Naming organic compounds: structure first

Student activity • observation and reasoning

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The question

Can someone reconstruct a molecule from your name?

Use carbon counts, bond types and positions to name simple organic structures. Rebuild a partner's named molecule to check that the name is unambiguous.

Equipment

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

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

Course coverage: Shared core: 4.3–4.4. Hydrocarbon naming within six carbons; later Chemistry-only functional-group chemistry is not required here.

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. Write the prefixes meth-, eth-, prop-, but-, pent- and hex- beside carbon counts 1–6.

2. Build or draw the straight-chain alkanes from methane to hexane; complete hydrogen counts using carbon valency four.

3. Name $CH_2=CH_2$ and $CH_2=CHCH_3$. Explain the -ene ending and why there is no ordinary one-carbon alkene.

4. Compare $CH_2=CHCH_2CH_3$ and $CH_3CH=CHCH_3$. Number from the end giving the C=C bond its lowest locant.

5. Construct $CH_3CH(CH_3)CH_3$. Identify its longest chain before naming the methyl branch; count total carbons separately.

6. Swap names with a partner, reconstruct displayed structures and identify any ambiguity.

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

Carbon-count prefixes: 1 meth, 2 eth, 3 prop, 4 but, 5 pent, 6 hex. Acyclic saturated hydrocarbons use -ane; an alkene contains C=C and uses -ene. A locant identifies a position. Names must reflect connectivity, not the way a drawing is rotated. Branched example is introductory naming practice.

Task	My structure / working	Reason / correction
Straight-chain alkane		
Alkene position		
Branched example		

Show your calculations, labelled model or correction here.

Explain and evaluate

Use evidence and show calculation steps where relevant

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1. Name $CH_3CH_2CH_2CH_2CH_3$.

2. Give hexane’s molecular formula.

3. Name $CH_2{=}CHCH_3$.

4. Distinguish but-1-ene from but-2-ene using structures.

5. Name $CH_3CH(CH_3)CH_3$ and explain the parent chain.

6. Why is but-3-ene renumbered as but-1-ene?