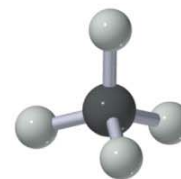
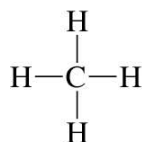
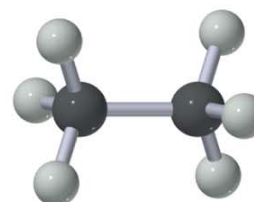
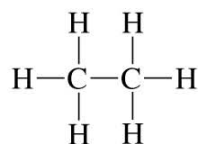


# Naming Organic Compounds

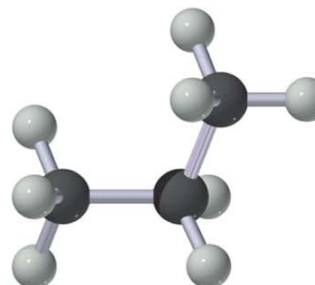
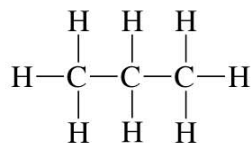
methane



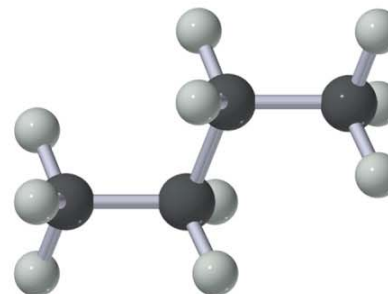
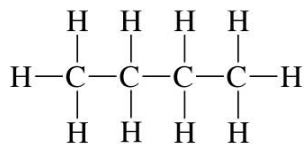
ethane



propane



butane



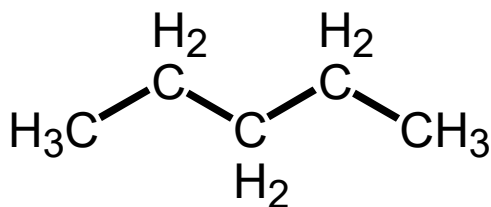
# Naming Organic Compounds

## Nomenclature for Straight Chain Alkanes:

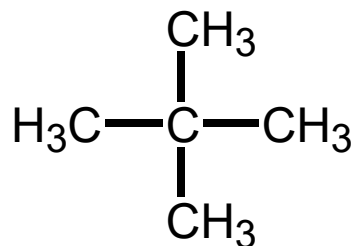
Condensed Structure			Molecule	Functional Group	Boiling Point
CH <sub>4</sub>			Methane	Methyl	-167.7 C
CH <sub>3</sub> CH <sub>3</sub>			Ethane	Ethyl	-88.6 C
CH <sub>3</sub> CH <sub>2</sub> CH <sub>3</sub>			Propane	Propyl	-42.1 C
CH <sub>3</sub> CH <sub>2</sub> CH <sub>2</sub> CH <sub>3</sub>			Butane	Butyl	-0.5 C
CH <sub>3</sub> CH <sub>2</sub> CH <sub>2</sub> CH <sub>2</sub> CH <sub>3</sub>			Pentane	Pentyl	36.1 C
CH <sub>3</sub> (CH <sub>2</sub> ) <sub>4</sub> CH <sub>3</sub>			Hexane	Hexyl	68.7 C
CH <sub>3</sub> (CH <sub>2</sub> ) <sub>5</sub> CH <sub>3</sub>			Heptane	Heptyl	98.4 C
CH <sub>3</sub> (CH <sub>2</sub> ) <sub>6</sub> CH <sub>3</sub>			Octane	Octyl	127.7 C
CH <sub>3</sub> (CH <sub>2</sub> ) <sub>7</sub> CH <sub>3</sub>			Nonane	Nonyl	150.8 C
CH <sub>3</sub> (CH <sub>2</sub> ) <sub>8</sub> CH <sub>3</sub>			Decane	Decyl	174 C
CH <sub>3</sub> (CH <sub>2</sub> ) <sub>10</sub> CH <sub>3</sub>			Dodecane	Dodecyl	216.3 C

