**Unit 8**

**Organic Chemistry**

O. Chemistry: deals with reactions and compounds that have carbon in them.

Most Organic Chemistry organic compounds also contain hydrogen (carbon – hydrogen chains. A.K.A. “hydrocarbons”).

Each carbon atom can bond four times with different atoms to create a compound.

**Organic compounds are named and classified according to how many carbon atoms that there are and if they are bonded by a single, double or triple bond.**

**Organic compounds that are bonded by a single bond (are represented by one line) are in the Alkane series.**

**Examples:**

**H**

**H C H**

**H**

**Methane**

**H H H H H**

**H C C H H C C C H**

**H H H H H**

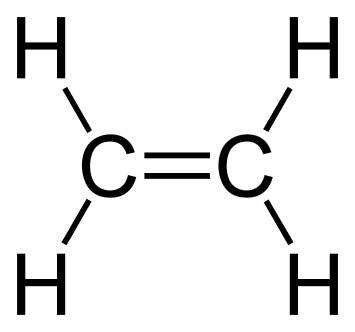
**Ethane Propane**

**\*\*Remember each carbon can bond four times**

**Alkenes and Alkynes**

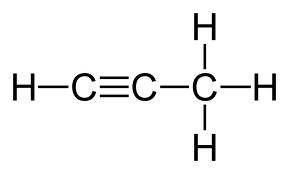
**Alkene series: are organic molecules that have at least one double bond.**

**Example: Ethene.**



**Alkyne series: are organic molecules that have at least one triple bond.**

**Example: Propyne.**

[](http://www.google.com/imgres?imgurl=http://upload.wikimedia.org/wikipedia/commons/e/ee/Propyne-2D-flat.png&imgrefurl=http://en.wikipedia.org/wiki/File:Propyne-2D-flat.png&h=663&w=1100&sz=14&tbnid=WHt5RdWYxn8z2M:&tbnh=90&tbnw=149&prev=/search?q=Picture+of+Propyne&tbm=isch&tbo=u&zoom=1&q=Picture+of+Propyne&docid=21UluTnBEKzWgM&sa=X&ei=vDOxT-Zqk6LxBL38hdcI&ved=0CFQQ9QEwAA&dur=1250)

Prefixes are often used in organic naming to indicate the number of carbons on the longest consecutive carbon chain (parent chain).

You will need to know the following prefixes:

Meth: 1 carbon

Eth: 2 carbons

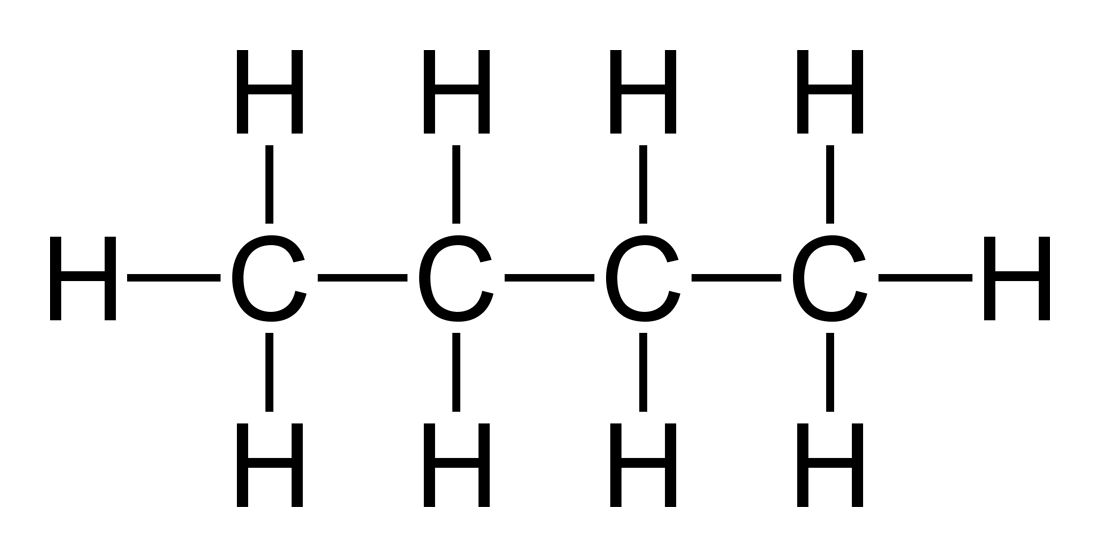
Prop: 3 carbons

But: 4 carbons

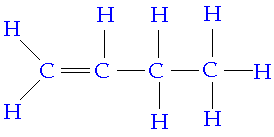
Pent: 5 carbons

Hex: 6 carbons

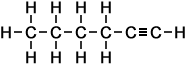
What would be a picture of Butane?



**What would be a picture of Butene?**



**What would be Hexyne?**



**Draw a picture of the following:**

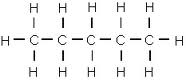
1. **Ethane**
2. **Propene**
3. **Pentyne**
4. **Propane**
5. **Hexane**
6. **Methane**

**Isomers**

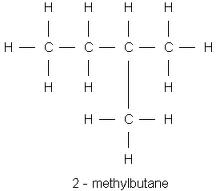
Isomers: are different forms of organic compounds that have different properties because they have a different structure (shaped different).

**Example:**

**C5H12**

[](http://www.google.com/imgres?imgurl=http://faculty.clintoncc.suny.edu/faculty/michael.gregory/files/Bio%20101/Bio%20101%20Lectures/Biochemistry/pentane.gif&imgrefurl=http://faculty.clintoncc.suny.edu/faculty/michael.gregory/files/bio%20101/bio%20101%20lectures/biochemistry/biochemi.htm&h=100&w=233&sz=2&tbnid=oorK_ylWg27DTM:&tbnh=58&tbnw=136&prev=/search?q=Picture+of+Pentane&tbm=isch&tbo=u&zoom=1&q=Picture+of+Pentane&docid=X7tXIgoMhCqHvM&sa=X&ei=tkWxT_jnGY6Q8wSv7viICQ&ved=0CF0Q9QEwBw&dur=8719)

**Pentane (Straight Chain)**

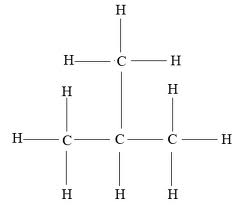
[](http://www.google.com/imgres?imgurl=http://www.hferrier.co.uk/higher/unit2b/unit2b4.gif&imgrefurl=http://www.hferrier.co.uk/higher/unit2b/unit2b.htm&h=239&w=275&sz=2&tbnid=p6H7WuqX9KhDxM:&tbnh=91&tbnw=105&prev=/search?q=Picture+of+2+-+Methylbutane&tbm=isch&tbo=u&zoom=1&q=Picture+of+2+-+Methylbutane&docid=SNFvTbLcEVGFEM&hl=en&sa=X&ei=OkaxT7KBFYHg2gWeh8Am&sqi=2&ved=0CFYQ9QEwAw&dur=1110)

**2-Methyl Butane (Bent Chain)**

**Use the following steps when naming isomers:**

1. **Identify the longest carbon to carbon chain (parent chain) and figure out the ending (ane, ene or yne).**

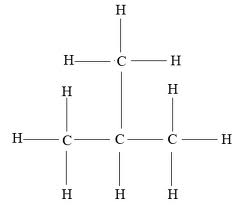
**Example:**

[](http://www.google.com/imgres?imgurl=http://images.wikia.com/gcse/images/6/60/2-methyl_propane.jpg&imgrefurl=http://gcse.wikia.com/wiki/Isomer&h=344&w=400&sz=26&tbnid=Eh2l5zSD3MZevM:&tbnh=91&tbnw=106&prev=/search?q=Picture+of+2+-+Methylpropane&tbm=isch&tbo=u&zoom=1&q=Picture+of+2+-+Methylpropane&docid=Tbbe1j7nS-DnZM&hl=en&sa=X&ei=3UaxT8GkJ5SK8QTwruz4CA&ved=0CGAQ9QEwAA&dur=1593)

**??-?? Propane**

1. **Number the carbons in the parent chain and identify the daughter chain (then work back**

**words).**

**[](http://www.google.com/imgres?imgurl=http://images.wikia.com/gcse/images/6/60/2-methyl_propane.jpg&imgrefurl=http://gcse.wikia.com/wiki/Isomer&h=344&w=400&sz=26&tbnid=Eh2l5zSD3MZevM:&tbnh=91&tbnw=106&prev=/search?q=Picture+of+2+-+Methylpropane&tbm=isch&tbo=u&zoom=1&q=Picture+of+2+-+Methylpropane&docid=Tbbe1j7nS-DnZM&hl=en&sa=X&ei=3UaxT8GkJ5SK8QTwruz4CA&ved=0CGAQ9QEwAA&dur=1593)**

**2 – Methyl Propane**

**From the 2nd C. Daughter Chain Parent chain**

**Draw the following:**

1. **Pentyne**
2. **3 – Ethyll Hexane**
3. **1, 4 Di Methyl Hexane**
4. **Butene**
5. **2 – Propyl Hexane**

**Cyclo – Isomer and**

**Benzene**

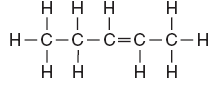
**“Cyclo”: Prefix that means circular. If you see the name of an isomer with “Cyclo” in front it means that these are chains that make rings.**

