SECTION 1

## Guide to Reading

**Section Preview**
Earth is part of a larger system called the solar system. Earth has water, land, and air that make it suitable for plant and animal life.

**Content Vocabulary**
- hydrosphere *(p. 32)*
- lithosphere *(p. 32)*
- atmosphere *(p. 32)*
- biosphere *(p. 32)*
- continental shelf *(p. 33)*

**Academic Vocabulary**
- approach *(p. 31)*
- assistance *(p. 32)*
- features *(p. 33)*

**Places to Locate**
- Isthmus of Panama *(p. 33)*
- Sinai Peninsula *(p. 33)*
- Mount Everest *(p. 33)*
- Dead Sea *(p. 33)*
- Mariana Trench *(p. 33)*

**Reading Strategy**
**Categorizing** As you read about Earth, complete a graphic organizer similar to the one below by describing the four components of Earth.

| Component | Description |
|---|---|
| Hydrosphere | |
| Lithosphere | |
| Atmosphere | |
| Biosphere | |

# Planet Earth

**An astronaut,** seeing Earth from the blackness of space, described it as "piercingly beautiful." From the vantage point of space, the Earth's great beauty resembles a blue and white marble, with contrasts of water and land beneath huge swirls of white clouds.

### NATIONAL GEOGRAPHIC Voices Around the World

*"To the ancient Egyptians the heavens were almost close enough to touch—a benign canopy of light and dark held up by mountain peaks. But modern science has exploded that ancient, peaceful mirage, replacing it with . . . change, and processes that sometimes defy human understanding. Guided by leaps of imagination and armed with potent new technologies . . . scientists have . . . claimed the universe itself as a titanic laboratory."*

—Kathy Sawyer,
"Unveiling the Universe,"
*National Geographic*, October 1999

*An astronomer with radio telescopes*



## Our Solar System

**MAIN Idea** Earth is part of a larger physical system that contains other planets, moons, and stars.

**GEOGRAPHY AND YOU** Have you ever seen a movie or read a book about outer space? Read to learn how Earth fits into the ever-changing solar system.

Earth is part of our solar system, which includes the sun and the objects that revolve around it. At the center of the solar system is the sun—a star, or ball of burning gases. The sun's enormous mass, or the amount of matter it contains, creates a strong pull of gravity. This basic physical force keeps the Earth and the other objects revolving around the sun.

### The Planets

Except for the sun, spheres called planets are the largest objects in the solar system. At least eight planets exist, and each is in its own orbit around the sun. Mercury, Venus, Earth, and Mars are the inner planets, or those nearest the sun. Earth, the third planet from the sun, is about 93 million miles (about 150 million km) away. Farthest from the sun are the outer planets—Jupiter, Saturn, Uranus, and Neptune.

The planets vary in size. Jupiter is the largest. Earth ranks fifth in size, and Mercury is the smallest. All of the planets except Mercury and Venus have moons, smaller spheres or satellites that orbit them. Earth has 1 moon, and Saturn has at least 18 moons. Ceres and Pluto are dwarf planets. *Dwarf planets* are small round bodies that orbit the sun, but have not cleared the area around their orbits of other orbiting bodies.

All of the planets are grouped into two types—terrestrial planets and gas giant planets. Mercury, Venus, Earth, and Mars are called *terrestrial planets* because they have solid, rocky crusts. Mercury and Venus are scalding hot, and Mars is a cold, barren desert. Only Earth has liquid water at the surface and can support varieties of life.

Farther from the sun are the *gas giant planets*—Jupiter, Saturn, Uranus, and Neptune. They are more gaseous and less dense than the terrestrial planets, even though they are larger in diameter. Each gas giant planet is like a miniature solar system, with orbiting moons and thin, encircling rings. Only Saturn's rings, however, are easily seen from Earth by telescope.

