

## Read and Learn

### Main Idea

GLE 0407.8.2  
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Climate is the pattern of seasonal weather in an area. Many factors affect climate throughout the world.

### Vocabulary

climate, p. 224

current, p. 227

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### Reading Skill

#### Fact and Opinion

Fact	Opinion

 Check For Understanding

## What is climate?

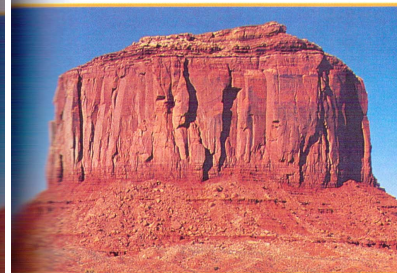
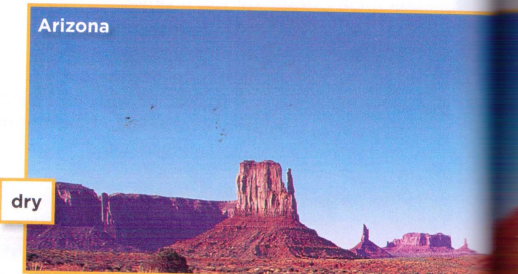
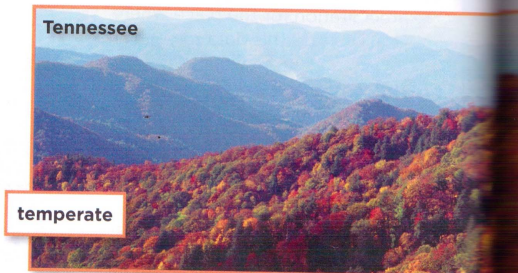
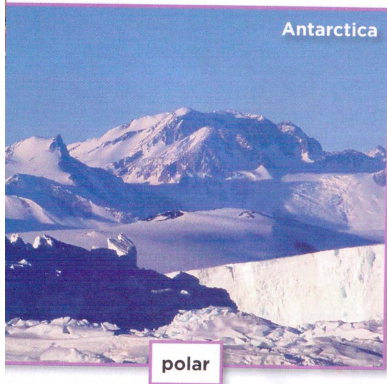
The weather where you live may change from day to day. However, you can predict what the weather will be like each season. The pattern of seasonal weather that happens year after year is called **climate** (KLIH•muht).

Climate is not the same everywhere on Earth. The city of Phoenix is in the southwest United States. The climate there is warm and dry all year. Snow and rain rarely fall. Seattle is in the northwest United States. There the climate is cool and wet.

Farmers depend on climate to grow their crops. Some crops grow well in cool climates with steady rain. Other crops need dry climates. Still others need warm, humid climates.

Think of climate as the average weather in a certain place over time. Some climates have similar patterns of temperature, humidity, precipitation, and wind. Such an area is called a *climate region*.

*Tropical* regions are near the equator. There the climate is warm, humid, and rainy. *Polar* regions have cold climates with low precipitation. Other regions are dry or cool. Tennessee is in a temperate region. *Temperate* regions lie between polar and tropical regions. Most temperate climates have four seasons. Others have only two seasons—a dry one and a wet one.



## Quick Check

**Fact and Opinion** *Cool climate regions are best.* Is this statement a fact or an opinion? Explain.

**Critical Thinking** Do all cities in Tennessee have the same climate? Explain your answer.



## What determines climate?

Several factors affect climate. *Altitude*, or the height of the land, is one factor.

### Altitude

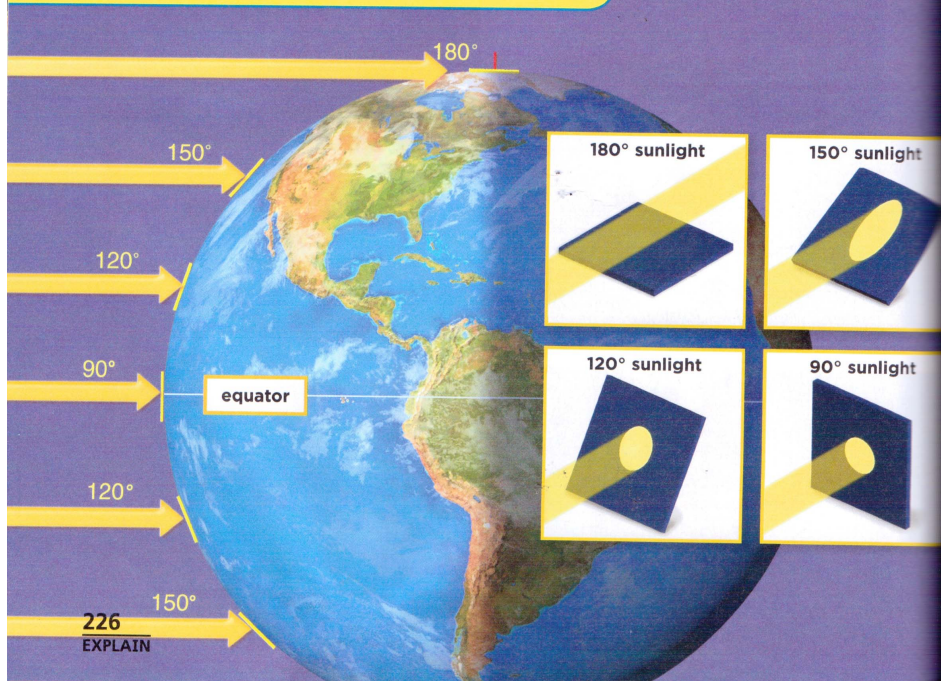
Higher altitudes have colder climates than lower altitudes. For example, the altitude of Mountain City, Tennessee, is about 700 meters (2,400 feet) above sea level. The altitude of Memphis is about 100 meters (300 feet) above sea level. Mountain City has colder average temperatures than Memphis.

