CHAPTERS

1. Exploring Geography
2. Climates and Ecosystems
3. Population and Culture
4. Resources and Land Use

Machu Picchu, Peru
1 The Study of Geography

Reading Focus
- How do geographers use tools to understand the world?
- What are the five themes of geography?
- How do geographers identify location, place, and region?
- Why do geographers study movement and human-environment interaction?

Key Terms
- geography
- GIS
- absolute location
- hemisphere
- relative location
- character of a place
- perception
- formal region
- functional region
- perceptual region

Main Idea
Geographers use a variety of methods to collect, organize, and analyze information about the world.

Your world changes constantly. It changes as you move from one place to another and do different things. Your world may be the small area where you spend most of your time—your home, school, favorite hangout, stores, and the routes that connect them. At other times, your world grows to include other places you have visited, read about, or seen on television. Sometimes your world is the entire earth, a planet where different people interact with each other and their environments.

The size and scope of your world constantly change, and so does its character. Each school year takes you into new classrooms, where you meet new teachers and students. The weather and seasons change. Families move as their sizes change, or as members find new jobs. Some stores close, and new ones open. Over days and weeks and years, your world changes.

Geographic Tools
Geography allows you to examine and understand the constantly changing world in which you live. Through the study of geography you learn to see your world from many different perspectives. By using geographic maps, graphs, and charts, you can see global patterns or changes in your own neighborhood. Geography can help you develop valuable insights about the earth, its people, and the many different relationships between them.

Geography comes from a Greek word meaning “writing about” or “describing” the earth. Geography is the study of where people, places, and things are located and how they relate to each other. People always have been geographers, because they always have been curious about their world.

Technology Geography uses scientific approaches to examine and understand where things are located. One tool that has been used for decades is sonar. Sonar stands for SOund, NAvigation, and Ranging, and analyzes sounds to determine distance and direction. Originally developed in 1906 to detect icebergs, sonar became an important military tool during World
# World Geography Concepts

<table>
<thead>
<tr>
<th>CONCEPT</th>
<th>DESCRIPTION</th>
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<tr>
<td>Geographic Tools</td>
<td>Instruments used to collect, organize, store, or display geographic information</td>
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<tr>
<td>Physical Characteristics</td>
<td>Features of the earth's surface, such as landforms, water systems, climate patterns, and plant and animal life</td>
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<td>Physical Processes</td>
<td>Actions of nature that change the physical environment</td>
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<tr>
<td>Climates</td>
<td>Regional long-term trends in weather and atmospheric conditions</td>
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<td>Ecosystems</td>
<td>Networks of plants and animals interacting with the environment</td>
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<td>Patterns of Settlement</td>
<td>Distribution of populations among urban and rural communities</td>
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<td>Urbanization</td>
<td>Increase in the percentage of people living in cities</td>
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<td>Migration</td>
<td>Movement of people, often influenced by push-and-pull factors</td>
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<td>Population Growth</td>
<td>Increase in the number of people in a specific area</td>
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<tr>
<td>Cultures</td>
<td>Learned behavior of people, including their belief systems, languages, governments, and material goods</td>
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<tr>
<td>Science and Technology</td>
<td>Discoveries and inventions that help people to change or adapt to their environments</td>
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<tr>
<td>Government and Citizenship</td>
<td>How different viewpoints influence political decisions, divisions, and policies connected to geographic issues</td>
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<tr>
<td>Cooperation and Conflict</td>
<td>Methods used by countries and organizations to pursue goals, such as maintaining or expanding control over territory</td>
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<tr>
<td>Economic Systems</td>
<td>Ways in which a society satisfies basic needs through the production and distribution of goods and services</td>
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<tr>
<td>Economic Activities</td>
<td>Use of natural resources, production of goods, provision of services, and distribution of information</td>
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<td>Global Trade Patterns</td>
<td>International networks for exchanging goods and services</td>
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<td>Natural Resources</td>
<td>Any part of the natural environment that people need and value</td>
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<td>Natural Hazards</td>
<td>Natural events in the physical environment that are destructive, such as volcanoes and hurricanes</td>
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<td>Environmental Change</td>
<td>Natural or human alterations to the environment</td>
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<tr>
<td>Understanding the Past</td>
<td>Analysis of how geography has affected historic events and how places, environments, and cultures have changed over time</td>
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<td>Planning for the Future</td>
<td>Use of geographic knowledge and skills to analyze problems and make decisions that affect the future</td>
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## Chart Skills

- **Geographic Tools**: Geographic concepts can be used to organize and interpret information about the earth. By understanding the concepts, you can recognize the geographic patterns and processes that shape your world.
  - Which of these concepts can be used to discuss how people affect their environment?
  - Whether or not a person lives in the city or in the country is a characteristic of which concept?
Deforestation in Brazil

Science and Technology This aerial photograph shows part of the Amazon region of Brazil. The light green areas represent patches of earth, where rain forest has disappeared.

Human-Environment Interaction How might human activities contribute to disappearance of the rain forest?

War I as surface ships tried to identify and avoid submarines. In geography, sonar is used to study the ocean floor.

Geographers also use remote-sensing technology, such as satellites. The Landsat Program has provided the United States with information since 1972. Landsat 7 was launched in 1999 and records images of the earth’s surface, which are downloaded to computers. Scientists can compare older and more recent images to identify changes in land use, vegetation, and urban growth.

Technological advances are always providing new opportunities for studying the earth. Recently, geographers have come to rely on the global positioning system (GPS). This system relies on a network of 24 satellites orbiting the earth. Using atomic clocks, the satellites broadcast extremely accurate time measurements. Back on earth, GPS units analyze these time signals to provide information about location.

Another recent innovation is the growing importance of geographic information systems (GIS). A GIS uses computer technology to collect, manipulate, analyze, and display data about the earth’s surface in order to solve geographic problems. It might combine data from satellite photos, census results, or tax assessors. This information is then “layered” by computers to show relationships among data. For example, an urban planner might develop a GIS that shows the number and location of schools, sirens, and highways within several miles of a nuclear power plant. This information would be used to determine if the community was well-prepared for dealing with a nuclear accident. A GIS can be used to study topics as different as public health, road construction, and retail market size.

Many people think about geography only when deciding where to live or how to travel from one place to another. You may find, however, that well-developed geographic skills will enable you to be more successful in your career. Perhaps you will help preserve a wildlife habitat or find new energy sources. Your understanding of geography also will help you be a better citizen, because you can vote for elected leaders who will use geographic information at the local, state, national, and global levels.

Geographic Concepts You have learned how geographically informed people use tools
such as maps, charts, and graphs. Another kind of tool is the geographic concept. We use ideas as tools to help organize the way we think about geography. Some of these geographic concepts are physical characteristics, patterns of settlement, science and technology, and economic activities. (See the chart on page 36.)

All of the concepts help us to recognize and understand geographic patterns and processes that we can relate to real-life situations around us. For example, physical processes, such as volcanoes, earthquakes, and erosion, have all shaped our world and continue to do so today. Economic activities, such as agriculture, industry, and mining, affect both the environment and society. Another geographic concept is cooperation and conflict. You can see examples of this concept in the news every day as individuals, organizations, and countries work together and compete for natural resources.

As you study geography, you will use these and other concepts to study how people, places, and environments are related. You will learn how to use geography to interpret the past and present. By recognizing and understanding geographic patterns and processes, you will be better able to make informed decisions that will affect your future.

Geography's Five Themes

The study of geography is fueled by human curiosity. Why are places on the earth so amazingly different from each other? Five important questions can help organize information about places:

- What is the location of a place?
- What is the character of a place?
- How are places similar to and different from other places?
- How do people, goods, and ideas move between places?
- How do people interact with the natural environment of a place?

Each of these questions is related to one of five themes that you can use to organize your study of the world. The five themes are location, place, region, movement, and human-environment interaction. Each theme offers a way of looking at the world and its people. The themes are not mutually exclusive. To thoroughly understand a place or problem, you need to know how the different themes relate to each other.

