absolute zero: [pg 227] 0 K (see Kelvin) temperature at which no heat can be transferred from matter absolute zero; substances possess no thermal energy, equal to -273.15°C, or -459.67°F.

acceleration: [pgs 215, 217] measures the rate of change in velocity

acid: [pg 181, 230] any of a large class of sour-tasting substances whose aqueous solutions are capable of turning blue litmus indicators red, of reacting with and dissolving certain metals to form salts, and of reacting with bases or alkalis to form salts

acid rain: [pgs 124, 150] formed when pollutants such as sulfur and nitrogen oxides, often from industrial emissions, combine with water in the atmosphere

Action/Reaction: [pg 217] Newton's third law of motion, states for every action, there is an equal and opposite reaction

actual mechanical advantage: [pg 220] benefit realized by using a machine; the measured amount that a machine multiplies force; includes the force of friction

adaptation: [pg 84] a change that helps an organism better fit the environment

aerate: [pg 153] to expose to the circulation of air for purification

air: [pg 120] a mixture with varying amounts of moisture and particulate matter, enveloping Earth; the atmosphere

air current: [pg 163] stream of air having similar air mass characteristics (see Jet Stream)

air mass: [pg 165] a large body of air that has the same characteristics of moisture and temperature as the surface over which it formed; examples, continental: forms over land; maritime: forms over water; polar: forms over higher latitudes; tropical: forms over lower latitudes

air pressure: [pg 165] pressure exerted by Earth's atmosphere

algae: [pg 109] any of various chiefly aquatic organisms, ranging in size from single-celled forms to the giant kelp

alloy: [pg 175] homogeneous (similar) mixture or solid solution of two or more metals

altitude: [pgs 163, 240] distance above Earth's surface.

alveoli: [pg 59] tiny sacs in the lungs where gases are exchanged

anaphase: [pg 72] stage of mitosis and meiosis in which the chromosomes move to opposite ends of the nuclear spindle

Aristotle: [pg 82] 384-322 B.C. Greek philosopher, author of works on logic, metaphysics, ethics, natural sciences, politics, and poetics, he profoundly influenced Western thought

antibodies: [pg 65] substances produced by the body to fight disease

arteries: [pg 60] a branching system of muscular, elastic tubes that carry blood away from the heart to the cells, tissues, and organs of the body

asexual reproduction: [pgs 71, 91] form of reproduction requiring only one parent

asteroids: [pg 137] small planet-like bodies formed in the universe; not big enough to become a planet

astrolabe: [pg 240] an instrument, now replaced by the sextant, that can be used to determine the altitude of the Sun or other celestial bodies

atmosphere: [pg 145] layers of gases that surround the Earth
atom: [pgs 154, 182] smallest particle of an element that still has the properties of the element

atomic mass unit: [pg 182] (a.m.u.s) the mass of an electron

atomic number: [pg 183] number of protons in an element

attraction: [pg 219] unlike charges and unlike poles move toward one another

Autumnal Equinox: [pg 134] marks the beginning of fall, about September 23; point at which the Sun passes the celestial equator (on its way south) causing equal amounts of daylight and darkness; see vernal equinox

axis: [pg 29] imaginary line, extending from the north pole to the south pole, through the center of the Earth about which Earth rotates

bacteria: [pg 65] microorganisms lacking a nucleus; many cause disease in plants and animals; examples, bacillus (rod shaped), coccus (spherical), and spirillum (spiral)

banding: [pg 156] strip or stripe that contrasts with something else in color, texture, or material

bar graph: [pgs 28, 35] visual representation of a relationship between two factors; used when the relationship is not continuous

base: [pg 70, 181, 230] any of a large class of compounds, having a bitter taste, a slippery solution, the ability to turn litmus blue, and the ability to react with acids to form salts

Bichat, Marie Francois Xavier: [pg 53] 1771-1802
French anatomist who pioneered the histological study of organs

Big Bang Theory: [pg 137] a theory holding that the universe originated approximately 20 billion years ago from the violent explosion of a very small agglomeration of matter of extremely high density and temperature

biomass: [pg 196] total mass of living matter within a given unit of environmental area, including plant material, vegetation, or agricultural waste used as a fuel or energy source

binomial nomenclature: [pg 56] scientific naming of species whereby each species receives a Latin or Latinized name of two parts, the first indicating the genus and the second being the specific epithet

biome: [pg 163] major regional or global biotic community, such as a grassland or desert, characterized chiefly by the dominant forms of plant life and the prevailing climate

blending: [pg 75] when the affects of two different genes for the same trait are both expressed

blizzards: [pg 168] storms with high winds and frozen precipitation; form in the upper atmosphere

blood: [pg 61] liquid tissue in the circulatory system

boiling point: [pg 175] the temperature at which matter changes phase from a liquid to a gas

brain: [pg 64] primary center for the regulation and control of bodily activities, receiving and interpreting sensory impulses, and transmitting information to the muscles and body organs

budding: [pg 91] type of asexual reproduction; unicelled organism splits in half with an equal division of genetic material, unequal division of cell material

buoyancy: [pg 178] upward force of a fluid

butte: [pg 151] hill that rises abruptly from the surrounding area and has sloping sides and a flat top

Calorie: [pg 104] (with a capital “C”) a kilocalorie; unit used to measure the energy in foods

calorie: [pgs 104, 198] (with a small “c”) amount of heat energy needed to raise the temperature of one gram of water by one degree Celsius

cancer: [pg 93] disease that results in abnormal cell division

capillary: [pg 60] small blood vessel where exchange of materials between blood and cells occurs

carbohydrates: [pgs 103, 104] substances used for quick energy; examples; cereal, bread
carbon dioxide: [pgs 110, 146, 149] waste gas released by plants and animals during respiration; used by plants during photosynthesis

carbon dioxide / oxygen cycle: [pg 110] recycling of carbon dioxide and oxygen on our planet

cardiac muscle: [pg 63] specialized striated muscle tissue of the heart; the myocardium

carotid artery: [pg 61] either of the two major arteries, one on each side of the neck, that carry blood to the head

carnivore: [pg 101] animal that gets its energy by eating other animals

categories: [pg 233] a specifically defined division in a system of classification

cast: [pg 155] a type of fossil where sediment falls into an imprint

cavern: [pg 149] large underground chamber, as in a cave

checklist: [pg 10] a list of items to be noted, checked, or remembered

Celsius: [pgs 227, 229] metric temperature scale; 0°C = freezing and 100°C = boiling point of water

cells: [pg 50] basic unit of structure for most living things; performs all physiological activities

cell membrane: [pg 51] surrounds the cell and controls what leaves and enters; also called plasma membrane

cell theory: [pg 50] well founded idea that all living things are composed of cells; all cells come from cells

cell wall: [pg 51] rigid structure composed of cellulose that surrounds, protects, and supports some types of cells, such as plant cells

centrifuge: [pg 180] an apparatus consisting of a compartment spun about a central axis to separate materials of different specific gravities, or to separate particles suspended in a liquid

cellular bond: [pg 184] forces or mechanisms, especially the ionic bond, covalent bond, and metallic bond, by which atoms or ions are bound in a molecule or crystal

chemical change: [pg 180] a change in matter where both physical and chemical properties are changed

chemical energy: [pg 193] stored energy found in all compounds; associated with chemical bonds

chemical equation: [pg 181] expression summarizing a chemical reaction

chemical properties: [pg 180] way a mineral changes, reacts, or behaves

chemical weathering: [pg 149] breakdown of rock by changing its chemical composition (make up)

chlorofluorocarbons (CFCs): [pg 125, 147] any of various halocarbon compounds consisting of carbon, hydrogen, chlorine, and fluorine, once used widely as aerosol propellants and refrigerants. Chlorofluorocarbons are believed to cause depletion of the atmospheric ozone layer

chlorophyll: [pgs 101, 109] protein molecule used during the process of photosynthesis to help convert light energy into chemical energy

chop: [pg 180] cut into small pieces

chloroplasts: [pgs 51, 54] cell structures (organelles) that contain chlorophyll, location of photosynthesis

chromosomes: [pg 51] usually found in the nucleus of a cell, contain genetic information; composed of DNA, the chemical that directs heredity

chromatography paper: [pg 180] filter paper that separates mixtures by differences in their solubility and how they adhere to the paper

circuit: [pg 230] path followed by electrons as they travel through conductors

circulatory system: [pgs 55, 60, 62] group of organs that includes heart, arteries, veins, lymph vessels, capillaries of body, and blood and lymph

