

# CHAPTER REVIEW

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## CONTENT REVIEW

### Multiple Choice

Choose the letter of the answer that best completes each statement.

1. A kind of echinoderm that is eaten by some people is a  
a. sea urchin.                      c. starfish.  
b. sea lily.                              d. lancelet.
2. To open a clam, a starfish uses its  
a. tube feet.                              c. madreporite.  
b. brain.                                      d. stomach.
3. Echinoderms have  
a. a backbone.  
b. a long history on Earth.  
c. lungs.  
d. smooth skin.
4. Echinoderms show  
a. bilateral symmetry.  
b. top and bottom symmetry.  
c. radial symmetry.  
d. no symmetry.
5. Digested nutrients are moved around the body of a starfish in its  
a. skin gills.                              c. bony plates.  
b. digestive glands.                      d. water vascular system.
6. Tunicates and lancelets are examples of  
a. vertebrates.                              c. echinoderms.  
b. fish.    d. chordates.
7. The side of an echinoderm where the mouth is located is called the  
a. aboral surface.                              c. oral surface.  
b. tunicate.                                      d. vascular surface.
8. Invertebrate chordates lack a  
a. larva.    c. nerve cord.  
b. notochord.                                      d. backbone.

### True or False

Determine whether each statement is true or false. If it is true, write "true." If it is false, change the underlined word or words to make the statement true.

1. All echinoderms have bilateral symmetry.
2. In echinoderms, tube feet and skin gills are used in respiration and excretion.
3. Lancelets have a primitive heart.
4. Echinoderms have nerves attached to plates in their endoskeleton.
5. A sea cucumber is a herbivore.
6. Tube feet are able to create suction when air is pumped out of them.
7. Some echinoderms have madreporites that tell them whether they are right side up.
8. If a piece of a starfish contains a portion of the central part of the body, the piece is able to regenerate.

### Word Relationships

A. An analogy is a relationship between two pairs of words or phrases generally written in the following manner: a:b::c:d. The symbol : is read "is to," and the symbol :: is read "as." For example, cat:animal::rose:plant is read "cat is to animal as rose is to plant."

In the analogies that follow, a word or phrase is missing. Complete each analogy by providing the missing word or phrase.

1. starfish:echinoderm::tunicate:\_\_\_\_\_
2. sea cucumber:detritus feeder::feather star:\_\_\_\_\_
3. eyespots:light::statocysts:\_\_\_\_\_
4. madreporite:aboral surface::mouth:\_\_\_\_\_

**B.** In each of the following sets of terms, three of the terms are related. One term does not belong. Determine the characteristic common to three of the terms and then identify the term that does not belong.

5. starfish, sea lily, lancelet, sea urchin
6. ring canal, radial canal, tube feet, skin
7. notochord, hollow dorsal nerve cord, pharyngeal slits, vertebrae
8. tube feet, brain, water vascular system, madreporite

## CONCEPT MASTERY

Use your understanding of the concepts developed in the chapter to answer each of the following in a brief paragraph.

1. What is radial symmetry? Name an animal that shows this kind of symmetry.
2. Briefly explain how a starfish eats a clam.
3. How does the water vascular system of a starfish help this animal to move?
4. What structures on a starfish tell this animal about its environment?
5. How do starfish reproduce?
6. How does a sea cucumber feed?
7. What characteristics does a lancelet share with vertebrate chordates?
8. Why is it not a good idea to break up a starfish and throw the pieces back into the water, especially if you fish for oysters?

## CRITICAL AND CREATIVE THINKING

Discuss each of the following in a brief paragraph.

1. **Making predictions** Suppose that you are living alone on a small tropical island in the Pacific Ocean. This island is protected by a coral reef that surrounds it. One day while you are skin diving, you notice several crown-of-thorns starfish eating some of the coral animals that are part of your reef. Predict what might happen if the crown-of-thorns starfish increase in number.
2. **Making comparisons** Compare the form and function of a starfish and a sea cucumber. Describe the animals' adaptations for movement and feeding.
3. **Applying concepts** Explain why many fertilized starfish eggs never develop into adult starfish.
4. **Designing an experiment** Your friend tells you that starfish can regenerate themselves from even a small portion of an arm. You challenge this assumption. Design an experiment to prove who is correct.
5. **Using the writing process** Suppose that humans had the ability to regenerate themselves. For example, an arm might be able to grow a whole new body. Write a science fiction story that describes how this process might work for a person who was severely injured in an automobile accident.

