English Glossary

This glossary defines each key term that appears in bold type in the text. It also shows the chapter, section, and page number where you can find the word used.

A

amplitude: distance a wave rises above or falls below its normal level, which is related to the energy that the wave carries; in a transverse wave, is one half the distance be-tween a crest and a trough. (Chap. 1, Sec. 2, p. 13)

C

carrier wave: particular transmission frequency assigned to a radio station. (Chap. 3, Sec. 3, p. 82)

compressional wave: a type of mechanical wave in which matter in the medium moves forward and backward in the same direction the wave travels. (Chap. 1, Sec. 1, p. 11)

concave lens: lens that is thicker at its edges than in the middle and causes light rays traveling parallel to the optical axis to diverge. (Chap. 4, Sec. 3, p. 111)

convex lens: converging lens that is thicker in the middle than at its edges. (Chap. 4, Sec. 3, p. 110)

D

diffraction: bending of waves around a barrier. (Chap. 1, Sec. 3, p. 22)

Doppler effect: change in the frequency or pitch of a sound that occurs when the sound source and the listener are in motion relative to each other. (Chap. 2, Sec. 1, p. 42)

E

eardrum: membrane stretching across the ear canal that vibrates when sound waves reach the middle ear. (Chap. 2, Sec. 2, p. 54)

echo: a reflected sound wave. (Chap. 2, Sec. 1, p. 41)

electromagnetic spectrum: range of electromagnetic waves, including radio waves, visible light, and X rays, with different frequencies and wavelengths. (Chap. 3, Sec. 2, p. 71)

electromagnetic waves: transverse waves that can travel through matter or space, are produced by the motion of electrically charged particles, and include X rays, ultraviolet waves, and visible light. (Chap. 1, Sec. 1, p. 12)

F

focal length: distance along the optical axis from the center of a concave mirror to the focal point. (Chap. 4, Sec. 2, p. 104)

focal point: single point on the optical axis of a concave mirror where reflected light rays pass through. (Chap. 4, Sec. 2, p. 104)

frequency: number of wavelengths that pass a given point in one second, measured in hertz (Hz). (Chap. 1, Sec. 2, p. 15)

fundamental frequency: lowest natural frequency that is produced by a vibrating string or vibrating column of air. (Chap. 2, Sec. 2, p. 49)

G

gamma ray: highest-frequency, most penetrating electromagnetic wave. (Chap. 3, Sec. 2, p. 76)

Global Positioning System (GPS): uses satellites, ground-based stations, and portable units with receivers to locate objects on Earth. (Chap. 3, Sec. 3, p. 85)

I

infrared wave: electromagnetic wave that is sensed as heat and is emitted by almost every object. (Chap. 3, Sec. 2, p. 73)

interference: ability of two or more waves to combine and form a new wave when they overlap. (Chap. 1, Sec. 3, p. 24)

L

law of reflection: states that the angle of incidence is equal to the angle of reflection. (Chap. 4, Sec. 2, p. 101)

lens: transparent object that has at least one curved surface that causes light to bend. (Chap. 4, Sec. 3, p. 109)

light ray: narrow beam of light traveling in a straight line. (Chap. 4, Sec. 1, p. 96)

loudness: the human perception of how much energy a sound wave carries. (Chap. 2, Sec. 1, p. 38)

M

mechanical wave: a type of wave that can travel only through matter. (Chap. 1, Sec. 1, p. 9)

medium: material through which a wave can travel. (Chap. 4, Sec. 1, p. 97)

N

natural frequency: frequency at which a musical instrument or other object vibrates when it is struck or disturbed; relative to its size, shape, and the material it is made from. (Chap. 2, Sec. 2, p. 47)

O

overtones: multiples of the fundamental frequency. (Chap. 2, Sec. 2, p. 49)

P

pitch: how high or low a sound is. (Chap. 2, Sec. 1, p. 40)

R

radiant energy: energy carried by an electromagnetic wave. (Chap. 3, Sec. 1, p. 70)

radio waves: lowest-frequency electromagnetic waves that carry the least amount of energy and are used in most forms of telecom-munications technology—such as TVs, telephones, and radios. (Chap. 3, Sec. 2, p. 72)

reflecting telescope: uses a concave mirror to gather light from distant objects. (Chap. 4, Sec. 4, p. 115)

reflection: occurs when a wave strikes an object or surface and bounces off. (Chap. 1, Sec. 3, p. 20) (Chap. 4, Sec. 1, p. 97)

refracting telescope: uses two convex lenses to gather light and form an image of a distant object. (Chap. 4, Sec. 4, p. 114)

refraction: bending of a wave as it moves from one medium into another medium; due to a change in speed. (Chap. 1, Sec. 3, p. 21) (Chap. 4, Sec.3, p. 109)

resonance: sound amplification that occurs when an object is vibrated at its natural frequency by absorbing energy from a sound wave or other object vibrating at this frequency. (Chap. 2, Sec. 2, p. 48)

reverberation: repeated echoes of sounds. (Chap. 2, Sec. 2, p. 53)

T

transverse wave: a type of mechanical wave in which the wave energy causes matter in the medium to move up and down or back and forth at right angles to the direction the wave travels. (Chap. 1, Sec. 1, p. 10)

U

ultraviolet radiation (UV): electromagnetic waves with higher frequencies and shorter wavelengths than visible light. (Chap. 3, Sec. 2, p. 75)

V

visible light: electromagnetic waves with wavelengths between 0.4 and 0.7 millionths of a meter that can be seen with your eyes. (Chap. 3, Sec. 2, p. 74)

W

wave: rhythmic disturbance that carries energy but not matter. (Chap. 1, Sec. 1, p. 8)

wavelength: in transverse waves, the distance between the tops of two adjacent crests or the bottoms of two adjacent troughs; in compressional waves, the distance from the centers of adjacent rarefactions. (Chap. 1, Sec. 2, p. 14)

X

X ray: high-energy electromagnetic wave that is highly penetrating and can be used for medical diagnosis. (Chap. 3, Sec. 2, p. 76)