cirrus clouds: [pg 166] high-altitude cloud composed of narrow bands or patches of thin, generally white, fleecy parts

class: [pg 56] a taxonomic category ranking below a phylum or division and above an order
classification:  [pg 233] organizing things based on characteristics

cleavage:  [pg 155] tendency of a mineral to break along regular surfaces in one or more specific directions

climate:  [pgs 120, 162] average weather conditions over a large geographic area that extends over a long period of time

climax community:  [pg 123] a relatively stable group of populations that usually occurs at the end of ecological succession

circuit:  [pg 203] a closed path followed or capable of being followed by an electric current

cloning:  [pg 92] asexual reproduction; usually associated with creating a new organism from cells of another

coal deposits:  [pg 196] fossil fuel formed from ancient fern forests

coefficient:  [pg 181] numerical measure of a physical or chemical property

cold front:  [pg 166] forms when a cold air mass of air meets a warm air mass

collision theory:  [pg 184] idea that atoms must collide in order to react

color:  [pg 175] appearance of objects or light sources described in terms of the individual's perception of them, involving hue, lightness, and saturation for objects and hue, brightness, and saturation for light sources

comets:  [pg 137] celestial objects, rock, ice, dust, and gas, with a very elliptical orbit around the Sun

compaction:  [pg 155] method of formation of sedimentary rocks

complete metamorphosis:  [pg 95] a life cycle that contains four distinct stages; egg, larva, pupa, and adult

community:  [pg 120] all of the populations of living things interacting in a given area

complex machine:  [pg 221] made up of more than one simple machine

compound:  [pg 184] two or more elements chemically combined

compound microscope:  [pg 235] a microscope consisting of an objective and an eyepiece at opposite ends of an adjustable tube

compressional wave:  [pg 201] (also longitudinal) travels parallel to its direction of motion; example, sound waves

concentrated solution:  [pg 176] much solute dissolved in a solvent (see saturated solution)

conclusion:  [pg 14] a judgment or decision reached after deliberation

condensation:  [pgs 110, 185] phase change by which matter changes from a gas to a liquid

conduction:  [pg 199] energy transfer by direct contact

conductivity:  [pg 177] ability of matter to conduct heat or electrical energy

conductor:  [pg 177] substance or medium that conducts heat, light, sound, or especially an electric charge

conservation:  [pg 125] the preservation or careful use of Earth's resources

constellations:  [pg 133] an arbitrary formation of stars perceived as a figure or design, especially one of 88 recognized groups named after characters from classical mythology and various common animals and objects

consumer:  [pgs 101, 113] organism that feeds on other living or dead matter

contour farming:  [pg 151] following the contour lines of uneven terrain to limit erosion of topsoil

contour lines:  [pg 240] a line on a map that joins points of equal elevation

control:  [pg 18] condition of an experiment that does not change; method of regulating a system; used to provide a comparison

convective:  [pg 199] heat energy transfer by differences in density; from high to low areas

convection cell:  [pg 199] formed by a circular motion of air due to differences in densities
convection currents: [pg 158, 159, 199] movement of one material through another by energy differences

Cook, James: [pg 104] 1728-1779. British navigator and explorer who commanded three major voyages of discovery, charting and naming many islands of the Pacific Ocean. He also sailed along the coast of North America as far north as the Bering Strait

coordinate system: [pg 138, 241] method of representing points in a space of given dimensions by coordinates

Copernicus, Nicolaus: [pg 130] 1473-1543 Polish astronomer who advanced the theory that the Earth and other planets revolve around the Sun, heliocentric view, disrupting the Ptolemaic system of astronomy

Coriolis Effect: [pg 132] observed effect of the Coriolis force, especially the deflection of an object moving above the Earth, rightward in the northern hemisphere and leftward in the southern hemisphere

Correns, Karl: [pg 75] German botanist that found that in some traits both genes of the pair for a trait can influence the trait in an individual

crater: [pg 137] bowl-shaped depression at the mouth of a volcano or geyser

Crick, Francis: [pg 70] Born 1916. British biologist who with James D. Watson proposed a spiral model, the double helix, for the molecular structure of DNA. He shared a 1962 Nobel Prize for advances in the study of genetics

crust: [pgs 147, 148] upper region of the solid part of Earth

crystallize: [pg 176] to cause to form crystals or assume a crystalline structure

cumulus clouds: [pg 166] towering thick white clouds that characterize cold fronts

current electricity: [pgs 202-203] electric charge that travels through a conductor

cytoplasm: [pg 51] watery material inside the cell.

DNA: [pg 70] (Deoxyribonucleic Acid) substance that carries the code for hereditary information

Darwin, Charles: [pg 81] 1809-1882. British naturalist who revolutionized the study of biology with his theory of evolution based on natural selection. His most famous works include Origin of Species (1859) and The Descent of Man (1871)

data: [pg 24] information from an investigation that is important to the study (singular – datum)

daughter cell: [pg 72] either of the two identical cells that form when a cell divides

decantation: [pg 180] pouring off a liquid without disturbing the sediment

deceleration: [pg 215] to decrease the velocity

decimal system: [pg 226] system of measurement in which all derived units are multiples of 10 of the fundamental units

decomposer: [pgs 101, 113] an organism that gets it energy by breaking down wastes or dead organisms

density: [pgs 164, 179] amount of matter per unit of volume

density currents: [pg 199] heat energy transfer in a fluid due to density differences

dependent variable: [pg 18] in an experiment, the factor you measure to determine the affect of independent variable (also responding variable)

deposition: [pgs 151, 153, 185] agents of weathering and erosion settle out particles they can no longer transport: phase change from a gas to solid

desert: [pg 163] dry, often sandy region of little rainfall, extreme temperatures, and sparse vegetation

deuterium: [pg 182] hydrogen with one neutron

dew point: [pg 167] temperature at which air becomes saturated and produces dew

diaphragm: [pg 57] curved sheet of muscle between the chest and the abdomen, responsible for breathing
dichotomous key: [pg 233] system using pairs of contradictory statements to identify characteristics for classification

diffraction: [pg 202] change in direction and intensity of a wave after passing by an obstacle or through an aperture

digestive system: [pg 55] group of organs that break down food so it can be absorbed and transported to the cells

dilute solution: [pg 176] small amount of a solute dissolved in a solvent (see solution)

disease: [pg 65] a breakdown in the structure or function of an organism

dissolve: [pg 180] to pass into solution

distillation: [pg 180] process of purifying a liquid by evaporation and condensation

domain: [pg 204] any of numerous contiguous regions in a ferromagnetic material in which the direction of spontaneous magnetization is uniform and different from that in neighboring regions

dominant: [pg 74] a trait that hides the affect of another

double helix: [pg 70] coiled structure of double-stranded DNA in which strands linked by hydrogen bonds form a spiral configuration

ductility: [pg 179] ability of matter to be easily molded or shaped

- E -

Earth: [pg 138] third planet from the Sun, having a sidereal period of revolution about the Sun of 365.26 days at a mean distance of approximately 149 million kilometers (92.96 million miles)

earthquake: [pgs 160, 161] violent shaking of Earth's crust due to the motion of the plates; fault

eclipse: [pg 136] partial or total blocking out of a heavenly body by another heavenly body caused by the motion of Earth and Moon as they relate to the Sun

ecological succession: [pg 123] changes in a community that occurs over a long period of time as a community reaches a state of balance

ecology: [pg 119] the study of how all living things interact with one another and with their physical environment

ecosystem: [pgs 112, 113, 121] the relationship between the community (plants and animals) and the nonliving factors with which they interact

efficiency: [pg 221] ratio of the energy delivered by a machine to the energy supplied for its operation

effort: [pgs 219-220] work put into a machine

effort distance: [pgs 220-221] measure of an object's travel using a machine

effort force (Fe): [pg 220] amount of push or pull applied to an object by a machine

egg: [pgs 66, 92] female reproductive cell with half the normal number of chromosomes found in a body cell; gamete

