**Carbon’s Role in Polymers and Life –Ch. 8.3 and 8.4**

**Ch 8.3 Polymers**

* Polymers are \_\_\_\_\_\_\_\_\_\_ complex molecules built from smaller molecules joined together in a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
* Most polymers contain the element \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
* Carbon can form large \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ because:
  + 1. it can make \_\_\_\_ covalent \_\_\_\_\_\_\_\_\_\_\_\_\_\_
  + 2. carbon can form straight \_\_\_\_\_\_\_\_\_\_, branched chains and \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
* Ex of Polymers: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* **Key Question:** What element is found in almost all polymers and why??
  + - **Answer**: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Natural polymers**

* \_\_\_\_\_\_\_\_\_\_\_\_\_\_, starch, silk, \_\_\_\_\_\_\_\_\_\_\_, and cotton are examples of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

polymers.

* You \_\_\_\_\_\_ polymers daily in the form of carbohydrates, \_\_\_\_\_\_\_\_\_\_, and \_\_\_\_\_\_\_\_\_.
* Other natural polymers are used in \_\_\_\_\_\_\_\_\_\_ for their \_\_\_\_\_\_\_\_\_\_\_\_ like silk and cotton.

**Synthetic polymers**

* Synthetic means ‘\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_’
* The most commonly used \_\_\_\_\_\_\_\_\_\_\_\_ polymer is all forms of \_\_\_\_\_\_\_\_\_\_.
* Plastic and many synthetic polymers are made from \_\_\_\_\_\_\_ or coal, both \_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_.
* Ex of synthetic polymers: \_\_\_\_\_\_\_\_\_\_\_, nylon, rayon, \_\_\_\_\_\_\_\_\_\_\_\_, styrofoam, \_\_\_\_\_\_\_\_\_\_\_\_\_.
* **Key Question:** List 5 examples of polymers you see in our classroom, natural or synthetic:
  + Answer: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Ch 8.4 Life with Carbon**

**4 classes of organic compounds**

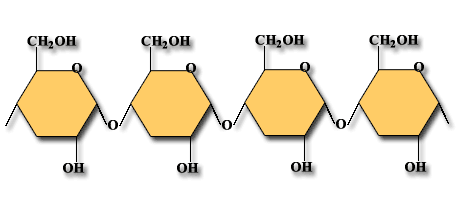
* We eat \_\_\_\_\_\_\_\_\_\_\_\_\_ compounds daily for \_\_\_\_\_\_\_\_\_\_, growth, and to \_\_\_\_\_\_\_\_\_\_\_\_\_ our bodies.
* The 3 main groups of organic compounds required by living thing that we eat are:
  + \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
  + \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
  + \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* Our \_\_\_\_\_\_\_ make the 4th class of organic compounds: \_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_. (DNA and RNA)

**Carbohydrates**

* Carbohydrate – an \_\_\_\_\_\_ -rich organic compound made of the elements \_\_\_\_\_\_\_\_\_\_, hydrogen and \_\_\_\_\_\_\_\_\_\_\_\_
* Simple carbohydrate – the simplest carbs are \_\_\_\_\_\_\_\_ (glucose is in your body – C6H12O6)

ex: \_\_\_\_\_\_\_\_, sugar, fruit juice, yogurt, and \_\_\_\_\_\_\_\_\_\_\_ all contain simple carbs.

* Complex carbohydrate – a \_\_\_\_\_\_\_\_\_\_\_ made of smaller molecules that are simple \_\_\_\_\_\_\_\_ bonded to one another
  + Ex: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Carbohydrates are polymers made of repeating chains of sugar molecules

**Proteins**

Proteins are polymers made of repeating chains of amino acids

* Proteins – formed from smaller molecules called \_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_
  + Your \_\_\_\_\_\_\_\_\_, hair, \_\_\_\_\_\_\_, and fingernails are all made of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
* Amino acid – a \_\_\_\_\_\_\_\_\_\_\_\_\_\_ that is a building block of \_\_\_\_\_\_\_\_\_\_\_\_\_\_.
* Each amino acid molecule has a \_\_\_\_\_\_\_\_\_\_\_\_ group (–COOH) and an \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ group (–NH3)
  + The body uses proteins from food to \_\_\_\_\_\_\_\_\_ and \_\_\_\_\_\_\_\_ body parts and to regulate \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* Examples of food with protein: meat, dairy, eggs, spinach, beans, and nuts.

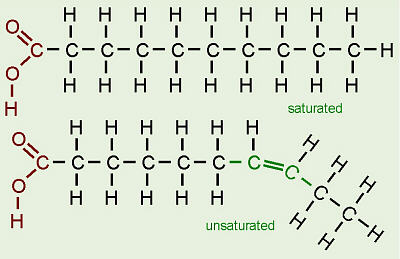
**Lipids**

* Lipids – \_\_\_\_\_\_\_\_\_\_\_-rich compounds made of \_\_\_\_\_\_\_\_\_, oxygen and \_\_\_\_\_\_\_\_\_\_\_\_\_
  + Lipids include \_\_\_\_\_\_\_, oils, waxes and \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* Gram for gram, lipids release \_\_\_\_\_\_\_\_\_\_as much energy in your body as do \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* Ex of food sources with lipids: oil, \_\_\_\_\_\_\_\_\_\_\_, dairy products, \_\_\_\_\_\_, nuts, and \_\_\_\_\_\_\_\_\_\_\_\_\_\_
* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ fats = have no double bonds, harder to break down.
* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ fats = have double bonds, easier to break down.
* Fatty acids – organic compound that is a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ of a fat or oil
* Cholesterol – a waxy lipid in animal cells used to build \_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_and acts as chemical messengers.

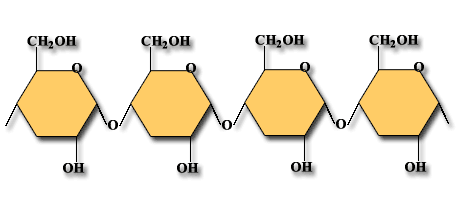
**Nucleic Acids**

* Nucleic acids – very large \_\_\_\_\_\_\_\_\_\_\_\_ molecules made up of carbon, oxygen, hydrogen, nitrogen and phosphorus
  + Two types – \_\_\_\_\_\_ and \_\_\_\_\_\_\_\_\_

Fats are polymers made of fatty acids and glycerol.



* Elements that make up all living things…
  + C – \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
  + H – \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
  + N – \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
  + O – \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
  + P – \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
  + S – \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Carbohydrates – polymer made of sugar molecules. Below is a starch molecule.

Proteins – polymer made of amino acids