

Glossary...

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**Glossary items with asterisk are required vocabulary for the Regents Examination.*

***abiotic** nonliving parts of the environment

acid/acidic a compound that releases hydrogen ions when dissolved in water; a substance, such as vinegar, with a sour taste. Any pH below 7 indicates an acid, the lower the pH, the stronger the acid. The lowest pH possible is pH 0. Strong acids are usually harmful to living cells.

acid rain rain that is more acidic than normal

***active transport** the process by which cells use energy to transport molecules through the cell membrane from areas of low concentration to areas of high concentration

***adaptive value** any trait that helps an organism survive and reproduce under a given set of environmental conditions

agarose a gel-like substance used in bacterial cultures

***AIDS** (acquired immunodeficiency syndrome) the disease that results when the HIV virus attacks the human immune system

***allergy** a condition in which a person's immune system is overly sensitive to environmental substances that are normally harmless

***amino acid** any one of several building blocks of protein

animal a complex, multicellular organism with specialized tissues and organs, but no cell walls; a heterotroph that obtains energy by consuming other organisms

***antibiotic** a medicine produced by microorganisms used to destroy pathogens in humans and domestic animals

***antibody** (pl. **antibodies**) a protein, produced by the immune system, that either attacks invading pathogens or marks them for killing

***antigen** a molecule found on the outer surfaces of cells that the immune system recognizes as either part of the body or an outside invader

antihistamine a substance that reduces the effects of histamines and the symptoms they cause

artificial selection the process of breeding two organisms with desirable characteristics to

produce offspring that have the advantages of both parents

***asexual reproduction** a method of reproduction in which all the genes passed on to the offspring come from a single individual or parent

***assumption** something accepted as true that may or may not actually be true

***ATP** (adenosine triphosphate) a compound that stores energy in cells

***autotroph** an organism that produces its own food; the source of energy for all other living things on Earth

***bacterium** (pl. **bacteria**) any one of many single-celled organisms without a distinct nucleus

***balance** a tool that measures mass by comparing the unknown mass of an object with an object of known mass

base a compound that produces hydroxide ions when dissolved in water, raising the pH above 7; the higher the pH, the stronger the base; strong bases are usually harmful to living cells

***bias** a tendency to favor something; prejudice

***biochemical process** a chemical process that occurs in a living thing

***biodiversity** the variety of species in an area

biome large groups of ecosystems with similar climates and organisms; examples include the tundra, taiga, temperate forest, chaparral, tropical rain forest, desert, temperate grassland, tropical savanna grassland, and polar and high-mountain ice

***biosphere** all of Earth's ecosystems, collectively; the biologically inhabited portions of Earth, including all of the water, land, and air in which organisms survive

***biotechnology** the combination of technology and biological sciences

***biotic** the living parts of the environment

***body cells** non-reproductive cells in an individual such as skin, liver, and muscle cells; body cells contain the full number of chromosomes typical of the species