Einstein, Albert: [pg 198] 1879-1955. German-born American theoretical physicist whose theories showed matter and energy can be changed into one another began the nuclear age

elasticity: [pg 179] ability of matter to be stretched and return to its original shape

electrical energy: [pg 193] produced from the motion of charges in an electric field

electricity: [pgs 202-205] flow of electrons through a conductor; energy that involves the motion of charges caused by the attraction of particles with opposite charges and the repulsion of particles with the same charge

electrolyte: [pgs 177, 200] chemical compound that can produce an electrically conductive medium; conducts electricity

electromagnet: [pg 204] magnet that uses electricity to create magnetism

electromagnetic field: [pg 204] area in which electromagnetic energy acts

electromagnetic spectrum: [pg 200] summary of all of the electromagnetic forms of energy; from lower frequencies such as radio-waves, short wave, AM, FM, TV, and radar to infrared rays, visible light and ultraviolet, and finally, the shorter wavelengths of x-rays and gamma rays
electron: [pg 182] negatively charged particle in an atom that is found in the electron cloud

electron cloud: [pg 182] location of electrons in an atom

electroscope: [pg 202] device that detects static electricity

element: [pgs 154, 182] pure substance made up of only one type of atom

elliptical: [pg 135] oval; shape of all orbits

embryo: [pg 94] organism at any time before full development, birth, or hatching

endocrine system: [pg 64] group of organs working together to regulate growth, development, and reproduction; hormone control system

energy: [pg 193] ability to do work or cause a change

energy pyramid: [pg 113] movement of energy from the Sun as the original source through producers, consumers, and decomposers (see food chain)

environment: [pg 115] combination of external physical conditions that affect and influence the growth, development, and survival of organisms

epicenter: [pg 161] point above the focus of an earthquake

epidermis: [pg 54] outermost layer of cells covering the leaves and young parts of a plant

equator: [pg 241] imaginary great circle around the Earth's surface, equidistant from the poles and perpendicular to the Earth's axis of rotation

erosion: [pgs 149, 150] wearing away material from the Earth's surface by water, wind, or ice through natural processes, including weathering, dissolution, abrasion, corrosion, and transportation

esophagus: [pg 57] muscular, membranous tube for the passage of food from the pharynx to the stomach; the gullet

evaporation: [pgs 110, 152, 180, 185] phase change from a liquid to gas on the surface of a liquid

evolution: [pg 80] change in a species over time

excretory system: [pg 62] a group of organs (liver, kidney, skin, lungs) that work together to remove wastes from the body

extinct: [pg 84] something that does not exist now, but once did

extinction: [pg 84] when all members of a species die off

fahrenheit: [pgs 227, 229] English temperature scale 32° F = freezing and 212° F = boiling of water

family: [pgs 56, 183] group of elements with similar properties; found in the vertical columns of the periodic table

fats: [pg 103] substance used to store energy

fertilization: [pg 92] the joining of an egg and sperm

fertilize, as in egg: [pg 92] the union of two sex cells, usually one sperm (male) and egg (female), the union produces a zygote

fertilize, as in soil [pg 153] addition of nutrients to the earth

field map: [pg 165, 240] graphic description of the physical characteristics of a region

filtration: [pg 180] Separation of a liquid and a solid or two solids with different particle size

first cross: [pgs 75, 76] see Punnett Square method of solving genetic problems

First Law of Motion (Principle of Inertia): [pg 217] an object at rest will stay at rest while an object in motion will stay in motion unless acted upon by an outside force

first quarter: [pg 136] Moon appears as a half-moon after new crescent; right side is completely illuminated, left side is dark

fission: [pgs 91, 197] act or process of splitting into parts; nuclear reaction in which an atom splits into fragments releasing millions of electron volts of energy; asexual reproductive where one-cell organism splits in half resulting in equal division of genetic material and an equal division of cell material
flammability: [pg 179] ease of matter to be ignited and capable of burning

flexibility: [pg 179] ability of matter to bend without breaking

flux lines: [pg 204] lines of magnetic force

focus: [pg 161] location of the crack caused by an earthquake; directly below the epicenter

food: [pg 102] materials needed by an organism for maintenance, growth and repair

food chain: [pg 112] the path of energy between organisms

food web: [pg 112] path of energy between all of the organisms in a community

force: [pg 217] push or pull

fossils: [pgs 86, 155] the remains or imprints of an organism that once lived; found in rock

fossil fuels: [pg 196] a nonrenewable energy resource formed from ancient forms of life; oil, natural gas, coal

Foucault, Jean: [pg 131] 1819-1868. French physicist who performed an experiment to prove Earth rotates on its axis

frame of reference: [pg 213] point from which motion is detected

freezing: [pg 185] phase change from a liquid to solid

freezing point: [pg 175] temperature at which liquid changes to a solid; 32° F, 0° C

friction: [pgs 213, 220] force that opposes motion of two objects in contact

frost action: [pg 149] form of erosion through the expanding action of frozen water

fulcrum: [pg 221] fixed point on a level around which the bar (leverage) rotates

full Moon: [pg 136] phase when the Moon is behind Earth; entire face of the Moon is illuminated

fusion: [pg 197] nuclear reaction in which small nuclei join together releasing a lot of energy; all stars produce energy this way

gametophyte: [pg 96] gamete-producing phase in a plant characterized by alternation of generations

gamma rays: [pg 201] very high energy wave (ten thousand to ten million electron volts); part of the electromagnetic spectrum

gas: [pg 185] phase of matter in which the particles are moving the fastest and are the furthest away from one another

gene: [pg 71] the unit of genetic information that contains the code for a particular trait

genetic engineering: [pg 83] alteration of an organism's genetic material to eliminate undesirable traits or produce desirable ones

genus: [pg 56] a taxonomic category ranking below a family and above a species and generally consisting of a group of species exhibiting similar characteristics, used either alone or followed by a Latin adjective or epithet, to form the name of a species

geocentric model: [pg 130] early model of the universe in which Earth is the center of the universe

geothermal energy: [pg 196] energy from the inside of Earth

glaciers: [pg 151] a moving mass of ice formed over many years in which snowfall exceeds melting

gland: [pg 64] cell or organ that produces a secretion for use elsewhere in the body or in a body cavity or for elimination from the body

global warming: [pg 125] increase in the Earth's temperature due to pollution from the burning of fossil fuels

gradient: [pg 240] rate of ascending or descending change between values

graduated cylinder: [pg 228] device used to measure volume

gram: [pg 227] unit of mass

granite: [pg 156] common, coarse-grained, light-colored, hard igneous rock consisting chiefly of quartz, orthoclase or microcline, and mica, used in monuments and for building
great circle: [pg 241] segment of a circle representing the shortest distance between two terrestrial points

gravity: [pg 147] natural force of attraction between any two massive bodies, which is directly proportional to the product of their masses and inversely proportional to the square of the distance between them

gravitational potential energy: [pg 195] energy of position

Greenhouse Effect: [pgs 125, 146] the trapping of infrared radiation by pollution in Earth’s atmosphere

greenhouse gases: [pg 146] gases that trap solar energy

groundwater: [pgs 148, 154] water beneath the Earth's surface, often between saturated soil and rock, that supplies wells and springs

Gulf Stream: [pgs 163-164] warm ocean current that originates from the Straits of Florida and travels in a general NE direction up along the coast of Europe

- H -

Habitat: [pg 55] area or type of environment in which an organism or ecological community normally lives

Halley's Comet: [pg 137] a comet named after Edmund Halley, with a period of approximately 76 years, the first one for which a return was successfully predicted, last appeared in 1986

hardness: [pgs 155, 175] resistance of a mineral to being scratched

Harvey, Dr. William: [pg 61] 1578-1657 English physician, anatomist, and physiologist who discovered the circulation of blood in the human body (1628)

heart: [pg 60] chambered, muscular organ in vertebrates that pumps blood received from the veins into the arteries, thereby maintaining the flow of blood through the entire circulatory system

heat: [pgs 193, 198, 199] energy that moves from areas of higher temperature to lower temperature

heliocentric model: [pg 130] model of the universe in which the Sun is the center of the universe

herbivore: [pg 101] an organism that gets its energy by eating plants

high pressure: [pg 165] in weather, an area of relatively high isobaric pressure when compared to a related low pressure area, often bounded by a front

horizon: [pg 240] the apparent intersection of the Earth and sky as seen by an observer

horizontal force: [pg 219] push or pull parallel to or in the plane of the horizon

Hooke, Robert [49] 1635-1703 English physicist, inventor, and mathematician who formulated the theory of planetary movement

hormones: [pg 64] substance, usually a peptide or steroid, produced by one tissue and conveyed by the bloodstream to another to effect physiological activity, such as growth or metabolism

hurricane: [pg 168] violent large storm; form over warm oceans; many convection cells merge into huge convection cells

hybrid: [pg 75] offspring of genetically dissimilar parents or stock, especially the offspring produced by breeding plants or animals of different varieties, species, or races; containing two different genes for a trait

hydroelectric energy: [pg 196] renewable energy that uses moving water to generate electricity

hydrosphere: [pg 148] liquid portion of Earth

hypothesis: [pg 12] a tentative, testable explanation of the observed relationship between variables

