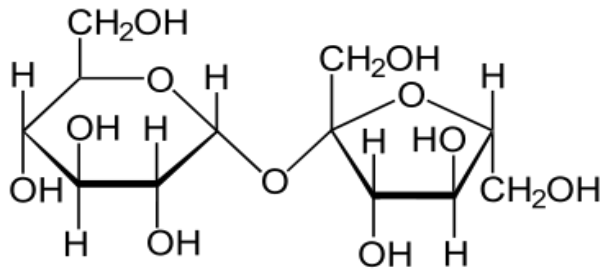


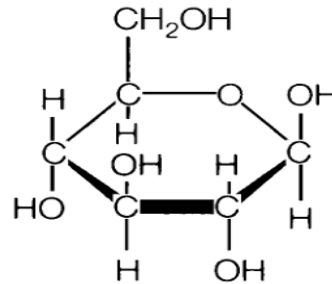
1 Carbohydrates

Carbohydrates Lab Name _____ Period __

Observe the structural formulas of two types of carbohydrates below; use the diagrams to answer the questions that follow.



Sucrose



Glucose

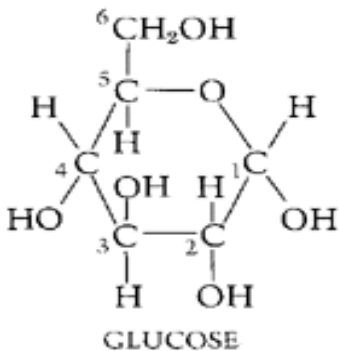
Make observations of the drawings above:

- What are the three types of atoms found in all carbohydrates? _____
- What is the basic unit of structure in all carbohydrates; what basic shape do you see in both?

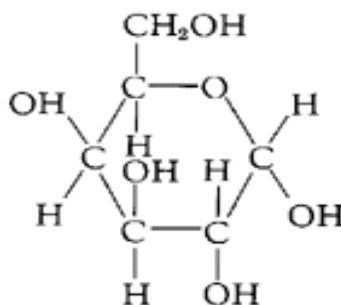
- What three letters do the names of most carbohydrates end with? _____

Monosaccharides

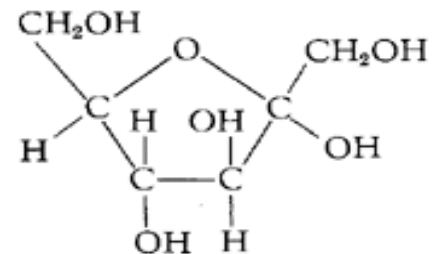
- Observe the structural formulas of three monosaccharides shown below. Use them to answer the questions that follow.



GLUCOSE



GALACTOSE



FRUCTOSE

1. What three atoms are present? _____
2. How many "RINGS" are present in each structure? _____
3. Why is this called a "mono" saccharide? _____

1 Carbohydrates

Disaccharides

Observe the structural formulas of two disaccharides in the space below. Use them to answer the questions that follow

