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Chapter 4 Ecosystems and Communities

Section 4–1 The Role of Climate (pages 87–89)

This section explains how the greenhouse effect maintains the biosphere's temperature range. It also describes Earth's three main climate zones.

What Is Climate? (page 87)

1. How is weather different from climate? _____

_____

_____

_____

_____

2. What factors cause climate? _____

_____

_____

_____

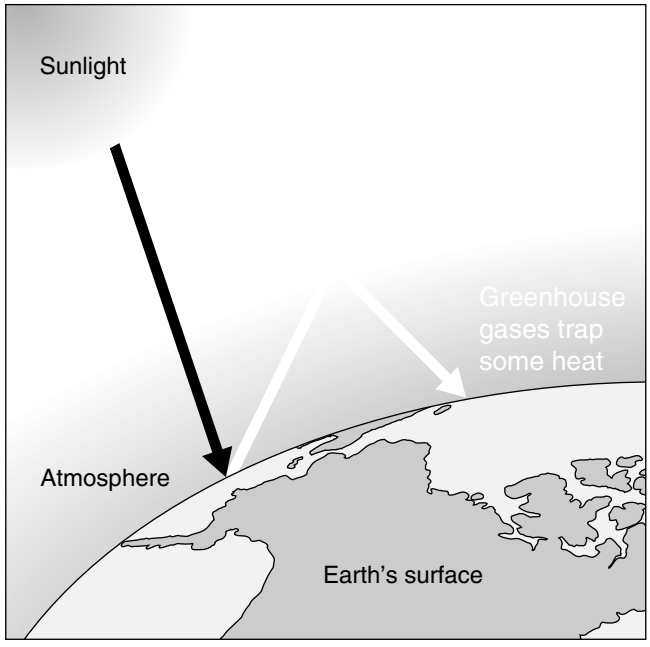
_____

The Greenhouse Effect (page 87)

3. Circle the letter of the world's insulating blanket.

a. oxygen **b.** the atmosphere **c.** the oceans **d.** solar energy

4. Complete the illustration of the greenhouse effect by showing in arrows and words what happens to the sunlight that hits Earth's surface.



Name_____ Class_____ Date_____

5. What effect do carbon dioxide, methane, and a few other atmospheric gases have on Earth's temperature? _____

6. What is the greenhouse effect? _____

_____

The Effect of Latitude on Climate (page 88)

7. Why does solar radiation strike different parts of Earth's surface at an angle that varies throughout the year? _____

_____

8. Circle the letter of where the sun is almost directly overhead at noon all year.
   a. the North Pole **b.** China **c.** the equator **d.** the South Pole

9. Why does Earth have different climate zones? _____

_____

_____

10. Complete the table about Earth's three main climate zones.

MAIN CLIMATE ZONES

Climate Zone	Location	Climate Characteristics
	Areas around North and South poles	
	Between the polar zones and the tropics	
	Near the equator	

Heat Transport in the Biosphere (page 89)

11. What force drives winds and ocean currents? _____

_____

12. The process in which water rises toward the surface in warmer regions is called _____.

13. Circle the letter of each sentence that is true about ocean currents.
   a. Patterns of heating and cooling results in ocean currents.
   b. Ocean currents transport heat within the biosphere.
   c. Surface water moved by winds results in ocean currents.
   d. Ocean currents have no effect on the climate of landmasses.

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Section 4–2 What Shapes an Ecosystem? (pages 90–97)

This section explains how biotic and abiotic factors influence an ecosystem. It also describes what interactions occur within communities and explains how ecosystems recover from a disturbance.

Biotic and Abiotic Factors (page 90)

1. Complete the table about factors that influence ecosystems.

FACTORS THAT INFLUENCE ECOSYSTEMS

Type of Factor	Definition	Examples
Biotic factors		
Abiotic factors		

2. What do the biotic and abiotic factors together determine? _____

_____

_____

The Niche (pages 91–92)

3. What is a niche? _____

_____

4. In what ways is food part of an organism's niche? _____

_____

5. Circle the letter of each sentence that is true about niches.

a. Different species can share the same niche in the same habitat.

b. No two species can share the same niche in the same habitat.

c. Two species in the same habitat have to share a niche to survive.

d. Different species can occupy niches that are very similar.

Community Interactions (pages 92–93)

6. When does competition occur? _____

_____

7. What is a resource? _____

8. What is often the result of direct competition in nature? _____

_____

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9. What is the competitive exclusion principle? _____

_____

10. What is predation? _____

_____

11. When predation occurs, what is the organism called that does the killing and eating, and what is the food organism called? _____

_____

12. What is symbiosis? _____

_____

13. Complete the table about main classes of symbiotic relationships.

MAIN CLASSES OF SYMBIOTIC RELATIONSHIPS

Class	Description of Relationship
Mutualism	
Commensalism	
Parasitism	

14. The organism from which a parasite obtains nutritional needs is called a(an) _____.

15. Circle the letter of each sentence that is true of parasites.

a. They generally weaken but do not kill their host.

b. They obtain all or part of their nutritional needs from the host.

c. They neither help nor harm the host.

d. They are usually smaller than the host.

Ecological Succession (pages 94–97)

16. What is ecological succession? _____

_____

17. What is primary succession? _____

_____

18. The first species to populate an area when primary succession begins are called _____.

19. When a disturbance changes a community without removing the soil, what follows?

_____

20. An area that was once referred to as a climax community may appear to be permanent, but what might cause it to undergo change? _____

_____

_____

Name_____ Class_____ Date_____

Section 4–3 Biomes (pages 98–105)

This section describes the unique characteristics of the world's major biomes. It also describes other land areas.

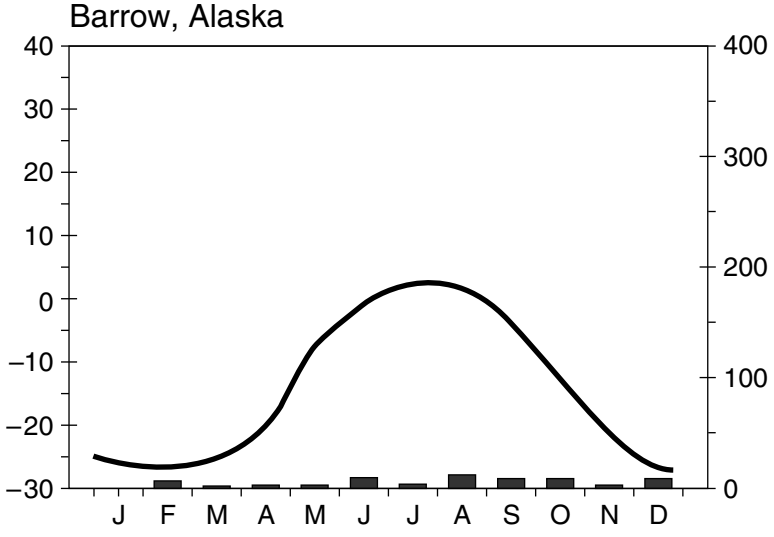
Introduction (page 98)

1. What is a biome? _____

Biomes and Climate (page 98)

2. What does a climate diagram summarize? _____

3. Complete the climate diagram by adding labels to the bottom and both sides of the graph to show what the responding variables are.



4. On a climate diagram, what does the line plot, and what do the vertical bars show?

5. What is a microclimate? _____

Name _____ Class _____ Date _____

The Major Biomes (pages 99–103)

6. Circle the letter of each sentence that is true about how each of the world's major biomes is defined.

a. Each is defined by a unique set of abiotic factors.

b. Each has a characteristic ecological community.

c. Each is defined by the country it is in.

d. Each is particularly defined by climate.

Use the map in Figure 4–11 on page 99 of your textbook to match the biome with its geographic distribution.

Biome	Geographic Distribution
_____ **7.** Tropical rain forest	**a.** Forest biome that occurs almost exclusively in the Northern Hemisphere
_____ **8.** Tundra	**b.** Biome that occurs on or near the equator
_____ **9.** Boreal forest	**c.** Biome that occurs near or above 60°N latitude

10. Complete the table about layers of a tropical rain forest.

LAYERS OF A TROPICAL RAIN FOREST

Layer	Definition
	Dense covering formed by the leafy tops of tall trees
	Layer of shorter trees and vines

11. In what kind of place do tropical dry forests grow? _____

_____

_____

12. What is a deciduous tree? _____

_____

13. What is another name for tropical savannas? _____

14. Is the following sentence true or false? Savannas are found in large parts of eastern Africa. _____

15. Circle the letter of each sentence that is true about deserts.

a. They are hot, day and night.

b. The soils are rich in minerals but poor in organic material.

c. Cactuses and other succulents are dominant plants.

d. Reptiles are the only wildlife.

