

Naming organic compounds

Lesson 1

[Click](#) to refresh yourself with naming of organic compounds.

[Click](#) to revise naming alcohols

Before we continue we must be familiar with the names of a few common substituent groups (side groups that protrude from the backbone and replace hydrogen atoms).

- CH₃ = methyl
- CH₃CH₂ = ethyl
- Cl = chloro
- Br = bromo
- I = iodo
- F = fluoro

Below are steps that provide a quick summary of the rules for naming hydrocarbons which do not have an OH, NH₂, COOH, or CO functional groups.

1 - Identify the longest continuous carbon chain. This becomes the backbone of the molecule. When faced with two competing backbones select the one that has the fewer substituent groups and no branched substituent group.

2 – Identify the substituent groups.

3 – Number the carbon atoms so that the substituent groups end up on the lowest numbered carbon atoms possible. For example, when adding the numbers of the carbon atoms containing the substituent groups the sum should be the lowest possible. If the sum is the same when numbering from right to left or from left to right then select the numbering so that the first carbon has the lowest number. If the first carbons still have the same name number choose the substituent group that comes first alphabetically.

4 – If more than one substituent group of a particular type exists use the prefix di, tri or tetra in the name. For example 2,3-dichloropentane or 2,3,3-trimethylhexane

5 - Use a comma to separate numbers and a dash (-) to separate numbers from words. No space between words so the name of a molecule is one complete word.

6 – Name the molecule by placing the side groups in alphabetical order.

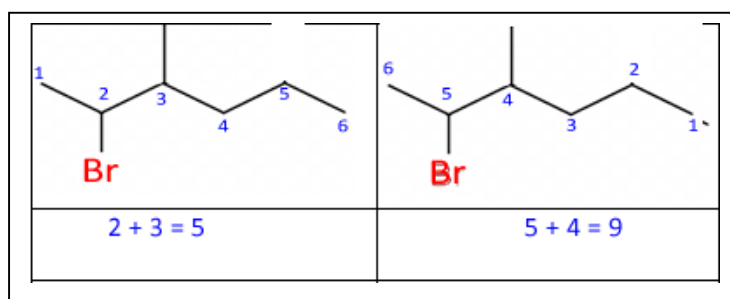
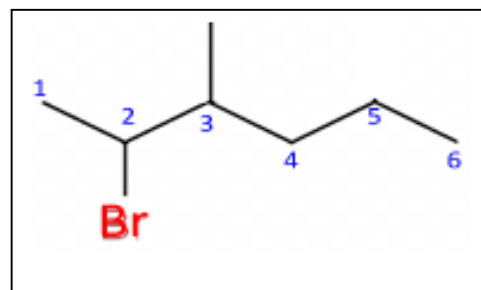
Example 1 Name the molecule on the right.

Step 1 - The longest carbon chain has 6 carbons, hence a hexane backbone.

Step 2 – Substituent groups are methyl and bromo.

Step 3 – Numbering left to right places the groups on carbons 2 and 3 giving a sum of 5 while numbering from right to left gives a sum of 9, as shown on the right. So we number from left to right.

Step 6 2-bromo-2-methylhexane



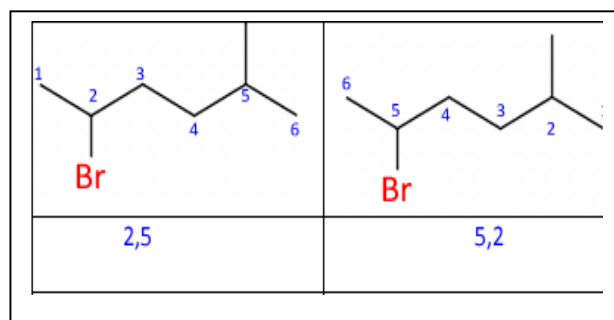
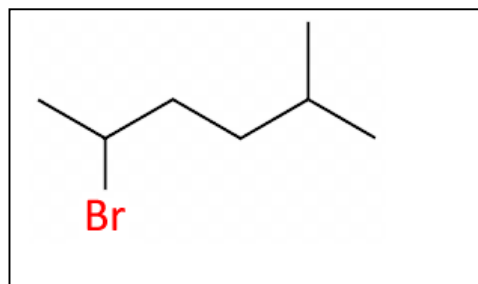
Example 2 Name the molecule on the right.

Step 1 - The longest carbon chain has 6 carbons, hence a hexane backbone.

Step 2 – Substituent groups are methyl and bromo.

Step 3 – Numbering left to right places the groups on carbons 2 and 5 giving a sum of 7 while numbering from right to left also gives a sum of 7, as shown on the right. Both numbering systems give carbon number 2 as the first carbon to have substituent group. Hence we use the alphabetical system and assign Bromo to carbon 2.

Step 6 2-bromo-5-methylhexane and not 5-bromo-2-methylhexane



Example 3 Name the molecule on the right.

Step 1 - The longest carbon chain has 6 carbons, hence a hexane backbone.

Step 2 – Substituent groups are methyl and bromo.

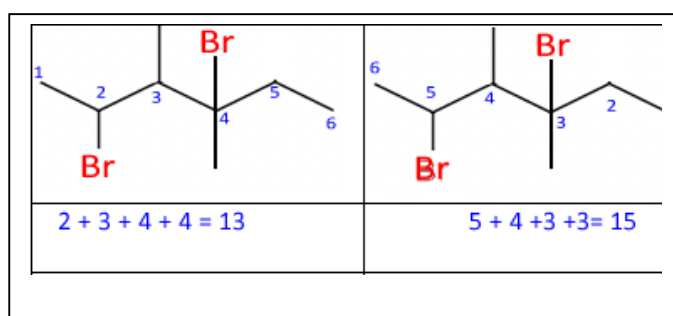
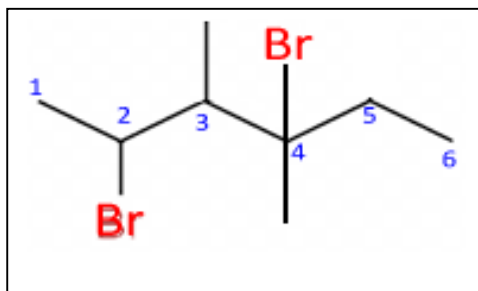
Step 3 – Numbering left to right places the groups on carbons 2, 3 and 4 while numbering from right to left places the groups on carbons 5, 4 and 3, as shown on the below. Numbering from left to right gives the lowest sum of carbons with groups attached.

Step 4 We have two bromo groups hence dibromo is used. Two methyl groups also are attached so we use diethyl.

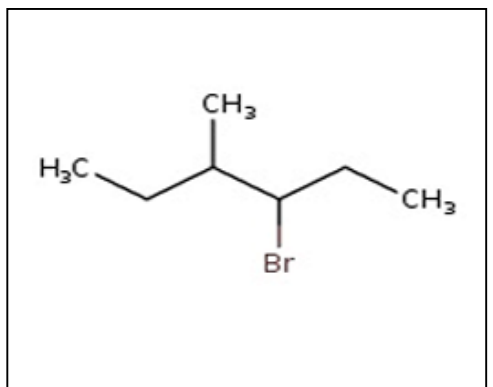
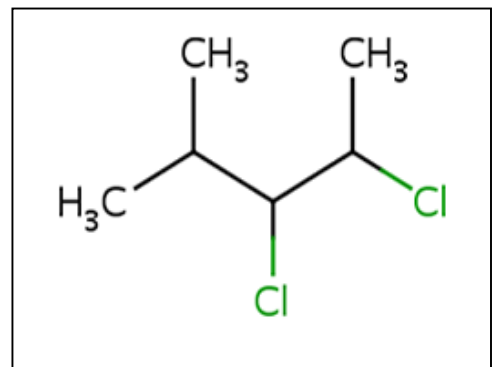
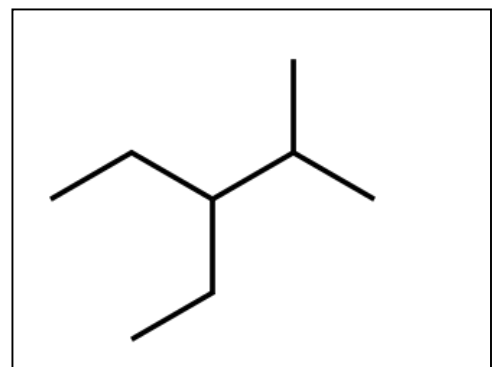
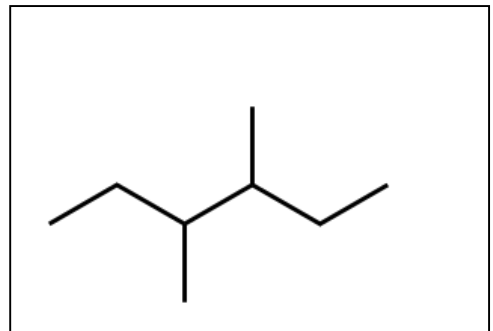
Step 5 Since the bromo groups are on carbons 2 and 4 we write 2,4-dibromo

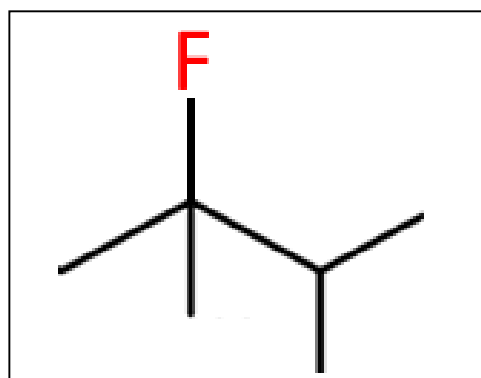
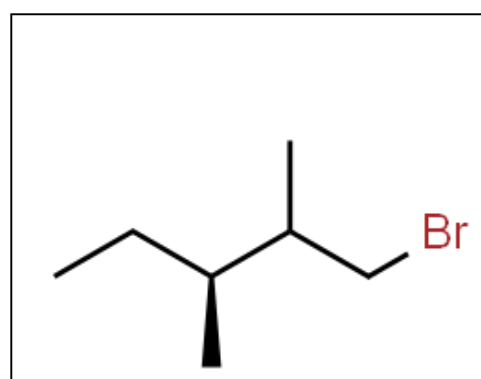
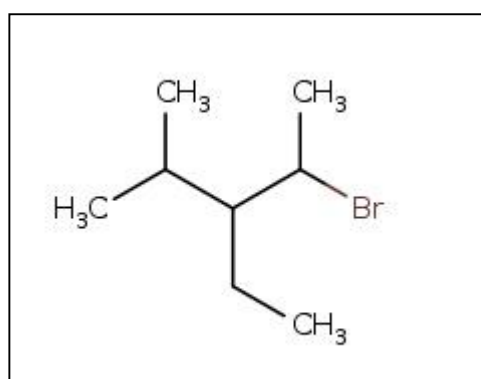
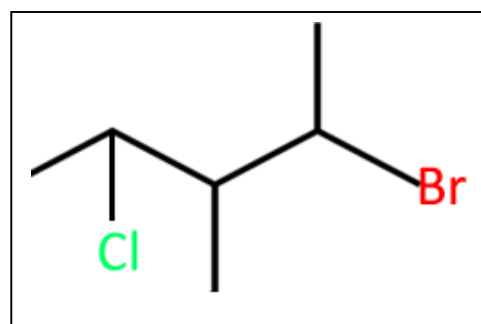
Since the two methyl groups are on carbons 4 and 3 we write 3,4-dimethyl

Step 6 Write the name placing the groups in alphabetical order. 2,4-dibromo-3,4-dimethylhexane



1) Name the following molecules

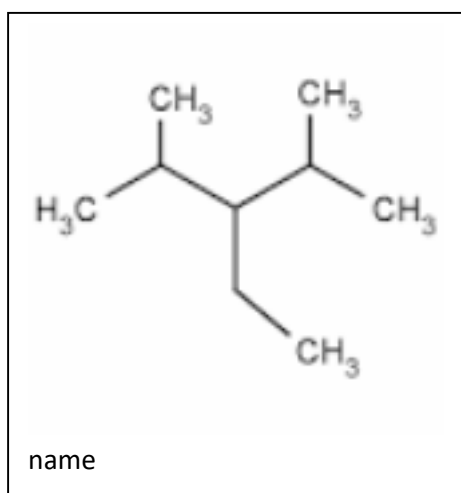




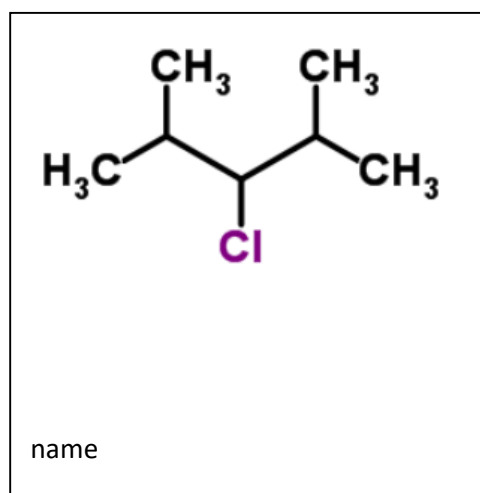
[Click](#) to revise naming alcohols

3) Name the following compounds

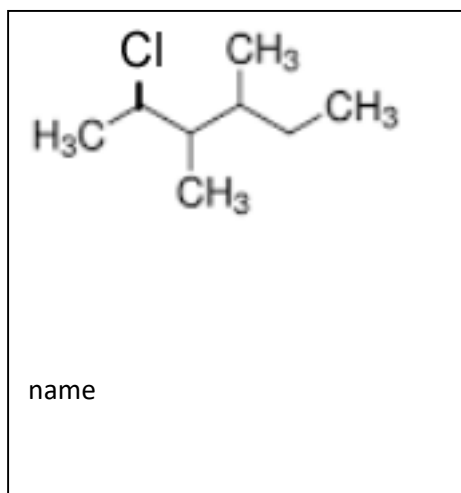
a)



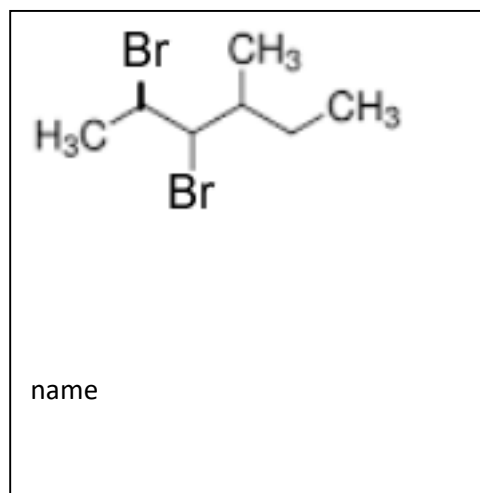
b)



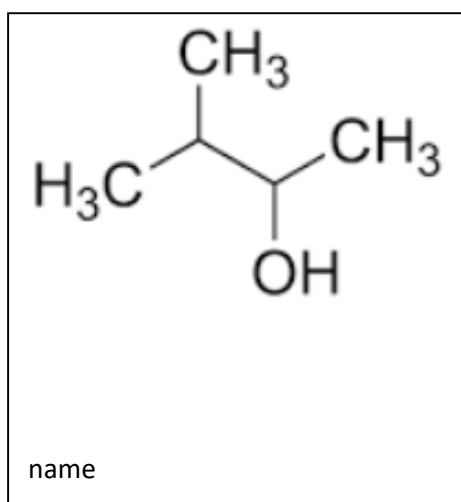
c)



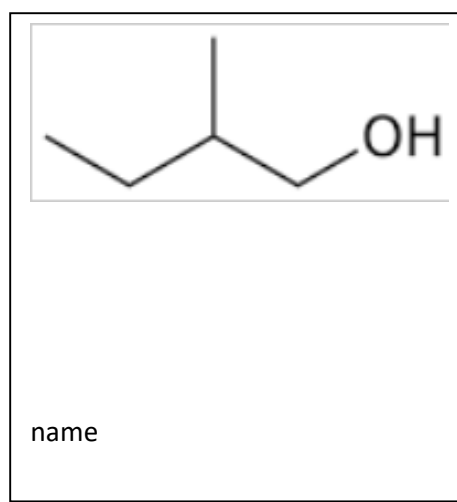
d)



e)

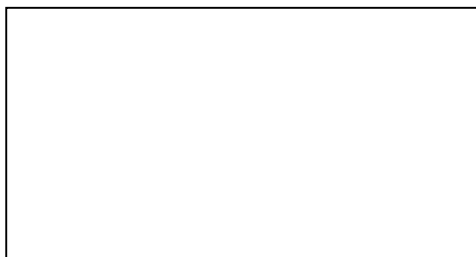


f)

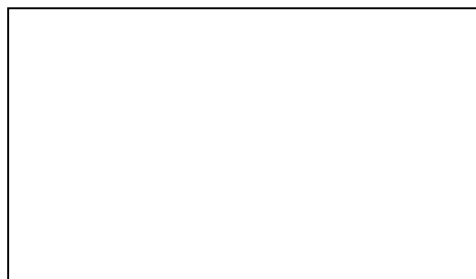


4) Draw the formulae of the following compounds.

a) 4-methylhexan-2-amine



b) 2-methylpropan-2-ol



c) 3,5-dimethylhexan-1-ol



d) 6-methylheptan-2,5-diol



e) Propyl ethanoate ([Click](#) for a revision of naming esters.)



f) 4-methylpent-2-ene

