

Section

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Biomes**► Before You Read**

Deserts are very different from rain forests. Each is home to species that can find everything they need to survive in their unique environment. This section discusses areas with their own specific sets of characteristics. Highlight each of the key terms that introduces one of these types of areas. Then use a different color to highlight important facts about each.

► Read to Learn**STUDY COACH**

Make Flash Cards Make flash cards to help you learn section material. Think of a quiz question for each paragraph. Write the question on one side of the flash card and the answer on the other side. Keep quizzing yourself until you know all of the answers.

✓ Reading Check

1. What is an estuary?

What is a biome?

A **biome** is a large group of ecosystems that shares the same type of climax community. All the ecosystems within the biome have similar climates and organisms. Biomes located on land are called terrestrial biomes. Biomes located in bodies of water are known as aquatic biomes.

Aquatic Biomes

Approximately 75 percent of Earth's surface is covered with water. Most of that water is salty. Salt water is found in oceans, seas, and some inland lakes. Freshwater is found in rivers, streams, ponds, and most lakes.

The oceans contain a large amount of biomass, or living material. Much of this biomass is made up of tiny organisms that humans cannot see. Large marine animals depend on these organisms for food.

What is an estuary?

An **estuary** (ES chuh wer ee) is a coastal body of water partly surrounded by land that forms where rivers meet the ocean. Freshwater and salt water come together in an estuary. The amount of salt in an estuary depends on how much freshwater the river brings into the estuary. ✓

Grasses that can grow in salt water can become very thick in an estuary. Their stems and roots trap food material for small organisms like snails, crabs, and shrimp. These organisms feed on the

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trapped, decaying materials. The nutrients in the food pass through the food chain when these smaller organisms are eaten by larger predators, including birds.

What are the effects of tides?

Each day, the gravitational pull of the sun and moon causes ocean tides to rise and fall. The area of shoreline that lies between the high and low tide lines is called the **intertidal zone**.

Many animals that live in the intertidal zone, such as snails and sea stars, have suctionlike adaptations. These allow the animals to hold onto rocks when wave action is strong. Other animals make their own strong glue that helps them stay in place. Clams, worms, snails, and crabs survive by burying themselves into the sand.

Where do most marine organisms live?

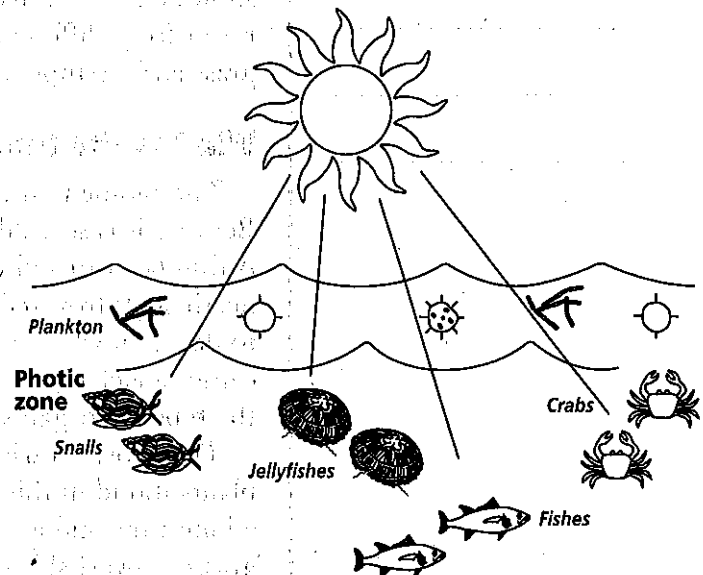
Most of the organisms that live in the marine (saltwater) biome are **plankton**. Plankton are tiny organisms that float in the waters of the photic zone. The **photic zone** is the area of the ocean that is shallow enough for sunlight to penetrate. Plankton include autotrophs (organisms that make their own nutrients), diatoms, eggs, and very young marine animals. Plankton are important because they form the base of the entire aquatic food chain. This means that every aquatic animal either eats plankton or eats an animal that eats plankton.

What are freshwater biomes?

Bodies of freshwater are another kind of biome. Lakes and ponds serve as home to many organisms. Plants grow around the shorelines and into the water. The shallow waters where these plants grow are home to tadpoles, aquatic insects, worms, certain fishes, and many other living things. All the life forms are part of the local food chain.

In deeper waters, it is colder and there are fewer species. Dead organisms drift to the bottom. There, bacteria break down the organisms and recycle the nutrients. Organisms decay more slowly at the bottom of a deep lake than in shallow water.

✓ Reading Check**2. Why are plankton important?**



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✓ Reading Check

3. What five abiotic factors does climate include?

Terrestrial Biomes

Terrestrial biomes vary greatly. At the north pole, the weather is very cold and there are no plants. As you move south, the weather gets warmer and there is a change in the size, number, and kinds of plants that cover the ground. As you continue south, the temperatures rise and you encounter forests. Still farther south are grasslands and deserts, with high summer temperatures and little rainfall. Near the equator, you find lush growth and much rainfall.

How does climate affect biomes?

Climate is a group of abiotic factors that influences the kind of climax communities that develop in an area. Climate includes wind, cloud cover, temperature, humidity, and the amount of rain and snow an area receives. The most common terrestrial biomes that result from differences in climate are tundras, taigas, deserts, grasslands, temperate forests, and tropical rain forests.

What is the tundra biome?

