ACT Science Glossary of Terms

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This glossary is meant as a tool to prepare you for the ACT Science Reasoning Test. You will not be asked any vocabulary questions on the ACT Science Reasoning Test, so there is no need to memorize any of these terms or definitions. However, reading through this list will familiarize you with general science words and concepts, as well as terms you may have encountered in the practice questions. These terms come from all the areas of science found on the ACT (Biology, Chemistry, Earth and Space Science, and Physics), but it is not guaranteed that any of the terms below will be included on an official ACT Science Reasoning Test.

Acceleration—The rate that velocity changes per unit time and the direction it changes in. Computed from the change in velocity divided by the change in time. Common units are meters per second squared (m/s^2).

Acceleration due to gravity—The acceleration of an object that is only acted on by the force of the Earth's gravity. This value is given the symbol g and near the surface of the Earth it has a value of approximately 9.8 m/s^2. The direction of the acceleration due to gravity is vertically downward.

Accuracy—The closeness of an experimental measurement to the accepted or theoretical value.

Acid—A substance that is a proton donor. The pH of an acid is less than 7.

Analysis—A stage in the scientific method where patterns of observations are made.

Aqueous solution—A solution in which the solvent is water.

Arteries—The vascular tissue which carries blood away from the heart.

Astronomy—The study of planets, stars, and space.

Atom—The smallest structure that has the properties of an element. Atoms contain positively charged protons and uncharged neutrons in the nucleus. Negatively charged electrons orbit around the nucleus.

ATP—(Adenosine Triphosphate)—A chemical that is considered to be the "fuel" or energy source for an organism.

Atria—The chambers of the heart that receive blood.

Base—A substance that is a proton acceptor. The pH of a base is greater than 7.

Calibration—The examination of the performance of an instrument in an experiment whose outcomes are known, for the purpose of accounting for the inaccuracies inherent in the instrument in future experiments whose outcomes are not known.

Capillaries—Vascular tissue that receives blood from the arterioles and releases the blood to the venuoles.

Catalyst—An agent that changes the rate of a reaction, without itself being altered by the reaction.

Celestial equator—The extension of the Earth's equator out onto the celestial sphere.

Celestial poles—The extension of the Earth's north and south pole onto the celestial sphere.

Celestial sphere—The imaginary sphere onto which all the stars are viewed as being on for the purposes of locating them.

Cell membrane—An organelle found in all cells that acts as the passageway through which materials can pass in and out. This organelle is highly selectively permeable, only allowing materials to pass through that it "chooses" chemically.

Cell wall—An organelle found primarily in plant cells and fungi cells, and also some bacteria. The cell wall is a strong structure that provides protection, support, and allows materials to pass in and out without being selectively permeable.

Centripetal force—The net force that acts to result in the centripetal acceleration. It is not an individual force, but the sum of the forces in the radial direction. It is directed toward the center of the circular motion.

Chemical change—A process that involves the formation or breaking of chemical bonds.

Chromosome—An organelle that contains the entire DNA of the organism.

Component—The part of a vector that lies in the horizontal or vertical direction.

Compound—A substance composed of more than one element that has a definite composition and distinct physical and chemical properties.

Concentration—A measure of the amount of solute that is present in a solution. A solution that contains very little solute is called dilute. A solution that contains a relatively large amount of solute is said to be concentrated.

Conclusion—The last stage of the scientific method where explanations are made about why the patterns identified in the analysis section occurred.

Constellation—An apparent grouping of stars in the sky that is used for identification purposes. These stars are not necessarily near each other in space since they are not necessarily the same distance from the Earth.

Continental rift—The region on a continent where new crust is being created, and the plates on either side of the rift are moving apart.

Convergent boundary—A boundary between two of the Earth's plates that are moving toward each other.

Cosmology—The study of the formation of the universe.

Crystal—A solid in which atoms or molecules have a regular repeated arrangement.

Current—The flow of charge past a point per unit time; it is measured in Amperes (A).

Cuticle—The top layer on a leaf. It is a non-living layer consisting primarily of wax that is produced by the epithelium, a cell layer directly underneath.

Cytoplasm—A jelly-like substance located in the cell where all of the internal organelles can be found. The cytoplasm consists primarily of water and supports the cell and its organelles.

Cytoskeleton—Organelles that are the internal "bones" of the cell. They exist in thick and thin tubules.

Decibel—A unit of measure for the relative intensity of sounds.

Declination—The celestial coordinate similar to that of latitude on the Earth. Declination measures how many degrees, minutes, and seconds north or south of the celestial equator an object is.

Delta—A fan shaped deposit of material at the mouth of a river.

Density—The mass of a substance for a given unit volume. A common unit of density is grams per milliliter (g/ml).

