CHEMISTRY YEAR 11 - MODULE 4 - LESSON 3

Calorimetry — Neutralisation

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 you mix a strong acid and a strong base, the cup warms up — no flame, no fuel. Just ions rearranging. Neutralisation calorimetry measures that warmth precisely, and reveals a remarkable fact: it doesn't matter which strong acid or base you use. The answer is always the same.

- The solution (coffee cup) calorimeter setup for neutralisation
- Why m = total mass of both solutions combined

2. Success Criteria

By the end, you should be able to:

- The solution (coffee cup) calorimeter setup for neutralisation
- Why strong acid + strong base gives ΔH n ≈ −57 kJ mol^{-1}
- The net ionic equation: $H^+(aq) + OH^-(aq) \rightarrow H_2O(l)$

3. Key Terms

Enthalpy change (ΔH)
The heat energy exchanged at constant pressure during a reaction.

Exothermic
A reaction releasing heat to surroundings (ΔH < 0).

Endothermic
A reaction absorbing heat from surroundings (ΔH > 0).

Calorimetry
The experimental measurement of heat changes during chemical processes.

Hess's Law
The total enthalpy change is independent of the pathway taken.

Entropy
A measure of the disorder or randomness of a system.

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 solution (coffee cup) calorimeter setup for neutralisation". Use one specific example from the lesson.

BAND 3 2 MARKS

2. Apply this idea to a new example: "Why strong acid + strong base gives ΔH n ≈ −57 kJ mol^{-1}". Show your reasoning clearly.

BAND 4 3 MARKS

3. Analyse why this idea matters for understanding Calorimetry — Neutralisation: "The net ionic equation: $H^+(aq) + OH^-(aq) \rightarrow H_2O(l)$".

BAND 5 4 MARKS

6. Extend: Apply the Idea

BAND 5/6 5 MARKS

A student gives a memorised answer about Calorimetry — Neutralisation 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 Calorimetry — Neutralisation?

☐ 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 Calorimetry — Neutralisation?

☐ 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 solution (coffee cup) calorimeter setup for neutralisation

BAND 3 2 MARKS

SUCCESS CRITERION 2

Prove that you can: Why strong acid + strong base gives ΔH n ≈ −57 kJ mol^{-1}

BAND 4 3 MARKS

SUCCESS CRITERION 3

Prove that you can: The net ionic equation: $H^+(aq) + OH^-(aq) \rightarrow H_2O(l)$

BAND 5 4 MARKS

One thing I still need help with: