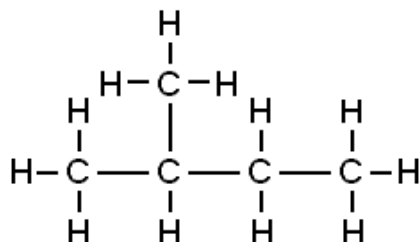


Branched Alkanes

The carbon chain in an alkane can also be branched, as shown below.



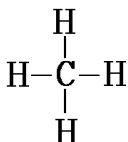
Alkanes with branched carbon chains are called **branched alkanes**. Unlike straight-chain alkanes, the carbons in a branched alkane cannot be connected with a straight line. Notice that branched alkanes contain at least 1 **branch carbon**, which is a carbon atom that is bonded to more than 2 other carbon atoms.

Notice that branching does not make an alkane unsaturated. Branched alkanes are still saturated hydrocarbons, and so have the general formula C_nH_{2n+2} .

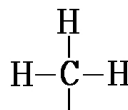
Naming Branched Alkanes

The longest continuous chain of carbon atoms is called the **parent chain**. All side branches are called **substituent groups**.

Each alkane-based substituent group is named for the straight-chain alkane having the same number of carbon atoms as the substituent. The ending *-ane* is replaced by the ending *-yl*.



Methane



Methyl group

An alkane-based substituent group is called an **alkyl group**.

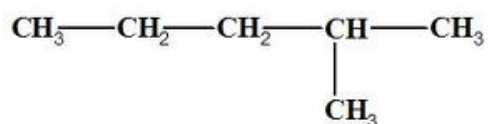
The following steps can be used to name a branched alkane:

1. Locate and name the parent chain.
2. Number the parent chain's carbon atoms from end-to-end, starting with the end that is closer to a branch carbon.
3. Name each alkyl group.

- If the same alkyl group appears more than once as a branch, use a prefix (di-, tri-, tetra-, etc.) before its name to indicate how many times it occurs. Then, use the number of the carbon to which each branch is attached to indicate its position.
- Whenever different alkyl groups are attached to the same parent structure, put their names in alphabetical order.
- Write the name using hyphens to separate numbers from words and commas to separate numbers. No space is added between the substituent name and the name of the parent chain.

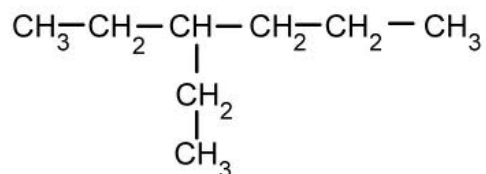
Example 1

Name the branched alkane shown below.



Example 2

Name the branched alkane shown below.



Example 3

Name the branched alkane shown below.

