

Sound

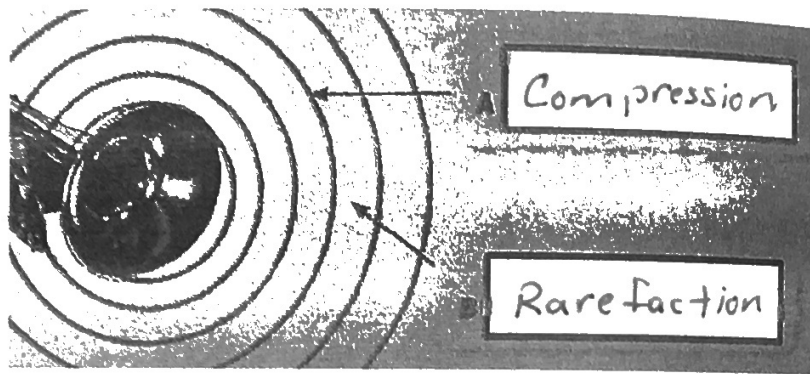
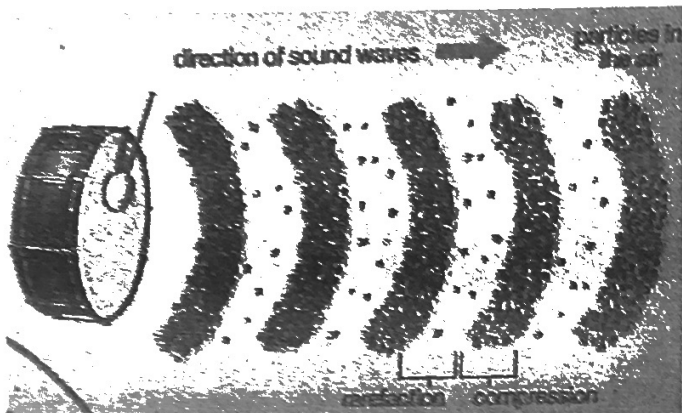
ps 38

Vibration is the complete back and forth motion of an object

Sound Waves

- Type of longitudinal waves (also known as Compression waves)
- Requires a medium for sound waves to travel
- Travel in all directions from their source
- Travels through all matter - solids, liquids and gases.
- Particles of the medium (DO / DO NOT) travel with the sound wave
- Sound waves (CAN / CAN NOT) travel through a vacuum. WHY? In a vacuum there are no particles to vibrate, which is required for sound waves

Fill in box A and B



ps 42

PITCH

Pitch is how high or low you think a sound is.

Pitch depends on the frequency and wavelength of a sound wave

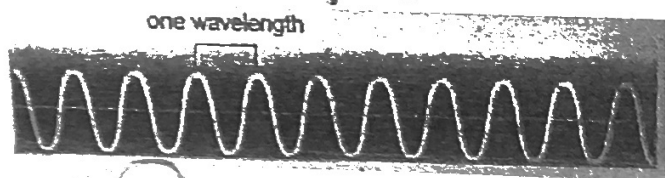
Higher the frequency the shorter the waves wavelength

Lower the frequency the longer the waves wavelength

HIGH Pitch sounds have high frequency and a short wavelength

LOW Pitch sounds have low frequency and a longer wavelength

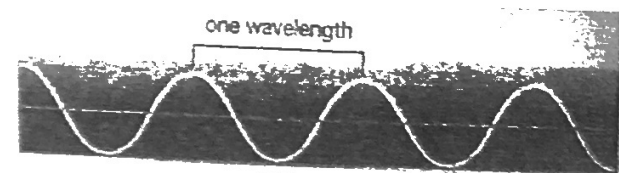
Example 1



High Frequency

(HIGH / LOW) Pitch sound

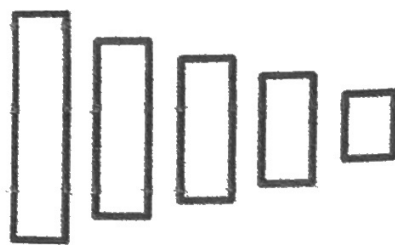
Example 2



Low Frequency

(HIGH / LOW) Pitch sound

Class Demo



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LOUDNESS

Loudness is a measure of how well a sound can be heard

The measure of how much energy a sound waves carries is the wave's intensity, or amplitude.

Greater the amplitude, louder the sound

Smaller the amplitude, softer the sound

Unit of measure for loudness is (Hertz / Decibel)

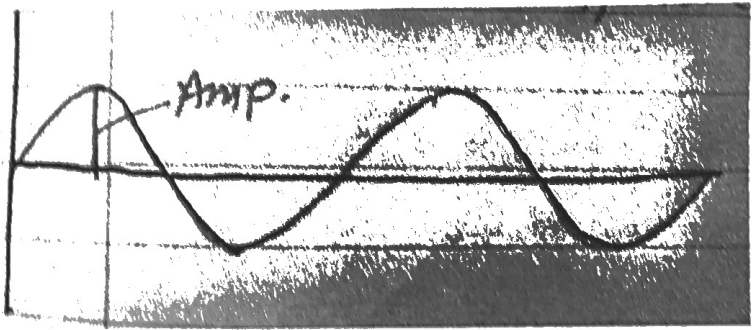
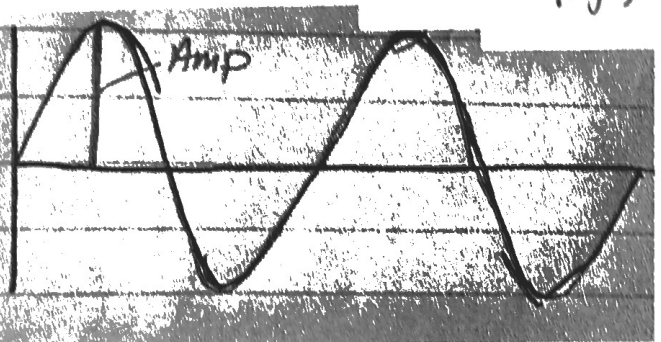
↓
frequency

(SOFT / LOUD) Sound Wave

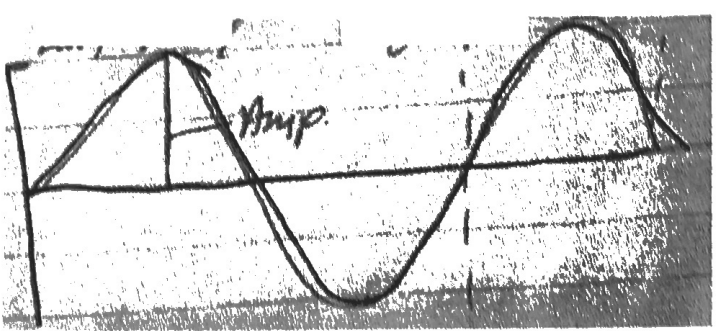
High Amp.

(SOFT / LOUD) Sound Wave

Low Amp.



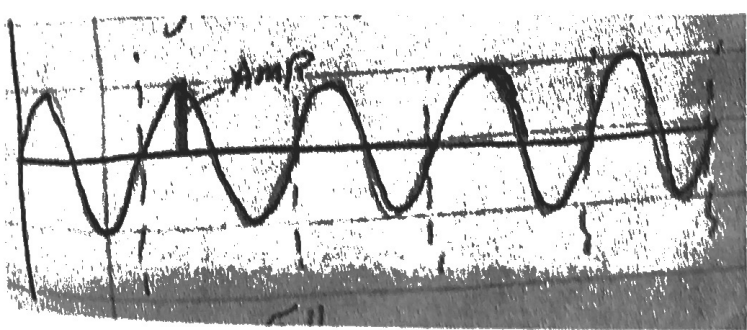
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Describe the wave

HIGH / LOW Pitch

LOUD / SOFT sound



Describe the wave

HIGH / LOW Pitch

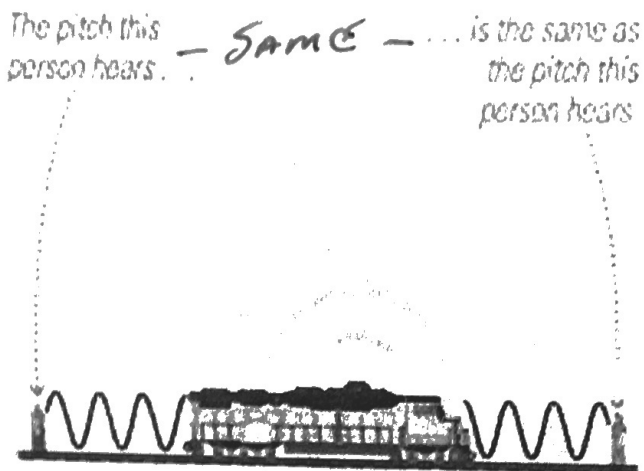
LOUD / SOFT sound

Doppler Effect

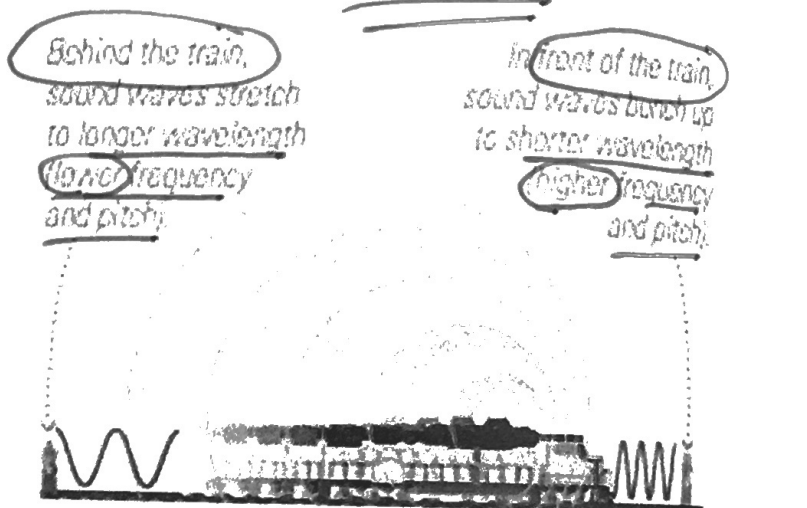
Have you ever been stopped at a railroad crossing when a train with its whistle blowing went past? You probably noticed the sudden change in the pitch of the whistle as the train passed. This change in pitch is called the Doppler effect. The Doppler effect is a change in the observed frequency of a wave when the sound source, the observer, or both are moving.

pitch based on frequency

train stationary



train moving to right



Away from me

Toward Me

a The whistle sounds the same no matter where you stand near a stationary train.

b For a moving train, the sound you hear depends on whether the train is moving toward you or away from you.

As shown in the diagram above, when you and the source of the sound are moving closer together, the sound waves are closer together. The sound has a higher frequency and a higher pitch. When you and the source are moving away from each other, the waves are farther apart. The sound has a lower frequency and a lower pitch.

- Doppler effect is a change in the observed frequency of a wave when the sound source, observer, or both are moving
- An ambulance has its siren on. What direction is the ambulance moving relative to you if the siren is decreasing in pitch? Circle your answer! *low pitch - behind the ambulance - Away*
 - behind you
 - toward you
 - away from you
 - maintaining the same position
- What property of a wave changes to create the Doppler effect? Circle your answer!
 - its speed
 - its medium
 - its amplitude
 - its frequency