CHEMISTRY YEAR 11 - MODULE 1 - LESSON 4

Distillation and Chromatography

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

Imagine trying to separate two invisible gases that are perfectly mixed. How would you even begin? Distillation and chromatography are the chemist's answer Ò□□¢Ò¢â□□š□¬Ò¢â□a¬□□□ two elegant techniques that exploit subtle differences in physical properties to pull apart what looks inseparable.

- The principles of simple distillation and fractional distillation
- Why boiling point differences allow distillation to work

2. Success Criteria

By the end, you should be able to:

- The principles of simple distillation and fractional distillation
- The principle of paper and thin-layer chromatography
- The meaning of Rf value and how to calculate it

3. Key Terms

Key idea
The central concept from Distillation and Chromatography.

Evidence
Information, observations or calculations used to support an answer.

Explain
Give a reasoned answer that links cause and effect.

Apply
Use a learned idea in a new example, problem or scenario.

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. 6. Explain the difference between simple distillation and fractional distillation. In your answer, specify when each technique is appropriate and the role of the fractionating column.

BAND 3 3 MARKS

2. 7. A student separates a mixture of three amino acids using paper chromatography. The solvent front moves 12.0 cm. Amino acid A moves 3.6 cm, B moves 9.6 cm, C moves 7.2 cm. Calculate the Rf value for each amino acid and identify which amino acid has the greatest affinity for the mobile phase.

BAND 4 4 MARKS

3. 8. Crude oil is a mixture of hydrocarbons with different boiling points. Evaluate the use of fractional distillation to separate crude oil into useful fractions, including a discussion of what makes this technique effective and any limitations.

BAND 5 4 MARKS

6. Extend: Apply the Idea

BAND 5/6 5 MARKS

A student gives a memorised answer about Distillation and Chromatography 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 Distillation and Chromatography?

☐ 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 Distillation and Chromatography?

☐ 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 principles of simple distillation and fractional distillation

BAND 3 2 MARKS

SUCCESS CRITERION 2

Prove that you can: The principle of paper and thin-layer chromatography

BAND 4 3 MARKS

SUCCESS CRITERION 3

Prove that you can: The meaning of Rf value and how to calculate it

BAND 5 4 MARKS

One thing I still need help with: