# **Climate and Biomes Comprehension Check**

For questions 1 and 2, consider the list of biomes below and choose two to describe. Include their climate, defining features, and any potential threats to their safety in your response.

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| --- | --- | --- | --- | --- |
| **Biomes** | | | | |
| Tropical Rain Forest | Temperate Forest | Taiga Forest | Savanna | Steppe |
| Prairie | Desert | Tundra | Ice | Aquatic |

1. Biome 1: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
2. Biome 2: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
3. Define and describe climate. How is climate different than weather?
4. What is latitude and how does it influence the climate?
5. What is elevation and how does it influence the climate?
6. What is topography and how does it influence the climate?
7. How do large bodies of water influence the climate?
8. What are wind systems and how do they influence the climate?
9. What is a biome and how is it different than an ecosystem? Support your answer with an example.
10. Earth’s climate has changed naturally over history. Why are scientists and environmentalists concerned about global warming now?

# **Climate and Biomes Comprehension Check Answer Key**

For questions 1 and 2, consider the list of biomes below and choose two to describe. Include their climate, defining features, and any potential threats to their safety in your response.

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1. Biome 1: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
   1. Students’ answers will vary depending on the biomes they choose. They may include any of the following in their responses:
   2. The tropical rain forest biome has a tropical, wet climate only found around the equator. This biome receives at least 100 inches of rain annually. Plants and trees grow well in the tropical rain forest biome because of the rain, humidity, and temperatures. Deforestation is threatening the vast number of species that call the tropical rain forest home.
   3. Temperate forest biomes grow in places with moderate climates, fair amounts of rainfall, and different seasons. They are located farther away from the equator than tropical rain forests and experience a variety of warm to cool temperatures. Temperate forest biomes are never too hot or too cold. They are dominated by trees, including deciduous as well as conifers and evergreens. Many plants and animals have adapted to survive the changing conditions throughout the year and call the temperate forest biome their home.
   4. Taiga forest biomes are also known as boreal forests, meaning “of northern regions.” They are located in vast areas of the far north of Europe, Asia, and North America. Taigas have a subarctic climate with extremely long, cold winters and short, cool summers. Much of the taiga is covered in permafrost, layers of earth that stay frozen all year long. Melting permafrost has created wetlands, making taigas home to aquatic plants and animals. Taigas contain conifer trees as well as animals that have adapted to survive the harsh seasons. Deforestation is also a concern in taiga biomes.
   5. Savannas, also called tropical grasslands, are dominated by grass rather than trees. They are found between rain forests and deserts in tropical areas. They are typically hot all year round and experience a short rainy season and a long dry season. Wildfires are common in savannas and help the biome by removing dead and dying growth to maintain the balance between larger plants and grasses. During the rainy season, life returns to the savanna with green grass and plants as well as herds of animals.
   6. A steppe is another grassland biome found between Earth’s tropical and polar regions. Steppes have semiarid climates with enough rain for small plants and short grasses. Temperatures in steppes vary with extremely hot summers and extremely cold winters.
   7. A prairie is a wide stretch of grassland with long, thick grasses. Prairies have temperate climates with rain in late spring and early fall, hot and dry summers, and long and cold winters. Prairies do not receive a lot of rain but do receive more rain than steppes.
   8. Deserts are the driest biomes, receiving less than 10 inches of rain each year. Deserts are extremely hot during the day but become chilly at night because they have no cloud coverage to trap the sun’s heat. Deserts located far from the equator can even experience winter! Dry biomes are mostly comprised of sand but sometimes contain stone and rock, hills, mountains, and even huge salt flats. Desertification is a major threat to deserts. When people cut down trees and clear plants, nothing is left to hold the ground together, causing deserts to grow. This endangers other biomes and the animals and plants that live nearby.
   9. When thinking about polar biomes, people often think of the tundra. The tundra exists mostly around the Arctic Circle or on top of very high mountains. It has a tundra climate with very dark and very cold (negative 25 degrees Fahrenheit!) winters. Summers in the tundra are extremely short, lasting only 6-10 weeks with temperatures that can reach up to 32-50 degrees Fahrenheit. The tundra exists beyond the tree line because the freezing temperatures and wind conditions make it almost impossible for life. Only such small plants as shrubs, grass, and colorful lichens that provide food for tundra animals live here. The tundra is under threat from mining and drilling for oil and other natural resources because these acts harm the habitats of tundra plants and animals.
   10. The ice biome contains ice caps, which are thick glaciers that cover massive sections of land. They are found near the North and South Poles. Ice caps contain no vegetation, and very few animals can survive.
   11. The aquatic biome, also known as the marine biome, is the largest biome on Earth. It covers about 71% of Earth’s surface. Aquatic biomes can be further broken down into saltwater and freshwater biomes. The aquatic biome includes such ecosystems as estuaries, kelp forests, and coral reefs. Aquatic biomes are in danger from global warming. Rising sea temperatures make it difficult for creatures to survive. For example, coral cannot survive in hot water. When corals die, many other animals in a reef lose their home and food supply, causing many to die too.
2. Biome 2: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
   1. See the answer key for question 1.
3. Define and describe climate. How is climate different than weather?
   1. Weather and climate are related but are two different concepts. Weather is the state of the atmosphere at a particular place and time. Climate, on the other hand, is the average weather of a place or region over a period of time. Climate is described by its temperature, variations in temperatures, amounts of sun, kinds and amounts of precipitation, levels of humidity, frequency of storms, and wind speed and direction.
4. What is latitude and how does it influence the climate?
   1. Latitude is one of the five major influences that affect climate. Latitude describes an area’s distance from the equator. The closer an area is to the equator, the warmer it is because it is closer to the sun. The tilt of Earth also affects the climate. The tilt not only causes different seasons throughout the year, but also affects how many daylight hours an area will get. The closer an area is to the equator, the longer its summers and days.
5. What is elevation and how does it influence the climate?
   1. Elevation also affects an area’s climate. Elevation refers to a place’s distance above sea level. The higher an area, the colder it is.
6. What is topography and how does it influence the climate?
   1. Differences in topography also affect climate. Land features such as mountains alter patterns of wind and precipitation, therefore changing the climate.
7. How do large bodies of water influence the climate?
   1. Climate is also affected by an area’s relative location to large bodies of water. Large bodies of water, such as oceans, may warm or cool nearby land and air. In addition, the air above oceans absorbs moisture, which can make for a wetter climate.
8. What are wind systems and how do they influence the climate?
   1. Finally, wind systems affect the climate of the land and water over which they move. Wind systems blow continuously around the planet in a variety of directions, changing climates as they go. Winds alter the ocean’s surface waves and currents, therefore altering climates even more. In addition, winds can create massive storms such as tornadoes and hurricanes.
9. What is a biome and how is it different than an ecosystem? Support your answer with an example.
   1. A biome is a specific environment that is home to living things suited to the particular place and climate. Examples of biomes include ice, tundra, desert, taiga, savanna, grassland, temperate forest, and tropical rain forest. Biomes and ecosystems are related but are not the same. An ecosystem is all the living and nonliving things in a specific environment and the interactions that occur among them. In general, biomes contain more than one ecosystem.
10. Earth’s climate has changed naturally over history. Why are scientists and environmentalists concerned about global warming now?
    1. Scientists know that Earth’s climate has changed naturally over the course of history. Earth’s temperature has warmed and cooled over time; however, Earth’s climate has become much warmer than expected over the last 200 years or so. Scientists agree that this change and pattern of warmer temperatures is directly related to human activities like cutting down forests and burning fossil fuels. If governments and businesses do not work together to address this change in climate, biomes will be affected even more drastically than they currently are.