

(19) **Today**

Section 3.4
Nomenclature

3.6 - 3.7 Conformations of Alkanes

Next Class (20)

Chap 4 Cycloalkanes

(21) **Second Class from Today**

Chap 4 Cycloalkanes

Third Class from Today (22)

Chap 5
Stereochemistry at Tetrahedral Centers

Please hand in reworked test 1 before leaving today.

Office hours for today are canceled.

Nomenclature of Alkanes: IUPAC Names based on the number of C's in the longest continuous chain of C atoms that contains the functional group

Determine longest continuous chain.

- This is the **parent hydrocarbon**
- If compound has two or more chains of the same length, parent hydrocarbon is chain with greatest number of substituents

tie for length

things hanging off the parent hydrocarbon


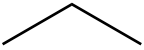

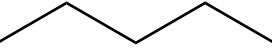

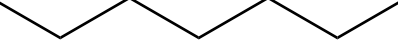
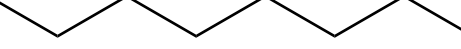
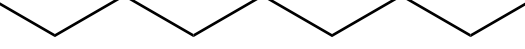
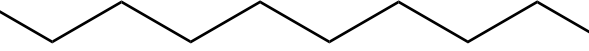
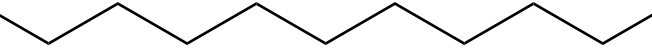
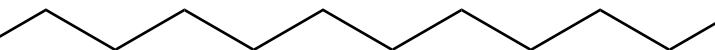
List the name of substituent(s) before the name of the parent hydrocarbon along with the number of the carbon to which it is attached--Substituents are listed in alphabetical order – neglecting prefixes such as di- tri- tert- etc.

- Find and list all of the substituents
- Names of alkyl substituents are based on the length of the substituent.
- Names for branched substituent such as *sec*-butyl and *tert*-butyl are acceptable, but systematic substituent names are preferable.
 - The numbering system for a branched substituent begins with the carbon attached to the parent hydrocarbon
 - This number together with the substituent name is placed inside parentheses
- Number the substituents
 - in the direction that gives the lower number for the lowest-numbered substituent. (Lowest possible number for all substituents on the parent chain)
 - When both directions yield the same lower number for the lowest numbered substituent, select the direction that yields the lower number for the next lowest numbered substituent
 - If same substituent numbers are obtained in either direction, number in the direction giving lowest number to the first (alphabetically) named substituent

dimethyl does not come before ethyl

position#-stuff hanging off longest chain longest chain of C atoms functional group ending

Nomenclature of Alkanes

Name	Formula	Skeletal Structure
methane	CH ₄	no skeletal structure for methane
ethane	CH ₃ CH ₃	
propane	CH ₃ CH ₂ CH ₃	
butane	CH ₃ CH ₂ CH ₂ CH ₃	
pentane	CH ₃ CH ₂ CH ₂ CH ₂ CH ₃	
hexane	CH ₃ CH ₂ CH ₂ CH ₂ CH ₂ CH ₃	
heptane	CH ₃ CH ₂ CH ₂ CH ₂ CH ₂ CH ₂ CH ₃	
octane	CH ₃ CH ₂ CH ₂ CH ₂ CH ₂ CH ₂ CH ₂ CH ₃	
nonane	CH ₃ CH ₂ CH ₂ CH ₂ CH ₂ CH ₂ CH ₂ CH ₂ CH ₃	
decane	CH ₃ CH ₂ CH ₂ CH ₂ CH ₂ CH ₂ CH ₂ CH ₂ CH ₂ CH ₃	
undecane	CH ₃ CH ₂ CH ₂ CH ₂ CH ₂ CH ₂ CH ₂ CH ₂ CH ₂ CH ₂ CH ₃	
dodecane	CH ₃ CH ₂ CH ₂ CH ₂ CH ₂ CH ₂ CH ₂ CH ₂ CH ₂ CH ₂ CH ₂ CH ₃	

