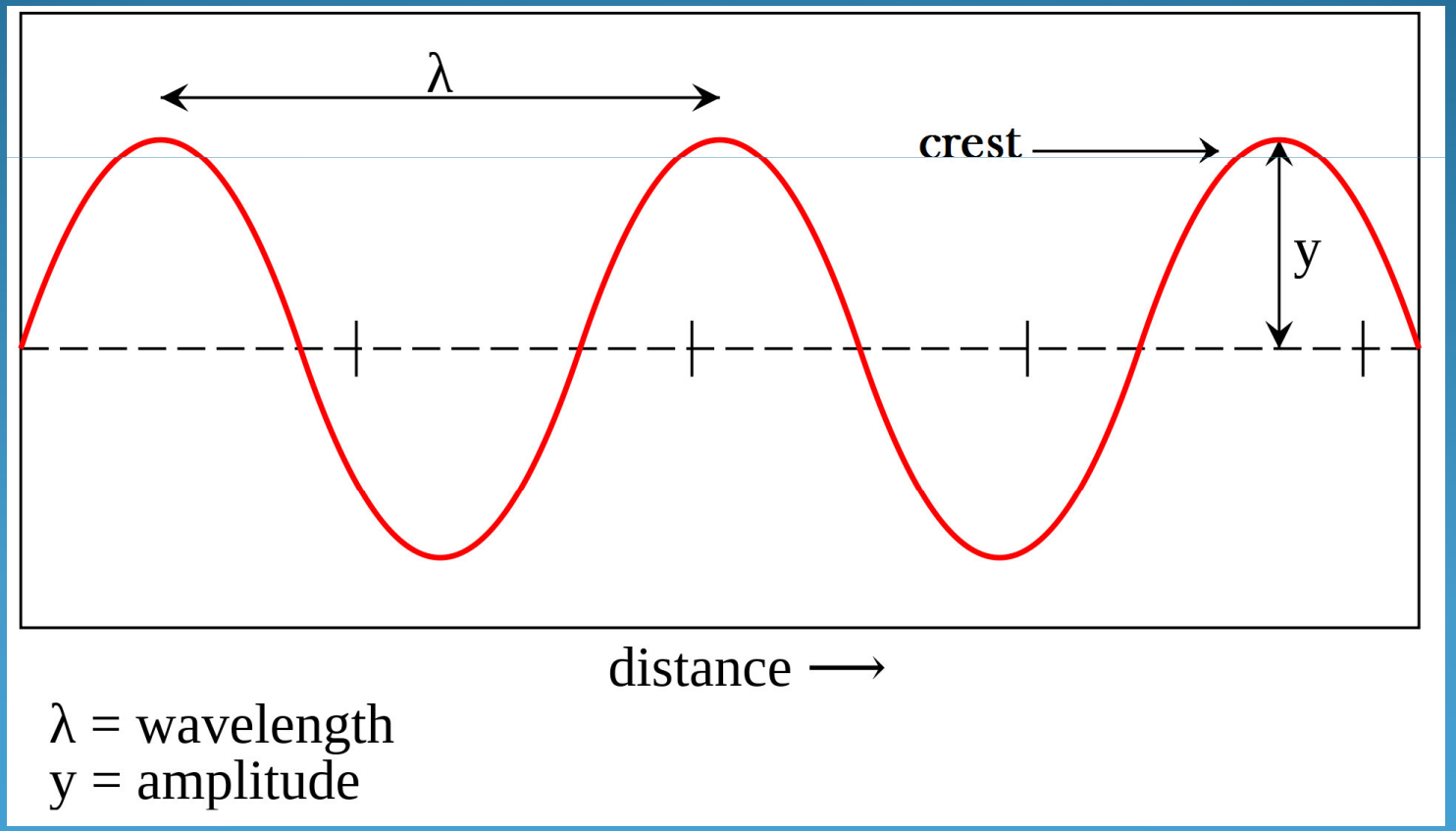
Waves

A wave is a disturbance that travels through matter or space, accompanied by a transfer of energy.



Characteristics of waves

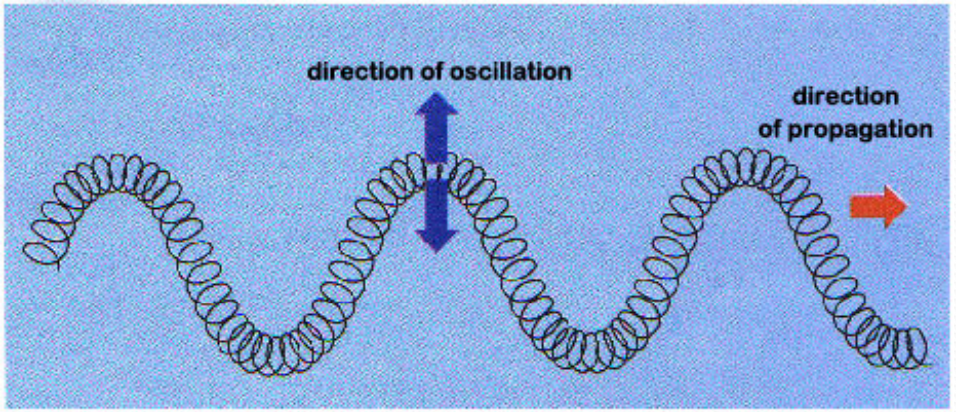
- ***Frequency:*** refers to how often the particells of the medium vibrate when a wave passes through the medium.
- ***Period:*** is the time for one complete cycle of an oscillation of a wave.

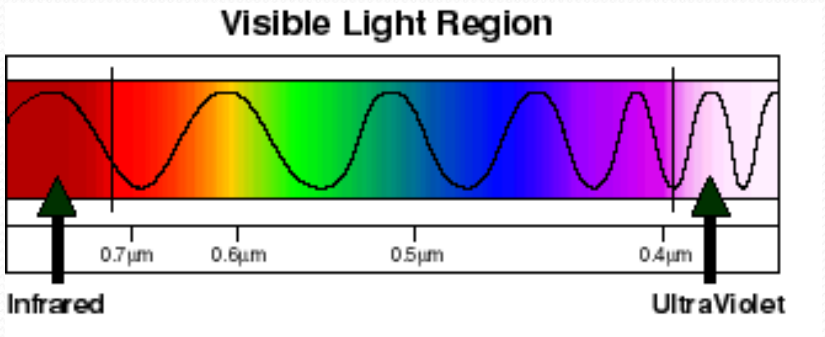
Frequency $f = \frac{1}{T}$ Hz

Periodic time $T = \frac{1}{f}$ sec

Categories of waves

- *Elastic or mechanical waves:* waves produced by the oscillating movement of the masses. These waves need a material medium to propagate and for this reason they're called mechanical.





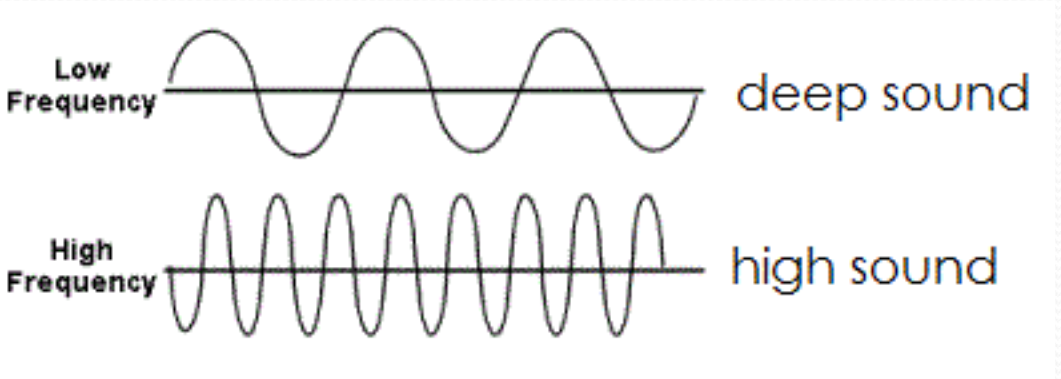
- *Light waves:* phenomenon related to the transmission of light ; the light propagates in a straight line. Light waves include those that are visible as well as those that are **invisible** to the human eye.

Sound Waves

Are elastic longitudinal waves which in order to get to the ear have a compression and a rarefaction of the air.

- ***Sound intensity:*** amount of energy flowing per unit time through a unit area that is perpendicular to the direction in which the sound waves are travelling.

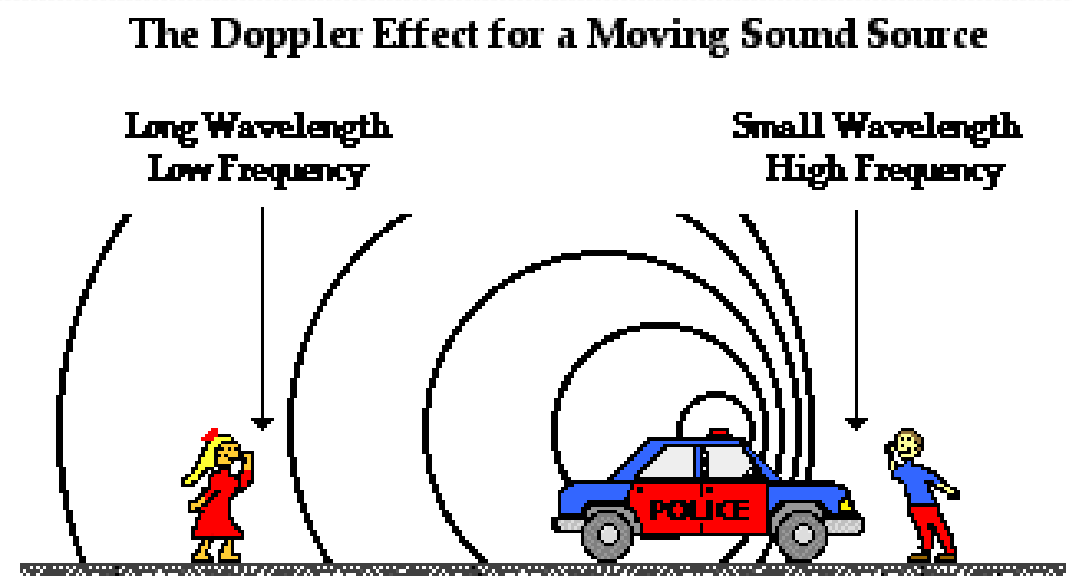
- ***Sound height:*** is bound to the frequency.



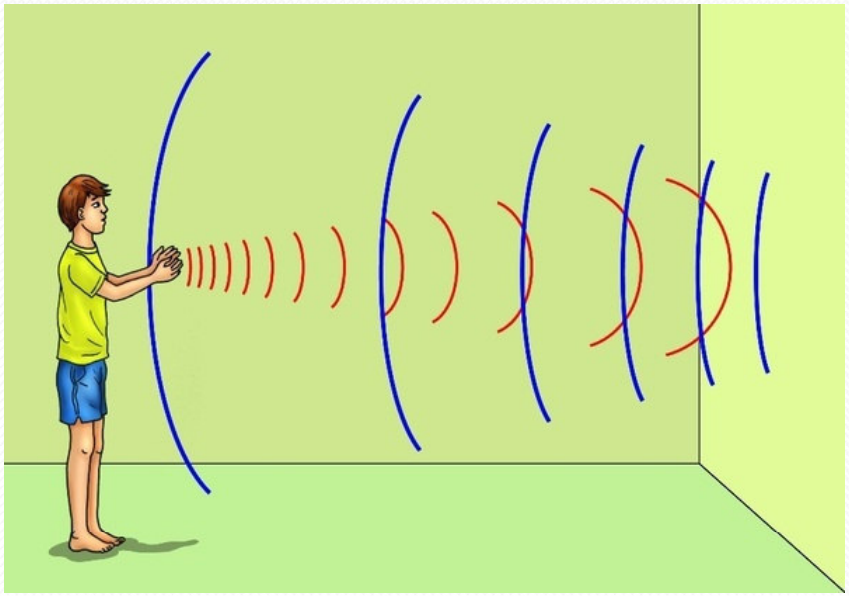
Physical effects bound to the sound

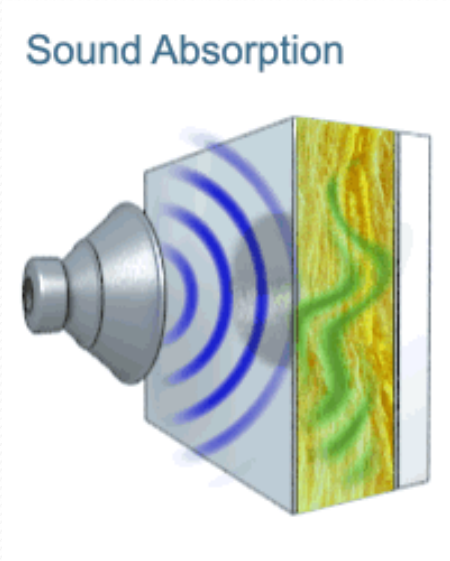
Doppler Effect:

Change in frequency of a wave for an observer moving relative to its source.



Reflection: If a source of sound is directed at a vertical surface some distance away, an ***ECHO*** may be heard. Sound waves "bounce" off the vertical surface, and are ***REFLECTED*** back towards the source.

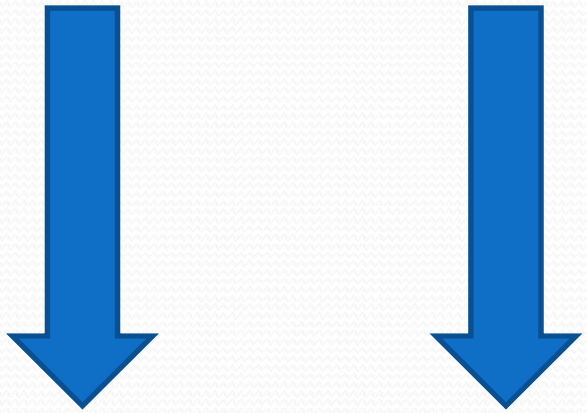




Absorption: When a sound wave impacts on an object, part of the energy of the wave is transferred to the particles making up the object. We say that the sound has been ***ABSORBED*** by the material.

Wave Front

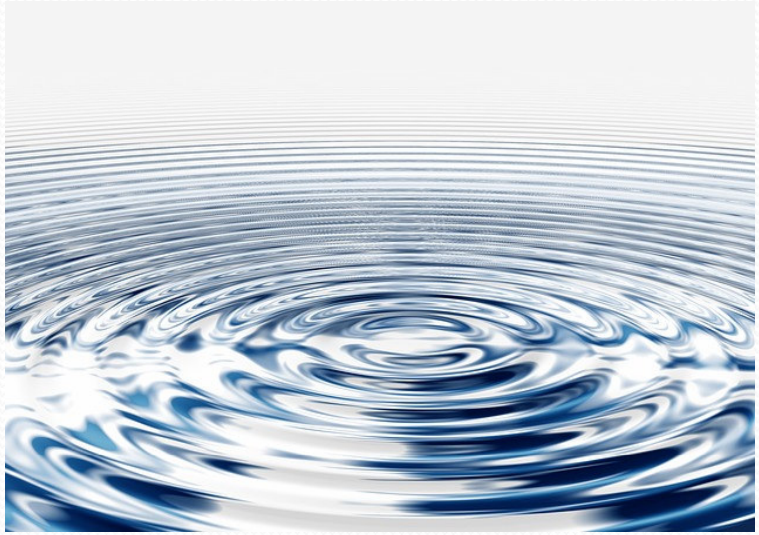
There are two types



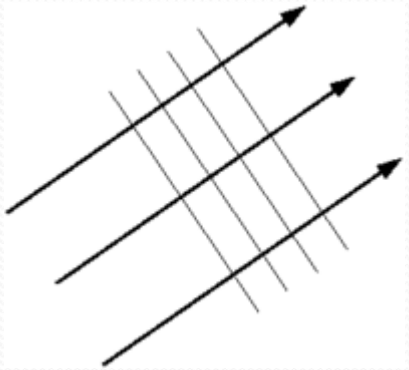
Circle waves

Straight waves

- *Circle waves:* Oscillation by means of a pointed instrument.



- *Straight waves:* Oscillations by means of a flat instrument.



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