

53 Weather and Climate



The word **weather** is used to describe what's happening outside at a specific time and place, and it can change from day to day or even within a day. **Climate** (KLY-met) describes the average weather in a place over a fairly long period of time (usually at least 30 years). **Climatologists** (kly-muh-TOL-o-jists) are scientists who study the earth's climates. They use such factors as temperature and precipitation to describe different types of climate. For example, think about the climate of a desert as opposed to a tropical rainforest and how their temperatures and precipitation vary.

CHALLENGE

How do climates vary?



Climatologists study long-term weather trends, which may affect food-supply predictions, species survival, and human health. They may examine tree rings or collect sediments or ice cores (like the one pictured above) to find out more about the earth's past climates. Climatologists often use computer models to help them understand and predict climate changes.

MATERIALS



For each student

- 1 Student Sheet 53.1, "Directed Reading Table: Weather and Climate"
data from Table 3 of Activity 51, "Investigating Local Weather"

PROCEDURE

1. Examine Figure 1, "Map of Climates of North America," shown on the next page. It shows some of the different climates found in this part of the earth.
2. Examine the photos and descriptions of the different climate types shown in Figure 2, "Climate Descriptions," on the next two pages. On Student Sheet 53.1, "Directed Reading Table: Weather and Climate," summarize the information about the different types of climates.
3. Work with your partner to:
 - a. Locate your state on Figure 1.
 - b. Record the climate type for your area in your science notebook.
 - c. Determine if your observations and experiences match this description of the climate for your area. In your science notebook, describe any similarities or differences between the climate description for your area and your own observations.
 - d. Compare the climate description with your data from Table 3, "Monthly Weather Averages," of Activity 51, "Investigating Local Weather." In your science notebook, describe any similarities or differences between the climate description for your area and your seasonal weather averages. (Your seasonal weather averages will be the average for several months during the same season. For example, in the United States, the summer season is typically from June through August.)

(Procedure continues on page E-22)

Figure 1: Map of Climates of North America



Figure 2: Climate Descriptions

POLAR

- Extremely cold and long winters, with only 2–4 months having temperatures above freezing
- Cool summers, with temperatures less than 10°C (50°F)
- Dry year-round, with very little precipitation (usually falls as snow)



SEVERE

- Warm summers, with temperatures over 10°C (50°F)
- Very cold winters, with at least one month averaging less than -3°C (27°F)
- Amount of precipitation varies



HIGHLAND

- Very high mountains, such as the Rocky Mountains in the western United States
- Cold to cool year-round, with temperatures between -18°C (-2°F) and 10°C (50°F)
- Amount of precipitation varies, usually falling as snow in winter



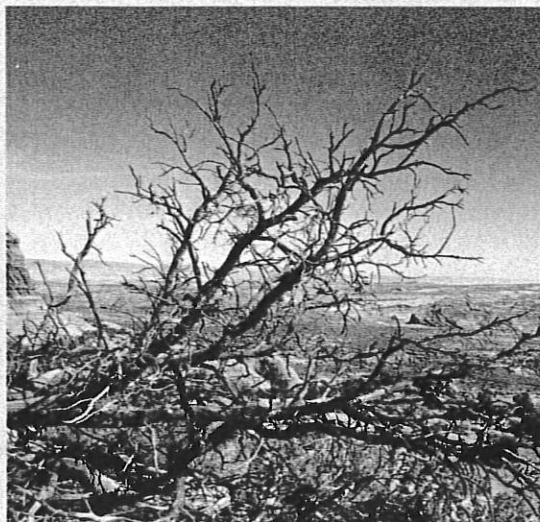
MILD

- Summers are warm or hot, with temperatures over 10°C (50°F)
- Winters are cool or cold, with temperatures below 18°C (64°F) but above -3°C (27°F)
- Moist climate, often with more precipitation in either the winter or summer



DRY

- Hot days and cool nights year-round
- Maximum summer temperatures usually over 31°C (88°F)
- Dry year-round, with very little precipitation



TROPICAL

- Hot year-round, with temperatures averaging over 18°C (64°F)
- Wet, with a total of more than 150 centimeters of rain in a year



4. Examine the three graphs on the next page. Each graph shows the average monthly temperature and precipitation for a specific place in the United States. In your science notebook, record which climate type you think each of the three places has and explain your reasoning.
5. Share and discuss your findings with the rest of your group. Remember to listen to and consider the ideas of other group members. If you disagree with someone's ideas, explain to the rest of the group why you disagree.

ANALYSIS

1. What are the most common climate types in the United States?
2. Compare your responses on Student Sheet 53.1 to Figure 1, "Map of Climates of North America." How do temperatures vary with latitude? Support your answer with evidence from this activity.
3. What is the relationship between weather and climate?
4. Could areas with different climates have the same weather? Explain.

EXTENSION

Graphs showing average temperature and precipitation for a particular area over a certain time period are known as *climographs* (KLY-moh-grafs). What does a climograph for your area look like? You can create your own climograph using the data from Table 3, "Monthly Weather Averages," of Activity 51, "Investigating Local Weather." First calculate the mean temperature for each month. Then use the temperature and precipitation data to create your own climograph.

Figure 3: Climate Graphs Showing Average Monthly Temperatures and Precipitation

