

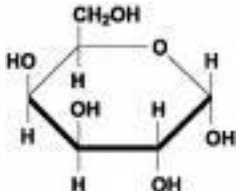
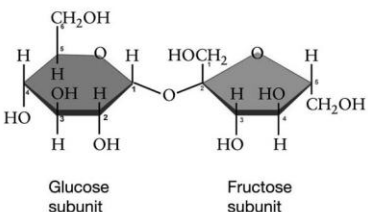
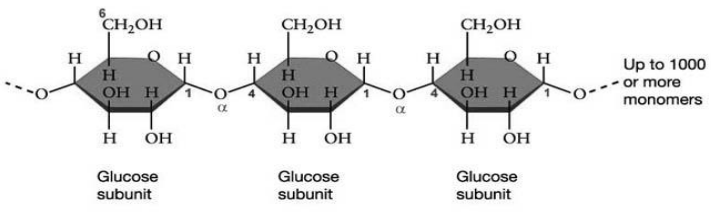
Biomolecules Worksheet

Name: _____

Period: _____

Date: _____

PART 1: BUILDING A MACROMOLECULE: All living things make large molecules, called macromolecules, from smaller molecules. Macromolecules can be made from a few repeating units, or can be composed of hundreds or thousands of smaller molecules. Each macromolecule has properties quite different from the units of which it is composed. Study the diagrams below, which show carbohydrate molecules. Beside each molecule, write whether it is a monosaccharide, a disaccharide, or a polysaccharide.

<p>1. _____</p>	
<p>2. _____</p>	
<p>3. _____</p>	

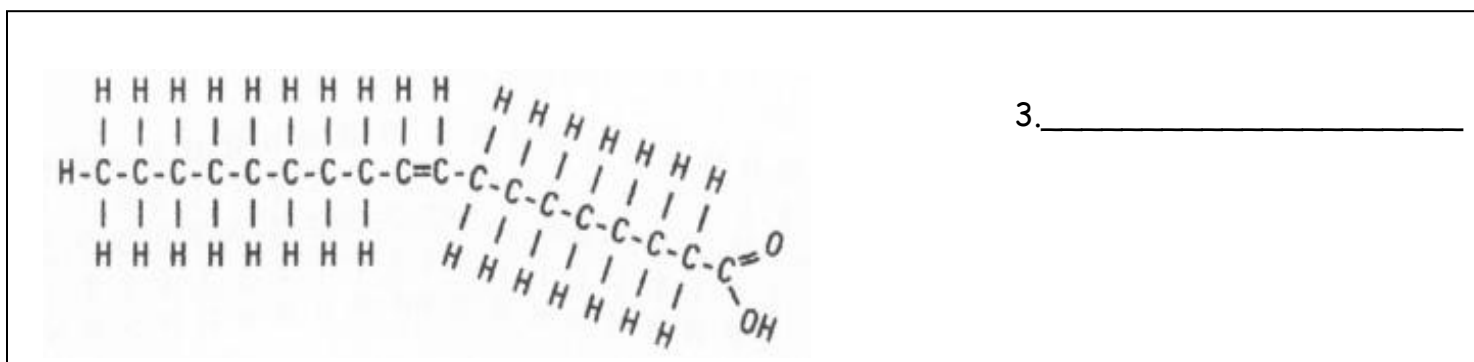
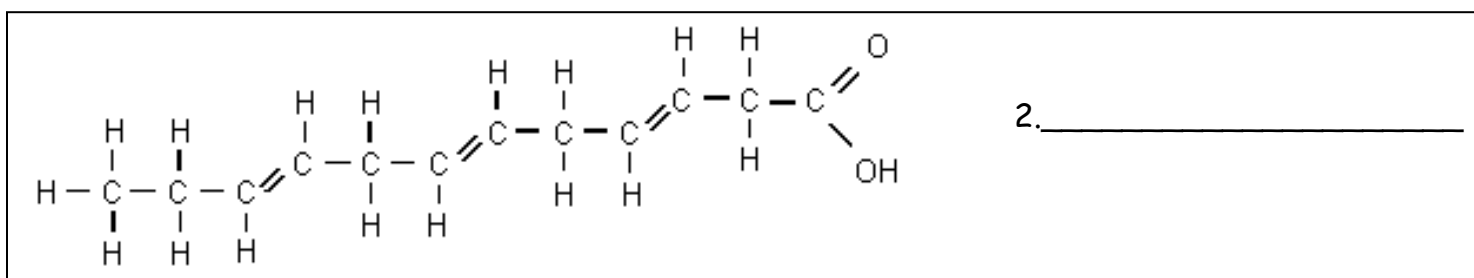
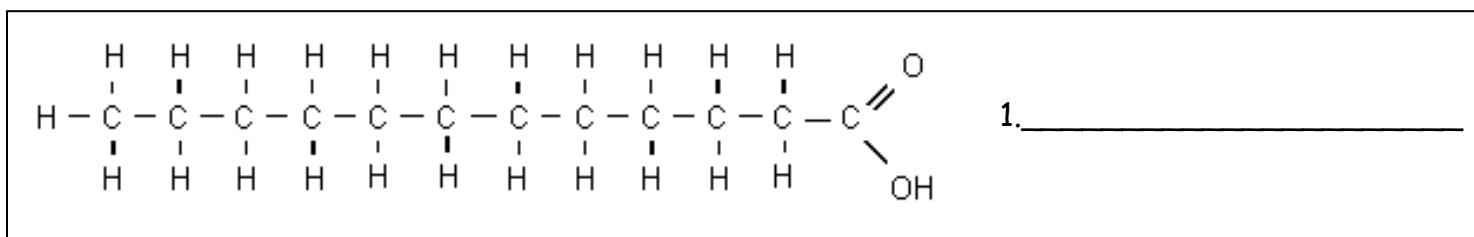
4. What is the function of #1 in our bodies? (text pg. 45)

5. What is the function of #3 in our bodies? (text pg. 46)

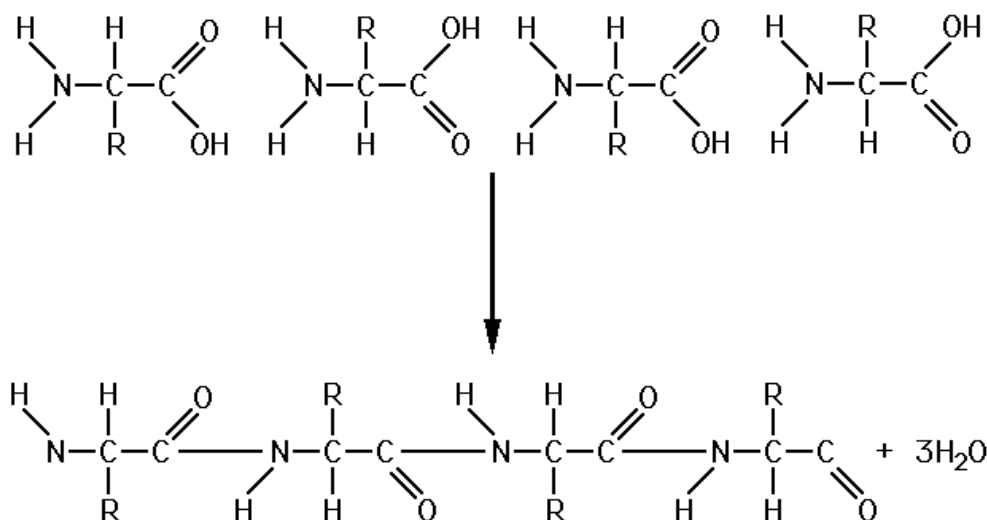
PART 2: DEGREE OF SATURATION: Each of the following structural formulas shows a fatty acid molecule. On the line, identify the fatty acid as saturated, unsaturated, or polyunsaturated.

1. Define a saturated fatty acid. Provide one example of a saturated fatty acid.
2. Define an unsaturated fatty acid. Provide one example of an unsaturated fatty acid.
3. Define a polyunsaturated fatty acid.

4. **DEGREE OF SATURATION:** Each of the following structural formulas shows a fatty acid molecule. On the line, identify the fatty acid as saturated, unsaturated, or polyunsaturated.



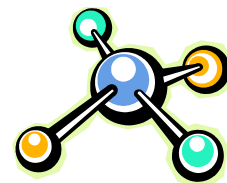
PART 3: SYNTHESIS-ANALYZING MACROMOLECULES: Study the diagram below and then answer the following questions.



1. What are the reactants? _____
2. What are the products? _____
3. What chemical process occurred in order to create this protein? _____
 - a. How do you know? _____

ORGANIC MOLECULES WORKSHEET

- 1) All organic compounds contain _____



CARBOHYDRATES: *Answer the following questions.*

- 1) What atoms make up carbohydrates? _____
- 2) What is the ratio of hydrogen to oxygen atoms present in all carbohydrates? _____
- 3) What are the three types of carbohydrates?
 - a. _____
 - b. _____
 - c. _____

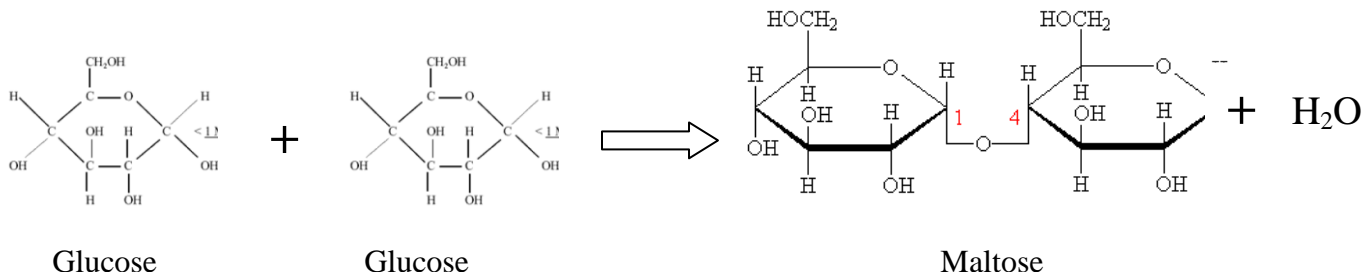
MONOSACCHARIDES & DISACCHARIDES: *Answer the following questions.*

- 1) What is the difference between monosaccharides and disaccharides?
- 2) What are the three examples of monosaccharides?
 - a. _____
 - b. _____
 - c. _____
- 3) What are the two examples of polysaccharides?
 - a. _____
 - b. _____

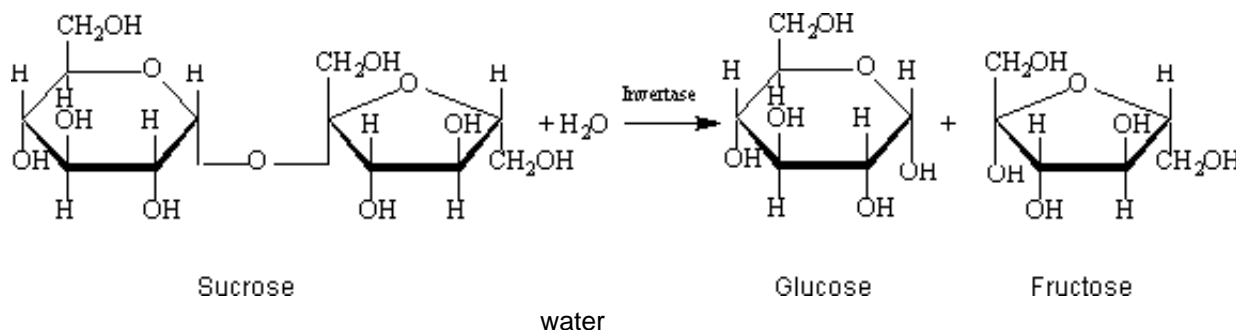
- 4) Monosaccharides all have the same formula: $C_6H_{12}O_6$. How can you write this formula in the simplest form that illustrates the proportion of elements in monosaccharides?

DEHYDRATION & HYDROLYSIS:

