

CIE Physics GCSE

Topic 3.4 - Sound

Flashcards

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How does sound travel through solids?



How does sound travel through solids?

Sound waves cause vibrations through the solid.



What type of wave are sound waves?



What type of waves are sound waves?

Longitudinal waves.



Can sound travel through a vacuum?



Can sound travel through a vacuum?

No, sound requires a medium to be transmitted.



What is an echo?



What is an echo?

A reflected sound wave.



How can the speed of sound be measured?



How can the speed of sound be measured?

Make a noise (eg. clap, fire a starter pistol) at a known distance from a solid wall. Record the time taken for the echo to be heard. Then half the time and use $\text{speed} = \text{distance}/\text{time}$ to calculate speed.



What is the speed of sound in air? (supplement)



What is the speed of sound in air? (supplement)

343 m/s



What is the speed of sound in steel?
(supplement)



What is the speed of sound in steel? (supplement)

5130 m/s



How does the speed of sound compare
in solids, liquids and gases?



How does the speed of sound compare in solids, liquids and gases?

It is fastest in solids and slowest in gases.



What is the range of frequencies audible to the human ear?



What is the range of frequencies audible to the human ear?

20 Hz - 20kHz

(20-20000Hz)



What is ultrasound?



What is ultrasound?

Sound with a frequency higher than 20kHz.



Describe the features of a longitudinal wave.



Describe the features of a longitudinal wave.

Longitudinal waves have **compressions** and **rarefactions**.



What wave property affects the volume of sound?



What wave property affects the volume of sound?

The amplitude (greater amplitude = louder sound).



What wave property affects the pitch of sound?



What wave property affects the pitch of sound?

The frequency (higher frequency = higher pitch).



How can ultrasound be used to measure distances? (supplement)



How can ultrasound be used to measure distances? (supplement)

- When waves reach a boundary between two media, they are partially reflected
- The speed of the waves is constant
- The time between emission and detection can be used to calculate distance (from distance = speed x time)

(remember to halve the time; the recorded time is for the distance there **and** back)



Describe applications of ultrasound (supplement)



Describe applications of ultrasound (supplement)

Ultrasound is used largely in medical imaging, specifically pregnancy scanning, as it is non-ionising so it does not increase the risk of cancer.



What is SONAR imaging? (supplement)



What is SONAR imaging? (supplement)

SONAR (Sound Navigation and Ranging) uses both low and high frequency sound waves for imaging eg. underwater.

