Holy Macromolecule

Name: _____ Date: _____ Block: _____

Introduction:

Just like you needing ingredients to make a cake, all living things have ingredients that make them up. We are made up of **molecules**. Many of these molecules are really big, hence the name **MACROMOLECULES!** Living things need and are made up of four (4) major types of macromolecules- **carbohydrates, proteins, lipids, and nucleic acids.**

Type of Polymer	Monomers making up Polymer	Example
I. Carbohydrates (Polysaccharides)	Monosaccharides	Sugars, Starch, Cellulose
II. Lipids	Fatty acids and glycerol	Fats, steroids, cholesterol
III. Proteins	Amino acids	Enzymes, structural components
IV. Nucleic Acids	Nucleotides	DNA, RNA

Procedure:

1. Move from station to station. Look at the food and nutritional facts for each food.
2. Consider the serving size found on the nutritional fact sheet, calculate the amount of **each macromolecule** and **nutrient** that was consumed.
3. Record your calculation in the chart provided.

Data Table:

Station #	Food	Carbohydrates (g)	Lipids (g)	Protein (g)
1				
2				
3				
4				
5				
6				
7				
8				

Nutrition Facts
Serv. Size 1 Bottle (355mL)
Servings 1

Amount Per Serving	
Calories 140	
	% Daily Value*
Total Fat 0g	**0%**
Sodium 10mg	**0%**
Total Carbohydrate 36g	**12%**
Sugars 35g	
Protein 0g	

*Percent Daily Values are based on a 2,000 calorie diet.

For example: I drank 1.5 bottles of Ale-8. How many grams of carbohydrates did I consume? _____g.

Analysis:

1. Calculate the total number of macromolecules and nutrients (in grams) that Steve consumed.
   a. Carbohydrates: _____
   b. Lipids: _____
   c. Protein: _____
   d. Nucleic Acids: _____

Total Calories Consumed by Steve:

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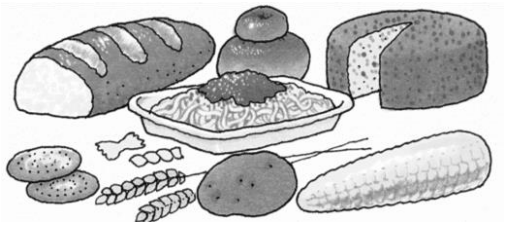
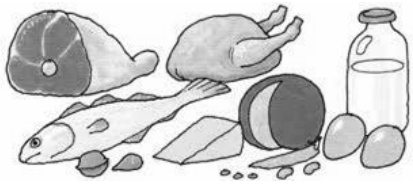
2. What type of macromolecule did Steve consume the most of? _____
3. What are some example of foods in the lab or in general, that are high in **carbohydrates**?
4. What are some examples of foods in the lab or in general, that are rich in **protein**?
5. What are some examples of foods in the lab or in general, that have high **lipid** content?
6. Why do you suppose **nucleic acids** were not included on the data table?
7. Many marathon runners will eat a meal high in a specific type of macromolecule the night before a race. Which macromolecule do you think this is? **Explain your answer.**

8. According to the Center for Disease Control (the CDC), **70 million** American adults have high cholesterol. Cholesterol is an oil-based substance and does not mix with the blood, which is water-based. ***DO NOT use the internet!***
   a. What is high cholesterol and what type of macromolecule is it considered?
   b. What type of disease can it lead to?_____
   c. A person with high cholesterol, may need to limit which types of food?



9. According to the American Diabetes Association, **25.8 million** American adults and children have diabetes. Diabetes mellitus refers to a group of diseases that affect how your body uses blood sugar (glucose). ***You MAY use the internet, but DO NOT plagiarize!***
    a. There are two main types of diabetes. What is the MAJOR difference between the two?

    b. Which type of macromolecule do people with diabetes mostly have to watch their intake of?



10. Phenylketonuria (PKU) is a genetic disorder in which a person cannot process phenylalanine, an amino acid.
    a. Which macromolecule would a person with this genetic disorder need to limit? _____
    b. On a PKU diet, what are some examples of foods that should be restricted or limited/eliminated?

11. What are some more examples of other diseases or disorders that are affected/caused by the foods we eat?

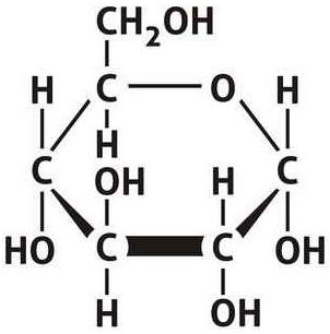
12. Compare what Steve ate to the recommended daily allowance (RDA). How would a dietician-***someone who studies diets or the food we eat***- say Steve's diet was for the day?

	MEN	**WOMEN**	**CHILD** aged 5-10	**GIRL** aged 11-16	**BOY** aged 11-16
Calories	2,500	2,000	1,800	1,850	2,200
Sugar (g)	120	90	85	90	110
Fat (g)	95	70	70	70	85
Saturated Fat (g)	30	20	20	25	25
Protein (g)	56	46	26	46	52
Salt (g)	6	5	4	6	6

There's a back!

Review of Macromolecules:

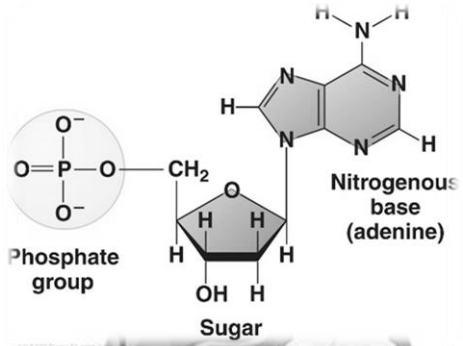
Identify the structure and pictures below. Write which macromolecule it belongs to, its monomer, and other identifying features.



Macromolecule: _____

Monomer: _____

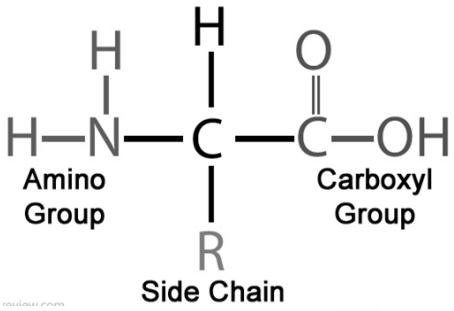
Examples: _____



Macromolecule: _____

Monomer: _____

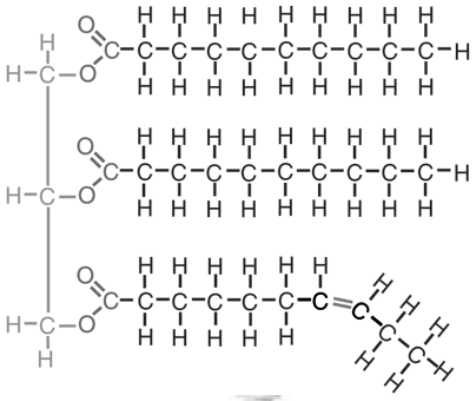
Examples: _____



Macromolecule: _____

Monomer: _____

Examples: _____



Macromolecule: _____

Monomer: _____

Examples: _____