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Chordate Classification and Characteristics



Read 9.1 (pp. 532-535).

Exercises

9.1

Circle the letter of the correct answer(s). One question has multiple answers.

- 1. What assumption is modern animal classification based on?
 - a. All creatures were designed by the Creator to populate the world.
 - **b.** All creatures can be traced back to original kinds that were just like animals of today.
 - c. All creatures have similar features because they perform many of the same functions.
 - d. All creatures arose from a common ancestor; closely related species share more similarities.
- 2. What is not a key feature of chordates?
 - a. backbone
 - **b.** notochord
 - c. postanal tail
 - d. dorsal nerve cord
- 3. What is the function of the notochord?
 - **a.** gives the body structural support
 - **b.** allows communication and balance
 - c. carries messages throughout the body
 - d. provides a place for muscles and tendons to attach
- **4.** What are two differences between the nerve cord of chordates and that of non-chordate invertebrates?
 - **a.** The chordate nerve cord is dorsal; the invertebrate nerve cord is ventral.
 - **b.** The chordate nerve cord provides support for the body; the invertebrate nerve cord does not provide support.
 - **c.** The chordate nerve cord disappears before birth; the invertebrate nerve cord remains throughout their life.
 - **d.** The chordate nerve cord develops as a hollow tube that fills in at maturity; the invertebrate nerve cord does not develop as a tube.

Circle *T* **if the statement is true or** *F* **if it is false.**

- **5. T F** We should expect different organisms to share similarities because they use many of the same biomolecules.
- 6. T F Some homologies appear to be a result of speciation from a common ancestor.

- 7. T F Chordates are characterized by a vertebral column that develops from a notochord.
- 8. T F All chordates have a dorsal nerve cord throughout their life.
- **9. T F** Some chordates have an internal postanal tail that is not visible externally.

Answer these questions.

- **10.** How do biologists classify organisms into a group?
- 11. How do biologists divide a group of organisms into smaller groups?
- **12.** Is it logical for different species to share homologies without having descended from a common ancestor? Explain your answer.
- **13.** Why do biologists who reject macroevolution still use modern taxonomy?

- 14. When do most chordates have a notochord?
- **15.** Why is the term *chordate* not interchangeable with the term *vertebrate*?
- 16. What vital structures does the nerve cord of most chordates develop into?
- **17.** What are four functions of the postanal tail?
- **18.** What is an example of a characteristic that is shared by two organisms that are not closely related?

Read 9.2 (pp. 535-541).

Exercises

Circle the letter of the correct answer(s). One question has multiple answers.

- 1. What chordate characteristics does a tunicate lose before it matures?
 - a. vertebrae
 - **b.** notochord
 - c. postanal tail
 - d. dorsal nerve cord
- 2. What feature can identify a creature as a vertebrate even if it lacks vertebrae?
 - a. brain
 - b. cranium
 - c. notochord
 - d. dorsal nerve cord
- 3. What does external fertilization require?
 - a. ovoviviparity
 - b. low metabolic rate
 - c. warm environment
 - d. water or much moisture
- 4. At the cellular level, what is the difference between ectotherms and endotherms?
 - a. Ectotherm cells perform activities more slowly than endotherm cells.
 - **b.** Ectotherm cells give off heat, while endotherm cells keep heat in the body.
 - c. Ectotherm cells perform better in warm habitats, while endotherm cells favor cool habitats.
 - **d.** Ectotherm cells produce more energy than endotherm cells produce from the same amount of food.
- 5. What is not a source of heat that increases an animal's body temperature?
 - a. sunshine
 - b. cellular processes
 - c. panting and sweating
 - d. metabolizing fat reserves
- 6. What type of environment could endotherms survive in more easily than ectotherms?
 - a. very moist
 - **b.** cold and cloudy
 - c. low food supply
 - d. warm and sunny

- 7. What do endotherms require to maintain a steady body temperature and level of activity?
 - a. viviparity
 - **b.** stable food supply
 - c. low metabolic rate
 - d. heat from the environment

Circle *T* if the statement is true or *F* if it is false. Correct the italicized part of any false statement.

- **8. T F** Vertebrates make up the largest group of *animals*.
- **9. T F** The *lancelet* is an invertebrate chordate that retains all three distinguishing characteristics of chordates throughout its life.
- **10. T F** The *vertebral column* is the primary defining characteristic of a vertebrate.
- **11. T F** Vertebrates can grow large and have active lifestyles and precise body control because of their *organ systems.*
- **12. T F** An endotherm gets most of its body heat from *metabolism*.
- **13. T F** A *warm-blooded* animal depends on the environment to regulate its body temperature.

Answer these questions.

- 14. What are two main functions of the vertebral column?
- **15.** What is the basic difference between external and internal fertilization?
- 16. What is the main type of fertilization that land animals use, and why do they use this type?
- **17.** How do oviparous and ovoviviparous animals differ from each other?
- **18.** In your own words, what does it mean for an animal to be viviparous?
- 19. Why can cold-blooded animals survive where resources are low?

- 20. How does the body temperature range of ectotherms differ from that of endotherms?
- **21.** What are three physical means that endotherms use to decrease their body temperature if they get too hot?

Review

Match each description with the chordate characteristic it describes. 9.1

- **22.** _____ supports the body
- 23. _____ often develops into a brain and spinal cord
- **24.** _____ used for movement, balance, or communication

Answer this question. 9.1

25. How do scientists use homologies to classify organisms?

- a. dorsal nerve cord
- b. notochord
- c. postanal tail



Read 9.3 (pp. 541-547).

Exercises

Circle the letter of the correct answer.

- 1. What common characteristic of fish is not shared by all fish?
 - a. fins
 - **b.** gills
 - c. ectothermic
 - d. aquatic habitat
- 2. What body part makes fish extremely sensitive to vibrations and pressure changes in the water?
 - a. gills
 - b. skull
 - c. lateral line
 - d. ampullae of Lorenzini
- 3. To what are dermal denticles most similar in composition?
 - a. teeth
 - b. operculum
 - c. bony fish scales
 - d. ampullae of Lorenzini
- 4. What is the main purpose of the ampullae of Lorenzini?
 - **a.** locating prey
 - b. protecting gills
 - c. avoiding predators
 - d. maintaining buoyancy
- 5. How can a bony fish rise to the surface of the water without swimming upward?
 - a. decrease the salt content in its swim bladder
 - **b.** increase the amount of gas in its swim bladder
 - c. reduce the amount of water in its swim bladder
 - d. shift its swim bladder from a ventral position to a dorsal position
- 6. What fish are scavengers and parasites with mouths designed for suction feeding?
 - a. bony fish
 - b. jawless fish
 - c. endothermic fish
 - d. cartilaginous fish