Glossary

A

abiotic [ay-bye-AW-tik] **element** any non-living component of the environment (p. 98)

active solar energy system a device that harnesses radiant energy from the Sun and converts it into a more useful form of energy (p. 244)

aesthetics [es-THET-iks] the concept of how visually attractive or beautiful something is (p. 325)

alternative energy source a source of energy that is not as common as conventional sources; alternative energy sources tend to be renewable and have few negative impacts on the environment (p. 242)

arch a curved structure used to span a space while supporting a load (p. 301)

B

bar graph [GRAFF] a type of graph used to make comparisons when one variable is in numbers and the other is not; useful for showing how data are distributed across categories (p. 400)

beam a horizontal structure designed to support a load (p. 295)

biodiversity [BYE-oh-dih-VUR-sih-tee] the variety of plant and animal life in an ecosystem (p. 152)

biofuel [BYE-oh-fyoo-uhl] a liquid fuel, such as ethanol, produced from plant or animal material (p. 248)

biotic [bye-AW-tik] **element** any living thing found in the environment (p. 97)

bubble [BUH-bul] **map** a graphic organizer that shows properties or characteristics (p. 409)

C

cantilever [KAN-tuh-LEE-ver] a beam supported at only one end (p. 297)

carnivore [KAHR-nuh-vawr] an organism that eats other animals only (p. 123)

cause-and-effect question a type of question that asks whether something is causing something else (p. 357)

cause variable see **independent variable**

centre of gravity the point around which an object's mass is equally balanced in all directions; the point where the mass seems to be concentrated (p. 290)

chemistry [KEH-muh-stree] the study of matter and its changes (p. 10)

circle [SER-kuhl] **graph** a type of graph that shows the whole of something divided into all of its parts; shows how different things compare in size or quantity; also known as **pie graph** (p. 401)

closed system a system in which the amount of matter remains constant over time (p. 135)

community a group of populations of different species in a given area (p. 97)

compare and contrast chart a graphic organizer that shows similarities and differences (p. 408)

comparison matrix [MAY-triks] a graphic organizer used to record and compare observations or results (p. 408)

competition [kawm-puh-TIH-shun] occurs when more than one organism tries to obtain the same basic resources in the same habitat (p. 107)

compression [kuhm-PREH-shun] an internal force that presses or squeezes the particles of an object together (p. 279)

concentrated solution [KAWN-suhn-TRAY-tid suh-LOO-shun] a solution with a large number of solute particles in a given volume of solution (p. 42)

concentration [kawn-suhn-TRAY-shun] the amount of solute present in an amount of solution (p. 43)

concept [KAWN-sept] **map** a graphic organizer that shows relationships between ideas; the ideas are connected by arrows and words or expressions that explain the connections (p. 406)

condensation [kawn-duhn-SAY-shun] the change in state of a substance from gas to liquid (p. 138)

conduction [kun-DUHK-shun] the transfer of thermal energy through a substance, or between substances in contact, by the collision of particles (p. 207)

consumer an organism that eats other living things for energy (p. 123)

controlled variable a condition that remains unchanged in an investigation; does not affect the outcome (p. 357)

convection [kun-VEK-shun] the transfer of thermal energy from one part of a fluid to another by a circulating current of faster-moving and slower-moving particles (p. 210)

conventional energy source a source of energy that has been widely used for many years (p. 234)

corrugation [kor-uh-GAY-shun] multiple folds in a material that provide additional strength (p. 296)

cycle [SYE-cuhl] a pattern in nature that repeats over time (p. 135)

cycle map a graphic organizer that shows cycles in nature (p. 405)

D

dead load a type of static load caused by the weight of the structure itself (p. 273)

decomposer [dee-kuhm-POH-zer] an organism that consumes and breaks down dead organisms or waste matter into simple substances (p. 124)

dependent variable the variable that is affected by a change in an investigation; the variable measured to see how it is affected by the independent variable; also known as **effect variable** (p. 357)

detrivore [DET-rih-vohr] an organism that feeds on large parts of decaying plant and animal matter and on waste material (p. 124)

dilute [dye-LOOT] **solution** a solution with a small number of solute particles in a given volume of solution (p. 42)

dissolve [dih-ZOHLV] to mix one type of matter into another type of matter to form a solution (p. 36)

dissolving mixing completely with a solvent to form a solution (p. 36)

distillation [dih-still-AY-shun] the process of separating liquids in a solution by heating the solution, trapping and cooling the gas, and collecting the resulting pure liquid (p. 69)

dome a shell structure that looks like the top half of a sphere (p. 302)

dynamic [dye-NAM-ik] **load** any load on a structure that is not caused by gravity; for example, wind or rushing water (p. 273)

E

Earth's energy balance the balance between the energy lost by Earth into space and the energy gained by solar radiation trapped by Earth's atmosphere (p. 238)

ecology [ee-CAWL-uh-jee] the study of relationships between organisms, and between organisms and their environment (p. 99)

ecosystem [EE-koh-sis-tum] the network of interactions that link the living and non-living parts of an environment (p. 98)

effect variable see **dependent variable**

electric generator a machine with moving parts that produce electricity when they spin (p. 75)

endangered species [SPEE-seez] species that are at risk of becoming extinct due to either reduction in numbers or an environmental threat (p. 152)

ergonomics [ur-guh-NAW-miks] the science of using knowledge of human characteristics to design structures and systems that are comfortable, safe, and efficient (p. 327)

evaporate [ih-VAH-puh-rate] change from a liquid to a gas (p. 67)

evaporation [ih-VAH-puh-RAY-shun] the process by which a sample of matter changes from a liquid to a gas (p. 68 Unit A: Pure Substances and Mixtures); the process in which a substance changes state from liquid to gas (p. 138, Unit B: Interactions in the Environment)

external force a force acting on an object or structure from the outside (p. 277)

extinction [ex-TINK-shun] the complete disappearance of a species from anywhere on Earth (p. 152)

F

filter a device with many small holes that trap solid pieces of a mixture but allow liquids and gases to pass through (p. 60)

filtration [fill-TRAY-shun] the process of passing a mechanical mixture through a filter to separate solid pieces from a liquid or gas (p. 60)

fishbone diagram a graphic organizer that shows the important ideas under the major concepts of a topic (p. 406)

floating [FLOH-ting] a separation technique in which a "lighter" component rises to the top of a liquid where it can be skimmed or poured off (p. 59)

flow chart a graphic organizer that shows a sequence of steps or a series of component relationships (p. 405)

food chain a sequence that shows how energy and nutrients are transferred from one organism to another in an ecosystem (p. 126)

food web a model that shows how food chains in an ecosystem are connected (p. 127)

force a push or a pull (p. 270)

form the shape and physical appearance of a structure (p. 268)

fossil [FOSS-uhl] **fuels** concentrated sources of chemical energy such as coal, oil (petroleum), and natural gas that were formed deep in Earth's structure over millions of years from decayed and compressed plant and animal material (p. 236)

frame structure a network of parts that supports loads (p. 274)

friction [FRIK-shun] a force produced when objects rub against each other (p. 231)

function [FUNK-shun] the task or purpose of a structure (p. 268)

G

gas a state of matter that does not have a definite volume or a definite shape; a gas takes the shape and volume of its container (p. 15)

geothermal [jee-oh-THUR-muhl] **energy** energy contained below Earth's surface (p. 208)

global warming an increase in Earth's global temperature due to changes in the atmosphere that enhance the greenhouse effect (p. 240)

graphic [GRAF-ik] **organizer** a diagram used to organize and display ideas visually; useful for connecting different concepts, ideas, and data (p. 405)

gravity the force of attraction between all objects; it is noticeable when at least one of the objects has a large mass; it is a non-contact force (p. 270)

greenhouse effect a rise in temperature resulting from certain gases in the lower atmosphere trapping radiant energy and warming Earth's surface (p. 238)

greenhouse gases gases such as water vapour, carbon dioxide, methane, and nitrous oxides that trap energy in Earth's atmosphere (p. 238)

H

habitat [HAB-uh-tat] the environment where an organism lives (p. 100)

heat the transfer of energy from the particles of a warmer object to the particles of a cooler object (p. 186)

herbivore [HUR-buh-vawr] an organism that eats plants only (p. 123)

heterogeneous mixture [heh-tuh-ruh-JEE-nee-uhs MIKS-cher] see **mechanical mixture**

homogeneous [hoh-muh-JEE-nee-uhs] **mixture** see **solution**

hypothesis [hye-PAW-thuh-sis] a prediction about the outcome of a controlled experiment along with an explanation for the outcome; may be written as an "if…then…because…" statement (p. 358)

I

I-beam a beam that is in the shape of the letter "I" when seen from the end (p. 296)

igneous [IG-nee-uhs] **rock** rock formed from magma that has cooled and solidified (p. 208)

independent variable the variable that is changed in an investigation; also known as **cause variable** (p. 357)

inference [IN-fer-uhns] a possible explanation of an observation; an educated guess based on experience, knowledge, and observations (p. 362)

insoluble [in-SOHL-yuh-buhl] unable to dissolve in a specified solvent (p. 41)

internal force a force acting between two parts of a body (p. 277)

invasive species [in-VAY-siv SPEE-seez] a species that has been introduced (accidentally or purposely) into an area where it did not exist before; often reproduces so aggressively that it replaces some of the original species (p. 153)

K

kinetic [ki-NEH-tik] **energy** energy that all moving objects possess; a particle has more kinetic energy when moving faster and less kinetic energy when moving slower (p. 187)

K-W-L chart a graphic organizer that shows what you know (K), what you want (W) to find out, and what you have learned (L) (p. 407)

L

law a general statement that describes a commonly occurring natural event; a law does not explain why or how a natural event occurs; it just describes what happens in detail (p. 351)

line graph a type of graph that shows changes in measurement when two variables are in numbers; shows a relationship between two sets of numbers (p. 400)

line of symmetry a line that divides an object in half; helps display symmetry (p. 323)

liquid [LIH-kwid] a state of matter with a definite volume, but no definite shape; a liquid takes the shape of its container (p. 14)

live load a type of static load caused by the weight of the objects it supports (p. 273)

load a force acting on a structure (p. 273)

M

mass the quantity of matter in an object, commonly measured in grams (g) or kilograms (kg) (p. 272)

matter anything that takes up space and has mass (p. 10)

mechanical mixture a mixture with different parts that you can see; also known as **heterogeneous mixture** (p. 24)

meniscus [muh-NIS-kuhs] the downward curve of the surface of a volume of liquid (p. 393)

metamorphic [met-uh-MOHR-fik] **rock** rock that is formed when heat and pressure change existing rock (p. 209)

micro-organism [MI-kro-OR-guh-nihz-um] a living thing that is small and must be viewed with the help of a microscope (p. 97)

mind map a graphic organizer that shows relationships between ideas; words or pictures representing ideas are connected by arrows; similar to a concept map, but does not include explanations for connections (p. 406)

mixture matter that contains two or more pure substances mixed together (p. 20)

mutualism [MYOO-chew-uhl-izm] an interaction between individuals of different species that benefits both individuals (p. 109)

N

native species [NAY-tiv SPEE-seez] species that occur naturally in an area (p. 153)

nested circle diagram a graphic organizer that shows parts within a whole (p. 407)

non-renewable energy resource a source of energy that could eventually be used up (p. 235)

nuclear [NOO-klee-er] **energy** the energy released when the particles of pure substances like uranium split apart (p. 75)

nutrient [NOO-tree-unt] a substance that an organism needs to grow and maintain its body (p. 102)

O

omnivore [OHM-nih-vawr] an organism that eats both plants and animals (p. 123)

organism a living thing (p. 97)

P

particle theory of matter an explanation of what matter is made of and how it behaves; the particle theory states that all matter is made up of tiny particles that are always moving, that attract each other, and that have space between them (p. 12 Unit A: Pure Substances and Mixtures); a theory that explains what matter is made of, and how it behaves (p. 185 Unit C: Heat in the Environment)

passive solar heating heating caused by the passage of radiant energy through the windows of a building (p. 244)

photosynthesis [foh-toh-SIN-thuh-sis] a process by which plants use water, carbon dioxide, and sunlight to produce sugars (food) (p. 122)

pie graph see **circle graph**

placemat organizer a graphic organizer that gives each student in a group space to write down what he or she knows about a topic; the group then discusses the answers and writes what they have in common in the middle section (p. 411)

plane of application an imaginary flat surface through which an applied force passes (p. 278)

point of application the location on an object where an external force is applied or concentrated (p. 278)

pollution [puh-LOO-shun] contaminants in the environment that could harm living things (p. 39)

population [paw-pyoo-LAY-shun] a group of organisms of the same species in a given area (p. 97)

precipitation [prih-sip-uh-TAY-shun] water in the liquid or solid state that falls to Earth (p. 138)

predator an organism that hunts other living things for food (p. 108)

prediction [preh-DIHK-shun] states what is likely to happen as the result of a controlled experiment; may be written as an "if…then…" statement (p. 358)

prey an animal that is hunted by a predator (p. 108)

primary succession [suhk-SESH-un] succession that develops a community of plants and animals in an area where no living things existed before (p. 148)

procedure a step-by-step description of how an investigation will be performed (p. 359)

producer an organism that makes its own food from non-living materials (p. 122)

pure [pyoor] **substance** matter that contains only one kind of particle (p. 20)

pyramid of numbers a model that shows the number of individuals at each level in a food chain or food web (p. 133)

Q

qualitative [KWAHL-ih-tay-tiv] **observation** an observation that describes characteristics that cannot be measured or expressed in numbers (p. 360)

quantitative [KWAHN-tih-tay-tiv] **observation** a measurable observation that can be expressed in numbers (p. 360)

R

radiant energy energy that travels in the form of electromagnetic waves through empty space; includes visible light, ultraviolet rays, and infrared rays (p. 214)

radiation [RAY-dee-AY-shun] the transfer of radiant energy by means of electromagnetic waves (p. 214)

radioactive [ray-dee-oh-ACK-tiv] a term used to describe pure substances whose particles naturally split into smaller particles, releasing energy as they break apart (p. 75)

renewable energy resource a source of energy that can be used indefinitely, without running out (p. 234)

repetitive strain injury damage, usually to the small muscles of the wrists or hands, from repeated activities over a long period of time (p. 329)

S

saturated solution a solution in which no more solute can dissolve (p. 43)

scavenger an organism that eats already dead animals (p. 123)

scientific inquiry [SI-ehn-TIH-fik in-KWI-ree] the process of exploring the world, asking questions, and searching for answers that increase our understanding (p. 348)

scientific notation a type of mathematical abbreviation that omits large numbers of zeros (p. 398)

secondary succession [suhk-SESH-un] succession that develops a community in an area after it has been disturbed (p. 150)

settling a separation technique in which a "heavier" component sinks to the bottom of a liquid, and the liquid can be poured off (p. 59)

sewage [SOO-ij] the mixture of water and waste that is flushed down toilets and sink drains (p. 64)

shear [sheer] forces acting in an object as a result of pushes and/or pulls in opposite directions; usually results in rips or tears in an object (p. 280)

shell structure a hollow structure with a curved shape providing high strength and rigidity (p. 275)

sieve [siv] a device used to separate the components of a mixture, with many visible holes that allow smaller solid pieces and liquids to pass through while blocking the larger solid pieces (p. 60)

sieving the process of passing a mechanical mixture through a sieve to separate the larger pieces of matter (p. 60)

solar energy radiant energy (mostly visible light and infrared radiation) produced at the Sun's outer surface and radiated out into space (p. 230)

solid a state of matter with a definite volume and a definite shape (p. 14)

solid structure an object that uses solid construction to support loads (p. 274)

solubility [SAWL-yuh-BILL-ih-tee] a measure of how much solute can dissolve in a certain solvent to form a saturated solution at a particular temperature and volume (p. 44)

soluble [SAWL-yuh-buhl] able to dissolve in a specified solvent (p. 41)

solute [SAWL-yoot] the smaller part of a solution; the part of a solution that dissolves in the solvent (p. 36)

solution a mixture that looks like a single pure substance; a uniform mixture of two or more pure substances; also known as **homogeneous mixture** (p. 25)

solvent the larger part of a solution; the part of a solution into which the solutes dissolve (p. 36)

sorting physically separating large pieces of a mechanical mixture so that similar pieces are together (p. 58)

species [SPEE-seez] a group of similar organisms that can mate and reproduce more of the same type of organism (p. 97)

stability the ability of a structure to remain in or return to a stable, balanced position when forces act on it (p. 290)

steward [STOO-erd] a person who carefully manages a resource by taking responsibility for their actions and educating others (p. 157)

structural failure the failure of a structure as a result of the structure, or part of the structure, losing the ability to support a load (p. 306)

structure [STRUK-cher] anything made of parts put together for a particular purpose (or purposes) (p. 268)

succession [suhk-SESH-un] a series of gradual changes that result in the replacement of one community of plants and animals by another (p. 148)

sustainable [suh-STAY-nuh-bul] something that can be maintained and used indefinitely (p. 136)

symmetry [SIM-uh-tree] an exact reflection on opposite sides of a line dividing an object in half (p. 323)

T

temperature [TEM-per-uh-cher] a measure of the average kinetic energy of the particles of a substance (p. 187)

tension [TEN-shun] an internal force pulling the particles of an object apart (p. 279)

theory [THEE-uh-ree] an explanation of an observation (p. 351)

thermal contraction a decrease in the volume of a substance caused by cooling (p. 189)

thermal energy the total kinetic energy and energy of attraction of all the particles of a material (p. 188)

thermal expansion an increase in the volume of a substance caused by heating (p. 189)

torsion [TOR-shun] internal twisting forces created in an object as a result of a twisting motion being applied to the object (p. 280)

tree diagram a graphic organizer showing concepts that can be broken down into smaller categories (p. 406)

truss a network of beams arranged in triangles (p. 300)

U

universal design an arrangement of the components of a structure or device resulting in the most user-friendly product possible (p. 332)

unsaturated solution a solution in which more solute can be dissolved (p. 43)

V

variable any condition that could affect the outcome of an investigation (p. 357)

Venn diagram a graphic organizer that shows similarities and differences (p. 408)

volume a measure of the quantity of space occupied by an object (p. 14)

W

weight [weyt] the force of gravity acting downward on an object, measured in newtons (N) (p. 272)

word splash a graphic organizer that "splashes" key words of a topic on a page randomly; similar to a word wall, but more colourful (p. 410)

word wall a graphic organizer that lists the key words and concepts for a topic (p. 410)