

## CHAPTER

**26****MS Life Science Glossary****CHAPTER OUTLINE**

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## 26.1 A

**abiotic** Physical (nonliving) properties of an organism's environment, such as sunlight, climate, soil, water and air.

**ABO blood type system** Blood group system that is determined by the presence or absence of certain molecules, called antigens, on the surface of red blood cells (RBCs); there are four blood types in the ABO system: A, B, AB, and O.

**abscisic acid** Plant hormone involved in maintaining dormancy and closing the stomata.

**absorption** Process in which substances are taken up by the blood; after food is broken down into small nutrient molecules, the molecules are absorbed by the blood.

**acid rain** Precipitation or deposits with a low (acidic) pH.

**acquired trait** A feature that an organism gets during its lifetime in response to the environment (not from genes); not passed on to future generations through gene

**active transport** The movement of a molecule from an area of lower concentration to an area of higher concentration; requires a carrier protein and energy.

**adaptation** A beneficial trait that helps an organism survive in its environment.

**adolescence** Period of life between the start of puberty and the beginning of adulthood.

**aerobic exercises** Types of exercises that cause the heart to beat faster and allow the muscles to obtain energy to contract by using oxygen.

**aerobic respiration** Cellular respiration in the presence of oxygen.

**aerofoil** A surface which is designed to aid in lifting or controlling by making use of the air currents through which it moves.

**AIDS** Acquired immune deficiency syndrome, which is a fatal condition caused by the human immunodeficiency virus (HIV).

**alcoholic fermentation** Fermentation in the absence of oxygen; produces ethyl alcohol (drinking alcohol) and carbon dioxide; occurs in yeasts.

**algal bloom** Excessive growth of aquatic vegetation or phytoplankton as a result of eutrophication.

**allele** An alternative form of a gene.

**allergen** A substance that triggers an allergy.

**allergy** A condition that occurs when the immune system attacks a harmless foreign substance.

**allopatric speciation** Speciation that occurs when groups from the same species are geographically isolated physically for long periods.

**alternation of generations** A lifecycle that alternates between a haploid gametophyte and a diploid sporophyte; characteristic of plants.

**altricial** Newborn that are helpless at birth and require much parental care.

**alveoli** Little *sacs* at the end of the bronchioles where most of the gas exchange occurs.

**amino acid** The units that combine to make proteins.

**amniotes** Vertebrates whose embryos are surrounded by an amniotic membrane.

**amniotic sac** Fluid-filled membrane that surrounds and protects a fetus within the uterus.

**anaerobic exercise** Types of exercises that involve short bursts of high-intensity activity; forces the muscles to obtain energy to contract without using oxygen.

**anaerobic respiration** Cellular respiration in the absence of oxygen; fermentation.

**anaphase** Third phase of mitosis and meiosis (anaphase I and anaphase II) where sister chromatids separate and move to opposite sides of the cell.

**angina** Chest pain caused by the lack of oxygen to the heart muscle; can happen during times of stress or physical activity.

**angiosperms** Plants with vascular tissue, seeds, and flowers.

**animal behavior** Any way that animals act, either alone or with other animals.

**anther** The pollen-containing structure in a flower.

**antibody** Protein that identifies pathogens or other substances as being harmful; can destroy pathogens by attaching to the cell membrane of the pathogen.

**antidiuretic hormone (ADH)** Hormone that controls the absorption of water back into blood.

**antigen** Any protein that triggers an immune response; usually a foreign protein, unlike any protein that the body makes.

**anvil** Second of three tiny bones that pass vibrations through the ear.

**apical dominance** Suppressing the growth of the side branches of a plant.

**applied science** The application of science to practical problems.

**aquaculture** The raising of aquatic plants and animals, especially seaweed, shellfish and other fish.

**aquatic biomes** Biomes divided into freshwater and marine biomes and defined according to different physical and ecological factors.

**Archaea** Microscopic one-celled organisms with no nucleus that tend to live in extreme environments.

**arteries** Blood vessels that carry blood away from the heart.

**artificial selection** Occurs when humans select which plants or animals to breed to pass specific traits on to the next generation.

**asexual reproduction** A form of reproduction in which a new individual is created by only one parent.

**asthma** A chronic illness in which the bronchioles are inflamed and become narrow.

**atherosclerosis** A chronic inflammation of the walls of arteries that causes swelling and a buildup of material called plaque.

**atom** The simplest and smallest particle of matter that still retains the physical and chemical properties of the element; the building block of all matter.

**atomic number** The number of protons in an element.

**ATP** A usable form of energy inside the cell; adenosine triphosphate.

**atrioventricular (AV) valves** Valves that stop blood from moving from the ventricles back into the atria.

**atrium** One of the two small, thin-walled chambers on the top of the heart that blood first enters.

**autoimmune disease** A disease that occurs when the immune system attacks the body's own cells.

**autonomic nervous system** Part of the motor division that carries nerve impulses to internal organs and glands.

**autosomes** The chromosomes other than the sex chromosomes.

**autotroph** Organism that produces complex organic compounds from simple inorganic molecules using a source of energy such as sunlight.

**auxin** Plant hormone involved in tropisms and apical dominance.

**axon** Part of a neuron that receives nerve impulses from the cell body and passes them on to other cells.

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## 26.2 B

**bacilli** Rod-shaped bacteria or archaea.

**bacteria** Microscopic one-celled prokaryotic organisms (without a nucleus).

**ball and socket joint** Joint structure in which the ball-shaped surface of one bone fits into the cuplike depression in another bone; examples include the shoulder and hip joints.

**barbel** A thin fleshy structure on the external part of the head, such as the jaw, mouth or nostrils, of certain fishes.

**basic science** Research whose goal is just to find out how the world works, not to solve an urgent problem. Basic research is the source of most new scientific information and nearly all new theories.

**behavioral isolation** The separation of a population from the rest of its species due to some behavioral barrier, such as having different mating seasons.

**bilateral symmetry** Body plan in which the left and right side are mirror images.

**binary fission** An asexual form of reproduction where a cell splits into two daughter cells.

**binomial nomenclature** The system for naming species in which the first word is the genus and the second word is the species.

**biodiversity** The number of different species or organisms in an ecological unit (i.e. biome or ecosystem).

**biogeochemical cycles** The pathway of elements like carbon and nitrogen through the non-living and living parts of the ecosystem.

**biohazard** Any biological material, such as infectious material that poses a potential to human health, animal health, or the environment.

**biological clock** Tiny structure in the brain that controls circadian rhythms.

**biome** A large community of plants and animals that live in the same place.

**biosphere** The part of the planet and atmosphere with living organisms.

**biotic** Biological (living) properties of an environment, i.e., the living organisms in a habitat.

**birth rate** Number of births per individual within the population per unit time.

**blood** A body fluid that is a type of connective tissue; moves oxygen and other compounds throughout the body.

**blood clotting** The complex process by which blood forms solid clots.

**blood pressure** The force exerted by circulating blood on the walls of blood vessels.

**bone marrow** Soft connective tissue found inside many bones; site of blood cell formation.

**brain** Control center of the nervous system that is located inside the skull.

**brain stem** Part of the brain that controls basic body functions, such as breathing, heartbeat, and digestion.

**breast cancer** Most common type of cancer in females; occurs when cells of the breast grow out of control and form a tumor.

**bronchitis** An inflammation of the bronchi.

**budding** Asexual reproduction in which part of the body of a fungus, for example, grows and breaks off, eventually becoming a new organism.

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## 26.3 C

**calorie** Unit used to measure the energy in food.

**calyx** The sepals collectively; outermost layer of the flower.

**Cambrian explosion** A sudden burst of evolution that may have been triggered by an environmental change(s); made the environment more suitable for a wider variety of life forms; occurred during the Cambrian Period.

**camouflage** An appearance which helps a species blend into the background.

**cancer** A disease in which abnormal cells divide out of control.

**capillaries** The smallest and narrowest blood vessels in the body.

**carapace** The thick dorsal shield seen in many crustaceans; often forms a protective chamber for the gills.

**carbohydrate** Nutrient that include sugars, starches, and fiber; give your body energy; class of organic compound.

**carcinogen** Anything that can cause cancer.

**cardiac muscle** An involuntary and specialized kind of muscle found only in the heart.

**cardiovascular disease (CVD)** Any disease that affects the cardiovascular system, although the term is usually used to describe diseases that are linked to atherosclerosis.

**cardiovascular system** The organ system that is made up of the heart, the blood vessels, and the blood.

**carnivore** An organism that eats other animals.

**carpel** *Female* portion of the flower; consists of stigma, style, and ovary.

**carrying capacity** Maximum population size that can be supported in a particular area without degradation of the habitat.

**cartilage** Smooth covering found at the end of bones; made of tough collagen protein fibers; creates smooth surfaces for the easy movement of bones against each other.

**cartilaginous skeleton** A skeleton made of bone-like material called cartilage.

**cell** The smallest living unit of life; the smallest unit of structure and function of living organisms.

**cell body** Part of a neuron that contains the nucleus and other organelles.

**cell cycle** Phases in the "life" of eukaryotic cells that leads to cell division.

**cell theory** All organisms are composed of cells; cells are the basic units of structure and function in an organism; cells only come from preexisting cells.

**cellular respiration** The process in which the energy in food is converted into energy that can be used by the body's cells; in other words, glucose is converted into ATP.

**cell wall** Provides strength and protection for the cell; found around plant, fungal, and bacterial cells.

**central nervous system** Part of the nervous system that includes the brain and spinal cord.

**central vacuole** Large organelle containing water, nutrients, and wastes; can take up to 90% of a plant cell's volume.

**cephalization** Having a head region with a concentration of sensory organs and central nervous system.

**cephalothorax** The anterior part of the arachnid body, derived from the fusion of the head and thorax.

**cerebellum** Part of the brain that controls body position, coordination, and balance.

**cerebrum** Part of the brain that controls awareness and voluntary movements.

**cervix** Narrow part of the uterus where it connects with the vagina.

**character displacement** Occurs when two or more species within the same area develop different specializations in order to coexist.

**chemical digestion** Digestion in which large food molecules are broken down into small nutrient molecules.

**chemical reaction** A process that breaks or forms the bonds between atoms.

**chemotroph** Organism that obtains energy by oxidizing compounds in their environment.

**childbirth** Process through which a baby passes from the uterus, through the vagina, and out of the mother's body.

**childhood** Period between a baby's first birthday and puberty.

**chitin** A nitrogen-containing material found in the cell wall of fungi; also found in the shells of animals such as beetles and lobsters.

**chlamydia** Most common bacteria causing sexually transmitted disease (STD) in the United States.

**chlorophyll** Green pigment in leaves; helps to capture solar energy.

**chloroplast** The organelle in which photosynthesis takes place.



**chromatin** Complex of DNA and proteins; visible when a cell is not dividing.

**chromosome** DNA wound around proteins; forms during prophase of mitosis and meiosis.

**chronic disease** A disease that lasts for a long time, perhaps a few years or longer.

**chronic obstructive pulmonary disease (COPD)** A disease of the lungs in which the airways become narrowed; leads to a limitation of the flow of air to and from the lungs causing shortness of breath.

**cilia** Finger-like projects from the cells; can be found from the cells of mucous membranes.

**circadian rhythms** An organism's daily cycles of behavior.

**classify** To organize into groups or categories; scientists classify organisms by their physical features and how closely related they are.

**climax community** A stable community that is the end product of succession.

**cloning** Creating an identical copy of a gene, or an an individual with the same genes.

**club mosses** Seedless vascular plants that resemble mosses.

**cnidarians** Invertebrates that have radial symmetry; includes the jellyfish.

**cocci** Sphere-shaped bacteria or archaea.

**cochlea** Liquid-filled structure in the ear that senses vibrations and generates nerve impulses in response.

**codominance** A pattern of inheritance where both alleles are equally expressed.

**commensalism** type of symbiosis in which one species benefits while the other is not affected.

**communication** Any way that animals share information.

**community** Populations of different species that occupy the same area and interact with each other.

**competition** Organisms of the same or different species compete for a limited supply of at least one resource, thereby lowering the fitness of one organism by the presence of the other.

**competitive exclusion principle** Species less suited to compete for resources will either adapt, be excluded from the area, or die out.

**complete digestive tract** A digestive tract with two openings, a mouth and anus.

**complete flowers** Flowers that contain all four structures: sepals, petals, stamens, and one or more carpels.

**compound** Any combination of two or more elements.

- concentration** The amount of a substance in relation to the volume.
- concussion** Bruise on the surface of the brain; the mildest and most common type of brain injury.
- conditioning** Way of learning that involves a reward or punishment.
- conifers** Group of gymnosperms that bear cones; includes spruces, pine, and fir trees.
- conjugation** The transfer of genetic material between two bacteria.
- connective tissue** Tissue that is made up of different types of cells that are involved in structure and support of the body; includes blood, bone, tendons, ligaments, and cartilage.
- consumer** An organism that must eat other organisms to obtain energy and nutrients.
- contraction** Shortening of muscle fibers.
- convergent adaptation** The appearance of similar traits in groups of animals that are evolutionarily unrelated to each other.
- cooperation** Working together with others for the common good.
- corals** Cnidarians that live on ocean reefs in colonies.
- cornea** Clear, protective covering on the outside of the eye that helps focus light.
- corolla** The petals of a flower collectively are known as the corolla.
- coronary heart disease** The end result of the buildup of plaques within the walls of the coronary arteries.
- courtship behaviors** Special behaviors that help attract a mate.
- cranium** a braincase
- crossing-over** Exchange of DNA segments between homologous chromosomes; occurs during prophase I of meiosis.
- cross-pollination** Sexual reproduction in plants where sperm from the pollen of one flower is received by the ovary of another flower.
- cuticle** Waxy layer that aids water retention in plants.
- cyanobacteria** Photosynthetic bacteria.
- cytokinesis** Division of the cytoplasm after mitosis or meiosis.
- cytokinins** Plant hormone involved in cell division.
- cytoplasm** All the contents of the cell besides the nucleus, including the cytosol and the organelles.
- cytoskeleton** The internal scaffolding of the cell; maintains the cell shape and aids in moving the parts of the cell.
- cytosol** A fluid-like substance inside the cell; organelles are embedded in the cytosol.

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## 26.4 D

**daughter cell** Cells that divide from the parent cell after mitosis or meiosis.

**death rate** Number of deaths within the population per unit time.

**decomposer** Organism that break down wastes and dead organisms and recycle their nutrients back into the environment.

**dendrite** Part of a neuron that receives nerve impulses from other cells and passes them on to the cell body.

**dermis** The layer of skin directly under the epidermis; made of a tough connective tissue that contains the protein collagen.

**desertification** A process leading to production of a desert of formerly productive land.

**diabetes** A disease in which the pancreas cannot make enough insulin.

**diaphragm** A sheet of muscle that extends across the bottom of the rib cage.

**digestion** Process of breaking down food into nutrients.

**digestive system** Body system that breaks down food, absorbs nutrients, and gets rid of solid food waste.

**diffusion** Movement of molecules from an area of high concentration to an area of low concentration; does not require energy.

**diploid** When a cell has two sets of chromosomes.

**dispersion** The spacing of individuals within a population.

**display behavior** Fixed set of actions that carries a specific message.

**DNA** Deoxyribonucleic acid; a nucleic acid that is the genetic material of all organisms.

**DNA replication** The synthesis of new DNA; occurs during the S phase of the cell cycle.

**domain** The least specific category of classification.

**dominant** Masks the expression of the recessive trait.

**dormant** Halting growth and development temporarily.

**double helix** The shape of DNA; a double spiral, similar to a spiral staircase.

**drug** Any chemical substance that affects the body or brain.

**drug abuse** Use of a drug without the advice of a doctor or for reasons other than those for which the drug was intended.

**drug addiction** Condition in which a drug takes over people's lives and they cannot stop using the drug even if they want to.

**drug overdose** Taking so much of a drug that it causes serious illness or death.

**duodenum** The first part of the small intestine; where most chemical digestion takes place.

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## 26.5 E

**ear** Sense organ that detects sound.

**ear canal** Tube-shaped opening in the ear that carries sound waves to the eardrum.

**eardrum** Membrane in the ear that vibrates when sound waves hit it.

**ecdysis** The ability to regenerate lost limbs, as well as other body parts.

**ecological succession** The continual replacement of one community by another; occurs after some disturbance of the ecosystem.

**ecology** The scientific study of how living organisms interact with each other and with their environment.

**ecosystem** A natural unit composed of all the living forms in an area, functioning together with all the abiotic components of the environment.

**ectothermic** cold-blooded; temperature depends on the temperature of their environment.

**eggs** female gametes or sex cells

**electron** A negatively charged particle in the atom, found outside of the nucleus.

**electron microscope** Microscope used to create high magnification (magnified many times) and high resolution (very clear) images.

**element** A substance that cannot break down into a simpler substance with different properties.

**elevation** Measures how high land is above sea level.

**embryo** An animal or plant in its earliest stages of development, before it is born or hatched.

**embryology** The study of how organisms develop.

**emigration** Movement of individuals out of a population.

**emphysema** A chronic lung disease caused by loss of elasticity of the lung tissue.

**endoplasmic reticulum (ER)** A folded membrane organelle; rough ER modifies proteins and smooth ER makes lipids.

**endostyle** Used to gather food particles and move them along the digestive tract.

- environmental tobacco smoke (ETS)** Secondhand smoke, which greatly increases the risk of lung cancer and heart disease in nonsmokers.
- enzyme** A substance, usually a protein, that speeds up a biochemical reaction.
- epidermis** The outermost layer of the skin; forms the waterproof, protective wrap over the body's surface; made up of many layers of epithelial cells.
- epididymis** Male reproductive organ where sperm mature and are stored until they leave the body.
- epiglottis** A flap of connective tissue that closes over the trachea when food is swallowed; prevents choking or inhaling food.
- epithelial tissue** A tissue that is composed of layers of tightly packed cells that line the surfaces of the body; examples of epithelial tissue include the skin, the lining of the mouth and nose, and the lining of the digestive system.
- erosion** Process by which the surface of the Earth is worn away by the action of winds, water, waves, glaciers, etc.
- esophagus** The narrow tube that carries food from the throat to the stomach.
- essential amino acids** Amino acids that must come from the proteins in foods; you cannot make these amino acids.
- estrogen** The main sex hormone in females.
- ethylene** Plant hormone involved in fruit ripening and abscission.
- Eukarya** Domain in which cells have a nucleus; includes plants, animals, fungi, and protists.
- eukaryote** Cell belonging to the domain Eukarya (fungi, animals, protists, and plants); has membrane-enclosed nucleus and organelles.
- evidence** Something that gives us grounds for knowing of the existence or presence of something else.
- evolution** The process in which something passes to a different stage, such as a living organism turning into a more advanced or mature organism; the change of the inherited traits of a group of organisms over many generations.
- evolutionary tree** Diagram used to represent the relationships between different species and their common ancestors.
- excretion** The process of removing wastes from the body.
- excretory system** The organ system that maintains homeostasis by keeping the correct balance of water and salts in your body; also helps to release wastes from the body.

**exhalation** Pushing air out of the body through the nose or mouth.

**exocuticle** The thin and waxy water resistant outer layer of the cuticle.

**experiment** A test to see if a hypothesis is right or wrong; a test to obtain new data.

**extensor** The muscle that contracts to cause a joint to straighten.

**external fertilization** Reproduction where the eggs are fertilized outside the body.

**external respiration** The movement of oxygen into the body and carbon dioxide out of the body.

**extinct** Something that does not exist anymore; a group of organisms that has died out without leaving any living representatives.

**extinction** The cessation of existence of a species or group of taxa.

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## 26.6 F

**F1 generation** The first filial generation; offspring of the P or parental generation.

**F2 generation** The second filial generation; offspring from the self-pollination of the F1 generation.

**fallopian tubes** Female reproductive organs through which eggs pass to reach the uterus, and where an egg may unite with a sperm.

**feedback regulation** Control of a biological process based on the effect of a stimulus.

**fermentation** Anaerobic respiration in which  $\text{NAD}^+$  is recycled so that it can be reused in the glycolysis (the breakdown of glucose) process.

**ferns** Seedless vascular plants that have large, divided fronds.

**fertilization** Union of a sperm and egg; occurs in a fallopian tube.

**fetus** Stage of a developing baby between the end of the 8th week after fertilization and birth.

**fever** Higher than normal body temperature.

**fibrin** A tough protein that forms strands during the blood clotting process.

**field scientist** Scientists who work outdoors.

**filter-feeder** An organism that feeds by filtering organic matter out of water.

**flagellum (plural flagella)** A tail-like structure that projects from the cell body of certain prokaryotic and eukaryotic cells, and it usually functions in helping the cell move.

**flexor** The muscle that contracts to cause a joint to bend.

**follicle** Nest of cells in an ovary that enclose an egg; protects egg during maturation prior to ovulation.

**food allergies** A condition in which the immune system reacts to harmless substances in food as though they were harmful.

**food chain** A visual representation of the flow of energy from producers to consumers in a community.

**food web** A visual representation of the complex eating relationships in a community; a cross-linking of food chains.



**fossil** The preserved remains or traces of animals, plants, and other organisms from the distant past; examples include bones, teeth, impressions, and leaves.

**fossil fuels** Fuels made from partially decomposed organic matter that has been compressed underground for millions of years; examples are: coal, natural gas, and oil.

**fossil record** Fossils and the order in which fossils appear; provides important records of how species have evolved, divided and gone extinct.

**fracture** Bone injury, often called a *break*; usually caused by excess bending stress on bone.

**fruiting body** Specialized structure used in sexual reproduction; part of the fungus that produces the spores.

## 26.7 G

**GAIA hypothesis** The concept that the biosphere is itself a living organism.

**Galápagos Islands** A group of islands in the Pacific Ocean off South America; known for unusual animal life. Many scientists, including Charles Darwin, made many discoveries that led to and support the theory of evolution by natural selection, while studying the plants and animals on these islands.

