Glossary

amplitude the maximum displacement from the equilibrium position of an object oscillating around the equilibrium position

antinode the location of maximum amplitude in standing waves

beat frequency the frequency of the amplitude fluctuations of a wave

constructive interference when two waves arrive at the same point exactly in phase; that is, the crests of the two waves are precisely aligned, as are the troughs

critical damping the condition in which the damping of an oscillator causes it to return as quickly as possible to its equilibrium position without oscillating back and forth about this position

deformation displacement from equilibrium

destructive interference when two identical waves arrive at the same point exactly out of phase; that is, precisely aligned crest to trough

elastic potential energy potential energy stored as a result of deformation of an elastic object, such as the stretching of a spring

force constant a constant related to the rigidity of a system: the larger the force constant, the more rigid the system; the force constant is represented by k

frequency number of events per unit of time

fundamental frequency the lowest frequency of a periodic waveform

intensity power per unit area

longitudinal wave a wave in which the disturbance is parallel to the direction of propagation

natural frequency the frequency at which a system would oscillate if there were no driving and no damping forces

nodes the points where the string does not move; more generally, nodes are where the wave disturbance is zero in a standing wave

oscillate moving back and forth regularly between two points

over damping the condition in which damping of an oscillator causes it to return to equilibrium without oscillating; oscillator moves more slowly toward equilibrium than in the critically damped system

overtones multiples of the fundamental frequency of a sound

period time it takes to complete one oscillation

periodic motion motion that repeats itself at regular time intervals

resonance the phenomenon of driving a system with a frequency equal to the system's natural frequency

resonate a system being driven at its natural frequency

restoring force force acting in opposition to the force caused by a deformation

simple harmonic motion the oscillatory motion in a system where the net force can be described by Hooke's law

simple harmonic oscillator a device that implements Hooke's law, such as a mass that is attached to a spring, with the other end of the spring being connected to a rigid support such as a wall

simple pendulum an object with a small mass suspended from a light wire or string

superposition the phenomenon that occurs when two or more waves arrive at the same point

transverse wave a wave in which the disturbance is perpendicular to the direction of propagation

under damping the condition in which damping of an oscillator causes it to return to equilibrium with the amplitude gradually decreasing to zero; system returns to equilibrium faster but overshoots and crosses the equilibrium position one or more times

wave a disturbance that moves from its source and carries energy

wave velocity the speed at which the disturbance moves. Also called the propagation velocity or propagation speed

wavelength the distance between adjacent identical parts of a wave