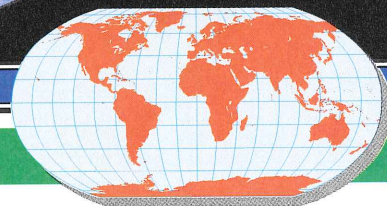


Looking at the Earth



CHAPTER FOCUS

Geographic Setting

Earth's distance from the sun, its daily rotation, slight tilt, and gaseous atmosphere all work together to make most of our world habitable.



Geographic Themes

Section 1 Planet Earth

MOVEMENT Sections of the earth's crust move to shape the land surface.

Section 2 Earth's Features

REGION The earth's land surface consists of many different landforms, such as mountains, hills, plateaus, and plains.

Section 3 Earth's Resources

HUMAN/ENVIRONMENT

INTERACTION People depend on the earth for the materials necessary for basic survival.

▲ **Photograph:** View of Earth from space

1 SECTION Planet Earth

SETTING THE SCENE

Read to Discover . . .

- the nature and structure of the earth.
- the forces that affect the surface of the earth, the setting for human life.

Key Terms

- atmosphere
- hydrosphere
- lithosphere
- biosphere
- mantle
- fold
- fault
- weathering
- erosion
- glacier

Identify and Locate

Mount Everest, Dead Sea, Mariana Trench, Grand Canyon of the Colorado River

The first astronaut to walk on the moon described the earth as looking “like a beautiful jewel in space.” The earth’s great beauty was seen as a contrast of water and land beneath huge swirls of white clouds. Together these features form the physical environment of the earth.

Earth Viewed From Outer Space

The earth is part of a system of objects that revolve around the sun. The earth’s surface is made up of water and land and is surrounded by air. Great contrasts exist in the heights and depths of the earth’s surface.

The Solar System

Earth is part of the solar system, which is made up of the sun and all the objects that revolve around it. The sun is a star and the center of the solar system. The sun’s great mass—the amount of matter it contains—creates the gravitation that keeps the other objects revolving around it.

The planets are the largest objects that revolve around the sun. Planets are spheres. There are at least 9 planets in our solar system, each with its own orbit around the sun. Planets vary in their distance from the sun. Mercury, Venus, Earth, and Mars are nearest to the sun. Jupiter, Saturn, Uranus, Neptune, and

Pluto are farthest away from the sun. The planets vary in size. Jupiter is the largest. Earth ranks fifth in size among the planets. All the planets except Mercury and Venus have moons. The number of moons a planet has also varies. Earth has 1 moon, while Saturn has perhaps as many as 22 moons.

There are thousands of smaller objects that revolve around the sun. Asteroids are planet-like objects. These small, irregularly shaped objects are found mainly between the orbits of Mars and Jupiter. Comets are bodies of dust and frozen gases. They resemble bright balls with long tails. Meteoroids are pieces of rock and iron. Many meteoroids fall into the earth’s **atmosphere**—the air that surrounds the earth—but most are burned up by friction before they reach the surface of the earth.

Earth’s Measurements

Earth is about 93 million miles (150 million km) from the sun. Earth is the third planet from the sun. Only Mercury and Venus are closer.

The diameter of Earth at the Equator is about 8,000 miles (12,700 km). The distance around Earth is shorter at the poles than at the Equator.

Water, Land, and Air

The surface of the earth is made up of water and land. About 70 percent of the



THE SOLAR SYSTEM

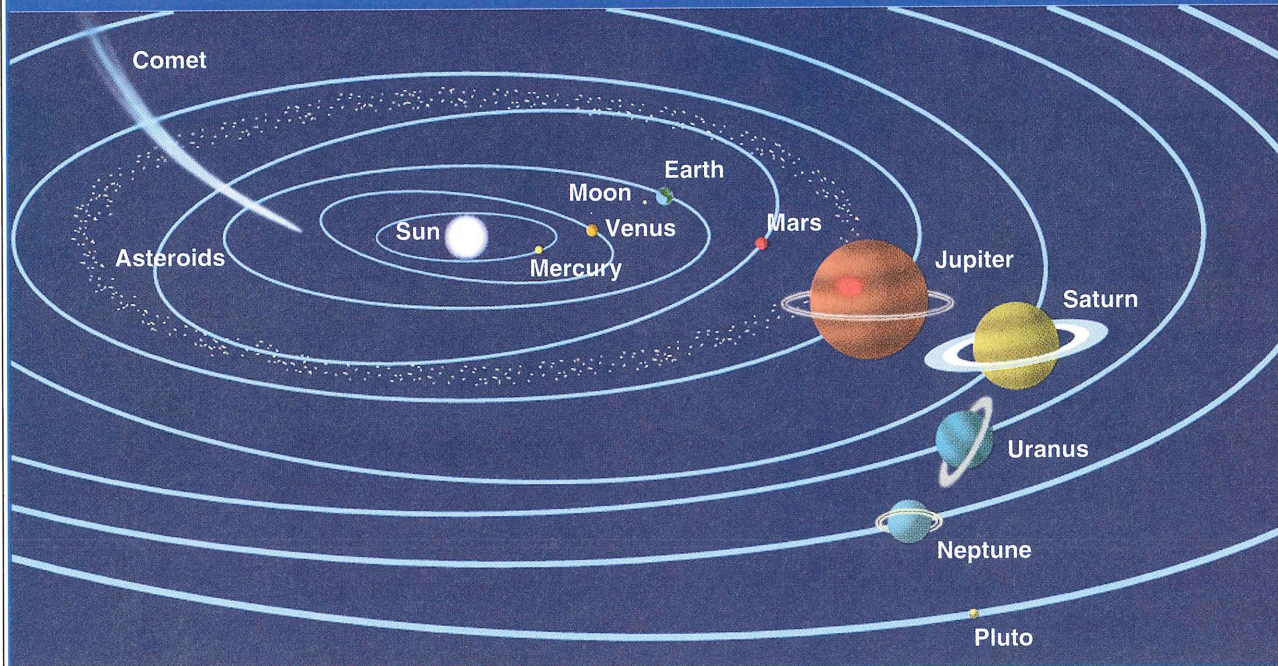


CHART STUDY

Nine known planets revolve around the sun, which is located at the center of the solar system. Between Mars and Jupiter is the asteroid belt—thousands of space boulders of greatly differing sizes. *Which planet is the largest? The smallest?*

surface is water. Oceans, lakes, rivers, and other bodies of water make up a part of the earth called the **hydrosphere**.

About 30 percent of the earth's surface is land. Land makes up a part of the earth called the **lithosphere**, the earth's crust. The largest bodies of land, which are known as continents, and the ocean basins, which are the lands beneath the oceans, are part of the lithosphere.

The atmosphere of the earth extends about 1,000 miles (about 1,600 km) above the earth's surface. About 78 percent of the atmosphere is nitrogen and 21 percent, oxygen. The remaining 1 percent consists of argon and small amounts of other gases.

All people, animals, and plants live on the earth's surface, close to the earth's surface, or

in the atmosphere. The part of the earth where life is found is called the **biosphere**.

Earth's Heights and Depths

The average height of the earth's land is about 2,800 feet (850 m) above sea level. The highest point on the earth is the top of Mount Everest in Asia, which is 29,028 feet (about 8,850 m) above sea level. The lowest point on the earth is the shore of the Dead Sea, which is 1,312 feet (400 m) below sea level.

The average depth of the earth's oceans is 12,450 feet (3,975 m). The deepest part of the ocean is the Mariana Trench, a long, narrow depression in the Pacific Ocean, southwest of Guam. The Mariana Trench is about 35,800 feet (10,900 m) deep.



PLACE

Earth's Structure

The earth's surface is always changing. Internal forces bring about changes in the earth's surface over time. Surface forces, such as wind, flowing water, and ice also change the earth's surface.

Inside the Earth

The inside of the earth is composed of three layers—the core, the **mantle**, and the crust. The inner core makes up the center of the earth. It lies about 4,000 miles (6,400 km) below the surface of the earth. Scientists believe that the inner core is solid and consists of iron and nickel. The other part of the core, the outer core, begins about 1,800 miles (2,900 km) below the surface of the earth. It is made up of melted iron and nickel.

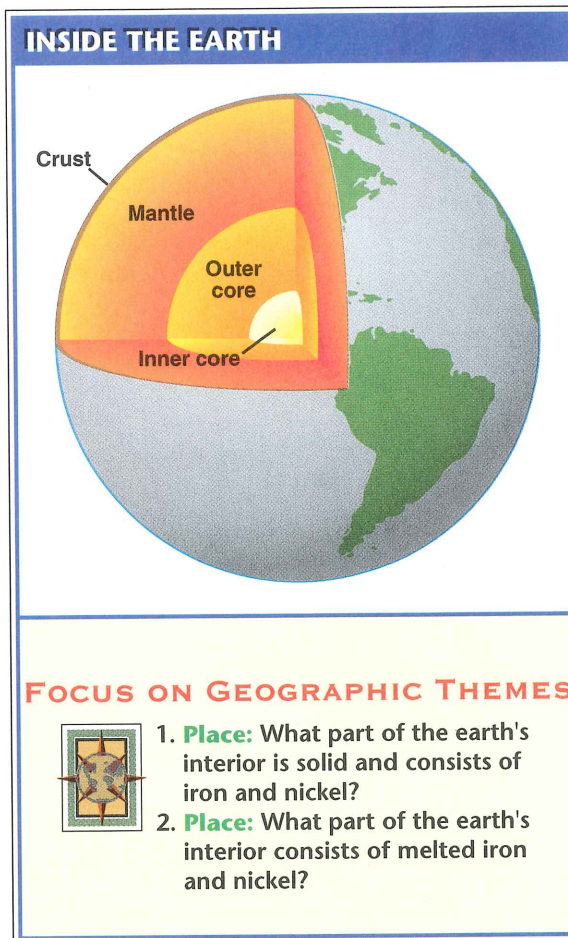
Next to the outer core is a thick layer of dense, hot rock called the mantle. The rock in the mantle consists of silicon, oxygen, aluminum, iron, and magnesium.

Next to the mantle is the earth's crust. This is a relatively thin layer, extending perhaps 3 to 30 miles (5 to 50 km) below the surface. The crust consists of huge platelike sections of rock that rest—or more accurately, float—on a partially melted layer in the upper mantle. The crust includes the continents and ocean basins.

Internal Forces

The surface of the earth has changed greatly over time. These changes have been largely the result of internal forces. These internal forces cause the plates of the earth's crust to move. Generally they move very slowly—only about 4 inches (10 cm) each year. When the plates spread apart, melted rock rises through the gaps and forms ridges. When the plates bump together, one may slide under another, forming a trench.

Shaking or sudden movements in the plates, called earthquakes, change the surface of the land and the floor of the ocean. Volcanoes are mountains formed when lava, or melted rock, rises through the earth's crust. If



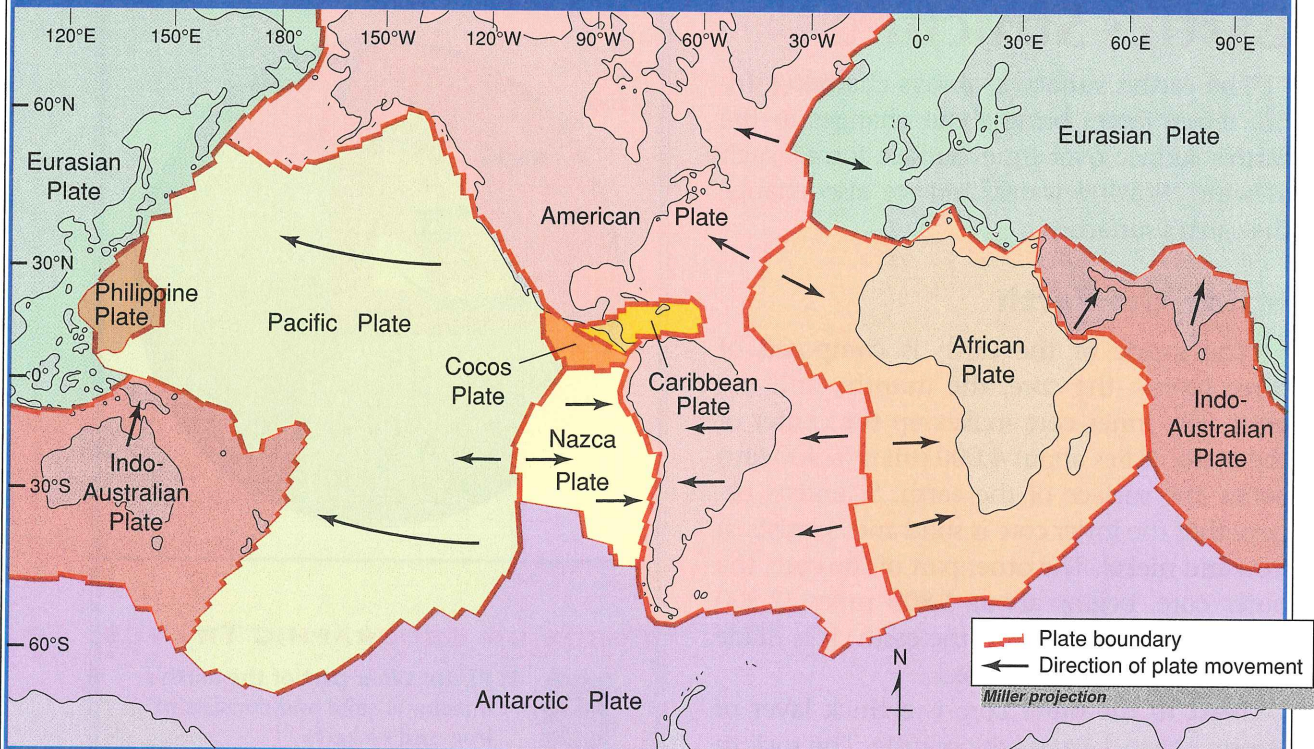
the lava is too thick, the flow is blocked and pressure builds. A sudden release may then occur, often with great force.

Internal forces can build or break down mountains in other ways, such as by **folds** or **faults**. Folds are bends in layers of rock. Such bends occur when the moving plates squeeze the earth's surface until it buckles.

Faults, or breaks in the earth's crust, occur when the folded land cannot be bent any further. Then the earth's crust cracks and breaks into huge blocks. Movement occurs along the faults and may be in any direction. Mountains formed by faults, or fault-block mountains, are generally steep on one side and gently sloping on the other.

Earthquakes and volcanoes under the ocean can cause as much damage as those on land. The release of these forces beneath the ocean often causes seismic sea waves, or tsunamis. Such a wave may move through the water

PLATES AND PLATE MOVEMENT



FOCUS ON GEOGRAPHIC THEMES



1. **Location:** Where is the Nazca Plate located?
2. **Movement:** Which plates are moving toward each other?
3. **Movement:** What plates are moving northward?
4. **Location:** Between which two plates is the Philippine Plate situated?

faster than 400 miles (644 km) per hour. Near the shore, tsunami can pile up and reach a height of more than 100 feet (30 m).

Earthquakes often occur where different plates meet one another. Many major earthquakes and volcanoes occur along the edges of the plates beneath the Pacific Ocean. Geologists call the area of earthquake and volcano activity that rims the Pacific Ocean the Ring of Fire. The Ring of Fire marks the boundary where the plates that cradle the Pacific meet the plates that hold the continents surrounding the Pacific.

Geologists believe that about 240 million years ago all the earth's landmasses were joined together. For example, Africa and South America were next to each other. Over time, the spreading of the ocean floor caused Africa and South America to be located as they are

today, with the Atlantic Ocean between them. The idea that the continents were once joined and then slowly drifted apart is called continental drift.

External Forces

Other forces also change the surface of the earth. Rocks are always breaking into smaller pieces. The process that breaks down rocks is called **weathering**. There are two basic kinds of weathering—chemical weathering and physical weathering.

Chemical weathering results when water dissolves some of the chemicals in rocks, causing them to disintegrate or when parts of iron-bearing rocks rust—just as metal does—and break apart. Physical weathering, by contrast, breaks rocks into large pieces. For example,



water seeps into the cracks in a rock and freezes, expanding and causing the rock to split. Physical weathering can also result when tree roots grow through cracks in a rock, forcing it apart.

Another force that changes the surface of the earth is **erosion**—the wearing away of the earth's surface. Erosion occurs by means of wind, flowing water, and glaciers.

Wind erosion involves the movement of dust, sand, and soil from one place to another. Plants help to protect the land from wind erosion; however, in dry places where people have cut down trees and plants, winds pick up large amounts of soil and blow it away. In deserts and on some beaches, windblown sands form hills called dunes. In general, vegetation grows on beach dunes and helps stop drastic erosion. The vegetation also helps protect the shoreline from erosion caused by pounding waves. As humans develop beachfront properties, however, they often destroy the protective dunes and hasten erosion.


Water erosion begins when rainwater flows off the land downhill in streams. As the water flows, it cuts into the land, wearing away the soil and rock. Over a period of time, the eroding action of water works to form first a gully and then a valley. Sometimes valleys are eroded even further to form valleys with high, steep walls called canyons. The Grand Canyon of the Colorado River is a good example of the eroding power of water. Over millions of years, the Colorado River has cut a canyon that is more than 1 mile (1.6 km) deep.

Erosion can also occur as **glaciers**, or large bodies of ice, move across the surface of the earth. As they move, glaciers change the land, destroying forests, carving out valleys, altering the course of rivers, and wearing down mountain tops. Scientists believe that in the last 2 million years glaciers have covered large areas of the earth's surface for long periods of time.

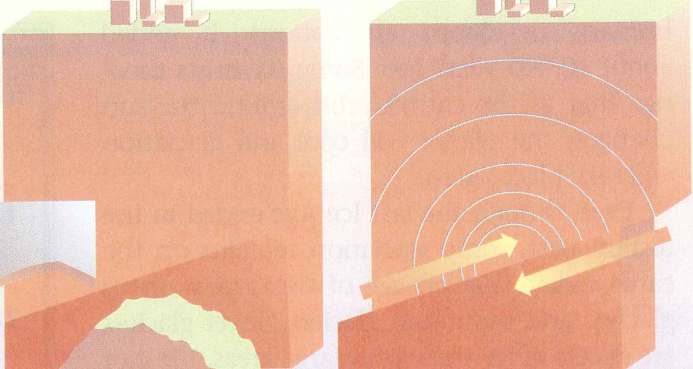
Collectively these periods are called the Ice Ages. The last part of the last one took place during the Pleistocene epoch—long before

CALIFORNIA EARTHQUAKE: JANUARY 17, 1994

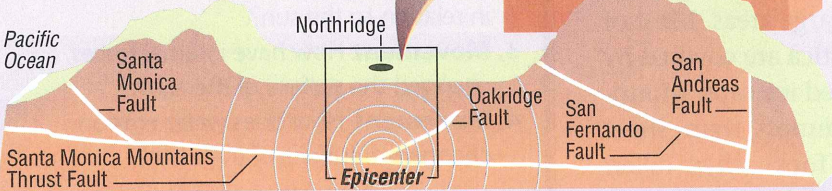
1 The earthquake was directly under Northridge



2 ...on a previously unmapped east-west fault.



3 Almost 10 miles under Northridge, rock on one side of the fault surged upward



4 ...while the other side plunged downward. Such movement characterizes a "thrust fault."

5 The earthquake was caused by a rock 10 miles long by 2 miles wide that moved upward 1 foot, setting off vibrations that spread out for miles.

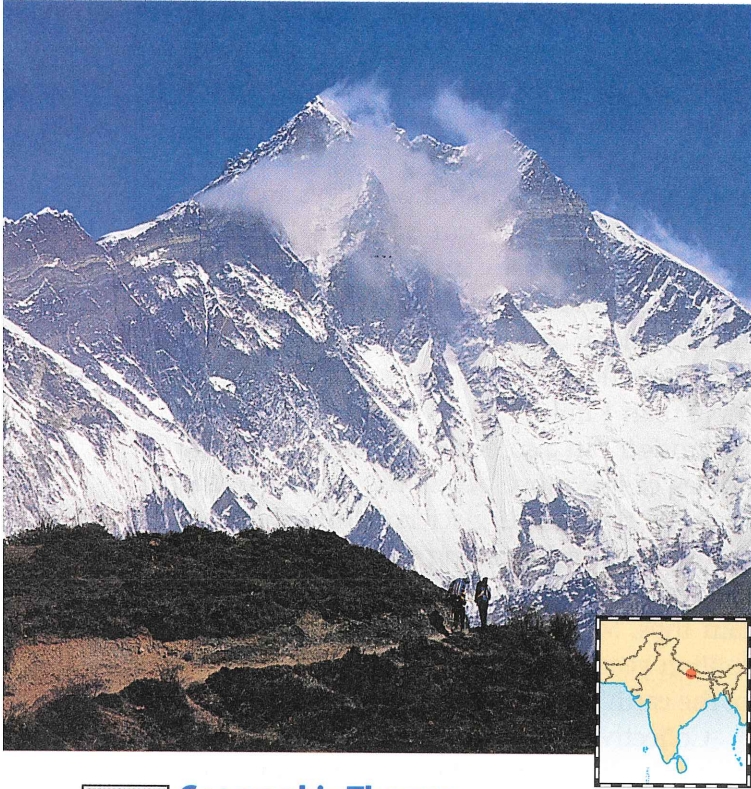
Source: USA Today, Columbus Dispatch

FOCUS ON GEOGRAPHIC THEMES

Place: Los Angeles, California

The earthquake that struck the Los Angeles area on January 17, 1994, was caused by a "thrust fault" located about 10 miles (16 km) beneath the town of Northridge. *What kind of underground activity occurs in a "thrust fault" earthquake?*





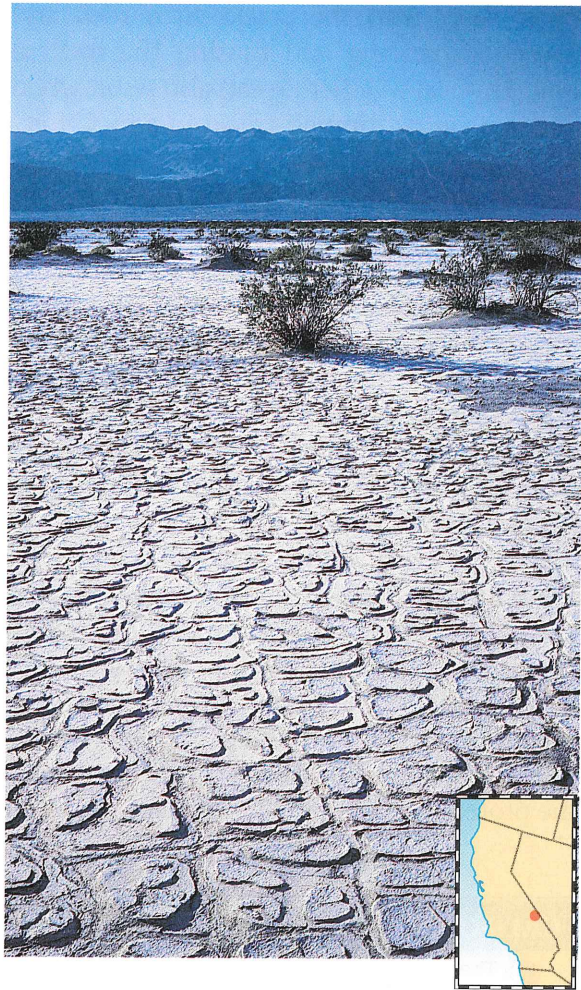
Geographic Themes

Place: High and Low Points

South Asia's Mount Everest is the world's highest mountain. California's Death Valley contains the lowest point in the Western Hemisphere. *Where is the world's lowest point?*

humans developed civilizations. It ended about 10,000 years ago. Some scientists theorize that as the earth's orbit around the sun changes, the planet will cool and glaciation will take place again.

Even though the last Ice Age ended in the distant past, some glaciation remains on the earth today. Glaciers are of two types—sheet glaciers and mountain glaciers. Sheet glaciers are sheets of ice that cover large areas. Most of Greenland and all of Antarctica are covered by sheet glaciers, generally called ice caps. Mountain glaciers are more common than sheet glaciers. Mountain glaciers form when fallen snow in mountains builds up and turns into ice. Gravity then pulls these glaciers downhill. As they move downward, mountain glaciers pick up rocks and soil in their paths and carve U-shaped valleys. When a glacier melts, it deposits its rock and soil.



SECTION 1 ASSESSMENT

Checking for Understanding

- 1. Define** atmosphere, hydrosphere, lithosphere, biosphere, mantle, fold, fault, weathering, erosion, glacier.
- 2. Locating Places** Where is Earth located in relation to the sun?
- 3. Movement** How have internal forces changed the surface of the earth?
- 4. Movement** How does water erosion change the surface of the earth?

Critical Thinking

- 5. Predicting Consequences** Imagine that the mantle of the earth ceased to circulate molten rock. What would be the consequences on land formation on the surface of the earth?



SETTING THE SCENE

Read to Discover . . .

- the variety of the earth's landforms.
- the features of the earth's oceans and seas.
- how the earth's water is recycled.

Key Terms

- isthmus
- plateau
- archipelago
- continental shelf
- groundwater
- water cycle
- evaporation

Identify and Locate

The continents: North America, South America, Europe, Asia, Africa, Australia, Antarctica; Isthmus of Suez; Isthmus of Panama; The oceans: Atlantic, Pacific, Indian, Arctic

Photographs of the earth taken from space show that the surface of the earth is far from uniform. The first section of this chapter discussed the internal and external forces that act on the natural features of the earth. In this section, you will read about the planet's variety of land and water areas.

PLACE**Landforms**

The natural features of the earth's land surfaces are called landforms. These features are classified by type in order to describe and define them. The names given to these features help people locate specific places.

Continents

Geographers divide most of the land surface of the earth into seven large landmasses called continents. North America and South America are the continents in the Western Hemisphere. Australia and Asia are in the Eastern Hemisphere. Most of Europe and Africa are in the Eastern Hemisphere, but a small part of their western coastal areas is in the Western Hemisphere. Antarctica, which includes the South Pole, is located in both the Western Hemisphere and the Eastern

Hemisphere. Asia is the largest continent, and Australia is the smallest.

Some continents, like Australia and Antarctica, stand alone, while others are joined in some way. An **isthmus** is a narrow piece of land that connects two large landmasses and separates two bodies of water. The Isthmus of Panama joins North America and South America and separates the Atlantic and Pacific oceans.

Europe and Asia are actually parts of one huge landmass. Some people consider this landmass to be one continent and call it Eurasia. Most geographers, however, use natural or political boundaries to divide the area into two separate continents. The Ural Mountains serve as a natural boundary between Europe and Asia.

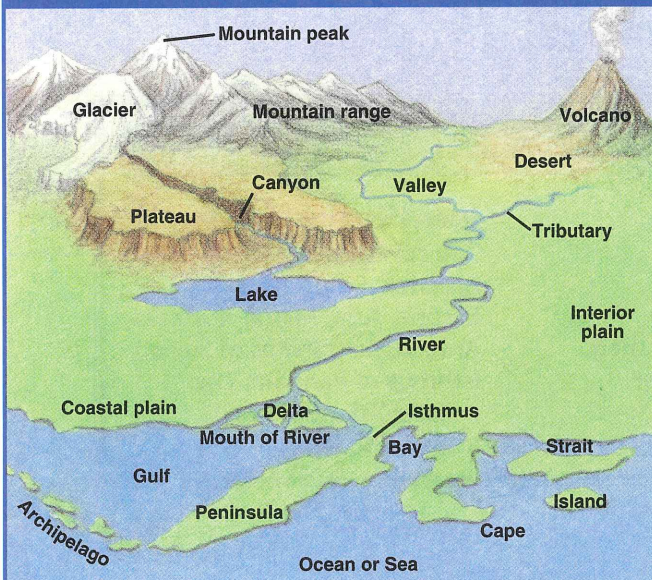
Major Landforms

The landforms of the earth vary greatly from place to place. The four major kinds of landforms are mountains, hills, plateaus, and plains. These landforms can be described in terms of their shapes and elevations.

Parts of the land that rise noticeably above the rest of the land are called either mountains or hills. Mountains have steep slopes and some kind of peak or summit. Mountains are



LANDFORMS AND WATER BODIES



FOCUS ON GEOGRAPHIC THEMES



1. **Place:** What landform connects two large landmasses?
2. **Location:** Where is a delta located?
3. **Place:** What landform is surrounded by water on three sides?
4. **Place:** What is a river branch called?

also called highlands because they are the highest landforms and have the greatest relief. Hills are generally more rounded, lower, and have less relief.

Two large areas of flatland with very little relief are plateaus and plains. A **plateau** is higher than the surrounding land and usually has at least one steep side, called a cliff. A plateau is sometimes called a tableland. Mountains often surround high-altitude plateaus. Plains are flat or gently rolling lands. Plains along the coasts of continents generally have low elevations and are called coastal plains. Interior plains are those that are located away from the coasts of continents. They generally have higher elevations.

Other Landforms

A valley and a canyon are two other kinds of landforms. A piece of land that extends out-

ward from a continent and that is surrounded by water on three sides is called a peninsula. An island is any body of land smaller than a continent that is completely surrounded by water. A group of closely scattered islands is called an **archipelago**.

The earth's oceans also have many kinds of landforms. There are as many different kinds of landforms on the bottoms of the oceans as there are on the continents. The underwater extension of a continent is known as a **continental shelf**. Continental shelves are narrow in some places and wide in others. They slope out from the land for up to 800 miles (about 1,290 km) and descend to a depth of about 600 feet (183 m) before dropping steeply to the ocean floor.

In some places the ocean floor is a flat plain. In other places there are high mountain ranges, great cliffs, valleys, deep trenches, and seamounts. Seamounts are underwater mountains with steep sides that rise above the ocean floor.

PLACE

Water Features

Water covers most of the earth's surface. Water makes up a portion of all living things, and all living things need water in order to live. The amount of water on the earth remains relatively constant as it moves from ocean to air to ground to ocean.

Oceans and Seas

About 70 percent of the earth's surface is water—almost all of it salt water. This large, continuous body of salt water is generally divided into four oceans. The oceans are named the Pacific, the Atlantic, the Indian, and the Arctic. The Pacific, the largest of the oceans, covers more area than all the earth's land combined. The Pacific Ocean is also deep enough in some places to cover the world's highest mountain with more than 1 mile (1.6 km) to spare.

