Section 4–4 Aquatic Ecosystems  (pages 106–112)

Introduction  (page 106)

1. Aquatic ecosystems are primarily determined by what characteristics of the overlying water?
   a. Depth
   b. Flow
   c. Temperature
   d. Chemistry

2. What does the depth of the water determine? It determines the amount of light that organisms can receive.

3. What does water chemistry primarily refer to? It refers to the amount of dissolved chemicals—especially salts, nutrients, and oxygen—on which life is dependent.

Freshwater Ecosystems  (pages 106–107)

4. What are the two main types of freshwater ecosystems?
   a. Flowing-water ecosystems
   b. Standing-water ecosystems

5. Where do flowing-water ecosystems originate? They originate in mountains or hills, often springing from an underground water source.

6. How does the circulating water in a standing-water ecosystem affect the ecosystem? The circulating water distributes heat, oxygen, and nutrients throughout the system.

7. What is plankton? Plankton is a general term for the tiny, free-floating, weakly swimming organisms that occur in both fresh water and salt water.

8. Complete the table about kinds of plankton.

<table>
<thead>
<tr>
<th>KINDS OF PLANKTON</th>
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<tbody>
<tr>
<td>Kind</td>
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<tr>
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<tr>
<td>Phytoplankton</td>
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<tr>
<td>Zooplankton</td>
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</tbody>
</table>

9. What is a wetland? It is an ecosystem in which water either covers the soil or is present at or near the surface of the soil, at least part of the year.
10. What is brackish water? It is a mixture of fresh and salt water.

11. What are three main types of freshwater wetlands?
   a. Bogs  
   b. Marshes  
   c. Swamps

12. What distinguishes a marsh from a swamp? The presence of trees and shrubs in swamps is what distinguishes swamps from marshes.

**Estuaries (page 108)**

13. What are estuaries? They are wetlands formed where rivers meet the sea.

14. Tiny pieces of decaying plants and animals make up the detritus that provides food for organisms at the base of an estuary’s food web.

15. Circle the letter of each sentence that is true about estuaries.
   a. Most primary production is consumed by herbivores.
   b. They contain a mixture of fresh water and salt water.
   c. Sunlight can’t reach the bottom to power photosynthesis.
   d. They are affected by the rise and fall of ocean tides.

16. What are salt marshes? They are temperate-zone estuaries dominated by salt-tolerant grasses above the low-tide line and by seagrasses under water.

17. What are mangrove swamps, and where are they found? They are coastal wetlands that are widespread across tropical regions, including southern Florida and Hawaii.

**Marine Ecosystems (pages 109–112)**

18. What is the photic zone of the ocean? It is the well-lit upper layer.

19. The permanently dark zone below the photic zone is called the aphotic zone.

20. What are the three main vertical divisions of the ocean based on the depth and distance from the shore?
   a. Intertidal zone  
   b. Coastal ocean  
   c. Open ocean

21. Circle the letter of each sentence that is true about the intertidal zone.
   a. Organisms there are exposed to extreme changes in their surroundings.
   b. The rocky intertidal zones exist in temperate regions.
   c. Organisms are battered by currents but not by waves.
   d. Competition among organisms often leads to zonation.
22. What is zonation? It is the prominent horizontal banding of organisms that live in a particular habitat.

23. What are the boundaries of the coastal ocean? It extends from the low-tide mark to the outer edge of the continental shelf.

24. Why is the coastal ocean often rich in plankton and many other organisms? The continental shelf is often shallow enough to fall mostly or entirely within the photic zone, where photosynthesis can occur.

25. A huge forest of giant brown algae in the coastal ocean is a(an) kelp forest.

26. Circle the letter of each sentence that is true about coral reefs.
   a. The coasts of Florida and Hawaii have coral reefs.
   b. The primary structure of coral reefs is made of the skeletons of coral animals.
   c. Almost all growth in a coral reef occurs within 40 meters of the surface.
   d. Only a few organisms are able to live near coral reefs.

27. What are the boundaries of the open ocean? It begins at the edge of the continental shelf and extends outward.

28. The benthic zone covers the ocean floor.

29. What are the boundaries of the benthic zone? It extends along the ocean floor from the coastal ocean through the open ocean.

30. Organisms that live attached to or near the bottom of the ocean are called benthos.
WordWise

Answer the questions by writing the correct vocabulary terms from Chapter 4 in the blanks. Use the circled letter from each term to find the hidden word. Then, write a definition for the hidden word.

What are physical factors that shape ecosystems?

What is the full range of physical and biological conditions in which an organism lives and the way in which the organism uses those conditions?

What are the planktonic animals called?

What is a layer of permanently frozen subsoil in the tundra?

What is the average, year-after-year condition of temperature and precipitation in a particular region?

Hidden Word: biome

Definition: A biome is a particular physical environment that contains a characteristic assemblage of plants and animals.