The biome that circles the north pole is called the **tundra**. Because it is so cold, only a few grasses and small plants grow. A thin layer of soil may thaw in the summer, but the soil underneath stays frozen. The cold causes any organisms that die there to decay slowly. As a result, nutrients are recycled slowly. This causes a lack of nutrients in the soil. The lack of nutrients limits the types of organisms the tundra can support.

The short growing season in the tundra limits the types of plants found in this biome, but the plants that do grow there live a long time and are resistant to drought and cold. These include grasses, dwarf shrubs, and cushion plants. Animals that live on the tundra include arctic foxes, weasels, lemmings, hares, snowy owls, hawks, musk oxen, caribou, and reindeer.

What is the taiga biome?

South of the north pole is the **taiga** (TI guh). The climate here is warmer and wetter than the tundra and forests of trees, such as fir and spruce, are found. Animals such as elk, deer, moose, squirrels, voles, weasels, and a variety of birds call the taiga home. The taiga stretches across much of Canada, northern Europe, and Asia.

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Biomes, *continued***What is the desert biome?**

The driest biome is the desert biome. A **desert** is an arid region with little to no plant life. The plants that do grow there are well adapted to these dry areas. In fact, many desert plants need little rainfall. Their leaves, stems, and coatings conserve water. Many also have spines, thorns, or poisons to protect against plant eaters.

Many small desert mammals are plant eaters that hide during the heat of the day and search for food at night. The kangaroo rat is a plant eater that does not have to drink water. Instead, these rodents get water from the plants they eat. Coyotes, hawks, and owls are meat eaters. They feed on snakes, lizards, and small desert mammals. Scorpions and some snakes use their venom to capture their prey.

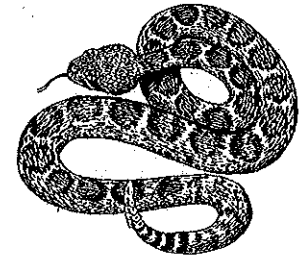
What is the grassland biome?

Grasslands, or prairies, are large communities covered with rich soil, grasses, and other grasslike plants. Grasslands most often exist in climates that have a dry season. In this type of biome, there is not enough water to support forests. Many of the grasses die off each winter, but the roots of the grasses survive and enlarge every year. This forms a continuous underground mat called sod.

Grasslands are known as the breadbaskets of the world because of the many types of grains that can grow there. Many other plants grow well there too, including wildflowers. At some times of the year, the grasslands are populated by herds of grazing animals including deer and elk. Other prairie animals include jackrabbits and prairie dogs. Foxes and ferrets prey on prairie dogs. Many species of insects, birds, and reptiles also make the grasslands their home.

What is the rain forest biome?

Rain forests are home to more types of life than any other biome. There are two types of rain forests—the temperate rain forest and the tropical rain forest. **Tropical rain forests** have warm temperatures, wet weather, and lush plant growth. They are located near the equator. The hot climate of these rain forests allows organisms to decay quickly. Plants must quickly absorb these nutrients before they are carried away from the soil by rain. Temperate rain forests are less common, but they also have large amounts of moisture. ☞

**Think it Over**

4. **Infer** Because of the many types of grains that can grow in these areas, they are called the breadbaskets of the world. (Circle your choice.)
- tundras
 - grasslands
 - tropical rain forests

**Reading Check**

5. What are the two types of rain forests?

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Biomes, continued**What is the temperate forest biome?**

Temperate or deciduous forests have precipitation that ranges from 70 to 150 cm annually. The soil has a rich humus top layer and a deeper layer of clay. If mineral nutrients in the humus are not immediately absorbed by roots, they might be washed into the clay and lost from the food web for many years. The forests are thick with broad-leaved trees that lose their leaves every year. Some of these trees are maple, oak, and elm. Animals that live in this biome include mice, rabbits, bears, and many different birds.

After You Read**Mini Glossary**

biome: a group of ecosystems with the same climate communities; biomes on land are called terrestrial biomes, those in water are called aquatic biomes

desert: an arid region with sparse to almost no plant life; the driest biome

estuary (ES chu wer ee): coastal body of water, partially surrounded by land, where salt water and freshwater mix

grassland: biome of large communities covered with rich soil, grasses, and similar plants

intertidal zone: the area of shoreline that lies between the high and low tide lines

photic zone: portion of the marine biome that is shallow enough for sunlight to penetrate

plankton: small organisms that drift and float in the waters of the photic zone

taiga (TI guh): the biome just south of the tundra; characterized by a boreal or northern coniferous forest composed of fir, hemlock, and spruce trees and acidic, mineral-poor soils

temperate/deciduous forest: biome composed of forests of broad-leaved hardwood trees that lose their foliage annually; receives 70–150 cm of precipitation annually

tropical rain forest: biome located near the equator; has warm temperatures, lots of rain, and lush plant growth

tundra: the biome that circles the north pole; treeless land with long summer days and short periods of winter sunlight

1. Review the terms and their definitions in the Mini Glossary above. Use one of these terms that describes a biome in a complete sentence. Write your sentence in the space below.

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Biomes, continued

2. Fill in the blanks below with the following words to make correct statements about the material you read in this section: **desert, tundra, plankton, photic zone, rain forest.**

- a. The _____ biome is home to more types of life than any other biome.
- b. The _____ is so cold that very little life exists there.
- c. The driest biome is the _____ biome.
- d. The part of the marine biome that is shallow enough for sunlight to penetrate is called the _____.
- e. The base of the entire marine biome food chain is formed by _____.



Visit the Glencoe Science Web site at **science.glencoe.com** to find your biology book and learn more about biomes.