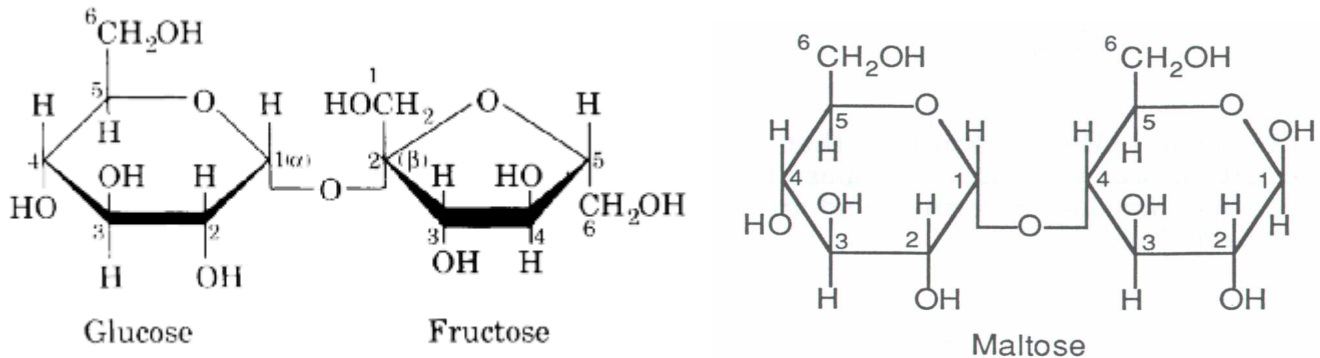


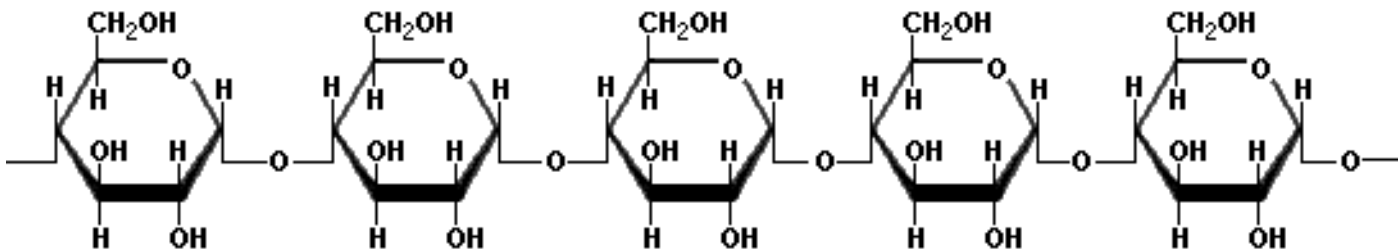
Figure 1

Sucrose

1. What three atoms are present? _____
2. How many "RINGS" are present in each compound? _____
3. Why is this called a "di" saccharide? _____

Polysaccharides

4-1. Observe the structural formula of a polysaccharide below. Use it to answer the questions that follow:



What atoms are present? _____

Notice that where the line bends (at the corners), the symbol for an atom is missing, what atom is missing? (HINT: go back and look at previous diagrams). _____

How many "RINGS" are present? _____

Why is this called a "poly" saccharide? _____

1 Carbohydrates

Food Tests

Benedict's Test for *Monosaccharides*

1. Write what you expect to happen in the data table. Write a hypothesis for one of these food items below:

2. Use the mortar and pestle to grind up a ***small*** amount of food with a larger amount of water.
3. Use the dropper to transfer *about* 20 drops of the liquefied food (***no food chunks***) into a test tube.
4. Add about 5-10 drops of Benedict's solution.
5. Set up two more tubes as positive and negative controls. Label each tube.
6. Place in boiling water bath for not longer than 3 minutes. Record your results in the table below.

| Test Item | Do you expect this to contain monosaccharides? | Benedict's Test Result | What does this indicate? |
|--|--|------------------------|--------------------------|
| Test Tube 1: Positive Control (Dextrose Solution & Benedicts) | | | |
| Test Tube 2: Negative Control (Water & Benedicts) | | | |
| Test Tube 3: Food 1 <hr/> (Food 1 Slush & Benedicts) | | | |
| Test Tube 4: Food 2 <hr/> (Food 2 Slush and Benedicts) | | | |

7. Benedict's is called an "indicator" because the color change indicates or shows the presence of monosaccharides. Is this result qualitative or quantitative? _____

8. What did the negative and positive controls help you understand? Explain the purpose of having a negative and positive control.

1 Carbohydrates

Iodine Test for *Polysaccharides*

1. Write what you expect to happen in the data table. Write a hypothesis for one of these food items below.
-
2. Make the positive control and a negative control by using a small amount of the substances provided (10-15 drops).
 3. Grind up food samples with some water using a mortar and pestle.
 4. Use a dropper to put 20 drops of the liquid (no food chunks!) into a test tube. Add 2-3 drops iodine. Fill in the table below with your results.

| Test item | Do you expect this to contain polysaccharides? | Iodine Test Result | What does this indicate? |
|---|--|--------------------|--------------------------|
| Test Tube 1: Positive control (Starch Solution & Iodine) | | | |
| Test Tube 2: Negative control (Water & Iodine) | | | |
| Test Tube 3: Food 1 _____ (Food1 Slush & Iodine) | | | |
| Test Tube 4: Food 2 _____ (Food 2 Slush & Iodine) | | | |

1 Carbohydrates

Conclusion: Complete the conclusion questions with **complete** answers.

1. Using the tests available to you, how could you determine if a substance contains disaccharides?

2. From what you notice in the lab what is the relationship between monomers and polymers? Explain using evidence.

3. Why do organisms use monosaccharides? Explain your thoughts.

4. Name three different kinds of polysaccharides and their uses

1.

2.

3.

5. Why organisms use polysaccharides? Explain your thoughts

6. How do you think monosaccharides and polysaccharides are used differently in living things? Explain your thoughts
