

## Climates

### An Introduction to Climates

Climate is the kind of weather a place has over a period of years. What do scientists (known as *climatologists*) look for when they study a **region's**<sup>1</sup> climate? You are already familiar with most of the ingredients. They measure average rainfall, sunshine, winds, and temperature. They also look at how each ingredient changes from month to month and year to year. Are there cold and hot seasons in the region? Or do the temperatures stay pretty much the same all year long? Does it rain more during certain months than others? Has it been unusually dry compared to other years?

Keeping track of climates is important work. People worry that human activity may be changing the global climate, which could cause big problems. There are five big factors that can make climates vary from place to place. How does each factor influence temperature and rainfall?

- 1.) **Latitude:** The distance of a place north or south from the **equator**<sup>2</sup>. The closer a region is to the equator, the hotter it is on average all year long. The farther away it is, the cooler it is. Summers become shorter and milder. As you approach the poles, winters become bitterly cold.
- 2.) **Altitude:** The height of a place above sea level. Higher elevations tend to be colder than lower elevations.
- 3.) **Oceans and Large Lakes:** Water rises and drops in temperature more slowly than land. Water also warms or cools the air above it. As wind blows this milder air around it affects a region's temperature. Areas near water tend to have milder winters and cooler summers than places at the same latitude that are away from water.
- 4.) **Mountain Ranges:** Air cannot go through mountains. Instead, it rises and cools as it travels up the side of a mountain. Cold air cannot hold as much water as warm air does. The rapid cooling causes rain, which removes most of the water. All of the rain stays on the same side of the mountain! The other side of the mountain is dryer and may even become as dry as a desert.
- 5.) **Wind:** Six major belts of wind blow around the Earth. They blow from different directions. For example, Polar winds blow north to south. Westerly winds blow west to east. As they do, they distribute cool air, heat, and moisture to different parts of the world.

---

<sup>1</sup> **region:** any large part of the Earth's surface

<sup>2</sup> **equator:** an imaginary circle around the middle of the earth, halfway between the North and South Poles

The world is divided into different climate zones. These zones have similar weather patterns all throughout the year. These weather patterns affect the types of **vegetation**<sup>3</sup> and animals found in each climate zone. Roses could never survive at the South Pole. The ice-cap climate is too cold and dark. Because it is too hot and dry in a desert climate, penguins could never survive there. As a result, places that have similar climates also have similar types of vegetation and animals.

---

<sup>3</sup> **vegetation:** plant life

Name: \_\_\_\_\_ Date: \_\_\_\_\_

1. What is the author's purpose for writing this passage about climate?
  - a. The author wants to compare and contrast climate zones.
  - b. The author wants to warn climbers to be careful to acclimate to their environment.
  - c. The author wants to educate the reader about climate.
  - d. The author wants to educate the reader about penguins.
  
2. The genre of this passage is:
  - a. fairytale
  - b. fiction
  - c. historical fiction
  - d. non-fiction
  
3. What happens as warm air travels up a mountainside?
  - a. It cools.
  - b. It remains the same temperature, which causes rain.
  - c. It gets even warmer.
  - d. It slows down.
  
4. What is altitude?
  - a. It is the distance north or south from the equator.
  - b. They are rivers running through the ocean.
  - c. It is the height of a place above sea level.
  - d. It is a group of mountains.
  
5. Which statement correctly pairs the climate factor with its effect on temperature?
  - a. A region with a latitude close to the equator is cold all year.
  - b. A region with a high altitude is warmer than lower altitude.
  - c. A region near an ocean is extremely cold in the winter.
  - d. A region on top of a mountain is cooler than at the base.

6. Describe the climate where you live, using some of the vocabulary from the passage.

---

---

---

7. The author writes that people worry about human activity changing the global climate, which could cause big problems. What type of effects might the author be concerned about?

---

---

---

8. The question below is an incomplete sentence. Choose the word that best completes the sentence.

Six major belts of wind blow around the Earth, \_\_\_\_\_ has the effect of distributing cool air, heat, and moisture to different parts of the world.

- a. yet
- b. which
- c. but
- d. or

9. Answer the following question based on the sentence below.

Roses could never survive at the South Pole, because the climate is too cold and dark.

In this sentence, the word South Pole best answers which question?

- a. Who?
- b. What?
- c. Where?
- d. Why?

10. **Vocabulary Word:** region: any large part of the Earth's surface.

Use the vocabulary word in a sentence: \_\_\_\_\_

---

## Teacher Guide and Answers

**Passage Reading Level:** Lexile 770

**Featured Text Structure:** Enumerative – the writer includes a list, giving examples of something. This text structure is often combined with cause/effect or problem/solution

**Passage Summary:** The passage defines climate in terms of measured rainfall, sunshine, winds and temperature. A list of factors that influence climate and how each can affect rainfall and temperature is provided.

1. What is the author's purpose for writing this passage about climate?
  - a. The author wants to compare and contrast climate zones.
  - b. The author wants to warn climbers to be careful to acclimate to their environment.
  - c. The author wants to educate the reader about climate.**
  - d. The author wants to educate the reader about penguins.
  
2. The genre of this passage is:
  - a. fairytale
  - b. fiction
  - c. historical fiction
  - d. non-fiction**
  
3. What happens as warm air travels up a mountainside?
  - a. It cools.**
  - b. It remains the same temperature, which causes rain.
  - c. It gets even warmer.
  - d. It slows down.
  
4. What is altitude?
  - a. It is the distance north or south from the equator.
  - b. They are rivers running through the ocean.
  - c. It is the height of a place above sea level.**
  - d. It is a group of mountains.
  
5. Which statement correctly pairs the climate factor with its effect on temperature?
  - a. A region with a latitude close to the equator is cold all year.
  - b. A region with a high altitude is warmer than lower altitude.
  - c. A region near an ocean is extremely cold in the winter.
  - d. A region on top of a mountain is cooler than at the base.**

6. Describe the climate where you live, using some of the vocabulary from the passage.

**Suggested answer:** Answers will vary but may include rainfall, sunshine, winds, temperature, seasons, altitude, latitude, and vegetation.

7. The author writes that people worry about human activity changing the global climate, which could cause big problems. What type of effects might the author be concerned about?

**Suggested answer:** Since weather patterns affect what plants and animals are in each climate zone, people may not be able to grow the same foods or certain animals might become extinct if they can no longer survive in the climate.

8. The question below is an incomplete sentence. Choose the word that best completes the sentence.

Six major belts of wind blow around the Earth, \_\_\_\_\_ has the effect of distributing cool air, heat, and moisture to different parts of the world.

- a. yet
- b. which**
- c. but
- d. or

9. Answer the following question based on the sentence below.

Roses could never survive at the South Pole, because the climate is too cold and dark.

In this sentence, the word South Pole best answers which question?

- a. Who?
- b. What?
- c. Where?**
- d. Why?

10. **Vocabulary Word:** region: any large part of the Earth's surface.

Use the vocabulary word in a sentence: answers may vary.