- I -

ice storm: [pg 168] forms when upper atmosphere temperature is warmer than that of lower atmosphere

Ideal Mechanical Advantage: [pg 220] calculated without including the force of friction

igneous rock: [pg 156] formed from liquid rock by solidification from a molten state (magma); intrusive and extrusive
immune system: [pg 65] a group of specialized cells working together to protect the body from infectious diseases

imprint: [pg 155] to produce a mark or pattern on a surface by pressure

inclined plane: [pg 221] simple machine that forms a slanted surface

incomplete dominance: [pg 75] heterozygous condition in which both alleles at a gene locus are partially expressed, often producing an intermediate phenotype

incomplete metamorphosis: [pg 95] a life cycle that contains three distinct stages; egg, nymph, and adult

independent variable: [pg 18] factor whose affect you are testing; manipulated variable

indicator: [pg 230] chemical used to gather information about a sample of matter

inert: [pg 183] not readily reactive with other elements; forming few or no chemical compounds

infectious diseases: [pg 65] caused by a pathogenic microorganism or agent

inferring: [pg 14] conclude from evidence or premises; linking something you already know to an observation

infrared light: [pg 201] light energy that is transferred to heat energy

inner core: [pg 148] innermost zone within the Earth; iron/nickel solid

insolation: [pg 163] solar radiation striking Earth or another planet

insulator: [pg 177] matter that does not conduct heat or electricity easily

International Date Line: [pg 241] an imaginary line through the Pacific Ocean roughly corresponding to 180° longitude, to the east of which, by international agreement, the calendar date is one day earlier than to the west

interpolating: [34] estimate a value of a function or series between two known values

isobar: [pgs 165, 240] type of isoline on a weather map used to connects points of equal barometric pressure

isoline: [pgs 165, 240] lines on a map or model (such as contours, isotherms, isobars) that connect points of equal value

isotherm: [pgs 165, 240] type of isoline on a weather map that connects points of equal temperature

isotope: [pg 182] atoms of the same element with different atomic masses

-- J --

jet stream: [pg 166] large stream of air moving in the upper atmosphere from west to east

joule: [pg 226] unit of work

Joule, James Prescott: [pg 198] 1818-1889. British physicist who established the mechanical theory of heat and discovered the first law of thermodynamics, showing that heat is related to the motion of the particles in matter

Jupiter: [pg 138] fifth planet from the Sun, the largest and most massive in the solar system, having a sidereal period of revolution about the Sun of 11.86 years at a mean distance of 777 million kilometers (483 million miles), a mean diameter of approximately 138,000 kilometers (86,000 miles), and a mass approximately 318 times that of Earth

-- K --

Kelvin: [pg 227] temperature scale that begins with absolute zero; temperature at which no heat can be transferred from matter

Kepler, Johannes: [pg 135] 1571-1630 German astronomer and mathematician. Considered the founder of modern astronomy, he formulated three laws to clarify the theory that the planets revolve around the Sun

kidney: [pg 62] either one of a pair of organs in the dorsal region of the vertebrate abdominal cavity, functioning to maintain proper water and electrolyte balance, regulate acid-base concentration, and filter the blood of metabolic wastes, which are then excreted as urine

kilogram: [pg 227] (kg) metric unit of mass
kilometer: [pg 227] (km) metric unit of length equal to 1,000 meters

kinetic energy: [pg 194] energy at work or in motion

kingdom: [pg 56] largest grouping in the classification system

knowledge: [pg 9] familiarity, awareness, or understanding gained through experience or study

Lamarck, Jean Baptiste: [pg 81] 1744-1829. French naturalist whose ideas about evolution influenced Darwin's theory

land breeze: [pg 169] forms when air over land is cooler than air over water; air moves out toward the water

large intestine: [pg 57, 62] portion of the intestine that extends from the ileum to the anus, forming an arch around the convolutions of the small intestine

last quarter: [pg 136] phase of the Moon that follows the old gibbous

latitude: [pgs 138, 163, 241] imaginary east-west parallel lines circling the Earth north and south of the equator; 0° parallel is the equator; used with meridians of longitude to locate places on the Earth

lava: [pg 156] rock formed by the cooling and solidifying of molten rock

lava plateau: [pg 161] build up of molten volcanic material in the formation of mountains

law: [pgs 15, 50] an idea or concept that is so well founded that it is almost equal to a fact

Law of Charges: [pg 203] like charges repel and unlike charges attract

Law of Conservation of Energy: [pgs 194, 204] energy cannot be created or destroyed just changed to other forms of energy

Law of Conservation of Mass: [pg 181] matter cannot be created or destroyed

Law of Universal Gravitation: [pg 135, 218] Newton's law determined that the strength of the gravitational force is dependent on the amount of mass, and on the square of the distance between the masses

Law of Poles: [pg 203] like poles repel and unlike poles attract

leaves: [pg 54] plant organ where photosynthesis occurs

lever: [pg 221] bar that is free to rotate around a fixed point called the fulcrum

light: [pg 120] visible form of the electromagnetic spectrum which provides energy for food and oxygen production by photosynthesis

lightning: [pg 168] abrupt, natural electric discharge in the atmosphere and accompanying visible flash of light

limiting factor: [pg 122] variables that affect how large a population can grow

Lind, James: [pg 104] Scottish physician known for his work in the prevention of scurvy by using citrus fruit

line graph: [pgs 28-34] visual representation of a relationship between two factors; used when the relationship is continuous

Linnaeus, Carolus: [pg 56] 1707-1778 Swedish botanist and founder of the modern classification system for plants and animals

liquid: [pg 185] phase of matter in which the particles are free to move over, under and around one another; the particles are further apart than in a solid

liter: [pg 227] basic unit of volume

lithosphere: [pg 147] solid portion of Earth

load: [pg 203] a device or the resistance of a device to which power is delivered

locomotion system: [pg 63] a group of organs working together to allow an organism to move

lodestone: [pg 203] rock that forms a natural magnet; magnetite
longitude: [pgs 138, 241] imaginary north-south lines circling the Earth east and west of the Prime Meridian in London, England; 0° longitude is the Prime Meridian - 180° longitude is International Date Line where a day begins; used with parallels of latitude to locate places on Earth

longitudinal wave: [pg 201] travels parallel to its direction of motion; example, sound waves

low pressure: [pg 165] in weather, an area of relatively low isobaric pressure when compared to a related high pressure area, often bordered by a front

lunar month: [pg 135] The average time between successive new or full moons, equal to 29 days 12 hours 44 minutes

lunar eclipse: [pg 136] occurs when Earth is between the Moon and Sun; Earth's shadow darkens the Moon; can last for more than an hour

lung: [pg 59, 62] two spongy, sac-like respiratory organs, occupying the chest cavity together with the heart and functioning to remove carbon dioxide from the blood and provide it with oxygen

luster: [pgs 155, 175] how a mineral reflects light from its surface; ability to shine

lymph: [pg 60] clear, watery fluid derived from body tissues that contains white blood cells associated with the body's defense from diseases

lysosome: [pg 51] an organelle in the cytoplasm that contains enzymes that break down protein

magnetic field: [pg 204] the region around a magnet or an electric current where electromagnetic energy acts

magnetism: [pgs 203, 204] force exerted by creating fields of attraction and repulsion

malleability: [pg 179] ability of matter to be changed in shape; (example, hammered into sheets)

Malpighi, Marcello: [pg 61] 1628-1694 Italian anatomist who was the first to use a microscope in the study of anatomy and discovered the capillary system

manipulated variable: [pg 18] factor whose affect is being tested; independent variable

mantle: [pg 147] layer of the Earth between the crust and the core

Mars: [pg 138] fourth planet from the Sun, having a sidereal period of revolution about the Sun of 687 days at a mean distance of 227.8 million kilometers (141.6 million miles) and a mean diameter of approximately 6,726 kilometers (4,180 miles)

mass: [pgs 19, 175, 217] the measure of the quantity of matter that a body or an object contains

mathematics: [pg 231] study of the measurement, properties, and relationships of quantities, using numbers and symbols

matter: [pgs 175, 193] anything that has mass and occupies space

mean: [pg 232] average of all scores

meander: [pg 152] follow a winding and turning course

measurement: [pg 10, 226] the dimension, quantity, or capacity determined by measuring

mechanical advantage: [pg 220] number of times a machine multiplies the effort force benefit realized by using a machine

mechanical energy: [pg 183] associated with the motion of matter; potential or kinetic energy

median: [pg 232] half-way between the highest and lowest score
meiotic cell division: [pg 93] cell division where each new cell receives one-half of a complete set of chromosomes; occurs only in gonads and produces sex cells (gametes).

melting: [pg 185] phase change from a solid to a liquid.

