

Physical Science—Waves and Sound

- I. Waves and Energy
 - a. Wave terminology
 - i. Wave—a periodic back-and-forth motion or oscillation that transmits energy
 - ii. Medium—the substance through which a wave transfers its energy
 - iii. Types of waves
 - iv. Transverse waves—waves which oscillate at right angles to the direction of wave travel
 1. Crests-- High points in a wave
 2. Troughs—Low points in a wave
 - v. Longitudinal waves—particles oscillate in the direction of the wave travel
 1. Compression pulse—area in which particles are compressed together
 2. Rarefaction pulse—area in which particles are spread out
 - b. Wave attributes
 - i. Wavelength—(λ) the length of a single wave
 - ii. Amplitude—a measure of how tall a wave is or how compressed it is; this determines how much energy a wave has or how strong it is
 - iii. Frequency—the number of waves that pass a fixed point in a certain amount of time; the SI unit for frequency is the *hertz* (frequency=number of wave cycles/t)
 - iv. Speed—the rate of speed at which a wave travels (velocity=wavelength x frequency)
 - c. Wave behavior
 - i. Reflection—a change in direction that occurs when waves bounce off of an object
 - ii. Refraction—the “bending” of a wave due entering a different medium
 - iii. Diffraction—the spreading out of a wave after it passes through a narrow opening
 - iv. Interference—the reinforcement or cancellation that occurs when two or more waves collide with each other
 1. Constructive
 2. Destructive

Noise-canceling technology:

- Phones and computers: <http://www.economist.com/node/15495918>
- Cars: <http://www.nydailynews.com/autos/ford-honda-noise-canceling-tech-new-cars-bmw-porsche-bring-noise-boosting-features-article-1.1168670>

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Christian Drosten



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