

Alkanes

1. Build Methane:

- Draw the structural formula and write the molecular formula of this molecule.
- What is the shape of this molecule?
- How many bonds does a C atom have?

2. Build Ethane:

- Draw and write its formula.
- Knowing that the electron clouds of the H's will repel each other how do you think the H's on the different C's will arrange themselves? Draw an end-view of this molecule.

3. Given the number of carbons, build the following straight-chain molecules: 3 carbons, 4 carbons, and 5 carbons.

- Draw, name, and write their formulas.
- Is it really correct to call these "straight" chains?

Branching

- Rearrange the C's on your pentane molecule to build its two isomers. Draw and name these two molecules.
- Attempt to put a propyl group on the pentane molecule. Is this possible? Why or why not?

Halogens

- Build 1,1-dichloroethane and 1,2-dichloroethane.
 - Which molecule is more likely to exist? Why?
 - Draw these two molecules. Are they isomers?
 - Why is it that a halogen can so easily be single bonded to a C?

Alkenes

1. Build ethene and propene.
 - a. Draw and give the formulas for these two molecules.
 - b. Why didn't we build methene?
 - c. What is the difference between 1-propene and 2-propene?
2. Build propadiene.
 - a. What do multiple double bonds do to the shape of the molecule?
3. Build the two butene isomers.
 - a. Draw and name these two molecules.

Alkynes

1. Build ethyne and propyne.
 - a. Draw and give the formulas for these two compounds.
 - b. What is the common name for ethyne?
 - c. Can we build propadiyne? Why or why not?

Aromatics

1. Start the next molecule by building hexane. Remove an H from each end of the molecule. Twist the C's on the C-C bonds so that you can wrap the chain into a ring. Bond the two end C's to each other.
 - a. Draw, name, and write the formula of this molecule.

methoxyethane

methylethanoate

aminoethane

ethanamide

Polymers

1. Start the polymerization process by building three or four ethene molecules. Without completely removing the bonds, break the double bond on two of the ethene molecules. You should then be able to bond one molecule to the other. Break the double bond on the third molecule and attach it to the end of the chain. Repeating this process will continue to increase the length of the chain.
 - a. Ethene is the monomer in this process. What is a monomer?
 - b. The common name for ethene is ethylene. What is the name of this polymer?
 - c. Why is this process called “addition” polymerization?

Challenge

1. Build a molecule using all but two of your C's to build a chain of atoms. Include two double bonds, a chlorine atom, and a two carbon branch on this chain. Draw and name your molecule.

2. Turn the chain into a ring. Draw and name the molecule.