PHYSICS YEAR 11 - MODULE 2 - LESSON 5

Acceleration and Graphical Analysis

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

A graph is not just a picture of data — it is a proof. The gradient of a force vs acceleration graph is a measurement of mass, and from that single line Newton's Second Law emerges.

- What a v-t graph gradient and area represent
- Why gradient of F vs a graph = mass

2. Success Criteria

By the end, you should be able to:

- What a v-t graph gradient and area represent
- What an F vs a graph gradient represents
- F net = ma as derived from graphical data

3. Key Terms

graph
not just a picture of data — it is a proof

force vs acceleration graph
a measurement of mass, and from that single line Newton's Second Law emerges

acceleration
constant — straight line on v-t graph

line of best fit
used — not data points — for gradient

Vectors and scalars
just different ways of writing the same thing

change of velocity
constant; and doubling the force doubles the rate of acceleration

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: "What a v-t graph gradient and area represent". Use one specific example from the lesson.

BAND 3 2 MARKS

2. Apply this idea to a new example: "What an F vs a graph gradient represents". Show your reasoning clearly.

BAND 4 3 MARKS

3. Analyse why this idea matters for understanding Acceleration and Graphical Analysis: "F net = ma as derived from graphical data".

BAND 5 4 MARKS

6. Extend: Apply the Idea

BAND 5/6 5 MARKS

A student gives a memorised answer about Acceleration and Graphical Analysis 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 Acceleration and Graphical Analysis?

☐ 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 Acceleration and Graphical Analysis?

☐ 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: What a v-t graph gradient and area represent

BAND 3 2 MARKS

SUCCESS CRITERION 2

Prove that you can: What an F vs a graph gradient represents

BAND 4 3 MARKS

SUCCESS CRITERION 3

Prove that you can: F net = ma as derived from graphical data

BAND 5 4 MARKS

One thing I still need help with: