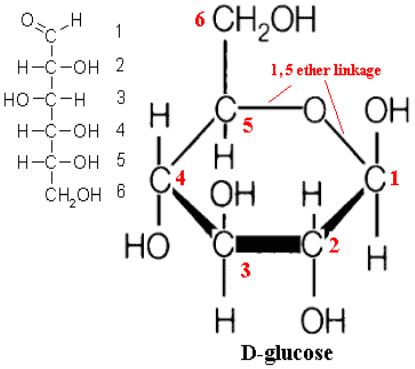
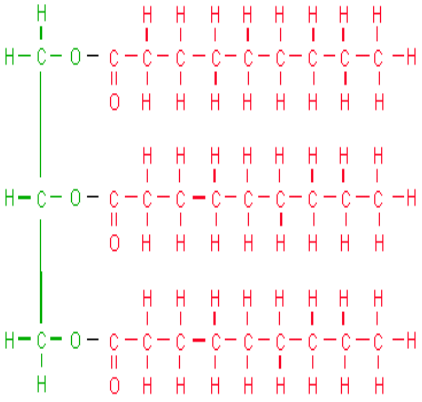
Biology Biomolecules Project! Name:_____

Food is fuel:
All living things need to obtain fuel from something. Whether the fuel is from your body, through the process of photosynthesis, or by ingesting something and breaking it apart into its components.

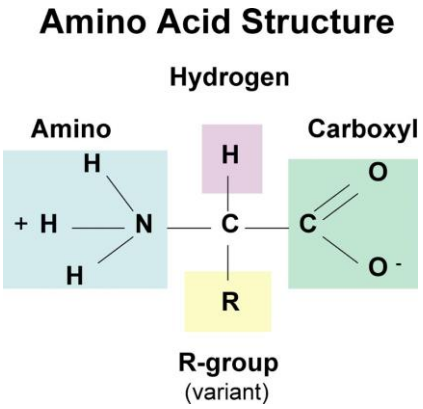
What makes food?
All organic (naturally occurring) molecules are classified into 4 general categories: carbohydrate, lipid, protein, and nucleic acid. Foods you consume consist of these 4 molecules. Let's take a look into the unique characteristics of these 4 categories (not to be confused with food groups), and sketch or write a few notes in the boxes on the right to help remember what we learn.



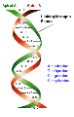
1. Carbohydrates – *sugars, starches (flour), grains.* Carbohydrates can be found in almost all food sources. Rice, cereal, potatoes, fruits, pasta, vegetables, etc., have some kind of carbohydrate in them. Carbohydrates can be compounds that are as simple as a single glucose ring, to strings of these rings. How these rings are arranged determines what kind of carbohydrate we have. Carbohydrates are the main energy source for the body. Your brain needs it to think, muscles need it to make ATP for muscle contractions. As well, every cell in your body needs carbohydrates to function. There are some carbohydrates that cannot be digested, so it just passes right through us.



2. Lipids – *fat, oil, lard, butter.* Depending on the physical state of the lipid it is classified as either a saturated fat or a non-saturated fat. Saturated fats are solid at room temperature. Examples: butter, animal fat. Non-saturated fats, such as various cooking oils, are liquids at room temperature. Fat is necessary in a diet to maintain the membranes of your cells, and they are used to make certain hormones. Fat is a huge energy source; however, it takes a lot of effort to break up this molecule and release its energy. That's why carbohydrates are used first. Our bodies can break them apart more easily.



3. Proteins – *beans, meat, green leafy vegetables.* Most people think of meat when protein is discussed. True as that may be, there are other means of obtaining your protein. There's an array of beans, all of which have protein; everything from kidney beans to peanuts. We need proteins to maintain our muscles and the components of proteins help us put together almost everything in our bodies – from something as small as markers on our cells and antibodies, to steroid hormones, muscle tissue, hair and nails. Proteins are composed of amino acid monomers.



4. Nucleic acids – the genetic material. When we eat, we consume the cells of an organism. Therefore we are also eating its DNA. We actually digest it and recycle its components.

Biomolecules Project- Food Labels

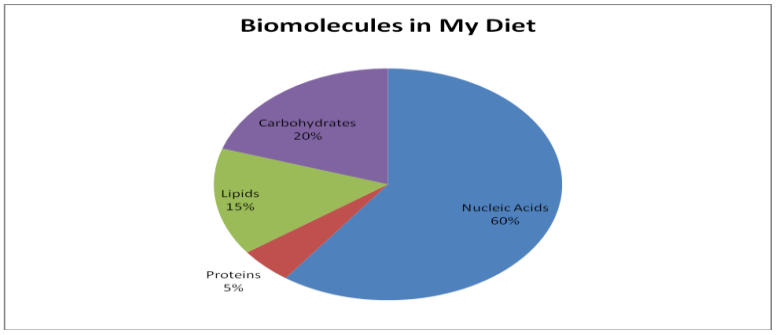
You will create a ONE PAGE Google Doc informational sheet about a food item of your choice. This is due at the end of class today.

1. Pick your favorite snack and find a picture of that item along with its nutrition label.
2. Highlight the following items on your nutrition label:
    a. Total Fat
    b. Saturated Fat
    c. Trans Fat
    d. Cholesterol
    e. Carbohydrate
    f. Dietary Fiber
    g. Sugars
    h. Protein

Use one color to highlight (or outline) all these components that fall under the same biomolecule category. (Ex. Highlight everything that is a lipid blue, everything that is a carbohydrate yellow, and everything that is a protein pink).

3. Find pictures of the following chemical structures represented on your label (C, H, O, etc should show in these pics):
    a. Saturated Fatty Acids (shown as Saturated Fat on your label)
    b. Cholesterol
    c. Cellulose (shown as Fiber on your label)
    d. Glucose (shown as sugars on your label)
    e. Protein

4. Create a pie chart showing the percentage of each biomolecule in the food that you chose (hint: look at the amount of grams of each biomolecules and divide that by total amount of grams in a serving). Make sure to include a title and key. You will need to create this using Excel or Google Spreadsheet. Ask Ms. FN for help!



5. A drawn diagram of the MONOMER and POLYMER structure of each eaten biomolecule (DO NOT COUNT NUCLEIC ACIDS). This will be turned in on a separate sheet of paper (DO NOT PUT THIS ON YOUR POSTER).

6. A description of how your body uses each biomolecule to function AND how it is different in structure and function to the other biomolecules. You may use a Venn Diagram to compare the biomolecules.