Inquiry Testing Food For Sugar and Starch

Purpose: What foods contain sugars and what foods contain starch?

Background information:

- **Go to Ragaller's webpage and watch Benedicts solution test**
- What color does a Bennidicts solution turn in the presence of sugar?

Hypothesis:
Which of the following are sugars and/or starches:

Data Table:

Substance	Before color	After Color	Sugar
1-Marshmallow			
2 - Karo Water			
3 - Potato Buds			
4 - Powdered Egg			
5 - Corn Starch			
6 - Water			

Substance	Before color	After Color	Starch
Marshmallow			
Karo Water			
Potato Buds			
Powdered Egg			
Corn Starch			
Distilled Water			

Set up:

1. In dish 1, Take 1 of the marshmallows and put it in dish #1. Be careful not to contaminate any other container or you will have to start over! Add 50 drops of water. Stir with stick #1. Return scoop to cup.

2. In dish 2, Use the bottled labeled #2 and give 3 to 4 BIG squeezes in dish #2. Add 50 drops of distilled water (or 5 squeezes). Stir with stick #2. Return the stick to beaker #2 immediately.

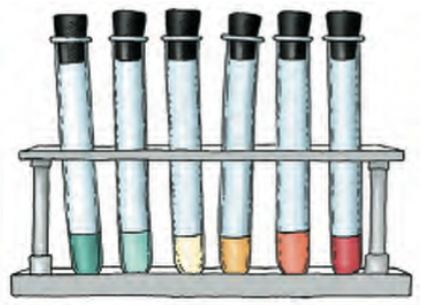
3. In dish 3, Use scoop #3 to scoop out 4 to 5 of substance 3. Add 50 drops of distilled water. Stir with stick #3. Return scoop and stick to beaker #3 immediately.

4. Continue this process for substances 4, 5, and 6.

Inquiry Testing Food For Sugar and Starch

Procedure to Test for Sugar:

1. Fill pipette labeled #1 with the substance from the dish labeled #1. Put 20 drops from the pipette into the empty test tube labeled #1. Return the remaining water from the pipette to the #1 dish. Return the pipette to the paper cup labeled #1 immediately.
2. Add 10 drops of the Benedict's solution to the test tube labeled #1.
3. Attach the test tube clamp and carefully walk the test tube to the water bath.
4. Place the test tube with the clamp on it into the water bath and let it sit for 1 minute. DO NOT REMOVE THE CLAMP WHILE IN THE WATER BATH.



5. Gently remove the test tube from the water bath. Observe the color of the solution and record the color on your data table.
6. **If the solution turns red, orange, yellow or green after heating, that means a sugar is present (+). If not those colors, a sugar is NOT present (-)**
7. **Repeat steps 1 through 7 for each substance in dishes #2,3,4,5 and 6 in the white tray.**
8. At the end of the period, clean the test tubes with soap and water and place face down on the pegs in front of the rack so the water can drip out.

Procedure to Test for Starch:

1. The control for this lab is the water, which is tray D**.**
2. Add 3 drops of Lugol (Iodine) solution to the dishes in the white tray ***NOT*** **in the test tubes.**
3. Observe the color in each dish. If the food has not dissolved in the water, *look for a color change in the food itself*, not the liquid.
4. Record the color of your liquid or food in each tray on your data chart.
5. Compare the color of the food in each dish to the color of the distilled water in dish DW (controlled experiment).
6. **If the color of the liquid or food is different than the control (and appears dark purple/black), this indicates a starch (+). If the solution is the same color as the control DW, then it's not a starch (-).**
7. After the observations and the recording of data, dump the contents of the white try carefully down the drain.
8. Wash your white plastic tray with soap and water. Dry the tray and leave it at your station.
9. Wipe off your lab station and make sure all containers are covered and all materials are exactly how you found them at the start of the lab.

Inquiry Testing Food For Sugar and Starch

Analyzing the data:

1. Which of the six substances tested positive for sugar?
2. Which of the six substances tested positive for starch?
3. Why if a substance turns black during a sugar test can you not assume the substance tested positive for starch?
4. Why if a substance turns orange during a starch test can you not assume the substance tested positive for sugar?
5. If amylase is an enzyme that breaks ***ALL*** starch into sugar, which substances in the data table had the enzyme Amylase added to it?

Substance	**Initial Test**		**Final Test**	
	Sugar	*Starch*	*Sugar*	*Starch*
A	-	+	-	+
B	-	+	+	-
C	-	-	-	-
D	+	-	+	-
E	+	+	+	+
F	+	+	+	-

6. How do you know amylase was not added to letter E? (Hint read question 5 again)
7. How do you know amylase was added to letter F? (Hint read question 5 again)