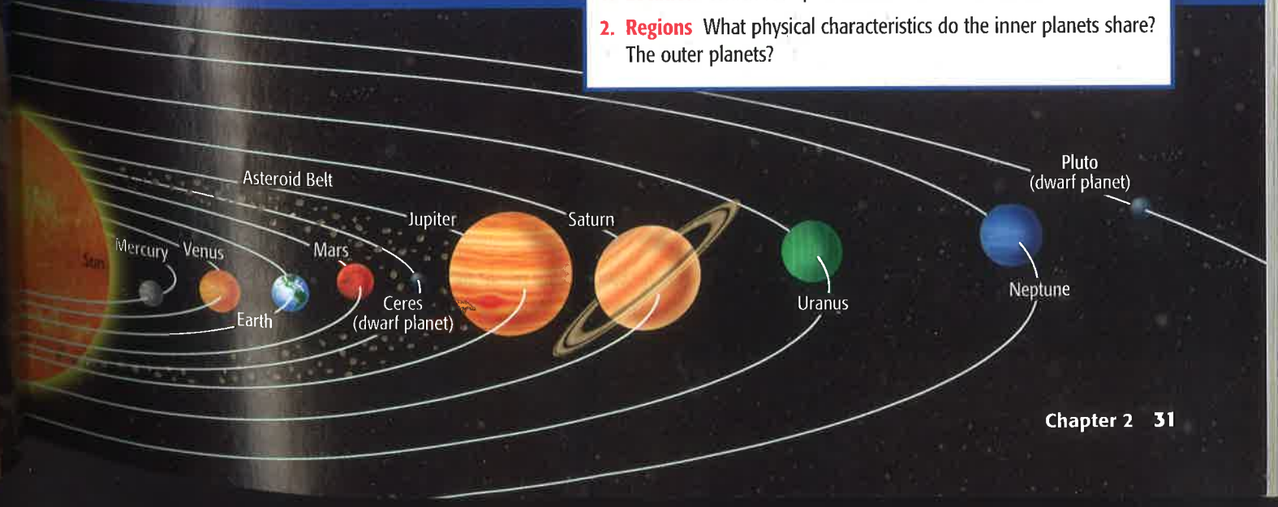
### Asteroids, Comets, and Meteoroids

Thousands of smaller objects—including asteroids, comets, and meteoroids—revolve around the sun. Asteroids are small, irregularly shaped, planet-like objects. They are found mainly between Mars and Jupiter in the *asteroid belt*. A few asteroids follow paths that cross Earth's orbit.

Comets, made of icy dust particles and frozen gases, look like bright balls with long, feathery tails. Their orbits are inclined at every possible angle to Earth's orbit. They may **approach** from any direction.

### NATIONAL GEOGRAPHIC The Solar System

**DIAGRAM STUDY**
1. **Location** Which four planets are closest to the sun?
2. **Regions** What physical characteristics do the inner planets share? The outer planets?



Meteoroids are pieces of space debris—chunks of rock and iron. When they occasionally enter Earth's atmosphere, friction usually burns them up before they reach the Earth's surface. Those that collide with Earth are called meteorites. Meteorite strikes, though rare, can significantly affect the landscape, leaving craters and causing other devastation. In 1908 a huge area of forest in the remote Russian region of Siberia was flattened and burned by a "mysterious fireball." Scientists theorize it was a meteorite or comet. A writer describes the effects:

> *"The heat incinerated herds of reindeer and charred tens of thousands of evergreens across hundreds of square miles. For days, and for thousands of miles around, the sky remained bright with an eerie orange glow—as far away as western Europe people were able to read newspapers at night without a lamp."*
>
> —Richard Stone, "The Last Great Impact on Earth," *Discover*, September 1996

READING Check **Movement** Besides the planets, what other things revolve around the sun?

# Getting to Know Earth

**MAIN Idea** Earth's surface is a complex mix of landforms and water systems.

**GEOGRAPHY AND YOU** What do you know about Earth's water, land, and air? Read to learn how these features support life on Earth.

The Earth is a rounded object wider around the center than from top to bottom. Earth has a larger diameter at the Equator—about 7,930 miles (12,760 km)—than from Pole to Pole, but the difference is less than 1 percent. With a circumference of about 24,900 miles (40,060 km), Earth is the largest of the inner planets.

## Water, Land, and Air

The surface of the Earth is made up of water and land. About 70 percent of our planet's 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, including continents and islands. Land makes up a part of the Earth called the **lithosphere,** the Earth's crust. The lithosphere also includes the ocean basins, or the land beneath the oceans.

The air we breathe is part of Earth's **atmosphere,** a layer of gases extending above the planet's surface. The atmosphere is composed of 78 percent nitrogen, 21 percent oxygen, and small amounts of argon and other gases.

All people, animals, and plants live on or close to the Earth's surface or in the atmosphere. The part of the Earth that supports life is the **biosphere.** Life outside the biosphere, such as on a space station orbiting Earth, exists only with the assistance of mechanical life-support systems.

NATIONAL GEOGRAPHIC **Water, Land, and Air**

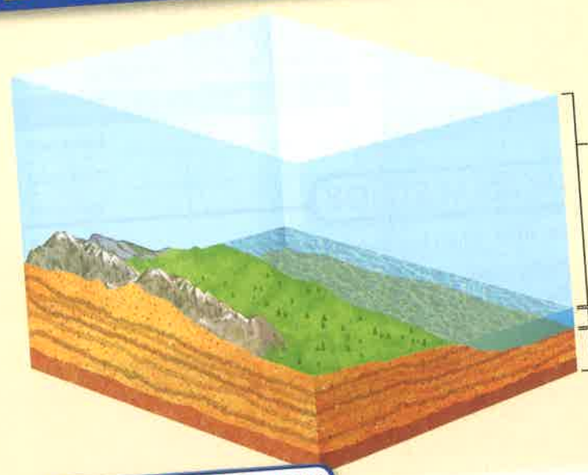



DIAGRAM STUDY

*The atmosphere, hydrosphere, and lithosphere form the biosphere, the part of Earth where life exists.*

1. **Place** What are Earth's water systems called?
2. **Human-Environment Interaction** How does human activity impact the biosphere?



## Landforms

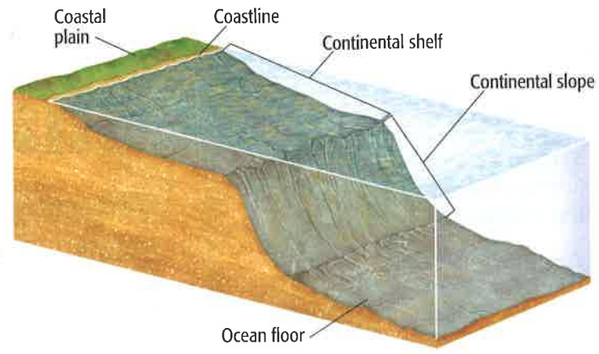
Landforms are the natural features of the Earth's surface. So are bodies of water. The diagram on pages RA2–RA3 shows many of the Earth's landforms, which have a particular shape or elevation. Landforms often contain rivers, lakes, and streams.

Underwater landforms are as diverse as those found on dry land. In some places the ocean floor is a flat plain. Other parts feature mountain ranges, cliffs, valleys, and deep trenches.

Seen from space, Earth's most visible landforms are the seven large landmasses called continents. Australia and Antarctica stand alone, while the others are joined in some way. Europe and Asia are parts of one landmass called Eurasia. A narrow strip of land called the **Isthmus of Panama** links North America and South America. At the **Sinai Peninsula,** the human-made Suez Canal separates Africa and Asia.

The **continental shelf** is an underwater extension of the coastal plain. Continental shelves slope out from land for as much as 800 miles (1,287 km) and descend gradually to a depth of about 660 feet (200 m), where a sharp drop marks the beginning of the continental slope. This area drops more sharply to the ocean floor.

**Underwater Landforms**




## Earth's Heights and Depths

Great contrasts exist in the heights and depths of the Earth's surface. The highest point on Earth is in South Asia at the top of **Mount Everest,** which is 29,028 feet (8,848 m) above sea level. The lowest dry land point, at 1,349 feet (411 m) below sea level, is the shore of the **Dead Sea** in Southwest Asia. Earth's deepest known depression lies under the Pacific Ocean southwest of Guam in the **Mariana Trench,** a narrow, underwater canyon about 35,827 feet (10,920 m) deep.

READING Check **Human-Environment Interaction** How does the biosphere support life on Earth?

THE WORLD

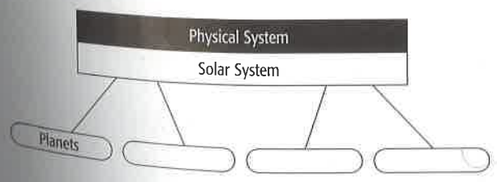
## SECTION 1 REVIEW

### Vocabulary

1. Explain the significance of: hydrosphere, lithosphere, atmosphere, biosphere, continental shelf.

### Main Ideas

2. List examples of Earth's landforms and water systems. How do these features help support life on our planet?
3. How are terrestrial planets and gas giant planets similar? How are they different?
4. Use a diagram like the one below to describe Earth's place in the larger physical system that includes other planets, moons, and stars.




### Critical Thinking

5. BIG Idea Think about Earth's surface and list conditions that must be present in a space station in order to support life.
6. **Drawing Conclusions** NASA has recently launched space probes to explore Mars. Why might Mars have been chosen for these explorations?
7. **Analyzing Visuals** Study the diagram of the solar system on page 31. How is the size of a planet's orbit influenced by its distance from the sun?

### Writing About Geography

8. **Descriptive Writing** Consider the ratio of water and land on Earth. Describe how Earth's landforms and bodies of water would be different if the proportions were reversed.

**Geography ONLINE**
**Study Central™** To review this section, go to glencoe.com and click on Study Central.

SECTION 2

# Forces of Change

## Guide to Reading

**Section Preview**
Internal and external forces shape the Earth's surface.

**Content Vocabulary**
- core *(p. 35)*
- mantle *(p. 35)*
- crust *(p. 35)*
- continental drift *(p. 35)*
- plate tectonics *(p. 35)*
- magma *(p. 35)*
- subduction *(p. 37)*
- accretion *(p. 37)*
- spreading *(p. 37)*
- fold *(p. 37)*
- fault *(p. 37)*
- faulting *(p. 38)*
- weathering *(p. 39)*
- erosion *(p. 39)*
- glacier *(p. 39)*
- moraine *(p. 39)*

**Academic Vocabulary**
- releasing *(p. 35)*
- constantly *(p. 35)*
- tension *(p. 38)*

**Places to Locate**
- Himalaya *(p. 37)*
- San Andreas Fault *(p. 37)*
- Kōbe *(p. 38)*
- San Francisco *(p. 38)*
- Ring of Fire *(p. 38)*
- Greenland *(p. 40)*
- Antarctica *(p. 40)*

**Reading Strategy**
**Taking Notes** As you read about the forces that change the Earth, use the major headings of the section to create an outline similar to the one below.

| Forces of Change |
|---|
| I. Earth's Structure |
| A. |
| B. |
| II. Internal Forces of Change |
| A. |
| B. |

**The center** of Earth is filled with intense heat and pressure. These natural forces drive numerous changes such as volcanoes and earthquakes that renew and enrich Earth's surface. These physical processes can also disrupt, and often destroy, human life. As a result, scientists are working to learn how to predict them.

### NATIONAL GEOGRAPHIC Voices Around the World

*"[S]cientists are doing everything they can to solve the mysteries of earthquakes. They break rocks in laboratories, studying how stone behaves under stress. They hike through ghost forests where dead trees tell of long-ago tsunamis. They make maps of precarious, balanced rocks to see where the ground has shaken in the past, and how hard. They dig trenches across faults, searching for the active trace. They have wired up fault zones with so many sensors it's as though the Earth is a patient in intensive care."*

—Joel Achenbach, "The Next Big One," *National Geographic*, April 2006

A geologist studying earthquake activity



# Earth's Structure

**MAIN Idea** The Earth's internal and external structure, including the tectonic plates, is responsible for the creation of the continents, oceans, and mountain ranges.

**GEOGRAPHY AND YOU** Are there mountains near where you live? Read to learn how Earth's mountains are formed.

For hundreds of millions of years, the surface of the Earth has been in slow but constant motion. Some forces that change the Earth, such as wind and water, occur on the surface. Others, such as volcanic eruptions and earthquakes, originate deep in the Earth's interior.

## A Layered Planet

The diagram at the right shows that Earth is composed of three main layers—the core, the mantle, and the crust. At the very center of the planet is a super-hot but solid inner **core.** Scientists believe that the inner core is made up of iron and nickel under enormous pressure. Surrounding the inner core is a band of melted iron and nickel called the liquid outer core.

Next to the outer core is a thick layer of hot, dense rock called the **mantle.** The mantle consists of silicon, aluminum, iron, magnesium, oxygen, and other elements. This mixture continually rises, cools, sinks, warms up, and rises again, **releasing** 80 percent of the heat generated from the Earth's interior.

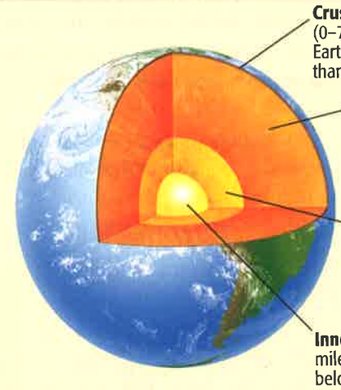
The outer layer is the **crust,** a rocky shell forming the Earth's surface. This relatively thin layer of rock ranges from about 2 miles (3.2 km) thick under oceans to about 75 miles (121 km) thick under mountains. The crust is broken into more than a dozen great slabs of rock called plates that rest—or more accurately, float—on a partially melted layer in the upper portion of the mantle. The plates carry the Earth's oceans and continents.

## Plate Movement

If you had seen the Earth from space 500 million years ago, the planet probably would not have looked at all like it does today. Many scientists believe that most of the landmasses forming our present-day continents were once part of one gigantic supercontinent called *Pangaea* (pan•JEE•uh). The maps on the next page show that over millions of years, this supercontinent has broken apart into smaller continents. These continents in turn have drifted and, in some places, recombined. The theory that the continents were once joined and then slowly drifted apart is called **continental drift.**

The term **plate tectonics** refers to all of the physical processes that create many of the Earth's physical features. Many scientists theorize that plates moving slowly around the globe have produced Earth's largest features—not only continents, but also oceans and mountain ranges. Most of the time, plate movement is so gradual—only about 1 inch (2 to 3 cm) a year—that it cannot be felt. As they move, the plates may crash into each other, pull apart, or grind and slide past each other. Whatever their actions, plates are **constantly** changing the face of the planet. They push up mountains, create volcanoes, and produce earthquakes. When the plates spread apart, **magma,** or molten rock, is pushed up from the mantle, and ridges are formed. When plates bump together, one may slide under another, forming a trench.

### NATIONAL GEOGRAPHIC Inside the Earth




### DIAGRAM STUDY

1. **Location** Which of Earth's layers is between the crust and the outer core?
2. **Location** How much does the temperature change from the inner core to the outer core? From the outer core to the mantle?

