PHYSICS YEAR 11 - MODULE 3 - LESSON 2

Wave Properties and the Wave Equation

Use this worksheet after reading the lesson to practise the key ideas and prove you can meet the success criteria.

Name _____

Date _____

Class _____

1. Key Ideas

Once we can name amplitude, wavelength, period and frequency precisely, we can connect them with one compact relationship: $v = f\lambda$. The challenge is not just plugging in numbers. It is reading the wave correctly first.

- The wave equation $v = f\lambda$
- Why distance graphs and time graphs tell different things

2. Success Criteria

By the end, you should be able to:

- The wave equation $v = f\lambda$
- The relationship $T = 1/f$
- How to identify amplitude and wavelength on a displacement-distance graph

3. Key Terms

The challenge
not just plugging in numbers

speed
usually fixed by the medium, so wavelength changes instead

Period
for one oscillation only

What phase
in wave language

wave
in phase or out of phase

Energy
conserved; machines can only transform energy, never create it (efficiency ≤ 100%)

4. Activity: Build the Lesson Map

Use the lesson to complete the table. Keep answers brief but specific.

Prompt	Your answer
Main concept	
Important example	
Common mistake to avoid	
How this links to the next lesson	

5. Short Answer Questions

1. Explain this lesson goal in your own words: "The wave equation $v = f\lambda$". Use one specific example from the lesson.

BAND 3 2 MARKS

2. Apply this idea to a new example: "The relationship $T = 1/f$". Show your reasoning clearly.

BAND 4 3 MARKS

3. Analyse why this idea matters for understanding Wave Properties and the Wave Equation: "How to identify amplitude and wavelength on a displacement-distance graph".

BAND 5 4 MARKS

6. Extend: Apply the Idea

BAND 5/6 5 MARKS

A student gives a memorised answer about Wave Properties and the Wave Equation but does not use evidence or reasoning.

Improve the answer by writing a stronger response that uses accurate terminology, a relevant example and a clear explanation.

7. Multiple Choice

1. What is the best first step when answering a question about Wave Properties and the Wave Equation?

☐ A. Identify the key concept being tested

☐ B. Write every fact from memory

☐ C. Ignore the command word

☐ D. Skip examples and evidence

2. Which answer would show stronger understanding of Wave Properties and the Wave Equation?

☐ A. An answer with accurate terms and reasoning

☐ B. A copied definition only

☐ C. A single-word response

☐ D. An answer with no example

3. What should you do if a question asks you to explain?

☐ A. Link the idea to a reason or cause

☐ B. List unrelated facts

☐ C. Only draw a diagram

☐ D. Write the shortest possible answer

8. Success Criteria Proof

Finish with evidence that you can do each success criterion.

SUCCESS CRITERION 1

Prove that you can: The wave equation $v = f\lambda$

BAND 3 2 MARKS

SUCCESS CRITERION 2

Prove that you can: The relationship $T = 1/f$

BAND 4 3 MARKS

SUCCESS CRITERION 3

Prove that you can: How to identify amplitude and wavelength on a displacement-distance graph

BAND 5 4 MARKS

One thing I still need help with: