CHEMISTRY YEAR 12 - MODULE 6 - LESSON 10

Enthalpy of Neutralisation — Comparing Strong & Weak

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

Why does vinegar mixed with NaOH release noticeably less heat than HCl mixed with NaOH — even when concentrations and volumes are identical? The answer connects the strong/weak distinction from L05 directly to measurable energy, and is one of the most elegant confirmations that equilibrium and thermochemistry are deeply linked.

- The net ionic equation for neutralisation: $H^+(aq) + OH^-(aq) \rightarrow H_2O(l)$
- Why strong acid + strong base gives the maximum enthalpy change per mole of water

2. Success Criteria

By the end, you should be able to:

- The net ionic equation for neutralisation: $H^+(aq) + OH^-(aq) \rightarrow H_2O(l)$
- $\Delta Hn \approx -57$ kJ/mol for strong acid + strong base
- Weak acid neutralisation releases less energy due to bond breaking

3. Key Terms

Dynamic equilibrium
A state where forward and reverse reaction rates are equal.

Le Chatelier's Principle
A system at equilibrium shifts to minimise applied disturbances.

Equilibrium constant (Keq)
The ratio of product to reactant concentrations at equilibrium.

Reaction quotient (Q)
The ratio of product to reactant concentrations at any instant.

Closed system
A system where neither matter nor energy can escape to surroundings.

Reversible reaction
A reaction that can proceed in both forward and reverse directions.

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 net ionic equation for neutralisation: $H^+(aq) + OH^-(aq) \rightarrow H_2O(l)$". Use one specific example from the lesson.

BAND 3 2 MARKS

2. Apply this idea to a new example: "ΔHn ≈ −57 kJ/mol for strong acid + strong base". Show your reasoning clearly.

BAND 4 3 MARKS

3. Analyse why this idea matters for understanding Enthalpy of Neutralisation — Comparing Strong & Weak: "Weak acid neutralisation releases less energy due to bond breaking".

BAND 5 4 MARKS

6. Extend: Apply the Idea

BAND 5/6 5 MARKS

A student gives a memorised answer about Enthalpy of Neutralisation — Comparing Strong & Weak 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 Enthalpy of Neutralisation — Comparing Strong & Weak?

☐ 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 Enthalpy of Neutralisation — Comparing Strong & Weak?

☐ 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 net ionic equation for neutralisation: $H^+(aq) + OH^-(aq) \rightarrow H_2O(l)$

BAND 3 | 2 MARKS

SUCCESS CRITERION 2

Prove that you can: $\Delta H_n \approx -57$ kJ/mol for strong acid + strong base

BAND 4 | 3 MARKS

SUCCESS CRITERION 3

Prove that you can: Weak acid neutralisation releases less energy due to bond breaking

BAND 5 | 4 MARKS

One thing I still need help with: