Wave properties and the wave equation

Name _____ Class _____ Date _____

Waves transfer energy from one place to another without transferring matter.

KEY EQUATION

$$v = f\lambda$$
$$T = 1 \div f$$

v = wave speed (m/s)
f = frequency (Hz)
λ = wavelength (m)
T = period (s)

WORKED EXAMPLE

A wave has f = 50 Hz and λ = 0.4 m.
v = 50 × 0.4 = **20 m/s**

Section A · Recall

Grade 4–5

1 Describe the difference between transverse and longitudinal waves. Give an example of each. [4]

2 Define amplitude and wavelength. [2]

Section B · Calculate

Grade 5–6

3 Complete the table. [4]

Frequency (Hz)	Wavelength (m)	Speed (m/s)
10	2	
500		330
	0.25	1
2×10^8	1.5	

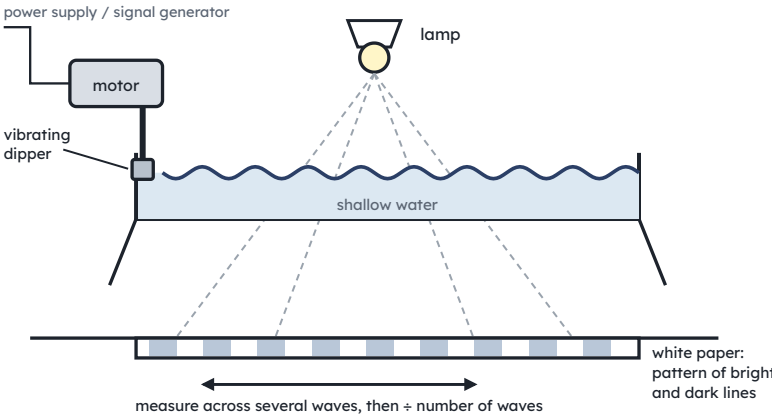
4 A wave has a period of 0.02 s. Calculate its frequency. [2]

5 Explain what happens to the wavelength of a wave if its frequency doubles but its speed stays the same. [2]

Section C · Required practical

Grade 6–7+

6 Describe how to measure the speed of water waves in a ripple tank. [4]



7 Waves in a solid: a string is attached to a vibration generator set to 40 Hz. A standing wave forms with 4 loops over 1.2 m. Calculate the wave speed. [3]

Exam-style question

AQA style

8 A student measures the speed of sound by standing 100 m from a large wall, clapping, and timing the echo.

a The echo takes 0.6 s to return. Calculate the speed of sound. [3]

b Suggest one reason why the student's value may be inaccurate, and one improvement. [2]

Total: _____ / 26

How confident am I?

	Not yet	Nearly	Got it
I can describe transverse and longitudinal waves	☐	☐	☐
I can use v = fλ and T = 1/f	☐	☐	☐
I can describe how to measure wave speed	☐	☐	☐