Earth Science
GLOSSARY

A

abrasion (u h -BRAY-z h u h n)
The process of wearing something down by friction. (p. 1 6)

absolute age
The actual age in years of an event or object. (p. 299)

acid rain
Rain that has become more acidic than normal due to pollution. (pp. 276, 566)

aftershock
A smaller earthquake that follows a more powerful earthquake in the same area. (p. 238)

air mass
A large volume of air that has nearly the same temperature and humidity at different locations at the same altitude. (p. 575)

air pollution
Harmful materials added to the air that can cause damage to living things and the environment. (p. 523)

air pressure
The force of air molecules pushing on an area. (p. 539)

alluvial fan (u h-LOO-vee-u h l)
A fan-shaped deposit of sediment at the base of a slope, formed as water flows down the slope and spreads at the bottom. (p. 153)

altitude
The distance above sea level. (p. 506)

aquaculture
The science and business of raising and harvesting fish in
a controlled situation. (p. 397)

aquifer
An underground layer of permeable rock that contains water. (p. 378)

artesian well
A well in which pressurized water flows upward to the surface. (p. 380)

asteroid
A small, solid, rocky body that orbits the Sun. Most asteroids orbit in a region between Mars and Jupiter called the asteroid belt. (p. 743)

asthenosphere (as-THEHN-uh-SFEER)
The layer in Earth's upper mantle and directly under the lithosphere in which rock is soft and weak because it is close to melting. (p. 1 87)

astronomical unit AU
Earth's average distance from the Sun, which is approximately 150 million kilometers (93 million mi). (p. 721)

atmosphere (AT-muh-SFEER)
The outer layer of gases of a large body in space, such as a planet or star; the mixture of gases that surrounds the solid Earth; one of the four parts of the Earth system. (pp. 10, 505)

atom
The smallest particle of an element that has the chemical
properties of that element. (p. xxxiii)

axis of rotation
An imaginary line about which a turning body, such as Earth rotates. (p. 684)

B

barometer
An instrument that measures air pressure in the atmosphere. (p. 542)

barrier island
A long, narrow island that develops parallel to a coast as a sandbar builds up above the water's surface. (p.160)

big bang
The moment in time when the universe started to expand out of an extremely hot, dense state, according
to scientific theory. (p. 778)

biomass
Organic matter that contains stored energy from sunlight
and that can be burned as fuel. (p. 344)

biosphere (BY-uh-SFEER)
All living organisms on Earth in the air, on the land, and in the waters; one of the four parts of the Earth system. (p. 11)

black hole
The final stage of an extremely massive star, which is invisible because its gravity prevents any form of radiation from escaping. (p. 766)

blizzard
A blinding snowstorm with winds of at least 56 kilometers per hour (35 mi/h), usually with temperatures below -7°C (20°F). (p. 586)

by-catch
The portion of animals that are caught in a net and then thrown away as unwanted. (p. 484)

C

chemical weathering
The breakdown or decomposition of rock that takes place when minerals change through chemical processes. (p. 118)

cleavage
The property of a mineral that describes its tendency to break along flat surfaces. (p. 53)

convection
The transfer of energy from place to place by the motion of heated gas or liquid; in Earth's mantle, convection is thought to transfer energy by the motion of solid rock, which when under great heat and pressure can move like a liquid. (pp. 193, 5 1 5, 756)

convection current
A circulation pattern in which material is heated and rises in one area, then cools and sinks in another area, flowing in a continuous loop. (p. 193)

convergent boundary (kun-VUR-j u h nt)
A boundary along which two tectonic plates push together, characterized either by subduction or a continental collision. (p. 198)

coral reef
A built-up limestone deposit formed by small ant-sized organisms called corals. (p. 474)

coriolis effect (KAWR-ee-OH-li hs)
The influence of Earth's rotation on objects that move over Earth. (p. 545)

corona
The outer layer of the Sun's atmosphere. (p. 756)
corona La capa exterior de la atmosfera del Sol.

crust
A thin outer layer of rock above a planet's mantle, including all dry land and ocean basins. Earth's continental crust is 40 kilometers thick on average and oceanic crust is 7 kilometers thick on average. (p. 187)

crystal
A solid substance in which the atoms are arranged in an orderly, repeating, three-dimensional pattern. (p. 46)

cycle
n. A series of events or actions that repeat themselves regularly; a physical and/or chemical process in which one material continually changes locations and/or forms. Examples include the water cycle, the carbon cycle, and the rock cycle.
v. To move through a repeating series of events or actions.

