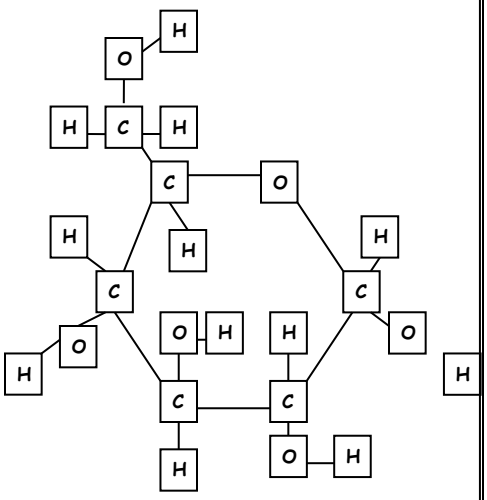
NAME _____ DATE_____ PERIOD_____

Macromolecule Structure – Option 1

***PART 1* – Color in the molecules listed below according to the key and answer the questions.**

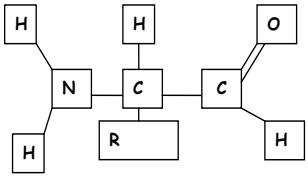
GLUCOSE



Glucose Key

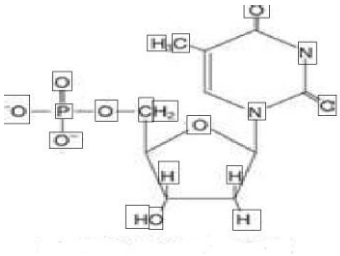
Carbon – black
Hydrogen – blue
Oxygen - red

Basic Structure of Amino Acid



Amino Acid Key
Carbon – black
Hydrogen – blue
Oxygen – red
Nitrogen – yellow
R- (varies from amino acid to mino acid) - white

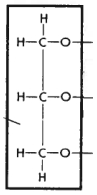
Nucleotide

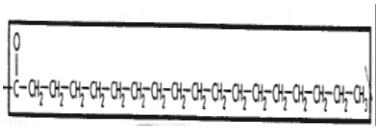


Nucleotide Key

Carbon –black
Hydrogen - blue
Oxygen - red
Nitrogen - yellow
Phosphate - purple

Glycerol and Fatty acids

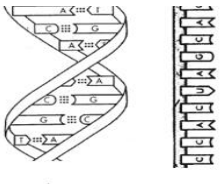


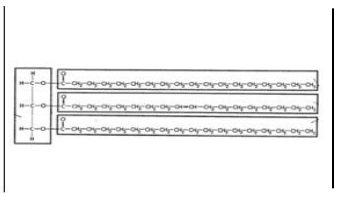


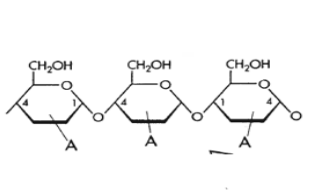
Key
Glycerol – orange
Fatty acid - green

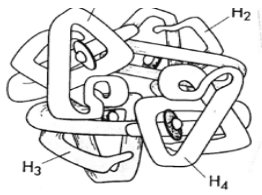
QUESTIONS:

1. Glucose is the monomer for which macromolecule?_____
2. Amino acids are the monomer for which macromolecule? _____
3. Nucleotides are the monomer for which macromolecule? _____
4. Glycerol and fatty acids are the building blocks of which macromolecule? _____
5. What element do all three molecules have in common? _____
6. What elements are bonded to carbon in glucose? _____
7. What elements are bonded to carbon in an amino acid? _____
8. What elements are bonded to carbon in a nucleotide?_____
9. What is the ratio of Carbon:Hydrogen:Oxygen (count them) in a carbohydrate? _____
10. What elements exist in proteins and nucleic acids but not in carbohydrates or lipids? _____
11. What element exists in nucleic acids that is not found in the other macromolecules? _____
12. Which macromolecule is made up of long chains of carbon and hydrogen? _____
13. Correctly label the polymers below: protein, nucleic acid, carbohydrate, lipid.









NAME _____ DATE_____ PERIOD_____

Part 2 – Read the passages and answer the questions.

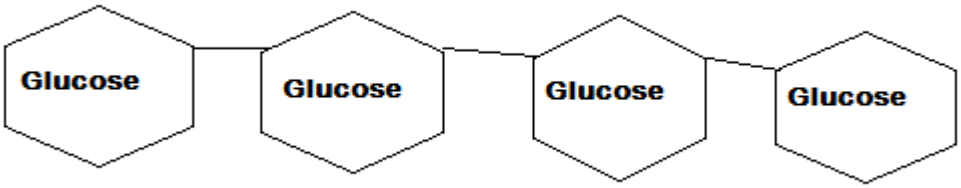
Macromolecules

Many of the molecules in living cells are so large that they are known as macromolecules, which means "giant molecules." Macromolecules are made from thousands or even hundreds of thousands of smaller molecules.

Macromolecules are formed by a process known as polymerization (pah-lih-mur-ih-ZAY-shun), in which large compounds are built by joining smaller ones together. The smaller units, or **monomers**, join together to form **polymers**. The monomers in a polymer may be identical, like the links on a metal watch band; or the monomers may be different, like the beads in a multicolored necklace.

Questions

1. What does polymerization mean? _____
2. Below is an illustration of a macromolecule called a carbohydrate. Label the monomer and polymer.



Chemistry of Life

The compounds in living things are studied in the field organic chemistry. This field studies compounds with bonds to carbon. Is carbon so interesting that a whole branch of chemistry should be set aside just to study carbon compounds? It is indeed, for two reasons. First, carbon atoms have four valence electrons. Each electron can join with an electron from another atom to form a strong covalent bond. Carbon can bond with many elements, including hydrogen, oxygen, phosphorus, sulfur, and nitrogen.

1. Up to how many elements can one carbon bond to? _____
2. List 5 elements carbon commonly bonds to. _____

Second, and even more important, a carbon atom can bond to other carbon atoms, which gives carbon the ability to form chains that are almost unlimited in length. These carbon-carbon bonds can be single, double, or triple covalent bonds. Chains of carbon atoms can even close upon themselves to form rings. Carbon has the ability to form millions of different large and complex structures. No other element even comes close to matching carbon's versatility.

3. What shapes can carbon molecules be found in? _____
4. Why can carbon so easily form large and complex compounds? _____
   _____