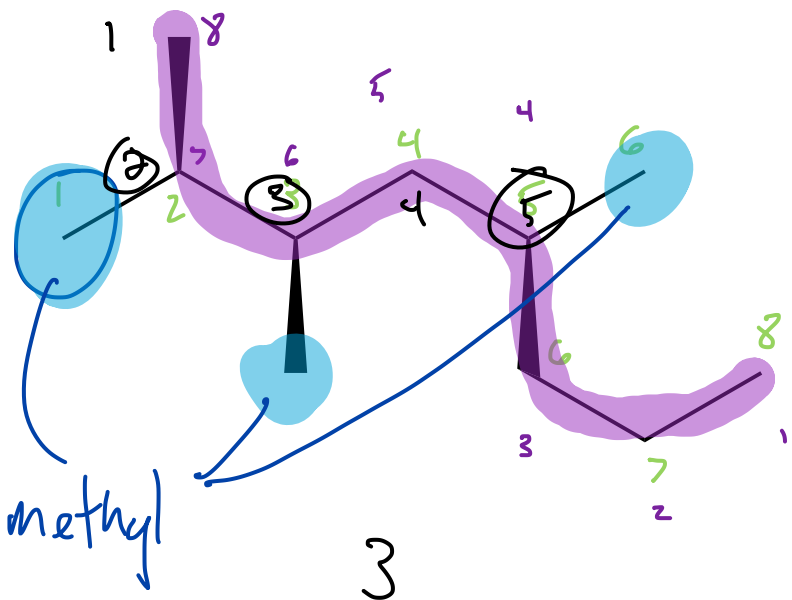
Nomenclature of Alkanes

trimethy

oct

ane

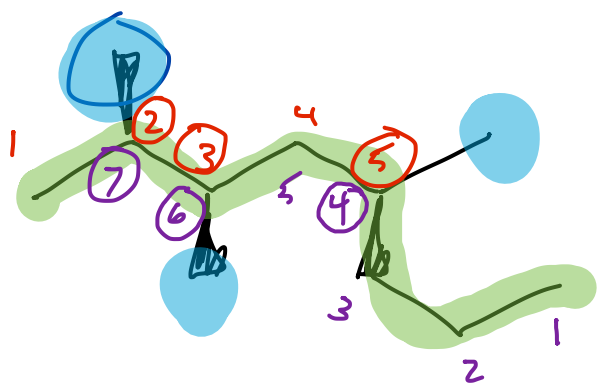
position#-**stuff hanging off longest chain** longest chain of C atoms **functional group ending**



purple or green ... highest # of substituents

2,3,5-trimethyloctane

which one? → 2,3,5
 ↘ ~~4,6,7~~
 2 is lower than 4
 this one



3

Nomenclature of Alkanes

position#-**stuff hanging off longest chain**longest chain of C atoms**functional group ending**

<p>longest chain: 6</p> <p>parent alkane name: hexane</p> <p>functional group (?) and position: alkane</p> <p>substituent names: methyl</p> <p>substituent positions: 3</p>	<p>$\text{CH}_3\text{CH}_2\text{CHCH}_2\text{CH}_2\text{CH}_3$ CH_3</p> <p>name: 3-methylhexane</p>
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Nomenclature of Alkanes

position#-**stuff hanging off longest chain**longest chain of C atoms**functional group ending**

longest chain:

7

parent alkane name:

heptane

functional group (?) and position:

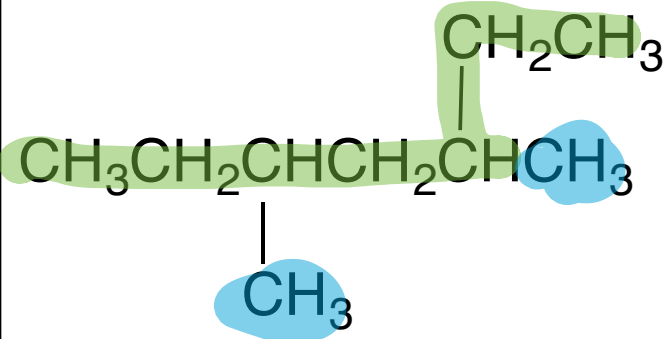
alkane

substituent names:

methyl

substituent positions:

3 + 5



name:

3,5-dimethylheptane

Nomenclature of Alkanes

longest chain:

7

parent alkane name:

heptane

functional group (?) and position:

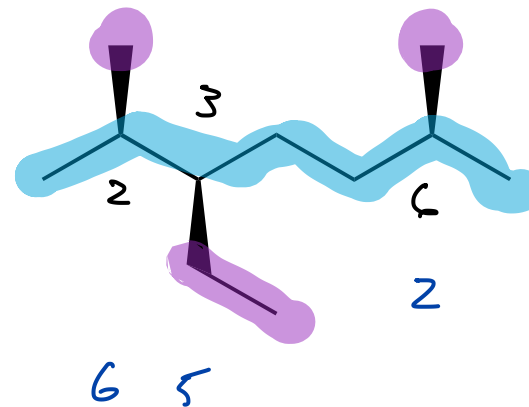
alkane

substituent names:

2 methyl groups
1 ethyl group

substituent positions:

2,3,6 or ~~2,5,6~~
lower



2,6-dimethyl-3-ethylheptane

Nomenclature of Alkanes

longest chain:

7

parent alkane name:

heptane

functional group (?) and position:

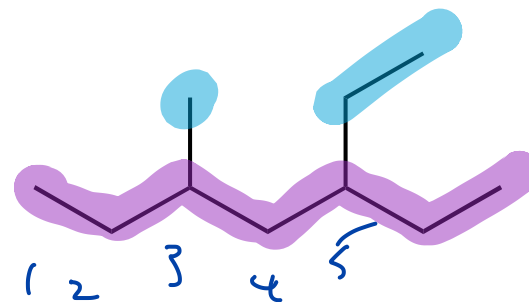
alkane keep one ending

substituent names:

methyl + ethyl

substituent positions:

3,5 or 3,5

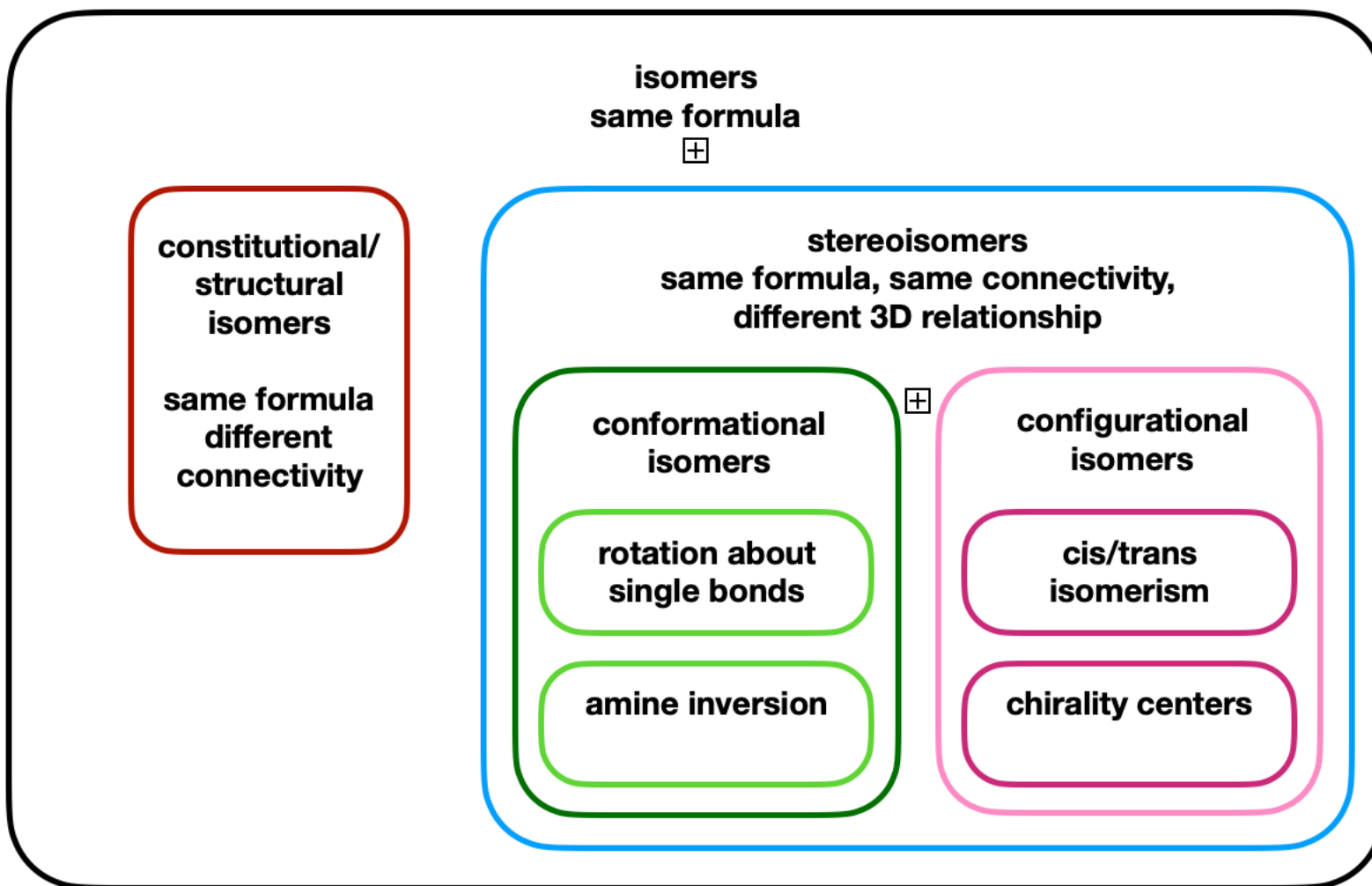


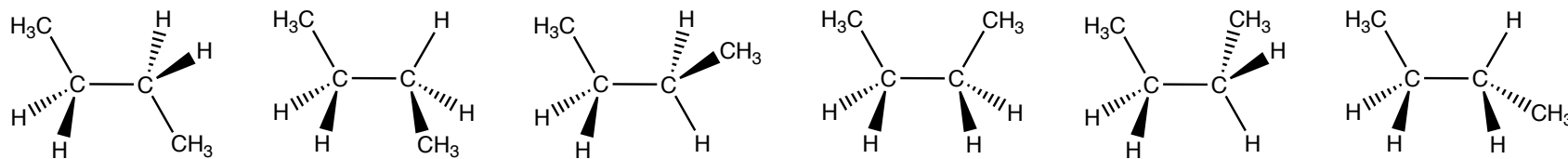
~~5-ethyl-3-methyl-5-~~

3 | 5
in a tie go in alphabetical order

3-ethyl-5-methylheptane

Isomers





<https://www.westfield.ma.edu/cmasi/organic/newman/newman-plain.html>

Rotation around Single Bonds: Newman Projections

Sections 3.6 - 3.7

