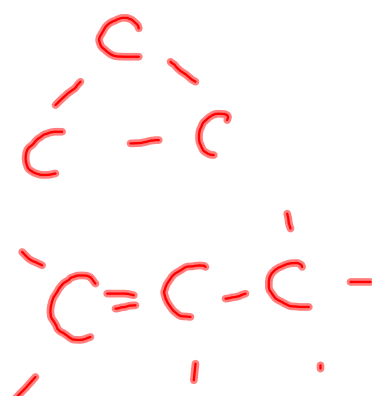
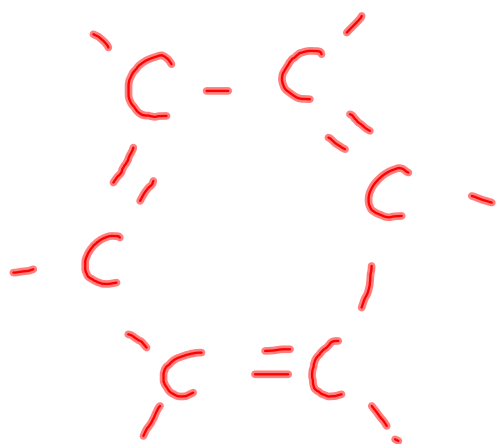


**Why does carbon form a large variety of compounds?**



## Structural Models and Diagrams

A variety of models exist to communicate how atoms are bonded to form molecules. These types of models include:

**Molecular formula** - works well for small, simple molecules.

As the number of atoms increase, less is known about the structure of the molecule.

Ex.  $\text{H}_2\text{O}$ ,  $\text{CH}_4$ ,  $\text{C}_2\text{H}_6$  **Count the atoms!**

**Expanded molecular formula** - shows the arrangement of atoms within a molecule

Ex.  $\text{CH}_3\text{CH}_3$

**Complete structural diagram** - shows all atoms and bonds

Ex.

[Bonding Capacity Review](#)

**Condensed structural diagram** - shows the C-C bonds, but omits the C-H bonds

Ex.

**Line Diagram** - shows bonds, but no atoms. The end of each line segment represent a C atom.

Ex.

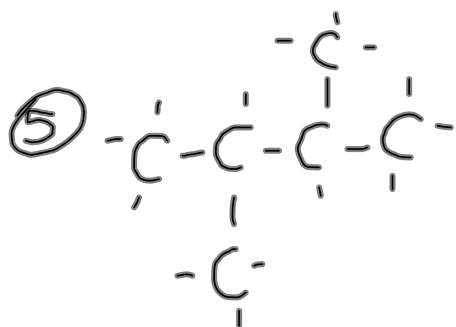
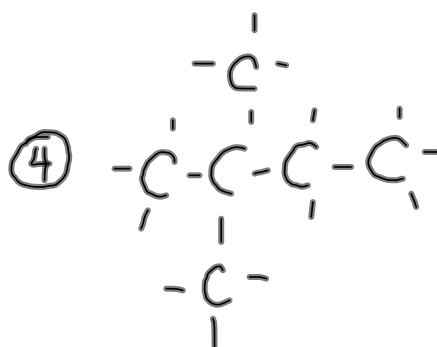
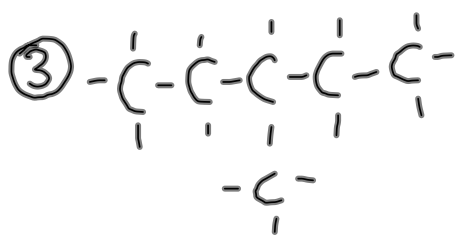
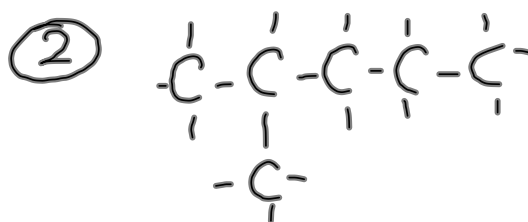
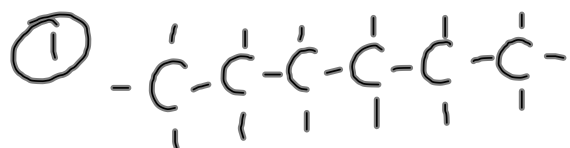
**\*\* Isomers** - compounds with the same molecular formula, but different structures\*\*

Ex.  $\text{C}_4\text{H}_{10}$

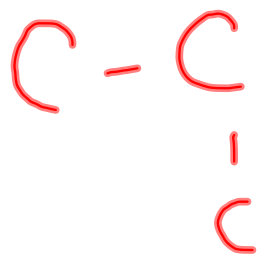


How many isomers can be drawn for  $\text{C}_2\text{H}_6$ ?


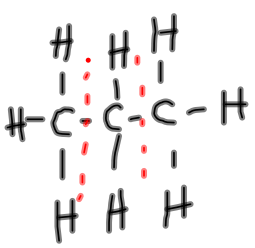
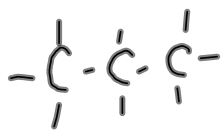

For  $\text{C}_5\text{H}_{12}$ ?

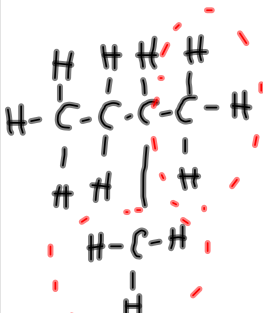



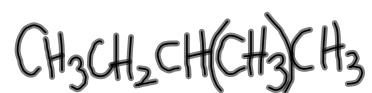


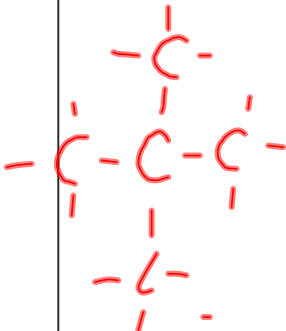



## Quick Review of Structural Models and Diagrams

Molecular Formula	Expanded Molecular Formula	Complete Structural Diagram	Condensed Structural Diagram	Line Diagram
$C_3H_8$ 	$CH_3CH_2CH_3$			

Molecular Formula	Expanded Molecular Formula	Complete Structural Diagram	Condensed Structural Diagram	Line Diagram
C <sub>5</sub> H <sub>12</sub>				



Molecular Formula	Expanded Molecular Formula	Complete Structural Diagram	Condensed Structural Diagram	Line Diagram
C <sub>5</sub> H <sub>12</sub>	C(CH <sub>3</sub> ) <sub>4</sub>			



Molecular Formula	Expanded Molecular Formula	Complete Structural Diagram	Condensed Structural Diagram	Line Diagram
C <sub>7</sub> H <sub>16</sub>		