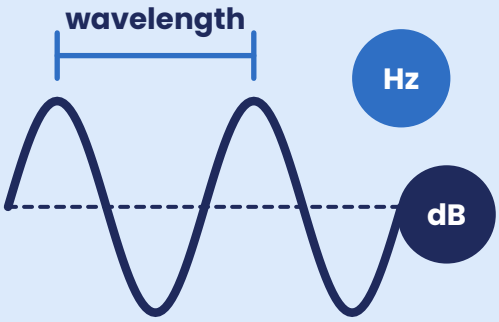
YOUR SCIENCE ONLINE
yourscienceonline.com



Year 9 • KS3 Physics

Waves & Sound

Mark Scheme – Teacher Copy

Answers, marking points and guidance for the Waves and Sound worksheet.

Wavelength | Frequency | Amplitude | Pitch | Loudness | Echoes

KEY IDEAS IN THIS WORKSHEET

YEAR 9

Name: _____ Class: _____

Date set: _____ Date due: _____

What's inside

Section A	Wave basics	**10 marks**
Section B	Sound	**14 marks**
Section C	Pitch, loudness and hearing	**14 marks**
Section D	Protecting hearing	**2 marks**

Marking notes

- (1) = one mark for each marking point.
- / separates alternative answers.
- Allow error carried forward in calculations.
- Accept any correct, clearly expressed alternative.

Total marks

40

© Your Science Online • yourscienceonline.com • For personal and single-classroom use only. Please do not share or resell.

Waves and Sound Worksheet – Mark Scheme

Total: 40 marks. (1) = one mark. Accept any scientifically correct alternative wording.

Section A – Wave basics

Q	Answer	Mark	Guidance
1(a)	wavelength	1	
1(b)	frequency; hertz (Hz)	2	
1(c)	amplitude	1	
1(d)	transverse; longitudinal	2	
2	waves transfer energy (1); but not matter (1)	2	
3	$v = f \times \lambda = 50 \times 6.0$ (1); = 300 m/s (1)	2	
	Section A total	**10**	

Section B – Sound

Q	Answer	Mark	Guidance
4	the drum skin vibrates (1); it makes air particles vibrate (1); creating compressions and rarefactions (1); the vibrations travel through the air to the ear (1)	4	
5	sound needs particles to vibrate (1); a vacuum has no particles (1)	2	
6	air: particles far apart, so vibrations pass on slowly (1); water: particles closer together, so faster (1); steel: particles closest together / strongly linked, so fastest (1)	3	accept: solids > liquids > gases with a particle reason
7	distance = speed × time (1); 330 × 6 (1); = 1980 m (1)	3	
8	light travels much faster than sound (1); about 300 000 000 m/s compared with 330 m/s (1)	2	
	Section B total	**14**	

Section C – Pitch, loudness and hearing

Q	Answer	Mark	Guidance
9	higher pitch; louder; lower pitch; quieter	4	1 mark each
10	quiet high note: small amplitude (1) and many waves close together (1); loud low note: large amplitude and fewer, more spread-out waves (1)	3	
11	ultrasound (1); use: scanning unborn babies / cleaning / sonar / detecting cracks (1)	2	
12	sound waves hit a hard surface (1); and are reflected back to the listener (1)	2	
13	distance there and back = 1500 × 0.8 = 1200 m (2); depth = 1200 ÷ 2 = 600 m (1)	3	
	Section C total	**14**	

Section D – Protecting hearing

Q	Answer	Mark	Guidance
14	any two: wear ear defenders / ear plugs; turn the volume down; limit the time exposed; stay away from loudspeakers	2	1 mark each
	Section D total	**2**	

Worksheet total: 40