Mendeleev, Dmitri: [pg 183] 1834-190. Russian chemist who first devised and published the periodic table of the elements (1869).

meniscus: [pg 228] curve on liquid surface in a graduated cylinder; point from which volume is measured.

Mendel, Gregor: [pg 74] 1822-1884. Austrian botanist and founder of the science of genetics. Through years of experiments with plants, chiefly garden peas, he discovered the principle of the inheritance of characteristics through the combination of genes from parent cells.

Mercalli Scale: [pg 161] assigns a numerical value to the damage associated with an earthquake.

Mercury: [pg 138] smallest of the planets and the one nearest the Sun, having a sidereal period of revolution about the Sun of 88.0 days at a mean distance of 58.3 million kilometers (36.2 million miles) and a mean radius of approximately 2,414 kilometers (1,500 miles).

meridian: [pg 138] imaginary great circle on the Earth's surface passing through the north and south geographic poles.

mesa: [pg 151] broad, flat-topped elevation with one or more cliff-like sides, common in the southwest United States.

metabolism: [pgs 54, 200] the sum of all the chemical reactions in an organism.

metalloid: [pg 184] element with both metal and nonmetal properties.

metamorphic rock: [pg 156] formed from exposure to extreme pressure and temperature.

metaphase: [pg 72] stage of mitosis and meiosis, following prophase and preceding anaphase, during which the chromosomes are aligned along the metaphase plate.

meteor: [pg 137] rock fragments formed from the beginning of the universe.

meteor shower: [pg 137] light show that forms from the friction of meteors moving through Earth's atmosphere.

meteorologist: [pg 165] one who reports and forecasts weather conditions, as on television.

meter: [pg 227] (m) metric standard for line measure; unit of distance.

methane: [pg 146] odorless, colorless, flammable gas, CH₄, the major constituent of natural gas, that is used as a fuel and is an important source of hydrogen and a wide variety of organic compounds.

metric system: [pg 226] decimal system of units based on the meter as a unit length, the kilogram as a unit mass, and the second as a unit time.

microgravity: [pg 219] not experiencing the effects of gravity; free fall.

microscope: [pgs 49, 235] devise used to examine objects too small to be observed well with the unaided eye.

Mid-Atlantic Ridge: [pg 160] a series of mountain ranges on the ocean floor, more than 84,000 kilometers (52,000 miles) in length, extending through the North and South Atlantic, the Indian Ocean, and the South Pacific. According to the plate tectonics theory, volcanic rock is added to the sea floor as the mid-ocean ridge spreads apart.

Milky Way Galaxy: [130] galaxy containing the solar system, visible as a broad band of faint light in the night sky.

mineral: [pgs 103, 154] pure substance made up of only one type of matter.

mitochondria: [pg 51] organelle that is the center for cellular respiration.

mitotic cell division: [pg 93] cell division where both new cells receive a complete set of chromosomes identical to that of the parent cell.

mixture: [pg 180] two or more substances physically combined; both keep their own characteristics.

mode: [pg 232] average that identifies the most frequently occurring score.
model: [pg 13] representation of an idea made to better understand the idea

Moh Scale: [pg 155] a scale used to determine the relative hardness of a mineral

Mohorovicic (mo-ro-vi-chich), Andrijia: [pg 148] associated with earthquake study, found way to determine the depth of the crust using seismic waves

molecule: [pgs 65, 184] smallest particle into which an element or a compound can be divided without changing its chemical and physical properties; a group of like or different atoms held together by chemical forces

momentum: [pg 214] measure of the motion of a body equal to the product of its mass and velocity

Moon: [pg 135] natural satellite of Earth

Mosely, Henry: [pg 183] 1887-1915. British physicist who organized the modern day periodic table, after his discovery that an atomic number of an element can be deduced from the element's x-ray spectrum

motion: [pg 213] change in an object's location in space over a period of time

mountain building: [pg 159] result of collision of continental plates

mouth: [pg 57] body opening through which an animal takes in food

multicellular: [pg 52] organism consisting of many cells

mutation: [pg 83] a change in the structure of the DNA of an organism

natural barriers: [pg 163] Earth's physical features that act as limiting agents in weather, weathering, and migrations

natural gas: [pg 196] fossil fuel; usually found in association with petroleum because it is formed in the same way

natural selection: [pg 81] Darwin's theory on the basis for evolution; only organisms that best fit their environment will survive

natural satellite: [pg 135, 138] a celestial body that orbits a planet; a moon

natural variation: [pgs 23, 24] differences due to chance

nerves: [pg 64] cord-like bundles of fibers made up of neurons through which sensory stimuli and motor impulses pass between the brain or other parts of the central nervous system and the eyes, glands, muscles, and other parts of the body

nervous system: [pgs 63, 64] a group of organs working together to control and coordinate the body's responses to changes in its environment; brain, spinal cord, nerves

neurons: [pg 64] impulse-conducting cells that constitute the brain, spinal column, and nerves, consisting of a nucleated cell body with one or more dendrites and a single axon

neutralization: [pg 230] a reaction between an acid and a base that yields a salt and water

neutron: [pg 182] neutral particle found in the nucleus of an atom

new crescent: [pg 136] Moon phase that follows when the Moon is between the Sun and Earth; only the back side of the Moon is illuminated (side not visible to a viewer on Earth)

new gibbous: [pg 136] Moon phase following first quarter; appears that part of the full Moon is missing.

new Moon: [pg 136] Moon is between the Sun and Earth; only the back side of the Moon is illuminated (the side not visible to a viewer on Earth)

newton: [pg 227] (N) basic metric unit of force (weight)

Newton, Sir Isaac: [pgs 15, 217] 1642-1727. English mathematician and scientist who developed the Laws of Motion and the Law of Universal Gravitation; his treatise on gravitation was supposedly inspired by the sight of a falling apple

nitrogen cycle: [pg 111] flow of nitrogen between the living and non-living environment

nitrogen oxide: [pg 146] product of combustion of fossil fuels; greenhouse gas
noble gases: [pg 181] any of the elements in Group O of the periodic table, which are chemically inert; including helium, neon, argon, krypton, xenon, and radon

Any of the elements in Group O of the periodic table, including helium, neon, argon, krypton, xenon, and radon, which are monatomic and with limited exceptions chemically inert.

nonrenewable energy resource: [pg 196] a fixed amount of resource on our planet that takes millions of years for nature to reproduce

North Atlantic Drift: [pg 164] (see Gulf Stream)

north pole: [pg 133] northern end of Earth’s axis of rotation, a point in the Arctic Ocean

nuclear energy: [pgs 193, 197] energy found in the nucleus of an atom

Nuclear Age: [pg 198] the atomic age

nucleus: [pgs 51, 182] information center for the cell; contains the chromosomes, central part of an atom

oblative sphere: [pg 134] shape of Earth; almost perfectly round but bulges at the equator

observing: [pg 235] using one or more senses to examine something carefully

obsidian: [pg 157] usually black or banded, hard volcanic glass that displays shiny, curved surfaces when fractured and is formed by rapid cooling of lava

occluded front: [pg 166] fast moving cold front overtakes a warm front, lifting it quickly

ocean currents: [pg 151, 163] (see Gulf Stream)

ocean ridges: [pg 160] underwater mountains (see Mid-Atlantic Ridge)

ocean trench: [pg 159] deep furrow or ditch cause by collision of plates when denser one slides under another

