CHEMISTRY YEAR 11 - MODULE 4 - LESSON 11

🎲 Entropy — Definition, Modelling & Predicting ΔS

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

width=device-width, initial-scale=1.0

- Key facts and terms for 🎲 Entropy — Definition, Modelling & Predicting ΔS
- How the main ideas in 🎲 Entropy — Definition, Modelling & Predicting ΔS connect

2. Success Criteria

By the end, you should be able to:

- Key facts and terms for 🎲 Entropy — Definition, Modelling & Predicting ΔS
- Where this lesson fits in Module 4
- How the main ideas in 🎲 Entropy — Definition, Modelling & Predicting ΔS connect

3. Key Terms

absolute entropy
A measure of the disorder or randomness of a system and its surroundings.

Unit alert
This is covered in detail in Lesson 12. Unit alert: Entropy is measured in J K^{-1} mol^{-1} — not kJ.

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Enthalpy change (ΔH)
The heat energy exchanged at constant pressure during a reaction.

Exothermic
A reaction releasing heat to surroundings (ΔH < 0).

Endothermic
A reaction absorbing heat from surroundings (ΔH > 0).

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. Q6 (4 marks) Distinguish between enthalpy (H) and entropy (S) as thermodynamic state functions. In your answer, address: (i) what each quantity measures; (ii) the reference point used for each; (iii) their respective units.

BAND 3 4 MARKS

2. Q7 (4 marks) For the reaction: $2\text{H}_2\text{O}_2\text{(l)} \to 2\text{H}_2\text{O(l)} + \text{O}_2\text{(g)}$, this reaction is both exothermic and spontaneous. (a) Predict and justify the sign of ΔS. (b) Explain using the Second Law why this reaction is spontaneous, even though $H_2O(l)$ has less entropy than $H_2O_2(l)$ per molecule.

BAND 4 4 MARKS

3. Q8 (6 marks) A student claims: "If a reaction is endothermic, it cannot be spontaneous, because it takes energy from the surroundings." Evaluate this claim using your knowledge of entropy and the Second Law of Thermodynamics. Support your answer with a specific example.

BAND 5 6 MARKS

6. Extend: Apply the Idea

BAND 5/6 5 MARKS

A student gives a memorised answer about 🎲 Entropy — Definition, Modelling & Predicting ΔS 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 🎲 Entropy — Definition, Modelling & Predicting ΔS?

☐ 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 🎲 Entropy — Definition, Modelling & Predicting ΔS?

☐ 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: Key facts and terms for 🎲 Entropy — Definition, Modelling & Predicting ΔS

BAND 3 2 MARKS

SUCCESS CRITERION 2

Prove that you can: Where this lesson fits in Module 4

BAND 4 3 MARKS

SUCCESS CRITERION 3

Prove that you can: How the main ideas in 🎲 Entropy — Definition, Modelling & Predicting ΔS connect

BAND 5 4 MARKS

One thing I still need help with: