NAME:_____ DUE DATE:_____

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LAB: TESTING FOR NUTRIENTS

The purpose of this lab is to experiment with food and DNA to test for the existence of proteins, carbohydrates and lipids.

MATERIALS

- A variety of test substances
- Test tubes
- Gloves
- Goggles
- Benedict's Solution
- Iodine
- Biuret Solution
- Brown Paper Bag
- Water
- Scoopulas
- Tape
- Marker

PRE-LAB

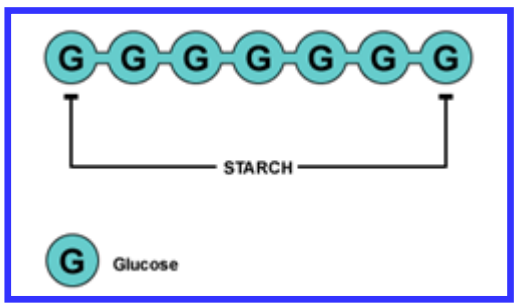
The table below lists the most common types of organic compounds found in living organisms. For each type of organic compound, give one or two examples and describe one characteristic, e.g. whether it is greasy, whether it contains genetic material, whether there is lots of this type of organic compound in meat or lots in pretzels and potatoes.

Type of Organic Compound	Examples	Characteristic of This Type of Organic Compound
Carbohydrates		
Lipids		
Nucleic acids		
Proteins		

[8 PTs]

For this lab we will use a variety of indicators (test substances which display a change to notify the presence of a specific substance/compound). The following indicators will be used:

COMPOUND	INDICATOR	WHAT WILL WE SEE?
CARBS (GLUCOSE)	Benedict's Solution	
CARBS (STARCH)	Iodine	
PROTEINS	Biuret Solution	
LIPIDS	Brown Paper Bag	



U2 LAB

STATION #1 (PROTEINS)

HYPOTHESIS

Which substances do you believe contain proteins? Which do not? Which do you believe will test as having the strongest protein? The weakest? Why?

[3 PTS]

PROCEDURE

(a) Label ten test-tubes 1-10 with tape and a marker.

(b) If the food is a solid, crush a small piece in a mortar with about 10 ml water. (If the food is a liquid, simply pour about 2 cm of it into a test-tube.)

(c) Pour about 2 cm of the crushed mixture into a test-tube.

(d) Add about 1 cm of Biuret solution into the test tube. Cork and shake gently.

(f) Record the results

STATION #2 (GLOCOSE)

HYPOTHESIS

Which substances do you believe contain glucose? Which do not? Which do you believe will test as having the strongest glucose? The weakest? Why?

[3 PTS]

PROCEDURE

(a) Label ten test-tubes 1-10 with tape and a marker.

(b) If the food is a solid, crush a small piece in a mortar with about 10 ml water. (If the food is a liquid, simply pour about 2 cm of it into a test-tube.)

(c) Pour about 2 cm of the crushed mixture into a test-tube.

(d) Add about 1 cm of Benedict's solution into the test tube. Cork and shake gently.

(f) Record the results

U2 LAB

STATION #3 (STARCH)

HYPOTHESIS

Which substances do you believe contain starch? Which do not? Which do you believe will test as having the strongest starch? The weakest? Why?

[3 PTS]

PROCEDURE

(a) Label ten test-tubes 1-10 with tape and a marker.

(b) If the food is a solid, crush a small piece in a mortar with about 10 ml water. (If the food is a liquid, simply pour about 2 cm of it into a test-tube.)

(c) Pour about 2 cm of the crushed mixture into a test-tube.

(d) Add about 2-3 drops of iodine into the test tube. Cork and shake gently.
***CAUTION IODINE IS VERY CORROSIVE AND WILL STAIN EVERYTHING! ***
(f) Record the results

STATION #4 (LIPIDS)

HYPOTHESIS

Which substances do you believe contain lipids? Which do not? Which do you believe will test as having the strongest lipids? The weakest? Why?

[3 PTS]

PROCEDURE

(a) Split your section of brown paper bag into 10 sections by making a grid with a marker.
(b) Label each grid section by test substance
(c) Rub a small amount of your substance on the paper bag.
(d) Let your bag sit to dry for 10-15 minutes.
(e) Hold the bag up to a light to test which grid sections have become semi-transparent.
(f) Record the results

U2 LAB

Fill out the following table by simply placing a ✓ or X *in the appropriate space.*

TEST SUBSTANCE	PROTEIN?	STARCH?	GLUCOSE?	LIPIDS?

[10 PTS]

APPLICATION / CONCLUSION

1 Which test substances surprised you? Why? [2 PTs]

2. Did your test for glucose indicate there was glucose in the starch sample? Does that mean that there is no glucose in starch? [2 PTs]

3 If one of your samples gives no purple colour with the biuret test, does this result mean that the sample contains no protein? [2 PTs]

4 If a food sample gives a purple colour with the biuret test does this mean that it contains only protein? Why or why not? [2 PTs]

U2 LAB

5. What sources of error exist in this lab? How could we alter this lab to achieve more accurate results? [2 PTs]

6. Sophisticated laboratory analyses indicate that pretzels contain approximately 70% starch, 10% protein, and 3% fat. Did you and your classmates get positive tests for starch, protein and fat in pretzels? If any of these tests were negative, what could account for this negative finding? [2 Pts]

7. List another food which would make a Biuret solution turn purple: [1 Pt]

8. List another food which would make a brown paper bag transparent, and benedict's solution orange: [1 Pt]

9. What balanced meal would cover all four of the organic compounds tested today? (List the meal ingredients and which nutrient they connect with) [4 PTs]