

Office Hours: M 1:30pm - 3:00pm
(in Park 169) W 11:00am - 12:00pm
or by appointment (email me)
or just email me with questions!

TA Hours w/ Sodtugs: T&Th 7:00pm - 8:00pm
(in Park 273)

Q-center: <https://www.brynmawr.edu/inside/offices-services/q-center/q-center-schedule>

Naming Alkanes

Isomerism

9/11/2026

Exam 1 next Friday during lecture

Quiz 1 in Recitation today

Chemistry ice cream social

This Friday 4pm in Park atrium courtyard

IUPAC systematic naming

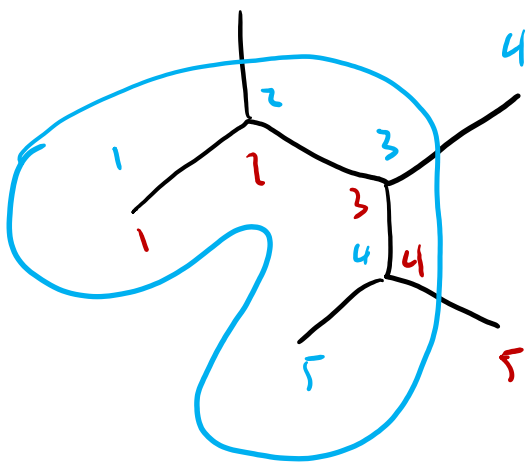
1. Identify the longest carbon chain (the "parent chain") in the molecule.

a. The **prefix** denotes the **number of carbons** in the parent chain.

b. The **suffix** for naming an **alkane** is "-ane". Other functional groups will get their own suffixes.



# of Carbon atoms in chain	prefix	Name of alkane	Drawing
1	meth -	methane	CH ₄
2	eth -	ethane	—
3	prop -	propane	
4	but -	butane	
5	pent -		
6	hex -		
7	hept -		
8	oct -		
9	non -		
10	dec -		
11	undec -		
12	dodec -		

