

Key words

Light: Electromagnetic radiation that can be detected by the human eye.

Longitudinal wave: Where the direction of vibration is the same as that of the wave.

Transverse wave: Where the direction of the vibration is perpendicular to the direction of the wave.

Ray: A narrow beam of light.

Medium: The substance the wave is travelling through, this could be a solid, liquid or gas.

Reflection: When light or any type of wave hits a new surface and returns in the direction it originated.

Refraction: The change in the direction of a wave when it passes from one medium into another.

Normal: A line drawn at 90° to the surface the ray of light is hitting.

Spectrum: The range of colours produced when white light passes through a prism.

Filter: Only allows certain wavelengths (colours) of light through, absorbing all others.

Transparent: A material that allows all light to pass through it.

Translucent: A material that allows most light through but not enough to make out detailed shapes.

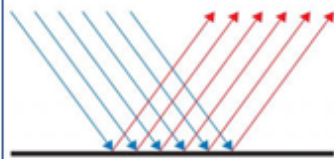
Opaque: An object that lets no light through.

Dispersion: The splitting of white light into different wavelengths (colours)

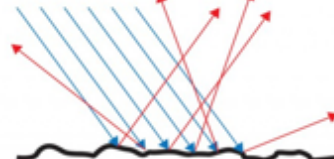
Light



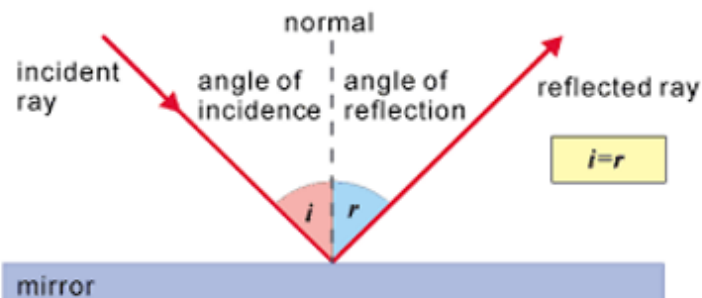
Specular



Diffuse



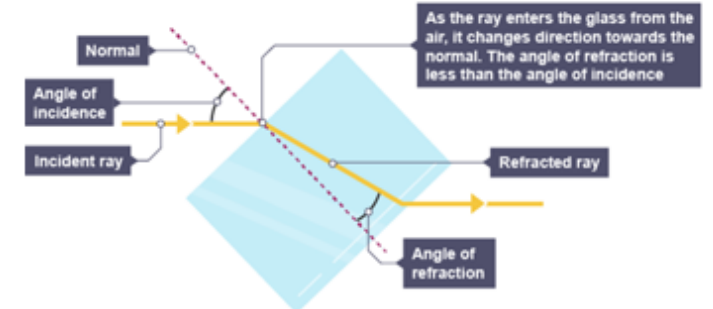
Specular reflection is when light reflected from a smooth surface at a definite angle, and diffuse reflection, which is produced by rough surfaces that tend to reflect light in all directions



When light hits a surface, some of it is absorbed and some of it is reflected. The light that is reflected is the colour of the object in that light. For example, a red object absorbs all the colours of the spectrum except red: it reflects red light.

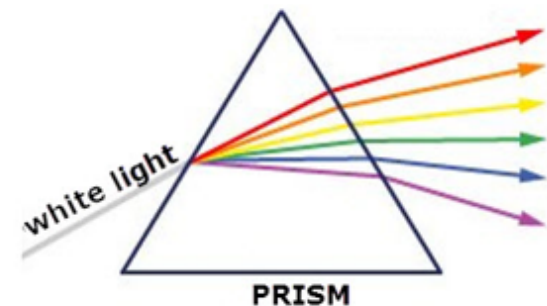


Light waves change speed when they pass across the boundary between two substances with a different density such as air and glass. This causes them to change direction, an effect called refraction.



The light slows down going into a denser substance, and the ray bends towards the normal.
The light speeds up going into a less dense substance, and the ray bends away from the normal.

Dispersed (Refracted) Light



These colors are often observed as light passes through a triangular prism. When white light passes through the prism, the white light is refracted and separated into different wavelengths of light. These appear as- red, orange, yellow, green, blue, indigo and violet.



Key words

Vibration: A back and forth motion that repeats.

Longitudinal wave: Where the direction of vibration is the same as that of the wave.

Transverse wave: Where the direction of the vibration is perpendicular to the direction of the wave.

Volume: How loud or quiet a sound is, in decibels (dB).

Pitch: How low or high a sound is. A low (high) pitch sound has a low (high) frequency.

Amplitude: The maximum amount of vibration, measured from the middle position of the wave, in metres.

Wavelength: Distance between two corresponding points on a wave, in metres.

Frequency: The number of waves produced in one second, in hertz.

Vacuum: A space with no particles of matter in it.

