CHEMISTRY YEAR 11 - MODULE 1 - LESSON 11

Polymers: Structure and Properties

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

Think of polymer chains like trains. A monomer is a single train carriage. Polymerisation is coupling thousands of carriages end-to-end. The type of carriage (monomer structure) and how they connect determines everything — from the flexibility of a shopping bag to the strength of a bulletproof vest. Understanding polymer structure is a direct application of the bonding and IMF principles you've already built up.

- The difference between monomers and polymers
- How monomer structure determines polymer properties

2. Success Criteria

By the end, you should be able to:

- The difference between monomers and polymers
- Addition and condensation polymerisation
- Common polymers and their uses (polyethylene, PVC, nylon, polyester)

3. Key Terms

Key idea
The central concept from Polymers: Structure and Properties.

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. Compare addition and condensation polymerisation. In your answer, describe the monomer requirements, the mechanism, and the products (including any byproducts) for each. Provide one named example of each type.

BAND 3 5 MARKS

2. 7. LDPE (low-density polyethylene) is used for flexible shopping bags while HDPE (high-density polyethylene) is used for rigid pipes. Both are made from the same monomer (ethylene). Explain how the difference in chain structure leads to these different applications.

BAND 4 4 MARKS

3. 8. Nylon-6,6 has a higher melting point (265°C) than polyethylene (~130°C for HDPE), despite both being addition-type synthetic polymers. Explain the molecular basis for this difference, referencing IMF types.

BAND 5 3 MARKS

6. Extend: Apply the Idea

BAND 5/6 5 MARKS

A student gives a memorised answer about Polymers: Structure and Properties 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 Polymers: Structure and Properties?

☐ 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 Polymers: Structure and Properties?

☐ 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 difference between monomers and polymers

BAND 3 2 MARKS

SUCCESS CRITERION 2

Prove that you can: Addition and condensation polymerisation

BAND 4 3 MARKS

SUCCESS CRITERION 3

Prove that you can: Common polymers and their uses (polyethylene, PVC, nylon, polyester)

BAND 5 4 MARKS

One thing I still need help with: