, its importance, and illustrations. The reading level of the article should be fourth or fifth grade.

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