Concepts in Motion Use StudentWorks™ Plus or glencoe.com.

# Internal Forces of Change

> *"[W]e have a highly successful theory, called plate tectonics, that explains . . . why continents drift, mountains rise, and volcanoes line the Pacific Rim. Plate tectonics may be one of the signature triumphs of the human mind. . . ."*
>
> Joel Achenbach, "The Next Big One," *National Geographic*, April 2006

**MAIN Idea** Plate tectonics is responsible for folding, lifting, bending, and breaking parts of the Earth's surface.

**GEOGRAPHY AND YOU** Have you seen news coverage about earthquakes or volcanoes in different parts of the world? Read to learn how the internal forces of plate tectonics can cause such natural disasters.

Many scientists estimate that plate tectonics has been shaping the Earth's surface for 2.5 to 4 billion years. According to some scientists, plate tectonics will have sculpted a whole new look for our planet millions of years from now.

Scientists, however, have not yet determined exactly what causes plate tectonics. They theorize that heat rising from the Earth's core may create slow-moving currents within the mantle. Over millions of years, these currents of molten rock may shift the plates around, but the movements are extremely slow and difficult to detect.

**READING Check** **Movement** What is the theory of continental drift?

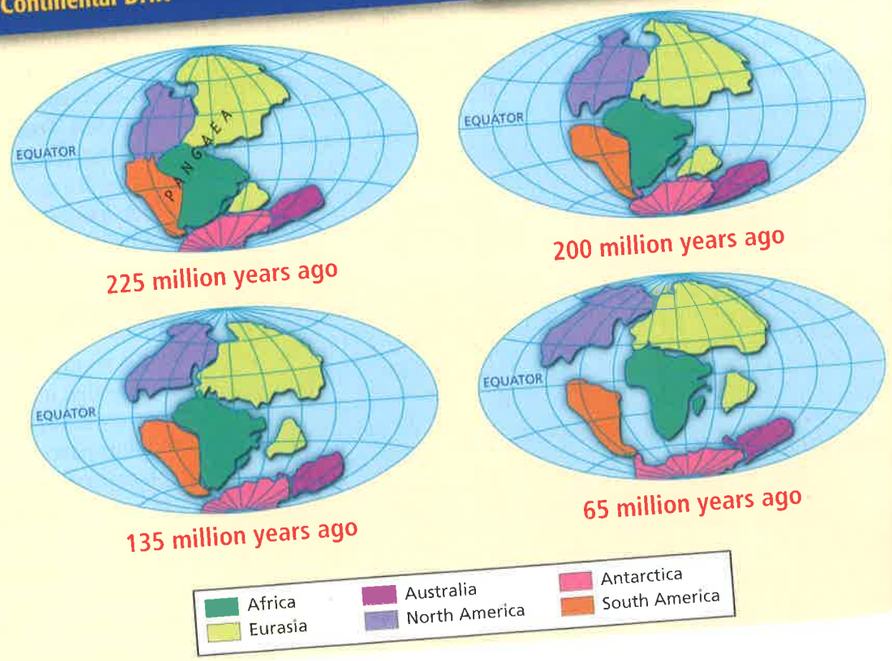
Earth's surface has changed greatly over time. Scientists believe that some of these changes come from forces associated with plate tectonics. One of these forces relates to the movement of magma within the Earth. Others involve movements that can fold, lift, bend, or break the solid rock at the Earth's crust.

**MAP STUDY**

1. **Regions** How does the first map of Pangaea compare to the last map? The map of plate movement?
2. **Movement** Which plates are moving toward each other? Away from each other?

**Maps In Motion** Use StudentWorks™ Plus or glencoe.com.

NATIONAL GEOGRAPHIC **Continental Drift**




## Colliding and Spreading Plates

Mountains are formed in areas where giant continental plates collide. For example, the **Himalaya** mountain ranges in South Asia were thrust upward when the Indian landmass drifted against Eurasia. Himalayan peaks are getting higher as the Indian landmass continues to move northward.

Mountains are also created when a sea plate collides with a continental plate. The diagram on page 38 shows how in a process called **subduction** (suhb•DUHK•shuhn) the heavier sea plate dives beneath the lighter continental plate. Plunging into the Earth's interior, the sea plate becomes molten material. Then, as magma, it bursts through the crust to form volcanic mountains. The Andes, a mountain system in South America, was formed over millions of years as a result of subduction. The Nazca Plate slid beneath the South American Plate.

