Homologous series: patterns and functional groups

Teacher / technician

YEAR 10 / LESSON 68 / CHEMISTRY + SCIENCE (DOUBLE AWARD)

Staff preparation and answer guidance. Keep separate from student sheets. Desk classification; alcohol and acid reactions remain in their later Chemistry-only lessons.

Coverage and delivery

Shared core: 4.3. Oxygen-containing functional groups are labelled extension recognition; their Chemistry-only reactions are not assessed here.

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
Optional model kits	1 per pair	15 kits if used

Immediate safety

No chemicals are used. Keep model components away from mouths.

Preparation and delivery

Read alongside the student method

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1. Prepare 30 booklets and up to 15 model kits. Keep all examples as drawings/models; do not issue organic liquids.

2. Preserve shared-core coverage. Label alcohol/acid recognition as contextual extension and do not introduce their later reaction requirements as Double Award assessment.

3. Explain that alkanes have no special reactive functional group; their shared saturated C–C/C–H framework is the classification feature.

4. Avoid the overgeneralisation that all alkenes, including multiple double bonds or rings, fit C_nH_{2n}. State the scope each time the general formula is used.

5. Use 10 minutes retrieval, 20 classification, 20 explanation and 10 correction. For physical properties use qualitative trends only; no invented temperatures.

Close of lesson

- Return models and retain the corrected classification table.

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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• Same general formula, same functional group/structural feature, similar chemical reactions, neighbouring members differ by CH_2; physical properties change gradually.

• C_5H_{12} and C_6H_{14}.

• C=C; the molecule contains a carbon–carbon double bond and is unsaturated.

• It contains oxygen as well as carbon and hydrogen.

• Molecular size and intermolecular attractions change, so physical properties can vary while characteristic reactions remain similar.

• A ring can also reduce hydrogen count; structure must show a C=C bond. The stated alkene formula assumes an acyclic molecule with one double bond.

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.