16. What amount of annual precipitation defines a desert biome? _____

_____

_____

Name_____ Class_____ Date_____

17. What factors maintain the characteristic plant community of temperate grasslands?

_____

_____

_____

18. Why is fire a constant threat in temperate woodland and shrubland? _____

_____

_____

19. Communities that are dominated by shrubs are also known as _____.

20. What kinds of trees do temperate forests contain?_____

_____

21. What is a coniferous tree? _____

_____

22. What is humus? _____

_____

23. What is the geographic distribution of the northwestern coniferous forest?

_____

_____

24. Boreal forests are also called _____.

25. What are the seasons like in a boreal forest? _____

_____

_____

26. Circle the letter of each sentence that is true about boreal forests.

a. Dominant plants include spruce and fir.

b. They have very high precipitation.

c. They have soils that are rich in humus.

d. Dominant wildlife include moose and other large herbivores.

27. What is permafrost? _____

_____

28. What happens to the ground in tundra during the summer? _____

_____

_____

29. Why are tundra plants small and stunted? _____

_____

_____

_____

Name_____ Class_____ Date_____

Other Land Areas (page 105)

30. When are the polar regions cold? _____

_____

31. What plants and algae can be found in the polar ice regions? _____

_____

32. In the north polar region, what are the dominant animals? _____

_____

33. The abiotic and biotic conditions of mountain ranges vary with _____.

34. Number the sequence of conditions you would find as you moved from the base to the summit of a mountain. Number the conditions at the base *1*.

_____ **a.** Stunted vegetation like that in tundra

_____ **b.** Grassland

_____ **c.** Forest of spruce and other conifers

_____ **d.** Open woodland of pines

Reading Skill Practice

You can often increase your understanding of what you've read by making comparisons. A compare-and-contrast table helps you to do this. On a separate sheet of paper, make a table to compare the major land biomes you read about in Section 4–3. The characteristics that you might use to form the basis of your comparison could include a general description, abiotic factors, dominant plants, dominant wildlife, and geographic distribution. For more information about compare-and-contrast tables, see Organizing Information in Appendix A of your textbook.

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

This section explains the main factors that govern aquatic ecosystems. It also describes the characteristics of freshwater ecosystems, freshwater wetlands, estuaries, and the different marine zones.

Introduction (page 106)

1. Aquatic ecosystems are primarily determined by what characteristics of the overlying water?

a. _____ **c.** _____

b. _____ **d.** _____

2. What does the depth of the water determine? _____

_____

3. What does water chemistry primarily refer to? _____

_____

_____

Freshwater Ecosystems (pages 106–107)

4. What are the two main types of freshwater ecosystems?

a. _____ **b.** _____

5. Where do flowing-water ecosystems originate? _____

_____

_____

6. How does the circulating water in a standing-water ecosystem affect the ecosystem?

_____

7. What is plankton? _____

_____

_____

8. Complete the table about kinds of plankton.

KINDS OF PLANKTON

Kind	Organisms	How Nutrition Obtained
	Single-celled algae	
	Planktonic animals	

9. What is a wetland? _____

_____

_____

Name _____ Class _____ Date _____

10. What is brackish water? _____

11. What are three main types of freshwater wetlands?

a. _____ **b.** _____ **c.** _____

12. What distinguishes a marsh from a swamp? _____

_____

_____

Estuaries (page 108)

13. What are estuaries? _____

_____

14. Tiny pieces of decaying plants and animals make up the _____ 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? _____

_____

_____

17. What are mangrove swamps, and where are they found? _____

_____

_____

Marine Ecosystems (pages 109–112)

18. What is the photic zone of the ocean? _____

_____

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

20. What are the three main vertical divisions of the ocean based on the depth and distance from the shore?

a. _____ **b.** _____ **c.** _____

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.

Name_____ Class_____ Date_____

22. What is zonation? _____

_____

23. What are the boundaries of the coastal ocean? _____

_____

_____

24. Why is the coastal ocean often rich in plankton and many other organisms?

_____

_____

_____

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

_____.

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? _____

_____

_____

28. The benthic zone covers the ocean _____.

29. What are the boundaries of the benthic zone? _____

_____

_____

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

_____.

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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: _ _ _ _ _

Definition: _____

_____