

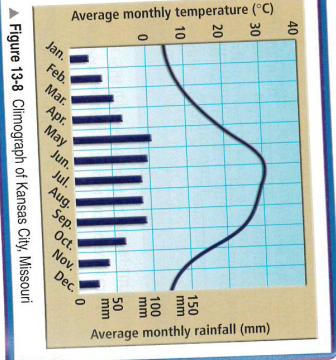
# 13-3 What are climate zones?

## INVESTIGATE

### Reading a Climograph

HANDS-ON ACTIVITY

1. Climographs allow scientists to compare different weather conditions to see if they are related. For example, scientists might compare hours of daylight and temperatures. Look at the climograph in Figure 13-8. In it, total rainfall and average monthly temperatures are compared.
  2. Observe which month has the most rainfall.
  3. Observe which month has the most rainfall.
- THINK ABOUT IT:** Are precipitation and temperature related in Kansas City, Missouri? How can you tell?



▲ Figure 13-8 Climograph of Kansas City, Missouri

**Objective**  
Identify and describe the three main climate zones.

- Key Terms**
- tropical** (TRAHP-in-kuh) zone: warm region near the equator
  - polar zone:** cold region above 60°N and below 60°S latitude
  - middle-latitude zone:** region between 30° and 60°N and S latitude

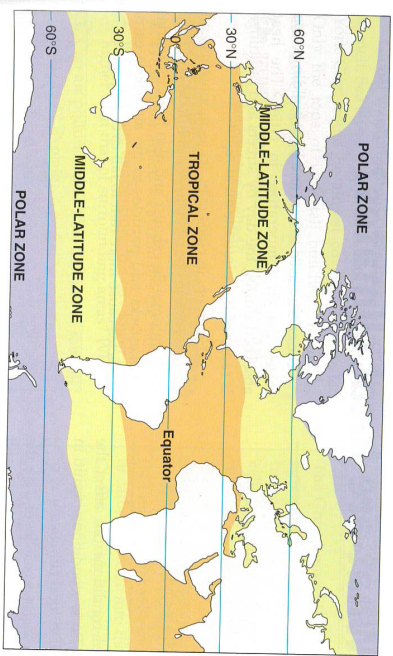
**Latitudes and Climate Zones** A climate zone is an area of Earth that has a certain temperature range and similar weather conditions. Figure 13-9 on the next page shows the three main climate zones. The warm zone near the equator is the **tropical zone**. It is between 30°N and 30°S latitude. The average monthly temperature is 18°C or higher. The coldest climate zones are the **polar zones**. These are above 60°N and below 60°S latitude. Temperatures do not go above 10°C. Between 30° and 60°N and S latitude are the **middle-latitude zones**. The temperature in the coldest months in these places averages no less than 10°C. The warmest month averages no colder than 18°C.

▶ **DEFINE:** What is a climate zone?

**Solar Energy and Climate Zones** The biggest influence on climate and weather is energy from the Sun. The amount of solar energy received at a particular spot is determined by the tilt of Earth on its axis. This tilt influences the angle at which sunlight strikes Earth.

Climatic conditions and weather are affected by how directly the Sun's rays strike an area. The Sun's rays are most direct and have the greatest effect at the equator. The places on Earth closest to the equator have the warmest climates. Because Earth's poles get the least amount of sunlight, they are the coldest places on Earth. In between, it depends on the seasons. Other factors that can affect the climate of a region include topography, location of lakes and oceans, availability of moisture, global wind patterns, ocean currents, and location of air masses.

▶ **ANALYZE:** What state in the United States has long, cold winters and short, warm summers? **Rainfall and Climate Zones** In each climate zone, there are many smaller climate zones based on rainfall. In the tropics, climates may be very arid, or dry. They can also be very humid, or wet. In the polar zones, the climate is always cold and never humid. The middle-latitude zones have many different climates.



▶ Figure 13-9 The three main climate zones are the tropical, middle-latitude, and polar zones.

The importance of climate cannot be overestimated. In addition to its effects on human life, climate determines the type of soil and vegetation found in a given area. This, in turn, determines how the land supports living things.

▶ **ANALYZE:** What creates smaller climate zones within the larger ones?

### CHECKING CONCEPTS

1. Earth is divided into \_\_\_\_\_ climate zones.
2. Places with the coldest temperatures are located in the \_\_\_\_\_ zone.
3. Places with the warmest temperatures are located in the \_\_\_\_\_ zone.
4. The middle-latitude zone has many different combinations of \_\_\_\_\_ and amounts of rainfall.
5. The middle-latitude zone is located between \_\_\_\_\_ N and S latitude.

### THINKING CRITICALLY

6. **IDENTIFY:** Using Figure 13-9, indicate the lines of latitude that separate the tropical zone from the middle-latitude zones.
7. **EXPLAIN:** Why are regions close to the equator (0° latitude) warmer than those far from the equator?
8. **CALCULATE:** What is the yearly temperature range for each city listed in your table?

### INTERPRETING VISUALS

Copy the table in Figure 13-10 onto a sheet of paper. Look at the three cities listed and their locations. Use the terms warm, moderate, and cold to fill in the column titled "Type of Climate." Study the list of temperatures. Match each city with its temperature. Write the numbers in the table. Then, answer the questions.

City	Latitude and Climate	Average Temperature	
		January	July
Singapore	1°N		
Pt. Barrow, AK	71°N		
Boston, MA	42°N		

▲ Figure 13-10

Coldest Month		Warmest Month	
January average: 78°F	July average: 79°F	January average: 73°F	July average: 44°F
January average: 30°F	July average: 73°F	January average: -11°F	July average: 44°F