**gamete** Haploid sex cell; egg or sperm.

**ganglia** A compact group of nerve cells having a specific function.

**gas exchange** The movement of oxygen across a membrane and into the blood and the movement of carbon dioxide out of the blood.

**gastric mill** A gizzard-like structure for grinding food.

**gastrovascular cavity** A large cavity having both digestive and circulatory functions.

**gene** The inherited unit of DNA that encodes for one protein (or one polypeptide).

**gene therapy** The insertion of genes into a person's cells to cure a genetic disorder.

**genetics** The study of inheritance.

**genital herpes** Common sexually transmitted disease (STD) that is caused by the herpes virus.

**genome** All of the genes in an organism.

**genotype** The genetic makeup of a cell or organism, defined by certain alleles for a particular trait.

**genus** The first word in the two word name given to every organism.

**geographic isolation** The separation of a population from the rest of its species due to some physical barrier, such as a mountain range, an ocean, or great distance.

**geologic time scale** A time scale used to describe when events happened in the history of Earth.

**gibberellins** Plant hormone involved in seed germination and stem elongation.

**ginkgo** Tree known as the *living fossil* because it is the only species left in the phylum Ginkgophyta.

**gliding joint** Joint structure that allows one bone to slide over the other; examples includes the joints in the wrists and ankles.

**global warming** Global increase in the Earth's temperature due to human activities that release greenhouse gasses into the atmosphere.

**golgi apparatus** The organelle where proteins are modified, labeled, packaged into vesicles, and shipped.

**gonad** Organ that produces gametes, such as the ovaries and testes.

**gonorrhea** Common sexually transmitted disease (STD); caused by bacteria.

**gravitropism** Plant growth towards or away from the pull of gravity.

**greenhouse gases** The cause of global warming by certain gases via the greenhouse effect.

**groundwater** Underground water reserves.

**gymnosperms** Seed plant where seeds are not enclosed by a fruit.

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## 26.8 H

**habitat** Ecological or environmental area where a particular species live.

**habituation** Learning to get used to something that is not dangerous, after being exposed to it for awhile.

**hallucinogenic drug** Psychoactive drug that can cause strange sensations, perceptions, and thoughts.

**halophiles** Organisms that live and thrive in very salty environments.

**hammer** First of three tiny bones that pass vibrations through the ear.

**haploid** When a cell has only one set of chromosomes, typical of a gamete.

**harem** A group of females followed or accompanied by a fertile male; this male excludes other males access to the group.

**hearing** The ability to sense sound.

**heart attack** Event that occurs when the blood supply to a part of the heart is blocked.

**hemoglobin** Protein that moves oxygen throughout the blood.

**hemophilia** A group of hereditary diseases that affect the body's ability to control blood clotting.

**hepatitis B** Sexually transmitted disease (STD) that damages the liver and is caused by a virus called hepatitis B.

**herbivore** A consumer of producers in a community; often organisms that eat plants.

**heterozygous** Having two different alleles for a particular trait.

**heterotroph** Organism which obtains carbon from outside sources.

**hibernation** State in which an animal's body processes are slower than usual.

**hinge joint** Joint structure in which the ends of bones are shaped in a way that allows motion in two directions only (forward and backward); examples include the knees and elbows.

**HIV** The human immunodeficiency virus, which causes AIDS.

**homeostasis** Maintaining a stable internal environment despite changes in the environment.

**homing** The ability of an insect to return to a single hole among many other apparently identical holes, after a long trip or after a long time

**homozygous** Having identical alleles for a particular trait.

**hormones** Chemical messengers that signal responses to stimuli.

**hornworts** Seedless nonvascular plants with hornlike sporophytes.

**horsetails** Seedless vascular plants with hollow, rigid stems.

**Human Genome Project** International effort to sequence all the base pairs in human DNA; completed in 2003.

**humidity** The amount of water in the air.

**hybrid** The offspring of different species, genera, varieties or breeds.

**hydropower** Use of power from falling water or other water movement to generate and distribute electricity; also known as hydroelectric power.

**hydroskeleton** Fluid-filled body cavity that provides support for muscle contraction.

**hyoid bone** A U-shaped bone at the root of the tongue; in salamanders it is used to help catch prey.

**hypertension** Also called high blood pressure; a condition in which a person's blood pressure is always high; the systolic blood pressure is always 140 mm Hg or higher, and/or their diastolic blood pressure is always 90 mm Hg or higher.

**hypertonic solution** Having a higher solute concentration than the cell; cell will lose water by osmosis.

**hyphae** Thread-like structures which interconnect and bunch up into mycelium; helps bring food, such as a worm, inside the fungus.

**hypothesis** A proposed explanation for something that is testable.

**hypotonic solution** Having a lower solute concentration than the cell; cell will gain water by osmosis.

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## 26.9 I

**ileum** The third part of the small intestine; covered with villi; the few remaining nutrients are absorbed in the ileum.

**immigration** Movement of individuals into a population from other areas.

**immune response** The specific third line of defense against pathogens; involves the immune system.

**immune system** System that protects the body from pathogens and other causes of disease.

**immunity** Ability to resist a pathogen because cells of the immune system remember the pathogen from a previous infection or vaccination.

**incomplete digestive tract** A digestive tract with only one opening.

**incomplete dominance** A pattern of inheritance where the offspring has a phenotype that is halfway between the two parents' phenotypes.

**incomplete flowers** Flowers that are missing one or more structures: sepals, petals, stamens, or carpels.

**infancy** The first year of life after birth.

**infectious disease** A disease that spreads from person to person.

**inflammation** Reaction causing redness, warmth, and pain that occurs at the site of an infection or injury.

**ingredient** A specific item that a food contains.

**inhalation** Taking air into the body through the nose and mouth.

**inherited traits** Features that are passed from one generation to the next.

**innate behavior** Any behavior that occurs naturally in all animals of a given species.

**insight learning** Learning from past experiences and reasoning.

**instinct** Any behavior that occurs naturally in all animals of a given species; another term for an innate behavior.

**integumentary system** The outer covering of the body; made up of the skin, hair, and nails.

**internal fertilization** Reproduction that occurs through the internal deposit of gametes.

**internal respiration** The exchange of gases between the blood and the cells of the body.

**interphase** Stage of the cell cycle when DNA is synthesized and the cell grows; composed of the first three phases of the cell cycle.

**invasive species** Exotic species, introduced into habitats, which then eliminate or expel the native species.

**invertebrate** Animal without a backbone.

**involuntary muscle** A muscle that a person cannot consciously control; cardiac muscle and smooth muscle are involuntary.

**iris** Colored structure at the front of the eye.

**isotonic solution** A solution in which the amount of dissolved material is equal both inside and outside the cell; no net gain or loss of water.

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## 26.10 J

**jejunum** The second part of the small intestine; where most nutrients are absorbed into the blood; lined with tiny “fingers” called villi.

**joint** Point at which two or more bones meet.



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## 26.11 K

**keratin** Tough, waterproof protein that is found in epidermal skin cells, nail, and hair.

**keystone species** A predator species that plays an important role in the community by controlling the prey population.

**kidney** Organ that filters and cleans the blood and forms urine; also maintains the volume of body fluids, maintains the balance of salt ions in body fluids, and excretes harmful metabolic by-products such as urea, ammonia, and uric acid.

**kidney dialysis** The process of artificially filtering the blood of wastes; a patient's blood is sent through a filter that removes waste products and the clean blood is returned to the body.

**kidney failure** When the kidneys are not able to regulate water and chemicals in the body or remove waste products from the blood.

## 26.12 L

**lactic acid fermentation** Anaerobic respiration that recycles  $\text{NAD}^+$  for glycolysis (the breakdown of glucose); occurs in animals and some bacteria and fungi.

**language** Use of symbols or sounds to communicate.

**large intestine** The relatively wide tube between the small intestine and anus where excess water is absorbed from food waste.

**larvae** Young or non-adult insects.

**larynx** Found just below the point at which the pharynx splits into the trachea and the esophagus. Your voice comes from your larynx; air from the lungs passes across thin membranes in the larynx and produces sound; also called the voicebox.

**latitude** How far a biome is from the equator.

**learned behavior** Behavior that occurs only after experience or practice.

**lens** Clear, curved structure in the eye that focuses light on the retina.

**leukemia** Cancer of the blood or bone marrow; characterized by an abnormal production of blood cells, usually white blood cells.

**life science** The study of living organisms, and how they interact with each other and their environment.

**lifestyle disease** A disease that is caused by choices that people make in their daily lives.

**ligament** Fibrous tissue that connects bones to other bones; made of tough collagen fibers.

**limiting factor** A living or nonliving property of a population's environment, which regulates population growth.

**lipid** Class of organic compound that includes fats, oils, waxes and phospholipids; nutrients, such as fats, that are rich in energy.

**liverworts** Seedless nonvascular plants that can have flattened bodies resembling a liver.

**lung cancer** A disease where the cells that line the lungs grow out of control; the growing mass of cells pushes into nearby tissues and can affect how these tissues work.

**lymph** Yellowish fluid that leaks out of tiny vessels into spaces between cells in tissues.

**lymphatic system** A network of vessels and tissues that carry a clear fluid called lymph; includes lymph nodes, lymph ducts, and lymph vessels.

**lymph nodes** Small, oval structures located along lymphatic vessels that filter pathogens from lymph.

**lymphocytes** Type of white blood cells involved in an immune response.

**lymphoma** Cancer of white blood cells called lymphocytes.

**lysosome** Organelle which contains degradative enzymes; breaks down unneeded materials.

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## 26.13 M

**macroevolution** Big evolutionary changes that result in new species.

**macromolecule** Very large molecules that make living organisms; includes carbohydrates, lipids, proteins, and nucleic acids.

**main ingredient** The ingredient that is present in the food in the greatest amount.

**mammary glands** Specialized sweat glands that produce milk.

**mantle** A fold of outer skin lining the shell of mollusks; releases calcium carbonate that is used to create the external shell.

**marsupial** A type of mammal where the female has an abdominal pouch or skin fold within which are mammary glands and a place for raising the young.

**mass extinction** An extinction when many species go extinct during a relatively short period of time.

**mating** Pairing of an adult male and female to produce young.

**matter** Anything that takes up space and has mass.

**mechanical digestion** Digestion in which large chunks of food are broken down into small pieces.

**medusa** Cnidarian with a bell-shaped body, with the mouth and tentacles facing downward, such as a jellyfish.

**meiosis** Nuclear division that results in haploid gametes.

**melanin** The brownish pigment that gives skin and hair their color.

**menstrual cycle** The monthly cycle of changes that occur in the uterus and ovaries.

**menstruation** Monthly shedding of the lining of the uterus through the vagina; also called a menstrual period.

**metamorphosis** The process by which insects transform from an immature or young insect into an adult insect.

**metaphase** Second phase of mitosis and meiosis (metaphase I and metaphase II) where the chromosomes are aligned in the center of the cell.

**methanogens** Organisms that live in swamps or in the guts of cows and termites and release methane gas.

**microevolution** Small changes in inherited traits; does not lead to the creation of a new species.

**microscope** A set of lenses used to look at things too small to be seen by the unaided eye.

**microscopy** All the methods for studying things using microscopes.

**migration** Movement of animals from one place to another; often seasonal.

**minerals** Chemical elements that are needed for body processes.

**mitochondria** Organelle where cellular respiration occurs; known as the "powerhouse" of the cell because this is the organelle where the ATP that powers the cell is produced.

**mitosis** Sequence of steps in which a nucleus is divided into two daughter nuclei, each with an identical set of chromosomes.

**molecule** Any combination of two or more atoms.

**molting** The process by which arthropods shed their hard exoskeleton in order to grow.

**monogamous** A mating system where the couple pair for the duration of the breeding season, or sometimes for a few years or until one mate dies.

**monotremes** A group of mammals that lays eggs and feeds their young by "sweating" milk from patches on their bellies.

**mosses** Seedless nonvascular plants with tiny stem-like and stem-like structures.

**motor division** Division of the peripheral nervous system that carries messages from the central nervous system to internal organs, glands, and muscles.

**motor neuron** Neuron that carries nerve impulses from the central nervous system to internal organs, glands, or muscles.

**movable joint** Most mobile type of joint; the most common type of joint in the body.

**mucus** Sticky, moist substance that coats mucous membranes.

**muscle fibers** Long, thin cells that can contract; also called muscle cells.

**muscular system** The body system that allows movement.

**muscular tissue** Tissue that is composed of cells that have filaments that move past each other and change the size of the cell. There are three types of muscle tissue: smooth muscle, skeletal muscle, and cardiac muscle.

**mutagen** A chemical or physical agent that can cause changes to accumulate in DNA.

**mutation** A change in the nucleotide sequence of DNA.

**mutualism** A type of symbiosis in which both species benefit.

**mycelial fragmentation** Asexual reproduction involving splitting off of the mycelia; a fragmented piece of mycelia can eventually produce a new colony of fungi.

**mycelium** Help the fungi absorb nutrients from living hosts; composed of hyphae.

**mycorrhizal symbiosis** A relationship between fungi and the roots of plants where both benefit; the plant provides sugar to the fungus; the fungi provides minerals and water to the roots of the plant.

**myopia** Vision problem in which nearby objects are clear but distant objects look blurry; also called nearsightedness.

**MyPlate** Visual representation of the relative daily portions of various food groups; replaced MyPyramid in 2011.

**MyPyramid** Diagram that shows how much you should eat each day of foods from six different food groups.

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## 26.14 N

**nacre** The iridescent inner shell layer produced by some bivalves, some gastropods, and some cephalopods; also known as mother of pearl.

**natural resources** Naturally occurring substances necessary for the support of life.

**natural selection** Causes beneficial heritable traits to become more common in a population, and unfavorable heritable traits become less common.

**negative feedback loop** When the response to a stimulus decreases the effect of the original stimulus.

**nematocysts** Specialized cells in cnidarians that can release a small thread-like structure and toxins to capture prey.

**neocortex** Site of the cerebral cortex where most of higher brain functions occur.

**nephron** Tiny, tube-shaped filtering unit found inside each kidney.

**nerve** Bundle of individual nerve cells.

**nerve impulse** Electrical signal that is transmitted by neurons.

**nerve net** Interconnected neurons that send signals in all directions.

**nervous system** Body system that controls all the other systems of the body.

**nervous tissue** Tissue composed of nerve cells (neurons) and related cells.

**neuron** Nerve cell that carries electrical messages.

**neurotransmitter** Chemical that carries nerve impulses from the axon of one neuron to the dendrite of the next neuron.