This Chart is similar to Table 4.1 in your book

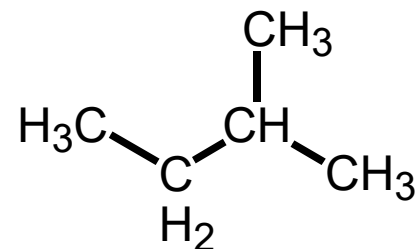
# Naming Organic Compounds



pentane



neopentane



isopentane

**Isomers** or **Constitutional Isomers** have the same atoms but with a different arrangement.

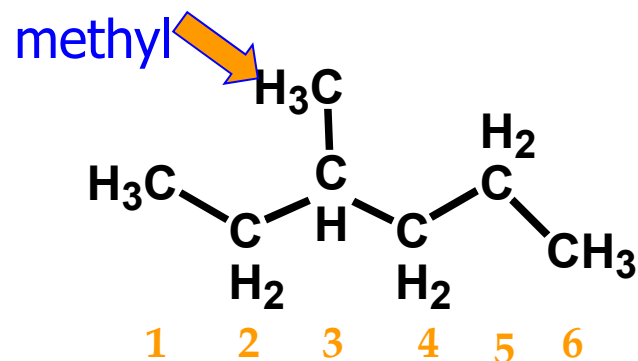
# Naming Organic Compounds

<b>Carbon Atoms</b>	<b>Constitutional Isomers</b>
1	1
5	3
10	75
15	4347
25	36,797,588
30	4,111,846,763

# Naming Organic Compounds

## IUPAC Nomenclature

- All compounds are named as derivatives of the longest single carbon chain.
- Appendages designated by prefixes.
- Number chain such that prefixes get the lowest number.
- Remember: substituent alkyl groups : ane → yl

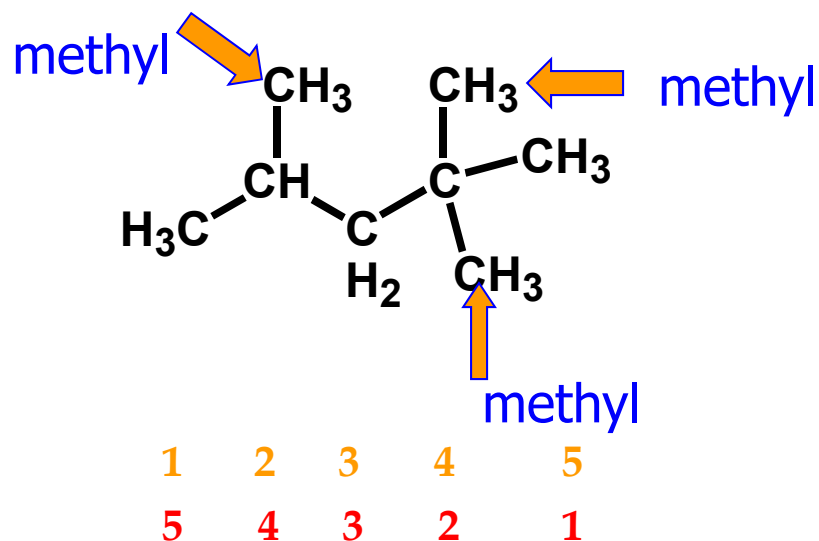


3-methyl hexane

Not 4 – methyl hexane

# Naming Organic Compounds

→ The modifying prefixes such as di, tri, tetra, etc. are used when you have more than one of the same group.



2,2,4-trimethyl pentane

not

2,4,4-trimethyl pentane

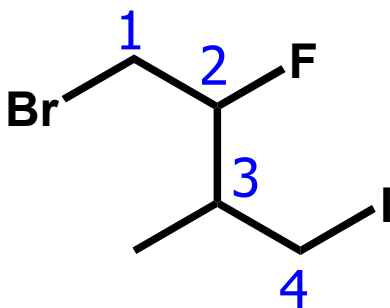
'isooctane' standard 100 octane for gasoline

# Naming Organic Compounds

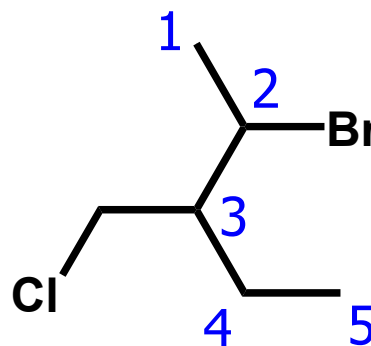
## Functional group nomenclature

The prefixes fluoro, chloro, bromo, iodo used to indicate presence of halogens (halo).

They are treated in same manner as alkyl substituents.



