

GLOSSARY

The following definitions of terms are intended to help teachers and parents use this document.

abiotic element. A physical but non-living feature of an ecosystem, such as climate, rocks, soils, ice, topography, and non-living organic matter.

achievement levels. Brief descriptions of four different degrees of student achievement of the provincial curriculum expectations for any given grade. Level 3, which is the “provincial standard”, identifies a high level of achievement of the provincial expectations. Parents of students achieving at level 3 in a particular grade can be confident that their children will be prepared for work at the next grade level. Level 1 identifies achievement that falls much below the provincial standard. Level 2 identifies achievement that approaches the standard. Level 4 identifies achievement that surpasses the standard.

acid rain. Precipitation that contains a high concentration of acids from pollutants (such as sulphur dioxide and nitrogen oxides) that are emitted by industrial processes and fossil fuel combustion. Acid rain is harmful to plant and animal life and corrodes many building materials.

adaptation. Any change in the structure or function of an organism that enables it to survive and reproduce successfully in its environment.

aerodynamic. Designed to reduce friction or drag from moving air.

airfoil. A teardrop-shaped or nearly teardrop-shaped structure that produces a

force or lift as it moves through air; aircraft wings and propeller blades are examples of airfoils.

algae. Small, often single-celled organisms that mostly live in water. Some are considered plants and some are considered protists (i.e., they have the characteristics of both plants and animals). Algae are a primary source of food for many aquatic animals.

alternative energy sources. Energy sources that are not based on the burning of fossil fuels or the splitting of atoms and that have a less damaging impact on the environment. Examples of alternative energy sources include solar energy, wind energy, geothermal energy, tidal energy, and hydroelectric energy.

amphibian. One of a class of animals that spends part of its life cycle in water and part on land. Amphibians include cold-blooded, smooth-skinned vertebrates, such as frogs, toads, salamanders, and newts. They are found in many different kinds of ecosystems, even deserts.

analyse. Dissect or break down something that is complex (e.g., a substance, a set of ideas, an event, a system) into its component parts and assess their relationship to each other and to the whole.

applied force. A force applied to an object by a person or another object directly pushing or pulling on it.

aquifer. A geological formation, often incorporating an underground layer of unconsolidated rock or soil, that contains or conducts ground water (which supplies water for wells and springs).

artery. A blood vessel that carries blood from the heart to other parts of the body.

assess. Make a reasoned, evidence-based judgement about the extent, condition, importance, or other characteristics of something.

asteroid. Any of the many small celestial bodies that revolve around the sun. Their diameters range from a few to several hundred kilometres. Also called a minor planet or planetoid.

atmosphere. A gaseous mass surrounding a celestial body, such as the air surrounding Earth.

bacteria. One-celled, microscopic, living organisms, some of which can cause disease. They also play a role in fermentation, putrefaction, and nitrogen fixation.

battery. A device consisting of one or more cells that can produce a direct current by converting chemical energy to electrical energy.

bevel gear. A tapered gear, shaped like a section of a cone, that is used to change the direction of motion. Bevel gears are usually mounted on shafts that are 90 degrees apart, but can be designed to work at other angles as well.

biodegradable. Capable of being decomposed (broken down) by natural biological processes.

biodiversity. The variety of organisms at all levels of classification and the variety of ecosystems within a specific geographic region and globally.

biomass. Organic matter, especially plant matter, that can be converted to fuel and used to produce energy.

biome. A large region with characteristic plant and animal populations that are determined by the region's geography and climate (e.g., a boreal forest).

biosphere. The biological component of the global ecosystem.

biotic elements. The living parts of an organism's environment.

built environment. That part of the environment that consists of human-made structures or has been modified for human use (e.g., buildings, roads, parks, farmland).

buoyancy. The upward force that a fluid exerts on an object. For some objects it can be sufficient to overcome completely the force of gravity and cause the object to float.

carbon. A widely distributed non-metallic element that occurs in different inorganic forms (e.g., diamonds, graphite) and in all organic compounds (can be found in all known forms of life).

carbon cycle. The continuous circulation of carbon in various forms between the atmosphere, the oceans, the earth's soils, and all living things.

carbon dioxide. A colourless, odourless gas produced by plant and animal respiration, decomposition, combustion, and the oxidation of carbon-containing substances. Carbon dioxide is needed by plants for photosynthesis and is also a greenhouse gas.

carnivore. An animal that normally eats mostly other animals. A few plants are also carnivorous.

carrying capacity. The maximum population size of a given species that an area

can support without reducing its ability to support the same species in the future.

castings. Undigested materials, soil, and bacteria excreted by a worm.

cell. The basic structural unit of an organism; the building block of life. All living things (organisms) are made of cells.

cell membrane. The outer boundary of the cell that controls the passage of material into and out of the cell.

cell wall. A structure that surrounds the cell membrane of some cells and provides it with strength and support.

chainring. The toothed gear attached to the crank of a bicycle, which drives the chain. A normal chainring may have anywhere from 20 to 54 teeth; the bigger the chainring, the “higher” the gear or the harder it is to turn the pedals. Many bicycles have two or three chainrings bolted together to increase the number of gear ratios that can be selected.

changes in state. A change from one physical state of matter (solid, liquid, or gas) to another; also called a phase change. Changes in state involve the addition of heat energy (as in melting/fusion, vaporization, and sublimation), which causes molecules to move faster, or the loss of heat energy (as in condensation, freezing, and deposition), which causes molecules to move more slowly.

charge capacity. The capacity of a rechargeable battery to maintain its charge, especially as it undergoes numerous recharges.

chemical change. A change in matter that implies the formation of a new substance. The changes are irreversible.

chemical energy. Energy released in a chemical reaction or absorbed in the formation of a chemical compound.

chloroplast. An energy-converting, membranous, sac-like organelle in plant cells that contains the green pigment chlorophyll, which is responsible for photosynthesis.

circuit. The complete path of an electric current around a series of wires and connections. If there is a break in the circuit, the current will not flow.

circulatory system. The body system consisting of the heart, blood vessels, and blood that delivers nutrients and other essential materials to cells and removes waste products (also called the cardiovascular system).

climate. The characteristic weather conditions within a region, including temperature, precipitation, wind, and other variables, averaged over a number of years.

climate change. A significant, long-term change in the world climate, which can be brought about by either human or natural factors.

comet. A celestial body that orbits the sun and consists of a central mass surrounded by an envelope of dust and gas that may form a tail that streams away from the sun.

community. Interdependent groups of plants and animals that live and interact together in a habitat.

composting. An aerobic, biological process in which organic wastes such as garden and kitchen waste are converted into a material (compost) that can be applied to land to improve soil structure and enrich the nutrient content of the soil.

compressibility. The property of being able to be compressed or made more compact.

compression. A force that presses or squeezes something together.

concentration. The measure of the amount of a particular substance in a specific amount of another substance; also the amount of dissolved substance contained per unit of volume of solvent.

condensation. The change of a gas into a liquid by cooling (loss of heat energy). For example, water vapour (a gas) from a boiling kettle condenses into liquid water when it comes into contact with a cold kitchen wall.

conduction. The movement or transmission of energy through a substance.

conductor. A material that transmits heat, electrical, or other kinds of energy.

conservation of energy. The principle that energy can be neither created nor destroyed but can only be changed from one form to another. Conservation of energy is also used to describe the wise use of energy.

conservation of resources. Use of natural resources only when needed in order to reduce waste and prevent loss of resources.

consumer. Organisms that feed on other organisms. Organisms that feed on green plants or decaying matter are called *primary consumers*. Carnivores are called *secondary consumers*, while those that feed on other carnivores are called *tertiary consumers*.

contact forces. Forces that result when two interacting objects are in contact with each other. Examples of contact forces include frictional forces and applied forces.

convection. The circulation and accompanying heat transfer that occurs when a fluid that has been warmed from underneath rises, cools, and then falls.

crown gear. A type of bevel gear whose teeth project at right angles to the plane of the wheel, resembling the points on a crown.

crystal. A homogeneous solid formed by the solidification of a substance, whose particles are arranged in a regular, repeating pattern with external plane faces.

cytoplasm. A gelatinous material that surrounds the nucleus of a cell.

decomposer. An organism that breaks down the bodies or parts of dead plant or animal matter into smaller pieces (decay). Decomposers, such as mushrooms, bacteria, and earthworms, are very important in food webs.

decomposition. The process of rotting and decay, which causes the complex organic materials in plants and animals to break down into simple inorganic elements that can be returned to the atmosphere and soil.

deforestation. The destruction of the world's forests, mainly rain forests, through direct human activity, such as logging and clearing for agriculture and grazing, and through the indirect effects of pollution and acid rain.

density. Mass per unit volume.

diagram conventions. See the brief section at the end of this glossary.

diffraction. The bending and spreading of light waves as they pass through a small slit or opening or close to an opaque surface. When we study the diffraction of sunlight using a prism, we see a spectrum (or rainbow) of colours.

diffusion. The movement of particles from an area of higher concentration to an area of lower concentration.

digestive system. The organs that take in food and turn it into products that the body uses to survive and stay healthy. Waste products that the body cannot use leave the body through bowel movements. The digestive system includes the salivary glands, mouth, esophagus, stomach, liver, pancreas, gallbladder, small and large intestines, and rectum.

dissolve. Mix a substance with a solvent to form a solution (e.g., mix sugar with water).

