

Lab Title:.....*Big Ol' Biomolecules*.....Lab #.....

Lab Partners:.....

Your Lab Score will be based on the following:

Neatness: All labs must be **well-written and done in pencil** unless directed otherwise. There are to be no cross-outs or misspelled words. Questions should be answered in complete sentences.

Accuracy: Certain **questions will be checked** for accuracy.

Completeness: All questions are to be answered completely. There are to be **NO BLANKS** or incomplete sections.

Lab Class Procedure: You are to **follow directions** and use lab equipment properly, work for the entire period, and follow proper clean-up procedures

Rubric:

Lab Score Category	Points Earned										
Neatness	0	1									
Accuracy	0	1	2	3	4						
Completeness	0	1	2	3							
Lab Class Procedure	0	1	2								
<u>Total Lab Score</u>	0	1	2	3	4	5	6	7	8	9	10

You are to submit all lab material with this lab report:

Comments:

Big Ol' Biomolecules

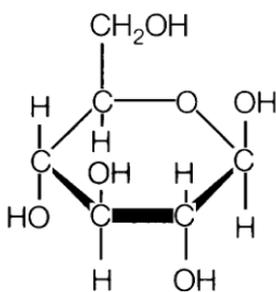
Introduction: As biologists, we depend on chemists for our understanding of how many chemicals play an important role in the life processes. Carbohydrates, proteins and fats are organic compounds made up of carbon, hydrogen and other elements. They are large molecules which are used by the cell for several purposes including: an energy source for respiration, components of cell structures like the cell membrane, cell growth, cell repair, energy storage, and catalyzing cellular and chemical reactions.

- Objectives:**
- A. To learn molecular formulas of carbohydrates
 - B. To make structural models of carbohydrates, proteins, and fats
 - C. To use those models to demonstrate how complex molecules are formed and broken down.

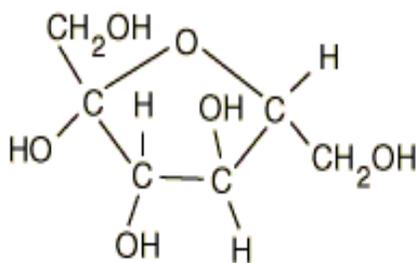
Materials: scissors
glue

Procedure:

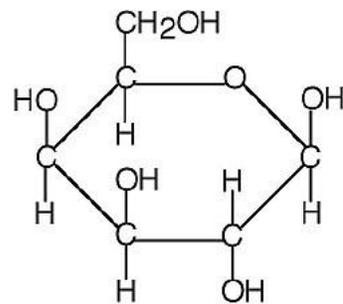
Monosaccharides: Glucose is an example of a monosaccharide which means it is **ONE** simple sugar. Fructose and Galactose are also examples of monosaccharides. Examine the pictures of the monosaccharides below and answer the questions that follow.



Glucose



Fructose



Galactose

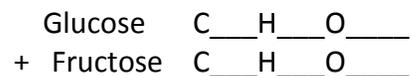
1. What three elements are present in glucose, fructose and galactose?
2. How many carbon atoms are present in:
Glucose _____
Fructose _____
Galactose _____
3. Write the structural formula for:
Glucose: C ___ H ___ O ___
Fructose: C ___ H ___ O ___
Galactose: C ___ H ___ O ___
4. How many times larger is the number of hydrogen atoms than oxygen atoms in each of the monosaccharides? _____
5. How many times larger is the number of hydrogen atoms than oxygen atoms in a molecule of water, H₂O? _____

Disaccharides

- Cut out a glucose and fructose paper model molecule and attempt to join the two molecules together like puzzle pieces. Do they fit together easily? _____
- In order to join them, remove the OH group from one and an H group from the other. Now do they fit together? _____
- When put together, glucose and fructose create a molecule of sucrose. In addition, removing an OH and an H group has just formed what molecule? _____
- Two molecules of sugar can be joined together by taking out the water in a process called _____
- Glue the glucose and fructose models together as well as the molecules of water removed and fill in the equation below.

Glucose + Fructose = _____ + _____

- To determine the molecular formula for sucrose, complete the following equation



Equals C ___ H ___ O ___

- Water H ___ O ___

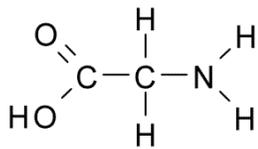
Formula for Sucrose C ___ H ___ O ___

Polysaccharides- The prefix poly means **many**. Starch, cellulose, and glycogen are three polysaccharides made of three or more molecules of simple sugars. Cut out the three molecules of glucose and paste them below to make a molecule of starch. Then complete the formula.

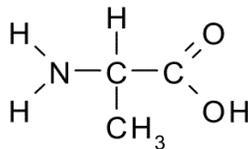
12. Glucose + Glucose + Glucose = _____ + ____ molecules of water

13. Determine the molecular formula for starch C ____ H ____ O ____

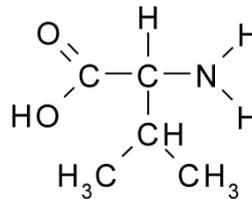
Proteins: are made of chains of **amino acids**. Examine the amino acids below and answer the following questions.



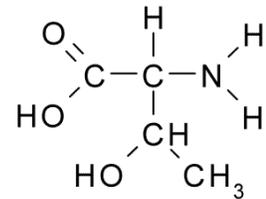
Glycine



Alanine



Valine



Threonine

14. Which element is present in amino acids that was absent from carbohydrates? _____

15. What is the formula for the following amino acids?

a. Glycine C ____ H ____ O ____ N ____

b. Alanine C ____ H ____ O ____ N ____

c. Threonine C ____ H ____ O ____ N ____

16. Are the molecular formulas for all amino acids the same? _____

17. Cut out the four amino acid molecules and remove the water to join them together in the following order:

Valine—Threonine—Alanine—Glycine

