

Speed of sound

Task 1: Sound in different materials

Look at this table of the speed of sound in different materials.

Material	Speed (m/s)
Wood	4000
Air	330
Metal	5000
Soft tissue	1500
Vacuum	0
Cork	500

a Display these figures in a different way so that you can easily see the pattern they show.

b What is a vacuum?

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c Think back to the previous lesson, can you suggest why sound does not travel in a vacuum?

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d What do you think is meant by the phrase 'soft tissues'?

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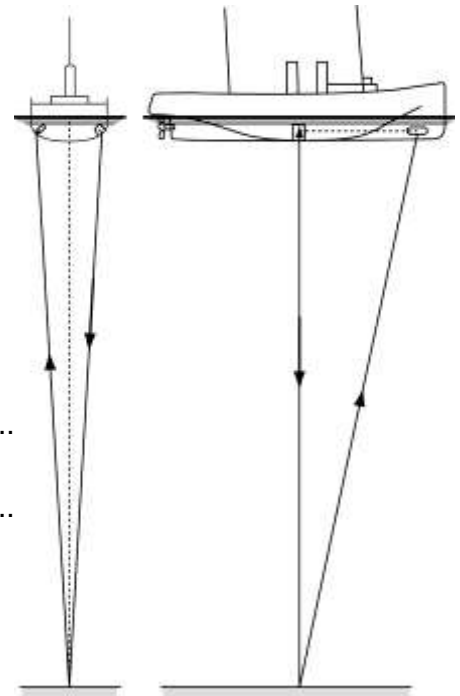
Task 2: Echo sounding

The picture shows a boat sending sound waves to the seabed.

The time taken for each pulse of sound to return to the boat is recorded.

This is used to find out how far it is to the seabed.

This is called echo sounding.



- 1 If the boat is in deep water, explain if the time taken for the sound to return will be longer or shorter.

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- 2 What do we call a reflected sound wave?

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- 3 Boats use echo sounding to find out distances in water such as the distance to the sea's bottom, icebergs and shoals (groups) of fish.

Why can't the people on the boat find out the distances by looking?

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- 4 If the depth measurements suddenly change, the equipment may be detecting fish.

- a Why would the depth suddenly change if the equipment were detecting a shoal of fish?

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- b How would the measured time keep changing if the equipment were detecting lots of small groups of fish?

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- 5 Find out how some animals use echo sounding.

Task 3: Re-arranging the equation

The speed of sound equation could be re-arranged to allow you to work out either the distance travelled or the time taken.

1 To work out the distance what would the equation look like?

2 To work out the time what would the equation look like?

You are now in a position to answer questions 11 and 12 on page 137 of your Pupil Book, so have a go!