Organic chemistry: retrieval and connections

Student activity • observation and reasoning

YEAR 11 / LESSON 101 / CHEMISTRY + SCIENCE (DOUBLE AWARD)

The question

Can you connect structure, reaction and evidence?

Use an original mixed review to link hydrocarbons, fuels and analytical reasoning. Chemistry-only acid/alcohol questions are explicitly separated.

Equipment

- Booklet, pencil, periodic table and optional molecular model kit

Desk activity only; keep small model pieces away from mouths.

Course coverage: Shared tasks/questions 1–4: hydrocarbons and fuels. Chemistry-only tasks/questions 5–6: alcohols and carboxylic acids.

Plan, model or apparatus sketch

Draw a labelled structure or model to explain your reasoning for this lesson.

Method and reasoning

Read the whole sequence before starting

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1. Draw ethane and ethene and classify each.

2. Explain fractional distillation using boiling ranges and a temperature gradient.

3. Complete $C_{10}H_{22} \rightarrow C_7H_{16} + ____$ and identify the second product family.

4. Balance complete propane combustion and explain one consequence of incomplete combustion.

5. Chemistry only: draw propan-1-ol and propanoic acid and label their functional groups.

6. Chemistry only: write ethanoic acid reacting with magnesium, then choose one misconception to correct.

Cleanup

- Return shared equipment and retain corrected reasoning.

Record your evidence

Blank spaces are for your own work

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Reference and task data

Original written prompts, not reproduced examination material. Cracking example is atom bookkeeping, not a unique industrial product mixture. Use C valency four and O valency two.

Task	My structure / working	Reason / correction
Core structures / separation		
Core equations		
Chemistry-only extension		

Show your calculations, labelled model or correction here.

Explain and evaluate

Use evidence and show calculation steps where relevant

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1. Classify ethane and ethene.

2. Explain separation in a fractionating column.

3. Complete the cracking equation.

4. Balance propane combustion and state a CO hazard.

5. Chemistry only: draw propan-1-ol and propanoic acid, showing their functional groups.

6. Chemistry only: balance acid plus magnesium.