CHEMISTRY YEAR 12 - MODULE 6 - LESSON 5

Strong vs Weak Acids & Bases — The Critical Distinction

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

The single most consequential distinction in Module 6 is not between acids and bases — it is between strong and weak acids, and confusing the two leads to wrong arrow notation, wrong pH calculations, and wrong indicator selection every time.

- The six strong acids: HCl, H_2SO_4 (1st), HNO_3, $HClO_4$, HBr, HI
- Strength = degree of ionisation (Ka) — intrinsic, temperature-dependent, not concentration-dependent

2. Success Criteria

By the end, you should be able to:

- The six strong acids: HCl, H_2SO_4 (1st), HNO_3, $HClO_4$, HBr, HI
- The four strong bases: NaOH, KOH, $Ca(OH)_2$, $Ba(OH)_2$
- All other acids and bases encountered in HSC are weak

3. Key Terms

Acid strength
A substance that donates protons (H^+) or accepts electron pairs, according to context.

Concentration
The amount of solute present in a given quantity of solution or solvent.

lower pH
Entirely due to its complete ionisation (100%) vs CH_3COOH's partial ionisation (~1.

not weakness
The low [OH^-] is due to low solubility, not weakness.

Brønsted-Lowry acid
A proton (H^+) donor in an acid-base reaction.

Brønsted-Lowry base
A proton (H^+) acceptor in an acid-base reaction.

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 six strong acids: HCl, H_2SO_4 (1st), HNO_3, $HClO_4$, HBr, HI". Use one specific example from the lesson.

BAND 3 2 MARKS

2. Apply this idea to a new example: "The four strong bases: NaOH, KOH, $Ca(OH)_2$, $Ba(OH)_2$". Show your reasoning clearly.

BAND 4 3 MARKS

3. Analyse why this idea matters for understanding Strong vs Weak Acids & Bases — The Critical Distinction: "All other acids and bases encountered in HSC are weak".

BAND 5 4 MARKS

6. Extend: Apply the Idea

BAND 5/6 5 MARKS

A student gives a memorised answer about Strong vs Weak Acids & Bases — The Critical Distinction 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 Strong vs Weak Acids & Bases — The Critical Distinction?

☐ 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 Strong vs Weak Acids & Bases — The Critical Distinction?

☐ 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 six strong acids: HCl, H_2SO_4 (1st), HNO_3, $HClO_4$, HBr, HI

BAND 3 2 MARKS

SUCCESS CRITERION 2

Prove that you can: The four strong bases: NaOH, KOH, $Ca(OH)_2$, $Ba(OH)_2$

BAND 4 3 MARKS

SUCCESS CRITERION 3

Prove that you can: All other acids and bases encountered in HSC are weak

BAND 5 4 MARKS

One thing I still need help with: