

## Echinoderms and Invertebrate Chordates

### ► Section 32-1: Echinoderms

#### Animals Develop in One of Two Ways

Read each question, and write your answer in the space provided.

1. What is a blastopore?

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2. What is the difference between a protostome and a deuterostome?

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3. What is the connection between the phylum Echinodermata and the phylum Chordata?

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4. Why is the term *sea star* more appropriate than the term *starfish*?

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5. What is the evidence that chordates and echinoderms evolved from an ancestral deuterostome?

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## Today's Echinoderms Share Four Major Characteristics

Read each question, and write your answer in the space provided.

6. What are ossicles?

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7. Why does the endoskeleton of echinoderms function like the exoskeleton of arthropods?

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8. What is the symmetry of echinoderms?

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9. What is the water-vascular system of an echinoderm?

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10. What are skin gills?

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Mark each statement below T if it is true or F if it is false.

\_\_\_\_\_ 11. Echinoderms have no head or brain.

\_\_\_\_\_ 12. Many species of echinoderms can regenerate a new arm if a portion is lost.

\_\_\_\_\_ 13. Sea stars ingest food after digestive juices liquefy the prey.

\_\_\_\_\_ 14. All echinoderms are hermaphrodites.

## Echinoderms Are a Diverse Group

*In the space provided, write the letter of the description that best matches the term or phrase.*

- |                         |  |
|-------------------------|--|
| _____ 15. sea stars     | a. along with feather stars, the most ancient and primitive echinoderms        |
| _____ 16. brittle stars | b. live on rocky ocean bottoms, have spines protruding from the endoskeleton   |
| _____ 17. sea lilies    | c. have feathery arms used in feeding  |
| _____ 18. feather stars | d. discovered in 1986  |
| _____ 19. sea urchins   | e. along with sea baskets, make up the largest class of echinoderms            |
| _____ 20. sand dollars  | f. do not have fused ossicles  |
| _____ 21. sea cucumbers | g. similar to sea urchins, but live on sandy ocean bottoms along the sea coast |
| _____ 22. sea daisies   | h. the echinoderms most familiar to people                                     |

## ► Section 32-2: Invertebrate Chordates

### Chordates Have a Completely Internal Skeleton

*Complete each statement by writing the correct term or phrase in the space provided.*

1. During the development of a chordate embryo, a stiff rod called the \_\_\_\_\_ develops along the back of the embryo.
2. Chordates have a single, \_\_\_\_\_ dorsal nerve cord.
3. Chordates have a series of \_\_\_\_\_ that develop in the wall of the pharynx, the muscular tube that connects the mouth to the digestive tract and windpipe.
4. Chordates have a(n) \_\_\_\_\_ that extends beyond the anus.

### Only a Few Chordate Species Are Invertebrates

*Read each question, and write your answer in the space provided.*

5. What are the characteristics of tunicate larvae?

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6. What are the characteristics of the adult tunicate?

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7. What are the characteristics of lancelets?

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