For example, the tiny principality of Monaco occupies steep hillsides on three sides of a beautiful natural harbor of the Mediterranean Sea.

A Mediterranean Location

Physical Characteristics
Monaco's natural beauty and cultural attractions draw tourists from all over the world.

Place Describe one physical characteristic and one human characteristic of Monaco.
Monaco's location makes it a popular destination for thousands of tourists who flock yearly to the sunny beaches of southern France. This movement, however, threatens the very beauty that attracts visitors to the area.

Location

Geographers studying a place usually begin by finding its location. A place's location can be described in either absolute or relative terms.

**Absolute Location** Where is a place? One way to answer this question is by describing its **absolute location**—its position on the globe.

The most common way to find a place's absolute location is by using the imaginary lines marking positions on the surface of the earth. The Equator is one such line. It circles the globe halfway between the North and South poles. The Equator divides the world into two **hemispheres**, or halves. All land and water between the Equator and the North Pole is located in the Northern Hemisphere. Likewise, everything that lies between the Equator and the South Pole is located in the Southern Hemisphere.

Imaginary lines that run parallel to the Equator are called lines of latitude, or parallels. They measure distances north or south of the Equator. The Equator is designated 0°, whereas the poles are 90° north (N) and 90° south (S).

Because the earth is tilted about 23 1/2° as it revolves around the sun, the Tropic of Cancer at 23 1/2°N and the Tropic of Capricorn at 23 1/2°S mark the boundaries of the places on the earth that receive the most direct sunlight and the greatest heat energy from the sun. Find the Equator and the tropics in the diagram on page 11.

Another set of imaginary lines are lines of longitude, or meridians, which run north and south between the two poles. The Prime Meridian, at 0°, runs through the Royal Observatory in Greenwich, England. Other meridians are measured in degrees from 0 to 180 east (E) or west (W) from Greenwich. Unlike lines of latitude, meridians are not parallel to each other. As you can see on the diagram on page 11, the distance between meridians is greatest at the Equator and decreases until they come together at the poles.

Using the grid formed by lines of latitude and longitude, you can name the precise or absolute location of any place on earth. Mogadishu, Somalia, is located at 2°N latitude and 45°E longitude. New Orleans, Louisiana, is at 30°N and 90°W. See page 11 to read more about this grid system.

**Relative Location** Another way to locate a place is to describe its **relative location**, or its relation compared to other places. New Orleans, for example, is several hundred miles south of Memphis, Tennessee, which is the next major city as you move up the Mississippi.

Although a place may have one fixed absolute location, it has many relative locations.
These can change over time. For example, in the 1800s a journey from New Orleans to Memphis took many days by boat. Today the cities are just over an hour apart travelling by airplane.

**Place**

Every place on the earth has features that distinguish it from other places. One challenge of geography is to understand how the character of a place is similar to and distinct from the character of other places. The **character of a place** consists of the place’s physical characteristics and human characteristics.

**Physical Characteristics** Places have unique physical characteristics, such as landforms, ecosystems, and climate. A place’s terrain may be mountainous, flat, or anywhere in between. Ecosystems range from leafy tropical rain forests to sparse, moss-covered tundra. Climate includes not only normal weather patterns but dramatic occurrences like hurricanes, blizzards, droughts, and floods.

**Human Characteristics** Places can also be described in terms of their human characteristics. How many people live, work, and visit a place? What are their languages, customs, and beliefs? How does their economy work? How are they governed?

Each place on the earth has a unique combination of physical and human characteristics. When travelers return from a vacation, they rarely talk about the places they visited in terms of latitude and longitude. Instead, they talk about the unfamiliar people, sites, and experiences that made their visit memorable. In addition to discussing new and different characteristics, they may also report that its residents speak the same language, use the same credit cards, and listen to the same music as do people at home. This mix of unique and common features is what geographers mean when they talk about “place.”

**Regions**

A third geographic theme deals with regions. A region is a group of places with at least one common characteristic. The common elements may be physical or human characteristics. Sometimes a region is determined by people’s perceptions.

