Organic molecules: five ways to represent them

Teacher / technician

YEAR 10 / LESSON 67 / CHEMISTRY + SCIENCE (DOUBLE AWARD)

Staff preparation and answer guidance. Keep separate from student sheets. Molecular models and written formulae only; no chemical handling.

Coverage and delivery

Shared core: 4.1–4.2. Alcohol examples are identification contrasts, not Chemistry-only reaction requirements.

Allow about 60 minutes. Follow the student sequence and use the answers to check reasoning.

Requisition • class of 30, working in 15 pairs

Item	Per pair / setup	Class total
Booklet / writing tools	1 per learner	30 sets
Model kits	1 per pair	15 kits

Immediate safety

Keep small model pieces away from mouths; use links gently and keep the desk clear.

Preparation and delivery

Read alongside the student method

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1. Supply 15 model kits containing at least five carbon pieces, twelve hydrogen pieces and suitable single/double links each; provide 30 booklets.

2. Do not issue hydrocarbon liquids or gases. Emphasise that models are representations: pieces are not to scale and bonds are not rigid coloured rods.

3. Check ethene double-bond counting carefully: two C–H bonds plus a C=C bond gives valency four at each carbon.

4. Keep the distinction between a displayed drawing and a condensed formula explicit. CH_3CH_3 alone is not a fully displayed formula.

5. Allow 10 minutes sorting, 25 modelling, 15 formula comparison and 10 peer checking. Avoid teaching that all carbon compounds are hydrocarbons.

Close of lesson

- Count and return all model pieces and keep corrected drawings.

Check before teaching

Check the cards, reference data and quantities against this requisition. Keep the staff answer guide separate until the checking stage. Supplied numerical practice datasets are labelled examples; they are not class measurements.

Answers and teaching notes

Expected explanations • do not give as experimental observations

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- CH_4, C_2H_6 and C_2H_4. Ethanol contains oxygen; CO_2 contains no hydrogen and also oxygen.
- Molecular C_2H_6; empirical CH_3.
- $H_2C{=}CH_2$ with all four individual C–H bonds drawn and one C=C bond.
- C_3H_8; 3 and 8 have no common factor greater than one.
- Connectivity and individual bonds; a molecular formula only counts atoms.
- C_5H_{12}.

References and provenance

Pearson Chemistry specification

Prepared 22 November 2026. Original wording, tables and questions. Sources inform the concepts and technique; the lesson scope and classroom quantities are explicitly described here. No laboratory trial or final school risk approval is claimed.