

## GLOSSARY

- ABO blood types** The human blood group system based on the presence or absence of antigens on red blood cells.
- absorb** To take in or soak up.
- absorption** The process of absorbing or being absorbed (see absorb).
- adaptation** Any inherited characteristic that increases an organism's chance for survival and reproduction.
- allele** A variant, or version, of a gene.
- anthropocentrism** A view that humans are central to the universe.
- anthropomorphism** Giving human characteristics to non-human organisms or objects.
- antibiotic** Medications that are used to fight bacterial and fungal diseases.
- aorta** The main artery that carries oxygen-rich blood from the left ventricle of the heart to the body.
- archaea** Single-celled organisms that do not have a nucleus and differ from bacteria in their cell membranes and other organelles. They often live in extreme environments.
- arteries** Branching system of large diameter, muscular blood vessels that carry blood away from the heart. They carry oxygen-poor blood away from the heart to the lungs and oxygen-enriched blood to body tissues.
- asexual reproduction** Process by which organisms make exact copies of themselves without the union of gametes (sperm and egg cells).
- atrium (plural: atria)** One of the two upper chambers in the human heart that receives blood returning from the body or lungs.
- bacteria** Single-celled organisms that do not have a nucleus or other membrane-bound organelles.
- bioengineering** The field of engineering that develops technological solutions to study or solve biological problems.
- biome** A large region classified by the interaction of the living organisms, climate, and geographical features.
- blood pressure** The pressure exerted by blood against the walls of the blood vessels, generated by contractions of the heart.
- blood vessels** Tubular structures that carry blood throughout the body, consisting of veins, arteries, and capillaries.
- bone** The hardened connective tissue that forms the skeleton in most vertebrates.
- capillaries** Narrow blood vessels with thin walls through which gases and other fluids are able to pass.
- cardiovascular system** Closed circulatory system, characteristic of vertebrates, that includes one or more hearts and a branching network of arteries, capillaries, and veins.
- carrier** An organism that carries and transmits a disease without exhibiting symptoms of the disease. In the case of infectious diseases, the microbe that causes the disease is latent in the carrier, but can be transmitted to another individual. In the case of a genetic disease or condition, the recessive gene that causes the condition is masked in a heterozygous individual. This individual is unaffected by the condition, but can transmit the recessive allele to offspring, where it will be expressed if the other parent also donates a recessive allele for the condition.
- carrying capacity** The largest population of a species that can survive long-term based on the resources available.
- cartilage** Tough white fibrous connective tissue that is flexible and resists compression.
- cell** The smallest structural unit enclosed by a membrane that makes up all living organisms.
- cell division** The process by which a parent cell splits to form two daughter cells in order for an organism to grow and replace injured and worn out cells or to reproduce via asexual reproduction.