drag. Resistance to motion through a fluid, especially the resistive force exerted on an airfoil or airplane by its motion through the air.

ecological niche. The relationships between a species and all the living and non-living things within its habitat; essentially, what a species does in and to an ecosystem and what it depends on from the ecosystem.

ecology. The branch of science concerned with the interrelationships between organisms and their environments.

ecosystem. A complex system that comprises living organisms and their environment, which interact as a unit.

electrical energy. Energy produced by the movement of electrons.

endangered species. A species that is in danger of extinction in the foreseeable future.

energy. The capacity to do work.

energy audit. An assessment of how much energy a building consumes, combined with suggestions on how to make it more energy-efficient.

environment. All the biotic and abiotic elements that surround and affect organisms or groups of organisms and influence their survival and development.

environmental impact. Positive and/or negative effects of a human activity or intervention on the environment (e.g., effects on natural resources, biodiversity, or the quality of air, water, and soil).

environmental literacy. The knowledge and perspectives required to understand the environmental implications of public issues; the capacity to determine whether environmental systems are healthy and to take appropriate action to maintain, restore, or improve the health of those systems. Environmental literacy includes an understanding of the relationships between the parts of environmental systems and the interdependence of their human and natural components.

environmental stewardship. The obligation to take care of our natural resources to ensure that they are sustainably managed for current and future generations.

ergonomics. The science of designing equipment that people can use more efficiently and safely.

erosion. The process by which the surface of the earth is worn away by the action of running water, glaciers, winds, and waves.

evaluate. Determine the significance, condition, or value of something on the basis of evidence and in relation to predetermined criteria.

evaporation. Change of state from a liquid to a gas (vapour); also called *vaporization*. Adding heat increases the rate of evaporation of a substance.

expectations. The knowledge and skills that students are expected to develop and

to demonstrate in their class work, on tests, and in various other activities on which their achievement is assessed. Overall expectations describe in general terms the knowledge and skills that students are expected to demonstrate by the end of each grade. Specific expectations describe the expected knowledge and skills in greater detail.

experiment. A procedure in which certain variables are changed under controlled conditions in order to understand a phenomenon or test a hypothesis.

exploded view. A diagram or other illustration showing all the parts of an object as if they had been pulled apart or exploded.

external force. A force acting between an object and its environment. It can be a contact force (e.g., a push) or a non-contact force (e.g., gravity).

extinction. The complete and permanent disappearance of a species from the earth.

fair test. An investigation in which all variables are controlled except the one that is being tested.

filtration. The process of passing a liquid or gas through a porous article or mass (paper, membrane, sand, etc.) to separate out matter in suspension.

flow rate. The amount of fluid that flows past a point in a given time.

food web. A complex network of feeding relationships. A food web is a more realistic portrayal of the energy flow within an ecosystem than a food chain.

force. A push, pull, or other factor that can make an object change speed, shape, or direction. If the total force is zero, the object is at rest or moving at a constant speed in a straight line.

fossil fuels. Carbon fuels that were formed hundreds of millions of years ago from the remains of plants and animals. Coal, oil, natural gas, and propane are common fossil fuels.

freezing. Change of state from a liquid to a solid. It involves removing heat energy.

friction. Force that resists movement between two objects in contact.

fusion. The process of liquefying or melting by the application of heat.

gas. A state of matter in which the molecules of a substance are widely separated and can move freely. A gas has no definite shape or volume.

gear. A toothed wheel that engages another toothed mechanism in order to change the speed, direction, or force of a transmitted motion. *See also* **bevel gear, crown gear, idler gear, rack and pinion system, spur gear, worm gear.** (For illustrations of these gears, *see* www.mech.uwa.edu.au/DANotes/gears/intro/intro.html; <http://www-education.rec.ri.cmu.edu/multimedia/idler.shtml>.)

generator. A device that changes mechanical energy into electrical energy.

geology. The science that deals with the history and structure of the earth, its rocks and minerals, and the processes that act upon the earth's surface and interior.

glacier. A large mass of ice that forms by the compaction and recrystallization of snow under freezing conditions. Glaciers often move downslope or outward in all directions because of the force of their own weight. They may become stagnant or retreat under warming conditions.

global warming. An increase in the earth's average atmospheric temperature as a

result of the enhancement of the greenhouse effect. The rise in temperature causes corresponding changes in other aspects of climate.

gravitational potential energy. The energy that an object possesses because of its position in a gravitational field. Water held back by a dam is an example of gravitational potential energy.

gravity. The natural force of attraction between two bodies. The gravitational pull of the earth draws all objects towards the centre of the planet.

gravity, centre of. The point around which a body's mass is equally balanced in all directions. The total mass of the object is concentrated at this point.

greenhouse effect. The retention of heat within the earth's lower atmosphere that is caused by the presence of greenhouse gases.

greenhouse gas. An atmospheric gas that allows solar radiation to pass through the atmosphere but absorbs the radiation that the earth emits back to space, thereby making the earth's surface warmer. These gases include water vapour, carbon dioxide, methane, ozone, and the fluorocarbons.

ground water. Underground water, consisting largely of surface water that has seeped down. It is the source of water in springs and wells.

habitat. The place where an organism lives and that provides it with the food, water, shelter, and space that it needs to survive.

hazardous waste. Waste containing substances that are dangerous to human health and/or the environment.

heat energy. A form of energy associated with the motion of atoms or molecules. The amount of heat energy increases as these particles move faster.

heat transfer. The transmission of heat through solid and fluid media by conduction, through fluid media by convection, and through empty space by radiation. Heat moves from hotter objects to cooler objects. No heat is transferred when the objects are at the same temperature.

herbivore. An animal that eats plants.

heterogeneous mixture. Any combination of substances that does not have uniform composition and properties (mechanical mixture).

hibernate. Be inactive during winter. Many insects, most reptiles and amphibians, and some mammals hibernate.

homogeneous mixture. A mixture of two or more substances that cannot be easily separated by common physical means (e.g., settling, filtration).

hydraulic systems. Systems that use the pressure of a liquid to do work.

hydroelectricity. Electricity that is produced by using the energy of running water to drive an electrical generator.

hydrometer. An instrument that uses buoyancy to measure the density of a liquid. It consists of a weighted tube that floats vertically. The tube has a scale that indicates the specific gravity, or density, of the liquid. The density of the liquid is determined by taking a reading on the scale at the point at which the surface of the liquid meets the floating tube.

hypothesis. A possible answer to a question or explanation of a phenomenon that accounts for all of the observed facts and is testable.

idler gear. An intermediate gear that is inserted between two or more other gear wheels. A single idler gear is used to reverse the direction of motion.

igneous rock. Rock that is formed when hot liquid rock from beneath the earth's surface rises, cools, and solidifies.

impermeable. Impassable; not permitting the passage of a fluid.

inorganic material. Material derived from non-organic or non-living sources.

input force. Force applied to a mechanism.

internal force. A force acting between the parts of a body.

introduced species. A species that is brought to an environment where it did not live before. Introduced species can cause great problems for native species and for people.

invasive species. A non-native species that is so reproductively successful and aggressive that it can dominate an area, often to the point of becoming a monoculture. It interferes seriously with the natural functioning and diversity of the system where it becomes established.

invertebrate. An animal without a backbone. Invertebrates include insects, arachnids (e.g., spiders and ticks), gastropods (e.g., snails and slugs), crustaceans (e.g., crayfish and isopods), centipedes, and worms.

investigation. Activity in which ideas, predictions, or hypotheses are tested and conclusions are drawn in response to a question or problem.

kinetic energy. The energy possessed by a system or object as a result of its motion.

lever. A rigid bar that can be turned freely about a fixed point. Levers are simple machines that make work easier.

life cycle. The sequence of developmental stages that an organism passes through in its lifetime.

lift. Upward force on a forward-moving object that results when the air flowing around the top of the object moves faster than the air flowing beneath it.

light. Radiative energy that can be detected by the human eye and makes things visible. When light strikes a surface it is absorbed, reflected, or transmitted.

limits to growth. Environmental limits to world population growth and to the use of non-renewable resources. The results of exceeding those limits could be a sudden and uncontrollable decline in both population and industrial capacity.

linear motion. Motion in which all parts of an object move in the same direction and in a straight, fixed path.

liquid. A state of matter in which the molecules of a substance are close together but free to move relative to each other. A liquid has a definite volume but no definite shape.

load. The mass or weight of an object that is moved by a machine, or the resistance to movement that a machine has to overcome.

machine. A device that reduces the force required to accomplish work. All machines are based on one or more simple machines. The simple machines are the lever, the pulley, the inclined plane, the wheel and axle, the wedge, and the screw.

magnetic force. A non-contact force produced by magnetic materials that attracts or repels other magnetic materials.

magnified drawing. A drawing that shows details that would be too small to see with the naked eye.

mammal. A warm-blooded, usually hairy animal that breathes air, gives birth to live offspring, and feeds milk to its young.

mass. The amount of matter in an object. Mass is measured in grams (g).

material. Matter from which other things can be made.

matter. Anything that takes up space and has mass. All substances and materials can be called matter.

mechanical advantage. In a machine, the ratio of the output force to the input force (i.e., output force divided by input force).

mechanism. A combination of parts designed to perform a specific function.

melting. Change of state from a solid to a liquid (also known as fusion). This process involves adding heat energy.

metamorphic rock. Rock formed when pre-existing rocks are changed by pressure or heat, or when sea water evaporates and the dissolved minerals are deposited on the sea floor.

metamorphosis. The transformation of an animal from one stage of its life cycle to another (e.g., from larva to adult).

meteoroid. A small solid extraterrestrial body, moving in space, that is smaller than an asteroid. When it enters the earth's atmosphere it is called a meteor.

microorganism. A living organism that can only be seen under a microscope. Microorganisms include bacteria, protozoans, and certain algae and fungi.

migration. The movement of animals from one region to another. In most cases organisms migrate to avoid local shortages of food, usually caused by winter or overpopulation. Animals may also migrate to a certain location to breed, as is the case with some fish.

mineral. A naturally occurring, homogeneous, inorganic, solid substance that has

a definite chemical composition and characteristic crystal structure.

mitochondria. Membranous organelles that are responsible for aerobic respiration in cells. They resemble a small bag with a larger bag inside that is folded back on itself.

mixture. The substance that is formed when two or more substances are added together. The substances are not chemically combined and may be separated again.

molecules. The smallest unit of a substance that displays all the properties of that substance. A molecule is composed of one or more atoms.

motion. Movement of an object in relation to its surroundings; a change of position that does not entail a change of location.

multicellular. Made up of two or more cells.

musculoskeletal system. The human system that gives us the ability to move. It consists of the muscular system and the human skeleton.

native species. A species that occurs naturally in a given area or region.

nervous system. A vast network of neurons and specialized tissues that regulates the actions and responses of an animal.

nitrogen. A colourless, odourless, gaseous element that makes up about four-fifths of the atmosphere and is present in combined forms in various minerals and in all animal and plant tissues.

nitrogen cycle. The circulation of nitrogen in nature, in which nitrates from the air are dissolved in falling rain, deposited in the soil, and taken in by plants, which are eaten by animals that die and decay, thereby returning the nitrogen to the soil. Nitrogen is returned to the atmosphere by bacteria that break down nitrogen

compounds formed in other parts of the cycle.

non-contact forces. Forces acting between two objects that are not in physical contact with each other (also called distant or at-a-distance forces). Magnetic and gravitational forces are non-contact forces.

non-renewable energy source. An energy source that is finite and cannot be renewed naturally. Examples are fossil fuels (natural gas, propane, coal, petroleum) and uranium.

nuclear energy. The energy released by a nuclear reaction; also called atomic energy.

nucleus. The central part of a plant or animal cell that is responsible for metabolism, growth, and reproduction. The positively charged centre of an atom, containing protons and neutrons.

nutrient. A substance that provides nourishment for growth and metabolism.

nutrient cycling. All of the processes involved in continuously transferring nutrients from one component of an ecosystem to another (e.g., air, water, soils, plants, animals).

omnivore. An animal that eats both plants and other animals.

opaque. Not allowing light to pass through.

optical. Relating to sight or the transmission or use of light.

organ. A part of the body, such as the heart or stomach, made of several different tissues, all working together to perform a specific function or group of functions.

organelles. Cell components that perform specific functions for the cell.

organic. Derived from living things; also, relating to or containing carbon compounds.

organic food. Food produced without using chemical fertilizers or pesticides.

organism. A form of life composed of mutually interdependent parts that maintain various vital processes (e.g., an animal, a plant, a fungus).

organ system. A group of organs that work together to perform a function.

osmosis. Movement of a fluid (usually water) through a selectively permeable membrane from an area of higher concentration to an area of lower concentration.

output force. Force exerted by a machine.

oxygen. A colourless, odourless, gaseous element that constitutes about one-fifth of the volume of the atmosphere and that all animals need to live.

ozone. A poisonous form of oxygen. It is harmful at ground level, but the ozone layer in the upper atmosphere shields life on earth from deadly ultraviolet radiation from space.

particle. An extremely small constituent of matter (e.g., grains of sand are particles; protons, neutrons, and electrons are particles that are in all matter).

particle theory of matter. The theory that explains the behaviour of solids, liquids, and gases. The particle theory of matter states that all matter is made up of tiny particles that are always moving, that attract each other, and that have space between them.

