BIOLOGY 3A Worksheet **Name:** _____
LAB 2: Biologically Important Molecules **Lab Section:** _____

Benedict's Test for Reducing Sugars:

1. Examine Figure 2. Which groups of a glucose molecule are involved in forming a polysaccharide? Write the groups.

2. In the Benedict's test, which of the solutions is a positive control? Which is a negative control?

3. Which is a reducing sugar, sucrose or glucose?

4. Which contains more reducing sugars, potato juice or onion juice?

5. Is there a difference between the storage of sugars in onions and potatoes?

The iodine test for starch:

6. In the Iodine test, which of the solutions is a positive control? Which is a negative control?

7. Which colors more intensely, onion juice or potato juice?

8. What can you infer about the storage of carbohydrates in onions? in potatoes?

9. Table 1. Color reactions for Benedict's and Iodine tests for solutions provided in laboratory

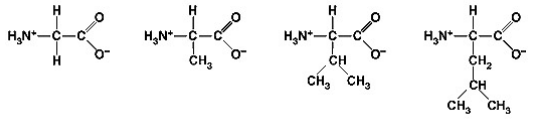
Tube	Solution	Benedict's Color Reaction	Iodine Color Reaction
1	10 drops onion juice		
2	10 drops potato juice		
3	10 drops sucrose solution		
4	10 drops glucose solution		
5	10 drops distilled water		
6	10 drops fructose solution		
7	10 drops starch solution		

Testing for Proteins:

10. Table 2. Color Reactions for the Biuret Test for solutions provided in the laboratory

Tube	Solution	Color
1	2 ml egg albumen/protein solution	
2	2 ml honey solution	
3	2 ml amino acid solution (glycine)	
4	2 ml distilled water	
5		

11. **Circle and label** the reactive amino and carboxyl groups on the four common amino acids shown below:



Glycine (Gly) Alanine (Ala) Valine (Val) Leucine (Leu)

12. In the Biuret's test, which of the solutions is a positive control? Which is a negative control?

13. Which contains more protein (C-N bonds), egg albumen or honey?

14. Do free amino acids have peptide bonds? **Explain** why or why not.

Testing for Lipids:

15. Examine Figure 7. What are the reactive groups of the fatty acids?

Solubility of Lipids in Polar and Non-polar Solvents

16. What do you conclude about the solubility of lipids in polar solvents such as water?

17. What do you conclude about the solubility of lipids in non-polar solvents such as chloroform?

The Sudan IV Test for Lipid

18. Table 3. Reactions for the Sudan IV Test for solutions provided in the laboratory

Tube	Solution	Description of Reaction
1	l ml salad oil + water	
2	1 ml salad oil + water + Sudan IV	
3	1 ml honey solution + Sudan IV	
4	1 ml distilled water + Sudan IV	
5	1 ml lipid + Sudan IV	

19. Is salad oil soluble in water?

20. Compare tubes 1 and 2 in the Sudan IV test. What is the distribution of the dye with respect to the separated water and oil?

21. What observation indicates a positive test for lipid?

22. Does honey contain much lipid?

23. Lipids supply more than twice as many calories per gram as do carbohydrates. Based on your results, which contains more calories, oil or honey?

The Grease-spot Test for Lipids

24. Table 4. Grease Spot Reactions for materials provided in laboratory

Item	Product	Description of Grease-spot Reaction
1		
2		
3		
4		
5		

25. Which of the food products that you tested contains large amounts of lipid?

Testing for Nucleic Acids:

26. How does the color compare between tubes 1 and 2? Why?

27. Do DNA and RNA react in similar ways? Why or why not?

28. Table 5. Dische Diphenylamine Reactions for materials provided in laboratory

Tube	Solution	Color Reaction
1	2 ml DNA solution	
2	1 ml DNA solution, 1 ml water	
3	2 ml RNA solution	
4	2 ml distilled water	

29. Saddleback CSI – Identification of Unknown

Table 6. Results of Five Biochemical Test on an Unknown **Unknown sample letter: .**

Biochemical Test	Color		Unknown Result
	Sample	**Control**	**(+/-)**
Benedict's test			
Iodine (starch)			
Biuret test (protein)			
Dische diphenylamine test (DNA)			
Sudan IV (lipid)			

30. **Please type your written report.**
Identity of the CSI Unknown: