Glossary

abiotic – Non-living.
acceleration – The rate of change of velocity with respect to time.
acid – A substance that dissolves in water with the formation of hydrogen ions and reacts with a base to form a salt and water. It neutralizes alkalis, dissolves some metals, and turns litmus red; typically, a corrosive and sour-tasting liquid.
adaptation – Adjustment to environmental conditions, modification of an organism or its parts that makes it more fit for existence under the conditions of its environment.
alleles – Any of the alternative forms of a gene that may occur at a given locus on a chromosome.
anemometer – An instrument for measuring and indicating the force or speed of the wind.
asexual reproduction – Involving or reproducing by reproductive processes (as cell division, spore formation, fission or budding) that do not involve the union of germ cells or egg and sperm.
asteroid – A small rocky body orbiting the sun.
atmosphere – The gaseous envelope surrounding the earth; consists of oxygen, nitrogen and other gases, extends to a height of about 40,744 km (22,000 miles), and rotates with Earth.
atmospheric pressure – The pressure exerted by the atmosphere at the surface of the Earth due to the weight of the air.
atom – The smallest particle of an element that can exist either alone or in combination.
atomic number – The number of protons in the nucleus of an atom.
bacteria – Unicellular, prokaryotic microorganisms that lack chlorophyll, multiply by fission, and can be seen only with a microscope; they occur in three main forms: spherical, rod-shaped and spiral. Some bacteria cause diseases such as pneumonia, tuberculosis and anthrax, and others are necessary for fermentation and nitrogen fixation.
balance – An instrument for measuring mass.
barometer – An instrument for determining the pressure of the atmosphere.
base – A substance that dissolves in water with the formation of hydroxyl ions and reacts with an acid to form a salt and water; turns litmus paper blue.
biogeochemical cycles – Relating to the partitioning and cycling of chemical elements and compounds between the living and nonliving parts of an ecosystem.
biological evolution – Changes in the genetic composition of a population through successive generations.
biomass – The amount of living matter.
biome – Major ecological community (tropical rain forest, grassland or desert).
biotechnology – Biological science when applied especially in genetic engineering and recombinant DNA technology.
biotic – Relating to life.
body covering – Feature that covers the body, such as fur or feathers.
body system – A system of the body (i.e. digestive system, circulatory system).
boiling point – The temperature at which a liquid boils.
capacity – The maximum amount or number that can be contained or accommodated.
carnivore – A flesh-eating animal.
cell – The smallest structural and functional unit of an organism.
cell division – The formation of two daughter cells from one parent cell, mitosis.
cell membrane – The bounding membrane of cells which controls the entry of molecules and the interaction of cells with their environment, plasma membrane.
cell respiration – Metabolic processes which break down nutrients into usable energy.
cell wall – A structure external to the plasma membrane of a plant cell. It provides structure and support.
characteristic – A distinguishing trait, feature, quality or property.
chemical change – A change in a substance resulting in an entirely different substance with different properties from the first.
chemical property – Chemical characteristics of a substance that distinguish it from other substances.
chemical reaction – A process that involves rearrangement of the molecular or ionic structure of a substance, as opposed to a change in physical form or a nuclear reaction.
chemosynthesis – Synthesis of organic compounds (as in living cells) by energy derived from chemical reactions.
chloroplast – A plastid that contains chlorophyll and is the site of photosynthesis.
chromosome – A threadlike structure of nucleic acids and protein found in the nucleus of most living cells, carrying genetic information in the form of genes.
chrysalis – The pupa of a butterfly and some insects.
cilia – Fine hair-like protrusions of the cell surface, which beat in unison to create currents of liquid over cell surface or propel the cell through the medium.

circuit – The complete path of an electric current usually including the source of electric energy.
circular motion – Motion of an object that follows the circumference of a circle.
classification – Systematic arrangement in groups or categories according to established criteria.
climate – The average course or condition of the weather at a place usually over a period of years as exhibited by temperature, wind velocity and precipitation.
comet – A celestial body that consists of a fuzzy head

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comet – A celestial body that consists of a fuzzy head usually surrounding a bright nucleus, that has a usually highly eccentric orbit, and that often, when in the part of its orbit near the sun, develops a long tail which points away from the sun.
community – Interacting populations that live in a defined habitat.
composition – The qualitative and quantitative makeup of a chemical compound.
compound – A substance formed from two or more elements chemically united in fixed proportions.
condensation – The conversion of a substance (such as water) from the vapor state to a denser liquid or solid state usually initiated by a reduction in the temperature of the vapor.
conduction – Process by which heat or electricity is transmitted through a material or body without movement of the medium itself.
conservation – A careful preservation and protection of something; especially planned management of a natural resource to prevent exploitation, destruction or neglect.
consumer – An organism requiring complex organic compounds for food, which it obtains by preying on other organisms or by eating particles of organic matter.
control – A group used as a standard of comparison for checking the results of an experiment.
covalent – Chemical bonds formed by the sharing of electrons between atoms.
convection – The circulatory motion that occurs in a fluid at a non-uniform temperature owing to the variation of its density and the action of gravity.
convergent – To come together or tend to come together at a point.
core – The central part of a celestial body (as Earth or sun) usually having different physical properties from the surrounding parts.
crust – The outer part of a planet, moon or asteroid composed essentially of crystalline rocks.
crustal deformation – A change in the crust of a planet, moon or asteroid.
crystal – A piece of a homogeneous solid substance having a natural, geometrically regular form with symmetrically arranged plane faces.
current – Continuous flow as of air, water or electric charge.
cycle – An interval of time during which a sequence of a recurring succession of events or phenomena is completed.
decay rate – The rate at which a radioactive isotope disintegrates until a final non-radioactive isotope is formed.
decomposers – Organisms such as bacteria and fungi that feed and breakdown dead organisms returning constituents of organic substances to the environment.
dependent variable – A variable whose values are determined by one or more (independent) variables.
design – To create, fashion, execute or construct according to plan.
differentiation – The sum of the processes whereby apparently indifferent cells, tissues and structures attain their adult form and function.
diversity – A great deal of variety.
DNA – Deoxyribonucleic acid, a double strand of nucleotides, that is a self-replicating material present in living organisms as the main constituent of chromosomes. It contains the genetic code and transmits the heredity pattern.
dominant – A gene, that when present, is expressed in the phenotype.
eclipse – The total or partial obscuring of one celestial body by another.
ecological – The interactions and relationships between organisms and their environment.
ecosystem – The complex of a community of organisms and its environment functioning as an ecological unit.
egg – Female gamete; ovum.
electric field – A region associated with a distribution of electric charge or a varying magnetic field, in which forces due to that charge or field, act upon other electric charges.
electric force – A force that exists between two charged objects.
electricity – A form of energy resulting from the existence of charged particles, either statically as an accumulation of charge or dynamically as a current.
electromagnetic radiation – A kind of radiation including visible light, radio waves, gamma rays and x-rays in which electric and magnetic fields vary simultaneously.
electromagnetic spectrum – The entire range of wavelengths or frequencies of electromagnetic radiation extending from gamma rays to the longest radio waves and including visible light.
electron – A stable subatomic particle with negative electrical charge, found in all atoms and acting as the primary carrier of electricity in solids.
element – Any of more than 100 fundamental substances that consist of atoms of only one kind and that singly or in combination constitute all matter.
emigration – A category of population dispersal covering one-way movement out of the population area.

Glossary – *(continues on next panel)*

Glossary

Higher-Order Thinking

Glossary – *(continued from previous panel)*

endothermic – Characterized by or formed with absorption of heat.
energy – The capacity for doing work, can be in various forms such as nuclear, sound, thermal and light.
entropy – A thermodynamic quantity representing the unavailability of a system's thermal energy for conversion into mechanical work, often interpreted as the degree of disorder or randomness in the system.
environment – The complex of physical, chemical and biotic factors that act upon an organism or an ecological community and ultimately determine its form and survival.
epicenter – The part of the Earth's surface directly above the focus of an earthquake.
equilibrium – A state in which opposing forces or influences are balanced.
eukaryotic – An organism composed of one or more cells containing visibly evident nuclei and organelles.
evaporation – To convert into vapor.
evidence – Facts or observations on which a conclusion can be based.
evolution (biological) – Changes in the genetic composition of a population through successive generations.
exothermic – Characterized by or formed with liberation of heat.
extinct – A species of organisms that no longer exists.
faulting – To fracture so as to produce a geologic fault.
fermentation – An enzymatically controlled anaerobic breakdown of an energy-rich compound.
fission – The splitting of an atomic nucleus resulting in the release of large amounts of energy.
flagella – Long hair-like extensions from the cell surface whose movement is used for locomotion.
focus – The place of origin of an earthquake or moonquake (as related to earthquakes).
folding – Causing rock strata to undergo bending or curvature.
food chain – An arrangement of the organisms of an ecological community according to the order of predation in which each uses the next usually lower member as a food source.
food web – The totality of interacting food chains in an ecological community; interacting food chains in an ecological community.
force – An influence, that if applied to a free body, results chiefly in an acceleration of that body in the direction of its application.
fossil – Remnant, impression or trace of an organism of past geologic ages that has been preserved in the Earth's crust.
fossil fuel – A fuel (such as coal, oil or natural gas) that is formed in Earth from plant or animal remains.
frame of reference – An arbitrary set of axes with reference to which the position or motion of something is described or physical laws are formulated.
friction – The force that resists relative motion between two bodies in contact.
fungi – Any of a major group of saprophytic and parasitic spore-producing organisms including molds, rusts, mildews, smuts, mushrooms and yeasts.
fusion – The union of atomic nuclei to form heavier nuclei resulting in the release of enormous quantities of energy.
galaxy – Any of the very large groups of stars and associated matter that are found throughout the universe.
gas – A fluid (such as air) that has neither independent shape nor volume but tends to expand indefinitely.
gene – A functional hereditary unit located at a particular point on a chromosome that controls or acts in the transmission of hereditary characteristics.
genetic drift – The process by which gene frequencies are changed.
germination – The beginning of growth in a spore, seed, zygote etc., especially following a dormant period.
glaciation – To subject to glacial action in which a large body of ice moves slowly down a slope or valley, or spreads outward on a land surface.
gravitation – A force manifested by acceleration toward each other of two free material particles or bodies, or of radiant-energy quanta.
gravity – The gravitational attraction of the mass of the Earth, the moon or a planet for bodies at or near its surface.
habitability – Suitable for a dwelling place.
habitat – The place or environment where a plant or animal naturally or normally lives and grows.
herbivore – A plant-eating animal.
heredity – The sum of the qualities and potentialities genetically derived from one's ancestors; the relation between successive generations, by which characteristics persist.
heritable – Capable of being inherited or of passing by inheritance.
homeostasis – A state of equilibrium between different but interrelated functions or elements, as in an organism or group.
humidity – The amount of moisture in the atmosphere.
hydrosphere – The aqueous envelope of the Earth including bodies of water and aqueous vapor in the atmosphere.
hypothesis – A formula derived by inference from scientific data that explains a principle operating in nature.
igneous – Relating to, resulting from, or suggestive of the intrusion or extrusion of magma or volcanic activity.
immigration – Coming into the population.
independent assortment – Each chromosome in a pair that is independent of other chromosomes.
independent variable – A variable whose value is specified first and determines the value of one or more other values.
infrared radiation – Invisible rays just beyond the red end of the visible spectrum. Their waves are longer than those of the spectrum colors but shorter than radio waves, and have a penetrating heating effect; used in cooking and photography.