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**An Island Nation**

**Urbanization** In Singapore, an island nation of Southeast Asia, modern skyscrapers tower over buildings constructed during the British colonial era.

**Place** How do the residential buildings at right preserve the architectural style of the colonial era?
Perception is a viewpoint that is influenced by one’s own culture and experiences.

Formal regions are areas in which certain characteristics are found throughout the area. For example, states, countries, and cities are all political regions. Within these formal regions, all people are subject to the same laws and are ruled by the same government. Formal regions can also be defined using other characteristics. The steppe region in Northern Eurasia consists of temperate grasslands with rich soils. The Corn Belt is the part of the United States where corn is grown in abundance. Chinatown is a part of San Francisco, California, containing many Chinese American people, restaurants, and stores.

Functional regions consist of a central place and the surrounding places affected by it. The places that make up a functional region are often linked by the flow or movement of something. The Amazon drainage basin in South America is the region drained by the Amazon River and its tributaries. The Dallas–Fort Worth metropolitan area is a functional region in that Dallas and Fort Worth share a common airport located between the two cities.

Perceptual regions are defined by people's feelings and attitudes about areas. Regions such as Dixie, the upper Midwest, and the Middle States have no precise borders. For example, if you ask people in the city of St. Louis whether Missouri is a southern state or a western state, the answers will vary depending on each person's individual perception.

Because various criteria can be used to define regions, the same place may be found in several different regions. From a physical perspective, Mexico is part of the North American continental region. Culturally, however, Mexico is linked to the Spanish-speaking nations of Central and South America.

Movement

Places do not exist in isolation. Because places have different characteristics, it follows that people, goods, and ideas will move between them.

New Orleans's history illustrates the importance of movement. The city was established by the French in the early 1700s, and it became a bustling port where goods brought down the Mississippi were loaded onto ocean-going ships.

South Pacific Region

Climates The village of Luautuanu is located in Samoa. This region of the Pacific Ocean is known for its scenic beauty and warm tropical climate.

Regions What does this photo suggest about rainfall in Samoa?

When the United States purchased Louisiana a century later, New Orleans became one of the young nation's five largest cities. During the mid-1800s, however, the east-west expansion of railroads throughout the nation cut into New Orleans's river trade. By the first part of the 1900s, the city's importance generally was limited to the states of Louisiana and Mississippi. As the twentieth century progressed, however, New Orleans transformed itself into a tourist hub and an important center for oil and gas production. Today, millions of people come from nations throughout the world to enjoy the distinctive charm and character of New Orleans.

Human-Environment Interaction

The final geographic theme involves how people use their environment. How have they changed it? What are the consequences of those changes? How have people responded to changes in their environment?
Human beings have made enormous changes in their environment. Some changes are intentional and others are accidental. Some changes are favorable and others are destructive. The American Southwest provides examples of positive and negative changes. Before the era of swimming pools, air conditioning, massive irrigation, and automobiles, this hot, dry region had few residents. Today, the region's population and economy are among the fastest-growing in the country.

New growth also has brought new challenges, however. Plants and wildlife brought in from other areas have altered the region's ecosystems. Furthermore, the rapid growth in the region's population is putting a strain on the already limited supplies of water.

SECTION 1 ASSESSMENT

1. **Key Terms** Define (a) geography, (b) GIS, (c) absolute location, (d) hemisphere, (e) relative location, (f) character of a place, (g) perception, (h) formal region, (i) functional region, (j) perceptual region.

2. **Geographic Tools** How do geographers use technology to study the earth?

3. **Geographic Tools** Why do geographers use the five themes of geography?

4. **Geographic Tools** What can geographers learn from (a) location, (b) place, and (c) region?

5. **Migration** How can human movement affect the environment?

6. **Critical Thinking** Making Comparisons
   (a) When might absolute location be of interest to a geographer? (b) When might relative location be more useful?

**Activity**

**Organizing Information** Create a concept web that identifies characteristics of each of the five themes of geography. Write a brief paragraph that describes your neighborhood in terms of the five themes.