Pascal's law. Scientific law that states that, if pressure is applied to fluids that are confined, the fluids will then transmit that same pressure in all directions at the same time.

photosynthesis. The process by which green plants use the energy from sunlight to convert carbon dioxide and water into

nutrients, producing oxygen as a byproduct. Photosynthesis is very important, because it produces the oxygen and carbohydrates that animals (including people) need to live.

physical change. A change in the shape, appearance, or state of material so that it can still be recovered as the original material (e.g., expanding, tearing, crumpling, folding, freezing, melting, etc., of a solid, liquid, or gas). Physical changes are reversible.

pneumatic system. A system that uses the pressure of a gas.

polar ice cap. High-latitude region of a planet or moon that is covered in ice; also called a polar ice sheet.

pollution. Contamination of the air, water, or soil that causes harm to human health or the environment.

population. The number of individuals of a specific species in a specific area at a specific time.

potential energy. The energy of a body or system that results from the position of the body or the arrangement of particles within the system; stored energy. Common examples are the elastic potential energy of a stretched elastic band or the gravitational potential energy of water at the top of a hydroelectric dam.

precipitation. Solid or liquid water that falls from clouds to the ground.

pressure. A measure of the amount of force applied to a particular area.

primary succession. A community of plants and animals that develops where none existed before (e.g., on the tops of mountains, newly-formed volcanic rocks, rocks newly exposed by erosion or glaciers).

principle. A general or universal truth or law that is basic to other truths. That which is inherent in something and that determines its nature or essence.

producer. An organism that produces new organic material from inorganic material with the aid of sunlight.

protist. An organism that has the characteristics of both plants and animals. Algae are classified as protists.

pulley. A simple machine consisting of a wheel with a groove in which a rope can run to change the direction or point of application of a force applied to the rope.

pure substance. A substance made of only one kind of material and having uniform properties throughout.

rack and pinion system. A gear system composed of a round gear (the pinion) and a flat gear only (the rack).

radiation. Emission or transmission of energy in the form of rays, waves, or particles.

recycle. Reduce waste by reprocessing used materials into new materials. Aluminum cans may be melted, for example, then reformed as aluminum cans or made into other aluminum products.

reduce. Reduce waste by consuming less, so as not to have to reuse or recycle later.

reflection. Changing of the direction of a light ray by bouncing it off a surface. All objects reflect light to some extent (some, such as a mirror, better than others). Sound can also be reflected; a common example of this is an echo.

refraction. Bending of light as it travels from one material to another.

renewable energy. Energy that can be replenished by natural processes (e.g., energy from the sun, wind, tides, waves, and biomass).

renewable resource. Any natural resource that can be replenished naturally with the passage of time (e.g., a forest).

reptile. Cold-blooded, scaly-skinned vertebrate that breathes air and lives mostly on land. Turtles, snakes, and lizards are reptiles.

resistance. The opposition of a substance to the flow of electrical current through it. Resistance is measured in ohms.

respiration. The process that involves the transfer of oxygen to cells and the breakdown of food to release energy. In complex animals, respiration involves the intake of oxygen and the discharge of carbon dioxide.

respiratory system. The organs involved in breathing, including the nose, throat, larynx, trachea, bronchi, and lungs; also called the respiratory tract.

reuse. Reduce waste by using disposable materials such as packaging or building materials over again or by refurbishing worn or used products for further use.

rock. A naturally formed solid material composed of one or more minerals. Rocks make up a large part of the earth's crust.

runoff. Water (originating as precipitation) that flows across surfaces rather than soaking in. Runoff may pick up a variety of pollutants from the ground and carry them into a river or lake.

salinity. A measure of the amount of dissolved salt in water.

saturation. The state in which a solvent contains the maximum amount of solute it can hold and can absorb no more.

scat. Animal excrement. Many scats can be identified by their shape, size, and colour.

scavenger. An animal that eats dead or decaying material.

scientific literacy. The knowledge and understanding of scientific concepts and processes required for personal decision making, participation in civic and cultural affairs, and economic productivity. People who are scientifically literate can find or determine answers to questions about everyday experiences. They are able to describe, explain, and predict natural phenomena.

secondary succession. A community of organisms that replaces an original community that was destroyed by a natural or human-related event (e.g., a hurricane, forest fire, volcano).

sectional drawing. A drawing that shows what could be seen of the inside of an object if a slice were cut through it.

sedimentary rock. Rock formed from material, including debris of organic origin, deposited as sediment by water, wind, or ice, and then cemented together by pressure.

see-through drawing. A drawing that shows what could be seen of the inside of an object if the object were transparent.

simple machine. See **machine**.

sludge. Solid matter that settles to the bottom of septic tanks or the sedimentation ponds of wastewater treatment plants. Sludge must be disposed of by bacterial digestion or other methods or pumped out for land disposal or incineration.

smog. A form of air pollution. Smog is a mixture of air pollutants but consists mostly of ground-level ozone and fine particles.

soil. The loose layer of the earth’s surface, consisting of particles of rocks and minerals mixed with organic matter.

solar system. The sun together with all the planets and other celestial bodies that revolve around it.

solid. The state of matter in which molecules are packed tightly together and vibrate in place. A solid has a definite volume and a definite shape.

solidification. The process of changing into a hard or compact mass; the change from a liquid or gaseous form to a solid form.

solubility. Quality or property of being able to be dissolved; the amount of a substance that can be dissolved in a given amount of solvent.

solute. A substance dissolved in another substance, usually the component of a solution present in the lesser amount.

solution. A homogeneous mixture of two or more substances, which may be solids, liquids, gases, or a combination of these.

solvent. A liquid capable of dissolving another substance. Paint thinner, mineral spirits, and water are examples of solvents.

sound. A kind of energy that is produced by vibrating matter and transmitted by waves through air and other media; the sensation produced when these waves stimulate the organs of hearing. The eardrums convert this vibrational energy into signals that travel along nerves to the brain, which interprets them as voices, music, or noise.

specialized cells. Cells that perform specific functions in multicellular organisms. Groups of specialized cells work together to form tissue, such as muscle. Different tissues work together to form larger functional units, called organs. Each cell,

tissue, and organ has a distinctive structure and set of functions that meet the needs of the organism as a whole.

species. A set of organisms that have many characteristics in common and that can breed with each other to produce fertile offspring. A species is the smallest category of taxonomic classification. Humans, dogs, cats, buttercups, and daffodils are examples of species.

speed. The rate of motion; the amount of distance travelled in a given interval of time.

spur gear. The simplest, most common type of gear, generally in the form of a cylinder or disk, with teeth around its circumference. The purpose of the teeth is to mesh with similar teeth on another mechanical device, possibly another gear wheel, so that force can be transmitted between the two devices in a direction tangential to their surfaces.

stability. The ability of a mechanism to maintain equilibrium or a structure to resume its original, upright position after displacement by an external force.

states of matter. The three forms or phases – solid, liquid, and gas – in which matter occurs. Each state is determined by different levels of molecular energy and different modes of molecular interaction.

static electricity. An electrical charge that builds up on the surface of an object when it is rubbed against another object made of different material.

strands. The four major areas of knowledge and skills into which the curriculum for science and technology is organized. The strands for science and technology are: Understanding Life Systems, Understanding Structures and Mechanisms, Understanding Matter and Energy, and Understanding Earth and Space Systems.

strength. The capacity to withstand forces, such as tension, compression, torsion, and shear, that tend to break an object or change its shape; an object's ability to hold its shape without collapsing.

structure. Something made up of parts that are put together in a particular way for a particular purpose or purposes. There are three common types of structural forms. *Solid structures* rely on solid construction materials to support and transfer loads to the ground (e.g., a dam). *Frame or skeletal structures* use a light framework to support the structure, which may be enclosed with a non-load-bearing exterior covering (e.g., a modern house or a tent). *Shell or surface structures* have curved shapes and internal supports that give them a high load-bearing capacity (e.g., an airplane wing).

strut. A strut is a structural component designed to resist longitudinal compression. Struts provide outward-facing support in their lengthwise direction, and thus can be used to keep two other components separate. They perform the opposite function of a tie.

sublimation. Change of state from a solid to a vapour without first becoming liquid.

substance. Physical matter or material that has mass and occupies space; the stuff of which an object consists.

succession. The more or less predictable sequence of changes in the composition of communities following a natural or human disturbance of their environment. For example, after a gap is made in a forest by logging, clearing, fire, or treefall, the first trees to return (the "pioneer" species) are often fast-growing, shade-intolerant varieties. These are eventually replaced by shade-tolerant species that can grow beneath the pioneer species.

surface mining. A method of mining in which the mineral deposit is reached by removing the soil and rocks above it (the opposite of underground mining).

sustainability. A process that can be maintained without interruption, weakening, or loss of valued qualities. Sustainability ensures that a population remains within the carrying capacity of its environment.

system. A group of interacting, interrelated, or interdependent elements forming a complex whole.

technological literacy. The ability to use, manage, assess, and understand technology. A technologically literate person understands what technology is, how it is created, and how it shapes society and in turn is shaped by society.

temperature. The degree of hotness or coldness of a body or environment.

tension. A force that acts to expand or lengthen the thing it is acting on. Tension involves stretching or straining.

theory. A set of general statements that provide plausible explanations for certain phenomena. Theories can be used to predict the occurrence of certain events.

tie. A horizontal beam used to prevent two other structural members from spreading apart or separating.

torsion. A force that causes an object to twist along its axis.

toxic. Able to cause harm or death to living things.

triangulation. The use of a triangular frame to give strength and rigidity to a structure. A triangle cannot change shape, even if its joints are movable.

truss. A rigid framework, usually of wood or metal, designed to support a structure. A truss may derive its strength from the geometric rigidity of the triangle and be composed of straight members that are subject only to longitudinal compression, tension, or both, or it may derive its strength from other factors, such as the rigidity of joints, the abutment of masonry, or the stiffness of beams.

turbine. A rotary engine, usually made with curved vanes on a central rotating spindle, that is driven by a current of water, steam, or gas. Generators in electric power stations are usually driven by turbines.

