CHEMISTRY YEAR 11 - MODULE 3 - LESSON 2

Synthesis & Decomposition

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 same chemical logic that detonated 2,750 tonnes of ammonium nitrate in Beirut in 2020 is used every day in mining — decomposition reactions release enormous energy when bonds break apart. Understanding these two fundamental reaction types gives you the power to predict what gets built and what breaks down.

- The general pattern for synthesis (A + B → AB)
- How to distinguish synthesis from decomposition by counting products

2. Success Criteria

By the end, you should be able to:

- The general pattern for synthesis (A + B → AB)
- The general pattern for decomposition (AB → A + B)
- Types of energy that drive decomposition

3. Key Terms

one product
C — Two reactants (Fe, O_2) combine to form one product (Fe_2O_3): synthesis. 2.

two or more products
Decomposition: one reactant breaks into two or more products (AB → A + B) [1].

Synthesis reaction
A reaction where two or more reactants combine to form a single product.

Decomposition reaction
A reaction where a single compound breaks down into simpler substances.

Precipitation reaction
A reaction in which an insoluble solid forms when two solutions are mixed.

Combustion reaction
A rapid reaction with oxygen producing heat, light and oxides.

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 general pattern for synthesis (A + B → AB)". Use one specific example from the lesson.

BAND 3 2 MARKS

2. Apply this idea to a new example: "The general pattern for decomposition (AB → A + B)". Show your reasoning clearly.

BAND 4 3 MARKS

3. Analyse why this idea matters for understanding Synthesis & Decomposition: "Types of energy that drive decomposition".

BAND 5 4 MARKS

6. Extend: Apply the Idea

BAND 5/6 5 MARKS

A student gives a memorised answer about Synthesis & Decomposition 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 Synthesis & Decomposition?

☐ 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 Synthesis & Decomposition?

☐ 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 general pattern for synthesis (A + B → AB)

BAND 3 2 MARKS

SUCCESS CRITERION 2

Prove that you can: The general pattern for decomposition (AB → A + B)

BAND 4 3 MARKS

SUCCESS CRITERION 3

Prove that you can: Types of energy that drive decomposition

BAND 5 4 MARKS

One thing I still need help with: