PHYSICS YEAR 11 - MODULE 2 - LESSON 7

Gravitational PE and Energy Conservation

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 rollercoaster car released from rest at the top of a 40 m drop arrives at the bottom at nearly 90 km/h. No engine. No push. The energy was always there — stored in position, waiting to become motion.

- $\Delta U = mg\Delta h$ for gravitational PE
- Why mass cancels from the conservation equation

2. Success Criteria

By the end, you should be able to:

- $\Delta U = mg\Delta h$ for gravitational PE
- Conservation of mechanical energy: $KE_1 + U_1 = KE_2 + U_2$
- When mechanical energy IS and IS NOT conserved

3. Key Terms

Force
A push or pull acting on an object that can cause it to accelerate.

Newton
The SI unit of force; 1 N = 1 kg·m/s^2.

Weight
The force due to gravity acting on a mass; W = mg.

Normal Force
The perpendicular contact force exerted by a surface on an object.

Friction
A force that opposes relative motion between two surfaces in contact.

Net Force
The vector sum of all forces acting on an object.

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: "ΔU = mgΔh for gravitational PE". Use one specific example from the lesson.

BAND 3 2 MARKS

2. Apply this idea to a new example: "Conservation of mechanical energy: $KE_1 + U_1 = KE_2 + U_2$". Show your reasoning clearly.

BAND 4 3 MARKS

3. Analyse why this idea matters for understanding Gravitational PE and Energy Conservation: "When mechanical energy IS and IS NOT conserved".

BAND 5 4 MARKS

6. Extend: Apply the Idea

BAND 5/6 5 MARKS

A student gives a memorised answer about Gravitational PE and Energy Conservation 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 Gravitational PE and Energy Conservation?

☐ 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 Gravitational PE and Energy Conservation?

☐ 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: $\Delta U = mg\Delta h$ for gravitational PE

BAND 3 | 2 MARKS

SUCCESS CRITERION 2

Prove that you can: Conservation of mechanical energy: $KE_1 + U_1 = KE_2 + U_2$

BAND 4 | 3 MARKS

SUCCESS CRITERION 3

Prove that you can: When mechanical energy IS and IS NOT conserved

BAND 5 | 4 MARKS

One thing I still need help with: