Waves, Sound, and Physical Optics

AP Physics 2 · Vocabulary in context

Word	Example
wave /weɪv/	A **wave** moves across the water.
Transverse /træns'vɜːs/	Light is a **transverse** wave: it shakes at right angles to its direction.
Longitudinal /ˌlɒŋgɪ'tjuːdɪnl/	Sound is a **longitudinal** wave: air moves back and forth along its direction.
wave pulse	A **wave pulse** is one single disturbance, such as one flick of a rope.
mechanical wave	Sound is a **mechanical wave**: it needs air or another material to travel.
linear mass density	A string with a larger **linear mass density** carries slower waves.
compression /kəm'preʃn/	A **compression** is where air particles are close together.
rarefaction /ˌreərɪ'fækʃn/	A **rarefaction** is where air particles are far apart.
wavelength /'weɪvleŋθ/	The **wavelength** is the distance from one crest to the next.
frequency /'friːkwənsi/	A **frequency** of 50 Hz means 50 waves every second. 50 Hz 50
amplitude /'æmplɪtjuːd/	Loud sounds have a large **amplitude**.
wave speed /weɪv spiːd/	The **wave speed** is 340 m/s. 340 m/s
pitch /pɪtʃ/	A higher frequency gives a higher **pitch**.

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Polarization /ˌpəʊlərəɪ'zeɪʃn/	**Polarization** lets light shake in only one direction.
intensity /ɪn'tensɪti/	The **intensity** of light is less far from the lamp.
Electromagnetic waves /ɪˌlektrəʊməg'netɪk weɪvz/	Light and radio waves are **electromagnetic waves**.
plane wave	Far from its source, a wave becomes a **plane wave** with straight wavefronts.
Doppler effect /'dɒplə ɪ'fekt/	The **Doppler effect** makes a passing car's sound change pitch.
superposition /ˌsuːpəpə'zɪʃn/	When two waves meet, **superposition** adds them together.
Constructive interference /kən'strʌktɪv ˌɪntə'fɪərəns/	**Constructive interference** happens when two crests meet and make a bigger wave.
destructive interference /dɪ'strʌktɪv ˌɪntə'fɪərəns/	A crest and a trough meet and give **destructive interference**.
standing wave /'stændɪŋ weɪv/	A guitar string makes a **standing wave**.
nodes /nəʊdz/	A string does not move at its **nodes**.
antinodes /ˌæntɪ'nəʊdz/	A string moves the most at its **antinodes**.
harmonic /hɑː'mɒnɪk/	The second **harmonic** has twice the frequency of the first.
beats /biːts/	Two guitar strings slightly out of tune make **beats**: the sound gets loud and soft again and again.

Word	Example
beat frequency /biːt ˈfriːkwənsi/	Notes of 440 Hz and 444 Hz give a **beat frequency** of 4 Hz. 440 Hz 444 Hz 4 Hz
Diffraction /dɪˈfrækʃn/	**Diffraction** makes waves spread out after a narrow gap.
Coherent /kəʊˈhɪərənt/	Laser light is **coherent**, so it gives a clear interference pattern.
diffraction grating /dɪˈfrækʃn ˈgreɪtɪŋ/	A **diffraction grating** splits white light into colours.
thin film /θɪn fɪlm/	A soap bubble is a **thin film** that shows bright colours.
antireflection coating /ˌæntɪrɪˈflekʃn ˈkəʊtɪŋ/	An **antireflection coating** on glasses cuts the glare.

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