Oscilloscope: Device for viewing patterns of sound waves that have been turned into electrical current.

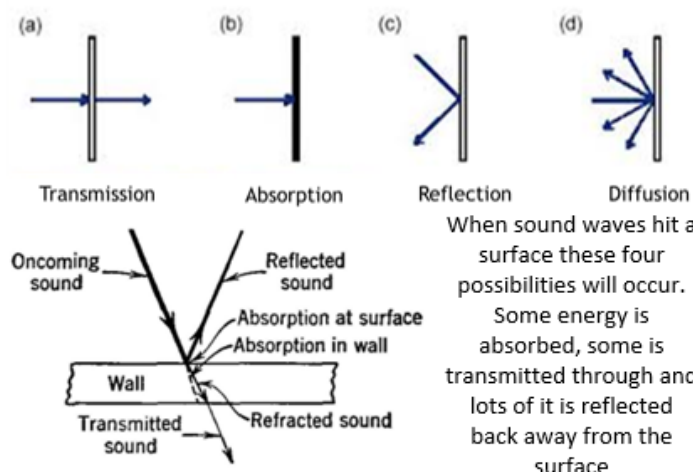
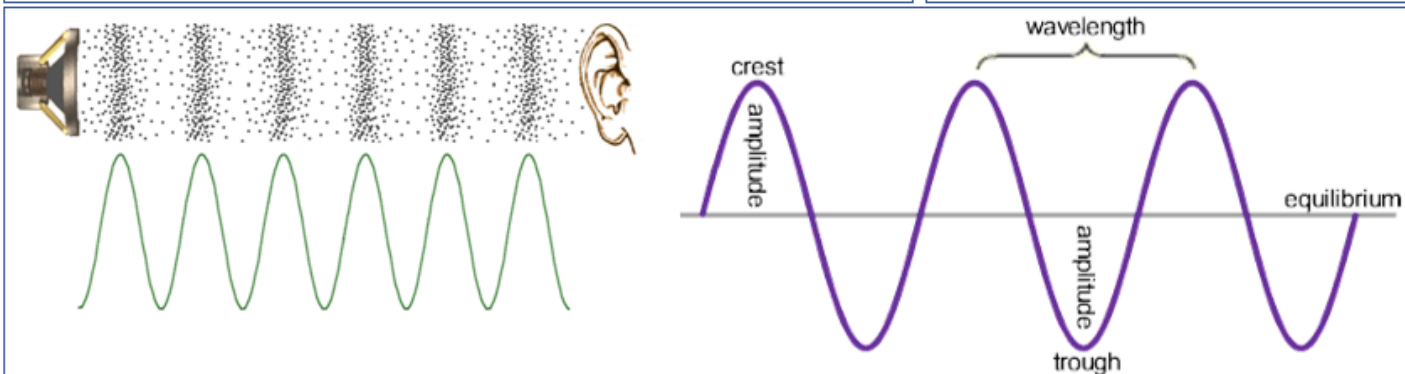
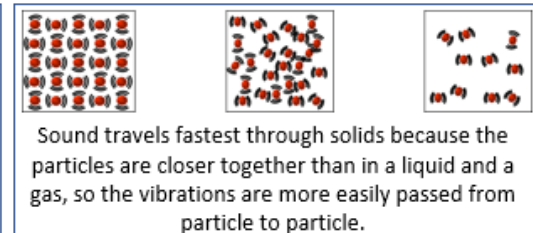
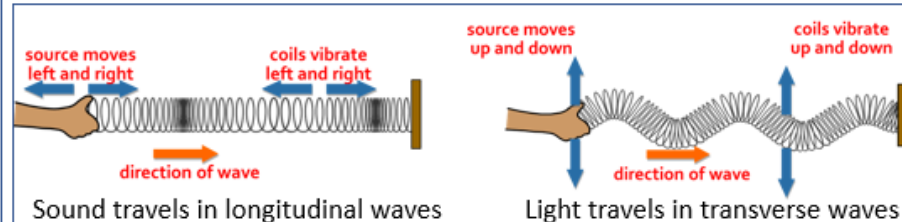
Absorption: When energy is transferred from sound to material.

Auditory range: The lowest and highest frequencies that a type of animal can hear.

Echo: Reflection of sound waves from a surface back to a listener.

Sound

Sound is made when an object or material vibrates. When you sing it's your vocal chords or on a guitar it's the strings. Sound travels in waves caused by the vibrations. These pass through molecules (gas, liquid or solid) and reach our ears. Sound waves transfer energy not matter.



Amplitude affects how loud the sound is, larger means louder sound.

Frequency and shorter wavelength results in a different pitch. High frequency will give you a high pitched sound.

Sound with a frequency above 20,000 hertz is known as ultrasound. Humans are not able to hear ultrasound, however many animals use it for communication and navigation. It is also used for medical purposes, cleaning and even purifying water