- cell membrane** The structure that separates the cell from its external environment.
- cellular respiration** The process in which oxygen is used to break down sugar from food.
- cell theory** All living organisms are made up of cells, cells are the basic units of structure and function in living organisms, and new cells are made from existing cells. While a theory when it was first proposed in the 1830s, this theory has been supported by extensive evidence and is now often known as the cell principle.
- chemical breakdown** The breaking up of larger molecules into smaller ones through the action of chemicals (for example, hydrochloric acid, enzymes).
- chromosome** A strand of DNA—and sometimes associated proteins—that contains the genes that store hereditary information.
- classification/classify** A process of grouping organisms into taxonomic levels based on shared characteristics and genetic relationships.
- clinical trial** The scientific investigation of a new treatment that has shown some benefit in animal or laboratory studies, but that has not yet been proven effective in humans.
- clone** An offspring produced by asexual reproduction, either naturally or through artificial processes.
- co-dominance** A condition in which two traits have equal dominance and, as a result, both traits can be observed distinctly in a heterozygous individual.
- competition** Interaction between organisms or species using the same limited resources, such as food and living space.
- consumer** Organism that must eat other organisms to obtain energy.
- control** A standard of comparison for checking or verifying the results of an experiment. In the parallel experiment a single variable is changed. The results are compared to the control in order to see if the variable had any effect.
- coronary arteries** The arteries that supply blood to the tissues of the heart.
- cross-section** A type of representation that shows what a view would look like when cutting through an object.
- cytoplasm** The material that fills much of the inside of cells.
- data** Factual information derived from scientific experiments.
- decomposer** An organism that obtains its energy by eating dead or decaying organisms or waste from living organisms.
- design** To develop a plan for a product or structure.
- digestive system** An integrated system consisting of specialized organs responsible for the ingestion, digestion, and absorption of food.
- disease** A breakdown in the structure and function of a living organism.
- DNA** Deoxyribonucleic acid; a long double-helical molecule, present in chromosomes, that contains the genes.
- DNA fingerprinting** A technique used to generate a unique pattern of DNA sequences from an individual, in order to identify the individual.
- dominant** The genetic condition in which one copy of a version of a gene (an allele) in an individual gives rise to an observed trait.
- ecologists** Scientists who study relationships between organisms and environments.
- ecology** The study of how living organisms interact with each other and with their physical environment.
- ecosystem** The interactions between organisms living in a specific area and their physical, non-living environment.
- egg cell** A cell produced by a female that contains half of the number of chromosomes present in other body cells. A female reproductive cell.
- emerging disease** Infectious disease that is new, due to evolution of a disease-causing agent, or has spread to new geographic areas.
- endangered species** A species that is in danger of becoming extinct due to loss of population or other threats.

- energy flow** The movement of energy through a system through producers and consumers.
- engineering** The field of applying science and technology to build products and/or solve practical problems.
- environment** The physical, chemical, and living factors in an area.
- epidemiologist** A scientist who traces the spread of a disease through a population.
- ethics** A system of principles that can guide decisions and practice in terms of whether something is morally right or just.
- evidence** Something that is helpful in forming a conclusion and is supported by data.
- evolution** The changes in species through time.
- excretory system** An integrated system consisting of specialized organs responsible for the removal of excess or harmful solutes, waste products, and excess water.
- extinct, extinction** A species in which the last member dies without any surviving offspring. Extinction is the process of becoming extinct.
- fertilization** The union of a male sperm and a female egg to form a zygote.
- field study** An investigation of organisms that is conducted outdoors.
- fluctuation** A change over time in size, numbers, or other characteristics.
- food web** A diagram that models the feeding relationships between organisms in an ecosystem.
- fossil** A remnant or impression left by an organism that lived in the past.
- fossil record** All of the information about past life that provides evidence about the history of life on Earth.
- full course** The complete prescription of an antibiotic from a doctor.
- function** The specialized activities performed by a system, organ, body part, or device.
- gene** A specific sequence of DNA that determines one or more traits.
- genotype** An individual's pair of alleles for a specific gene or group of genes that determine a trait.
- genus** A group of species that share specific characteristics and are related.
- germ theory of disease** The theory that microbes can cause infectious diseases.
- habitat** The specific environment where an organism lives based on what the organism requires to survive.
- heterozygous** An organism that has two different alleles for a specific trait.
- homozygous** An organism that has two identical alleles for a specific trait.
- hypothesis** A possible explanation for observations, facts, or events, that may be tested, verified, or answered by further investigation.
- immune system** A system of specialized cells that coordinate and communicate in order to inactivate foreign material.
- impaired** Diminished, damaged, or weakened in such a way that functioning becomes poor or ceases.
- incomplete dominance** A condition in which a heterozygous individual shows a trait that is different from either homozygote, and usually intermediate between them.
- indicator** A chemical that indicates the presence, absence, or concentration of a particular substance.
- infection** The presence of a disease caused by a pathogen, such as a bacteria or virus.
- infectious** A disease that is passed from one organism to another.
- inference** A conclusion, or the process of developing a conclusion based on evidence.

## Teacher Resource IV: More Resources

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- informed consent** Permission that is given by a patient to undergo a medical or surgical treatment or to participate in an experiment after the patient understands the risks involved.
- inherit, inherited** The passage of traits from parent to offspring.
- interneuron** Neurons in the brain and spinal cord of vertebrates that process signals arriving from sensory neurons and relay signals to motor neurons.
- introduced species** A species that has been moved by humans from its normal habitat to a new habitat, either intentionally or by mistake.
- invention** A new object, process, or technique that is useful in some way.
- invertebrate** An organism that does not have a jointed backbone.
- joint** A junction between two or more bones, usually allowing some form of motion.
- kingdom** Until 1990, the most general level of biological classification. Now the second level of classification, below the domain level.
- law of superposition** A scientific law that states that in a sequence of sedimentary rock layers, the youngest layer is closer to the earth's surface and the oldest layer is at the bottom.
- ligament** A band of dense connective tissue that bridges a joint by connecting the bones together.
- magnify, magnification** To enlarge an image of an object, the extent to which an image of an object is enlarged.
- mass** An object or a measurement of the amount of matter in an object.
- mechanical breakdown** The purely physical process of breaking down larger substances into smaller pieces without changing the chemical composition of the substance.
- microbe** A microscopic cellular organism or a virus.
- mitochondria** The organelles that produce most of the energy that cells need.
- motor neuron** Nerve cells connected to a muscle or gland that receive signals from interneurons and transfer signals to effector cells to produce a response in the muscle or gland.
- multicellular** An organism made up of many cells.
- muscular system** The system of muscles that help various parts of the body to move.
- musculoskeletal system** The muscular and skeletal systems working together to provide structure and support to the body, and to help the body to move.
- mutation** A change in the DNA of a gene that can lead to a different trait.
- natural selection** A process in which individuals with certain traits that give them a better chance for survival and reproduction pass their traits on to the next generation at a greater rate than individuals with less adaptive traits. These traits increase in the population, and over time this results in changes in the inherited characteristics of the population.
- nerves** Bundles of fibers containing neurons that carry signals to and from the central nervous system.
- nervous system** The body organ system in animals that coordinates and controls the actions of internal organs and body systems by receiving and processing sensory information from the external environment, and coordinating short-term reactions to these stimuli.
- neuron** A nerve cell that transmits messages.
- nuclear membrane** The structure that separates the nucleus from the rest of the cell.
- nutrients** Chemicals that an organism takes in from its environment to use as a source of energy or in promoting growth.
- observation** Any description or measurement gathered by the senses or instruments.
- organ** A collection of tissues which performs a particular function or set of functions.
- organelles** Cell structures, often surrounded by a separate membrane, that perform a specific function.

- pedigree** A tree constructed from data collected on a single trait within a family.
- petri dish** A dish that contains food for microbes that are being cultured or grown.
- phenotype** An organism's observable traits.
- photosynthesis** A process in which plants and algae use energy from sunlight to convert carbon dioxide and water into food.
- phylum/phyla** A group of Classes of organisms that share specific characteristics.
- placebo** An inactive substance given to a patient in order to compare its effects with those of a potential drug. In the clinical trial the placebo is acting as a control.
- placebo effect** Even though, in a clinical trial, a placebo should not directly produce any medical benefits, sometimes patients will report feeling better after taking it. This is referred to as the placebo effect.
- plankton** Small, usually microscopic, aquatic organisms that drift or weakly swim in the top layers of oceans, lakes, rivers, and ponds.
- population** A group of the same species of organisms living in a specific location or habitat.
- predator** An organism that kills another organism in order to eat it.
- prey** An organism that is consumed by another organism.
- producer** Organisms that are able to produce their own food, often through photosynthesis.
- prosthesis/prosthetic** An artificial replacement for a body part.
- protist** An organism made up of a single cell or many cells with a nucleus, and that is not an animal, plant, or fungus.
- prototype** An early model built for testing an idea.
- pulse** Rhythmic stretching of arteries caused by blood being forced through the arteries by contractions of the heart.
- Punnett square** A diagram that is used to show the likelihood of each outcome of a breeding experiment.
- qualitative** Information that is concerned with qualities, not numbers or quantities.
- quantitative** Information that is based on numerical measurements.
- quarantine** The period of isolation used to control the spread of an infectious disease.
- range** The limits between which variation is possible.
- recessive** The genetic condition in which a trait is not observed in the phenotype of a heterozygous individual.
- red blood cell** The blood cell that transports oxygen.
- regulation/regulate** The process of keeping chemicals and conditions in the body balanced.
- reproducible** Capable of being recreated and repeated.
- reproductive system** The system of organs and structures necessary for sexual activity and the production of offspring.
- resistant** The characteristic of bacteria that have an increased chance to survive and reproduce when there is an antibiotic present in the environment.
- respiratory system** The system of organs that work together to take oxygen into the body and to remove carbon dioxide from the body.
- risk factors** Factors that increase the chance of something negative happening.
- sample size** The number of observations in a sample.
- science** The systematic study of the natural world.
- scientific method** A set of processes used when conducting investigations. These generally involve making observations, collecting and analyzing data, and drawing conclusions, especially when testing scientific hypotheses.
- sensitivity** The degree of response of an organism or body part to stimulation.

## Teacher Resource IV: More Resources

**sensory neurons** Neurons that carry signals from receptors and transmit information about the environment to processing centers in the brain and spinal cord.

**sexual reproduction** Process by which a sperm cell from a male unites with an egg cell from a female to produce offspring that inherit traits from both.

**skeletal system** The organ system consisting of bones, cartilage, ligaments, and tendons that provide a rigid, supportive, and protective structure for an organism.

**species** A group of organisms with similar characteristics and evolutionary history that can successfully reproduce.

**sperm cell** Cell produced by a male that contains half of the chromosomes of body cells. A male sex cell.

**stimulate, stimulation** To temporarily increase the activity of an organism or body part by exciting a nerve or organ.

**stratigraphic column** A diagram representing a series of rock layers.

**structure** The way that an organ or body part is made up, including its shape and the types of tissues or other substructures that form it.

**surface area** The part of a structure that is exposed. For example, during digestion, mechanical breakdown of food increases the surface area of the food so that more of it is exposed to chemicals and is therefore digested more quickly. Increasing the surface area of a liquid speeds up the rate of evaporation or absorption.

**system (body system)** A group of organs that work together to perform a specific function.

**technology** The application of science to solve practical problems.

**tendon** A strip of connective tissue that connects muscle to bone.

**tissue** A group of similar cells and cellular material that perform a particular function.

**touch receptors** Areas of the skin that contain collections of nerve endings that respond to the pressure of touch by sending nerve impulses to other parts of the nervous system.

**toxin** A chemical produced by one organism that is harmful to another organism.

**trade-off(s)** Potential outcome of any type of decision or action that involves some form of compromise, especially when each of the possible choices involves both advantages and disadvantages. When one option is chosen over another during a decision-making process, any desired outcome that must be given up is called a trade-off.

**trait** A specific version of a characteristic that varies from one individual to another.

**vaccine, vaccination** A substance that stimulates the body's immune response in order to prevent or control an infection, and the process of administering that preparation.

**valves** Structures that allow fluids to flow only in one direction. In the heart they are flaps that open to allow blood to flow through in one direction and close to prevent blood from flowing in the opposite direction.

**variable** The only factor in a scientific experiment that is different from the control group.

**variation** Differences in individuals of the same species.

**vector** An organism that spreads disease-causing microbes from one host to another without getting sick itself.

**veins** Blood vessels that carry blood from the capillaries back to the heart.

**ventricle** The large, lower chambers of the heart that pump blood.

**vertebrate** An organism with a jointed backbone.

**virus** A microbe that is not made of cells and cannot grow or reproduce outside of a living cell.

**voluntary** A type of action that is under the control of the individual. One that can be done differently, or stopped, if the individual chooses to do so.

**white blood cell** One type of cell in the immune system that is responsible for fighting infections.