

# Year 8 Physics – Sound

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## Knowledge

- Sound is made when objects (e.g. a speaker) vibrate, although the vibrations may not be visible.
- The number of vibrations per second is called the frequency. Frequency is measured in hertz (Hz).
- Sound can travel through solids, liquids and gases, but cannot travel through a vacuum.
- Sound travels fastest in solids and slowest in gases.
- Sound travels at about 300 m/s in air - this is much slower than light.
- Echolocation is used by some animals (and by sonar machines) to locate objects and measure the distance to them.
- An oscilloscope can be used to visualise sound.
- The frequency of a sound determines its pitch – the higher the frequency, the higher the pitch.
- Humans can hear sounds from about 20 Hz to 20,000 Hz. Sounds above a frequency of 20,000 Hz are called ultrasound.
- The amplitude of a sound determines its loudness – the greater the amplitude, the louder the sound.
- The loudness of a sound is measured in decibels (dB).
- Exposure to loud sounds can cause tinnitus (permanent ringing in the ears) and hearing loss. Extremely loud sounds can cause the ear drum to burst.

## Understanding & Skills

- compare the pitch and loudness of sounds using oscilloscope traces
- do calculations for sound echoes using the formula **speed = distance ÷ time**