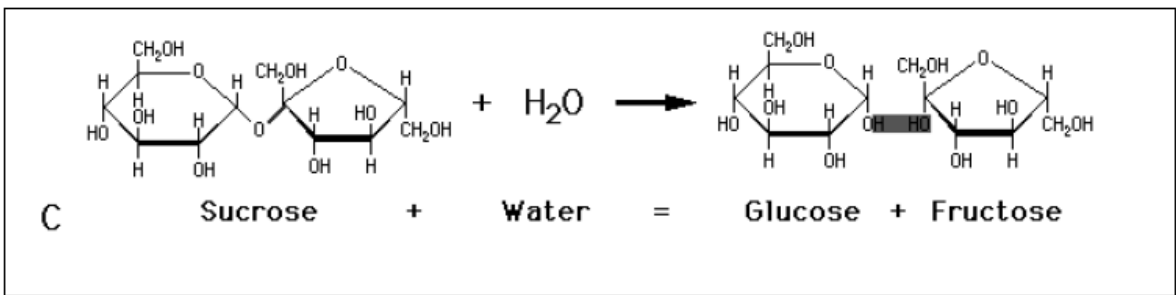
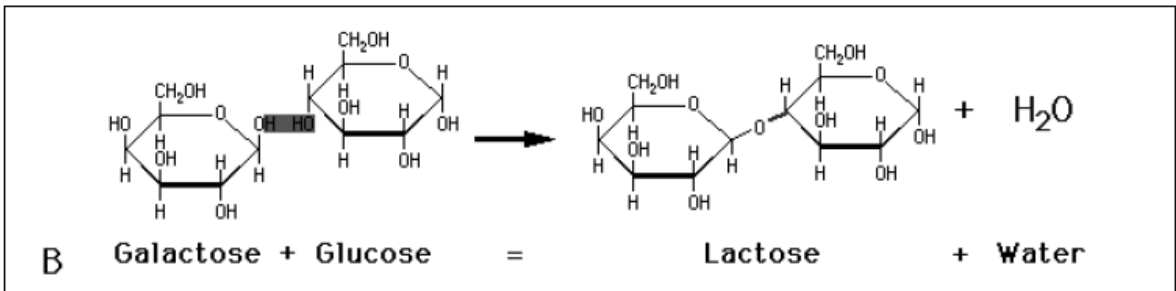
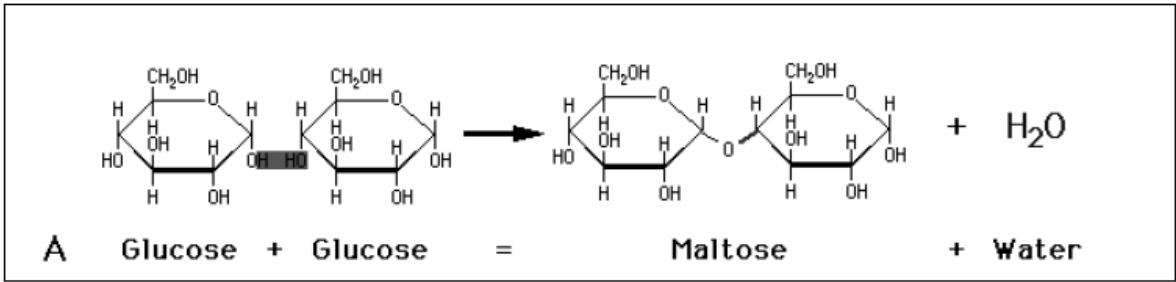
Below is an example of *dehydration synthesis*. In dehydration synthesis, a hydrogen atom from one molecule joins with a hydroxyl group (-OH) from another molecule to form water, leaving two molecules bonded to the same oxygen atom. For example, when glucose and glucose combine by dehydration synthesis, they form maltose and water.



Below is an example of *hydrolysis*. Complex organic molecules are broken down by the addition of the components of water – H^+ and OH^- .



- 5) What are the products of the hydrolysis reaction? _____
- 6) What are the reactants of the dehydration synthesis reaction? _____
- 7) How are the reactions in #5 and #6 related? _____
-
- 8) Look at the three reactions below. Which reaction reaction(s) is hydrolysis taking place? _____
- a. How do you know?
- 9) Look at the three reactions below. Which reaction(s) is dehydration synthesis taking place in? _____
- a. How do you know?



10) What are polysaccharides? _____

11) What substance would the repeating unit that makes up glycogen? _____

Directions: Write each name or formula under the correct heading in the charts below. Use these items:

Sucrose

Glucose

Starch

$C_6H_{12}O_6$

Cellulose

Maltose

Fructose

$C_{12}H_{22}O_{11}$

Lactose

Glycogen

Galactose

	<u>Disaccharide</u>
5.	
6.	
7.	
8.	

	<u>Monosaccharide</u>
1.	
2.	
3.	
4.	

	<u>Polysaccharide</u>
9.	
10.	
11.	

Direction: Answer the following questions.

1. List the 3 types of carbohydrates.

- a. _____
- b. _____
- c. _____

2. What is the difference between a monosaccharide, disaccharide and a polysaccharide?

3. What is the following reaction showing? **Maltose + water → Glucose + Glucose**

a. What are the reactants? _____

4. What is the following reaction showing? **Glucose + Glucose → Maltose + water**

a. What are the products? _____

5. What elements make up all carbohydrates? _____

6. What are some foods that contain carbohydrates? _____
