Year 9 Physics: Waves and Sound Worksheet

Lower Secondary · Year 9 · Wave properties, sound and hearing

Name: ..... **Class:** ..... **Date:** ..... **Score: / 40**

Section A: Wave basics [10 marks]

amplitude | wavelength | frequency | hertz (Hz) | transverse | longitudinal | speed = frequency × wavelength

1 Use words from the box to complete the sentences.

(a) The distance from one crest to the next crest is the ..... . **[1]**

(b) The number of waves passing a point each second is the ..... and is measured in ..... . **[2]**

(c) The maximum height of a wave from the rest position is the ..... . **[1]**

(d) In a ..... wave the vibrations are at right angles to the direction of travel, for example light. In a ..... wave they are parallel to the direction of travel, for example sound. **[2]**

2 State what a wave transfers and what it does not transfer. **[2]**

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3 Calculate the speed of a wave with frequency 50 Hz and wavelength 6.0 m. **[2]**

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Section B: Sound [14 marks]

4 Explain how sound travels from a drum to your ear. **[4]**

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5 Explain why sound cannot travel through a vacuum. **[2]**

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6 Complete the table about the speed of sound. **[3]**

Material	Speed (m/s)	Explanation
Air (about)	330	
Water (about)	1500	
Steel (about)	5000	

7 You see lightning and hear the thunder 6 seconds later. Calculate how far away the storm is. (Speed of sound = 330 m/s) **[3]**

8 Explain why you see lightning before you hear thunder. **[2]**

Section C: Pitch, loudness and hearing [14 marks]

9 Complete the table. **[4]**

Wave property changed	Effect on the sound
Higher frequency	
Larger amplitude	
Lower frequency	
Smaller amplitude	

10 Describe how an oscilloscope trace would look for a quiet, high-pitched note compared with a loud, low-pitched note. **[3]**

11 The normal range of human hearing is 20 Hz to 20 000 Hz. What name is given to sound above 20 000 Hz? Give one use. **[2]**

12 Describe how an echo is formed. **[2]**

13 A ship sends a sound pulse to the seabed and receives the echo after 0.8 s. The speed of sound in water is 1500 m/s. Calculate the depth of the water. **[3]**

Section D: Protecting hearing [2 marks]

14 Give two ways to protect your hearing from loud noise. **[2]**