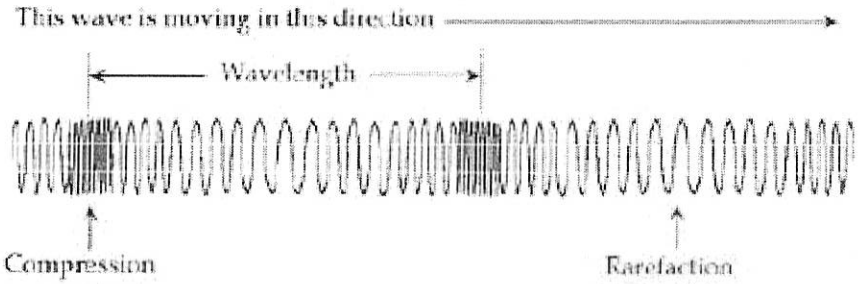
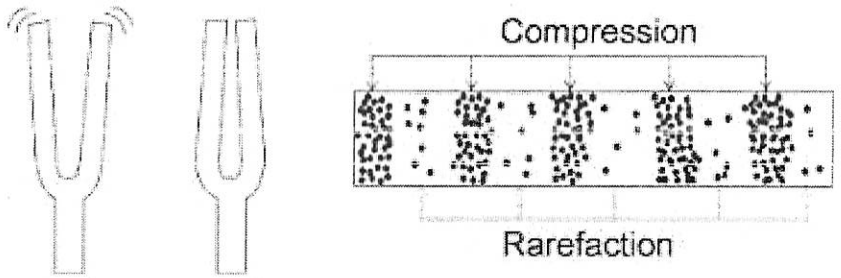
Longitudinal Waves and Sound

Name _____

Date _____ Hour _____

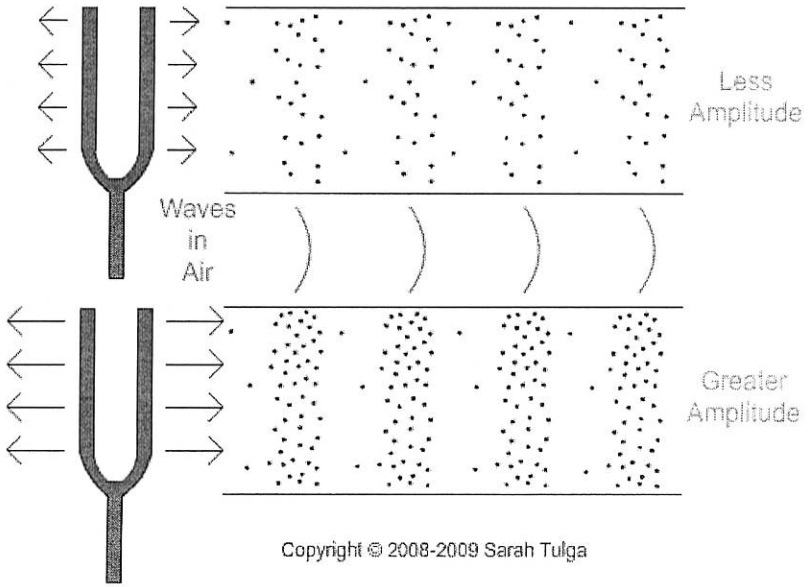
Longitudinal Waves:





Amplitude- How compressed the molecules get. Hitting a tuning fork harder would cause the tines to vibrate farther in and out, pushing the molecules harder into each other, causing denser compressions.

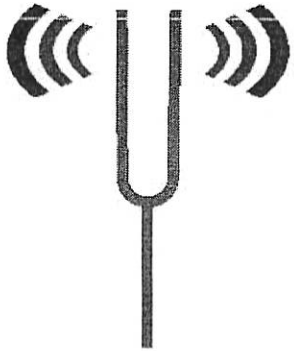
Frequency- The number of waves that occur in a given amount of time. i.e. Waves per second. This is related to the wavelength. The shorter the wavelength, the higher the frequency. The longer the wavelength the lower the frequency.

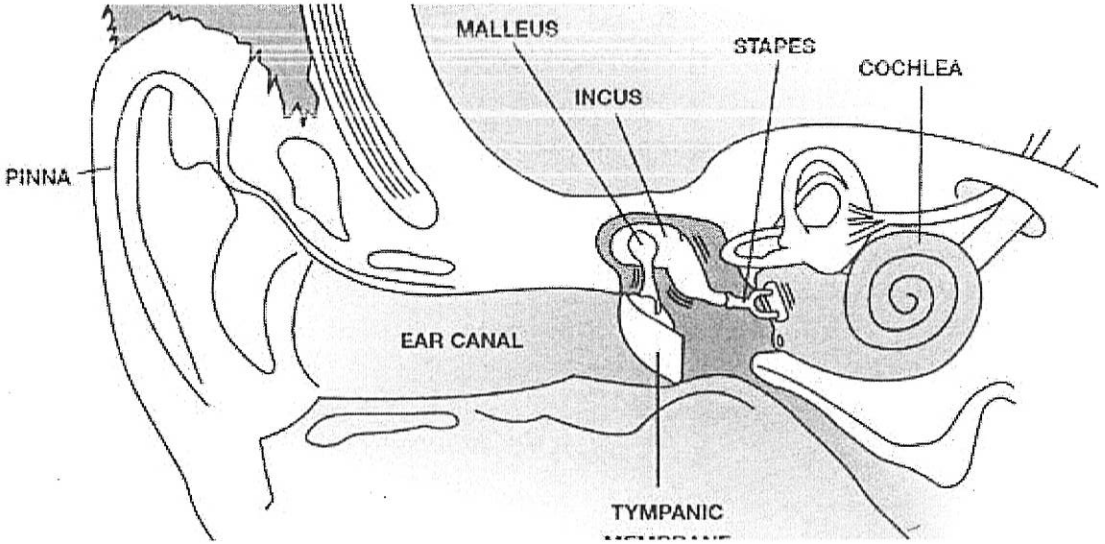


Loudness = Amplitude

Pitch = Frequency

How We Hear





Loudness: This is the **amplitude** of the sound wave. The stronger the vibrations, the more compressed the molecules in the air become. These carry more energy to the eardrum, causing it to vibrate harder. This transfers more energy through the ear to the tiny cilia in the cochlea, which transfer messages through the auditory nerve to the brain. The cilia can become damaged by too much vibrational energy.

Pitch:

- The shorter the wavelength of the sound wave, the higher the **frequency**. This gives a higher pitch.
- The longer the wavelength of the sound wave, the lower the **frequency**. This gives a lower pitch.