Oersted, Hans Christian: [pg 204] 1777-1851. Danish physicist, demonstrated that current electricity gives rise to a magnetic field

old crescent: [pg 136] This is the last illuminated phase before a New Moon

old gibbous: [pg 136] Moon phase occurs as the amount of illumination decreases on the full Moon

omnivore: [pg 101] organism that gets energy by eating plants and/or animals

operational definition: [pg 21] a description allows people to agree or recognize the thing being described associated with scientific experimentation

orbital motion: [pgs 135, 218] circular motion that occurs when the force of gravity and the forward inertia of an object are in balance

order: [pg 56] a taxonomic category of organisms ranking above a family and below a class

organs: [pg 53] group of tissues working together to perform certain functions; example - stomach has muscle and nervous tissue working together to help digest food

organ system: [pg 53] a group of organs working together to perform certain functions; example - the mouth, esophagus, stomach, and intestines all work to make food available for use

organelle: [51] differentiated structure within a cell, such as a mitochondrion, vacuole, or chloroplast, that performs a specific function

origin: [31] point at which something comes into existence or from which it derives or is derived

outer core: [pg 148] liquid Earth zone between the inner core and the mantle; like the inner core, composed of iron and nickel

oxygen: [pg 149] nonmetallic element constituting 21 percent of the atmosphere by volume that occurs as a diatomic gas, \(O_2\), and in many compounds such as water and iron ore. It combines with most elements, is essential for plant and animal respiration, and is required for nearly all combustion

oxygen cycle: [pg 110] movement and recycling of oxygen through the ecosystem through various forms and compounds

ozone: [pgs 125, 145, 146] gas located in the stratosphere that protects Earth from UV radiation
ozone depletion: [pg 147] loss of atmospheric ozone associated with destruction by CFCs and human health concerns

- P -

P-wave: [pg 201] (primary wave) compressional wave of energy transmitted through Earth during earthquake

Pacific Rim: [pg 159] countries and landmasses surrounding the Pacific Ocean

Pangaea: [pg 158] supercontinent that existed million of years ago when all of the continents were joined

parallel: [pg 138, 241] lines of latitude run east-west and are parallel to one another

parallel circuit: [pg 203] each load has its own path back to the source of electricity; example, if a lamp light goes out in your home, it does not open the circuit for all of the other loads

parasitism: [pg 122] relationship whereby one organism benefits (parasite) and one is harmed (host)

Pavlov, Ivan Petrovich: [pg 59] 1849-1936 Russian physiologist who is best known for discovering the conditioned response. He won a 1904 Nobel Prize for research on the nature of digestion

percentage of error: [pgs 23, 231] compares data to a standard value

pedigree chart: [pg 77] shows relationships between generations; a representation of pairings and offspring that helps show patterns of inheritance

period: [pg 183] row on the periodic table; properties of the elements in a period change in a predictable manner

Periodic Table of Elements: [pg 183] organization of all elements based on similar and repeating properties

petrification: [pg 155] formation of fossils when minerals replace living tissue

petroleum: [pg 196] fossil fuel; formed mostly from remains of plants and animals living in shallow oceans

pH: [pg 230] unit of measure for strength of an acid or base

phase: [pg 184] state of material; solid, liquid, or gas

phases of the Moon: [pg 136] new Moon, new crescent, first quarter, new gibbous, full Moon, old gibbous, last quarter, off crescent

phase change: [pgs 180, 185] change from one material state to another

phloem: [pg 54] tissue that carries food products down the stem to the roots from the plant’s leaves

photovoltaic cell: [pg 196] device that converts solar energy directly into electrical energy

photosynthesis: [pgs 54, 101, 109] process by which carbon dioxide, water, and light energy are converted into chemical energy (simple sugar)

phylum: [pg 56] a primary division of a kingdom, as of the animal kingdom, ranking next above a class in size

physical properties: [pg 175] phase, shape or size of matter

physical weathering: [pg 149] breakdown size and shape of rock without change in chemical composition

planet: [pg 138] nonluminous celestial body larger than an asteroid or a comet, illuminated by light from a star, such as the Sun, around which it revolves

plasma: [pg 185] a phase of matter achieved under very high temperature such as that which exists on our Sun and other stars

plate: [pg 158] section into which the Earth’s crust is divided and that is in constant motion relative to other plates, which are also in motion

plotting a graph: [pg 33] placing the data points at the correct positions on the graphing grid

Pluto: [pg 138] ninth and usually farthest planet from the Sun, having a sidereal period of revolution about the Sun of 248.4 years, 4.5 billion kilometers or 2.8 billion miles distant at perihelion and 7.4 billion kilometers or 4.6 billion miles at aphelion, and a diameter less than half that of Earth
pollution: [pg 121] substances that are harmful to living things

population: [pg 120] all members of the same type of living things in a given area

potential energy: [pg 194] stored energy; energy at rest as a result of its state or position; energy of position such as gravitational potential energy

power: [pgs 220, 226] amount of work done per unit of time

power plant: [pg 204] structures, machinery, and associated equipment for generating electric energy from another source of energy, such as nuclear reactions or a hydroelectric dam

precipitation: [pg 153] any form of water, such as rain, snow, sleet, or hail, that falls to the Earth's surface

predation: [pg 101] when one organism (predator) eats another organism (prey)

predicting: [pg 14] making an educated guess as to what might happen; forming a hypothesis

pressure: [pg 147] force applied uniformly over a surface, measured as force per unit of area

primary wave: [pg 201] (P-wave) compressional wave of energy transmitted through Earth during earthquake

Prime Meridian: [pg 138, 241] zero meridian (0°), used as a reference line from which longitude east and west is measured, passes through Greenwich, England

Principle of Inertia: [pgs 135, 217] Newton's first Law of Motion

producer: [pgs 101, 113] organism that can make their own food from nonliving materials; example, green plants

product: [pg 181] substance created as a result of a reaction

projectile motion: [pg 219] curved motion due to the forward inertia of an object and the pull of gravity

prophase: [pg 72] first stage of mitosis, during which the chromosomes condense and become visible, the nuclear membrane breaks down, and the spindle apparatus forms at opposite poles of the cell

protein: [pgs 103, 104] nutrient needed for growth and repair of cells and tissues

protium: [pg 182] hydrogen with no neutrons

proton: [pg 182] positively charged particle found in the nucleus of an atom

Ptolemy, Claudius: [pg 130] proposed geocentric view of the universe, placing the Earth as the center of the universe

pulley: [pg 220] grooved wheel that rotates around (not with) an axle; machine based on the lever

pulse: [pg 61] surge of blood through the arteries as the heart pumps blood

pulse point: [pg 61] a place on the body, such as the neck or wrist, where the pulse can be easily felt

pumice: [pg 156] light, porous, glassy lava, used in solid form as an abrasive and in powdered form as a polish and an abrasive

Punnett, R.C. (pg 75) discovered a method of statistically, mathematically determining the genetic characteristics of offspring (see Punnett Square)

Punnett Square: [pg 75] grid used to help determine the genes in offspring

pure cross: [pg 75] containing two similar genes for a trait (see first cross)

qualitative data: [pg 24] information that is relevant to an investigation that cannot be put directly into numeric form

quantitative data: [pg 24] numeric information that is relevant to an investigation

radiant energy: [pg 193] type of energy that makes up the electromagnetic spectrum

radiation: [pg 199] heat energy transfer that can occur across space

radiowave: [pg 200] relatively low energy wave that is part of the electromagnetic spectrum
reactant: [pg 181] substance participating in a chemical reaction, especially a directly reacting substance present at the initiation of the reaction

reactivity: [pg 179] how readily matter combines with other matter

recessive: [pg 74] trait whose affect may be hidden by a dominant trait

recording: [pg 10] information or facts, set down especially in writing as a means of preserving knowledge

reflection: [pg 202] when a light or sound wave bounces off a surface

refraction: [pg 202] when a wave bends because it is slowing down or speeding up

relative humidity: [pg 167] water vapor in a given sample of air compared to the maximum amount of water vapor that air sample can hold

renewable energy resources: [pg 196] energy resources that will be around for millions of years such as wind and solar energy

reproductive system: [pg 65] male and female organs, glands; necessary to produce offspring

repulsion: [pg 219] tendency of particles with like charges and like poles to push away from one another

resistance distance: [pg 220] actual distance the machine has to travel

resistance force: [pg 220] weight of the object

respiratory system: [pgs 55, 59] group of organs that bring oxygen to and remove carbon dioxide from the blood

responding variable: [pg 18] the factor you measure to determine the affect of manipulated variable; dependent variable

revolution: [pg 135] orbital motion about a point, especially as distinguished from axial rotation

rib: [pg 59] one of a series of long, curved bones occurring in 12 pairs in human beings and extending from the spine to or toward the sternum

ribosomes: [pg 51] cell structure that assists in building proteins

Richter Scale: [pg 161] measures the relative energy of an earthquake

Ring of Fire: [pg 159] circular region in the Pacific Ocean where the plates are so active that many volcanoes occur

rock: [pg 154] solid Earth made up of more than one mineral

rock cycle: [pg 158] cycle by which rocks change to other types of rocks

roots: [pg 54] plant organs that help a plant take in materials from the soil

rotation: [pg 135] act or process of turning around a center or an axis

run-off: [pgs 150, 154] water that moves on the surface of Earth

- $-$

S-wave: [pg 201] (secondary wave) transverse wave of energy transmitted through Earth during earthquake

saliva: [pg 57] watery mixture of secretions from the salivary and oral mucous glands that lubricates chewed food, moistens the oral walls, and contains ptyalin

San Andreas fault: [pg 159] a major zone of fractures in the Earth’s crust extending along the coastline of California from the northwest part of the state to the Gulf of California

saturated solution: [pg 176] solution that holds the maximum solute for a given temperature

Saturn: [pg 138] sixth planet from the Sun and the second largest in the solar system, having a sidereal period of revolution about the Sun of 29.5 years at a mean distance of about 1,425,000,000 kilometers (886,000,000 miles), a mean diameter of approximately 119,000 kilometers (74,000 miles), and a mass 95 times that of Earth

scaling a graph: [pg 31] setting up values for the graphing grid to best display the data

Schleiden, Matthias: [pg 49] German botanist responsible for the discovery that all plants are composed of cells
Schwann, Theodor, [pg 50] 1810-1882 German physiologist and pioneer histologist who described the cell as the basic structure of animal tissue

science: [pg 9] exploring and explaining the natural world

scientific inquiry: [pg 9] scientific study of the natural world

scientific notation: [pg 230] a method of writing or displaying numbers in terms of a decimal number between 1 and 10 multiplied by a power of 10

screw: [pg 221] simple machine that forms a spiral inclined plane

scurvy: [pg 104] disease caused by deficiency of vitamin C, characterized by spongy and bleeding gums, bleeding under the skin, and extreme weakness

sea breeze: [pg 169] forms when air over the water is cooler than air over land; denser, cooler air moves toward the land

season: [pg 133] one of the four natural divisions of the year, spring, summer, fall, and winter, in the North and South Temperate zones

Second Law of Motion: [pg 217] force is directly related to mass and acceleration

secondary wave: [pg 201] (S-wave) transverse wave of energy transmitted through Earth during earthquake

sedimentary rock: [pg 155] formed from weathered rocks, through the process of erosion; may contain fossils

sedimentation: [pg 151] deposit of particles by water, wind, and glaciers

seed: [pg 96] reproductive embryo for young plant surrounded by stored food and a protective coat

segregation: [pg 74] separation of paired alleles especially during meiosis, so that the members of each pair of alleles appear in different gametes

seismic waves: [pg 161] wave that radiates from the point of origin of an earthquake, moving in all directions through solid rock

seismograph: [pg 161] very delicate instrument that detects and records passing earthquake waves

selective breeding: [pg 83] a form of genetic engineering in breeding in order to choose special traits for the offspring

senses: [pg 175] any of the faculties by which stimuli from outside or inside the body are received and felt, as the faculties of hearing, sight, smell, touch, taste, and equilibrium

series circuit: [pg 203] electricity travels through all of its loads before it travels back to its source of electrical energy; example - if one light in a string goes out, it acts to open the circuit, blocking the flow of electricity

sex cell: [pg 93] germ cell or gamete

sexual reproduction: [pgs 73, 92] union of sperm and egg producing an offspring where half of the genetic information for the new individual comes from each parent

shooting star: [pg 137] meteor, a bright trail or streak that appears in the sky when a meteoroid is heated to incandescence by friction with the Earth's atmosphere

sideral day: [pg 132] measured or determined by means of the apparent daily motion of the stars; uses star as a frame of reference

sideral time: [pg 132] measured or determined by means of the apparent motion of the stars; uses distant star as a frame of reference

skeletal muscles: [pg 63] attached to the internal structure composed of bone and cartilage that protects and supports the soft organs, tissues, and other parts of a vertebrate organism

skin: [pg 62] membranous tissue forming the external covering or integument of an animal and consisting in vertebrates of the epidermis and dermis

small intestine: [pg 57] narrow, winding, upper part of the intestine where digestion is completed and nutrients are absorbed by the blood

smell: [pg 175] quality of something that may be perceived by the olfactory sense
smooth muscle: [pg 63] tissue that contracts without conscious control, having the form of thin layers or sheets made up of spindle-shaped, unstriated cells with single nuclei and found in the walls of the internal organs, such as the stomach, intestine, bladder, and blood vessels, excluding the heart.

soil: [pgs 120, 152] organic material mixed with rock fragments; formed from weathered rock.

solar day: [pg 132] measured or determined by means of the apparent daily motion of the Sun; uses Sun as a frame of reference.

solar collector: [pg 196] a physical collection unit for solar energy.

solar eclipse: [pg 136] partial or total blocking of the Sun; Moon is between Earth and Sun; total solar eclipse lasts only a few minutes.

solar energy: [pg 196] energy from sunlight.

solar radiation: (pg 134) Sunlight.

solid: [pg 185] phase of matter in which the particles of the matter are closest together.

solubility: [pgs 175, 176] how well a substance can dissolve in a given amount of solvent.

solubility graphs: [pg 176] summary of solubility of various substances in given mass of water.

solute: [pg 175] substance that dissolves in a solvent; component of a solution present in the lesser amount.

solution: [pg 175] homogeneous (similar) mixture of two or more substances, which may be solids, liquids, gases, or a combination of these.

solvent: [pg 175] substance in which a solute is dissolved.

sound energy: [pg 193] form of vibrational energy.

south pole: [pg. 133] The southern end of Earth's axis of rotation, a point in Antarctica.

specialize: [pg 52] to develop so as to become adapted to a specific function or environment.

species: [pg 56] organisms with similar characteristics; smallest grouping in the classification system; ability to reproduce.

specific heat: [pgs 174, 198] amount of heat needed to raise the temperature of one gram of matter by one degree Celsius.

speed: [pg 214] rate or a measure of the rate of motion.

sperm: [pgs 66, 92] male fertilizing cell, contains one half the number of chromosomes found in a body cell.

sphere: [pg 134] a celestial body, such as a planet or star.

spinal cord: [pg 64] thick, whitish cord of nerve tissue that extends from the medulla oblongata down through the spinal column and from which the spinal nerves branch off to various parts of the body.

spring scale: [pg 228] instrument that measures force.

spores (sporophyte): [pg 96] small, usually single-celled reproductive body that is highly resistant to desiccation and heat and is capable of growing into a new organism, produced especially by certain bacteria, fungi, algae, and nonflowering plants.

staining: [pg 239] adding a chemical to a specimen to make it easier to observe.

star trails: [pg 131] time-lapse photographs created because of Earth's rotating.

stars: [pg 137] celestial body that can produce its own light.

statistics: [pg 231] collection, organization, and interpretation of numerical data, especially the analysis of population characteristics by inference from sampling.

static electricity: [pg 202] electrical charge "at rest," charges builds up on matter and are then discharged.

stationery front: [pg 166] meeting of a cold and warm air mass; move very slowly relative to one another; produces weather closely resembling warm front weather.

stem: [pg 54] plant organ that helps to support the plant.
stomach: [pg 57] one of the principal organs of digestion, located in vertebrates between the esophagus and the small intestine

stomates: [pg 54] minute pores in the epidermis of a leaf or stem through which gases and water vapor pass

stratus cloud: [pg 166] low-altitude cloud formation consisting of a horizontal layer of gray clouds

stratosphere: [pgs 145, 147] upper portion of the atmosphere; above the troposphere, below the mesosphere

streak: [pg 154] color of the powdered mineral which can easily be seen by rubbing the mineral on a white or clear smooth surface such as ceramic

stop watch: [pg 229] a watch that can be instantly started and stopped by pushing a button and used to measure an exact duration of time

stored energy: [pg 194] energy held in reserve - potential energy

strip-mining: [pg 150] to mine (ore) from the surface of the Earth, by removing layers exposed to the atmospheric environment

subduction: [pg 159] sliding of a denser plate under a less dense plate

sublimation: [pgs 153, 185] phase change of matter from solid to gas

summer solstice: [pg 134] beginning of summer (about June 21st); longest period of daylight in one day

Sun: [pgs 129-138] star closest to Earth

supersaturated solution: [pg 176] This is a solution that holds more solute than it normally can for a given temperature

synodic month: [pg 135] average time between successive new or full moons, equal to 29 days 12 hours 44 minutes; uses the Sun as a frame of reference; also lunar month

synoptic weather map: [pg 165] weather map that summarizes a number of weather conditions

taiga: [pg 163] subarctic, evergreen coniferous forest of northern Eurasia located just south of the tundra and dominated by firs and spruces

teeth: [pg 57] hard, bone-like structures rooted in sockets in the jaws of vertebrates used for mechanical digestion

telephase: [pg 72] final stage of mitosis or meiosis during which the chromosomes of daughter cells are grouped in new nuclei

temperate deciduous forest: [pg 163] shedding or losing foliage at the end of the growing season

temperate rain forest: [pg 163] dense evergreen forest

temperature: [pgs 149, 162, 175, 199] measures the average kinetic energy in a sample of matter

texture: [pg 175] appearance and feel of a surface

theory: [pg 9, 15, 50] carefully thought out, logically reasoned, well founded idea about the natural world

Theory of Continental Drift: [pg 158] continents were once all joined into one large continent and over millions of years separated into the present continents

Theory of Plate Tectonics: [pg 159] Earth consists of a number of plates which make up the lithosphere; plates can move

thermometer: [pg 229] an instrument for measuring temperature, especially one having a graduated glass tube with a bulb containing a liquid, typically mercury or colored alcohol, that expands and rises in the tube as the temperature increases

Third Law of Motion: [pg 217] for every action there is an equal and opposite reaction

Thompson, Benjamin (Count Rumford): [pg 198] 1753-1814. American-born British public official and physicist, first scientist credited with showing that heat is a form of energy

thunderstorms: [pg 168] hazardous storms normally form after severe heating of Earth's surface; results in numerous powerful convection cells

thunder: [pg 168] crashing or booming sound produced by rapidly expanding air along the path of the electrical discharge of lightning.
tissues: [pg 53] group of similar cells that perform the same function; example- cells in muscle tissue work together to create motion

topographic map: [pg 240] graphic representation of the surface features of a place or region on a map, indicating their relative positions and elevations

tornadoes: [pg 168] rotating column of air usually accompanied by a funnel-shaped downward extension of a cumulonimbus cloud, having a vortex several hundred yards in diameter whirling destructively at speeds of up to 500 miles (800 kilometers) per hour

trachea: [pg 59] tube that carries air from the nose to the bronchi on the way to the lungs. Also called the windpipe

transpiration: [pg 110, 153] to give off vapor containing waste products, as through animal or plant pores

transverse wave: [pg 201] wave that travels perpendicular to its direction of motion; radiant energy travels as transverse waves

trait: [pg 71] genetically determined characteristic or condition

trench: [pg 159] formation that results when one plate slides under another plate

triple beam balance: [pg 228] device used to measure mass

tritium: [pg 182] hydrogen with two neutrons

troposphere: [pg 145] lower portion of the atmosphere where weather takes place

tsunamis: [pg 161] giant waves caused by underwater earthquakes

tundra: [pg 163] treeless area between the icecap and the tree line of Arctic regions, having a permanently frozen subsoil and supporting low-growing vegetation such as lichens, mosses, and stunted shrubs

ultraviolet waves: [pg 201] light energy that can cause a suntan

unicellular: [pg 52] one-celled

universe: [pg 129, 193] all matter and energy, including Earth, the galaxies and all therein, and the contents of intergalactic space, regarded as a whole

Universal Law of Gravitation: [pg 134] Newton’s Law which states that all matter in the universe is attracted to one another

unknown: [pg 231] a quantity of unknown numerical value

unsaturated solution: [pg 176] solution that can hold more solute for a given temperature

Uranus: [pg 138] seventh planet from the Sun, revolving about it every 84.07 years at a distance of approximately 2,869 million kilometers (1,790 million miles), having a mean equatorial diameter of 52,290 kilometers (32,480 miles) and a mass 14.6 times that of Earth

urinary structures: [pg 62] regulatory organs involved in the formation and excretion of urine and the removal of metabolic wastes

vacuole: [pg 51] cell structure for storage

vaporization: [pg 185] phase change from a liquid to gas

variable: [pg 18] factor whose change might influence a relationship

vegetation: [pg 151, 162] plants of an area or a region; plant life

vegetative propagation: [pg 92] asexual reproduction where a part of an organism can be separated and grown into another individual

vein: [pg 60] blood vessels that carry blood and wastes to the heart

velocity: [pg 214] vector quantity measures speed with direction; represents time rate of change in displacement
Venus: [pg 138] second planet from the Sun, having an average radius of 6,052 kilometers (3,760 miles), a mass 0.815 times that of Earth, and a sidereal period of revolution about the Sun of 224.7 days at a mean distance of approximately 108.1 million kilometers (67.2 million miles)

vernial equinox: [pg 435] marks the beginning of spring, about March 21; point at which the Sun passes the celestial equator (on its way north) causing equal amounts of daylight and darkness; see autumnal equinox

vertical force: [pg 219] upright push or pull at right angles to the horizon

Venn diagram: [pg 13] a diagram using circles to represent an operation in set theory, with the position and overlap of the circles indicating the relationships between the sets

Virchow, Rudolf: [pg 50] 1821-1902 German physician and pathologist known for his contributions to cell theory and the study of disease

virus: [pg 50] considered the "exception" to the Cell Theory, extremely small, often associated with harmful diseases, only capable of reproducing when inside an organism

visible light: [pg 200] part of the electromagnetic spectrum that you can see

vitamins: [pg 103] a group of substances needed in small quantities for the health of an organism

volcanic islands: [pg 160] formed from volcanoes

volcano: [pgs 160, 161] ridge or mountain that releases liquid rock from an opening near the top

voltmeter: [pg 228] electrical device to measure voltage drop across a resistor; always attached in parallel; galvanometer with a high resistance in series

volume: [pg 175] amount of space occupied by a three-dimensional object or region of space

von Baer, Karl Ernst: [pg 80] 1792-1876. Estonian-born German naturalist and pioneer embryologist who discovered the mammalian egg (1827)

warm front: [pg 166] leading edge of an air mass which has warmer temperatures than the preceding air mass; usually associated with steady precipitation

water: [pg 103, 120, 149] clear, colorless, odorless, and tasteless liquid, H₂O, essential for most plant and animal life

water budget: [pg 162] method of comparing the inflow and outflow of water within the Earth's hydrosphere

water cycle: [pg 153] phase change and movement of water between the living and nonliving environment; atmosphere, hydrosphere, and lithosphere; hydrologic cycles

water pressure: [pg 149] pressure exerted by the liquid part of Earth

water vapor: [pg 146, 153] water in a gaseous state, especially when diffused as a vapor in the atmosphere and at a temperature below boiling point

Watson, James: [pg 70] Born 1928. American biologist who with Francis Crick proposed a spiral model, the double helix, for the molecular structure of DNA. He shared a 1962 Nobel Prize for advances in the study of genetics

watt: [pg 226] unit of power

wavelength: m [pg 201] distance from top (crest) of one wave through the bottom (trough), and back to the top of another wave

weather: [pg 162] local or short term changes determined by variables in temperature, wind, moisture, and pressure

weather front: [pg 166] area by which two air masses meet

weather map: [pg 165] graphic representation showing temperature, barometric pressure, wind speed, and relative humidity

weather patterns: [pg 165] (see weather)

weather satellite: [pg 165] space craft orbiting the Earth to relay weather data

weather station: [pg 165] a facility or location where meteorological data are gathered, recorded, and released
weathering: [pg 148] when rock is changed physically or chemically as it interacts with air, water and living things

wedge: [pg 221] simple machine; a moving inclined plane

Wegener, Alfred: [pg 158] 1880-1930. German geophysicist, meteorologist, and explorer who proposed the theory of continental drift

weight: [pg 213] force created by the response of mass to the pull of gravity; measure of the heaviness of an object

weightlessness: [pg 219] not experiencing the effects of gravity

wet mount: [pg 239] when an object is prepared for view under a microscope by adding water

wheel and axle: [pg 221] lever that rotates in a circle

wind: [pg 151] a natural and perceptible movement of air parallel to or along the ground

wind belts: [pg 163] associated with the pressure belts of the Earth, responsible for the movement of massive weather systems

wind energy: [pg 196] renewable energy; can turn turbines in order to generate electricity

winter solstice: [pg 134] marks the beginning of winter; occurs about December 21; shortest day of the year, when the Sun is over the tropic of Capricorn

wood: [pg 196] form of renewable energy

work: [pgs 198, 219] force applied through a distance

- Y -
y-axis: [pg 29] vertical axis of a two-dimensional Cartesian coordinate system

zenith: [pg 248] highest point above the observer's horizon attained by a celestial body

- Z -
zygote: [pgs 66, 92] cell produced after a sperm and egg cell unite; contains the full number of chromosomes