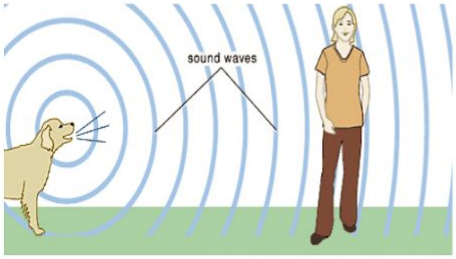
Sound

A sound is a vibration that travels through the air or another medium and can be heard when they reach in a person's or animal's ear.The sound is produced by rapid to and fro movements, called vibrations. The sound travels through the air at a speed of about 332 meters per second.

Sound needs a medium to travel. The medium can be solid, liquid or gases. It cannot travel in a vacuum. Sound travels faster in solids and liquids than in gases. Sound travels at a speed of 1500 m/s in water and at 5000 m/s in steel. Sound travels roughly at a velocity of 330 m/s in the air at 0^0 Celsius. The velocity of sound is maximum in solid and least in gas. The sound is reflected from the hard surfaces. Soft surfaces are better on absorbing sound.

Sound wave



A sound wave is a periodic disturbance which travels through a medium transferring energy from one point to another without causing any permanent displacement of the medium. A sound wave is produced by vibrating bodies. The vibration causes the surrounding air molecules to vibrate also producing a disturbance of the air. This disturbance travels out from the source of vibration in the form of longitudinal waves, which is the sound you hear.

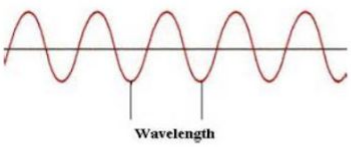
Frequency (f)

The number of complete waves sets up in a medium in one second is called frequency of the wave. Its SI unit is hertz (Hz).

Time period (T)

The time taken by the wave to complete one cycle or a complete wave is called time period. Its unit is second.

Wavelength (λ)



The distance between two consecutive troughs or crests in a transverse wave or the distance between two consecutive compressions or rarefactions in a longitudinal wave is called wavelength. It is denoted by λ. If λ is the wavelength, f is the frequency and v is the propagation speed. Its SI unit is meter (m).

then,

$\lambda = v/f$

Velocity of Sound Wave (v)

The velocity with which sound wave propagates in a medium is called the velocity of a sound wave. Its SI unit is m/s. If λ is the wavelength, f is the frequency and v is the velocity of a sound wave.

then,

$v = \lambda f$

Transmission of sound:

The sound is produced by a vibrating body. It is propagated from the source to the listener through a medium in the form of sound waves. In the absence of a medium, no sound waves can travel.