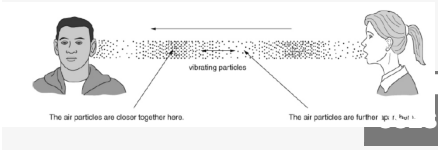
SOUND VIBRATIONS AND WAVES

Sound is a way of transferring **energy**. Sounds are made when things **vibrate**.The vibrations are passed on by **particles**. Sound therefore need a **medium** (substance) to pass on the vibrations ,so it can travel through solids, liquids & gases but not through empty spaces.The speed of sound is usually faster through materials in which particles are closer together. Closer particles hit each other more easily and so the energy is more likely to be passed from one particle to the next. Sound travels faster in solids than in liquids, and it travels slowest in gases.

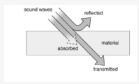
FREQUENCY AND AMPLITUDE

The **frequency** of a sound wave is the number of complete waves passing a point each second. The unit of is the **hertz(Hz)**. **Pitch** is how high or low a sound is. High frequency sounds have a high pitch. The **amplitude** of a wave is how far the particles move as the vibration pass. The larger the amplitude, the louder the sound .The loudness of a sound is also described as the **volume** or the **intensity** of the sound. The loudness of a sound is measured using a **sound intensity meter**. The units are **decibels (dB)**.

Sound and Waves

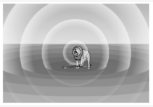


ABSORBING, REFLECTING AND TRANSMITTING



Sound waves can be **Reflected** by a material. This usually happens if the material is hard. Soft materials **Absorb** some of the sound that reaches them, and **Transmit** only a little.

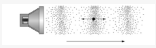
ABSORBING, REFLECTING AND TRANSMITTING (PT.2)



When a sound wave moves energy from one place to another, we say that the energy has been **transferred**. The energy spreads out in all directions unless something stops them. This means that the intensity of a sound gets less as you get further from its source

EARS AND HEARING

Longitudinal Waves

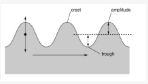


OF SOUND

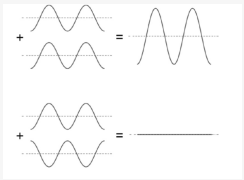
Humans and other animals use sound for communication. Some animals **[bats & dolphins]**, use ultrasound to locate their prey and avoid obstacles. Humans use ultrasound in sonar, to find the depth of the sea or locate fish or submarines. Humans use the energy transferred by ultrasound to clean delicate objects **[Jewllery]** or in physio-therapy **(to relieve pain or aid healing)**

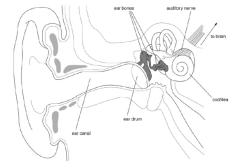
COMPARING WAVES

Transvers waves



All Waves





Sound is detected by ears and microphones. In a **microphone**, sound waves make a **diaphragm** vibrate, and electronics are used to convert the vibrations into changes in an electrical current.

EARS AND HEARING (PT.2)

The **auditory range** of an animal is the range of frequencies of the sound it can hear. Animals such as bats and dolphins can hear ultrasounds (sounds with frequencies greater than 20 000 Hz). some animals can hear infrasounds (frequencies less than 20 Hz)

Transverse wave	Waves on the surface of water. Particles vibrate at right angles to direction wave is travelling
Longit-udinal waves	Sound waves. Particles vibrate in same direction as wave travels
All waves	Transfer energy without transf-erring matter. can be reflected, transmitted and absorbed. can affect other waves by **suprtposition , when their effect can add up or cancel out

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