

## Chapter 26 Assessment

### Reviewing Content

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

### Understanding Concepts

11. All members of the animal kingdom are multicellular, eukaryotic heterotrophs whose cells lack cell walls. Animals are specialized to carry out the functions of feeding, respiration, circulation, excretion, response, movement, and reproduction.
12. The epithelial cells have a thin, flat structure through which gases diffuse easily.
13. Example: When a dog becomes too hot, it pants. Panting releases heat, and body temperature decreases.
14. The terms *anterior*, *posterior*, *dorsal*, *lateral*, *ventral*, *bilateral symmetry*, and *motile* should be used on the drawings of a fish. The terms *radial symmetry* and *motile* should be used as titles on the jellyfish. The term *sessile* should be used to label the sponge.
15. Because cephalization involves the location of sense organs and nerve cells that process information at its anterior end, the animal can respond to the environment more quickly and in more sophisticated ways than simpler animals can.
16. A protostome is an animal whose mouth is formed from the blastopore, and a deuterostome is an animal whose anus is formed from the blastopore.
17. The endoderm is the innermost layer of tissue, which develops into the linings of the digestive tract and much of the respiratory system. The mesoderm is the middle layer of tissue, which develops into the muscular system and much of the circulatory, reproductive, and excretory systems. The ectoderm is the outermost layer of tissue, which develops into sense organs, nerves, and the outer layer of the skin.
18. Specialized cells that move around within the walls of sponges
19. Choanocytes trap and engulf food particles sifted from water that flows into the pores, and digestion is completed by archaeocytes. From water that flows inside the body cavity, oxygen diffuses into the cells, and wastes, including carbon dioxide, are carried away.
20. Many sponges have photosynthetic organisms in their tissues. These photosynthetic organisms provide food and oxygen for the sponge, and the sponge provides a protected area for the photosynthetic organisms.
21. Statocysts in cnidarians help determine the direction of gravity.
22. The cnidarian paralyzes its prey and pulls it into its gastrovascular cavity.
23. In one type, a bud grows from the side of an existing polyp. In another type, polyps produce tiny medusas that become new individuals.
24. Male and female medusas produce eggs and sperm. After external fertilization, the zygote grows into a larva that eventually becomes a polyp. The polyp buds to release young medusas.
25. Like other animals, sponges are multicellular, are heterotrophic, have some specialized cells, and lack cell walls. Unlike most other animals, sponges have pores all over their bodies and are sessile, and most lack symmetry.
26. Sample answers: How long can the gemmules survive without water? How long can the gemmules survive being kept in a freezer at 0°C? How long does it take gemmules that have survived drought or freezing to grow when moved to a favorable environment?
27. Cnidarians have radial symmetry. Since radially symmetrical animals lack a front end, they do not usually move forward in one direction.
28. Many of the comb jelly's characteristics are similar to those of cnidarians, but cnidarians do not have an anal opening. Therefore, the comb jelly should not be classified as a cnidarian.
29. Sample answer: Governments might pass laws that restrict the use of fertilizers and insecticides in coastal areas with coral reefs in the ocean nearby. These laws might make it difficult for farmers to make a living.
30. Sample answer: The life cycle is more complex in a cnidarian. In most cnidarian species, larvae that form as a result of fertilization develop into polyps. The polyps then reproduce asexually, forming medusas that reproduce sexually to complete the life cycle. In a sponge, there is no asexual stage in a complete life cycle, although pieces of adult sponges can reproduce asexually.

31. The nerve net enables cnidarians to detect external stimuli. Cnidocytes are activated by an external stimulus such as a brush against the cnidarian's tentacles.

32. Just as an inventory clerk maintains an even supply of merchandise, internal feedback mechanisms maintain homeostasis. When supplies run low, the clerk orders more supplies. Similarly, when the body runs low on food, for instance, an animal becomes hungry and eats. When the store's supply is adequate, the clerk stops ordering supplies. Similarly, when the body no longer needs food, hunger ceases and the animal stops eating.

33. Choanocytes are specialized cells that use flagella to move a steady current of water through the sponge.

34. Both a hydra and a Portuguese man-of-war are cnidarians of the class Hydrozoa. They differ in that a hydra lives as a solitary polyp and is found in fresh water, while a Portuguese man-of-war is a colony of polyps and is found in salt water.

### Standardized Test Prep

- |      |      |       |
|------|------|-------|
| 1. A | 5. A | 9. B  |
| 2. D | 6. D | 10. A |
| 3. E | 7. D | 11. C |
| 4. C | 8. E |       |

## 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.
19. Students should outline the life cycle of *Trichinella* roundworm, as detailed on page 691 of the text.
20. By absorbing the host's digested food
21. 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.
22. Sample answer: sharp jaws; pharynx covered with mucus to which food particles stick; mucous bag for catching food particles
23. By contracting longitudinal and circular muscles alternately and using its setae to prevent slipping
24. A hermaphrodite such as an earthworm is an animal that produces both sperm and eggs.
25. Aquatic annelids respire through gills. Land-dwelling annelids respire through their moist skin.
26. A free-swimming larval phase called a trochophore is characteristic of both mollusks and annelids.
27. 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.
28. 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.
29. Aquatic mollusks respire with gills inside their mantle cavity, and land mollusks respire using a mantle cavity lined with blood vessels.
30. Sexually, by external fertilization; eggs develop into free-swimming larvae
31. Filter-feeding bivalves concentrate pollutants in their tissues; this concentration can be measured.
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

### Standardized Test Prep

- |      |      |       |       |
|------|------|-------|-------|
| 1. A | 5. D | 9. E  | 13. A |
| 2. D | 6. C | 10. C | 14. A |
| 3. D | 7. B | 11. E | 15. B |
| 4. A | 8. C | 12. B |       |

## Chapter 28 Assessment

### Reviewing Content

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

### Understanding Concepts

11. The variety of respiratory organs among arthropods enables arthropods to live in both terrestrial and aquatic environments. Terrestrial arthropods obtain oxygen through tracheal tubes or book lungs. Aquatic arthropods use gills or book gills to remove oxygen from water.
12. Most terrestrial arthropods dispose of nitrogen-containing waste by using Malpighian tubes, which remove wastes from the blood, concentrate them, and then add them to undigested food before it leaves via the anus. In aquatic arthropods cellular wastes diffuse from the body into the water.
13. All have a brain. Two nerves that run around the esophagus connect the brain to a ventral nerve cord. Ganglia along the cord coordinate movements of the legs and wings.
14. It covers and protects the cephalothorax.
15. Decapods are motile, whereas barnacles are sessile. Barnacles have no abdominal segments and do not use mandibles.
16. It is adapted for biting and grinding food.
17. Both chelicerae and pedipalps are appendages adapted as mouthparts. Chelicerae contain fangs used to capture and paralyze prey, and pedipalps are usually modified to handle prey.
18. Ticks and mites are parasites. Their mouthparts are adapted to dig into a host's tissues and suck out fluids.
19. Centipedes have many segments, each with one pair of legs. Millipedes have many segments, each with two pairs of legs. The bodies of insects are divided into three sections—head, thorax, and abdomen—with three pairs of legs attached to the thorax.
20. The characteristics of insects have enabled them to thrive in many different habitats.
21. Insect adaptations for feeding include: mouthparts adapted to specific feeding functions, e.g., grinding or sucking; saliva containing digestive enzymes; in bees, chambers for the storage of food.

22. Ants, bees, and termites form societies in which individuals work together for the benefit of the whole group. Individuals specialize in performing specific roles or tasks.

23. In most echinoderms, nitrogen-containing cellular wastes are excreted primarily in the form of ammonia, which is passed into surrounding water through the thin-walled tissues of tube feet and skin gills.

24. The eggs and sperm of sea stars are released into open water, where fertilization occurs. Eventually the larvae, which have bilateral symmetry, swim to the ocean bottom, where they mature into adults that have radial symmetry.

25. The crown-of-thorns feeds on coral and has destroyed extensive areas of the Great Barrier Reef.

### Critical Thinking

26. The adaptation enables honeybees to carry pollen from one flower to another, thus pollinating the flowers in the process. The adaptation also enables honeybees to collect food and carry it back to the hive.

27. Crabs have soft shells soon after they molt because the new exoskeleton has not had time to become hardened.

28. The animal is not an insect, because insects have three distinct body regions, one pair of antennae, one pair of compound eyes, three pairs of mouthparts, and three pairs of walking legs.

29. As the temperature decreases, the time for the eggs to hatch increases. It would take about 62 hours for the eggs to hatch at 18°C, and 40 hours for them to hatch at 25°C. On the basis of the trend shown on the graph, it might take 88 hours for eggs to hatch at 10°C.

30. The crayfish is responding to the greater amount of oxygen dissolved in surface water than at lower depths. In addition, the movement of the crayfish's legs can further increase the amount of oxygen dissolved in the stagnant pool and create a flow of this oxygenated water over the gills, where respiration occurs.

31. Adults and larvae do not compete with one another for food. Also, different types of food may be abundant at different times of the year, and these differences may correlate to stages in the insect's life cycle.

32. Unlike arthropods, echinoderms have spiny skin, radial symmetry, an internal skeleton, a water vascular system, and suction-cuplike structures called tube feet.

33. Pheromones warn of danger and enable males and females to communicate during courtship and mating, thus helping to ensure survival of individuals and species.

34. As insects moved into different environments over time, they evolved through natural selection adaptations that allowed them to succeed in those environments. Among these adaptations are flight, different ways of responding to stimuli, and a life cycle in which the young differ from adults in appearance and feeding methods.

### Standardized Test Prep

- |      |      |      |       |
|------|------|------|-------|
| 1. C | 4. C | 7. E | 10. B |
| 2. B | 5. D | 8. A |       |
| 3. B | 6. C | 9. B |       |