**Example:**

**C5H10**

**Cyclo Pentane**

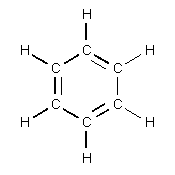
**C5H10**



**Pentene**

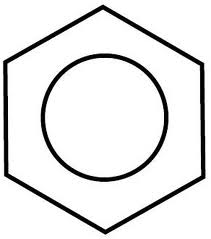
**Benzene: is a very common Cyclo isomer made of 6 carbons and alternating single and double bonds.**

**C6H6**

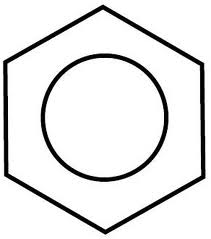


**Benzene**

**\*\*Since benzene is a very common Carbon chain there is a picture that is shorter than the original.**

[](http://www.google.com/imgres?imgurl=http://1.bp.blogspot.com/_u5WXQG2FLK4/S6vY4ceSN5I/AAAAAAAAAB4/vK0WUcOyhoE/s1600/benzene.JPG&imgrefurl=http://pandoragaming.co.uk/profile/3815887/&h=330&w=292&sz=16&tbnid=deRTzDejOM8oRM:&tbnh=90&tbnw=80&prev=/search?q=Picture+of+Benzene&tbm=isch&tbo=u&zoom=1&q=Picture+of+Benzene&docid=HMrZX8OcwHnHcM&sa=X&ei=eT6xT4XiBo6m8QSwvOTSCA&ved=0CGgQ9QEwBg&dur=1390)

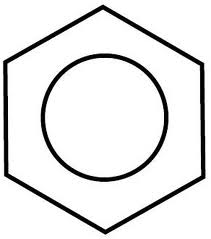
**Benzene**

**[](http://www.google.com/imgres?imgurl=http://1.bp.blogspot.com/_u5WXQG2FLK4/S6vY4ceSN5I/AAAAAAAAAB4/vK0WUcOyhoE/s1600/benzene.JPG&imgrefurl=http://pandoragaming.co.uk/profile/3815887/&h=330&w=292&sz=16&tbnid=deRTzDejOM8oRM:&tbnh=90&tbnw=80&prev=/search?q=Picture+of+Benzene&tbm=isch&tbo=u&zoom=1&q=Picture+of+Benzene&docid=HMrZX8OcwHnHcM&sa=X&ei=eT6xT4XiBo6m8QSwvOTSCA&ved=0CGgQ9QEwBg&dur=1390)**

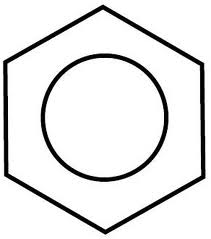
**2 – Chloro Benzene**

When naming benzene chains you number the carbons by starting at the top and going clockwise. The daughter chains off of benzenes can be smaller carbon chains or single elements.

**Example:**

**[](http://www.google.com/imgres?imgurl=http://1.bp.blogspot.com/_u5WXQG2FLK4/S6vY4ceSN5I/AAAAAAAAAB4/vK0WUcOyhoE/s1600/benzene.JPG&imgrefurl=http://pandoragaming.co.uk/profile/3815887/&h=330&w=292&sz=16&tbnid=deRTzDejOM8oRM:&tbnh=90&tbnw=80&prev=/search?q=Picture+of+Benzene&tbm=isch&tbo=u&zoom=1&q=Picture+of+Benzene&docid=HMrZX8OcwHnHcM&sa=X&ei=eT6xT4XiBo6m8QSwvOTSCA&ved=0CGgQ9QEwBg&dur=1390)**

**3, 6 – Chloro Bromo Benzene**

**[](http://www.google.com/imgres?imgurl=http://1.bp.blogspot.com/_u5WXQG2FLK4/S6vY4ceSN5I/AAAAAAAAAB4/vK0WUcOyhoE/s1600/benzene.JPG&imgrefurl=http://pandoragaming.co.uk/profile/3815887/&h=330&w=292&sz=16&tbnid=deRTzDejOM8oRM:&tbnh=90&tbnw=80&prev=/search?q=Picture+of+Benzene&tbm=isch&tbo=u&zoom=1&q=Picture+of+Benzene&docid=HMrZX8OcwHnHcM&sa=X&ei=eT6xT4XiBo6m8QSwvOTSCA&ved=0CGgQ9QEwBg&dur=1390)**

**2 – Methyl Benzene**

**Draw the following:**

1. **Propyne**
2. **Cyclo Butene**
3. **1,3 - Ethyll Pentane**
4. **3 – Butyl Benzene**
5. **1, 2, 6 – Tri Methyl Benzene**
6. **Ethyne**