interstellar – Located, taking place or traveling among the stars, especially of the Milky Way galaxy.
ion – An atom or group of atoms that carries a positive or negative electric charge as a result of having lost or gained one or more electrons.
isotope – Any of two or more species of atoms of a chemical element with the same atomic number and nearly identical chemical

interstellar – Located, taking place or traveling among the stars, especially of the Milky Way galaxy.
ion – An atom or group of atoms that carries a positive or negative electric charge as a result of having lost or gained one or more electrons.
isotope – Any of two or more species of atoms of a chemical element with the same atomic number and nearly identical chemical behavior, but with differing atomic mass or mass number and different physical properties.
jumping genes – Genes that move from one position on the chromosome to another.
kinetic energy – Energy associated with motion.
landform – A natural feature of a land surface.
life – An organism that has the capacity for metabolism, growth, reaction to stimuli and reproduction.
life cycle – The series of stages in form and functional activity through which an organism passes from fertilized ovum to the fertilized ovum of the next generation.
liquid – A fluid (such as water) that has no independent shape but has a definite volume, does not expand indefinitely and that is only slightly compressible.
lithosphere – The solid part of a celestial body (such as Earth), specifically, the outer part of the solid Earth composed of rock essentially like that exposed at the surface and usually considered to be about 80 kilometers (50 miles) in thickness.
magma – Molten rock material within the Earth from which igneous rock results by cooling.
magnetic reversal – Periods of time in which there was a reversal in direction of the Earth's magnetic field.
mantle – The part of the interior of a terrestrial planet, especially the Earth, that lies beneath the lithosphere and above the central core.
mass – The property of a body that is a measure of its inertia and that is commonly taken as a measure of the amount of material it contains causing it to have weight in a gravitational field.
matter – Material substance that occupies space, has mass and is composed of atoms consisting of protons, neutrons and electrons that constitutes the observable universe, and that is interchangeable with energy.
mean – The sum of a set of numbers divided by the number of elements in the set.
median – The middle number or item in a set of numbers or objects arranged from least to greatest, or the mean of the two middle numbers when the set has two middle numbers.
metamorphism – A change in the constitution of rock; specifically, a pronounced change affected by pressure, heat and water that results in a more compact and more highly crystalline condition.
meteor – Any of the small particles of matter in the solar system that are directly observable only by their incandescence from frictional heating on entry into the atmosphere.
meteoroid – One of a large number of celestial bodies of various size that appear as meteors when they enter Earth's atmosphere.
method – A systematic procedure, technique or mode of inquiry employed by or proper to a particular discipline or art.
microorganisms – An organism of microscopic or ultramicroscopic size.
metric system – A decimal system of weights and measures based on the meter and on the kilogram.
Milky Way – A broad luminous irregular band of light that stretches completely around the celestial sphere and is caused by the light of myriads of faint stars.
mineral – A solid homogeneous crystalline chemical element or compound that results from the inorganic processes of nature.
mitochondria – Cell structure responsible for cellular respiration.
mixture – A portion of matter consisting of two or more components in varying proportions that retain their own properties.
mode – The number or object that appears most frequently in a set of numbers of objects.
model – A description or analogy used to help visualize something (such as an atom) that cannot be directly observed.
molecule – The smallest particle of a substance that retains all the properties of the substance and is composed of one or more atoms.
moon cycle – The cycle of the moon's phases, from new to full and back.
motion – An act, process or instance of changing position through time.
multicellular – Having or consisting of many cells.
mutation – A relatively permanent change in hereditary material involving either a physical change in chromosome relations or a biochemical change in the codon(s) that make up genes.
natural – Existing in, or produced by nature.
natural selection – The principle that in a given environment individuals having characteristics that aid survival will produce more offspring, and the proportion of individuals having such characteristics will increase with each succeeding generation.
nesting – To build or occupy a nest; settle in.
neutral – Neither acidic nor basic (as in pH).
neutrons – An uncharged elementary particle that has a mass nearly equal to that of the proton and is present in atomic nuclei.
nuclear – Used in or produced by a nuclear reaction; referring to particles or properties of an atomic nucleus.
nuclear reaction – A change in the identity or characteristics of an atomic nucleus that results when it is bombarded with an energetic particle.

