

How sound travels and how we hear it

Grade 6 science (Year 7 · Class 6) · Test answers (mark scheme)

Model answers and mark allocations are given for every question. Award marks for equivalent wording, and check that explanations link loudness to size of vibration and pitch to frequency.

Level: Grade 6 science (Year 7 · Class 6) · **Curriculum:** MS-PS4-1

Question 1 How sound is made (3 marks)

All sounds are produced by **vibrations**. In a drum the **skin** vibrates and in a guitar the **strings** vibrate.

Marking: 1 mark for vibrations, 1 mark for the drum skin, 1 mark for the string.

Question 2 No sound in space (3 marks)

Sound is passed on from particle to particle in a medium. A vacuum has no particles, so there is nothing to carry the vibrations and the sound cannot travel.

Marking: 1 mark for sound being passed from particle to particle, 1 mark for a vacuum having no particles, 1 mark for the conclusion.

Question 3 Two traces (4 marks)

- a. **P**, because its waves are taller.
- b. **Q**, because it has more waves each second.
- c. $f = 4 \div 0.020 = \mathbf{200 \text{ Hz}}$.
- d. $f = 8 \div 0.020 = \mathbf{400 \text{ Hz}}$.

Marking: 1 mark for each part.

Question 4 Canyon echo (2 marks)

Total distance = $340 \times 2.4 = 816 \text{ m}$. The wall is half of this: $816 \div 2 = \mathbf{408 \text{ m}}$.

Marking: 1 mark for 816 m, 1 mark for halving with unit.

Question 5 Hearing care (2 marks)

Keep the volume low, and take regular breaks from listening (or use headphones that block outside noise so the volume can stay low).

Marking: 1 mark for each sensible way.

Question 6 Loudness and pitch (3 marks)

Loudness is how loud a sound seems and depends on the size of the vibration. Pitch is how high or low a note sounds and depends on the frequency, the number of vibrations each second.

Marking: 1 mark for loudness linked to size of vibration, 1 mark for pitch linked to frequency, 1 mark for a clear difference.

Question 7 Speed of sound (2 marks)

The particles in steel are much closer together, so each particle passes the vibration on to its neighbour more quickly than in air.

Marking: 1 mark for closer particles, 1 mark for passing vibrations quicker.

Question 8 Unit (1 mark)

The **hertz (Hz)**.

Marking: 1 mark.