Displacement—The change in position of an object. Computed from the final position minus the initial position. Common units of measure are meters (m).

Divergent boundary—A boundary between two of the Earth's plates that are moving away from each other.

DNA—Contains all genetic material for an organism. The smallest units of DNA are called *nucleotides*.

Ecliptic—The apparent path of the Sun across the sky over the course of a year.

Electric potential energy—The energy due to an object's position within an electric field.

Electromagnetic wave—A light wave that has an electric field component and a magnetic field component. An electromagnetic wave does not require a medium to travel through.

Electrostatic force—The force that exists between particles due to their charge. Particles of like charge repel, particles of unlike charge attract.

Element—The smallest entity that has distinct chemical properties. It can not be decomposed by ordinary chemical reactions.

Ellipse—A geometric shape that is formed when a plane is intersected with a cone. In this case the plane intersects the cone at an angle so that a shape similar to a circle but stretched in one direction is formed. The orbits of the planets around the Sun represent ellipses.

Endoplasmic reticulum—An organelle that is used to transport proteins throughout the cell.

Energy—The ability to do work or undergo change. Kinetic energy is the energy of motion, while potential energy is stored energy.

Epicycle—Smaller circles on which the planets traveled around the Earth in the geocentric model of the solar system. Epicycles were used to explain the retrograde motion of planets and help make the predicted positions of the planets match the observed positions.

Equilibrium—A state at which the forward and reverse reaction proceed at the same rate.

Focal length—The distance from a focal point to a mirror or lens.

Force—That which acts on an object to change its motion; a push or pull exerted on one object by another. Common units are Newtons (N).

Freefall—An object in one-dimensional motion that is only acted on by the force of the Earth's gravity. In this case its acceleration will be -g or g downward.

Frequency—The number of cycles or repetitions per second. Frequency is also often measured as the number of revolutions per second. The common units of frequency are Hertz (Hz) where one Hertz equals 1/second.

Frictional force—The force that acts parallel to surfaces in contact opposite the direction of motion or tendency of motion.

Functional group—A group of atoms that give a molecule a certain characteristic or property.

Gel electrophoresis—A process used in laboratories to determine the genetic make up of DNA strands. This process involves the movement of chromosomes through a gel from one pole to the other. Magnetism is used to pull the chromosomes through the gel.

Geocentric model—The model of the solar system that places the Earth at the center with the planets and the Sun orbiting around it.

Geology—The study of rocks and minerals.

Glacier—A large mass of snow-covered ice.

Golgi apparatus—An organelle that packages proteins so that they can be sent out of the cell.

Gravitational force—The attractive force that exists between all particles with mass.

Heliocentric model—The model of the solar system that places the Sun at the center with the planets orbiting around it.

Heterogeneous—A mixture that is not uniform in composition.

Homogeneous—A mixture in which the components are uniformly distributed.

Hydrate—A crystal of a molecule that also contains water in the crystal structure. If the water evaporates, the crystal becomes anhydrous.

Hydrology—The study of the Earth's water and water systems.

Hypothesis—A step in the scientific method where a prediction is made about the end result of an experiment. A hypothesis is generally based on research of related data.

Igneous rock—A rock formed through the cooling of magma.

Image distance—The distance from an image to a mirror or lens.

Inertia—The tendency of an object to follow Newton's First Law, the law of inertia. That is the tendency of an object to remain at rest or in motion with constant velocity unless acted on by a force.

Inorganic—A material that is neither plant nor animal in origin.

Intensity—The power per unit area of a wave; measured in Watts/m^2.

Ion—An atom that has either lost electrons to become a positively charged cation, or has gained electrons to become a negatively charged anion.

Isomers—Substances that have the same molecular formula (same number of elements) in different arrangements.

Isotopes—Atoms of the same element, with different numbers of neutrons, and hence a different atomic mass.

Jovian planet—One of the outer planets of the solar system that have characteristics similar to that of Jupiter. They are also called gas planets. They are large, have high mass, have many moons, may have rings, are far from the Sun and each other, have thick atmospheres, are gaseous and have low density, have a composition similar to that of the Sun, have short rotation rates, and have long revolution periods around the Sun. The Jovian planets are Jupiter, Saturn, Uranus, and Neptune.

Kinetic energy—The energy due to an object's motion or velocity.

Land breeze—The breeze that develops on the shoreline due to unequal heating of the air above the land and ocean. Land breeze occurs at night when the air above the land is cooler and the air above the ocean is warmer. The breeze blows from the land to the sea.

Latitude—The coordinate used to measure positions on the Earth north or south of the Earth's equator. Latitude is measured in degrees, minutes, and seconds. Zero-degrees latitude is the Earth's equator.

Longitude—The coordinate used to measure positions on the Earth east or west of the prime meridian, which goes through Greenwich, England. Longitude is measured in degrees, minutes, and seconds.

Longitudinal wave—A wave that has the direction of motion of the particles in the medium parallel to the direction of motion of the wave. Sound is an example of a longitudinal wave.

Mass—The amount of matter in an object; also a measure of the amount of inertia of an object. Common units are Kilograms (kg).

Meander—A broad curve in a river.

Meiosis—A process of cellular reproduction where the daughter cells have half the amount of chromosomes. This is used for purposes of sexual reproduction to produce sex cells that will be able to form an offspring with a complete set of chromosomes with different DNA than the parents.

Meniscus—The curved surface of a liquid in a container, caused by surface tension.

Metamorphic rock—A rock whose crystal structure has been changed through heat and/or pressure.

Meteorology—The study of the Earth's atmosphere and weather.

Mid-oceanic ridge—A region under the ocean where new crust is being created, and the plates on either side of the ridge are moving apart.

Mineral—A naturally occurring element or compound found in the Earth's crust.

Mitochondria—An organelle that produces ATP.

Mitosis—A process in which cells produce genetically identical offspring.

Mixture—A physical combination of different substances.

Mole—The amount of substance that contains as many particles as there are atoms in 12 grams of the carbon 12 isotope (6.022×10^{23} particles).

Molecular mass—The sum of the atomic masses in a molecule.

Molecule—A substance formed by a chemical bond between two or more atoms.

Net force—The vector sum of all the forces acting on an object.

Newton—The metric and System International unit of force. One Newton equals one kg/s^2.

Non-renewable resource—A resource that is not replaced in nature as quickly as it is used. In many cases it is not replaced or re-formed at all.

Normal force—This force acts between any two surfaces in contact. It is the part of the contact force that acts normal or perpendicular to the surfaces in contact.

Nucleolus—An organelle found inside a nucleus that is responsible for the production of ribosomes.

Nucleotide—The smallest unit of DNA. There are five different types of nucleotides: adenine, guanine, thymine, cytosine, and uracil. The arrangement of genes is based directly on the specific arrangement of nucleotides.

Nucleus—An organelle in a cell that contains all of the DNA and controls the functions of the cell.

Object distance—The distance from an object to a mirror or lens.

Oceanography—The study of the Earth's oceans.

Orbit—The path an object takes as it travels around another in space.

Organic—A material that is plant or animal in origin.

Oxbow lake—A crescent shaped lake formed when a meander is cutoff from the river it was part of.

Oxidation—The loss of electrons by a substance in a chemical reaction.

Parallel circuit—A circuit with more than one path for the current to follow.

Period—The time, often measured in seconds, for one complete repetition or rotation.

Phloem—Vascular tissue found in plants that transports mostly sugar and water; can travel either "shoot to root" or "root to shoot."

Photon—A particle of light. A discreet amount of light energy where a single photon of light is the smallest unit of light energy possible.

Photosynthesis—A process by which the sunlight's energy, water, and carbon dioxide are transformed into sugar and oxygen.

Physical property—A property that can be observed without performing a chemical transformation of that substance.

Plate tectonics—The theory in which Earth's crust is made up of many plates that float on the mantle. This theory explains the movement of the continents, the formation of mountains, earthquakes, volcanoes, and the existence of mid-oceanic ridges.

Polymer—A large molecule made up of repeating units of one or more small molecules (monomers).

Position—The location of an object in a coordinate system. Common units of measure are meters (m).

Potential difference—The difference in electric potential energy per unit charge between two points. This is commonly called voltage. The common unit of measure for potential difference is called Volts.

Potential energy—The energy due to an object's position or state.

Precession—The process by which the Earth's axis traces out a circle on the celestial sphere.

Precision—The measurement of the closeness of measurements obtained from two or more experimental runs.

Pressure—Force per unit area. Units used to measure pressure are torr, atmosphere (atm), and Pascal (Pa).

Procedure—A logical list of steps that explain the exact actions taken to perform an experiment.

Projectile—An object in two-dimensional motion that has a vertical acceleration equal to -g (or g downward) and a horizontal acceleration of zero.

Protein synthesis—A process by which DNA will transport its information by way of RNA to the ribosomes where proteins will be assembled.

Qualitative observation—An observation that includes characteristics other than amounts or measurements; may include shapes, colors, actions, and odors.

Quantitative observation—An observation that includes characteristics of measurements or amounts.

Radiation—The emission of energy.

Reactant—A substance that is consumed in a chemical reaction to form products.

Reduction—The gain of electrons by a substance in a chemical reaction.

Renewable resource—A renewable resource is replaced in nature as quickly as it is used.

Resistance—The resistance to the flow of electrons through a circuit. The resistance is dependant on the current flowing through the circuit element and the voltage across the circuit element; resistance in measured in Ohms.

Respiration—A process by which sugar is converted into ATP and carbon dioxide; may include oxygen which is called *aerobic respiration.*

Retrograde motion—The apparent westward motion of objects in the sky from one night to another.

Reversible reaction—A reaction in which products can revert back into reactants.

Ribosome—An organelle where protein synthesis occurs; can be found floating freely in the cytoplasm or attached to the outside of endoplasmic reticulum.

Right ascension—The celestial coordinate similar to that of longitude on the Earth. Right ascension is measured in hours, minutes, and seconds with 24 hours making up 360° around the celestial sphere.

River system—A river and its associated tributaries and drainage basin.

RNA—(Ribonucleic Acid)—Responsible for transmitting genetic information from the DNA to the ribosomes for protein synthesis.

Rock cycle—The rock cycle summarizes how rocks of different types are formed and how they can be transformed from one type into another.

Scalar—A quantity that has a magnitude or amount only.

scientific method—A process by which data is collected to answer an integral question. The major steps are problem, hypothesis, research, procedure, observations and data collection, analysis of data, and conclusion.

Sedimentary rock—A rock made up of sediments that have been deposited, compacted and cemented over time.

Sea breeze—The breeze that develops on the shoreline due to unequal heating of the air above the land and ocean. Sea breeze occurs during the day when the air above the ocean is cooler and the air above the land is warmer. The breeze blows from the sea to the land.

Series circuit—A circuit with only one path for the current to follow. The current in each element in a series circuit is the same.

Solubility—The amount of solute that can be dissolved completely in a solvent at a given temperature.

Solution—A homogeneous mixture of a solute (usually solid, but sometimes liquid or gas) in a solvent (usually a liquid, but sometimes a solid or gas).

Speed—The magnitude of velocity. It measures the rate position changes with time without regard to the direction of motion; common units are meters per second (m/s).

Speed of light—The speed of light in a vacuum is the fastest speed possible. As light travels in other materials it will change speed. The speed of light in any material is still the fastest speed possible in that material; commonly denoted by the symbol c.

Spindle fiber—An organelle used during mitosis and meiosis that separates and "pulls" chromosomes towards the opposite poles of the cell.

Spontaneous reaction—A reaction that does not require an external source of energy to proceed.

Star—A body composed mostly of hydrogen and helium that radiates energy and that has fusion actively occurring in the core.

States of matter—Solid, liquid, and gas. In solids, atoms or molecules are held in place. The shape and volume of a solid usually do not vary much. In liquids atoms or molecules can move, but their motion is constrained by other molecules. Liquids assume the shape of their container. In gasses the motion of atoms or molecules is unrestricted. Gases assume both the volume and the shape of their containers and they are easily compressible.

Temperature—The measure of the average kinetic energy of the molecules of a substance.

Tension—The force that acts and is transferred along ropes, strings, and chains.

Terminal moraine—A ridge of material deposited by a glacier at its farthest point of advance.

Terrestrial planet—One of the inner planets of the solar system that have characteristics similar to that of the Earth. They are small, have low mass, have few or no moons, have no rings, are close to the sun and are close to each other, have thin or no atmosphere, are rocky and have high density, have long rotation rates, and have short revolution periods around the Sun. The terrestrial planets are Mercury, Venus, Earth, and Mars.

Topography—The study of the surface features of the planet primarily through mapping.

Transverse wave—A wave that has the direction of motion of the particles in the medium perpendicular to the direction of motion of the wave.

Uniform circular motion—Motion with constant speed in a circle. Since the direction of the velocity changes in this case, there is acceleration even though the speed is constant.

Valence electrons—Electrons that are in the outer atomic shell and can participate in a chemical reaction.

Vector—A quantity that has both a magnitude (an amount) and a direction. In one-dimensional motion, direction can be represented by a positive or negative sign. In two-dimensional motion, the direction is represented as an angle in the coordinate system.

Veins—In plants, found in the leaves; sometimes called the vascular bundle that contains the xylem and phloem. In animals, tube-like tissue that usually transports blood.

Velocity—The rate that a position changes per unit time and the direction it changes in. Common units are meters per second (m/s).

Ventricles—Chambers found in animal hearts that pump blood away from the heart.

Voltage—Another name for potential difference.

Voltmeter—A device used to measure voltage in a circuit.

Water cycle—The movement of water between the land, oceans, and atmosphere.

Weight—The force of the Earth's gravity on an object. Near the surface of the Earth the weight is equal to the object's mass times the acceleration due to gravity ($W = mg$).

Xylem—Vascular tissue found in plants that transports water in one direction; "root to shoot." This is the water that will be sent to the photosynthetic cells in order to perform photosynthesis.