amber: A type of fossil that forms when partial or complete insects and small arthropods become embedded in tree resin; fossilizes when the resin is buried and hardens into a clear shell. See also fossil.

angle of separation: Angle between lines originating from the eye of the observer toward two objects, such as a star—the Sun—and the horizon. See also horizon.

annular eclipse: A type of solar eclipse in which the Moon is too far from Earth to cover the Sun completely, so the outer edge of the Sun is seen as a ring. See also solar eclipse.

apparent: Seeming real or true; for example, the Sun’s apparent motion across the sky is due to Earth’s rotation, not the Sun’s motion.

asteroid: A small, mostly rocky solar system object that orbits independently around the Sun; minor planet. See also asteroid belt.

asteroid belt: A large group of asteroids that orbits the Sun between Mars and Jupiter. See also asteroid.

astronomer: A scientist who studies the stars, planets, and other objects in space. See also astronomy.

astronomical unit: A unit of measure equal to the average distance between Earth and the Sun, about 150 million kilometers (93 million miles); abbreviated AU.

astronomy: The branch of science that studies the stars, planets, and other objects in space. See also astronomer.

atmosphere: The mixture of gases that surrounds a planet or moon.

aurora: Light display that occurs mostly near the poles when gases in Earth’s atmosphere glow when hit by charged particles carried by solar winds. See also solar wind.

axis (plural: axes): An imaginary line that runs through the middle of an object (for example, from pole to pole) around which that object rotates; a line at the side or bottom of a graph.

basin: An area where rock dips toward a central point or depression, as in a crater. See also crater.

cast: Type of fossil that forms when sand, minerals, or other matter fill a cavity-shaped mold over time and then harden, forming a replica of the original organism. See also fossil.

celestial: Of or relating to things in the heavens.

chromosphere: The layer of the Sun’s atmosphere below the corona. See also corona.

coma: The part of a comet that surrounds the nucleus and that is made of gas and dust. See also comet.

comet: A mass of frozen gas, cosmic dust, ice crystals, and organic material whose orbit around the Sun takes it outside the solar system.

constellation: An observed pattern of stars.

core: The center of a planet, star, or moon.

corona: The outer layer of the Sun’s atmosphere that becomes visible from Earth during a total solar eclipse.

crater: A bowl-shaped pit on a planet, moon, or asteroid formed by the impact of an object; also formed by volcanoes. See also basin.

crescent: The phase of the Moon in which only a curved edge of the Moon’s side that faces Earth is illuminated; occurs between a new moon and a quarter moon. See also phase; waxing crescent; waning crescent.

day: The time it takes a planet to complete one rotation on its axis; one Earth day is approximately 24 hours long. See also day.

degree: A unit for measuring angles and arcs; one degree equals $\frac{1}{360}$ of a circle.
**galaxy:** A large system of dust, gas, stars, and other celestial bodies that has a particular shape.

**gaseous planets:** Planets composed of compounds that under normal Earth conditions would be gases; includes Jupiter, Saturn, Uranus, and Neptune.

**gibbous moon:** The phase of the Moon in which three-fourths of the Moon's side that faces Earth is illuminated; occurs between a quarter moon and full or new moon. See also phase.

**gravity:** A force of attraction between two objects; the strength of the force is due to the mass and distance between the two objects.

**gravity assist:** A technique that uses the pull of a planet's gravity to change a spacecraft's speed and direction.

**greenhouse effect:** The trapping of heat by a planet's atmosphere.

**greenhouse gases:** The gases in a planet's atmosphere, such as water vapor and carbon dioxide, that absorb energy radiated from the planet and prevent its escape into space.

**Earth-centered:** A description of the universe in which it was believed that all the planets, stars, Moon, and Sun revolve around Earth.

**eclipse:** The complete or partial block of the Sun or Moon's light that occurs when the Moon passes between the Sun and Earth and casts a shadow on Earth, or when the Moon enters the shadow of Earth.

**ecliptic:** The apparent path of the Sun, planets, and Moon in the sky as seen from Earth; the plane along which the Sun, planets, Moon, and other solar system objects orbit.

**ellipse:** An oval-shaped closed curve; the shape of a planet's orbit.

**equinox:** Either of two times of the year (fall or spring) during a planet's orbit when the north and south poles are equidistant from the Sun, causing day and night to be equal in length.

**erosion:** The process by which terrestrial planetary materials are broken down and moved from place to place, for example, by wind and water.

**first quarter:** The phase of the Moon in which only the right half of the Moon's side is that faces Earth is illuminated; occurs when the Moon, Earth, and Sun form a 90° angle. See also phase; third quarter.

**flyby:** Method astronomers use to observe a planet or moon whereby a spacecraft “flies by” the planet or moon, taking pictures of it and gathering other scientific data as it does.

