

Box 1: Keywords

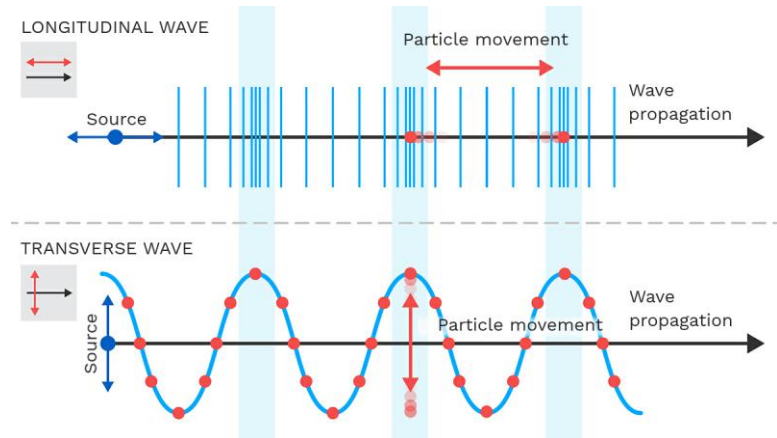
Word	Definition
Amplify	To increase the amplitude of a sound so that it sounds louder
Audible range	The range of frequencies that you can hear
Decibel	A unit of sound intensity or loudness (dB).
Echo	A reflection of a sound wave by an object.
Frequency	The number of complete waves or vibrations produced in one second (measured in hertz).
Hertz	The unit of frequency (Hz).
Infrasound	Sound below a frequency of 20 Hz.
Longitudinal	A wave where the vibrations are in the same direction as the direction the wave moves.
Oscilloscope	A device that enables you to see electrical signals, like those made by a microphone.
Pitch	A property of sound determined by its frequency
Sonar	Using ultrasound and reflections to detect objects underwater
Speed of sound	The distance sound travels in 1 second (330 m/s).
Ultrasound	Sound at a frequency greater than 20 000 Hz, beyond the range of human hearing.

Box 2: Key skills

Linking ideas; Describing waves; Interpreting sound wave diagrams;
Applying the particle model; Measuring sound waves and speed of sound

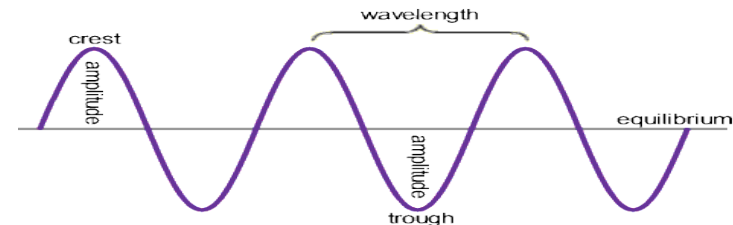
Box 3: Types of waves

A wave is an oscillation or vibration that transfers energy or information without transferring matter.



Sound waves are **longitudinal** waves
Light waves are **transverse** waves

Box 4: Features of waves



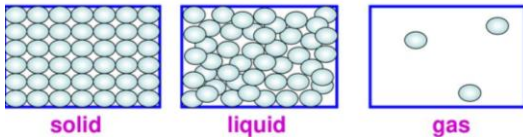
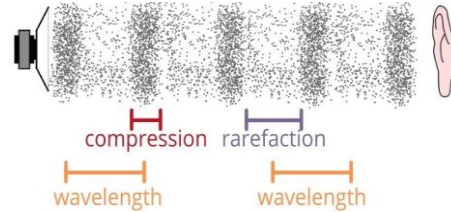
The **wavelength** of a wave is the distance from one point on a wave to the same point on the next (e.g. crest to crest). It is measured in metres (m)

The **amplitude** of a wave is the distance from the equilibrium to the crest (or trough). It is also measured in metres (m)

The **frequency** of a wave is the number of waves that pass a particular point each second. It is measured in **Hertz** (Hz).

Box 5: Sound

Sound waves are **mechanical** waves – they need a medium to travel through. Sound waves cannot travel through a **vacuum**.

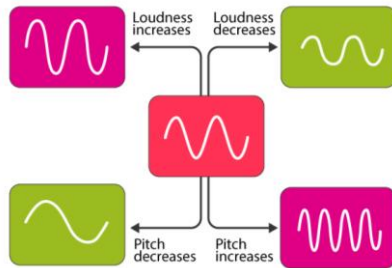


Sound actually travels fastest through a solid as the particles are closer together compared to a gas

Box 8: Infrasound and Ultrasound

Infrasound has a frequency of below 20Hz
Ultrasound has a frequency of above 20,000 Hz
These frequencies of sounds can't be heard by humans.

Box 6: Loudness and Pitch

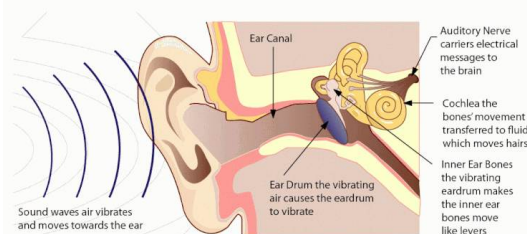


The **loudness** (volume) of a sound depends on the **amplitude** of the wave – a **large amplitude** wave makes a **loud sound**

The **pitch** of a sound depends on the **frequency** of the wave – a **high frequency** wave makes a **high pitched sound** (such as a whistle)

Box 7: Detecting sound

We hear sounds because particles **vibrate** which makes different structures in our ears vibrate. The vibrations are converted to **electrical signals** carried by the auditory nerve to our brain

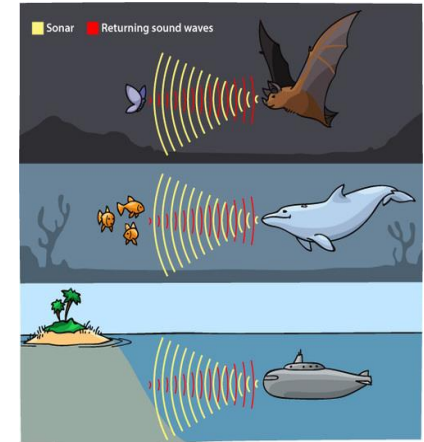


Different animals have different audible ranges – children can hear sounds with frequencies between 20Hz and 20,000 Hz

Box 9 Echoes

An echo is a **reflected sound**. Hard surfaces such as walls are better reflectors of sound than soft surfaces such as curtains.

Reflections of ultrasounds are used to “see” unborn babies in a pregnant mother; bats and dolphins to find their food and submarines to measure distances underwater.



Box 10: Pathway

Previous knowledge: KS2 Sound

Future links: KS4 Energy; Wave motion

Careers: Musicians; Sound engineers; Builders; Architects; Sonographers; Doctors; Nurses; Physiotherapists

Box 11: Cross curricular links