

Sound & its Qualities: INTENSITY

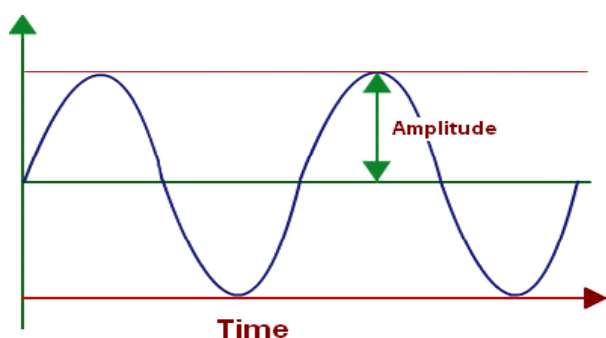
Sound intensity and distance.

The amount of energy that is transported past a given area of the medium per unit of time is known as the intensity of the sound wave. The greater the amplitude of vibrations of the particles of the medium, the greater the rate at which energy is transported through it, and the more intense that the sound wave is. (Intensity is the energy/time/area; and since the energy/time ratio is equivalent to the quantity power, intensity is simply the power/area.)

The Threshold of Hearing and the Decibel Scale

Humans are equipped with very sensitive ears capable of detecting sound waves of extremely low intensity. The faintest sound that a human ear can detect is known as the threshold of hearing. The most intense sound that the ear can safely detect without suffering any physical damage is more than one billion times more intense than the threshold of hearing.

The scale for measuring intensity is the decibel scale. The threshold of hearing is assigned a sound level of 0 decibels (abbreviated 0 dB); A sound that is 10 times more intense is assigned a sound level of 10 dB. A sound that is 10×10 or 100 times more intense is assigned a sound level of 20 dB. A sound that is $10 \times 10 \times 10$ or 1000 times more intense is assigned a sound level of 30 dB. Observe that this scale is based on powers of 10.



To conclude, the intensity of sound depends on the wave amplitude. The taller the wave is, the more intense the sound will be and the other way round.



1.- Decide if these sentences are True or False. Correct the false sentences.

_____ The faintest sound that a human can hear is known as the threshold of touching.

_____ The decibel scale is used for measuring the intensity of sound.

_____ A sound with a level of 0 decibels is the highest sound a human can hear.

_____ If a sound is 1000 times more intense than the threshold of hearing, this sound has a level of 30 dB.