Bodies of salt water that are smaller than oceans are called seas, gulfs, and bays. These



bodies of water are often partially enclosed by land. The Mediterranean Sea is one of the earth's largest seas. It is almost entirely encircled by the southern part of Europe, the northern part of Africa, and the southwestern part of Asia. The Gulf of Mexico is nearly encircled by the coasts of the United States and Mexico. The Bay of Bengal borders Southeast Asia and part of southern Asia.

Although 97 percent of the world's water is found in oceans, the water is too salty to be used for drinking, farming, or manufacturing. Today, only a small amount of freshwater can be obtained from the ocean by removing salt. Efficient and low-cost methods of changing seawater into freshwater will need to be developed in order to meet the world's increasing shortage of freshwater.

Lakes, Streams, and Rivers

Other water features of the earth include lakes, streams, and rivers. A lake is a body of water completely surrounded by land. The greatest number of lakes are found in areas where glacial movement has cut deep valleys, and glacial deposits have acted as dams as the ice melted. Northern North America contains thousands of these glacial lakes. Most lakes contain freshwater.

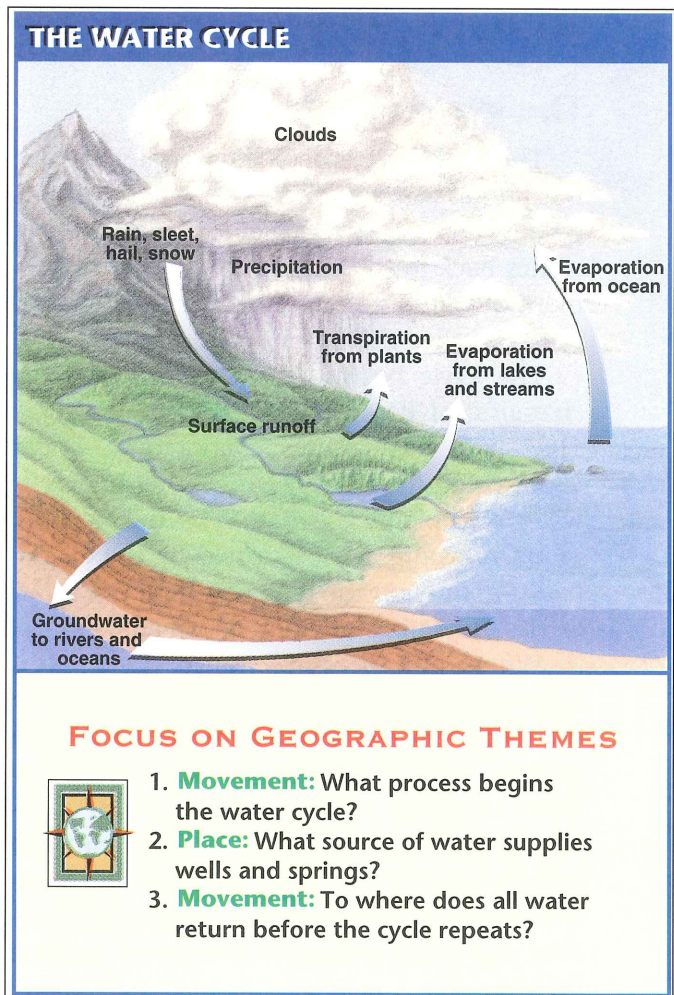
A stream is a body of water flowing through the land. Streams combine to form a river—a stream of water of considerable volume. Most rivers begin high in the mountains and hills. The river's source might be a melting glacier or an overflowing lake. As a river flows along, it picks up additional water from rainfall. Often rivers flow into one another, creating major waterways that flow for thousands of miles before emptying into a gulf, sea, or ocean.

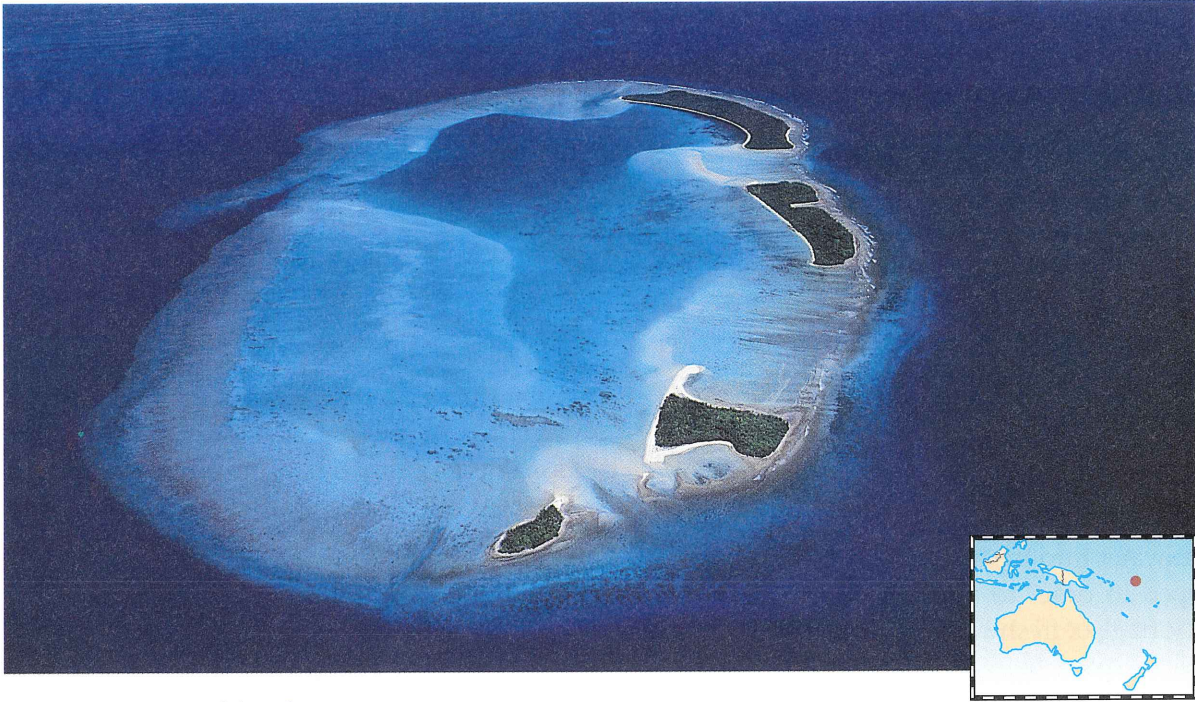
The water in lakes and rivers makes up a small percentage of the earth's water supply. This water, however, is very important to people because it is freshwater. Unlike ocean water, freshwater can be used by people for drinking, farming, or manufacturing. These water sources are so important that most large urban areas began as settlements along the shores of lakes and rivers where people would have a constant supply of water.

Groundwater

Another source of freshwater is **groundwater**, which lies beneath the earth's surface and supplies wells and springs. The main source of groundwater is rain and melted snow that filter through the soil. Water that seeps into the ground from lakes and rivers also contributes to groundwater. People in many rural areas and in some cities depend on groundwater for their needs.

Of the earth's total water supply, only 3 percent is freshwater, and most of this is not available for human consumption. More than 2 percent is locked in glaciers and ice caps. The Antarctic ice cap, for example, contains more freshwater than the rest of the world's regions combined. Another 0.5 percent is groundwater. Rivers and lakes contain far less than 1 percent of the earth's water.





Geographic Themes

Place: Kayangel Atoll, South Pacific

This ring-shaped low island in the Pacific Ocean surrounds an inner lagoon. *How does the Pacific Ocean compare to the world's other oceans?*

The Water Cycle

The earth today has as much water as there was and as much as there ever will be. This is because all of the water that is used eventually comes back to the oceans. The regular movement of water from ocean to air to ground to ocean is called the **water cycle**.

The cycle begins with **evaporation**—the changing of liquid water into vapor, or gas. The sun's heat causes evaporation. Water vapor rising from the oceans, other bodies of water, and plants is gathered by the air. How much moisture can be carried by the air depends mainly on the temperature. Warmer air carries more moisture than cooler air.

When moisture-filled warm air rises, it cools and forms clouds. Certain clouds release moisture, which returns to the earth as precipitation. Because of gravity, returned water flows downhill toward the ocean. It forms streams, rivers, and lakes. It sinks into the ground and becomes groundwater. Sometimes it forms ice caps and glaciers. Eventually, however, the water returns to the ocean and the cycle repeats.

The amount of water that evaporates is approximately the same amount that falls back to the earth. This amount varies little from year to year. Thus, the total volume of water in the cycle is more or less constant.

SECTION 2 ASSESSMENT

Checking for Understanding

- 1. Define** isthmus, plateau, archipelago, continental shelf, groundwater, water cycle, evaporation.
- 2. Locating Places** What continents are joined by the Isthmus of Panama?
- 3. Region** What are the four basic types of landforms?
- 4. Location** Where is freshwater found?

Critical Thinking

- 5. Making Comparisons** How are the landforms of the ocean floor similar to the landforms of the continents?



3 SECTION Earth's Resources

SETTING THE SCENE

Read to Discover . . .

- the importance of natural resources.
- the ways in which the distribution of resources affects people and countries.

Key Terms

- natural resource
- renewable resource
- nonrenewable resource
- imports
- exports

Identify and Locate

Southwest Asia, Japan

Elements from the earth that are not made by people but can be used by them are called **natural resources**. Even though a place might be rich in natural resources, people must develop them. For example, some places have fertile soil, but people must work that soil in order to produce crops and have large supplies of food.

HUMAN/ENVIRONMENT INTERACTION

Importance of Resources

The earth supports human life because it provides what is needed for survival. The basic elements include air, water, soil, plants, and animals. The air that is around the earth contains oxygen, which people and animals breathe. People, animals, and plants depend upon freshwater to live. The earth's soils support the growth of vegetation. Plants and animals form part of the food chain for humans.

Minerals and Fuels

People use the earth's resources to make their lives better. Minerals and fossil fuels are among these resources. Minerals are substances from the earth that are not living or made from living things. Fossil fuels are fuels—including coal, oil, and gas—that

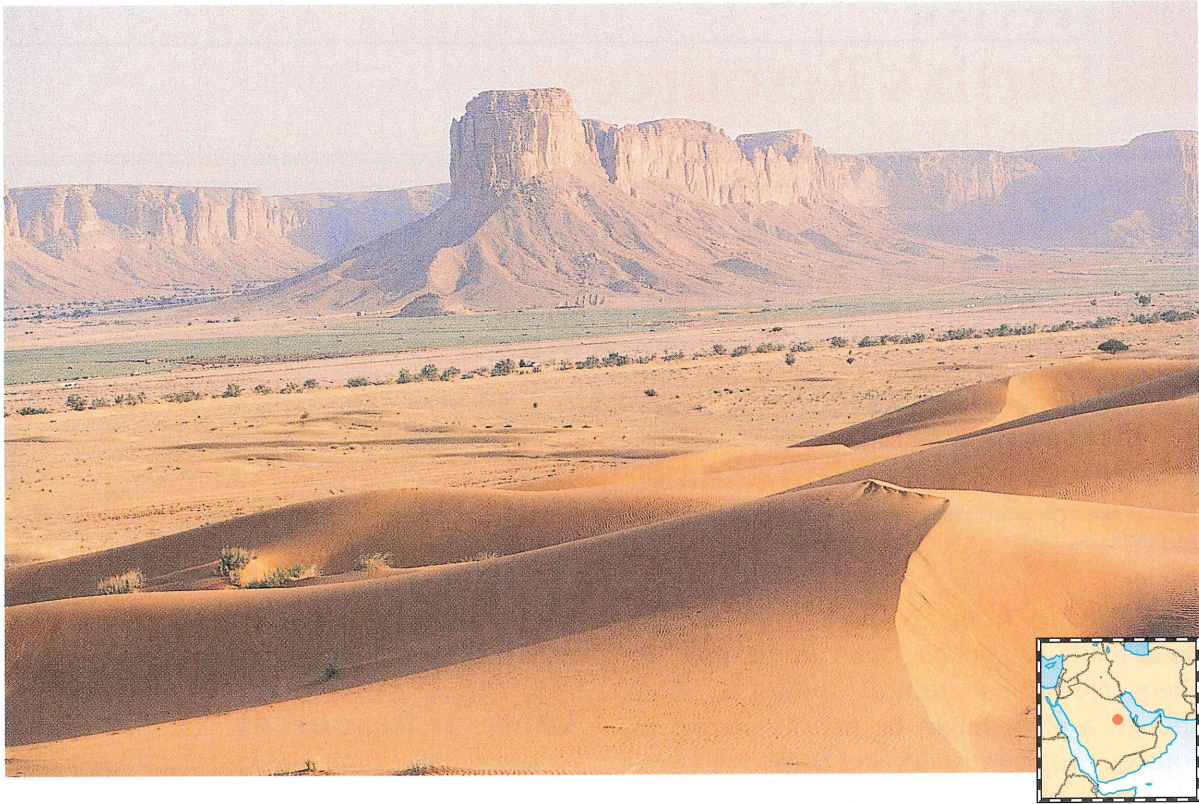
formed from the remains of plants and animals that lived millions of years ago.

Value of Resources

Use, supply, and changes over time help determine how important certain natural resources are. People living in separate parts of the world and at different times may not give the same value to the same resource. For example, a resource such as copper can serve as a raw material for making useful things, such as water pipes in houses. On the other hand, an artist may prize copper because of its worth in making works of art, such as wall decorations. Some people think resources such as gold and silver are valuable because of their use in making jewelry or as a form of money. Photographers might assign a different value to silver because of its importance in making and processing film.

Supply, often influenced by location, also affects value. When there is a small supply of something, it is generally given a greater value. For example, Native Americans who lived far from the oceans used shells as a form of money. Those groups who lived near the shore, where there were many shells, did not place as much value on them. Rubber is another example. People once thought of rubber trees as important natural resources because they provided all the world's rubber. Later synthetic, or artificial, rubber was developed. This made it possible for people to produce large amounts of





Geographic Themes

Place: Arabian Peninsula

The Arabian Peninsula of Southwest Asia is rich in oil, a fossil fuel on which modern industrialized countries depend. *What are other examples of fossil fuels?*

a substance that could be used in place of natural rubber. The increased use of synthetic rubber lowered the value of natural rubber.

The value of a resource may change over time. The energy resource uranium is an example. Uranium is needed to split atoms to release nuclear energy. Before the development of nuclear energy, uranium had few uses. Therefore, people did not give it as much value as they do today.

HUMAN/ENVIRONMENT INTERACTION

Managing Resources

Resources are renewable if they replace themselves naturally or if people can grow or raise continuous supplies of them. Some **renewable resources** are forests and animal life.

People are important in determining how resources are used and renewed. For example,

lumber companies can carefully choose which trees to cut and how many. They can also plant a harvested area with new trees to help renew forestland resources.

The earth's crust, however, has many **non-renewable resources**—resources that can never be replaced. Such resources include most minerals and fossil fuels. People may recycle, or reuse, these resources, but natural growth or human skill cannot replace them.

People also affect the quality of the basic elements of air, water, and soil. These resources cannot be replaced but can be conserved, or protected, through proper management. Farmers, for example, can keep soil fertile by changing the crops that are grown on a plot of land from year to year.

Minerals form most of the earth's land resources and are often found naturally in the ores that people mine. Many of the earth's more than 2,000 different minerals help support or improve human life, and so people



value them. Certain mineral resources provide important medicines and building materials. Factories often mix minerals to make different kinds of materials. For example, factories blend iron ore with alloys such as manganese to produce steel. Minerals in the form of fertilizers aid in producing greater amounts of food.

