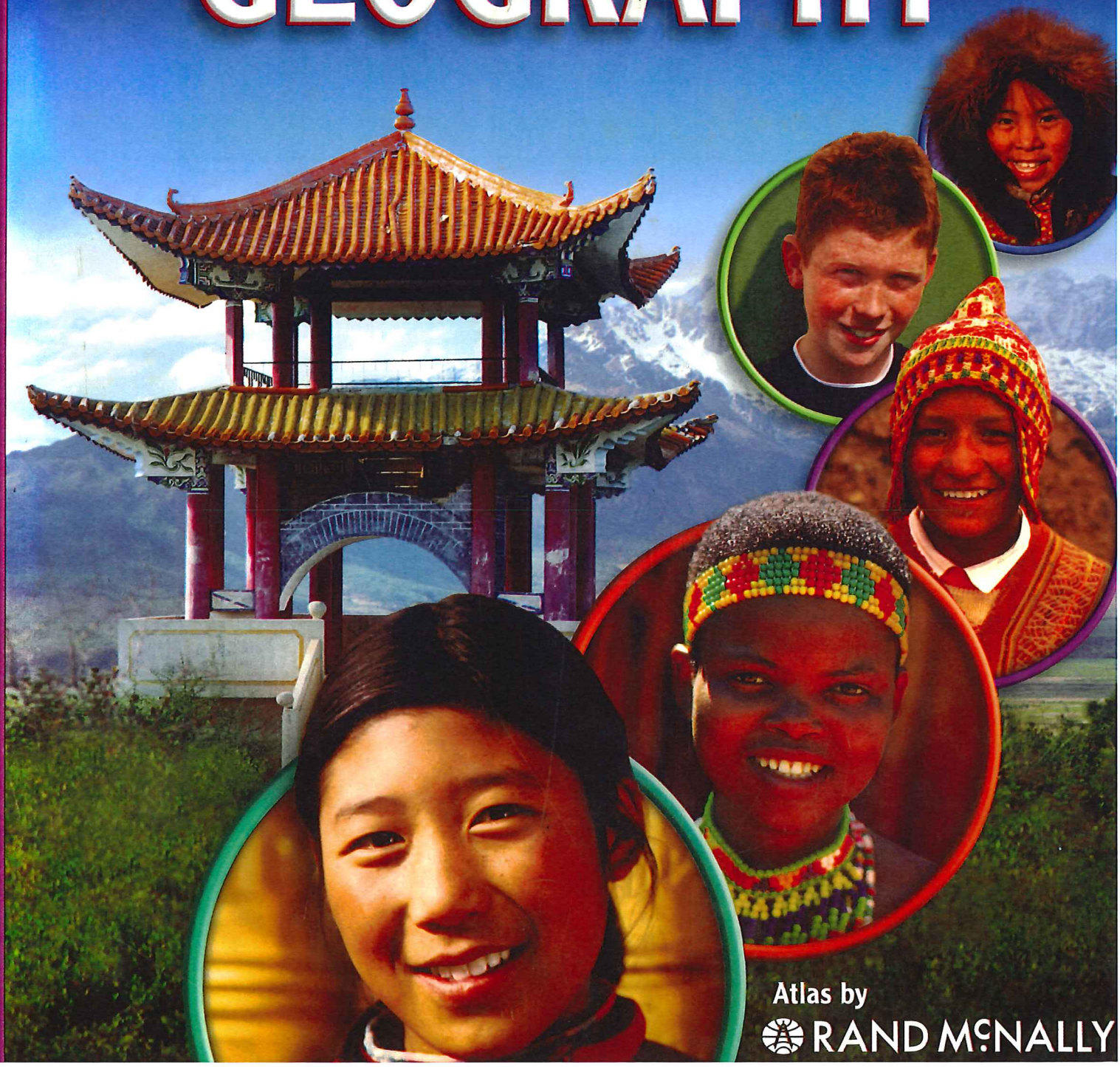
McDougal Littell

World Cultures and GEOGRAPHY



Atlas by RAND McNALLY

SECTION 3

Reading for Understanding

Key Ideas

BEFORE, YOU LEARNED

The Earth's surface is covered with both continental and oceanic landforms. The hydrologic cycle circulates the water.

NOW YOU WILL LEARN

The Earth's rotation and revolution influence weather, climate, and living conditions on Earth.

Vocabulary

TERMS & NAMES

solstice the time during the year when the sun reaches the farthest northern or southern point in the sky

equinox one of the two times a year when the sun's rays are over the equator and days and night around the world are equal in length

weather the condition of the Earth's atmosphere at a given time and place

climate the typical weather conditions of a region over a long period of time

precipitation falling water droplets in the form of rain, snow, sleet, or hail

vegetation region an area that has similar plants

savanna a vegetation region with a mix of grassland and scattered trees

desert a region with plants specially adapted to dry conditions

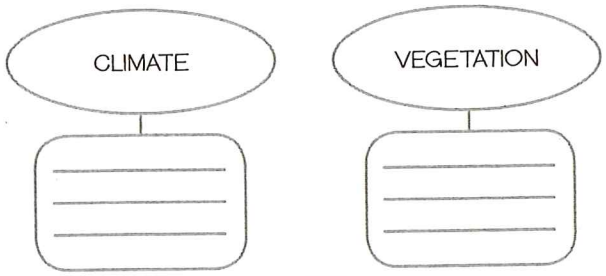
Visual Vocabulary desert

Reading Strategy

Re-create the diagram shown at right. As you read and respond to the **KEY QUESTONS**, use the diagram to help you summarize information about the world's climate and vegetation.

See Skillbuilder Handbook, page R5

SUMMARIZE



GRAPHIC ORGANIZERS
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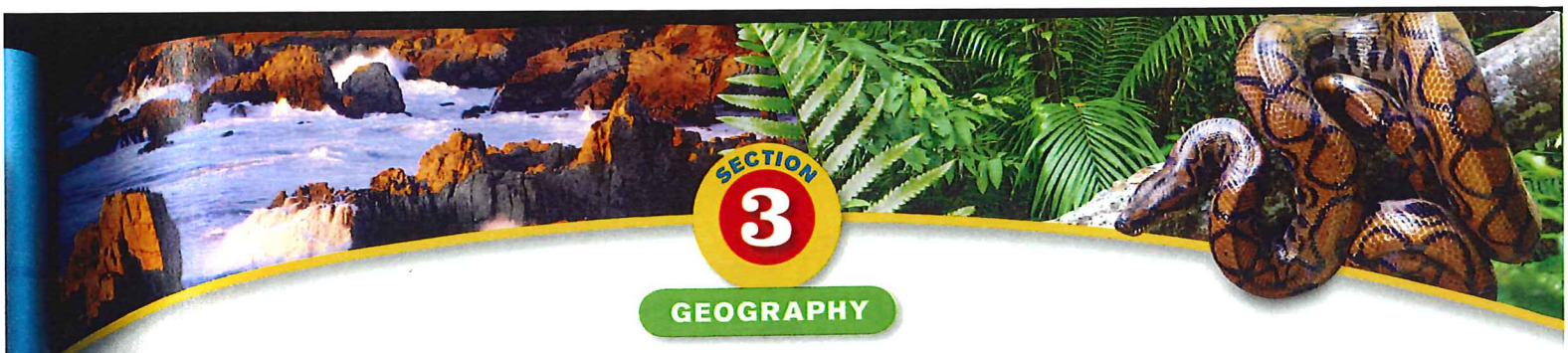


SECTION 3

GEOGRAPHY

Climate and Vegetation

Connecting to Your World

Every moment in the day, weather and climate are a part of your life. They affect what clothes you wear and how you get to school. You might walk or ride your bike if it is not too cold or too wet. But if it's raining or snowing you may go in a car or by bus. Some school activities, like sports, depend on weather and climate, too. In fact, weather and climate affect plant and animal life and nearly every human activity.

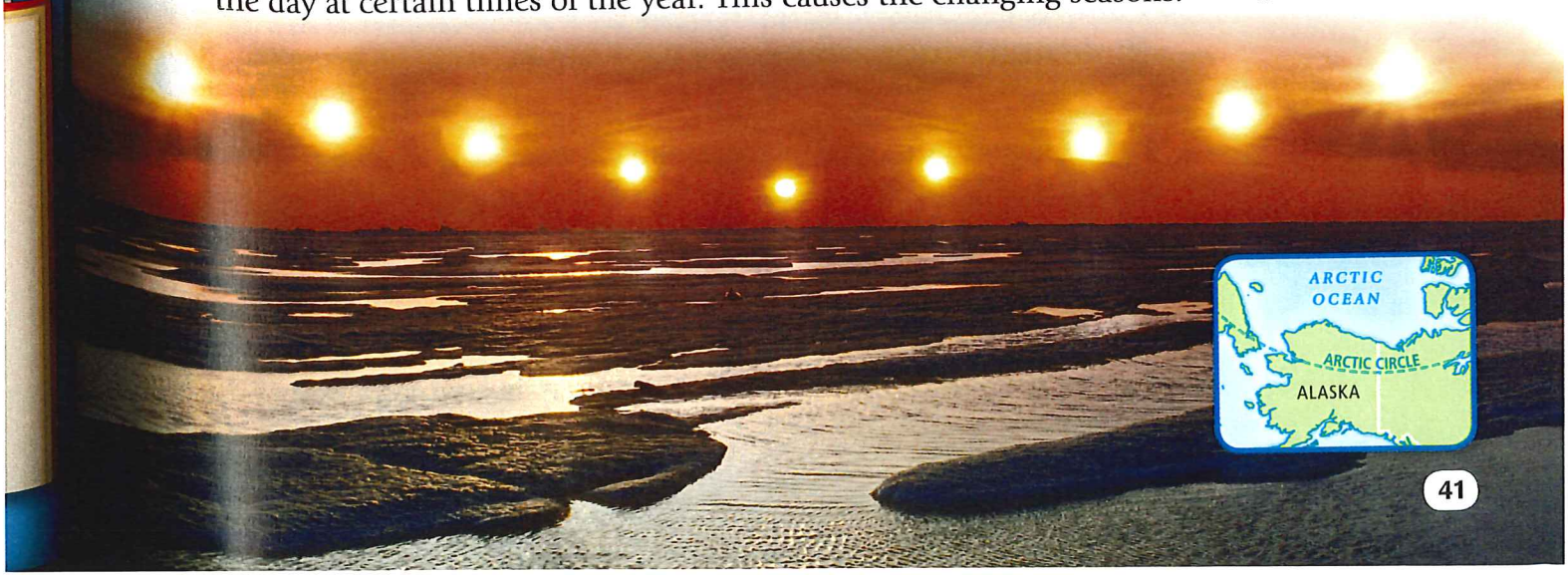
Inupiat Woman The harsh climate of the Arctic makes wearing a fur parka necessary.

The Earth's Rotation and Revolution

KEY QUESTION How does Earth's revolution affect seasons?

The Earth rotates as it revolves around the sun. Rotation is the motion of the Earth as it spins on its axis once every 24 hours. Revolution is the motion of the Earth as it circles, or makes a year-long orbit, of the sun.

Earth's Movement The Earth is tilted at a 23.5° angle. The Earth's revolution around the sun affects patterns of Earth's weather and climate. The Earth's tilt stays the same as it revolves around the sun. As a result, different parts of the Earth get direct rays from the sun for more hours of the day at certain times of the year. This causes the changing seasons.



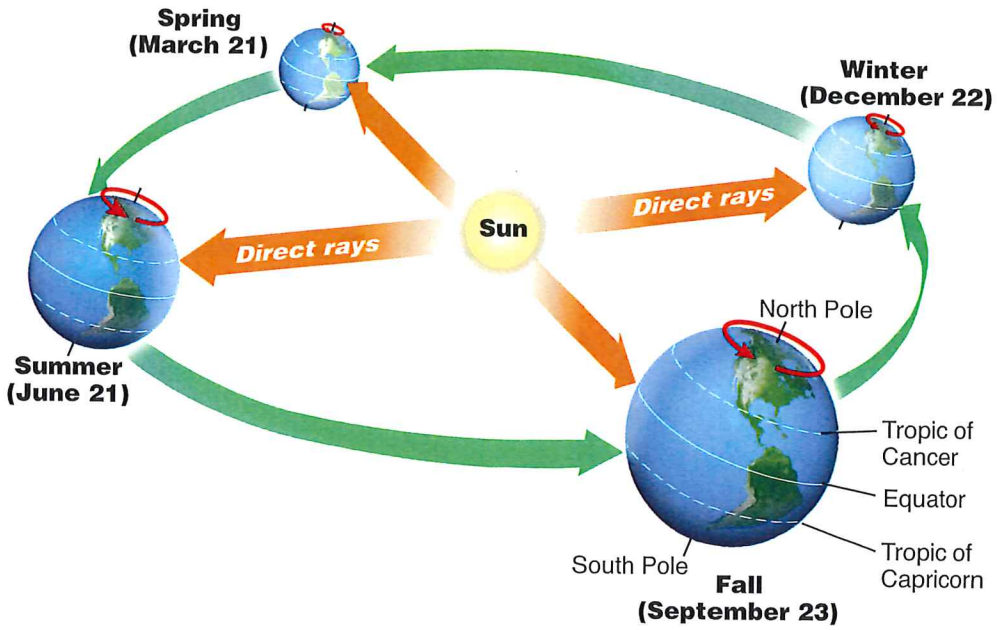
Midnight Sun in the Arctic Multiple exposures show the position of the sun over a 24-hour period in the Arctic summer.

Seasons: Northern Hemisphere

Earth's Revolution
The seasons are related to the Earth's tilt and revolution around the sun.

CRITICAL THINKING

Compare and Contrast Which part of the Earth's surface doesn't experience seasons?



Seasons The term **solstice** is used to describe the time during the year when the sun reaches the farthest northern or southern point in the sky. In the Northern Hemisphere, the summer solstice is the longest day of the year and begins summer. The winter solstice is the shortest day of the year and begins winter. These dates are reversed in the Southern Hemisphere. The beginning of spring and autumn start on the **equinox**. On these two days, the sun's rays are directly over the equator, and days and nights around the world are equal in length. The Earth's revolution brings the temperature and weather changes we call seasons to many parts of the Earth. But in some regions there is little change. The illustration above shows the position of the Earth at the start of the four seasons in the Northern Hemisphere.

SUMMARIZE What causes seasons on Earth?

Weather and Climate

KEY QUESTION What is the difference between weather and climate?

People often confuse weather and climate. **Weather** is the condition of the Earth's atmosphere at a given time and place. For example, today may be sunny and warm. **Climate** is the term for the typical weather conditions of a certain region over a long period of time.

Causes of Weather Several factors interact to cause weather at a particular location. They include solar energy, wind, landforms,

bodies of water, water vapor, cloud cover, and elevation. The combination of all these factors varies from location to location, creating local weather conditions.

The most important weather factor is the amount of energy, in the form of heat from the sun, that a location receives. This is why, for example, the time of year influences the weather. In summer, much more solar energy is found in the atmosphere, and weather conditions change. Winds move the solar energy and moisture that air holds across the Earth. Also, land heats and cools more quickly than bodies of water do. So land located near a body of water has a different weather pattern from locations further inland.

Clouds and water vapor are connected to each other in weather patterns. Clouds hold water vapor in the atmosphere. Water vapor determines whether there will be **precipitation**, which is falling water droplets in the form of rain, snow, sleet, or hail.

Finally, as elevation above sea level rises, air becomes thinner and loses its ability to hold moisture, so it becomes cooler. The temperature drops by about 3.5°F for every 1,000-foot increase in elevation. So, you can find ice and snow on the tops of mountains even at the equator.

Causes of Climate There are many different climates around the world. A place's location on the Earth, especially its latitude, is important in determining climate. For example, climates are warmer near the equator and colder near the poles.

Wind and ocean currents help distribute the sun's heat from one part of the world to another. Ocean currents are like rivers flowing through the ocean. They move warm waters away from the equator and cold water from the poles. Air currents blowing over the ocean waters pick up heat and moisture and move them to other parts of the Earth.

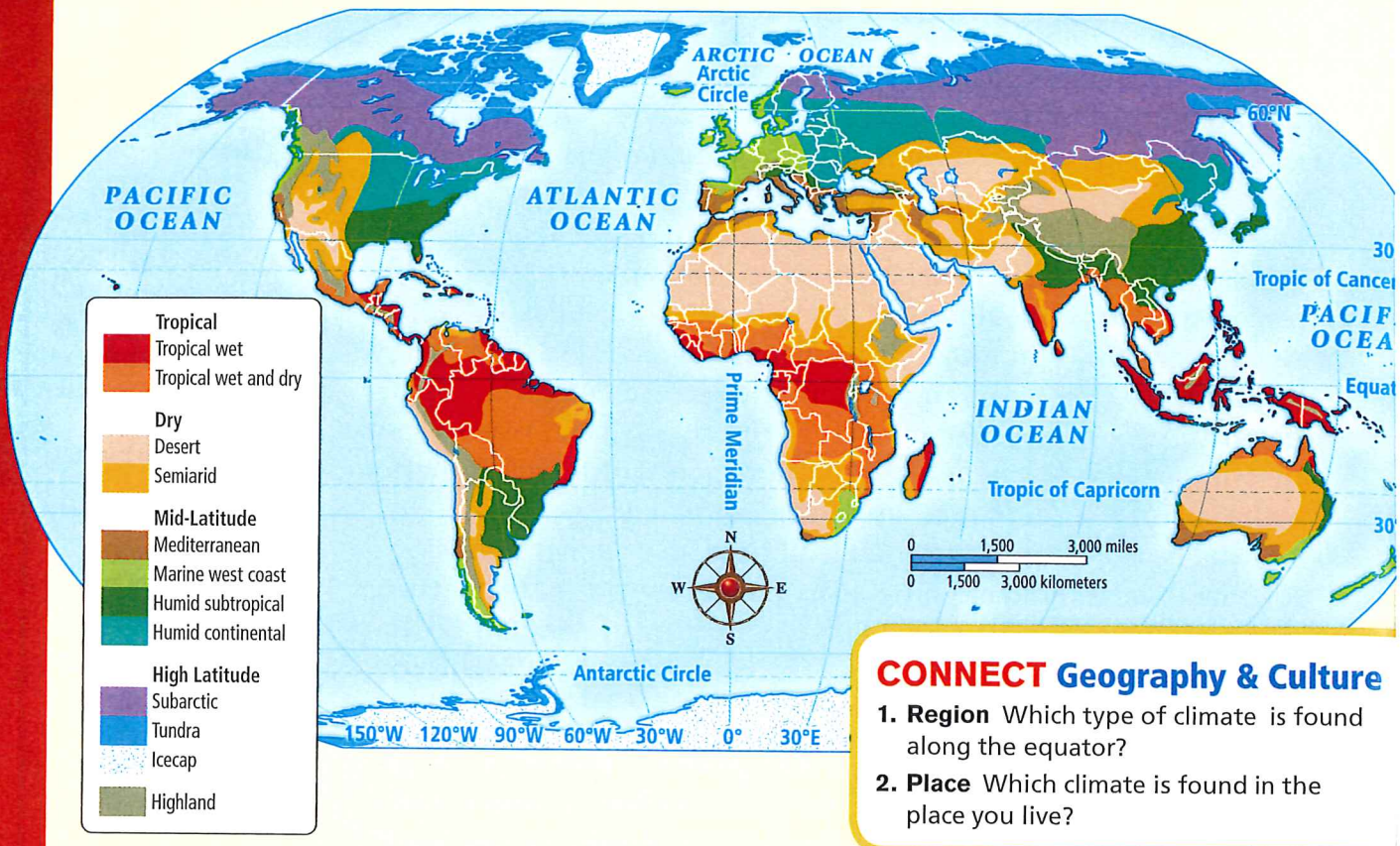
COMPARE Explain the difference between weather and climate.

Climate and Vegetation Regions

KEY QUESTION What are climate and vegetation regions?

To categorize climate regions, geographers divide the Earth into three general zones of latitude: tropical, middle, and high. These zones are found on both sides of the equator. Tropical latitudes are found between the equator and Tropic of Cancer and between the equator and the Tropic of Capricorn where it is usually hot. Middle latitudes extend from the tropic lines to the lines of the Arctic and Antarctic circles. High latitude refers to the cold areas around the North and South Poles.

