UNIT 7	ACTIVITY	Macromolecule Web Quest

Purpose. Now that we know the purpose of macromolecules, we need to answer the question of where they come from. Plants are able to make macromolecules on their own. However, we learned that humans are unable to produce macromolecules on their own. In order to obtain macromolecules, or the parts to build them, humans must eat. Therefore, we can conclude that macromolecules are found in foods. This web quest is in place of a lab in which we would explore our food and what macromolecules it contains.

Part One: Introduction
In part one, you will learn how to identify the different macromolecules through a variety of tests.

1. Login and open your web browser.
2. Type in the following address: http://bit.ly/7bmacrolab
3. Read the instructions in red and blue.
     a. What macromolecules will you be testing in this online lab?

     _____

4. Click on **carbohydrates**.
     a. Look at the diagrams. According to the diagrams, what elements are found in

     carbohydrates? _____

5. Read the information in red.
     a. How will the Benedict solution tell you there is sugar present?

     _____

     b. What type of sugar does Benedict solution test for?

     _____

6. Click on the link "click here to fill a test tube with 2mL of water." When the next page loads, click on "click here to add 2mL of Benedict's reagent to the water."

7. Benedict's reagent must be heated in order for the test to work. Click on the picture of the beaker on the hot plate.
     a. What color is the water in the test tube? _____

8. Click on the link that says "click here" next to the picture of the glucose solution. When you do this, you are adding simple sugars (monosaccharides) to the test tube.
     a. What is the color of the solution in the test tube? _____

9. Click on "click here to continue." Read the information in red.

     a. The negative result (no sugar present) has a _____ color.

     b. The positive result (sugar present) has a _____ color.

10. Click on "click here to continue." Now you will be testing if a solution contains starch. Iodine is used because it changes color when it comes in contact with a starch. We use a different substance to test for starches because starches are long chains of simple sugars connected together. Benedict's solution can only detect simple sugars, not starches. Click on "click here for results."
    a. What is the color of the solution of water and iodine? _____

11. Now you will add the starch solution to the container. Click on the Argo corn starch box.
    a. What is the color of the solution now? _____

12. How do you know if a starch is present in the solution by adding iodine?

    a. The negative result (no starch present) has a _____ color.

    b. The positive result (starch present) has a _____ color.

13. Great! You now know how to test for sugar and starches. In other words, you know how to determine if a substance has carbohydrates in it. Click on "click here to continue." Then click on **proteins**.
    a. Look at the diagram. What elements are present in proteins? (Ignore R)

    _____

14. Read the information in red.
    a. How will the biuret reagent tell you there is a protein present?

    _____

15. Click on "click here to fill a test tube with 2mL of water." Read the information to verify your answer for #14a. Click on "click here to add 2 m: of Biuret…"
    a. What is the color of the solution? _____

16. Click on "click here to continue." Now we will add the protein solution to the test tube to see what happens. Click on the picture of the protein solution.
    a. What is the color of the solution now? _____

17. Click on "click here to continue." How do you know if protein is present in a solution by adding biuret reagent?
    a. The negative result (no protein present) has a _____ color.

    b. The positive result (portein present) has a _____ color.

18. Great! You now know how to test for proteins. Click on "click here to continue." Then, click on "**Fats**" at the bottom of the page.
    a. Look at the diagram. Which elements are present in fats (lipids)?

    _____

19. Read the information in red.
    a. How will the Sudan IV tell you there is a fat (lipid) present?

    _____

20. Click on "click here to fill a test tube with 2mL of water." Read the information to verify your answer to #19a. Click on "click here to add 2mL of Sudan..." Then, click on "click here to continue."
   a. What is the color of the solution in the test tube? _____

21. Click on "click here to continue." Now you will add vegetable oil to the solution. Click on the picture of vegetable oil.
   a. What is the color of the solution in the test tube? _____

22. How do you know if a lipid is present in a solution using Sudan IV?

   a. A negative result (no lipid/fat present) has a _____ color.

   b. A positive result (lipid/fat is present) has a _____ color.

23. Great! Now you know how to determine if a solution has a lipid in it. Click on "click here to continue." Before moving on to part two, fill out the table below.

Macromolecule	Negative Result Color	Positive Result color
Carb - Simple Sugar (Benedict's Solution Test)		
Carb - Starch (Iodine Solution Test)		
Protein (Biurets Reagent Test)		
Lipid (fat) (Sudan IV Test)		

Part Two: Testing Foods
In part two you will examine common foods to see if they contain sugars, starches, proteins, and fats. For each food listed (there are six) complete the online tests. Each test will return a result. You must record the result in the appropriate space on the following page. To do this, determine the color of the solution after it is added to the food. Record you results in TABLE A. Then, determine if that is a positive or negative result. Record your results in TABLE B. The first food is done for you as an example.

After you have completed part two, complete Part Three.

Table A: Color test result (indicate the color you saw)

Food	Sugar	Starch	Protein	Fat
Potatoes	*Light Blue*	*Dark Brown*	*Clear*	*Clear*
Orange Juice				
Almonds				
Eggs				
Salmon				
Milk				

Table B: Positive or negative result (indicate with a YES if it is a positive result or NO if it is a negative result).

Food	Sugar	Starch	Protein	Fat
Potatoes	*No*	*Yes*	*No*	*No*
Orange Juice				
Almonds				
Eggs				
Salmon				
Milk				

Part Three: Results
Under each macromolecule, list which foods are a good source for that macromolecule. Carbohydrates will contain responses for both sugar and starch.

Carbohydrates	Proteins	Lipids (Fats)