**neutron** The non-charged particle of the atom; located in nucleus of the atom.

**niche** A specific role that an organism occupies within an ecosystem.

**nictitating membrane** A third transparent eyelid.

**nitrogen fixation** Process by which gaseous nitrogen is converted into chemical forms that can be used by plants.

**noninfectious disease** Disease that does not spread from person to person.

**nonrenewable resource** A natural resource that exists in fixed amounts and can be consumed or used up faster than it can be made by nature.

**nonvascular plants** Plants that do not have vascular tissue to conduct food and water.

**notochord** A hollow nerve cord along the back.

**nuclear envelope** A double membrane that surrounds the nucleus; helps regulate the passage of molecules in and out of the nucleus.

**nuclear power** A nonrenewable resource, where nuclear fission is used to generate energy.

**nucleic acid** Class of organic compound that includes DNA and RNA.

**nucleoid** The prokaryotic DNA consisting of a condensed single chromosome.

**nucleotide** The units that make up DNA; consists of a 5-carbon sugar, a phosphate group, and a nitrogen-containing base.

**nucleus** Membrane enclosed organelle in eukaryotic cells that contains the DNA; primary distinguishing feature between a eukaryotic and prokaryotic cell; the information center, containing instructions for making all the proteins in a cell, as well as how much of each one.

**nutrients** Chemicals in food that your body needs.

**nutrition facts label** The label on packaged food that shows the nutrients in the food.

**nymphs** A developmental stage of insects, where the young is usually similar to the adult.



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## 26.15 O

**obesity** Having a very high percentage of body fat; obese people are at least 20 percent heavier than their healthy weight range.

**observational learning** Learning by watching and copying the behavior of someone else.

**ocean acidification** Process whereby the oceans' uptake of anthropogenic carbon dioxide from the atmosphere causes an ongoing decrease in ocean pH.

**oil gland** Skin organ that secretes an oily substance, called sebum, into the hair follicle.

**omnivore** A consumer in a community that eat both producers and consumers; usually eaters of both plants and animals.

**omnivorous** Eating both plant and animal material.

**optical (light) microscope** A microscope that focuses light, usually through a glass lens; used by biologists to visualize small details of biological specimens.

**organ** A group of tissues that work together to perform a common function.

**organelle** Small structure found in cells; has specialized functions; many are membrane-bound, such as mitochondria, plastids, and vacuoles. Membrane-bound organelles are found only in eukaryotic cells.

**organic compound** Compounds made up of a carbon backbone and associated with living things.

**organism** A living thing.

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

**osmosis** Diffusion of water across a membrane.

**outdoor air pollution** Chemical, physical, or biological agents that modify the natural characteristics of the atmosphere, and cause unwanted changes to the environment and to human health.

**oval window** Membrane in the ear that passes vibrations from the stirrup to the cochlea.

**ovaries** Female reproductive organs that produce eggs and secrete estrogen.

**ovary** Enlarged part of the carpel where the ovules are contained.

**ovulation** Release of an egg by an ovary.

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## 26.16 P

**paleontologists** Scientists who study fossils to learn about life in the past.

**paralysis** Inability to feel or move parts of the body.

**parasite** The organism that benefits in a relationship between two organisms in which one is harmed.

**parasitism** A type of symbiosis in which the parasite species benefits, while the host species is harmed.

**parasympathetic division** Division of the autonomic nervous system that controls body processes under non-emergency conditions.

**parent cell** Cell that divides into daughter cells after mitosis or meiosis.

**parthenogenesis** Reproduction where an unfertilized egg develops into a new individual.

**passive transport** Movement of molecules from an area of higher concentration to an area of lower concentration; does not require energy.

**pathogen** A disease causing agent.

**pearl** The hard, round object produced within the mantle of a living shelled mollusk.

**pedigree** A chart which shows the inheritance of a trait over several generations.

**pedipalps** The second pair of arachnid appendages used for feeding, locomotion, and/or reproductive functions.

**pentadactyl** Having five fingers or toes.

**peptidoglycan** Complex molecule consisting of sugars and amino acids that makes up the bacterial cell wall.

**Periodic Table** Table that organizes elements according to their unique characteristics, like atomic number, density, boiling point, and other values.

**peripheral nervous system** All the nerves of the body that lie outside the central nervous system.

**phagocytes** A type of white blood cells that travel to sites of inflammation and destroy pathogens and debris.

**phagocytosis** The process by which phagocytes engulf and destroy pathogens or debris.

**pharynx** A long tube that is shared with the digestive system; both food and air pass through the pharynx.

**phenotype** The physical appearance that is a result of the genotype.

**pheromones** Chemicals secreted by animals, especially insects, that influence the behavior or development of others within the same species.

**phloem** Vascular tissue that carries the sugars made during photosynthesis (in the leaves) to other parts of the plant.

**phospholipid** A lipid molecule with a hydrophilic head and two hydrophobic tails; makes up the cell membrane.

**photosynthesis** The process by which specific organisms (including all plants) use the sun's energy to make their own *food* from carbon dioxide and water; process that converts the energy of the sun, or solar energy, into carbohydrates, a type of chemical energy.

**phototropism** Plant growth towards or away from light.

**physical dependence** Condition in which drug abusers need a drug to feel well physically.

**physical fitness** The ability of your body to carry out your daily activities without getting out of breath, sore, or overly tired.

**pineal eye** An eye-like structure that develops in some cold-blooded vertebrates.

**pinna** Outer part of the ear that gathers sound waves.

**pioneer species** The species that first inhabit a disturbed area.

**pivot joint** Joint structure in which the end on one bone rotates within a ring-type structure which can be made partly of bone and partly of ligament.

**placenta** Spongy mass of blood vessels from the mother and fetus that allows substances to pass back and forth between the mother's blood and the fetus's blood.

**placental** A type of mammal that has a placenta that nourishes the fetus and removes waste products.

**placoid** Plate-like, as in the scales of sharks.

**plaque** Cell pieces made up of fatty substances, calcium, and connective tissue that build up around the area of inflammation; builds up on the lining of blood vessels.

**plasma** The straw-colored fluid in blood; about 90 percent water and about 10 percent dissolved proteins, glucose, ions, hormones, and gases.

**plasma membrane** Surrounds the cell; made of a double layer of specialized lipids, known as phospholipids, with embedded proteins; regulates the movement of substances into and out of the cell; also called the cell membrane.

**plasmid** Small circular piece of DNA; found in prokaryotic cells.

**platelets** Fragments of larger cells that are important in blood clotting.

**pneumonia** An illness in which the alveoli become inflamed and flooded with fluid.

**poikilothermic** Cold-blooded; without the ability to independently warm the blood.

**polygamous** A mating system in which where there is more than one mate.

**polygenic inheritance** A pattern of inheritance where the trait is controlled by many genes and each dominant allele has an additive effect.

**polyp** Cnidarian with a cup-shaped body directed upward.

**population** A group of organisms belonging to the same species, that live in the same area, and interact with one another.

**population growth rate** How the population size changes per unit of time.

**positive feedback loop** When the response to a stimulus increases the original stimulus.

**precipitation** Water that falls to the earth in the form of rain, snow, sleet, hail.

**precocial** Newborn that are independent at birth or hatching and require little parental care.

**predation** An interaction where a predator organism feeds on another living organism or organisms, known as prey.

**primary pollutants** Substances released directly into the atmosphere by processes such as fire or combustion of fossil fuels.

**primary succession** Ecological succession that occurs in disturbed areas that have no or little soil, i.e. after a glacier retreats.

**producer** An organism that can absorb the energy of the sun and convert it into food through the process of photosynthesis; i.e. plants and algae.

**product** The end result of a reaction.

**prokaryote** A microscopic single-celled organism, including bacteria and cyanobacteria; does not have a nucleus with a membrane or other specialized organelles.

**prophase** Initial phase of mitosis and meiosis (prophase I and prophase II) where chromosomes condense, the nuclear envelope dissolves and the spindle begins to form.

**protein** Organic compound made up of smaller molecules called amino acids; performs many functions in the cell.

**protist** Eukaryotic organism that belongs to the kingdom Protista; not a plant, animal or fungus

**proton** The positively charged particle of the atom; located in nucleus of the atom.

**protozoa** Animal-like protists.

**pseudopodia** A moving fake foot; the cell surface extends out a membrane and the force of this membrane propels the cell forward.

**puberty** Stage of life when a child becomes sexually mature.

**pulmonary circulation** The part of the cardiovascular system which carries oxygen-poor blood away from the heart to the lungs, and returns oxygen-rich blood back to the heart.

**Punnett square** Visual representation of a genetic cross that helps predict the expected ratios in the offspring, first described by Reginald C. Punnett in the early 20<sup>th</sup> century.

**pupa** Insect metamorphosis stage in which wing development begins.

**pupil** Black opening in the iris that lets light enter the eye.

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## 26.17 Q

**quadrupedal** four-footed

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## 26.18 R

**radial symmetry** A body plan in which any cut through the center results in two identical halves.

**radiometric dating** A method to determine the age of rocks and fossils in each layer of rock; measures the decay rate of radioactive materials in each rock layer.

**radula** A molluscan feeding structure, composed mostly of chitin.

**reactant** The raw ingredients in a chemical reaction.

**recessive** Expression is masked by the dominant factor (allele); only expressed if both factors are recessive.

**recombinant DNA** DNA formed by the combination of DNA from two different sources, such as placing a human gene into a bacterial plasmid.

**recycling** The breaking down of an item into raw materials to make new items.

**red blood cells** Flattened disk-shaped cells that carry oxygen, the most common blood cell in the blood. Mature red blood cells do not have a nucleus.

**reducing** Minimizing the use of resources.

**reflex arc** Path of nerve impulses that bypass the brain for a quicker response.

**reflex behaviors** The only truly innate behaviors in humans, occurring mainly in babies.

**renewable resources** Resources that are replenished by natural processes at about the same rate at which they are used.

**reproductive isolation** Allopatric and sympatric speciation; isolation due to geography or behavior, resulting in the inability to reproduce.

**respiration** The process of getting oxygen into the body and releasing carbon dioxide.

**respiratory disease** A disease of the lungs, bronchial tubes, trachea, nose, and/or throat.

**respiratory system** The organ system that allows oxygen to enter the body and carbon dioxide to leave your body.

**retina** Layer of light-sensing cells that covers the back of the eye.

**ribosome** The cell structure on which proteins are made; not surrounded by a membrane; found in both prokaryotic and eukaryotic cells.

**RNA** The nucleic acid that carries the information stored in DNA to the ribosome.

**rough endoplasmic reticulum** The part of the ER with ribosomes attached; proteins can be modified in the rough ER before they are packed into vesicles for transport to the golgi apparatus.

**runoff** Water that is not absorbed by the soil that eventually returns to streams and rivers.



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## 26.19 S

**scanning acoustic microscope** A microscope that focuses sound waves instead of light.

**scanning electron microscope (SEM)** A microscope that scans the surfaces of objects with a beam of electrons to produce detailed images of the surfaces of tiny things.

**scientific method** A careful way of asking and answering questions to learn about the physical world that is based on reason and observable evidence.

**scientific theory** A well-established set of explanations that explain a large amount of scientific information.

**secondary pollutants** Substances formed when primary pollutants interact with sunlight, air, or each other.

**secondary succession** Ecological succession that occurs in disturbed areas that have soil to begin with, i.e. after a forest fire.

**seedless vascular plants** Plants with vascular tissue but no seeds.

**segmentation** A body plan that has repeated units or segments.

**selectively permeable** Semipermeable; property of allowing only certain molecules to pass through the cell membrane.

**semen** "Milky" liquid that contains sperm and secretions of glands; passes through the urethra and out of body.

**semicircular canals** Liquid-filled part of the ear that senses changes in position and generates nerve impulses in response.

**semiconservative replication** Describes how the replication of DNA results in two molecules of DNA, each with one original strand and one new strand.

**semilunar (SL) valves** Found in the arteries leaving the heart; prevents blood flowing back from the arteries into the ventricles.

**semipermeable** Allowing only certain materials to pass through; characteristic of the cell membrane.

**sensory division** Division of the peripheral nervous system that carries messages from the sense organs and internal organs to the central nervous system.

**sensory neuron** Neuron that carries nerve impulses from sense organs or internal organs to the central nervous system.

**sepals** Outermost layer of the flower that is usually leaf-like and green.

**serving size** Tells you how much of the food you should eat to get the nutrients listed on the label.

**sessile** Permanently attached and not freely moving.

**sex-linked inheritance** The inheritance of traits that are located on genes on the sex chromosomes.

**sex-linked trait** A trait that is due to a gene located on a sex chromosome, usually the X-chromosome.

**sexual dimorphism** Extreme difference between the sexes.

**sexually transmitted disease (STD)** Disease that spreads through sexual contact and is caused by a pathogen.

**sexual reproduction** Reproduction where gametes from two parents combine to make an individual with an unique set of genes.

**sickle cell disease** A blood disease that is caused by abnormally-shaped blood protein hemoglobin.

**silk** A thin, strong, protein strand extruded from the spinnerets; most commonly found on the end of the abdomen of spiders.

**sister chromatids** The two identical molecules of DNA in a chromosome after the DNA is replicated.

**skeletal muscle** The muscle that is usually attached to the skeleton.

**skeletal system** Body system that is made up of bones, cartilage, and ligaments.

**skeleton** Sturdy scaffolding of bones and cartilage that is found inside vertebrates.

**slash-and-burn agriculture** A method of agriculture in the tropics in which the forest vegetation is cut down and burned, then crops are grown for a few years, and then the forest is allowed to grow back.

**small intestine** The narrow tube between the stomach and large intestine where most chemical digestion and absorption of nutrients take place.

**smooth endoplasmic reticulum** Part of the ER that does not have ribosomes attached; where lipids are synthesized.

**smooth muscle** Involuntary muscle found within the walls of organs and structures such as the esophagus, stomach, intestines, and blood vessels.

**social animals** Animals that live in groups with other members of their species.

**solar power** The use of solar cells to convert sunlight into electricity.

**somatic cell** A body cell; not a gamete.

- somatic nervous system** Part of the motor division that carries nerve impulses to muscles that control voluntary body movements.
- speciation** The creation of a new species; either by natural or artificial selection.
- species** A group of individuals that are genetically related and can breed to produce fertile young; the second word in the two word name given to every organism is the species name.
- sperm** male gametes or sex cells
- spinal cord** Long, tube-shaped bundle of neurons that carry nerve impulses back and forth between the body and brain.
- spindle** Fibers that move chromosomes during mitosis and meiosis.
- spiracles** Openings on the sides of the insect abdomen, through which air is taken in.
- spirilli** Spiral-shaped bacteria or archaea.
- sponging** The ability of an insect mouthpart to absorb liquid food.
- sporangium** Capsule, formed by the sporophyte, which releases spores.
- spore** The basic reproductive unit of fungi.
- sprain** A ligament injury; usually caused by the sudden overstretching of a joint which causes tearing.
- stamen** The part of the flower consisting of a filament and an anther that produces pollen.
- starch** Large, complex carbohydrate; found in foods such as vegetables and grains; broken down by the body into sugars that provide energy.
- stigma** The knoblike section of the carpel where the pollen must land for fertilization to occur.
- stimulant drug** Psychoactive drug that speeds up the nervous system.
- stirrup** Last of three tiny bones that pass vibrations through the ear.
- stomach** The sac-like organ at the end of the esophagus where proteins are digested.
- stomata** Special pores in leaves; carbon dioxide enters the leaf and oxygen exits the leaf through these pores.
- strain** An injury to a muscle in which the muscle fibers tear because the muscle contracts too much or contracts before the muscle is warmed up.
- stroke** A loss of brain function due to a blockage of the blood supply to the brain.