Glossary – *(continues on next panel)*

Glossary

Higher-Order Thinking

PBAS Success

Glossary – *(continued from previous panel)*

nucleus – 1. The positively charged central portion of an atom that comprises nearly all of the atomic mass and that consists of protons and neutrons. 2. The portion of a eukaryotic cell that is surrounded by a nuclear membrane and contains DNA.
nutrient – A nutritive substance or ingredient.
observe – To watch carefully, especially with attention to details or behavior for the purpose of arriving at a judgment.
ocean trench – A long, narrow, deep depression in the ocean bed.
omnivore – An animal that feeds on both animal and vegetable substances.
orbit – A path described by one body in its revolution about another (as by the Earth about the sun or by an electron about an atomic nucleus).
organ – A differentiated structure (such as a heart, kidney, leaf or stem) consisting of cells and tissues, and performing some specific function in an organism.
organ systems – Organs working together for a specific function.
organic – Compounds containing carbon and chiefly or ultimately of biological origin.
organism – An individual constituted to carry on the activities of life by means of organs separate in function but mutually dependent; a living being.
oxidation – Combination of a substance with oxygen.
oxidize – To combine with oxygen.
parasite – An organism living in, with or on another organism in which a parasite obtains benefits from a host that it usually injures.
particle – Any of the basic units of matter and energy (such as a molecule, atom, proton, electron or photon).
pattern – A reliable sample of traits, acts, tendencies or other observable characteristics.
periodic table – An arrangement of chemical elements based on the periodic law.
pH scale – A numerical measure of the acidity or alkalinity of a chemical solution.
phenomenon – A fact or event of scientific interest susceptible to scientific description and explanation.
photosynthesis – The chemical process by which chlorophyll-containing plants use light to convert carbon dioxide and water into carbohydrates, releasing oxygen as a byproduct.
physical change – A change in a substance that does not alter its chemical makeup.
physical properties – A property of a material that can be observed without changing the chemical makeup of the material.
physiology – The biological science of essential and characteristic life processes, activities and functions.
pitch – The property of a sound, especially a musical tone, that is determined by the frequency of the waves producing it; highness or lowness of sound.
planet – Any of the large bodies that revolve around the sun in the solar system.
pollution – A substance that, when added to the environment causes the environment to be harmful or unfit for living things.
population – All the plants or animals of the same kind found in a given area.
potential energy – The energy that matter has because of its position or because of the arrangement of atoms or parts.
precipitation – A deposit on Earth of hail, mist, rain, sleet or snow.
predator – An animal that lives by capturing prey as a means of maintaining life.
prey – An animal taken by a predator as food.
producer – Any of various organisms (such as a green plant) which produce their own organic compounds from simple precursors (such as carbon dioxide and inorganic nitrogen) and many of which are food sources for other organisms.
prokaryotic – A cellular organism (such as a bacterium or a blue-green alga) that does not have a distinct nucleus.
property – A quality or trait belonging to an individual or thing.
proton – A stable subatomic particle occurring in all atomic nuclei with a positive electric charge equal in magnitude to that of an electron.
qualitative – Involving quality or kind.
quantitative – Involving the measurement of quantity or amount.
radiation – The transfer of heat by radiation (such as energy transfer). The process of emitting radiant energy in the form of waves or particles (such as particle emission).
react – To undergo chemical reaction (chemically).
reactant – A substance that enters into and is altered in the course of a chemical reaction.
recycle – To process (as liquid body waste, glass or cans) in order to regain material for human use.
reference point – A basis or standard for evaluation, assessment or comparison; a criterion.
reflection – The throwing back by a body or surface of light, heat or sound without absorbing it.
refraction – Deflection from a straight path undergone by a light ray or energy wave in passing obliquely from one medium (such as air) into another (such as glass) in which its velocity is different.
repel – To force away or apart, or tend to do so by mutual action at a distance.
replicate – To duplicate experiments, procedures or samples.
reproduction – The process by which organisms give rise to offspring and which fundamentally consists of the segregation of a portion of the parental body by a sexual or an asexual process, and its subsequent growth and differentiation into a new individual.
resource – Industrial materials and capacities (as mineral deposits and waterpower) supplied by nature (earth science) and substances used by an organism for survival (biology).

respiration – The physical and chemical processes by which an organism supplies its cells and tissues with the oxygen needed for metabolism and relieves them of the carbon dioxide formed in energy-producing reactions.
rotation – The turning of a body part about its long axis as if on a pivot.

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rotation – The turning of a body part about its long axis as if on a pivot.
scavenger – An organism that feeds habitually on refuse or carrion.
scientific law – A statement of an order or relation of phenomena that, so far as is known, is invariable under the given conditions.
scientific method – Principles and procedures for the systematic pursuit of knowledge involving the recognition and formulation of a problem, the collection of data through observation and experiment, and the formulation and testing of hypotheses.
scientific theory – A plausible or scientifically acceptable general principle or body of principles offered to explain phenomena.
sediment – Material deposited by water, wind or glaciers.
segregation – The separation of two alleles in a heterozygote when gametes are formed.
significant figure – Each of the digits of a number that are used to express it to the required degree of accuracy.
solid – A substance that does not flow perceptibly under moderate stress, has a definite capacity for resisting forces (such as compression or tension) that tend to deform it, and under ordinary conditions retains a definite size and shape.
solubility – The amount of a substance that will dissolve in a given amount of another substance.
solution – An act, or the process by which a solid, liquid or gaseous substance is homogeneously mixed with a liquid or sometimes a gas or solid.
sound waves – Mechanical radiant energy that is transmitted by longitudinal pressure waves in a material medium (such as air) and is the objective cause of hearing.
species – A group of organisms consisting of similar individuals capable of exchanging genes or interbreeding.
sperm – A male gamete.
star – A natural luminous body visible in the sky, especially at night.
structure – The arrangement of particles or parts in a substance or body.
survival – The continuation of life or existence.
system – 1. A group of body organs that together perform one or more vital functions. 2. An organized group of devices, parts or factors that together perform a function or drive a process (weather systems, mechanical systems).
technology – Human innovation in action that involves the generation of knowledge and processes to develop systems that solve problems and extend human capabilities. The innovation, change, or modification of the natural environment to satisfy perceived human needs and wants.
theory – A supposition or a system of ideas intended to explain something, especially one based on general principles independent of the thing to be explained.
tides – The alternate rising and falling of the surface of the ocean and water bodies (such as gulfs and bays) connected with the ocean that occurs usually twice a day, and is caused by the gravitational attraction of the sun and moon occurring unequally on different parts of the Earth.
tissue – An aggregate of cells usually of a particular kind together with their intercellular substance that form one of the structural materials of organisms.
tool – A device that aids in accomplishing a task, a form of technology.
trait – An inherited characteristic.
transform – To change in composition or structure.
unit – A determinate quantity (such as of length, time, heat or value) adopted as a standard of measurement.
unity – The state of being united into a whole.
uplift – To cause (a portion of Earth's surface) to rise above adjacent areas.
variable – A quantity that may assume any one of a set of values.
velocity – The rate of change of position and direction with respect to time.
virus – Any of various submicroscopic pathogens consisting essentially of a particle of nucleic acid enclosed in protein and able to replicate only within a living cell.
volcano – A vent in the crust of the Earth or another planet from which usually molten rock, ash and steam are ejected.
water cycle – The sequence of conditions through which water passes from vapor in the atmosphere through precipitation upon land or water surfaces and ultimately back into the atmosphere as a result of evaporation and transpiration.
wave – A disturbance or variation that transfers energy progressively from point to point in a medium, and that may take the form of an elastic deformation or of a variation of pressure, electric or magnetic intensity, electric potential, or temperature.
wavelength – The distance between successive crests of a wave.
weather – The state of the atmosphere with respect to heat or cold, wetness or dryness, calm or storm, clearness or cloudiness.
weathering – To subject to the action of the elements.