

controlled experiment an experiment that tests only one factor at a time by using a comparison of a control group with an experimental group (p. 9)

convex spherical mirror a mirror whose reflecting surface is an outward-curved segment of a sphere (p. 463)

crest the highest point above the equilibrium position (p. 384)

critical angle the minimum angle of incidence for which total internal reflection occurs (p. 506)

cyclic process a thermodynamic process in which a system returns to the same conditions under which it started (p. 346)

D

decibel a dimensionless unit that describes the ratio of two intensities of sound; the threshold of hearing is commonly used as the reference intensity (p. 417)

destructive interference a superposition of two or more waves in which individual displacements on opposite sides of the equilibrium position are added together to form the resultant wave (p. 391)

diffraction a change in the direction of a wave when the wave encounters an obstacle, an opening, or an edge (p. 532)

dispersion the process of separating polychromatic light into its component wavelengths (p. 509)

displacement the change in position of an object (p. 41)

doping the addition of an impurity element to a semiconductor (p. 927)

Doppler effect an observed change in frequency when there is relative motion between the source of waves and an observer (p. 412)

drift velocity the net velocity of a charge carrier moving in an electric field (p. 611)

E

elastic collision a collision in which the total momentum and total kinetic energy remain constant (p. 216)

elastic potential energy the energy available for use when an elastic body returns to its original configuration (p. 170)

electric circuit a set of electrical components connected such that they provide one or more complete paths for the movement of charges (p. 642)

electric current the rate at which charges pass through a given area (p. 608)

electric field a region where an electric force on a test charge can be detected (p. 572)

electric potential the work that must be performed against electric forces to move a charge from a reference point to the point in question divided by the charge (p. 596)

electrical conductor a material in which charges can move freely (p. 561)

electrical insulator a material in which charges cannot move freely (p. 561)

electrical potential energy potential energy associated with a charge due to its position in an electric field (p. 594)

electromagnetic induction the process of creating a current in a circuit by a changing magnetic field (p. 708)

electromagnetic radiation the transfer of energy associated with an electric and magnetic field; it varies periodically and travels at the speed of light (p. 733)

electromagnetic wave a wave that consists of oscillating electric and magnetic fields, which radiate outward from the source at the speed of light (p. 446)

emission spectrum a diagram or graph that indicates the wavelengths of radiant energy that a substance emits (p. 764)

entropy a measure of the randomness or disorder of a system (p. 355)

environment the combination of conditions and influences outside a system that affect the behavior of the system (p. 337)

equilibrium in physics, the state in which the net force on an object is zero (p. 129)

excited state a state in which an atom has more energy than it does at its ground state (p. 926)

F

fluid a nonsolid state of matter in which the atoms or molecules are free to move past each other, as in a gas or liquid (p. 274)

force an action exerted on an object which may change the object's state of rest or motion; force has magnitude and direction (p. 120)

frame of reference a system for specifying the precise location of objects in space and time (p. 40)

free fall the motion of a body when only the force due to gravity is acting on the body (p. 60)