PHYSICS YEAR 11 - MODULE 3 - LESSON 4

Wave Superposition and Interference

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

When waves meet, they do not bounce off each other as solid objects do. Their displacements add. That simple idea of superposition explains interference patterns, path difference, and why coherence matters.

- The principle of superposition
- Why resultant displacement is an algebraic sum

2. Success Criteria

By the end, you should be able to:

- The principle of superposition
- The difference between constructive and destructive interference
- The meaning of path difference

3. Key Terms

Work
The product of force and displacement in the direction of the force; $W = Fd$.

Energy
The capacity to do work, measured in joules (J).

Kinetic Energy
The energy of motion; $KE = \frac{1}{2}mv^2$.

Potential Energy
Stored energy due to position or configuration.

Power
The rate at which work is done or energy is transferred; $P = W/t$.

Conservation of Energy
The principle that energy cannot be created or destroyed, only transformed.

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 principle of superposition". Use one specific example from the lesson.

BAND 3 2 MARKS

2. Apply this idea to a new example: "The difference between constructive and destructive interference". Show your reasoning clearly.

BAND 4 3 MARKS

3. Analyse why this idea matters for understanding Wave Superposition and Interference: "The meaning of path difference".

BAND 5 4 MARKS

6. Extend: Apply the Idea

BAND 5/6 5 MARKS

A student gives a memorised answer about Wave Superposition and Interference 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 Superposition and Interference?

☐ 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 Superposition and Interference?

☐ 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 principle of superposition

BAND 3 2 MARKS

SUCCESS CRITERION 2

Prove that you can: The difference between constructive and destructive interference

BAND 4 3 MARKS

SUCCESS CRITERION 3

Prove that you can: The meaning of path difference

BAND 5 4 MARKS

One thing I still need help with: