ORGANIC MOLECULES WORKSHEET Name:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_Period:\_\_\_\_\_\_Date:\_\_\_\_\_\_\_\_\_

Part 1: CARBON: Answer the following questions.

1. All organic compounds contain \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
2. In order for a carbon atom to be considered stable it needs to form \_\_\_\_\_\_\_\_ covalent bonds.
3. Compounds that contain only hydrogen and carbon atoms are called \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
4. The following structural formulas show four different compounds of carbon and hydrogen (hydrocarbons). Below each structural formula, write the chemical formula and label any double and triple bonds.



 1.\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ 2.\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ 3.\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_



4.\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Part 2: CARBOHYDRATES: Answer the following questions.

1. What atoms make up carbohydrates? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. What is the ratio of hydrogen to oxygen atoms present in all carbohydrates? \_\_\_\_\_\_\_\_\_

1. What are the three types of carbohydrates?
	1. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
	2. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
	3. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Part 3: MONOSACCHARIDES & DISACCHARIDES: Answer the following questions.

1. What are the monomers of carbohydrates? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. What is the difference between monosaccharides and disaccharides?

1. What are the three examples of monosaccharides?

* 1. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

* 1. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

* 1. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. What are the three examples of disaccharides?

* 1. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

* 1. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

* 1. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
1. Look at the structural formulas below. These three sugars all have the same chemical formula (C6H12O6).
	1. Are the structural formulas the same? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
	2. What do we call compounds that have the same chemical formula, but differ in their structural formulas? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_



1. Monosaccharides all have the same formula: C6H12O6. How can you write this formula in the simplest form (reduced) that illustrates the proportion of elements in monosaccharides? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
2. 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 fructose combine by dehydration synthesis, they form sucrose and water.

  **+**  H2O

  water

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



 water

1. What are the products of the hydrolysis reaction? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. What are the reactants of the dehydration synthesis reaction?\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. How are the reactions in #7 and #8 related?\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. What is the chemical formula for disaccharides?\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. Why is the chemical formula of disaccharides not double that of the monosaccharides?

1. In what life process does hydrolysis occur?\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. Look at the three reactions below. Which reaction(s) is hydrolysis taking place? \_\_\_\_\_\_\_\_\_\_\_\_\_\_
	1. How do you know?

1. Look at the three reactions below. Which reaction(s) is dehydration synthesis taking place? \_\_\_\_\_\_\_\_\_
	1. How do you know?



1. What are the common names for sucrose and lactose? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
2. What are polysaccharides? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
3. What substance would the repeating unit that makes up starch, cellulose, and glycogen?

 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_