CHEMISTRY YEAR 12 - MODULE 7 - LESSON 3

Hydrocarbons — Structure, Homologous Series & 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

The physical properties of every fuel, lubricant, and wax on Earth are controlled by the same simple idea: the strength of the intermolecular forces between hydrocarbon molecules, which depends directly on chain length, molecular shape, and available surface area.

- The structural features of alkanes, alkenes, and alkynes
- Why London dispersion forces increase with chain length

2. Success Criteria

By the end, you should be able to:

- The structural features of alkanes, alkenes, and alkynes
- The first eight alkane names, formulas, and typical states at 25°C
- The boiling point and solubility trends within homologous series

3. Key Terms

Alkane
Not actually flat — it adopts a low-energy zigzag arrangement.

Alkene
An unsaturated hydrocarbon containing at least one carbon-carbon double bond.

Alkyne
An unsaturated hydrocarbon containing at least one carbon-carbon triple bond.

insoluble in water
Hexane is insoluble in water because water's hydrogen-bond network would need to be disrupted, and hexane cannot replace those interactions with equally strong ones [1].

Hydrocarbon
An organic compound containing only carbon and hydrogen atoms.

Functional group
A specific atom arrangement determining characteristic chemical reactions.

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 structural features of alkanes, alkenes, and alkynes". Use one specific example from the lesson.

BAND 3 2 MARKS

2. Apply this idea to a new example: "The first eight alkane names, formulas, and typical states at 25°C". Show your reasoning clearly.

BAND 4 3 MARKS

3. Analyse why this idea matters for understanding Hydrocarbons — Structure, Homologous Series & Physical Properties: "The boiling point and solubility trends within homologous series".

BAND 5 4 MARKS

6. Extend: Apply the Idea

BAND 5/6 5 MARKS

A student gives a memorised answer about Hydrocarbons — Structure, Homologous Series & 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 Hydrocarbons — Structure, Homologous Series & 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 Hydrocarbons — Structure, Homologous Series & 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 structural features of alkanes, alkenes, and alkynes

BAND 3 2 MARKS

SUCCESS CRITERION 2

Prove that you can: The first eight alkane names, formulas, and typical states at 25°C

BAND 4 3 MARKS

SUCCESS CRITERION 3

Prove that you can: The boiling point and solubility trends within homologous series

BAND 5 4 MARKS

One thing I still need help with: