

What is sound? How is it made?

Vibrations we can hear

Sound travels fastest through solids because particles are closer see foldable p. 9 in Int. NB

Sound vs Light examples:   
thunder vs. Lightning (see then hear)   
fireworks (see then BOOM!)

We can't hear sound in space because no particles (vacuum)

Sound waves bouncing (reflection) echo absorption - prevents echo curtains, carpet

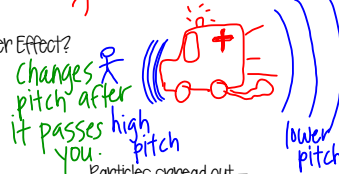
Volume = (intensity) loudness/softness of a sound.   
Pitch = highness/lowness of sound

2 things are required for sound:

1. vibrating material
2. medium to carry sound energy

What is the Doppler Effect?

NASCAR ambulance



Particles close = compression   
Particles spread out = rarefaction

Frequency = # waves per second

measured in hertz (Hz)

human range -

infrasonic 20-20,000 ultrasonic

radio stations -

AM kHz lower frequency radio waves   
FM MHz higher frequency radio waves EM

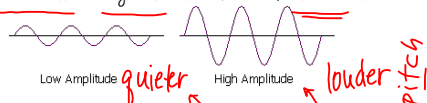
reverberation - repeated echo off of barriers

interference 2 waves

constructive - compressions align = louder   
destructive - do not align = cancel out = silence

Sound is measured in decibels (dB)

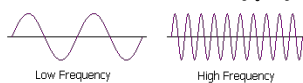
Amplitude is the size of the vibration, and this determines how loud the sound is. Larger vibrations make a louder sound.



Amplitude is important when balancing and controlling the loudness of sounds, such as with the volume control on your CD player. It is also the origin of the word amplifier, a device which increases the amplitude of a waveform.

Frequency is the speed of the vibration, and this determines

the pitch of the sound. It is only useful or meaningful for musical sounds, where there is a strongly regular waveform.



low pitch

high pitch