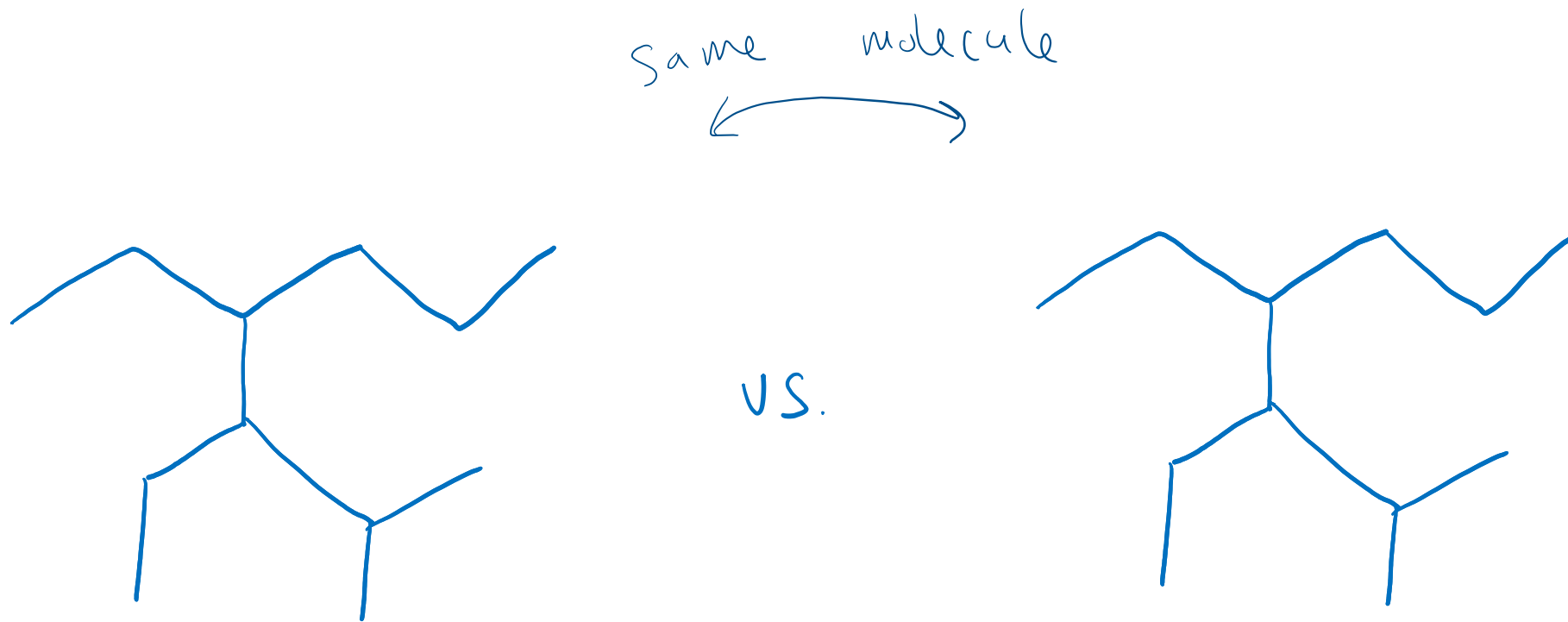


pentane

longest chain may "snake around" - be careful!

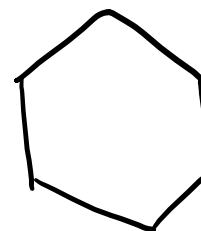
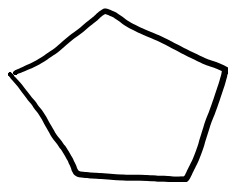
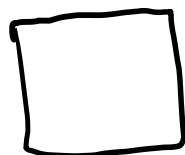
Not always straight / left to right.

What if there are two possible “parent chains” that have the same length?



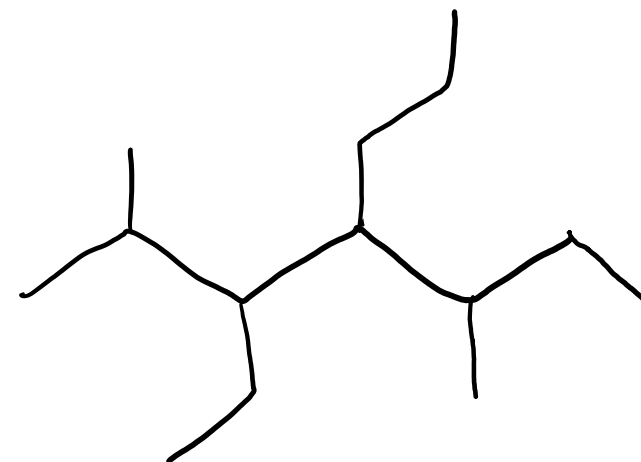
Choose the chain with the most **substituents** (groups that branch off the chain)

If the longest chain is a ring...



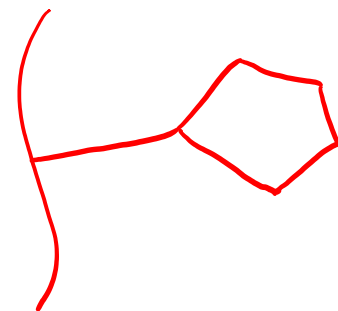
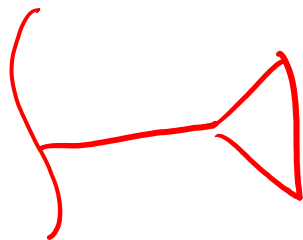
2. Name the substituents attached to the parent chain.

# of Carbon atoms in substituent	Name of substituent	Drawing
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		

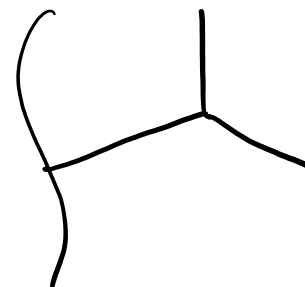
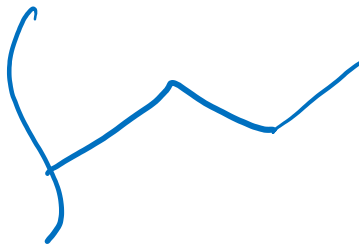


Other alkyl substituents

Cycloalkanes can be substituents:

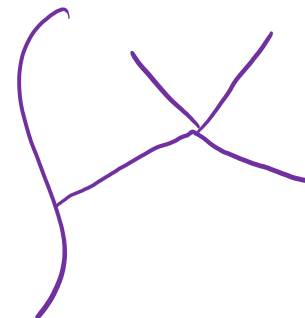
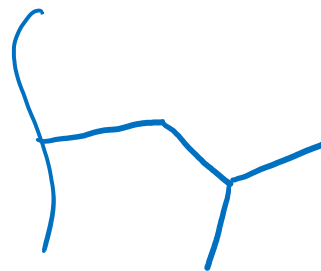
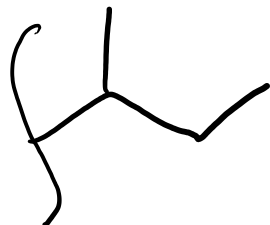


The “propyl” group can have two different forms:



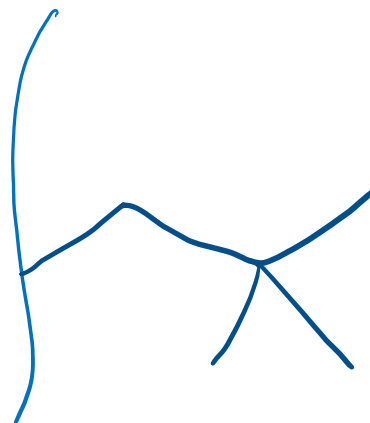
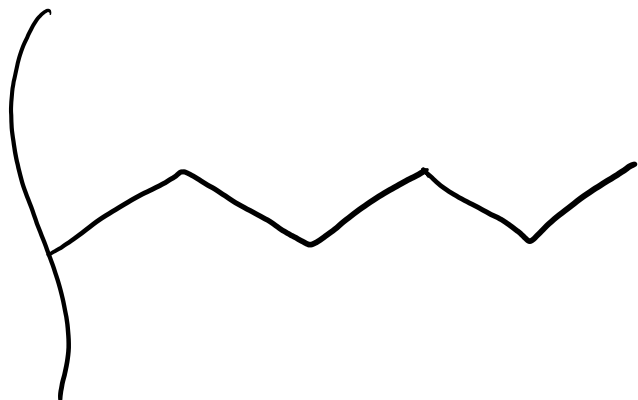
Other alkyl substituents

The “butyl” group has four different forms:

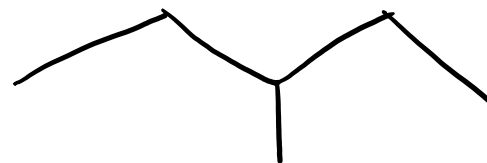
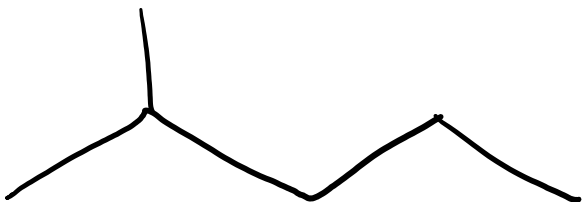


Other alkyl substituents

Pentyl has many different forms, but only two we will discuss:

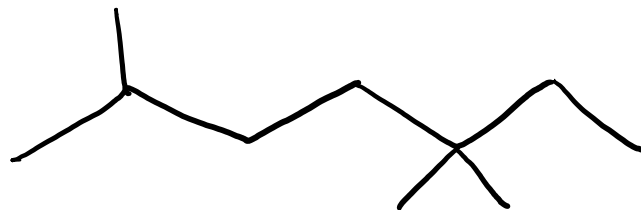
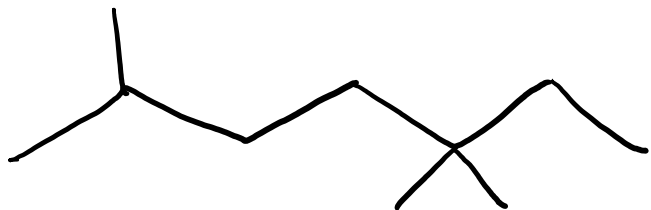


3. **Number** the parent chain and **assign a “locant”** to each substituent

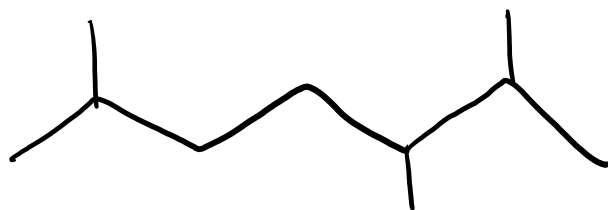


Parent chain should be numbered so that substituent gets the smallest locant # possible.

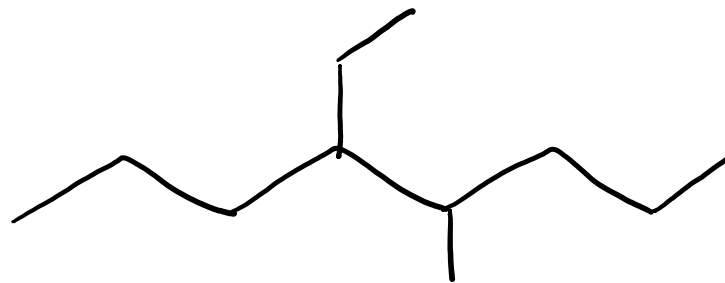
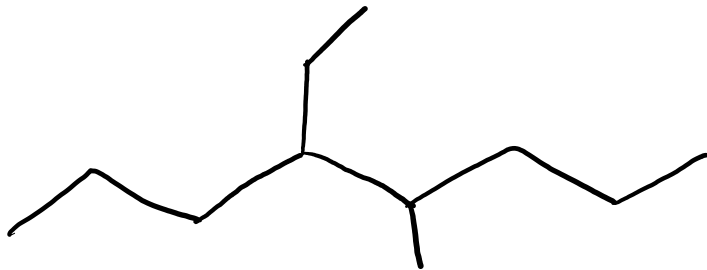
When there are multiple substituents, number the parent chain so that the first substituent has the lowest locant # possible.



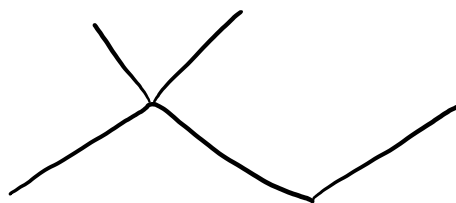
If there's a tie, go to the second substituent, etc.



If there's still a tie after checking all substituents, go alphabetically.



Multiples of the same substituent are denoted with di, tri, tetra, etc.



These prefixes **do not** count alphabetically (i.e. dimethyl vs ethyl)

4. Order **substituents alphabetically** in front of the parent chain name

These prefixes **count** alphabetically

iso

neo

cyclo

These **do not count**

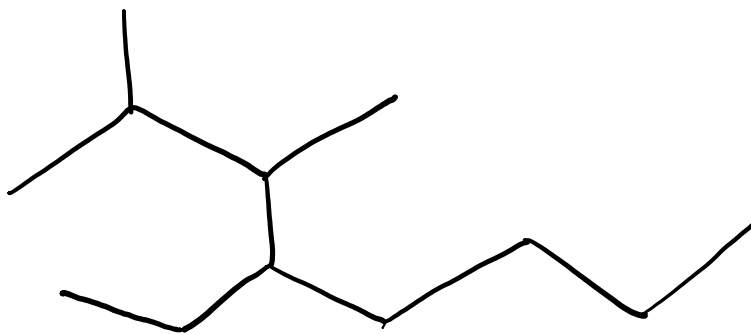
di

tri

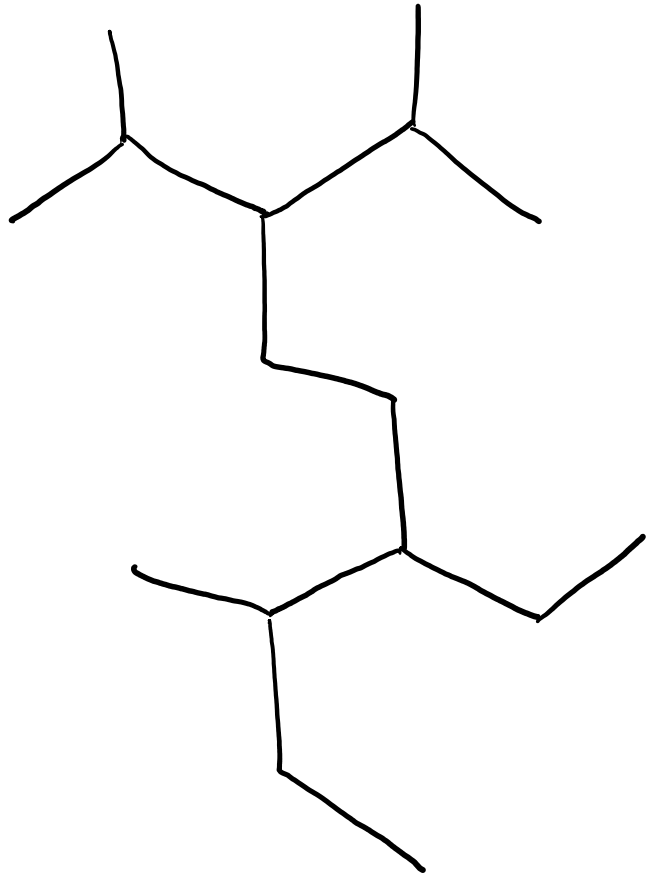
tetra

sec-

tert-

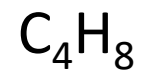


Practice

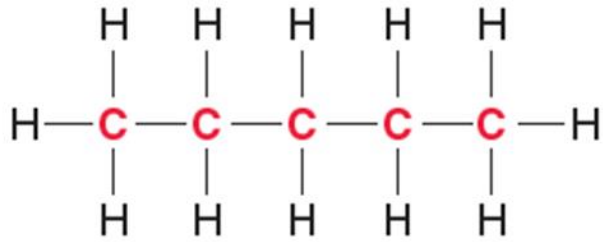


Isomerism

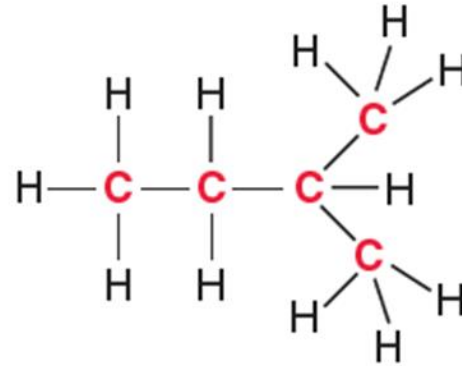
HW Ch 1. #8e: Draw the [Lewis] structure of C_3H_6



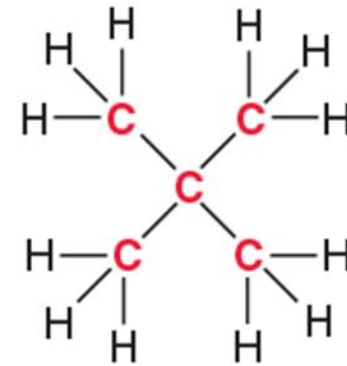
Constitutional isomers (structural isomers)



Pentane
Boiling point = 36°C



2-Methylbutane
Boiling point = 28°C



2,2-Dimethylpropane
Boiling point = 10°C

Identifying Constitutional Isomers

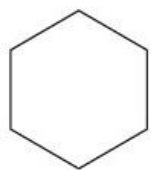
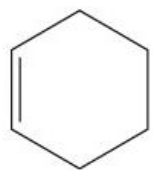
- 1) Ensure the molecular formula is the same
- 2) Find the longest chain containing the most double/triple bonds
- 3) # the carbons as in naming
- 4) If there is any difference in...
 - the size of the longest chain,
 - #'s assigned to multiple bonds, and/or
 - #'s assigned to the C's with substituents

Then the connectivity is different and they **are constitutional isomers**.

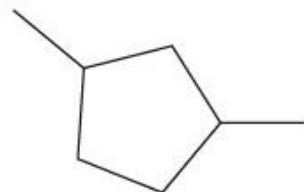
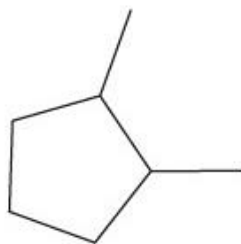
Poll

pollev.com/timcook653 or text timcook653 to 22333
Or use Android/iPhone app

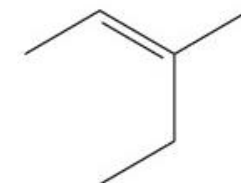
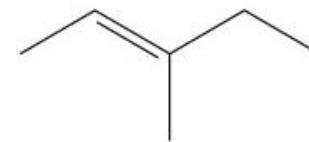
Which of these pairs of molecules are constitutional isomers?



A



B



C