- *bond** the chemical link between atoms that hold molecules together
- calibrate** to adjust the scale of a measurement tool
- *carnivore** an organism that survives by eating animals
- *carrying capacity** the largest population of any single species that an area can support
- *catalyst** a substance that can speed up the rate of a chemical reaction without being changed or used up during the reaction
- *cell** the basic unit of structure and function that makes up all organisms
- *cell membrane** the thin boundary between the cell and its environment
- *cellular respiration** the process in which nutrients are broken apart, releasing the chemical energy stored in them
- Celsius** a temperature scale based on 100 equal units, with 0 as the freezing point of water and 100 as the boiling point of water
- *chloroplast** the green organelle that contains chlorophyll; where photosynthesis takes place
- chlorophyll** the molecules in chloroplasts that help convert light energy to chemical bond energy
- *chromatography** a laboratory technique used to separate mixtures of molecules
- *chromosome** a thick, threadlike structure that contains genetic information in the form of DNA
- *circulation** the flow of materials within a cell as well as between parts of a multicellular organism
- classify** to group things based upon their similarities
- climax community** a relatively diverse and stable ecosystem that is the end result of succession
- *clone** an organism that is genetically identical to the organism from which it was produced
- *cloning** a technique used to make identical organisms
- *community** a combination of all the different populations that live and interact in the same environment
- *competition** the struggle between organisms for the same limited resources in a particular area
- *compound light microscope** a tool that uses more than one lens and a light source to magnify an object
- *conclusion** the decision made about the outcome of an experiment; usually based on how well the actual result matches the predicted result
- *consumer** an organism that obtains its energy from producers
- *control** that group in an experiment in which everything—except the variable to be tested—is identical; the standard of comparison in an experiment
- *controlled experiment** an experiment in which all variables—except for the one being tested—are exactly the same
- coverslip** a thin slice of glass that covers the specimen on a slide
- *cytoplasm** the jellylike substance that is between the cell membrane and the nucleus and that contains specialized structures
- *data** the results of specific trials or tests completed during experiments
- *decomposer** an organism, generally a bacterium or fungus, that consumes dead organisms and organic waste
- decomposition** the process whereby dead organisms, as well as the wastes produced by living organisms, are broken down into their raw materials and returned to the ecosystem
- *deforestation** forest destruction that results from human activity
- *dependent variable** the part of an experiment that is changed to test a hypothesis
- depletion** a serious decline or reduction
- detrimental** damaging; harmful
- *development** the changes that occur from the fertilized egg to a complete individual; occurs by mitosis and differentiation of cells
- deviation** a change from normal circumstances

- ***dichotomous key** a guide that compares pairs of observable traits to help the user identify an organism
- ***differentiation** the process that transforms developing cells into specialized cells with different structures and functions
- ***diffusion** the movement of molecules from areas of high concentration to areas of low concentration
- ***digestion** the process that breaks down large food molecules into simpler molecules that the organism can use
- ***direct harvesting** the destruction of an organism, or the removal of an organism from its habitat
- ***disease** a condition, other than injury, that prevents the body from working as it should
- ***dissection** the act of cutting apart a dead organism to examine its internal structure
- ***DNA** (deoxyribonucleic acid) the material found in all cells that contains genetic information about that organism
- ***dynamic equilibrium** the constant small corrections that normally occur to keep an organism's internal environment within the limits needed for survival
- ***ecological niche** the specific role played by an organism or a population of organisms in the ecosystem
- ***ecological succession** the process by which an existing community is replaced by another community
- ***ecology** the study of how living things interact with one another and with their environment
- ***ecosystem** all the living and nonliving things that interact in a specific area; a subdivision of the environment
- ***egg** a sex cell produced by a female
- ***electronic balance** a balance that measures mass automatically
- ***electrophoresis** a tool that allows scientists to separate mixtures of molecules according to size
- ***element** a substance consisting of only one kind of atom
- ***embryo** an organism in the early stages of development (prior to birth)
- endocrine glands** various hormone-producing glands that secrete substances directly into the blood or lymph
- endoplasmic reticulum** an organelle that transports proteins and other materials from one part of the cell to another
- ***energy flow** the movement of energy through an ecosystem
- ***energy pyramid** a diagram showing how food energy moves through the ecosystem
- ***environment** every living and nonliving thing that surrounds an organism
- environmental impact statement** a statement that includes an analysis of how a new project or technology might affect the environment
- ***enzymes** proteins that speed up the rate of chemical reactions in living things
- ***equilibrium** a state of balance and stability
- estrogen** a hormone (produced by the ovaries) that controls female sexual development and the reproductive process
- ***evidence** support for the idea that something is true
- ***evolution** the process by which species have changed over time
- ***excretion** the removal of all the wastes produced by the cells of the body
- ***experiment** a series of trials or tests that are done to support or refute a hypothesis
- ***expressed** the way that an unseen gene is seen in an organism as an actual physical trait
- ***extinction** the disappearance of all members of a species from Earth
- Fallopian tubes** that part of the female reproductive system where the egg cell is fertilized by the sperm cell; also called oviducts
- ***feedback mechanism** a cycle in which the output of a system either modifies or reinforces the first action taken by the system
- ***fertilization** the process that combines a sperm cell and an egg cell
- ***fetus** the unborn, developing young of an animal during the later stages of development
- ***finite** limited; able to be used up; opposite of infinite
- flow of energy** the movement of energy through an ecosystem
- ***food chain** a representation that identifies the specific feeding relationships among organisms

- ***food web** a representation of many interconnected food chains that shows the feeding relationships among producers, consumers, and decomposers
- forceps** a tool used mainly during dissection to lift out small parts, to move structures, and to pry parts open
- ***fossil** the preserved remains of ancient organisms
- ***fossil fuel** a fuel, such as coal and gas, that comes from the remains of organisms that lived millions of years ago
- ***fossil record** a collection of fossils used to represent Earth's history
- ***fungus** (pl. **fungi**) the kingdom of organisms that are mostly multicellular, have cell walls made of chitin, and are heterotrophic
- ***gamete** an egg or sperm cell; a sex cell
- ***gas exchange** the process of obtaining oxygen from the environment and releasing carbon dioxide
- ***gene** (pl. **genes**) a segment of DNA (on a chromosome) that contains the code for a specific trait
- ***gene expression** see *expressed*; the result of activated genes
- ***genetic engineering** a set of technologies that humans use to alter the genetic instructions of an organism by substituting DNA molecules
- ***genetic recombination** the formation of a new combination of genes during sexual reproduction
- ***genetic variation** the normal differences found among offspring
- ***geologic time** Earth's history as revealed by layers of rock
- ***global warming** a increase in Earth's average surface temperature caused by an increase in greenhouse gases
- ***glucose** a sugar that is a major source of energy for cells
- ***graduated cylinder** a tool used to measure the volume of a liquid
- greenhouse effect** the trapping of heat by gases in the atmosphere
- greenhouse gas** an atmospheric gas that traps heat
- growth** an increase in the size or number of cells
- ***guard cells** specialized cells that control the opening and closing of the pores on the surface of a leaf
- ***habitat** the place where an animal or plant lives
- ***herbivore** an organism that eats only plants
- ***heredity** the passing of traits from parent to offspring
- ***heterotroph** organism that cannot make its own food; a consumer
- histamine** a chemical that is released as the immune system's reaction to an allergy
- ***homeostasis** the ability of an organism to maintain a stable internal environment even when the external environment changes
- ***hormone** a chemical produced in the endocrine glands
- ***host** the organism in a parasitic relationship that provides a home and/or food for the parasite
- hot water bath** in the science laboratory, usually a large beaker of water heated on a hot plate; used to heat test tubes that contain a flammable liquid, such as alcohol
- humerus** the long bone in the upper part of the arm
- ***hypothesis** a statement that predicts a relationship between cause and effect in a way that can be tested
- ***immune system** the body's primary defense against disease-causing pathogens
- ***immunity** the body's ability to destroy pathogens before they cause disease
- ***independent variable** a factor that might influence the dependent variable in an experiment
- ***indicator** a substance that changes color when it encounters certain chemical conditions
- ***industrialization** the process of converting an economy into one in which large-scale manufacturing is the primary economic base
- ***inference** a conclusion or deduction based on observations
- infinite** without limits or bounds
- ***inorganic** a type of molecule that does not contain both carbon and hydrogen but can contain any other combination of elements
- ***insulin** a hormone that prompts glucose to move from the blood into body cells, resulting in a lower glucose level in the blood
- ***limiting factor** any factor in the environment that limits the size of a population

lipid any one of a group of organic compounds that includes oils, fats, and waxes

***magnification** the ability of a microscope to make an object appear larger

***mass** a measure of the quantity of matter in an object

***meiosis** the process that results in the production of sex cells (sperm and egg)

***meniscus** the curved surface at the top of a column of liquid

***metabolism** all the chemical reactions that occur within the cells of an organism

***metric ruler** a tool used to measure the length of an object

***microbe** any microscopic organism

micrometer a unit of length equal to one millionth of a meter

***microscope** a tool that uses a lens or a combination of lenses to magnify an object

***mitochondria** pod-shaped organelles that contain enzymes used to extract energy from nutrients

***mitosis** the process that divides the cell's nucleus into two, each with a complete set of genetic material from the parent cell

