## Land Biomes

#### **BEFORE YOU READ**

After you read this section, you should be able to answer these questions:

- What are eight kinds of land biomes?
- What kinds of organisms live in each land biome?

National Science Education Standards LS 1a, 3a, 3c, 3d, 4b, 4c, 4d, 5a, 5b

### What Are Biomes?

Imagine that you have to explain the difference between a desert and a forest to someone. What would you say? You might say that a forest gets more rain than a desert. You might also say that different organisms live in forests than in deserts. Both of these features, as well as many others, make these two environments different from each other.

Rainfall is an *abiotic factor*, or nonliving part, of the environment. Organisms and their interactions are *biotic factors*, or living parts, of the environment. A large area with similar biotic and abiotic factors is called a **biome**. A biome is made up of many related ecosystems.

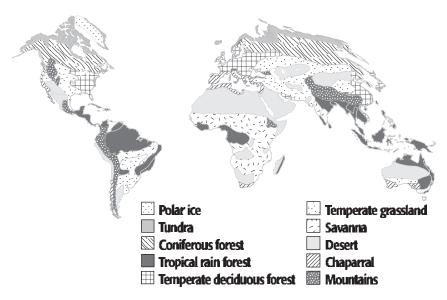
There are many different biomes on Earth. The figure below shows a map of the major land biomes. *Land biomes* are biomes that are found on land.



**Summarize** As you read about each type of land biome, write down its important features. When you finish reading this section, write a summary of the features of each type of land biome into your notebook.

## Critical Thinking

**1. Compare** How is a biome different from an ecosystem?



## TAKE A LOOK

**2. Identify** On which two continents are most savanna biomes found?

This map shows some of the major land biomes on Earth.

## READING CHECK

3. Identify What are two features that forest biomes have in common?

#### **STANDARDS CHECK**

**LS 4b** Populations of organisms can be categorized by the functions they serve in an ecosystem. Plants and some microorganisms are producersthey make their own food. All animals, including humans, are consumers, which obtain their food by eating other organisms. Decomposers, primarily bacteria and fungi, are consumers that use waste materials and dead organisms for food. Food webs identify the relationship among producers, consumers, and decomposers in an ecosystem.

#### **Word Help:** <u>function</u> use or purpose

4. Identify What are two producers in a temperate deciduous forest?

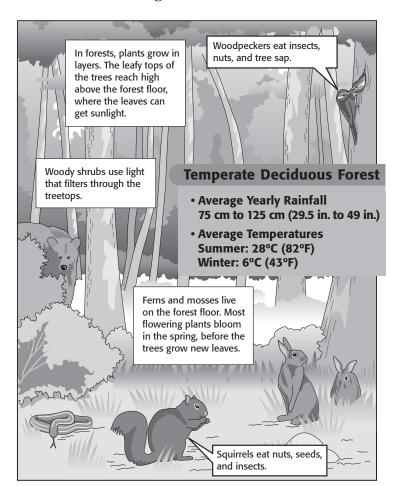
### What Are Three Kinds of Forest Biomes?

Three forest biomes are coniferous forests, temperate deciduous forests, and tropical rain forests. All of these forests receive plenty of rain, and the temperatures are not extreme. The kind of forest that forms in an area depends on the area's climate.

#### **TEMPERATE DECIDUOUS FORESTS**

Have you seen trees with leaves that change color and then fall off the trees? If so, you have seen deciduous trees. The word deciduous comes from a Latin word that means "to fall off." Deciduous trees shed their leaves to save water during the winter. Temperate deciduous forests contain many deciduous trees. As the figure below shows, many different organisms live in deciduous forests.

When deciduous trees lose their leaves, more light can reach the ground. Therefore, the ground in deciduous forests gets a lot of sunlight during part of the year. Small trees and shrubs can grow on the forest floor.

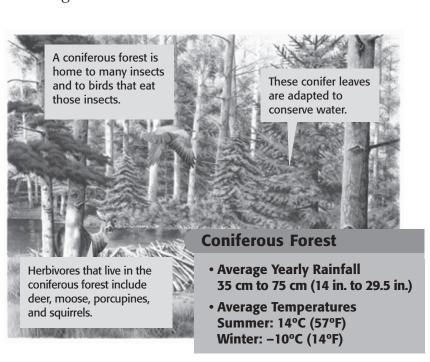


**SECTION 1** Land Biomes continued

#### **CONIFEROUS FORESTS**

The coniferous forest gets its name from conifers, the main type of tree that grows there. Conifers are trees that produce seeds in cones. They have special needle-shaped leaves covered in a thick, waxy coating. These features help the tree conserve water. The waxy coating also protects the needles from being damaged by cold weather. Most conifers are evergreens. They stay green all year and do not lose all their leaves at once.

In coniferous forests, decomposition is slow. The ground may be covered by a thick layer of needles. The trees prevent much sunlight from reaching the ground. Because there is little light there, not many plants live under the conifer trees. The figure below shows some of the organisms that live in coniferous forests.





5. Identify Where do conifers produce their seeds?

## Critical Thinking

<b>6. Compare</b> Why does
the floor of a temperate
deciduous forest have more
small plants than the floor of
a coniferous forest?

<b>7.</b>	Explain	Why is it impor-
ta	nt for tree	es in a coniferous
fo	rest to co	nserve water?

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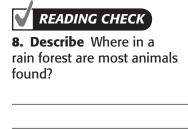
SECTION 1 Land Biomes continued

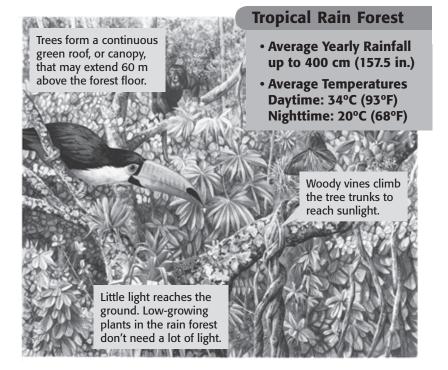
#### TROPICAL RAIN FORESTS

Tropical rain forest biomes contain the greatest variety of plants and animals on Earth. The warm temperatures and high rainfall allow a lot of plants to grow. Trees grow very tall and dense. Their leaves prevent much light from reaching the forest floor, so not many small plants live on the forest floor.

The many plants in a rainforest support many different kinds of animals. Most of the animals in a rain forest live in the trees. Birds such as toucans are omnivores that eat fruits. reptiles, and other birds. Carnivores, such as harpy eagles, eat other animals, such as howler monkeys. Howler monkeys are herbivores that eat fruits, nuts, and leaves.

You may think that the soil in a rain forest is very rich in nutrients because of all the plants that live there. However, most of the nutrients in the tropical rain forest are found in plants, not in soil. The soil is so thin that many trees grow roots above-ground for support.





## TAKE A LOOK

**9. Infer** Why do many vines grow on tree branches instead of on the forest floor?

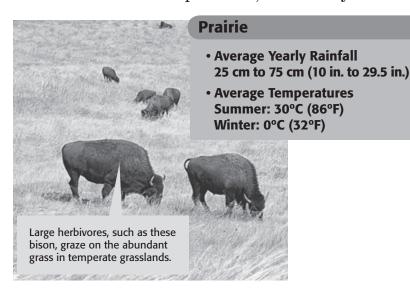
## What Are Two Kinds of Grassland?

A *grassland* is a biome made up mainly of grasses. small flowering plants, and a few trees. The two main kinds of grassland are temperate grasslands and savannas.

#### **TEMPERATE GRASSLANDS**

In temperate grasslands, the summers are warm and the winters are cold. The soils of temperate grasslands are very rich in nutrients, so many kinds of grasses grow there. Fires, droughts, and grazing prevent trees and shrubs from growing.

Many seed-eating animals, such as prairie dogs and mice, live in this kind of grassland. They use camouflage and burrows to hide from predators, such as coyotes.

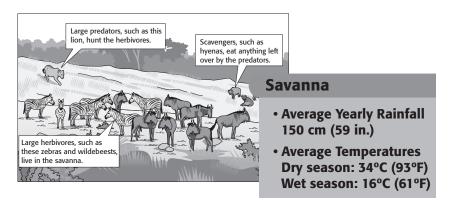




10. Identify What are two ways small animals hide from predators?

#### **SAVANNAS**

The **savanna** is a grassland that has a lot of rainfall during some seasons and very little rainfall in others. During the dry season, savanna grasses dry out and turn yellow. However, the roots can live for many months without water.



## TAKE A LOOK

11. Compare How does the amount of rainfall in a temperate grassland compare with the amount of rainfall in a savanna?

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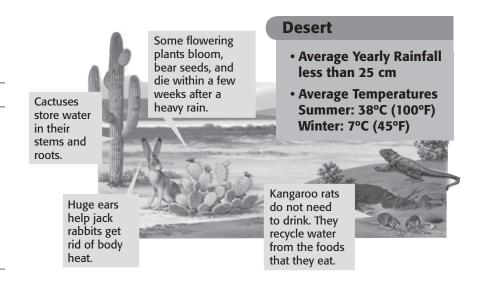
**SECTION 1** Land Biomes continued

### What Is a Desert?

**Deserts** are very dry biomes, and most are very hot. The organisms that can live in a desert have special features that let them survive in the dry climate.

Many desert plants have roots that spread near the surface. This allows them to take up water quickly after a rain, before it evaporates.

Desert animals also have ways to survive the hot, dry desert conditions. Some live underground, where it is cooler. They come out only at night, when air temperatures are lower. Others, such as the fringe-toed lizard, bury themselves in the loose sand to escape the heat and avoid predators.



# READING CHECK

**12. List** What are two ways that burrowing under the ground helps the fringe-toed lizard?

## Math Focus

13. Calculate About how many inches of rain does a desert get every year? Show your work.

1 in. = 2.54 cm

## What Is a Tundra?

Imagine a place on Earth that is too cold for trees to grow. A **tundra** is a biome that has very cold temperatures and little rainfall. Two kinds of tundra are polar tundra and alpine tundra.

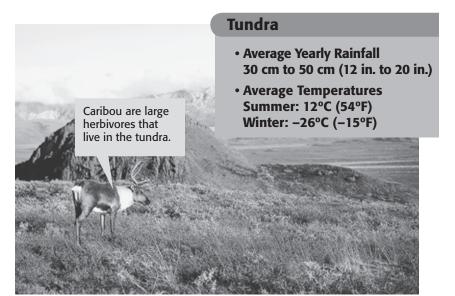
#### **POLAR TUNDRA**

Polar tundra is found near the North and South Poles. In polar tundra, the layer of soil below the surface stays frozen all year long. This layer is called *permafrost*.

During the short, cool summers, only the water in the soil at the surface melts. This surface soil is too shallow for most plants. Only plants with shallow roots, such as grasses and small shrubs, are common. Mosses and lichens grow beneath these plants. Growing close to the ground helps the plants resist the wind and the cold.

Animals of the tundra also have ways to live in this biome. In the winter, food is hard to find and the weather is very harsh. Some animals, such as bears, sleep through much of the winter. Other animals, like the caribou, travel long distances to find food. Many animals have extra layers of fat to keep them warm.

During the summer, the soil above the permafrost becomes muddy from melting ice and snow. Insects, such as mosquitoes, lay eggs in the mud. Birds that prey on these insects are carnivores. Other carnivores, such as wolves, prey on herbivores, such as caribou and musk oxen.



#### **ALPINE TUNDRA**

Alpine tundra is similar to polar tundra. Alpine tundra has permafrost. However, alpine tundra is found at the tops of tall mountains. Above an elevation called the tree line, trees cannot grow on a mountain. Alpine tundra is found above the tree line. It gets a lot of sunlight and a moderate amount of rainfall.



14. Explain How does growing close to the ground helps tundra plants?

### TAKE A LOOK

**15. Describe** How are the ecological roles of a caribou in a tundra and a zebra in a savanna similar?



**Share Experiences** Have you ever been to a very cold place? In a group, discuss what it was like.

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**4. Compare** How is alpine tundra different from polar tundra?