

9.5: End of Chapter Key Terms

Definition: Longitudinal and Transverse Waves

- **Wave:** A disturbance that transfers energy through matter or space, characterized by its wavelength, frequency, and amplitude.
- **Longitudinal Wave:** A wave in which the particle displacement is parallel to the direction of wave propagation, such as sound waves in air.
- **Compression:** The region in a longitudinal wave where particles are closest together.
- **Rarefaction:** The region in a longitudinal wave where particles are furthest apart.
- **Transverse Wave:** A wave in which the particle displacement is perpendicular to the direction of wave propagation, such as waves on a string or electromagnetic waves.
- **Crest:** The highest point of a wave in a transverse wave.
- **Trough:** The lowest point of a wave in a transverse wave.
- **Wavelength:** The distance between successive crests, troughs, compressions, or rarefactions in a wave.
- **Frequency:** The number of waves that pass a given point per second measured in cycles per second, called Hertz (Hz).
- **Amplitude:** The maximum displacement of particles from their rest position, indicating the wave's energy or intensity.
- **Period:** The time it takes for one complete wave cycle to pass a given point, the inverse of frequency.
- **Wave Speed:** The speed at which a wave travels through a medium, calculated as the product of wavelength and frequency.
- **Medium:** The substance or material through which a wave travels.
- **Mechanical Wave:** A wave that requires a medium to travel, such as sound waves or water waves.
- **Displacement:** The distance and direction from the equilibrium position to a point on the wave.
- **Propagation:** The movement or transmission of waves through a medium or space.
- **Wave Equation:** A mathematical formula that describes the propagation of waves through a medium, often expressed as $v_{\text{wave}} = \lambda f$, where f is frequency, and λ is wavelength.

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