***model** a representation used to explain or demonstrate a process or structure; also used to predict what might occur in a new situation

molecule a particle in which two or more atoms combine to form a single unit; the smallest unit of a compound

muscular system a body system comprised of tissue that contracts when it is stimulated; the combination of muscles that enables the body to move

***mutation** any alteration in the sequence of DNA

***natural selection** the process by which the organisms that are best adapted to a specific environment survive and produce more offspring than organisms that are not as well adapted

neutral a solution with a pH of 7 that is neither acidic nor basic; the tissues of many living things maintain a pH within 1 or 2 units of this neutral point

***niche** the specific role played by an organism in its ecosystem

nitrogen cycle the movement of nitrogen from the atmosphere to the soil and organisms and then back to the atmosphere

nitrogen fixation the process by which nitrogen forms compounds that can be used by living things

***nonrenewable resource** any resource, such as fossil fuels and minerals, that cannot be replaced

***nuclear fuel** an energy source that results from splitting atoms

***nucleus** a large structure within a cell that controls the cell's metabolism and stores genetic information, including chromosomes and DNA

nucleic acids large, complex organic molecules that contain the instructions cells need to carry out their life processes

nutrient a substance that provides the body with the materials and energy needed to carry out the basic life of cells

objective one of the lenses of a microscope

***observation** any information that is collected with any of the senses

ocular the eyepiece lens of a microscope

***opinion** ideas people have that may or may not be based in fact

optimum the most favorable condition

***organ** a body structure made of different kinds of tissues combined to perform a specific function

***organ system** several organs that work together to perform a major function in the body

***organelle** a structure within the cell that carries out a specific function

***organic** term used to describe molecules that contain both hydrogen and carbon

***organic compound** a compound that contains both hydrogen and carbon

***ovary** (pl. **ovaries**) the organ of the human female reproductive system that produces an egg cell, the female gamete

***overproduction** the potential for a species to increase its numbers beyond the area's carrying capacity

oviduct the part of the female reproductive system where the egg cell is fertilized by the sperm

oxygen-carbon dioxide cycle the movement of oxygen and carbon dioxide between living things and the environment

***ozone shield** the layer of ozone gas in the upper atmosphere that protects Earth from some of the sun's radiation

- *pancreas** an endocrine organ that secretes insulin
- *parasite** an organism that survives by living and feeding on other organisms
- parasitic relationship** an arrangement in which one organism lives in or on a host organism, deriving some or all of its nourishment from the host, to the host's detriment
- *pathogen** an organism that invades the body, causing disease
- *peer review** the process by which scientists carefully examine the work of other scientists to look for possible flaws in their experimental design or their interpretation of results
- *pH** a measure of whether a substance is acidic, neutral, or basic
- *photosynthesis** the process by which some organisms are able to capture light energy and use it to make food from carbon dioxide and water
- pioneer species** the first organisms to become established in a new habitat
- pipette** a laboratory tool that looks like a slender tube but works something like an eyedropper
- *placenta** the organ that enables nutrients and oxygen to pass from the mother's blood to the fetus, and waste products to pass from the fetus to the mother's blood
- plant** any complex, multicellular organism that obtains energy through photosynthesis and consists of cell walls and specialized tissues and organs
- poaching** illegally capturing or killing an organism
- *pollution** a harmful change in the chemical makeup of the soil, water, or air
- *population** all the individuals of a single species that live in a specific area
- *predator** an animal that hunts and kills other animals for food
- predator-prey relationship** the connection between predators and prey that limits the growth of both populations
- *prey** an animal that is hunted and killed by predators
- primary succession** the first group of communities that moves into a previously lifeless habitat
- *producer** an organism that makes its own food from light energy and inorganic materials
- *progesterone** a hormone associated with sexual development and the reproductive system
- proportion** the relationship of one thing to another in terms of size, number, amount, or degree
- protist** a single-celled organism with both its genetic materials and its organelles enclosed in membranes
- quarantine** confined isolation
- radius** one of the two long bones of the lower forearm
- *receptor molecule** certain protein molecules in the cell membrane that can receive chemical messages from other cells
- *recombination** the additional mixing of genetic material from a sperm and egg which results in a unique combination of genes
- refute** to disprove
- *replicate** to copy
- *renewable resource** Earth's resources, such as our food supply and solar energy, which, given time, can be replaced
- *research plan** the initial stage of an experiment that involves finding background information, developing a hypothesis, and devising an experimental method for testing the hypothesis
- *respiration** the process by which the chemical bond energy stored in nutrients is released for use in cells
- *reproduction** the process by which organisms produce new organisms of the same type
- *ribosome** one of the tiny structures in the cell that is the site of protein production
- rider** one of the devices that is moved along the beam of a balance
- *scavenger** a carnivore that feeds on the bodies of dead organisms
- science** a way of learning about the natural world and the knowledge gained through that process
- *scientific literacy** a basic knowledge of the natural world combined with an understanding of the diverse ways that scientists gain knowledge
- scientific theory** a concept, which has been tested and confirmed in many different ways, that explains a wide variety of observations
- secondary succession** a type of change that occurs when a disturbance empties an existing habitat without destroying the soil
- *selective breeding** the process of choosing a few organisms with desirable traits to serve as the parents of the next generation

- sensor** a structure that reacts to stimuli by sending a nerve impulse to the brain
- ***sex cell** an egg (female) or a sperm (male)
- ***sexual reproduction** a method of reproduction that involves two parents to produce offspring that are genetically different from either parent
- sibling** a brother or sister
- ***simple sugar** the result of the digestion of starches. Glucose is a simple sugar.
- skeletal system** the body system that contains the bones, provides shape and support, and protects internal organs
- smog** a kind of air pollution that results when certain pollutants react with sunlight
- ***species** a group of organisms that share certain characteristics and can mate with one another, producing fertile offspring
- sperm** the male sex cell
- splice** to join two things together
- ***stain** a chemical used to make cell structures more visible when viewed under a microscope
- steady state** the condition in which something remains relatively constant in spite of minor fluctuations
- ***stereoscope** a microscope that uses two eyepieces; often used for dissections; also called a dissecting microscope
- ***stimulus** (pl. **stimuli**) any change in the environment that causes an organism to react
- stomata** a tiny pore found on the underside of most leaves
- ***subunit** the section of a DNA molecule that contains a sugar, a phosphate, and a base
- symbiotic** a kind of long-term association between members of different species in which at least one species benefits and neither species is harmed
- ***synthesis** a life process that involves combining simple substances into more complex substances
- tare button** a function on an electronic balance that returns the mass reading to zero
- ***technology** all of the practical scientific knowledge that has been used to meet human needs
- ***template** the pattern for a new molecule
- ***testes** the male reproductive organ that produces sperm and the hormone testosterone
- ***testosterone** a hormone associated with male sexual development and reproduction
- ***theory** an explanation, supported by many observations and/or experiments, that can be used to accurately explain related occurrences
- ***thermal pollution** a kind of water pollution in which the temperature of the water increases
- ***tissue** a group of specialized cells that perform a specific function
- toxic** poisonous
- ***trade-off** an exchange or agreement made to reach a compromise
- ***trait** a characteristic that is passed from parent to offspring through the genes
- transpiration** the process whereby plants absorb water through their roots and eliminate it through tiny pores on the undersides of their leaves
- ***triple-beam balance** a tool, with a single pan and three bars calibrated in grams, used to measure mass
- tumor** a clump of cells that develops when cancerous cells divide uncontrollably
- ulna** one of the two long bones in the lower forearm
- ***uterus** the organ, in female animals, where the embryo develops into a fetus
- ***vaccine** a substance made of weakened, killed, or partial pathogens and designed to protect the body from future invasions of that pathogen
- ***vacuole** storage sacs within the cytoplasm of a cell that may contain either wastes or useful materials, such as water or food
- vertebrate** an animal with a backbone
- ***virus** a nonliving particle of protein and genetic material that reproduces by invading the cell of a living organism
- ***volume** the space occupied by something
- ***water cycle** the process by which water continuously moves from Earth's surface to the atmosphere and back
- ***zygote** the cell that results from the joining of the egg and sperm