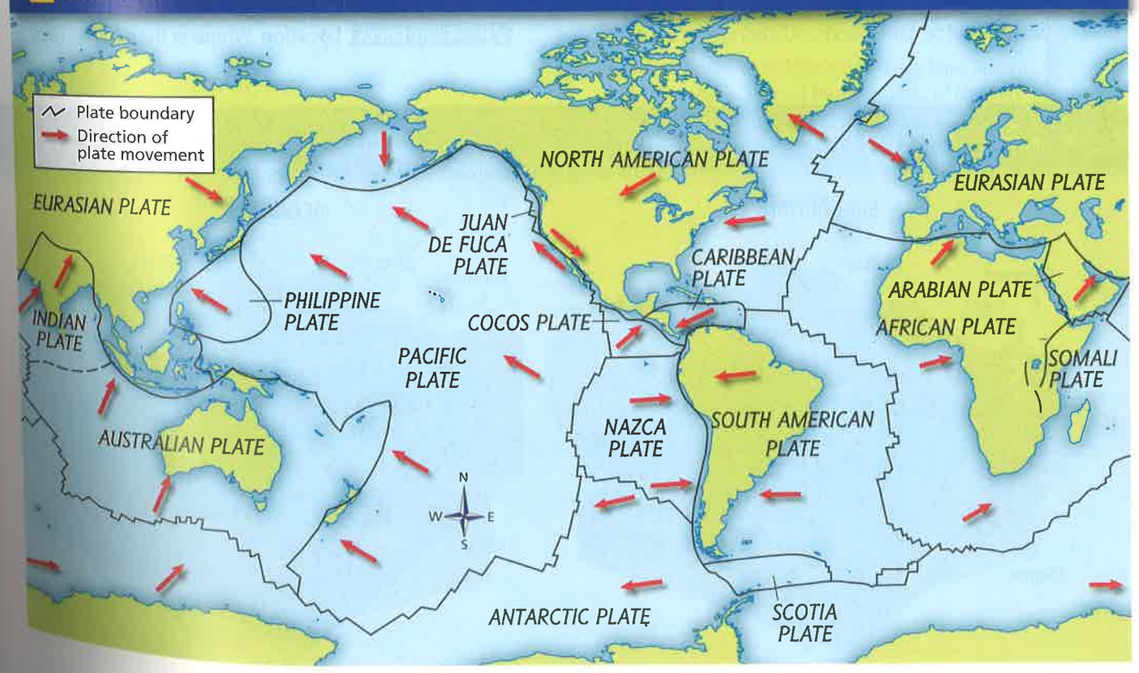
In other cases where continental and sea plates meet, a different process, known as accretion, occurs. During **accretion** (uh•KREE•shuhn), pieces of the Earth's crust come together slowly as the sea plate slides under the continental plate. This movement levels off seamounts, underwater mountains with steep sides and sharp peaks, and piles up the resulting debris in trenches. This buildup can cause continents to grow outward. Most scientists believe that much of western North America expanded outward into the Pacific Ocean over more than 200 million years as a result of accretion.

New land can also form when two sea plates converge. In this process, one plate moves under the other, often forming an island chain at the boundary. Sea plates also can pull apart in a process known as **spreading.** The resulting rift, or deep crack, allows magma from within the Earth to well up between the plates. The magma hardens to build undersea volcanic mountains or ridges and some islands. This spreading activity occurs down the middle of the Atlantic Ocean's floor, pushing Europe and North America away from each other.

## Folds and Faults

Moving plates sometimes squeeze the Earth's surface until it buckles. This activity forms **folds,** or bends, in layers of rock. In other cases, plates may grind or slide past each other, creating cracks in the Earth's crust called **faults.** One famous fault is the **San Andreas Fault** in California.

NATIONAL GEOGRAPHIC **Plate Movement**



The process of **faulting** occurs when the folded land cannot be bent any further. Then the Earth's crust cracks and breaks into huge blocks. The blocks move along the faults in different directions, grinding against each other. The resulting **tension** may release a series of small jumps, felt as minor tremors on the Earth's surface.

## Earthquakes

Sudden, violent movements of tectonic plates along a fault line are known as earthquakes. These shaking activities dramatically change the surface of the land and the floor of the ocean. During a severe earthquake in Alaska in 1964, a portion of the ground lurched upward 38 feet (11.6 m).

Earthquakes often occur where plates meet. Tension builds up along fault lines as the plates stick. The strain eventually becomes so intense that the rocks suddenly snap and shift. This movement releases stored-up energy along the fault. The ground then trembles and shakes as shock waves surge through it moving away from the area where the rocks first snapped apart.

In recent years disastrous earthquakes have occurred in **Kōbe,** Japan, and in Los Angeles and **San Francisco.** These cities are located along the **Ring of Fire,** one of the most earthquake-prone areas on the planet. The Ring of Fire is a zone of earthquake and volcanic activity around the perimeter of the Pacific Ocean. Here the plates that cradle the Pacific meet the plates that hold the continents surrounding the Pacific. North America, South America, Asia, and Australia are affected by their location on the Ring of Fire.

## Volcanic Eruptions

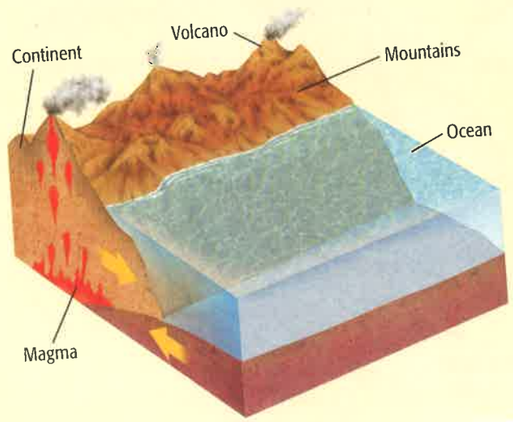
Volcanoes are mountains formed by lava or by magma that breaks through the Earth's crust. Volcanoes often rise along plate boundaries where one plate plunges beneath another, as along the Ring of Fire. In such a process, the rocky plate melts as it dives downward into the hot mantle. If the molten rock is too thick, its flow is blocked and pressure builds. A cloud of ash and gas may then spew forth, creating a funnel through which the red-hot magma rushes to the surface. There the lava flow may eventually form a large volcanic cone topped by a crater, a bowl-shaped depression at a volcano's mouth.

Volcanoes also arise in areas away from plate boundaries. Some areas deep in the Earth are hotter than others, and magma often blasts through the surface as volcanoes. As a moving plate passes over these hot spots, molten rock flowing out of the Earth may create volcanic island chains, such as the Hawaiian Islands. At some hot spots, molten rock may also heat underground water, causing hot springs or geysers like Old Faithful in Yellowstone National Park.

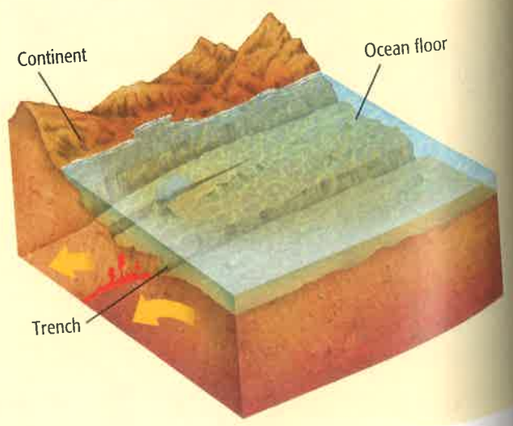
**READING Check** **Location** Where is the Ring of Fire?

NATIONAL GEOGRAPHIC **Forces of Change**

**SUBDUCTION**




**ACCRETION**






# External Forces of Change

**MAIN Idea** External forces such as weathering and erosion also shape the surface of the Earth.

**GEOGRAPHY AND YOU** Have you ever seen soil washed over the road after a heavy rain? Read to learn how wind and rain can shape Earth's surface.

External forces, such as wind and water, also change the Earth's surface. Wind and water movements involve two processes. **Weathering** breaks down rocks, and **erosion** wears away the Earth's surface by wind, glaciers, and moving water.

## Weathering

The Earth is changed by two basic kinds of weathering. Physical weathering occurs when large masses of rock are physically broken down into smaller pieces. For example, water seeps into the cracks in a rock and freezes, then expands and causes the rock to split. Chemical weathering changes the chemical makeup of rocks. For example, rainwater that contains carbon dioxide from the air easily dissolves certain rocks, such as limestone. Many of the world's caves have been and continue to be formed by this process.

## Wind Erosion

Wind erosion involves the movement of dust, sand, and soil from one place to another. Plants help 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. Wind erosion can provide some benefits. The dust carried by wind often forms large deposits of mineral-rich soil.

## Glacial Erosion

Another cause of erosion is **glaciers,** or large bodies of ice that move across the Earth's surface. Glaciers form over time as layers of snow press together and turn to ice. Their great weight causes them to move slowly downhill or spread outward. As they move, glaciers pick up rocks and soil in their paths, changing the landscape. They can destroy forests, carve out valleys, alter the courses of rivers, and wear down mountaintops.

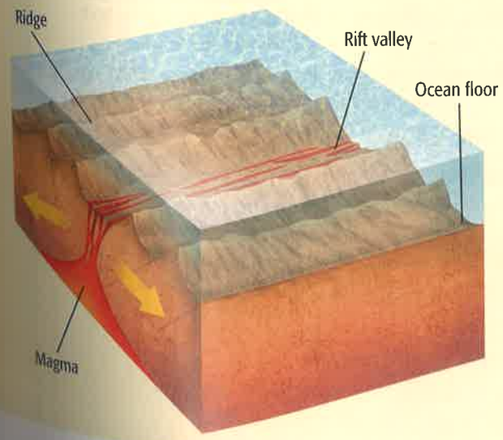
When glaciers melt and recede, in some places they leave behind large piles of rocks and debris called **moraines.** Some moraines form long ridges of land, while others form dams that hold water back and create glacial lakes.

### DIAGRAM STUDY

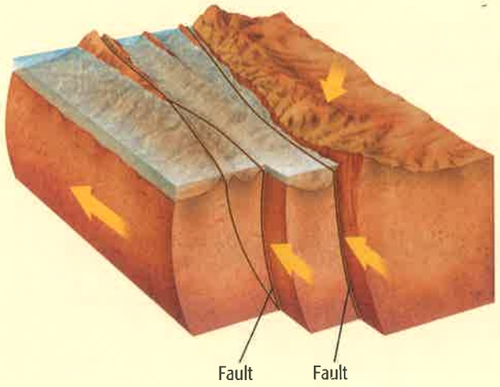
1. **Place** How does accretion create deep trenches?
2. **Human-Environment Interaction** How have human settlements been affected by the process of faulting?

Concepts in Motion Use StudentWorks™ Plus or glencoe.com.

**SPREADING**




**FAULTING**



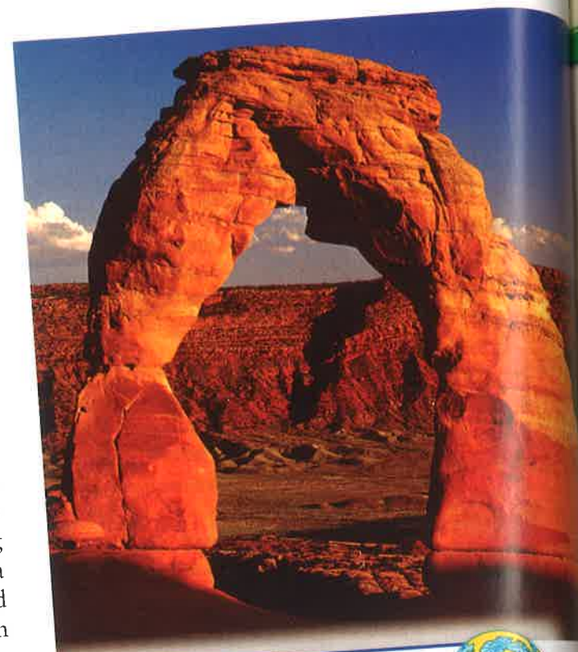
There are two types of glaciers. Sheet glaciers are flat, broad sheets of ice. Today sheet glaciers cover most of **Greenland** and all of **Antarctica.** They advance a few feet each winter and recede in the summer. Large blocks of ice often break off from the coastal edges of sheet glaciers to become icebergs floating in the ocean. Mountain glaciers, located in high mountain valleys where the climate is cold, gouge out round, U-shaped valleys as they move downhill.

## Water Erosion

Water erosion begins when springwater and rainwater flow downhill in streams, cutting into the land, and wearing away the soil and rock. The resulting sediment grinds away the surface of rocks along the stream's path. Over time, the eroding action of water forms first a gully and then a V-shaped valley. Sometimes valleys are eroded even further to form canyons. The Grand Canyon is an example of the eroding power of water.

Oceans also play an important role in water erosion. Pounding waves continually erode coastal cliffs, wear rocks into sandy beaches, and move sand away to other coastal areas.

READING Check **Regions** How have many of the world's caves been formed?



NATIONAL GEOGRAPHIC *Fast-moving water, the most significant cause of erosion, helped create the Delicate Arch in Arches National Park near Moab, Utah.*

**Movement** How does water erosion form valleys and canyons?

## SECTION 2 REVIEW

### Vocabulary

1. Explain the significance of: core, mantle, crust, continental drift, plate tectonics, magma, subduction, accretion, spreading, fold, fault, faulting, weathering, erosion, glacier, moraine.

### Main Ideas

2. How does the internal structure of the Earth influence the creation of continents, oceans, and mountain ranges?
3. Describe the two kinds of weathering and the three kinds of erosion that shape the surface of the Earth.
4. Use a chart like the one below to explain how plate tectonics is responsible for folding, lifting, bending, and breaking parts of Earth's surface.

| Forces of Change | | |
|---|---|---|
| Process | How It Works | Example |
| Subduction | | |
| | | |
| | | |

### Critical Thinking

5. BIG Idea Based on your understanding of plate tectonics, what changes would you predict to the Earth's appearance millions of years from now?
6. **Drawing Conclusions** In what ways can erosion be both beneficial and harmful to agricultural communities?
7. **Analyzing Visuals** Study the map of plate movement on page 37. Which plates are responsible for the earthquakes that have occurred in California?

### Writing About Geography

8. **Descriptive Writing** Review how internal forces shape the surface of the Earth. Now imagine that the mantle ceased to circulate molten rock. Write a description of how land formation on the surface of the Earth would be different.

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