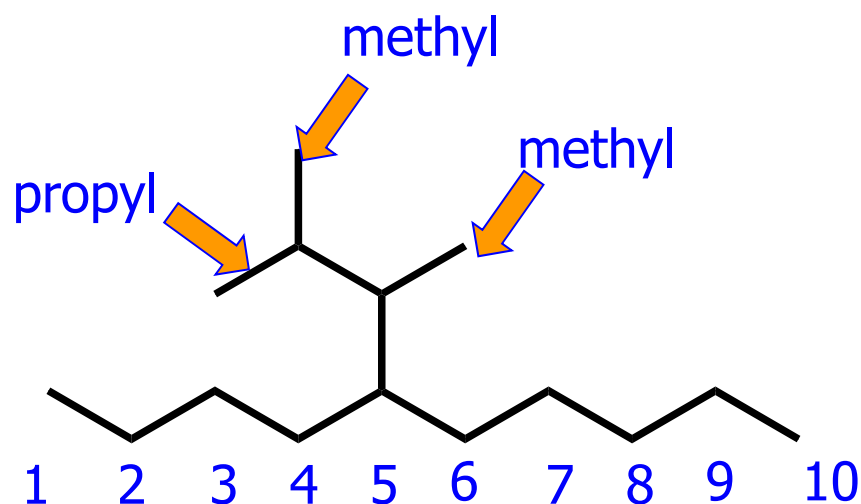
1-bromo-2-fluoro-4-iodo-  
3-methylbutane



2-bromo-3-(chloromethyl)pentane

# Naming Organic Compounds

- More complex appendages are named as derivatives of the longest carbon chain in a side group.
- These are enclosed in parentheses.

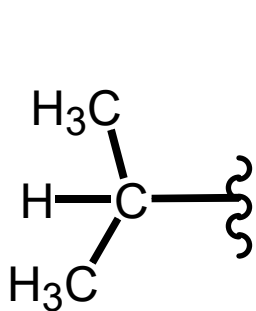


5-(1,2-dimethylpropyl)decane

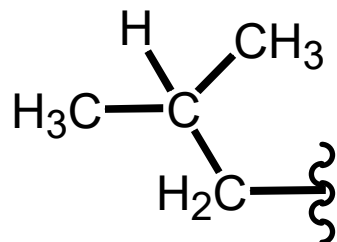


# Naming Organic Compounds

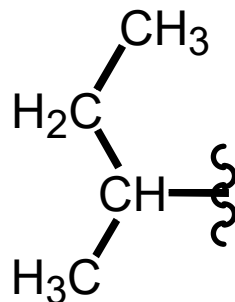
## Common Branched Groups:



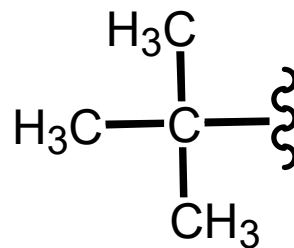
Isopropyl



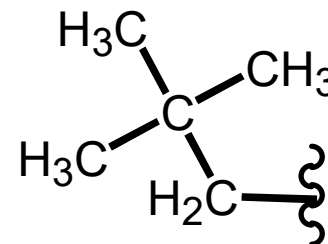
Isobutyl



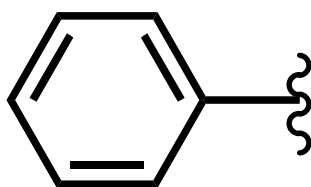
*Sec*-butyl



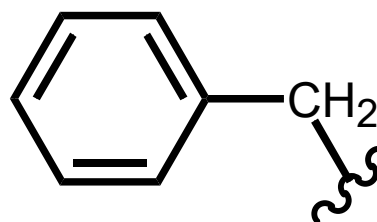
*Tert*-butyl



Neopentyl



Phenyl



Benzyl

# Naming Organic Compounds

## Rules for IUPAC Nomenclature

1. Find the longest chain including suffix. Check for longest (dominant) group.
2. Name each appendage on this chain.
3. Alphabetize groups. Prioritize groups: halogens like alkyl go by alphabetical order. Hydroxyls get higher priority. Ignore di- , tri-, etc., but things like iso-, neo-, cyclo- count!
4. Number principal chain from one end in such a way that the smaller number is used at the first point of difference. Or, if a functional group is present, the one with the highest priority groups gets the lowest number.
5. Assign to each appendage group a number giving its point of attachment to principal chain.
6. Write out the name paying proper attention to commas and hyphens!

# For Next Time....

- ▶ Monday More Chapter 4 (4.1 – 4.7)
  - ▶ BRING YOUR MODEL SET!
- ▶ Homework Problems Chapter 3  
#1,4,7,15,34,35,37,39,43,44, 47
- ▶ Homework Problems Chapter 4
- ▶ #1, 6, 10, 19, 25, 28, 36, 43, 48, 51,52, 63