vacuole. A large sac within the cytoplasm of a cell, composed of a single membrane.

vaporization. See **evaporation**.

variable. The component in an investigation that the investigator decides to change on a systematic basis.

variation. The differences between individuals within a species; for example, humans show variations in hair, eye, and skin colour and in size.

vein. A blood vessel that takes blood back to the heart from other parts of the body.

vertebrate. An animal with a backbone and a brain enclosed in a skull.

vibrate. Move back and forth rapidly.

viscosity. The resistance of a fluid to flow. Viscosity can be viewed as the effect of different layers of a fluid exerting a shearing force on each other, or on other surfaces, as they move against each other.

volume. The magnitude of sound.

water cycle. The cycle of evaporation and condensation that circulates water from the earth's surface to the atmosphere (as

water vapour) and back again (as precipitation); also called the hydrologic cycle.

watershed. The entire geographical area drained by a river and its tributaries. All runoff from within the watershed is conveyed to the same outlet.

water system. A river and all its branches or tributaries.

weather. The specific condition of the atmosphere at a particular place and time. It is measured in terms of such things as wind, temperature, humidity, atmospheric pressure, cloudiness, and precipitation. In most places, weather can change from hour to hour, day to day, and season to season.

weathering. The breakdown over time of rocks and sediments at or near the earth's surface as a result of biological, chemical, and physical processes.

weight. A measure of gravitational force (equal to the body's mass times the acceleration of gravity), commonly stated as a measure of the heaviness of an object.

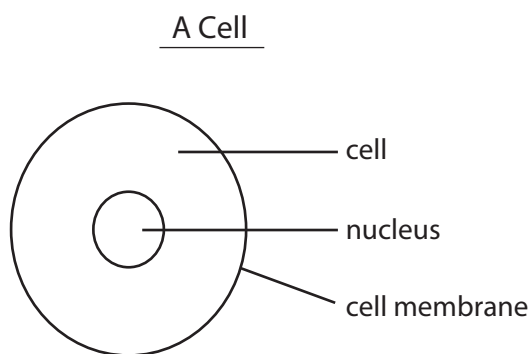
wetland. An area with soft, wet land intermingled with surface water; a marsh. Wetlands are valuable because of the habitat they provide for many animals and plants and their ability to clean up polluted water.

work. The amount of effort expended in moving an object. It is calculated as the amount of force applied to the object times the distance through which the force acts.

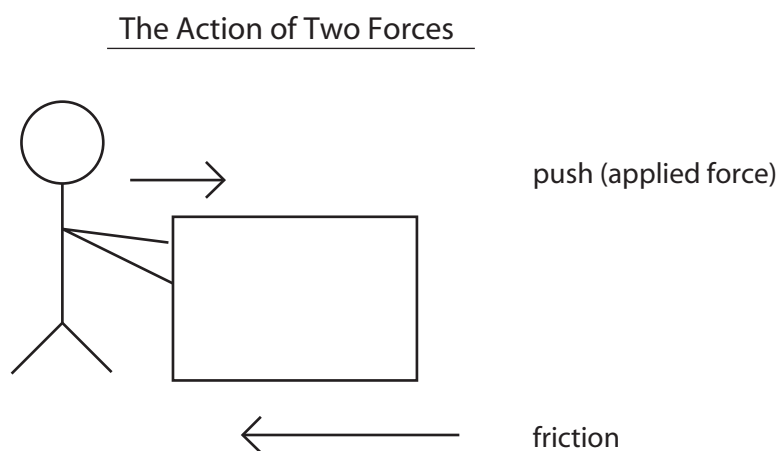
worm gear. A screw-shaped gear that turns against a spur gear and transmits motion between shafts that are at right angles.

Conventions for Scientific and Technical Diagrams

A diagram has a title, which is placed at the top and underlined. The title and all labels of elements in the diagram need to be printed clearly or typed. All labels are given in the singular form (e.g., *cell* not *cells*). All labels are placed on the right-hand side of the diagram, and are set a few spaces away from the diagram, never written on the diagram itself. Straight lines (not arrows) are used to connect labels to the appropriate part of the diagram. If the diagram has been produced from observations made using a microscope, the magnification is given. The following is an example of a properly labelled diagram:



For a diagram that shows the action of one or more forces, an arrow is used to show the direction of the force. The length of the arrow shows the magnitude of the force. Each force is clearly labelled. The following is an example of a diagram indicating the action of two forces:



Isometric technical drawings are those that represent three-dimensional figures. Teachers should set their own standards for these, basing them on diagram conventions and the ability of their students.

Orthographic technical drawings are those that represent various views of an object, such as the view from the front, back, top, and/or sides. Students should indicate the top, bottom, front, back, and at least one side on such a drawing.

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