

Glossary

additive color

A primary light color—red, blue, or green; these three colors produce white light when added together.

angle of incidence

The angle between a wave striking a barrier and the line perpendicular to the surface.

angle of reflection

The angle between a reflected wave and the normal to the barrier from which it is reflected.

angstrom

An angstrom is 1/100,000,000 of a centimeter.

concave lens

A lens that is thinner in the middle than at the edges; used to correct nearsightedness.

convex lens

A lens that is thicker in the middle than at the edges; used to correct farsightedness.

diffraction grating

A piece of transparent or reflecting material, which contains many thousands of parallel lines per centimeter; used to produce a light spectrum by diffraction.

electromagnetic wave

A wave that does not have to travel through matter in order to transfer energy.

electromagnetic spectrum

Transverse radiant energy waves, ranging from low frequency to very high frequency, which can travel at the speed of light.

element

A substance that cannot be broken down into simpler substances by ordinary means.

equilateral triangle

A triangle with three equal angles of 60 degrees and sides of equal length.

filter

A screen that allows only certain colors to pass through it; a transparent material that separates colors of light.

focal length

The distance between the principal focus of a lens or mirror and its optical center.



focal point/focus

The point that all light rays from a mirror or lens pass through.

frequency

The number of waves that pass a point in a given unit of time.

gamma ray

High-energy wave of high frequency and with a wavelength shorter than an x ray; released in a nuclear reaction.

image

The reproduction of an object formed with lenses or mirrors.

in phase

When two or more light rays overlap exactly at the crest and the trough, they are said to be “in phase.”

index of refraction

The amount that light is refracted when it enters a substance; given as the ratio of speed of light in a vacuum to its speed in a given substance.

infrared radiation

Invisible radiation with a longer wavelength than red light and next to red light in the electromagnetic spectrum; used in heat lamps, to detect heat loss from buildings, and to detect certain tumors.

interference

The addition by crossing wave patterns of a loss of energy in certain areas and reinforcement of energy in other areas.

kaleidoscope

A toy in which reflections from mirrors make patterns. It was invented in 1819 by David Brewster.

laser (light amplification by stimulated emission of radiation)

A device that produces a highly concentrated, powerful beam of light which is all one frequency or color and travels only in one direction.

law of reflection

Angle of incidence equals the angle of reflection.

lens

A curved, transparent object; usually made of glass or clear plastic and used to direct light.



light

Light is a form of energy, traveling through the universe in waves. The wavelengths of visible light range from less than 4,000 angstroms to more than 7,000 angstroms.

normal

A line perpendicular to a surface.

opaque

Not transparent; no light passes through the material.

optical axis

The line straight out from the center of a parabolic mirror; straight line through the center of a lens.

optical fiber

A thin strand of glass that transmits light down its length.

optical telescope

A tube with magnifying lenses or mirrors that collect, transmit, and focus light.

out of phase

When the crest of one wave overlaps the trough of another they are said to be “out of phase.”

parabola

A curved line representing the path of a projectile; the shape of the surface of a parabolic mirror.

parabolic mirror

A curved mirror.

pigment

A material that absorbs certain colors of light and reflects other colors.

plane mirror

A mirror with a flat surface.

polarized light

Light in which all waves are vibrating in a single plane.

prism

A transparent material with two or more straight faces at an angle to each other.

real image

An image that can be projected onto a screen; formed by a parabolic mirror or convex lens.



reflection

The light or image you see when light bounces off a surface; bouncing a wave or ray off a surface.

reflecting telescope

A telescope in which magnification is produced by a parabolic mirror.

refraction

Bending of a wave or light ray caused by a change in speed as it passes at an angle from one substance into another.

scattering

The spreading out of light by intersecting objects, whose size is near the wavelength.

spherical

Surface of a lens or mirror that is part of a sphere.

subtractive color

One of the three pure pigment colors—magenta, yellow, cyan; these pigment colors produce black when mixed.

translucent

Semitransparent; a material that admits some light.

transparent

See-through; light can go through.

true image

A true image is the way other people see us. It is the opposite of the image that is seen in a mirror.

ultraviolet radiation

Radiation that has a shorter wavelength than visible light; next to violet light in the electromagnetic spectrum.

virtual image

An image formed by a mirror or lens that cannot be projected onto a surface.

visible light spectrum

Band of visible colors produced by a prism when white light is passed through it.

wavelength

The total linear length of one wave crest and trough.

x ray

Invisible electromagnetic radiation of great penetrating power.

