CHEMISTRY YEAR 11 - MODULE 1 - LESSON 10

Intermolecular Forces and Physical 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

Imagine all substances are held together with Velcro. Some molecules have industrial-strength Velcro (hydrogen bonds), some have standard Velcro (dipole-dipole), and some have the weakest possible fuzzy fabric (dispersion forces only). The strength of the "Velcro" between molecules determines the boiling point, viscosity, surface tension — everything. Learning to identify and rank IMFs is the final key to predicting physical properties.

- The three types of IMFs: dispersion, dipole-dipole, and hydrogen bonding
- Why dispersion forces increase with molecular size and shape

2. Success Criteria

By the end, you should be able to:

- The three types of IMFs: dispersion, dipole-dipole, and hydrogen bonding
- Which molecular features give rise to each type of IMF
- How IMF type and strength determine physical properties

3. Key Terms

Key idea
The central concept from Intermolecular Forces and Physical 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. Explain why the boiling point of water (100°C) is much higher than that of hydrogen sulfide (H_2S, −60°C), even though H_2S is a larger, heavier molecule. In your answer, identify all the IMFs present in each substance and explain which is stronger.

BAND 3 4 MARKS

2. 7. A student is given three substances with BP data: fluoromethane (CH_3F, BP −78°C), methanol (CH_3OH, BP 65°C), and methane (CH_4, BP −162°C). (a) Identify the IMFs present in each substance. (b) Explain the BP trend in terms of IMF strength.

BAND 4 5 MARKS

3. 8. Evaluate the statement: "The boiling point of a substance depends entirely on the type of intermolecular force present — a substance with hydrogen bonding will always have a higher boiling point than one with only dispersion forces." Is this statement correct? Provide evidence and reasoning to support your answer.

BAND 5 4 MARKS

6. Extend: Apply the Idea

BAND 5/6 5 MARKS

A student gives a memorised answer about Intermolecular Forces and Physical 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 Intermolecular Forces and Physical 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 Intermolecular Forces and Physical 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 three types of IMFs: dispersion, dipole-dipole, and hydrogen bonding

BAND 3 2 MARKS

SUCCESS CRITERION 2

Prove that you can: Which molecular features give rise to each type of IMF

BAND 4 3 MARKS

SUCCESS CRITERION 3

Prove that you can: How IMF type and strength determine physical properties

BAND 5 4 MARKS

One thing I still need help with: