

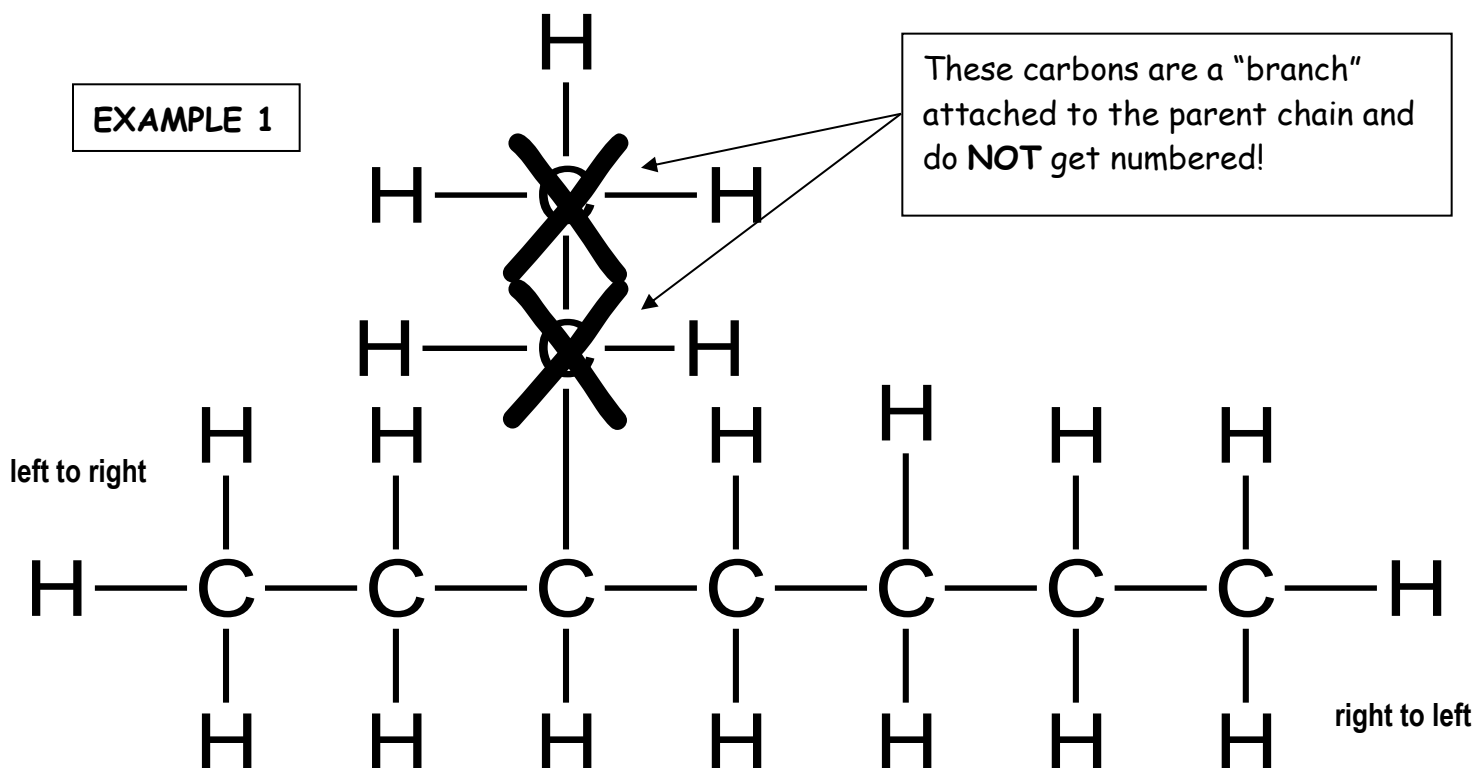
Name: _____

IUPAC Organic Nomenclature Activity - Branching Chains

Branching Hydrocarbon Chains

When **branches** (alkyl groups) are attached to the parent (longest) chain of carbons, carbons are numbered in the chain. Those numbers are used to indicate where on the parent chain the branch is attached. **The lowest possible set of numbers need to be used.** The carbons can be numbered from **left to right** OR **right to left**, but the numbering system that gives the lowest numbers for the **branches** attached to the main chain will always be used.

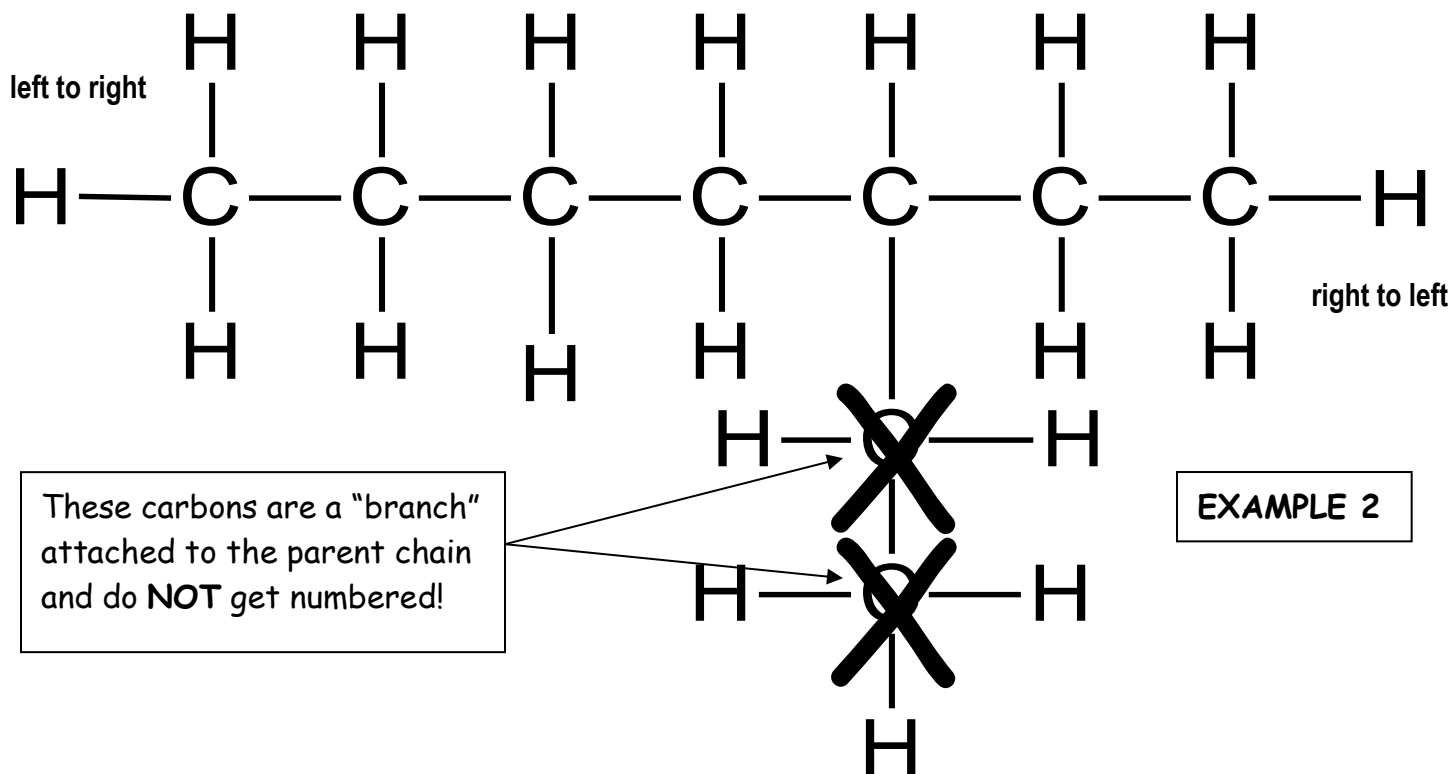
- 1). **Number the carbons** in the parent chain of the compound shown below starting at the **right** and going to the **left**.
- 2). **Number the carbons** in the main chain of the compound shown below starting at the **left** and going to the **right**.



- 3). For this compound, which method of numbering - **right to left** OR **left to right** - gives the lowest number to the "branch" attached to the parent chain?

Answer: _____

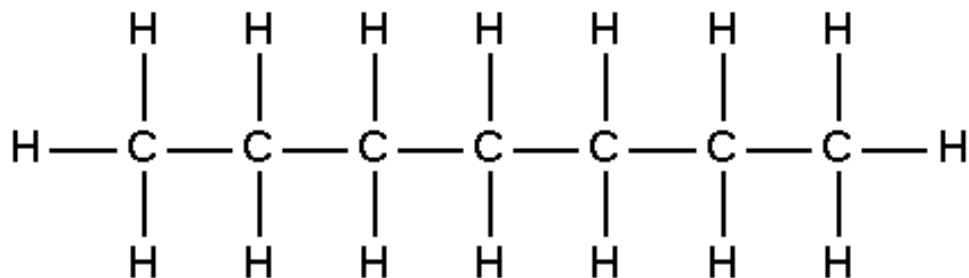
4). Repeat steps 1 and 2 for the compound shown below.



5). For this compound, which method of numbering - **right to left** OR **left to right** - gives the lowest number to the "branch" hanging off the main chain?

Answer: _____

6). Consider a hydrocarbon with 7 carbons in the parent chain and all single bonds between the carbons atoms. What would the name of this hydrocarbon be if there was no branching off of the main chain?

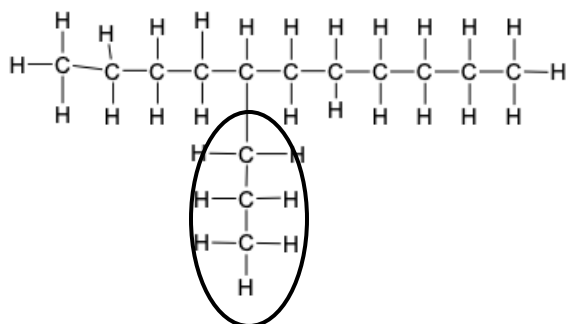


Answer: _____

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But it isn't JUST "heptane", is it? There are two carbons and five hydrogens attached to the parent chain. If the "branch" that is attached to the main chain is made up of ONLY carbons and hydrogens, Table P is used to help identify it. The suffix -yl is used after the correct prefix to indicate a branch. For example, one carbon (with its 3 hydrogens) hanging off the main chain is called a methyl group, two carbons (with their 5 hydrogens) hanging off the main chain is called an ethyl group, etc.

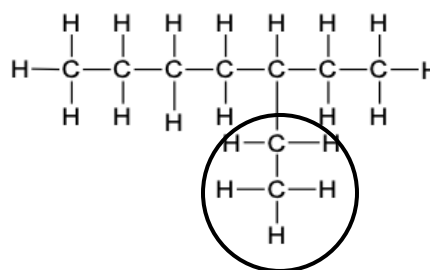
7). Name the branch attached to the main chains of each of the compounds shown below.



Compound A

Name of branch from

Compound A: _____

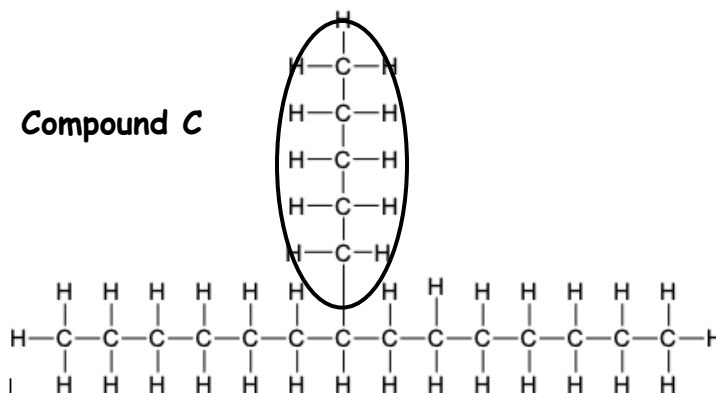


Compound B

Name of branch from

Compound B: _____

Compound C

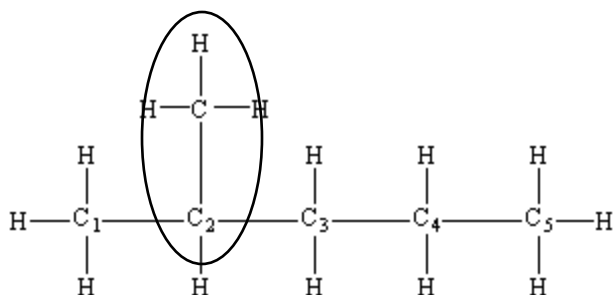


Name of branch from Compound C: _____

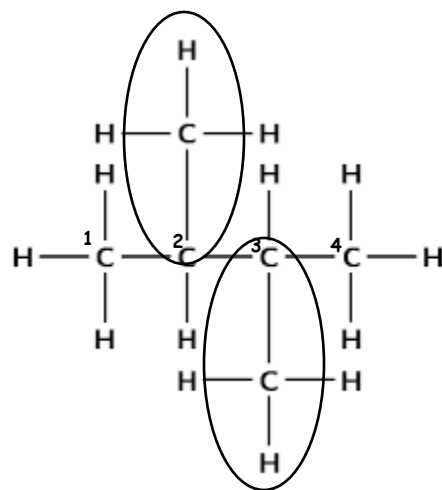
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When a parent chain has one or more branches attached, it must be first communicated what carbon of the main parent chain the branch is on. The carbons are numbered in the parent chain such that the branch has the lowest number possible. After providing the number, the branch must be named, using the prefixes from Table P. The suffix of branches is a -yl ending. Lastly, the parent chain must be named using Table P for the prefix and Table Q for the suffix.

Examine the following examples:

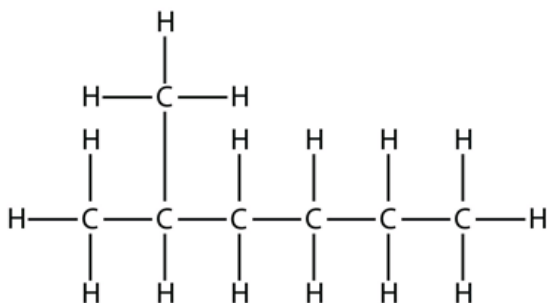


2 - methyl pentane



2,3 di methyl butane or
2 methyl 3 methyl butane

8). Name the compound shown below. Be sure to number the carbons on the parent chain to give the location of the branch using the lowest possible number.

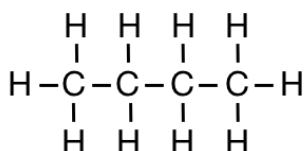


Answer: _____

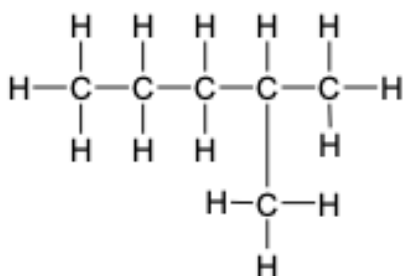
9). **Practice:** Name the following hydrocarbons.

Remember:

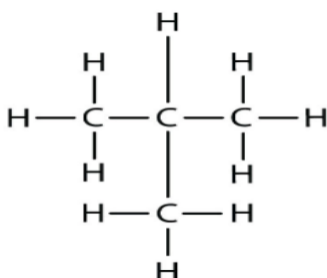
- Use Table P for the parent chain prefix
- Use Table Q to determine the suffix if a double or triple bond is present
- Number the carbons if a branch or a double/triple bond is present
- Make sure that the branches/multiple bonds have the lowest numbers possible



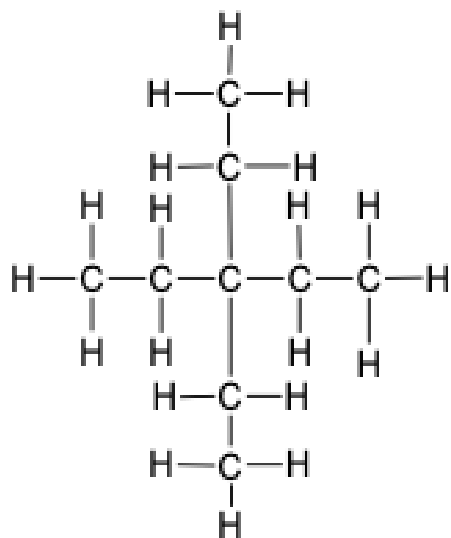
Answer: _____



Answer: _____



Answer: _____



Answer: _____

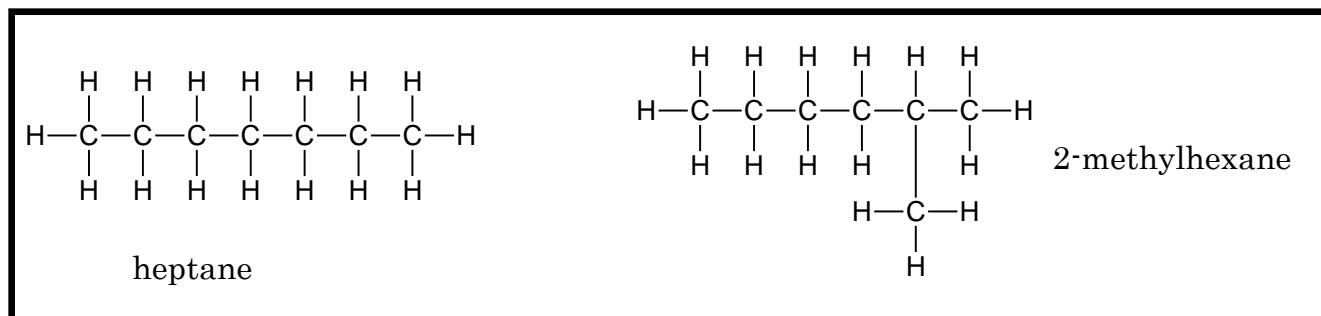
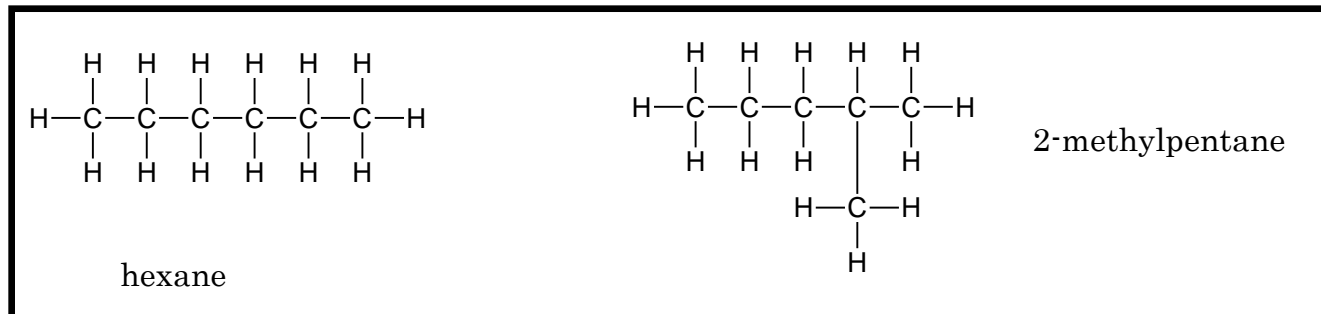
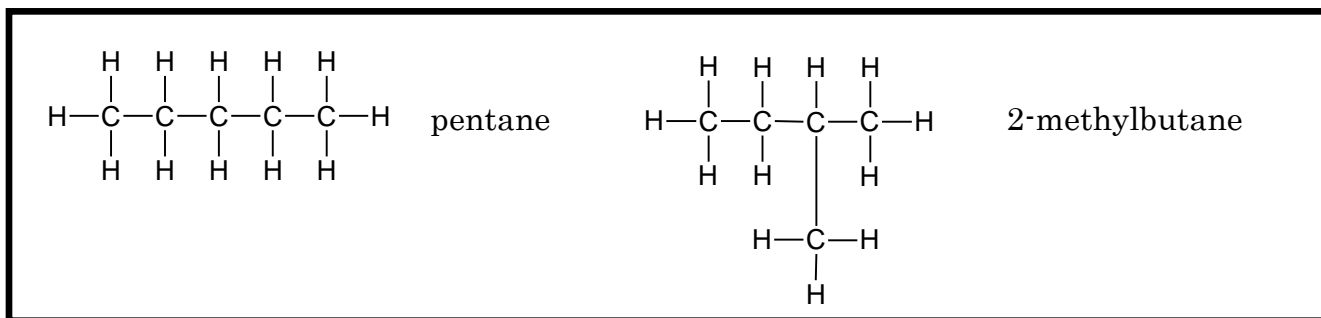
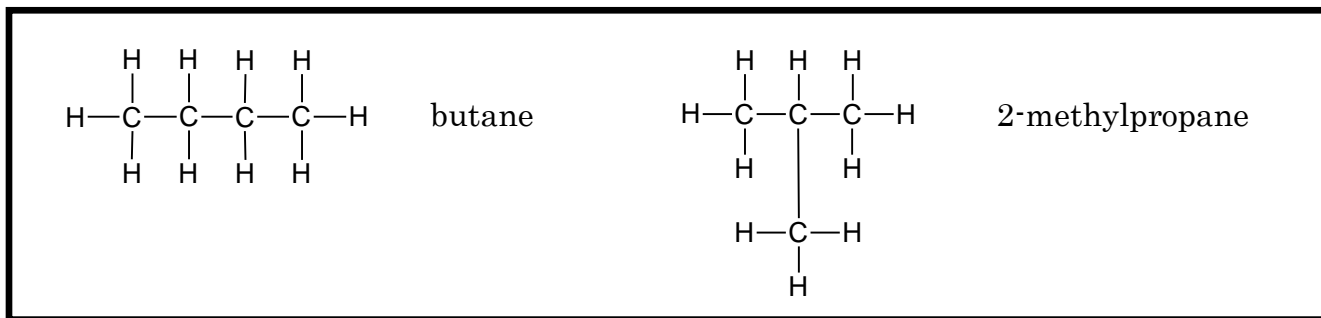
10). **Practice:** Draw the following hydrocarbons.

Remember:

- Use **Table P** for the parent chain prefix
- Use **Table Q** to determine the suffix if a double or triple bond is present
- **Number the carbons** if a branch or a double/triple bond is present
- Make sure that the branches/multiple bonds have the lowest numbers possible

3 ethyl pentane	2 propyl hexane
2 methyl butane	3, 3-Dimethylpentane
2 methyl 3 ethyl heptane	2,2,3 Dimethyl hexane

Model 2.



Key Question

11). In your group, describe how each pair of molecules is similar and different.

12). What is the term that is used to relate these two molecules?

Answer: _____