COMPARING World Climate Regions



CONNECT Geography & Culture

1. **Region** Which type of climate is found along the equator?
2. **Place** Which climate is found in the place you live?

	TYPES	CHARACTERISTICS	VEGETATION
TROPICAL	Tropical Wet	rainy all year round	broadleaf trees
	Tropical Wet and Dry	has a rainy season	grasslands and savanna
DRY	Desert	less than 10 inches of precipitation	specially adapted plants
	Semiarid	up to 20 inches of rain	grasslands called steppe
MID-LATITUDE	Mediterranean	wet winter	plants that have adapted to a dry season in the summer
	Marine West Coast	rainy year round	mixed forests of broadleaf and needleleaf trees or only needleleaf trees
	Humid Subtropical	long, hot, humid summers	
	Humid Continental	wide range of summer and winter temperatures	grasslands and savanna
HIGH LATITUDE	Subarctic	cold dry climate	specially adapted plants
	Tundra	permanent ice and snow	specially adapted plants
	Icecap	permanent ice and snow	none
HIGHLAND	Varies with latitude, elevation, and continental location		

Climate Regions As you can see on the map on the opposite page, the Earth has five general climate regions: tropical, mid-latitude, high latitude, dry, and highland. Tropical climates are always hot and can be rainy most of the year or only during one season. The middle latitudes have the greatest variety of climates, ranging from hot and humid to cool and fairly dry. Climates along the oceans are also included in this category. High latitude climates are cool to cold all year long. Dry climates can be found in every latitude region. Highland climates are based on the elevation of a particular place. So, for example, as you go up a mountain, the climate may change from warm to cooler to cold.

Vegetation Regions The term **vegetation region** refers to an area that has similar plants. A vegetation region is named for the types of trees, grasslands, and specially adapted plants found there. The four basic types of vegetation are: forest, savanna, grasslands, and desert. Forests can be cold, tropical, or temperate. **Savanna** is a mix of grasslands and trees. Grasslands can have short or tall grasses, depending on the amount of rain. Finally, a **desert**—which can be hot or cold—has plants specially adapted to very dry conditions.

SUMMARIZE Identify the five main climate regions.

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Section 3 Assessment

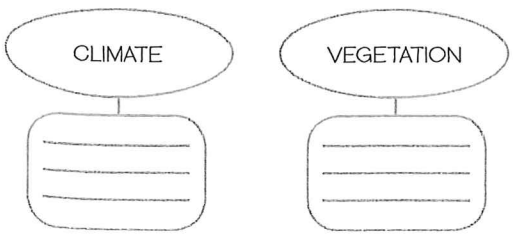
TERMS & NAMES

1. Explain the importance of
- weather
- climate
- precipitation
- vegetation region

USE YOUR READING NOTES

2. Summarize Use your completed chart to answer the following question:

What are the basic causes of weather and which factor is the most important?



KEY IDEAS

3. What causes the changing seasons?

4. What are the causes of climate?

5. How are vegetation regions named?

CRITICAL THINKING

6. Analyze Causes and Effects Why are the seasons reversed in the Northern and Southern Hemispheres?

7. Draw Conclusions How does location affect climate and vegetation?

8. CONNECT to Today What weather conditions have caused problems in the United States recently?

9. WRITING **Write a Description** Determine what climate and vegetation region you live in. Then write a paragraph describing the climate features and types of vegetation.

Animated GEOGRAPHY

Amazon Rain Forest

Click here to enter the rain forest @ ClassZone.com

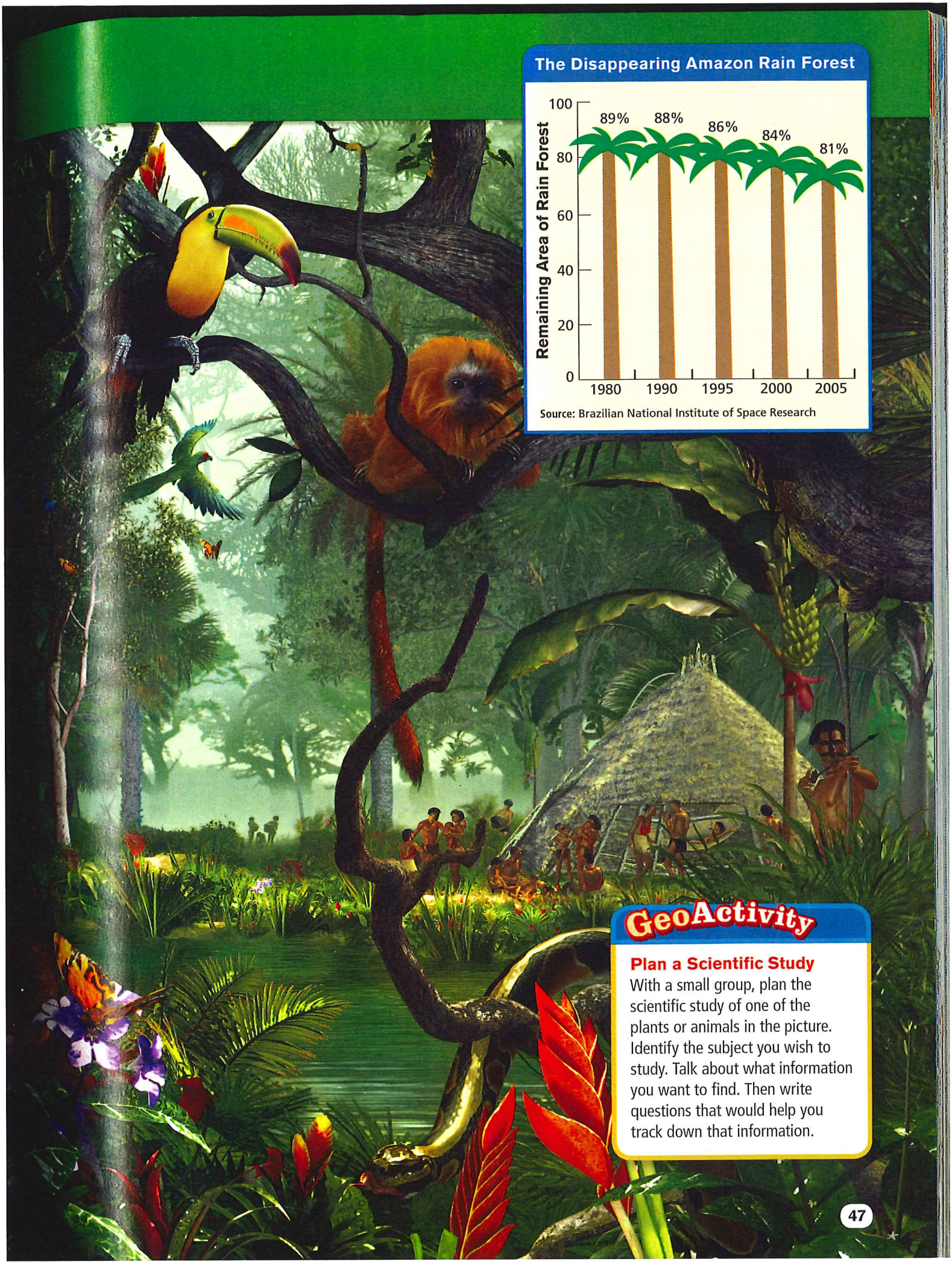
AMAZON RAIN FOREST

The Amazon rain forest is one of the world's most important physical features. It acts as the "lungs of the planet" by producing oxygen, and is the home of millions of plants and animals.

Click here to learn more about this frog and the amazing diversity of plants and animals in the forest.

Click here to see Yanamamö village life in the rain forest and learn about how the Yanamamö interact with the forest.

Click here to see the methods scientists are using to study plants and animals in the rain forest.



The Disappearing Amazon Rain Forest

Source: Brazilian National Institute of Space Research

GeoActivity

Plan a Scientific Study

With a small group, plan the scientific study of one of the plants or animals in the picture. Identify the subject you wish to study. Talk about what information you want to find. Then write questions that would help you track down that information.