**stroma** Fluid in the chloroplast interior space; surrounds the thylakoids.

**stromolites** Fossils made of algae and a kind of bacteria; some of the oldest fossils on Earth.

**sunburn** A burn to the skin that is caused by overexposure to UV radiation from the sun's rays or tanning beds.

**sweat gland** Gland that opens to the skin surface through skin pores; found all over the body; secretes sweat.

**symbiosis** Close and often long-term interactions between different species, in which at least one species benefits.

**sympathetic division** Division of the autonomic nervous system that prepares the body for fight or flight in emergencies.

**sympatric speciation** Speciation that occurs when groups from the same species stop interbreeding, because of something other than physical separation, such as behavior.

**synapse** Place where the axon of one neuron meets the dendrite of another neuron.

**syphilis** Very serious STD that is caused by bacteria.

**systemic circulation** The portion of the cardiovascular system which carries oxygen-rich blood away from the heart to the body, and returns oxygen-poor blood back to the heart.

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## 26.20 T

**tapeworms** Intestinal parasites in the phylum Platyhelminthes.

**taste buds** Tiny bumps on the tongue that contain taste neurons.

**taxonomy** The science of naming and classifying organisms.

**telophase** Final phase of mitosis and meiosis (telophase I and telophase II) where a nuclear envelope forms around each of the two sets of chromosomes.

**tendon** A tough band of connective tissue that connects a muscle to a bone.

**teratogen** A chemical that causes deformities.

**terrestrial biomes** Biomes defined based on plant and climatic factors.

**testes** Male reproductive organs that produce sperm and secrete testosterone.

**testosterone** The main sex hormone in males.

**theory of evolution** Theory developed by Charles Darwin that explains how populations of organisms can change over time.

**thermophiles** Organisms that live in very hot environments, such as near volcanoes and in geysers.

**thigmotropism** Differential plant growth in response to contact with an object.

**thylakoid** Flattened sacs within the chloroplast; formed by the inner membranes.

**tissue** A group of specialized cells that function together.

**tolerance** Condition in which people need to take more of a drug to feel the same effects as when they first started using the drug.

**touch** The sense of pain, pressure, or temperature.

**trachea** A long tube that leads down to the chest where it divides into the right and left bronchi in the lungs; also called the windpipe.

**trait** A feature or characteristic of an organism; for example, your height, hair color, and eye shape are physical traits.

**transcription** The synthesis of a RNA that carries the information encoded in the DNA.

**transduction** Transfer of DNA between two bacteria; occurs with the aid of a virus (bacteriophage).

**trans fat** Manufactured fat that is added to certain foods to keep them fresher for longer.

**transformation** The process by which bacteria pick up foreign DNA and incorporate it in their genome.

**translation** The synthesis of proteins as the ribosome reads each codon in RNA, which code for a specific amino acid.

**transmission electron microscope (TEM)** A microscope that focuses a beam of electrons through an object and can make an image up to two million times bigger, with a very clear image ("high resolution").

**transpiration** Process by which water leaves a plant by evaporating from the leaves.

**trophic level** A level of the food chain reflected in the ecological pyramid.

**tropism** Plant growth response towards or away from a stimulus.

**tuberculosis (TB)** A common and often deadly infectious disease caused by a type of bacterium called mycobacterium.

**tumor** Mass of cells that grow out of control; associated with cancer.

**tympanum** Equivalent to the middle ear; used in hearing.

**type 1 diabetes** The type of diabetes that occurs when the immune system attacks normal cells of the pancreas.

**type 2 diabetes** Type of diabetes that occurs when body cells no longer respond to insulin.

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## 26.21 U

**umbilical cord** Tube containing blood vessels that connects a fetus to the placenta.

**universal donor** A person with type O positive blood; type O red blood cells do not have any antigens on their membranes and so would not cause an immune reaction in the body of a recipient.

**universal recipient** A person with type AB positive blood; the blood plasma of AB blood does not contain any anti-A or anti-B antibodies. People with type AB blood can receive any ABO blood type.

**urinary bladder** Organ that collects the urine which comes from the kidneys.

**urinary system** The organ system that makes, stores, and gets rid of urine.

**urinary tract infection (UTI)** Bacterial infections of any part of the urinary tract.

**urination** The process of releasing urine from the body.

**urine** A liquid that is formed by the kidneys when they filter wastes from the blood; contains mostly water and also dissolved salts and nitrogen-containing molecules.

**uterus** Female reproductive organ where a baby develops until birth.

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## 26.22 V

**vaccination** Deliberate exposure to a pathogen in order to bring about immunity without causing disease.

**valarian respiration** Respiration in which the capillary beds are spread throughout the epidermis, so that gases can be exchanged through the skin.

**valves** In the heart; keep the blood flowing in one direction.

**vascular tissue** Tissues that conduct food, water, and nutrients in plants.

**vector** An organism that carries pathogens from one person or animal to another.

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

**ventricle** One of the two muscular V-shaped chambers that pump blood out of the heart.

**vesicle** Small membrane-enclosed sac; transports proteins around a cell or out of a cell.

**vestigial structure** Body part that, through evolution, has lost its use, such as a whale's pelvic bones.

**villi** Contain microscopic blood vessels; nutrients are absorbed into the blood through these tiny vessels; located on the jejunum and the ileum.

**visible light** Electromagnetic radiation that humans can detect with their eyes.

**vision** The ability to see light.

**vitamins** Substances that the body needs in small amounts to function properly.

**vivipary** A reproductive system in most mammals and some reptiles and fish, in which living young are produced rather than eggs laid.

**voluntary muscle** A muscle that a person can consciously control; skeletal muscle is voluntary.



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**26.23 W**

**waterborne diseases** Diseases caused by organisms transmitted via contaminated water.

**water pollution** The contamination of water bodies by substances, mostly anthropogenic, which cause a harmful effect on living organisms.

**water vascular system** A network of fluid-filled canals; functions in gas exchange, feeding, and also in locomotion.

**wavelength** The distance from any point on one wave to the same point on the next wave.

**whisk ferns** Seedless nonvascular plants with tiny stem-like and stem-like structures.

**white blood cells** Nucleated blood cells that are usually larger than red blood cells; defend the body against infection by bacteria, viruses, and other pathogens.

**wind power** The conversion of wind energy into electricity via wind turbines.

**withdrawal** Symptoms like vomiting, diarrhea, or depression that can occur when people stop using a drug.

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**26.24 X**

**xylem** Vascular tissue responsible for the transport of water and nutrients from the roots to the rest of the plant.

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**26.25** Y

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**26.26 Z**

**zygote** Cell that forms when a sperm and egg unite; the first cell of a new organism.

