

Chapter 11 Structure and Function of Invertebrates

Chapter 11 Level A

What Is an Animal?

Use Target Reading Skills

Sample student notes:

What are the functions of animals? *Animals must obtain food and oxygen, keep a stable environment within their bodies, reproduce, and move about to meet their needs.* **How are animals classified?** *Animals are classified according to how they are related, which is based on their evolutionary history.*

1. Anatomy is the structure of an organism.

Physiology is the study of functions in organisms.

2. a. Tissues are groups of similar cells that perform a specific function. **b.** Organs are groups of several different tissues that perform more complex functions. **c.** Organ systems are groups of organs that work together to perform the broadest functions.

3. a. obtaining food and oxygen **b.** keeping internal conditions stable **c.** moving
d. reproducing

4. An adaptation is a structure or behavior that allows animals to perform basic functions in their environments.

5. b

6. a

7. true

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8. If conditions are not stable, the animal cannot survive for long.

9. a. obtaining food **b.** reproducing

10. true

11. Sexual reproduction is the process by which a new organism develops from the joining of two sex cells—an egg cell and a sperm cell.

12. fertilization

13. Asexual reproduction is the process by which a single organism produces a new organism identical to itself.

14. false

15. symmetry

16. bilateral

17. radial

18. true

19. a, c

20. phylum

21. d

22. true

23. a. its body structure b. how it develops
c. its DNA

24. false

Sponges and Cnidarians

Use Target Reading Skills

Possible student notes:

What are sponges? *Sponges are invertebrates that usually have no body symmetry and never have tissues or organs.* **What are cnidarians?** *Cnidarians are invertebrates that have stinging cells and take food into a central body cavity.* **What are the two body structures of cnidarians?** *A vase-shaped cnidarian is called a polyp, and a bowl-shaped cnidarian is called a medusa.*

1. A sponge has a central cavity with structures surrounding it that are adapted for different functions: collar cells, spikes, jelly-like cells, and pores.

2. a, c

3. spikes

4. A sponge produces both sperm and egg cells. Sperm cells are released into the water, where they enter another sponge and fertilize its eggs.

5. larva

6. Cnidarians are invertebrate animals that use stinging cells to capture food and defend themselves.

7. a, b, d

8.

9. A cnidarian captures prey by using its stinging cells to snare prey and sometimes inject venom. Then its tentacles pull the prey into its mouth.

10. false

11. a, b, c

12. They reproduce both sexually and asexually. Budding is the most common form of asexual reproduction.

Worms and Mollusks

Use Target Reading Skills

Possible student notes:

What are the characteristics of worms? *Worms are invertebrates that have long, narrow bodies without legs.* **What are the three types of worms?**

flatworms, roundworms, and segmented worms

What are the characteristics of mollusks? *Mollusks have a soft body often covered by a shell, a thin layer of tissue called a mantle that covers the internal organs, and an organ called a foot.* **What are the types of mollusks?** *gastropods, bivalves, and cephalopods*

1. flatworms; roundworms; segmented worms

2. a. invertebrates b. long, narrow bodies without legs c. tissues, organs, and body

systems **d.** bilateral symmetry **e.** have head and tail ends

3. b, d

4. a, c

5. parasite

6. b, d

7. A planarian inserts a feeding tube into its food source. Digestive juices flow into the food to break it down. Then the planarian sucks up the food into its body, where it finishes digestion.

8. false

9. A tapeworm is one type of parasitic flatworm. Its structure is adapted to the function of absorbing food from the host's digestive system.

Polyp
Mouth
Central cavity
Medusa
Mouth
Central cavity

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10. c, d

11. anus

12. The animal's body uses foods efficiently because its one-way digestive system enables it to absorb a large amount of the needed substances in foods.

13. b, c

14. two

15. A closed circulatory system moves the blood around an animal's body quickly.

16. b, d

17. hard outer shell: protects the soft body; mantle: covers the internal organs and produces the shell; foot: adapted for crawling, digging, or catching prey

18. false

19. In an open circulatory system, the heart pumps blood into a short vessel that opens into the body spaces containing the internal organs. The blood sloshes over the organs and eventually returns to the heart.

20. The gills remove oxygen from the water. The cilia on the gills move back and forth to make water flow over the gills. Carbon dioxide moves out of the blood and into the water through the gills.

21. **a.** presence of a shell **b.** type of foot **c.** type of nervous system

22. gastropods; bivalves; cephalopods

23. gastropods

24. A radula is a flexible organ with tiny teeth that gastropods use to obtain food.

25. Bivalves are mollusks that have two shells

held together by hinges and strong muscles.

26. Bivalves have two shells. Unlike gastropods, they do not have radulas. Most are filter feeders; they strain their food from water.

27. a, c

28. cephalopods

29. They use their muscular tentacles. Their large eyes and complex nervous systems help them find and capture prey.

30. a, c, d

Arthropods

Use Target Reading Skills

Possible student notes:

What is an arthropod? *invertebrate that has an external skeleton, a segmented body, and jointed appendages* **What is a crustacean?** *arthropod with two or three body sections, five or more pairs of legs, and two pairs of antennae* **What is an arachnid?** *arthropod with two body sections, four pairs of legs, and no antennae* **What are centipedes and millipedes?** *arthropods with two body sections and numerous pairs of legs*

1. a. crustaceans b. arachnids c. centipedes and millipedes d. insects

2. An arthropod is an invertebrate that has an external skeleton, a segmented body, and jointed attachments called appendages.

3. a, d

4. The exoskeleton protects the animal and keeps it from drying out.

5. The arthropod sheds its exoskeleton in a process called molting. After molting, its new exoskeleton is soft for a while, and then it hardens.

6. two; two; three

7. true

8. b

9. a

10. A crustacean is an arthropod that has two or three body sections, five or more pairs of legs, and two pairs of antennae.

11. a, c

12. metamorphosis

13. arachnid

14. a, b

15. c, d

16. b

17. a

18. a, b

19. a, b

20. An insect is an arthropod with three body sections, six legs, one pair of antennae, and usually one or two pairs of wings.

21. b

22.

23. sensing the environment, directing body activities

24. compound

25. tubes

26. egg; larva; pupa; adult

27. nymph

Abdomen Thorax Head

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Echinoderms

Use Target Reading Skills

Possible student notes:

What are echinoderms? *Echinoderms are invertebrates with an internal skeleton and a system of fluid-filled tubes called a water vascular system.*

What are tube feet? *tiny structures that stick out from the underside of an echinoderm and act like suction cups* **How does a sea star eat?** *It captures food with tube feet and envelops it with its stomach.*

What are the four major groups of echinoderms?
sea stars, brittle stars, sea urchins, and sea cucumbers

1. An echinoderm is a radially symmetrical invertebrate with an internal skeleton and an internal system of fluid-filled tubes called a water vascular system.

2. endoskeleton

3. an internal organ system made up of fluidfilled tubes inside the echinoderm's body

4.

5. true

6. Brittle Stars: Use tube feet to catch food;

Move flexible arms against the ocean floor

Sea Urchins: Scrape food with teethlike structures;

Use tube feet that extend out between the

spines

Sea Cucumbers: Sweep food into mouth with

tentacles; Use tube feet on underside