**fossil:** The preserved remains or impressions of organisms of Earth's geological past. See also amber; cast; mold.

**full moon:** The phase of the Moon in which the entire side of the Moon that faces Earth is fully illuminated; occurs when Earth is between the Moon and Sun. See also phase.

**horizon:** The plane that extends from one's eye to the edge of Earth; the apparent connection between Earth and the sky.

**Hubble Space Telescope:** A telescope that orbits Earth 600 km above the surface.

**inertia:** The tendency of an object to remain either at rest or in motion unless acted on by an outside force. See also Law of Inertia.

**lander:** A spacecraft that lands on a planet to gather data directly from the planet’s surface.

**landform:** A physical feature of a planet's surface, such as a mountain, plain, or valley.
latitude: An angular distance on a globe that runs parallel (east and west) to the equator; measured in degrees north and south. See also longitude.

Law of Inertia: Law stating that a body in motion tends to travel in a straight line unless an outside force disturbs it. See also inertia.

Law of Universal Gravitation: Law stating that any two objects in the universe have gravity and will attract each other, and that attraction depends on how much mass each object has and their distance from each other. See also gravity.

longitude: An angular distance on a globe that runs perpendicular (north and south) to the equator; measured in degrees east and west. See also latitude.

lunar: Of or relating to the Moon.

lunar eclipse: The blocking of sunlight to the Moon; occurs during a full moon, when Earth's shadow lands on the Moon. See also eclipse.

maria: Dark, flat, low-lying regions on the Moon's surface.

mass: The total amount of matter in an object; not dependent upon gravitational pull. See also weight.

meteor: The streak of light that is produced when a meteoroid burns as it enters an atmosphere. See also meteoroid; meteorite.

meteorite: A meteoroid that strikes a planet, moon, or asteroid. See also meteor; meteoroid.

meteoroid: A solid object moving in interplanetary space, distinguished from asteroids and planets by its smaller size. See also asteroid; meteor; meteorite.

model: A representation that is used to study objects, ideas, or systems that are too complex, distant, large, or small to study easily firsthand.

mold: A fossil type that is an impression of a shell, bone, tooth, or other body part left in the rock after the organism is covered by soft material. See also fossil.

moon: A rocky object that orbits a planet; a natural satellite.

NASA: The National Aeronautics and Space Administration, an organization that oversees the United States' space program, established in 1958.

neap tide: Lower-than-normal high tide that occurs when the first or third quarter moon, Earth, and the Sun are at right angles to each other and the gravitational force of the Sun partially offsets the gravitational force of the Moon. See also spring tide; tide.

nebula: A concentration of dust and gas in space.

new moon: A phase of the Moon in which the side of the Moon that faces Earth is not illuminated at all; occurs when the Moon is between Earth and the Sun.

nuclear fusion: The reaction by which hydrogen gas changes into helium gas and releases energy in the form of heat and light.

nucleus: The main part of a comet, which is made of ice, gas, and dust.

orbit: (noun) The curved path of one object, such as a planet or moon, around a central object, such as a star or planet; (verb) to move in a circular or elliptical path around a central object. See also revolve.

orbital period: The time that it takes an object to orbit another object one complete time. See also period of revolution.

orbiter: A spacecraft that studies a planet by orbiting it rather than by flying past it.
paleontologist: Scientist who studies life forms of the past. See also fossil.
partial lunar eclipse: A lunar eclipse in which part of the full moon’s illuminated disk becomes temporarily darkened by Earth’s shadow; occurs when the Moon moves partially into the umbra of Earth’s shadow. See also eclipse; lunar eclipse.
partial solar eclipse: A solar eclipse in which the new moon temporarily blocks part of the Sun’s disk; occurs when the new moon, Earth, and the Sun are not completely aligned and the umbra of the Moon’s shadow falls into space and viewers on Earth are located in the penumbra of the Moon’s shadow. See also eclipse; solar eclipse.
penumbra: The lighter, outer part of a shadow cone. See also umbra.
penumbral lunar eclipse: Lunar eclipse—barely visible from Earth—that occurs when the new moon moves into the penumbral shadow of Earth’s shadow. See also eclipse; lunar eclipse.
period of revolution: The time it takes an object to orbit another object one complete time. See also orbital period.
period of rotation: The time it takes an object to spin on its axis in one complete rotation. See also rotation.
petrified wood: Fossil originally of wood in which the wood has been replaced by some mineral. See also fossil.
phase: Any of eight various stages in which the Moon appears to change its shape.
photosphere: The layer of the Sun’s atmosphere below the chromosphere that provides the sunlight that reaches Earth. See also chromosphere; corona.
plane: A flat surface; an imaginary surface along which the planets orbit. See also ecliptic.
planet: A massive, usually spherical space object that orbits a star and shines by reflecting the star’s light.
Polaris: The current star to which the North Celestial Pole of Earth points; also called the “North Star.”
probe: Instrument that makes observations and takes measurements such as atmospheric content, turbulence, temperature, particle size, and radiation either on a planet’s surface or in its atmosphere.
prominence: A loop of gas that comes from the Sun’s surface, linking parts of sunspot regions. See also sunspot.
radiation: The process by which energy is transferred from one object, such as the Sun, to another object, such as a planet, without the space between them being heated.
rays: Spoke-like patterns of ejected material that radiate from a crater.
revolution: The movement of one object around a central object. See also revolve.
revolve: To move in a curved path or orbit. See also orbit; revolution.
rotate: To turn or spin around a central point or axis. See also axis; rotation.
rotation: The movement of one object as it turns or spins around a central point or axis. See also axis; rotate.
satellite: A natural (for example, the Moon) or artificial (for example, the Hubble Space Telescope) object that orbits another object in space.
scale: The ratio between the measurements on a map or model and the actual measurements of an object.
scale factor: A method for reducing all measurements by the same amount to achieve the measurement of the scale model.
season: One of four natural parts of the year on Earth, including spring, summer, autumn (or fall), and winter; seasons vary from planet to planet and depend on the planet's rotation on its axis and revolution around the Sun.

shadow: An area where light is blocked by an object.

solar eclipse: The blocking of the Sun's light that occurs during a new moon when the Moon's shadow falls on Earth. See also eclipse.

solar energy: Energy from the Sun.

solar flare: A sudden brightness near a sunspot; explosion of gas from the Sun's surface. See also sunspot.

solar noon: Time of day when the Sun reaches its highest point in the sky for a given place on Earth.

solar system: A star with planets and other objects in orbit around it; our solar system is made up of the Sun, nine planets, asteroids, meteoroids, comets, and other space objects.

solar wind: A stream of electrically charged particles (primarily protons and electrons) that flow outward from the Sun's corona.

solstice: Either of two times of the year during which the north pole (around June 21) or the south pole (around December 21) is most directed toward the Sun.

space probe: An unmanned spacecraft that collects information in space.

space shuttle: A reusable spacecraft designed to transport astronauts, materials, and satellites to and from Earth's orbit.

space weather: The conditions on the surface of the Sun that ultimately affect Earth and its atmosphere.

spinoff: A product or process that was originally created for the space program that has been adapted for use on Earth.

spring tide: Higher-than-normal high tide during the month that normally occurs during a new and full moon when the Sun, Moon, and Earth are in line and their gravitational forces are combined. See also neap tide.

star: A sphere of hot glowing gases that releases energy in the form of heat and light. See also Sun.

Sun: The star in the center of our solar system around which Earth and eight other planets revolve. See also planet.

sunspot: A relatively darker, cooler area on the Sun's surface that emits charged particles.

technology: The application of science principles in processes, tools, and devices.

tectonics: The change in a surface of a planet due to internal forces.

terrestrial: Of or having to do with solid rock; name given to the four inner planets (Mercury, Venus, Earth, and Mars). See also planets.

third quarter: The phase of the Moon in which only the left half of the Moon's side that faces Earth is illuminated; occurs when the Moon, Earth, and the Sun form a 90° angle. See also phase; first quarter.

tide: Periodic rising and falling of the surface level of an ocean and other waters resulting from the gravitational attraction of the Moon and the Sun on the solid and liquid surfaces of Earth. See also neap tide; spring tide.

total lunar eclipse: Eclipse in which the entire disk of the full moon is covered by the Earth's umbra. See also eclipse.

total solar eclipse: Eclipse visible on Earth from inside the Moon's umbra; occurs when the Sun's entire disk—except for the corona—is blocked by the new moon. See also eclipse.
umbra: The inner, darker part of a shadow. See also penumbra.

universe: The entirety of everything that is known to exist in space.

velocity: Speed and direction that an object travels over a specified distance during a measured amount of time; rate of motion.

volcano: A landform, usually cone shaped, produced by a collection of erupted material around a vent, or opening, in the surface of a planet or moon and through which gas and erupted material pass.

waning crescent: Phase of the Moon in which a narrow strip of the Moon’s lighted hemisphere is visible from Earth; shaped like a crescent; light is on the left; occurs before a new moon. See also phase.

waning gibbous: Phase of the Moon in which the lighted portion of the Moon’s side that faces Earth is getting smaller; occurs after a full moon. See also phase.

waxing crescent: Phase of the Moon in which a narrow strip of the Moon’s lighted hemisphere is visible from Earth; shaped like a crescent; light is on the right; occurs after a new moon. See also phase.

waxing gibbous: Phase of the Moon in which the lighted portion of the Moon’s side that faces Earth is getting larger; occurs before a full moon. See also phase.

weight: A measure of the force of gravity on an object.

year: The time it takes a planet to complete one revolution around the Sun; Earth’s year is 365 ¼ days long. See also day.
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