CHEMISTRY YEAR 12 - MODULE 8 - LESSON 15

Drug Synthesis & Green Chemistry

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

Making aspirin in the lab looks simple on paper, but pharmaceutical synthesis is about more than obtaining a product. Chemists also ask how much waste is produced, how efficiently atoms end up in the desired molecule, whether catalysts can improve the route, and how a candidate drug moves from discovery to approval.

- The reagents, conditions and products in aspirin synthesis
- Why green chemistry is about waste prevention, not only yield

2. Success Criteria

By the end, you should be able to:

- The reagents, conditions and products in aspirin synthesis
- The stages of pharmaceutical drug development
- The meanings of atom economy, E-factor and catalyst

3. Key Terms

but pharmaceutical synthesis
about more than obtaining a product

ask how much waste
produced, how efficiently atoms end up in the desired molecule, whether catalysts can improve the route, and how a candi

Why
product formation not enough to judge whether a synthesis route is environmentally responsible?

Product formation
not enough because

Why green chemistry
about waste prevention, not only yield

This
an esterification-style reaction in which the aspirin product is formed along with

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 reagents, conditions and products in aspirin synthesis". Use one specific example from the lesson.

BAND 3 2 MARKS

2. Apply this idea to a new example: "The stages of pharmaceutical drug development". Show your reasoning clearly.

BAND 4 3 MARKS

3. Analyse why this idea matters for understanding Drug Synthesis & Green Chemistry: "The meanings of atom economy, E-factor and catalyst".

BAND 5 4 MARKS

6. Extend: Apply the Idea

BAND 5/6 5 MARKS

A student gives a memorised answer about Drug Synthesis & Green Chemistry 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 Drug Synthesis & Green Chemistry?

☐ 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 Drug Synthesis & Green Chemistry?

☐ 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 reagents, conditions and products in aspirin synthesis

BAND 3 2 MARKS

SUCCESS CRITERION 2

Prove that you can: The stages of pharmaceutical drug development

BAND 4 3 MARKS

SUCCESS CRITERION 3

Prove that you can: The meanings of atom economy, E-factor and catalyst

BAND 5 4 MARKS

One thing I still need help with: