

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

Question Set 26

- 1* Sarah is investigating how to measure the speed of sound, and knows that sound is produced when there is a lightning flash during a thunder storm.

Sarah

It takes approximately 4 seconds after I see the lightning flash for me to hear the thunder sound. If I know the thunder storm is approximately 1 km away, I can use this information to calculate the speed of sound.



Explain why Sarah's method is inaccurate, and suggest one other method Sarah can use to accurately measure the speed of sound.

The speed of sound in air is approximately 340 m/s.

Use the equation: speed = distance \div time

You may include a diagram to support your answer.

[6]

$$\text{Speed} = \frac{\text{distance}}{\text{time}} = \frac{1000}{4} = 250 \text{ m/s}$$

This is much lower than the actual value of 340 m/s. The method is not accurate as both the distance and time are approximated so they need to be measured more accurately by using a digital stopwatch and repeat it multiple times and take an average to reduce the impact of reaction time, and measure distance using map so it is exact.

Total Marks for Question Set 26: 6

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