

GCSE Physics B (Twenty First Century Science)
J259/02 Depth in physics (Foundation Tier)

Question Set 1

1

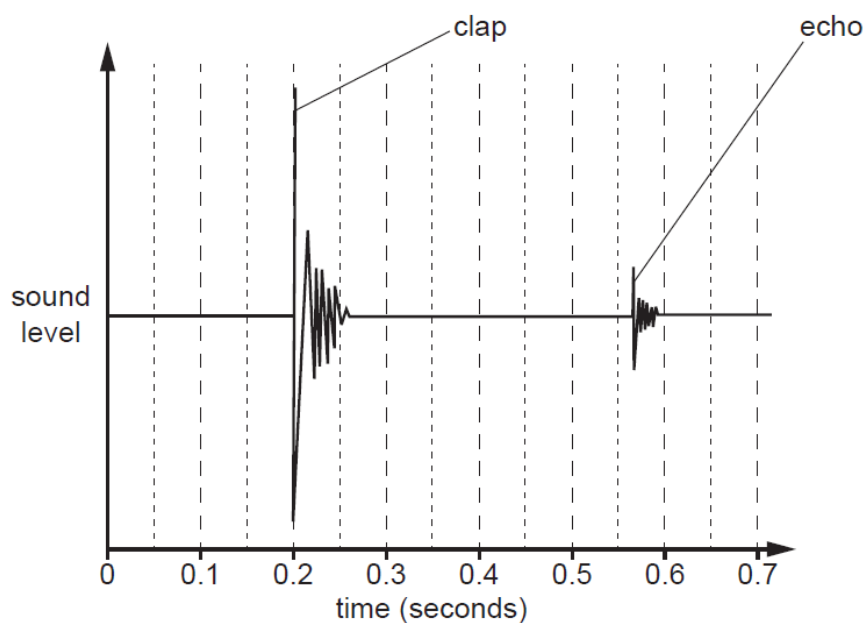
Over 300 years ago, Isaac Newton measured the speed of sound in air in a long outdoor corridor.

Eve and Ali repeated this experiment by measuring the time between a clap and its echo.



(a) Eve clapped her hands, and Ali timed with a tablet computer.

The computer recorded the sound of the clap and its echo and produced the graph below.



(i) What time was the sound of the **clap** recorded?

Time = 0.2 seconds [1]

(ii) What time was the sound of the **echo** recorded?

Time = 0.57 seconds [1]

(iii) Calculate the time of travel for the sound wave to go from Eve to the wall and to return to the computer.

$$0.57 - 0.2 = 0.37$$

Time of travel = 0.37 seconds [1]

(b) The distance from Eve to the reflecting wall is 64 m.

Explain how you can use the distance, together with a time from part (a), to calculate the speed of sound.

You do not have to include the calculation. [2]

$V = \frac{S}{t}$ but remember you have to double the distance.

(c) Isaac Newton's value for the speed of sound was less accurate than the one given by this method.

Suggest and explain why Newton could not get an accurate answer. [2]

His value for time was inaccurate as he didn't have the technology to measure time accurately (needs to use a clock/computer)

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