

Waves Sound

KS3 Physics · Follows the national curriculum

Name _____ Class _____ Date _____

1. Worked example

How does a drum make a sound we can hear?

Step 1 · Source

Hitting the drum makes its skin vibrate.

Step 2 · Medium

The vibrating skin pushes and pulls on the air, making the air particles vibrate.

Step 3 · Detector

The vibrations travel through the air to your ear and make your eardrum vibrate.

Answer: Vibrations travel through the air to the ear

Check: Every sound starts with something vibrating.

2. Now try one with the steps

A tuning fork vibrates 500 times in 2 seconds. What is its frequency?

Step 1 · Frequency

Step 2 · Calculate

Answer:

3. Practice

Show your working. The marks tell you how much is expected.

1. What causes all sounds? [1]

2. Sound is a longitudinal wave. What does 'longitudinal' mean? [1]

3. What are compressions and rarefactions? [2]

4. Explain why sound cannot travel through a vacuum. [1]

5. What property of a sound wave decides how loud it is? [1]
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6. What property of a sound wave decides its pitch? [1]
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7. A tuning fork vibrates 500 times in 2 s. What is its frequency, in Hz? [1]
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8. Write 2 kHz in hertz. [1]
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9. Put these in order of the speed of sound in them, fastest first: air, steel, water. [1]
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10. Two traces have the same number of waves, but trace A is twice Compare the two sounds. [2]
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11. Describe how a microphone detects sound. [2]
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12. A loudspeaker is fed an electrical signal. Describe how it makes sound. [2]
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13. A bell rings inside a jar air is pumped out. Describe what you see and hear, and explain why. [3]
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14. An oscilloscope screen shows 4 complete waves across a width that represents 0.01 s. What is the frequency of the sound, in Hz? [2]
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4. Before you hand it in

"Loud sounds have a high pitch."

Loudness depends on amplitude; pitch depends on frequency. A loud low note is possible.

"Air moves from the speaker to my ear."

Air particles vibrate about their positions and pass the energy on.

"Sound travels fastest in air because air is light."

Sound is fastest in solids, slower in liquids, slowest in gases — and cannot travel through a vacuum.