D

dam
A structure that holds back and controls the flow of water in a river or other body of water. (p. 398)

data
Information gathered by observation or experimentation that can be used in calculating or reasoning. Data is a plural word; the singular is datum.

delta
An area of land at the end, or mouth, of a river that is formed by the buildup of sediment. (p. 153)

density
A property of matter representing the mass per unit volume. (pp. 54, 506)

deposition (DEHP-u h-ZIS H- u h n)
The process in which transported sediment is laid down. (p. 145)

desalination (de-SAL-i h-nay-sh u n)
The process of removing salt from ocean water. Desalination is used to obtain fresh water. (p. 4 18)

desertification (dih-zuR-tu h-fi h-KAY-sh u h n)
The expansion of desert conditions in areas where the natural plant cover has been destroyed. (p. 133)

dew point
The temperature at which air with a given amount of water vapor will reach saturation. (p. 554)

divergent boundary (d i h-VUR-j u h nt)
A boundary along which two tectonic plates move apart, characterized by either a mid-ocean ridge or a continental rift valley. (p. 198)

divide
A continuous high line of land-or ridge-from which water drains to one side or the other. (pp. 151, 369)

Doppler effect
A change in the observed frequency of a wave, occurring when the source of the wave or the observer is moving. Changes in the frequency of light are often measured by observing changes in wavelength, whereas changes in the frequency of sound are often detected as changes in pitch. (p. 776)

downwelling
The movement of water from the surface to greater depths. (p. 438)

drainage basin
An area of land in which water drains into a stream system. The borders of a drainage basin are called divides. (pp. 151, 369)

drought (drowt)
A long period of abnormally low amounts of rainfall. (p. 413)

dune
A mound of sand built up by wind. (p. 161)

E

earthquake
A shaking of the ground caused by the sudden movement of large blocks of rocks along a fault. (p. 221)

eclipse
An event during which one object in space casts a shadow onto another. On Earth, a lunar eclipse occurs when the Moon moves through Earth's shadow, and a solar eclipse occurs when the Moon's shadow crosses Earth . • (p. 703)

electromagnetic radiation
(ih-LEHK-troh-mag-NE HT-i h k RAY-dee-AY-sh u h n)
Energy that travels across distances as certain types of waves. Types of electromagnetic radiation are radio waves, microwaves, infrared radiation, visible light, ultraviolet radiation, x-rays, and gamma rays. (p. 655)

element
A substance that cannot be broken down into a simpler substance by ordinary chemical changes. An element consists of atoms of only one type. (p. 45)

elevation
A measure of how high something is above a reference point, such as sea level. (p. 25)

ellipse
An oval or flattened circle. (p. 721)

El Nino (eh l N E EN-yoh)
A disturbance of wind patterns and ocean currents in the Pacific Ocean that causes temporary climate changes in many parts of the world. (pp. 440, 632)

energy
The ability to do work or to cause a change. For example, the energy of a moving bowling ball knocks over pins; energy from food allows animals to move and to grow; and energy from the Sun heats Earth's surface and atmosphere, which causes air to move. (p. xxxi)

epicenter (E H P- i h-SEHN-tu h r)
The point on Earth's surface directly above the focus of an earthquake. (p. 228)

equator
An imaginary east-west line around the center of Earth that divides the planet into the Northern Hemisphere and the Southern Hemisphere; a line set at 0° latitude. (p. 18)

equinox (EE-kwh u-NAH KS)
In an orbit, a position and time in which sunlight shines equally on the Northern Hemisphere and the Southern Hemisphere; a time of year when daylight and darkness are nearly equal for most of Earth. (p. 686)

erosion
The process in which sediment is picked up and moved from one place to another. (p.145)

estuary (EHS-choo-EHR-ee)
A shoreline area where fresh water from a river mixes with salt water from the ocean. (p. 468)

eutrophication (yoo-TRAF-ih-KAY-sh u n)
An increase in nutrients in a lake or pond. Eutrophication can occur naturally or as a result of pollution, and causes increased growth of algae and plants.
(p. 372)

evaporation
The process by which liquid changes into gas.
(pp. 365, 552)

exfoliation (ex-FOH-lee-AY-sh u h n)
In geology, the process in which layers or sheets of rock gradually break off. (p. 116)

experiment
An organized procedure to study something under controlled conditions. (p. xl)

extrusive igneous rock
(ih k-STROO-sihv I H G-nee-u hs)
Igneous rock that forms as lava cools on Earth's surface.
(p. 83)

F

false-color image
A computer image in which the colors are not what the human eye would see. A false-color image can assign different colors to different types of radiation coming from an object to highlight its features.
(p. 32)

fault
A fracture in Earth's lithosphere along which blocks of rock move past each other. (p. 221)

fault-block mountain
A mountain that forms as blocks of rock move up or down along normal faults in areas where the lithosphere is being pulled apart. (p. 258)

floodplain
A flat area of land on either side of a stream that becomes flooded when a river overflows its banks.
(p. 1 52)

focus
In an earthquake, the point underground where the rocks first begin to move. (p. 228)
foco sismico En un terremoto, el punto subterraneo donde comienza el movimiento de las rocas.

folded mountain
A mountain that forms as continental crust is compressed
and rocks bend into large folds. (p. 256)

folfation
The arrangement of minerals within rocks into flat or wavy parallel bands; a characteristic of most metamorphic rocks. (p. 1 00)

force
A push or a pull; something that changes the motion of an object. (p. xxxiii)

fossil
A trace or the remains of a once-living thing from long ago. (pp. 287, 463)

fossel fuels
Fuels formed from the remains of prehistoric organisms that are burned for energy.
(pp. 326, 524)

fracture
The tendency of a mineral to break into irregular pieces.
(p. 53)

freezing rain
Rain that freezes when it hits the ground or another surface and coats the surface with ice. (p. 564)

fresh water
Water that is not salty and has little or no taste, color, or smell. Most lakes and rivers are made up of fresh water. (p. 363)

friction
A force that resists the motion between two surfaces in contact. (p. xxxvii)

front
The boundary between air masses. (p. 578)

fusion
A process in which particles of an element collide and combine to form a heavier element, such as the fusion of hydrogen into helium that occurs in the Sun's core. (p. 756)

G

galaxy
Millions or billions of stars held together in a group by their own gravity. (p. 650)

gas
A state of matter different from liquid and solid, with no definite volume and no definite shape.

gas giant
A large planet that consists mostly of gases in a dense form. The four large planets in the outer solar systemJupiter, Saturn, Uranus, and Neptune-are gas giants. (p. 734)

geographic information systems
Computer systems that can store, arrange, and display geographic data in different types of maps. (p. 33)

geologic time scale
The summary of Earth's history, divided into intervals of time defined by major events or changes on Earth. (p. 305)

geosphere (J EE-u h-SFEER)
All the features on Earth's surface-continents, islands, and seafloor-and everything below the surface-the inner and outer core and the mantle; one of the four parts of the Earth system. (p.12)

geothermal energy
Heat energy that originates from within Earth and drives the movement of Earth's tectonic plates. Geothermal energy can be used to generate electricity. (p. 342)

geyser A type of hot spring that shoots water into the air. (p. 276)

glacier (G LAY-sh u h r)
A large mass of ice that exists year-round and moves over land. (p.165)

global winds
Winds that travel long distances in steady patterns over several weeks. (p. 544)

gravity
The force that objects exert on each other because of their mass. (p. xxxiii)

greenhouse effect
The process by which certain gases in a planet's atmosphere absorb and emit infrared radiation, resulting in an increase in surface temperature. (p. 520)

greenhouse gases
Gases, such as carbon dioxide and methane, that absorb and give off infrared radiation as part of the greenhouse effect. (p. 520)

groundwater
Water that collects and is stored underground. (p. 376)

H

habitat
The natural environment in which a living thing gets all that it needs to live; examples include a desert, a coral reef, and a freshwater lake. (p. 466)

hail
Layered lumps or balls of ice that fall from cumulonimbus clouds. (p. 564)

half-life
The length of time it takes for half of the atoms in a sample of a radioactive element to change from an unstable form into another form. (p. 299)

hardness
The resistance of a mineral or other material to being scratched. (p. 55)

high-pressure system
A generally calm and clear weather system that occurs when air sinks down in a high-pressure center and spreads out toward areas of lower pressure as it nears the ground. (p. 580)

hot spot
An area where a column of hot material rises from deep within a planet's mantle and heats the lithosphere above it, often causing volcanic activity at the surface. (p. 203)

humidity
The amount of water vapor in air. (p. 554)

humus (HYOO- m u h s)
The decayed organic matter in soil. (p. 123)

hurricane (H U R- i h-KAYN)
A tropical low-pressure system with sustained winds of 120 kilometers per hour (74 mi/h) or more. (p. 583)

hydroelectric energy
Electricity that is generated by the conversion of the energy of moving water. (p. 340)

hydrogen fuel cell
A device that uses hydrogen and oxygen to produce electricity. The byproducts are heat and water. (p. 344)

hydrosphere (HY-d ruh-sFEER)
All water on Earth-in the atmosphere and in the oceans, lakes, glaciers, rivers, streams, and underground reservoirs; one of the four parts of the Earth system. (p. 10)

hydrothermal vent
An opening in the sea floor from which heated water rises and mixes with the ocean water above. (p. 480)

hypothesis
A tentative explanation for an observation or phenomenon. A hypothesis is used to make testable predictions. (p. xl)

I

ice age
A period of time during which surface temperatures drop significantly and huge ice sheets spread out beyond
the polar regions. (p. 631)

iceberg
A mass of floating ice that broke away from a glacier. (p. 374)

ice core
A tubular sample that shows the layers of snow and ice that have built up over the years. (p. 293)

igneous rock (IH G-nee-uhs)
Rock that forms as molten rock cools and becomes solid. (p. 78)

impact crater
A round pit left behind on the surface of a planet or other body in space after a smaller object strikes the surface. (p. 672)

impermeable
Resistant to the passage of water. (p. 377)

index fossil
A fossil of an organism that was common, lived in many areas, and existed only during a certain span of time. Index fossils are used to help determine the age of rock layers. (p. 297)

infrared radiation (IHN-fruh-REHD RAY-dee-AY-sh u h n) Radiation of lower frequencies than visible light. (p. 519)

inner core
A solid sphere of metal, mainly nickel and iron, at Earth's
center. (p. 186)

intertidal zone
The narrow ocean margin between the high-tide mark and the low-tide mark. (p. 466)

intrusive igneous rock (ih n-TROO-sihv I H G-nee-uhs)
Igneous rock that forms as magma cools below Earth's surface. (p. 83)

irrigation
The process of supplying water to land to grow crops. (p. 395)

isobar (EYE-suh-BAHR)
A line on a weather map connecting places that have the same air pressure. (p. 597)

J

jet stream
A wind that flows in the upper troposphere from west to east over vast distances at great speeds. (p. 548)

K

kelp forest
A large community of kelp, a type of seaweed that can attach to the ocean floor. (p. 476)

kettle lake
A bowl-shaped lake that was formed as sediment built up around a block of ice left behind by a glacier. (p. 1 69)

L

lander
A craft designed to land on a planet's surface. (p. 668)

latitude
The distance in degrees north or south from the equator. (pp. 18, 614)

lava
Molten rock that reaches a planet's surface through a volcano. (pp. 62, 263)

law
In science, a rule or principle describing a physical relationship that always works in the same way under the same conditions. The law of conservation of energy is an example.

