CHEMISTRY YEAR 11 - MODULE 2 - LESSON 13

Limiting Reagents & Theoretical Yield

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

Most real reactions don't have reactants in perfect stoichiometric proportions — one runs out first and stops the reaction. Identifying which reactant is the limiting reagent, and calculating the maximum possible yield, are among the most tested skills in HSC Chemistry.

- Limiting reagent (LR) — the reactant that runs out first
- Why the reaction stops when the LR is consumed

2. Success Criteria

By the end, you should be able to:

- Limiting reagent (LR) — the reactant that runs out first
- Excess reagent — the reactant remaining when reaction stops
- Theoretical yield — maximum product from LR

3. Key Terms

Mole
The SI unit for amount of substance; contains exactly 6.022×10^{23} particles.

Avogadro's Number
6.022×10^{23} — the number of particles in one mole of a substance.

Molar Mass
The mass of one mole of a substance, measured in g/mol.

Limiting Reagent
The reactant that is completely consumed first, limiting the amount of product formed.

Empirical Formula
The simplest whole-number ratio of atoms in a compound.

Molecular Formula
The actual number of atoms of each element in a molecule of a compound.

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: "Limiting reagent (LR) — the reactant that runs out first". Use one specific example from the lesson.

BAND 3 2 MARKS

2. Apply this idea to a new example: "Excess reagent — the reactant remaining when reaction stops". Show your reasoning clearly.

BAND 4 3 MARKS

3. Analyse why this idea matters for understanding Limiting Reagents & Theoretical Yield: "Theoretical yield — maximum product from LR".

BAND 5 4 MARKS

6. Extend: Apply the Idea

BAND 5/6 5 MARKS

A student gives a memorised answer about Limiting Reagents & Theoretical Yield 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 Limiting Reagents & Theoretical Yield?

☐ 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 Limiting Reagents & Theoretical Yield?

☐ 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: Limiting reagent (LR) — the reactant that runs out first

BAND 3 2 MARKS

SUCCESS CRITERION 2

Prove that you can: Excess reagent — the reactant remaining when reaction stops

BAND 4 3 MARKS

SUCCESS CRITERION 3

Prove that you can: Theoretical yield — maximum product from LR

BAND 5 4 MARKS

One thing I still need help with: