

Glossary

Acceleration—The rate at which an object's velocity changes with time.

Altitude—Height above Earth's mean sea level.

Apparent Weight—The net sum of all forces acting on a body is its apparent weight.

Biotechnology—Any technique that involves the research, manipulation, and manufacturing of biological molecules, tissues, and living organisms to improve or obtain products, or perform specific functions.

Buoyancy—Driven Convection Convection created by the difference in density between two or more fluids in a gravitational field.

Capillarity—The attraction a liquid has for itself versus the attraction it has for a solid surface, such as the liquid's container.

Combustion Science—The study of the process of burning.

Concave—Curved inward like the inner surface of a sphere.

Convection—Energy and/or mass transfer in a fluid by means of bulk motion of the fluid .

Convex—Curved like the outer surface of a sphere.

Critical Point—The temperature at which the differences between liquids and gases disappear. Above that temperature, the liquid smoothly transforms to the gaseous state; boiling disappears.

Dendrites—Branching structures that develop as a molten metal solidifies under certain conditions.

Density—The mass of a body divided by its volume (average density).

Differentiation—The process by which cells and/or tissues undergo a progressive specialization of form or function.

Diffusion—Intermixing of atoms and/or molecules in solids, liquids, and gases due to a difference in composition.

Dopant—An impurity intentionally added to a pure semiconductor to alter its electronic or optical properties.

Drop Facility—Research facility that creates a microgravity environment by permitting experiments to freefall through an enclosed vertical tube.

Fluid—Anything that flows (liquid or gas).

Fluid Physics—The study of the properties and motions of liquids, gases, and fluid-like solids.

Force—An action exerted upon a body in order to change its state, either of rest, or of uniform motion in a straight line.

Freefall—Falling in a gravitational field where the acceleration is the same as that due to gravity alone.

Fundamental Physics—The study of several physics subfields, including studies where interaction forces are weak, where extremely uniform samples are required, where objects must be freely suspended and their acceleration must be minimized, and where mechanical disturbances that are unavoidably present in Earth-bound laboratories must be eliminated.



G–Universal Gravitational Constant (6.67×10^{-11} N m²/kg²)

g–The acceleration Earth’s gravitational field exerts on objects at Earth’s surface (approximately 9.8 meters per second squared).

g-jitter–The vibrations experienced by microgravity experiments (for example on parabolic aircraft and the Space Shuttle) that cause effects similar to those that would be caused by a time-varying gravitational field.

Gradient–The variation of a quantity such as temperature with respect to a given parameter, typically distance, °C/cm.

Gravitation–The attraction of objects due to their masses.

Homogeneous–Uniform in structure and/or composition.

Immiscible–The situation where two or more liquids do not mix chemically.

Inertia–A property of matter that causes it to resist changes in velocity.

Joule Heating–Heating a material by flowing an electric current through it.

Law of Universal Gravitation–A law stating that every mass in the universe attracts every other mass with a force proportional to the product of their masses and inversely proportional to the square of the distances between their centers.

Materials Science–The study of developing quantitative and predictive relationships between the processing, structure, and properties of materials.

Microgravity (μg)–An environment in which the apparent weight of a system is small compared to its actual weight (due to gravity).

Morphology–The form and structure of an object.

Nucleus–A source upon which something, such as a crystal, grows or develops.

Quasi-steady Acceleration–Accelerations in spacecraft related to the position in the spacecraft, aerodynamic drag, and vehicle rotation.

Regolith–A layer of powder-like dust and loose rock that rests on bedrock. In the case of the moon, fragmentation of surface rocks by meteorite bombardment created much of the regolith material.

Rheology–The scientific study of the deformation and flow of matter.

Satellite–A natural or man-made object that orbits a celestial body.

Semiconductor–A substance, such as germanium and silicon, that is a poor electrical conductor at room temperature but is improved by minute additions of certain substances (dopants) or by the application of heat, light, or voltage; a material with a forbidden energy gap less than 3 eV.



Skylab—NASA's first orbital laboratory that was operated in 1973 and 1974.

Spacelab—A scientific laboratory developed by the European Space Agency that is carried into Earth orbit in the Space Shuttle's payload bay.

Speed—The magnitude of velocity.

Surfactant—A substance added to a liquid to change its surface tension.

Velocity—The rate at which the position of an object changes with time; it is a vector quantity.

Weight—The weight of an object is the gravitational force exerted on it by Earth.