light-year
The distance light travels in one year, which is about 9.5 trillion kilometers (6 trillion mi). (p. 7 62)

liquefaction
A process in which the shaking of ground causes loose, wet soil to act like a liquid. (p. 238)

lithosphere (LIHTH-u h-SFEER)
The layer of Earth made up of the crust and the rigid rock of the upper mantle, averaging about 40 kilometers thick and broken into tectonic plates. (p. 1 87)

lock
A section of a waterway, closed off by gates, in which the water level is rasied or lowered to move ships through. (p. 398)

loess (LOH-uhs)
Deposits of fine-grained, wind-blown sediment. (p. 162)

longitude
The distance in degrees east or west of the prime meridian.
Longitude lines are numbered from 0° to 180°. (p. 19)

longshore current
The overall direction and movement of water as waves
strike the shore at an angle. (pp. 159, 444)

longshore drift
The zigzag movement of sand along a beach, caused by the action of waves. (p. 159)

low-pressure system
A large and often stormy weather system that occurs when air moves around and into a low-pressure center, then moves up to higher altitudes. (p. 581)

luster
The property of a mineral that describes the way in which light reflects from its surface. Major types of luster are metallic and nonmetallic. (p. 52)

M

magma
Molten rock beneath Earth's surface. (p. 62)

magnetic reversal
A switch in the direction of Earth's magnetic field so that the magnetic north pole becomes the magnetic south pole and the magnetic south pole becomes the magnetic north pole. (p. 200)

main sequence
The stage in which stars produce energy through the fusion of hydrogen into helium. (p. 766)

mantle
The layer of rock between Earth's outer core and crust, in which most rock is hot enough to flow in convection currents; Earth's thickest layer. (p. 187)

map legend
A chart that explains the meaning of each symbol used on a map; also called a key. (p. 1 7)

map scale
The comparison of distance on a map with actual distanceon what the map represents, such as Earth's surface. Map scale may be expressed as a ratio, a bar scale, or equivalent units. (p. 17)

mare (MAH-ray)
A large, dark plain of solidified lava on the Moon. The plural form of mare is maria (MAH -ree-u h). (p. 693)

marine climate
A climate influenced by a nearby ocean, with generally mild temperatures and steady precipitation. (p. 616)

mass
A measure of how much matter an object is made of.

mass wasting
The downhill movement of loose rock or soil. (p. 1 47)

matter
Anything that has mass and volume. Matter exists ordinarily as a solid, a liquid, or a gas. (p. xxxiii)

mechanical weathering
The breakdown of rock into smaller pieces of the same material without any change in its composition. (p. 116)

metamorphic rock (MEHT-u h-MAWR-fi hk)
Rock formed as heat or pressure causes existing rock to change in structure, texture, or mineral composition. (p. 78)

metamorphism (MEHT-Uh-MAWR-FIHZ- u h m)
The process by which a rock's structure or mineral composition is changed by pressure or heat. (p. 96)

meteor
A brief streak of light produced by a small particle entering Earth's atmosphere at a high speed. (p. 745)

meteorite
A small object from outer space that passes through Earth's atmosphere and reaches the surface. (p. 745)

meteorologist (MEE-tee-uh-RAH L -u h-j i hst)
A scientist who studies weather. (p. 594)

microclimate
The climate of a smaller area within a subclimate. (p. 624)

mid-ocean ridge
A long line of sea-floor mountains where new ocean crust is formed by volcanic activity along a divergent boundary. (p. 1 92)

mineral
A substance that forms in nature, is a solid, has a definite chemical makeup, and has a crystal structure. (p. 43)

molecule
A group of atoms that are held together by covalent bonds so that they move as a single unit.

monsoon
A wind that changes direction with the seasons. (p. 550)

moraine (m u h - RAYN)
A deposit of till left behind by a retreating glacier. Moraines can form along a glacier's sides and at its end. (p. 168)

N

natural resource
Any type of matter or energy from Earth's environment that humans use to meet their needs. (p. 323)

neap tide
A tide of small range occurring during the first- and third-quarter phases of the Moon. (p. 451)

nebula (NEHB-yuh-luh)
A cloud of gas and dust in space. Stars form in nebulae. (p. 765)

neutron star
A dense core that may be left behind after a higher-mass star explodes in a supernova. (p. 766)

nonpoint-source pollution
Pollution with a source that is hard to find or scattered. (p. 408)

nonrenewable resource
A resource that exists in a fixed amount or is used up more quickly than it can be replaced in nature. (p. 324)

nuclear fission (FI H S H - u h n)
The process of splitting the nuclei of radioactive atoms, which releases huge amounts of energy mainly in the form of radiation and heat energy. (p. 337)

ocean current
A mass of moving ocean water. (pp. 436, 617)

oceanic-continental subduction
A boundary along which a plate carrying oceanic crust sinks beneath a plate with continental crust. (p. 209)

oceanic-oceanic subduction
A boundary along whicn a plate carrying oceanic crust sinks beneath another plate with oceanic crust. (p. 208)

orbit
n. The path of an object in space as it moves around another object due to gravity; for example, the Moon moves in an orbit around Earth. (p. 650)
v. To revolve around, or move in an orbit; for example, the Moon orbits Earth.

ore
A rock that contains enough of a valuable mineral to be mined for a profit. (p. 64)

original remains
A fossil that is the actual body or body parts of an organism. (p. 288)

outer core
A layer of molten metal, mainly nickel and iron, that surrounds Earth's inner core. (p. 186)

overfishing
The catching of fish at a faster rate than they can reproduce. (p. 483)

ozone
A gas molecule that consists of three oxygen atoms. (p. 519)

P

Pangaea (pa n-JEE-u h)
A hypothetical supercontinent that included all o f the landmasses on Earth. It began breaking apart about 200 million years ago. (p. 192)

parallax
The apparent shift in the position of an object when viewed from different locations. (p. 763)

particulates
Tiny particles or droplets, such as dust, dirt, and pollen, that are mixed in with air. (p. 524)

penumbra
A region of lighter shadow that may surround an umbra; for example, the spreading cone of lighter shadow cast by a space object. (p. 703)

permeable
Allowing the passage of water. (p. 376)

phytoplankton (fy-toh-PLANGK-tu h n)
Microscopic floating organisms that live in water and, like plants, convert sunlight and carbon dioxide into food. (p. 478)

planet
A spherical body, larger than a comet or asteroid, that orbits the Sun, or a similar body that orbits a different star.

point-source pollution
Pollution that enters water from a known source. (p. 406)

precipitation
Any type of liquid or solid water that falls to Earth's surface, such as rain, snow, or hail. (pp. 365, 553)

prime meridian
An imaginary north-south line that divides the planet into the Eastern Hemisphere and the Western Hemisphere. The prime meridian passes through Greenwich, England. (p. 19)

probe
A spacecraft that is sent into a planet's atmosphere or onto a solid surface. (p. 669)

projection
A representation of Earth's curved surface on a flat map. (p. 20)

pyroclastic flow (PY-roh-KLAS-ti h k)
A dense cloud of superheated gases and rock fragments that moves quickly downhill from an erupting volcano. (p. 264)

Q

quasar
The very bright center of a distant galaxy. (p. 773)

R

radiation (RAY-dee-AY-sh u h n) Energy that travels across distances as certain types of waves. (p. 5 13)

rain shadow
An area on the downwind side of a mountain that gets less precipitation than the side that faces the wind. (p. 625)

recrystallization
The process by which bonds between atoms in minerals break and re-form in new ways during metamorphism. (p. 97)

recycling
The reusing of materials that people would otherwise throw away, such as paper, glass, plastics, and certain metals. (p. 334)

relative age
The age of an event or object in relation to other events or objects. (p. 295)

relative humidity
The comparison of the amount of water vapor in air with the maximum amount of water vapor that can be present in air at that temperature. (p. 554)

relief
In geology, the difference in elevation between an area's high and low points. (p. 25)

relief map
A map that shows the differences in elevation in an area. Relief maps can show elevations through the use of contour lines, shading, colors, and, in some cases, three dimensional materials. (p. 16)

remote sensing
A method of using scientific equipment to gather information about something from a distance. Most remotesensing methods make use of different types of electromagnetic
radiation. (p. 30)

renewable resource
A natural resource that can be replaced in nature at about the same rate as it is used. (p. 324)

revolution
The motion of one body around another, such as Earth in its orbit around the Sun; the time it takes an object to go around once. (p. 685)

rift valley
A deep valley formed as tectonic plates move apart, such as along a mid-ocean ridge. (p. 199)

ring
In astronomy, a wide, flat zone of small particles that orbit around a planet's equator. (p. 737)

rip current
A narrow stream of water that breaks through sandbars and drains rapidly back into deeper water. (p. 444)

rock
A naturally formed solid that is usually made up of one or more types of minerals. (p. 75)

rock cycle
The set of natural, repeating processes that form, change, break down, and re-form rocks. (p. 78)

salinity (su h -LI H N- i h -tee)
The measure of the amount of dissolved salt contained in water. (p. 428)

salt water
Water that contains dissolved salts and other minerals. Oceans consist of salt water. (p. 363)

sandbar
A ridge of sand built up by the action of waves and currents. (p. 160)

satellite
An object that orbits a more massive object. (p. 663)

saturation
A condition of the atmosphere in which the rates of evaporation and condensation are equal. (p. 554)

season
One part of a pattern of temperature changes and other weather trends over the course of a year. Astronomical seasons are defined and caused by the position of Earth's axis relative to the direction of sunlight. (pp. 618, 686)

sediment
Solid materials such as rock fragments, plant and animal remains, or minerals that are carried by water or by air and that settle on the bottom of a body of water or on the ground. (p. 89)

sedimentary rock (sEHD-u h-ME H N-tu h-ree)
Rock formed as pieces of older rocks and other loose materials get pressed or cemented together or as dissolved minerals re-form and build up in layers. (p. 78)

seismic wave (SYZ-m i hk)
The vibrations caused by an earthquake. (p. 227)

seismograph (SYZ - m u h-GRAF)
An instrument that constantly records ground movements. (p. 232)

sensor
A mechanical or electronic device that receives and responds to a signal, such as light. (p. 31)

septic system
A small sewage system, often for one home or business,
that uses an underground tank to treat wastewater. (p. 406)

sewage system
A system that collects and treats wastewater from a city or a town. (p. 405)

sinkhole
An open basin that forms when the roof of a cavern becomes so thin that it falls in. (p. 155)

sleet
Small pellets of ice that form when rain passes through a layer of cold air and freezes before hitting the ground. (p. 564)

slope
A measure of how steep a landform is. Slope is calculated as the change in elevation divided by the distance covered. (p. 25)

smog
The combination of smoke and fog; a type of air pollution that occurs when sunlight causes unburnt fuels, fumes, and other gases to react chemically, often seen asa brownish haze. (p. 524)

soil horizon
A soil layer with physical and chemical properties that differ from those of soil layers above or below it. (p. 124)

soil profile
The soil horizons in a specific location; a cross section of soil layers that displays all soil horizons. (p. 124)

solar cell
A device that converts the energy of sunlight into electrical energy. (p. 341)

solar system
The Sun and its family of orbiting planets, moons, and other objects. (p. 650)

solar wind
A stream of electrically charged particles that flows out in all directions from the Sun's corona. (p. 759)

solstice (SAH L-sti hs)
In an orbit, a position and time during which one hemisphere gets its maximum area of sunlight, while the other hemisphere gets its minimum amount; the time of year when days are either longest or shortest, and the angle of sunlight reaches its maximum or minimum. (p. 686)

sonar (S0-NAHR)
A system that uses underwater sound waves to measure distance and locate objects. (p. 434)

space station
A satellite in which people can live and work for long periods. (p. 664)

spectrum (SPE HK-tru h m)
Radiation from a source separated into a range of wavelengths. 2. The range of colors that appears in abeam of visible light when it passes through a prism. See also electromagnetic radiation. (p. 656)

spring
A flow of water from the ground at a place where the surface of the land dips below the water table. (p. 380)

spring tide
A tide of large range occurring during the new and full moons, resulting in an extra-high tidal bulge and an extra-low tidal dip. (p. 451)

storm surge
A rapid rise in water level in a coastal area that occurs when a hurricane pushes a huge mass of ocean water, often leading to flooding and widespread destruction. (p. 585)

streak
The color of a mineral powder left behind when a mineral is scraped across a surface; a method for classifying minerals. (p. 51)

stress
The force applied by an object pressing on, pulling on,
or pushing against another object. (p. 221)

subduction
The process by which an oceanic tectonic plate sinks under another plate into Earth's mantle. (p. 206)

sunspot
A darker spot on the photosphere of the Sun. A sunspot appears dark because it is cooler than the surrounding area. (p. 758)

system
A group of objects or phenomena that interact. A system can be as simple as a rope, a pulley, and a mass. It also can be as complex as the interaction of energy and matter in the four parts of the Earth system.

T

technology
The use of scientific knowledge to solve problems or engineer new products, tools, or processes.

tectonic plate (te h k-TA H N- i h k)
One of the large, moving pieces into which Earth's lithosphere is broken and which commonly carries both oceanic and continental crust. (p. 189)

tectonics (teh k-TA H N-ih ks)
The processes in which the motion of hot material under a crust changes the crust of a space body. Earth has a specific type of tectonics called plate tectonics. (p. 726)

telescope
A device that gather visible light or another form of electromagnetic radiation. (p. 657)

terrestrial planet
Earth or a planet similar to Earth that has a rocky surface. The four planets in the inner solar system-Mercury, Venus, Earth, and Mars-are terrestrial planets. (p. 725)

theory
In science, a set of widely accepted explanations of observations and phenomena. A theory is a well-tested explanation that is consistent with all available evidence.

theory of plate tectonics
A theory stating that Earth's lithosphere is broken into huge plates that move and change in size over time.

thunder
The sound wave created by intensely heated air around a lightning bolt. (p. 588)

thunderstorm
A storm with lightning and thunder. (p. 588)

tidal range
The difference in height between high tide and low tide. (p. 450)

tide
The periodic rising and falling of the water level of the ocean due to the gravitational pulls of the Moon and the Sun. (p. 448)

till
Sediment of different sizes left directly on the ground by a melting, or retreating, glacier. (p. 168)

topography
All natural and human-made surface features of a particular area. (p. 24)

tornado
A violently rotating column of air stretching from a cloud to the ground. (p. 591)

transform boundary
A boundary along which two tectonic plates scrape past each other, and crust is neither formed nor destroyed. (p. 198)

tropical storm (T RA H P-ih-ku h l)
A low-pressure system that starts in the tropics with winds of at least 65 kilometers per hour (40 mi/h) but less than 120 kilometers per hour (74 mi/h). (p. 583)

tsunami (tsu-NA H -m ee)
A water wave caused by an earthquake, volcanic eruption, or landslide. (p. 238)

turnover
The yearly rising and sinking of cold and warm water layers in a lake. (p. 371)

ultraviolet radiation
(UHL -tru h-VY-u h-liht RAY-dee-AY-sh u h n)
Radiation o f higher frequencies than visible light, which can cause sunburn and other types of damage. (p. 519)

umbra
The dark, central region of a shadow, such as the cone of complete shadow cast by an object. (p. 703)

uniformitarianism
(Yoo- n u h -fawr- m i h -TAI R-ee-u h - n i hz-u h m)
A theory stating that processes shaping Earth today, such as erosion and deposition, also shaped Earth in the past, and that these processes cause large changes over geologic time. (p. 304)

universe
Space and all the matter and energy in it. (p. 650)

upwelling
The vertical movement of deep water up to the surface. (p. 438)

urban heat island
The warmer body of air over a city. (p. 624)

V

variable
Any factor that can change in a controlled experiment, observation, or model. (p. R30)

volcanism
The process of molten material moving from a space body's hot interior onto its surface. (p. 726)

volcano
An opening in the crust through which molten rock, rock fragments, and hot gases erupt; a mountain built up from erupted materials. (p. 262)

volume
An amount of three-dimensional space, often used to describe the space that an object takes up.

W, X, Y, Z

water cycle
The continuous movement of water on Earth, through its atmosphere, and in the living things on Earth. (p. 364)

water table
The highest part in the ground that is saturated, or completely filled with water. (p. 377)

wavelength
The distance between one peak and the next peak on a wave. (p. 656)

weather
The condition of Earth's atmosphere at a particular time and place. (p. 543)

weathering
The process by which natural forces break down rocks.
(p. 115)

wetland
A wet, swampy area that is often flooded with water. (p. 468)

wind
The horizontal movement of air caused by differences in air pressure. (p. 543)