Fossil fuels are an especially valued resource today. Because these fuels were formed over thousands of lifetimes, they are considered nonrenewable. Such resources provide heat, light, and the energy necessary to run machines. They are also used in the manufacturing of plastics, fertilizers, and other goods.

HUMAN/ENVIRONMENT INTERACTION

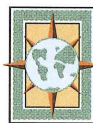
Distribution of Resources

The natural distribution of resources greatly influences how countries relate to one another. Most natural resources are not evenly distributed over the earth. Some places may have large amounts of a certain resource while others may have little or none.

The scarcity of certain resources and goods has led to trade among the world's countries. For example, in order to build jet aircraft, the United States must buy certain resources from other countries. Resources or goods brought into one country from another are known as **imports**. Resources or goods sent from one country to another are known as **exports**.

Because of the scarcity of resources, countries are interdependent, relying on each other for goods and services. Some Southwest Asian countries, for example, depend on the United States for wheat, other food products, and certain manufactured goods. The United States, in turn, depends on these countries for part of its oil supply. In another case, Japan sells steel, automobiles, and other manufactured goods throughout the world. Yet Japan, which is poor in natural resources, must get oil and raw materials from other countries to manufacture the items that it sells.

The uneven distribution of the earth's resources has effects other than promoting



Geographic Themes

Movement: Alaska

The trans-Alaska pipeline carries oil from northern Alaska to the port of Valdez. *Why is oil a nonrenewable resource?*

trade. At many times in the earth's history, it has led to conflict. Many wars have begun because rulers believed that their countries needed the resources or goods that another country possessed.

SECTION 3 ASSESSMENT

Checking for Understanding

- 1. Define** natural resource, renewable resource, nonrenewable resource, imports, exports.
- 2. Locating Places** What region is a leading oil producer?
- 3. Place** What determines the importance of natural resources?
- 4. Human/Environment Interaction** How are renewable and nonrenewable resources different?

Critical Thinking

5. Expressing Problems Clearly

Summarize the relationship between resource use and supply.





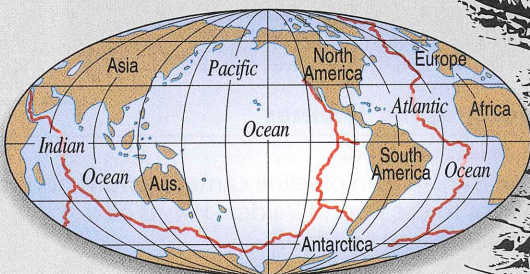
NATIONAL GEOGRAPHIC

GEOFACTS

Where is the world's largest mountain range?

MID-OCEAN RIDGE

The ridge winds around the globe for 46,000 miles (74,000 km).



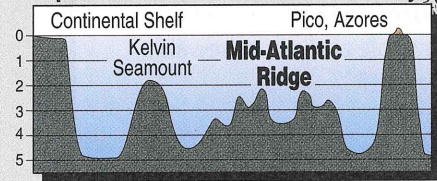
Fracture Zones

These zones cleave the Mid-Atlantic Ridge at right angles.

Rift Valley

A rift valley on the scale of the Grand Canyon runs the length of the Mid-Atlantic Ridge. In some places the valley stretches 20 miles (30 km) across and plunges 5,000 feet (1,524 m). The chart below compares the vertical scale of the ridge and valley with selected Atlantic features.

Depth in thousands of meters*



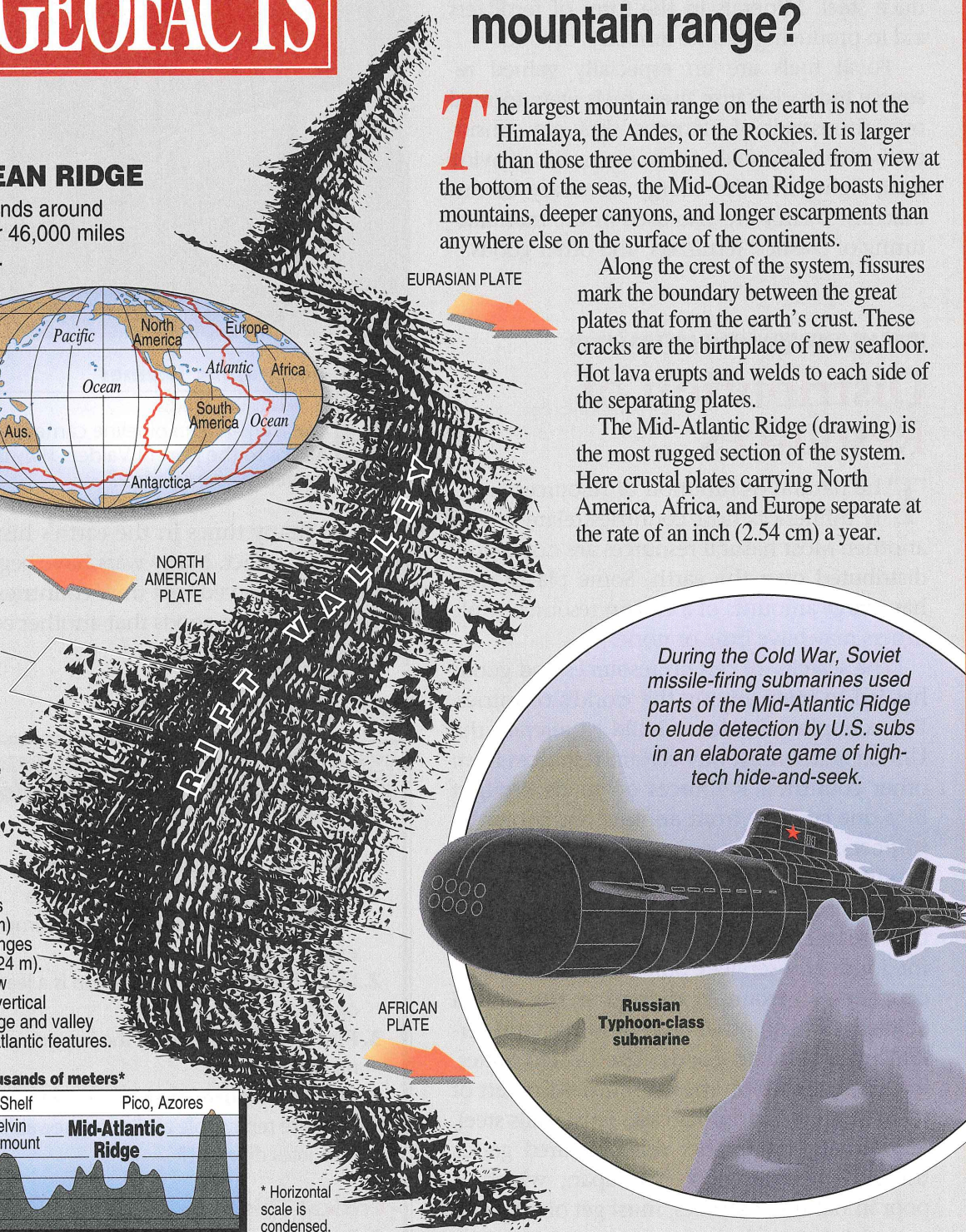
* Horizontal scale is condensed.

Designed by BILL PITZER

The largest mountain range on the earth is not the Himalaya, the Andes, or the Rockies. It is larger than those three combined. Concealed from view at the bottom of the seas, the Mid-Ocean Ridge boasts higher mountains, deeper canyons, and longer escarpments than anywhere else on the surface of the continents.

Along the crest of the system, fissures mark the boundary between the great plates that form the earth's crust. These cracks are the birthplace of new seafloor. Hot lava erupts and welds to each side of the separating plates.