### Latitude

Another factor that affects climate is latitude. *Latitude* describes how far a place is from the equator. Sunlight does not warm all latitudes equally.

Because Earth's surface is curved, beams of sunlight strike Earth at a wider angle above or below the equator. The beam of sunlight that strikes the equator is more focused. This causes areas near the equator to be warm. At higher latitudes, the climate is mild or temperate. Near the poles, the climate is cold all year.

### Angles of Sunlight at Different Latitudes



## Winds and Currents

Temperature differences between latitudes cause global winds and ocean currents. *Global winds* are winds that move air between the equator and the poles. The winds affect weather patterns throughout the world.

Ocean currents move water between the equator and the poles. A **current** is a directed flow of a gas or liquid. Warm ocean currents can warm an area. Cold ocean currents can make an area cooler.



### Read a Diagram

What factor most likely explains the difference in climate between New York City and Miami?

**Clue:** Compare the latitudes of the two cities.

## Quick Lab

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### Weather and Climate

- Study the data tables. They show average weather information for Murfreesboro, TN, and Miami, FL.

#### Murfreesboro, Tennessee

Season	High Temperature	Precipitation
Summer	88°F	100 mm
Fall	72°F	87 mm
Winter	49°F	116 mm
Spring	70°F	120 mm

#### Miami, Florida

Season	High Temperature	Precipitation
Summer	88°F	192 mm
Fall	84°F	158 mm
Winter	76°F	51 mm
Spring	82°F	98 mm

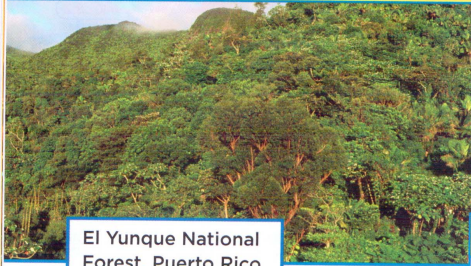
- Predict** What kind of weather would you predict for these two locations throughout the year?
- Infer** What factor best explains the differences between the two climates? Why do you think so?

### Quick Check

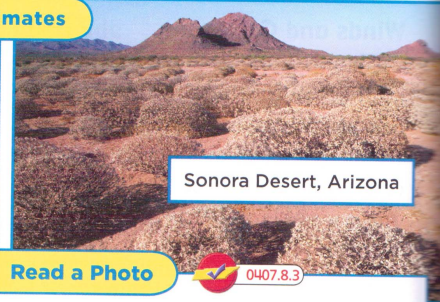
**Fact and Opinion** *The equator has a warm climate.* Is this statement a fact or an opinion?

**Critical Thinking** On what part of Earth is sunlight the least concentrated?

## The Water Cycle in Two Different Climates



El Yunque National Forest, Puerto Rico



Sonora Desert, Arizona

### Read a Photo



How would each of the two climates shown in the photos affect the water cycle?

**Clue:** Compare the amount of water in the two environments.

## How do weather and climate affect the water cycle?

Weather and climate affect the water cycle in several ways. Have you noticed how the air feels more humid after a summer afternoon rainstorm? A rainstorm places more water on the ground than can be absorbed. The warm summer air evaporates the water. The air feels moist.

When temperatures are low there is less evaporation than when temperatures are high. As temperatures increase, the rate of evaporation also increases.

The amount of water in the environment affects the water cycle, too. A dry climate, like Arizona's, has less water to evaporate than a tropical climate, like Puerto Rico's. This means there will be less precipitation in Arizona than in Puerto Rico.

Wind direction also affects the water cycle. The air in Tennessee can come from the southwest, the northwest, or anywhere in between. For example, if the air in Tennessee traveled from Arizona, it would be dry. There might not be enough water vapor for precipitation.

If the air in Tennessee traveled from the Gulf of Mexico, there would be a lot of water vapor in the air. You might want to grab an umbrella if that was the case! The water vapor might condense over your town, and fall as precipitation.

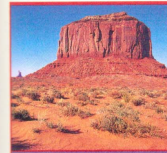
### Quick Check

**Fact or Opinion** State one fact and one opinion about climate and the water cycle.

**Critical Thinking** How can a climate affect the water cycle?

## Lesson Review

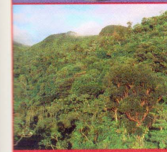
### Visual Summary



**Climate** regions have regular patterns of air temperature, humidity, precipitation, and wind.



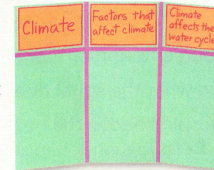
**Factors that affect climate** are latitude, global winds, and ocean currents.



**Climate affects the water cycle**, as does weather.

### Make a FOLDABLES Study Guide

Make a Trifold Chart. Use it to summarize what you read about climate.



### Think, Talk, and Write

- Main Idea** What factors affect the climate of a region?
- Vocabulary** Ocean \_\_\_\_\_ move water from one place to another.
- Fact and Opinion** Choose a climate. Why would you enjoy living in that climate? Why would you not enjoy that climate? Include facts from this lesson.
- Critical Thinking** How is climate different from weather?

Fact	Opinion

### TCAP Test Prep

Which of these statements best describes a region's climate?

- A sunny
- B tropical
- C cloudy with a chance of rain
- D high temperature in the 80s

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### Math Link

#### Find the Average Temperature

For five years, a weather station recorded high temperatures of 86°F, 89°F, 90°F, 92°F, and 88°F on the same date. What was the average temperature over the five years?

### Social Studies Link

#### Learn About Climate

Choose another country or region. Research and report on its climate. Find out about the crops people grow there. Show how climate affects the people who live there.