The Mid-Atlantic Ridge (drawing) is the most rugged section of the system. Here crustal plates carrying North America, Africa, and Europe separate at the rate of an inch (2.54 cm) a year.



During the Cold War, Soviet missile-firing submarines used parts of the Mid-Atlantic Ridge to elude detection by U.S. subs in an elaborate game of high-tech hide-and-seek.

Russian Typhoon-class submarine

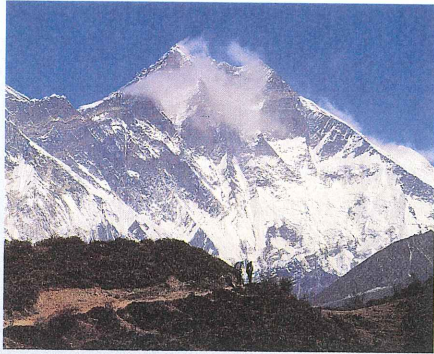
Ridge drawing by William Bond, NGS



1

SECTION

Planet Earth



Mount Everest in the Himalaya range of South Asia

KEY TERMS

atmosphere (p. 27)
 hydrosphere (p. 28)
 lithosphere (p. 28)
 biosphere (p. 28)
 mantle (p. 29)
 fold (p. 29)
 fault (p. 29)
 weathering (p. 30)
 erosion (p. 31)
 glacier (p. 31)

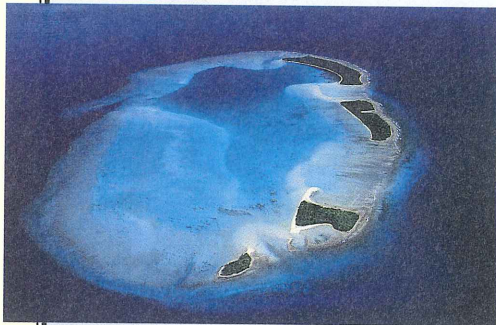
SUMMARY

- The earth is made up of water, land, and air. Water makes up the earth's hydrosphere. Land makes up part of the earth's lithosphere, while the air comprises earth's atmosphere.
- Sections of the earth's crust float and move on a mantle layer, causing some continents to move apart and some to move together.
- External forces, such as water, wind, and gravity, help to shape the earth's surface through erosion, movement, and new landforms.

2

SECTION

Earth's Features



KEY TERMS

isthmus (p. 33)
 plateau (p. 34)
 archipelago (p. 34)
 continental shelf (p. 34)
 groundwater (p. 35)
 water cycle (p. 36)
 evaporation (p. 36)

Kayangel Atoll in the South Pacific

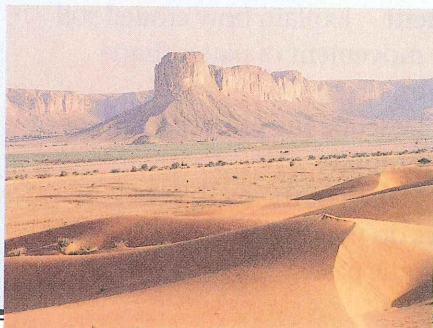
SUMMARY

- Landforms are the physical features that make up the surface of the earth. Four major types are mountains, hills, plains, and plateaus.
- Water is both a physical feature and a resource. Oceans, rivers, lakes, and streams are water features.
- Water is a limited resource that is circulated and purified repeatedly through the water cycle.

3

SECTION

Earth's Resources



KEY TERMS

natural resource (p. 37)
 renewable resource (p. 38)
 nonrenewable resource (p. 38)
 imports (p. 39)
 exports (p. 39)

The Arabian Peninsula

SUMMARY

- The earth's many natural resources are not divided evenly among the countries of the world. Use, supply, and changes over time are factors in deciding how important natural resources are.
- Renewable resources replace themselves naturally or can be raised in continuous supply by people. Nonrenewable resources, such as fossil fuels, can never be replaced.



Reviewing Key Terms

Choose the vocabulary term that best completes each of the sentences below. Write your answers on a separate sheet of paper.

- | | |
|---------------------------|---------------------|
| hydrosphere (p. 28) | lithosphere (p. 28) |
| mantle (p. 29) | folds (p. 29) |
| weathering (p. 30) | glaciers (p. 31) |
| plateau (p. 34) | archipelago (p. 34) |
| groundwater (p. 35) | water cycle (p. 36) |
| natural resources (p. 37) | imports (p. 39) |
| exports (p. 39) | |

SECTION 1

- _____ are bends in layers of rock formed by internal forces in the earth.
- The mixture of solid and liquid rock around the earth's core is called the _____.
- The process that breaks down rocks is called _____.
- The earth's _____ consists of oceans, lakes, and other bodies of water.
- Land makes up part of the earth called the _____.
- _____ are large masses of ice that carve out U-shaped valleys.

SECTION 2

- A group of islands is called a/an _____.
- The _____ purifies water and keeps a global water balance.
- A _____ is a large flatland with one steep side and little relief.
- The main source of _____ is rain that filters through the soil.

SECTION 3

- Earth elements used by humans but not made by them are called _____.
- Resources sent from one country to another are called _____.
- _____ are resources brought into one country from another.

Reviewing Facts

SECTION 1

- What are comets and meteoroids?
- How does chemical weathering occur on the earth?

SECTION 2

- Oceans cover most of the earth's surface. What are some features of the ocean floor?
- Where are the greatest number of lakes found?

SECTION 3

- Many of the earth's resources are available in limited quantities and cannot replenish themselves. What fossil fuels are classified as nonrenewable resources?
- What are the earth's resources that replace themselves naturally called?

Critical Thinking

- Determining Cause and Effect** What forces—both external and internal—shaped the landforms in your immediate region?
- Identifying Central Issues** What are the important factors facing the earth in regard to supplies of freshwater?
- Analyzing Information** Why is the demand for the earth's natural resources increasing?



Geographic Themes

- Movement** Explain how eroded soil and the movement of plates shape landforms.
- Place** Describe the physical features of your community.
- Place** Which of the earth's natural resources do you use on a daily, weekly, and periodic basis?

Projects

Individual Activity

Prepare a chart with six headings: mountains, hills, plateaus, plains, and two other landforms of your choice. Use an atlas to find at least seven of each feature, one from each continent. What conclusions can you draw about landforms?

Cooperative Learning Activity

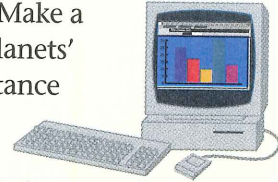
Work in teams of three to create an advertising campaign about the wise use of resources in your part of the country. Posters, pamphlets, informational skits, videos, or multimedia presentations are a few ways to draw attention to issues. Share your campaign with the rest of your class.

Writing About Geography

Narration Choose two or three landforms in your community. Describe the relief, slope, and elevation of each and the processes that caused each landform. Write a descriptive paragraph telling how these landforms have caused people to follow a certain way of life.

Technology Activity

Building a Database Make a chart comparing the planets' sizes, atmospheres, distance from the sun, number of moons, and average temperatures. Put this information into a database, with separate fields for each type of information. Print and distribute your database to the rest of the class.



Locating Places

THE WORLD: PHYSICAL GEOGRAPHY

Match the letters on the map with the places and physical features of the earth. Write your answers on a separate sheet of paper.

- | | |
|----------------------|--------------------|
| 1. Arctic Ocean | 9. Australia |
| 2. Himalayas | 10. Atlantic Ocean |
| 3. Gulf of Mexico | 11. North America |
| 4. Isthmus of Panama | 12. Africa |
| 5. Pacific Ocean | 13. Indian Ocean |
| 6. Bay of Bengal | 14. Antarctica |
| 7. Asia | 15. Ural Mountains |
| 8. Mediterranean Sea | |

