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| Triton Central High School |
| **GOT POPCORN?** |
| Mitchell Carter |
|  |
| Block 1 |
| 4774 W. 600 N. Fairland, IN 46126 |

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# Introduction

It is the job of this team to find a tasty and nutritious popcorn snack that follows public law 54 to help deplete the scourge know as obesity, and by extension diabetes. This product will possibly be put into vending machines that will go into schools. The hypothesis for Mitchell’s team hypothesis is that if our popcorn is better than most of the competitors and it fits all of the restrictions of public law 54 it will sell to the customer easier. To achieve this hypothesis, first, Mitchell’s team and I had to think of ideas for a pleasant tasting popcorn and research it. The team found a Nutella popcorn and tested it for macromolecules, calories, and they did a taste test. The team ended up using the Nutella based popcorn and it fit all of the requirements for public law 54.

# Materials and Methods

## Nutritional Tests

### Glucose Test Materials

* 1 sample of food
* 200 mL of distilled water in a beaker
* Test tube rack
* Test tube holder
* 12 test tubes
* 8 Transfer pipettes
* Hot plate with beaker containing distilled water to make a hot water bath
* 8 Test tube brush
* 1 beaker, 250 mL
* 1 beaker, 500mL
* Oven mitt
* Benedict’s solution

### Glucose Test Methods

1. Make sure your goggles are covering your eyes.

2. Make a hot water bath by heating 200 mL of distilled water in a 500ml beaker to near boiling.

Use caution around the hot plate and hot water. Use the oven mitt to handle the beaker.

3. Place 1 mL of Benedict’s Solution in two test tubes labeled #1 and #2.

4. Note the color of the Benedict’s solution.

5. Add 1 mL of distilled water to test tube #1. Stir.

6. Add 1 mL of the glucose solution to test tube #2. Stir.

7. Using test tube holders, submerge the bottoms of both test tubes in the hot water bath for three

minutes.

8. Observe and record in your data table the colors of each test tube. If the Benedict’s solution is

working correctly, the glucose solution should change color.

### Starch Tests Materials

* Lugol’s Iodine Stain
* 12 test tubes
* Test tube rack
* Test tube holder
* 8 Test tube brush
* 1 beaker, 250 mL
* 1 beaker, 500mL
* 1 graduated cylinder, 10mL
* 1 sample of food
* 200 mL of distilled water in a beaker
* 8 Transfer pipettes
* 2 Stirring rods
* Safety Goggles
* Laboratory Journal

### Starch Test Methods

1. Make sure your goggles are covering your eyes.

2. Place 1 mL of distilled water in a test tube labeled #1.

3. Place a 1 mL of the starch solution in a test tube labeled #2.

4. Note the color of the Lugol’s Iodine.

5. Add 3 drops of Lugol’s Iodine to each test tube. Stir.

6. Observe and record the results from both tests in your data table. If the Lugol’s Iodine solution is

working correctly, the starch solution should change color.

### Protein Test Materials

* 1 sample of food
* 12 test tubes
* Test tube rack
* Test tube holder
* 8 Test tube brush
* 1 beaker, 250 mL
* 1 beaker, 500mL
* 200 mL of distilled water in a beaker
* 8 Transfer pipettes
* Biuret Stain
* 2 Stirring rods
* Safety Goggles
* Laboratory Journal

### Protein Test Methods

1. Make sure your goggles are covering your eyes.

2. Place 1 mL of distilled water in a test tube labeled #1.

3. Place 1 mL of the protein solution in a test tube labeled #2.

4. Notice the color of the Biuret solution.

5. Add 3 drops of Biuret Solution to each test tube.

6. Observe and record the results from both tests in your data table.

### Lipids Test Materials

* 1 sample of food
* 200 mL of distilled water in a beaker
* 8 Transfer pipettes
* 12 test tubes
* Test tube rack
* Test tube holder
* 8 Test tube brush
* 1 beaker, 250 mL
* Brown paper, multiple pieces, approximately 2 to 3 cm square
* Safety Goggles
* Laboratory Journal

### Lipids Test Methods

1. Make sure your goggles are covering your eyes.

2. Place 1 to 2 drops of distilled water onto a piece of brown paper labeled #1 in pencil.

3. Place 1 to 2 drops of cooking oil onto a second piece so brown paper, labeled #2. 4. Set the papers aside and allow them to dry.

5. Observe and record the results in your data table.

6. Draw and complete a summary table in your Laboratory Journal similar to the one shown below.

The test for simple sugar has been completed for you as an example.

## Calorie test Materials

* Laboratory Journal
* Pencil
* Paper
* Nutella nutritional facts
* Popcorn nutritional facts
* Calculator

## Calorie Test Methods

1. Find the calories on the nutritional facts on the back of the Nutella and the popcorn
2. Since one tablespoon is used of Nutella and one serving of Nutella is two tablespoons so there is only half the calories in the Nutella popcorn than one serving of Nutella. There was only one serving of popcorn.
3. Then add the calories together to get the total calories

## Taste Test Material

* Fellow classmates
* Paper
* Pencil
* Product

## Taste Test Methods

1. Take the popcorn around the class
2. Have everyone taste one piece of the popcorn
3. Record if the person liked it or not on a piece of paper

# Results

**Nutritional Tests**

|  |  |
| --- | --- |
| Macromolecule | Positive or Negative |
| Glucose (simple sugar) | Negative |
| Starch | Positive |
| Protein | Negative |
| Lipids | Positive |

**Calories**

After dividing and adding this is what the calories ended up being:

Calories=170

**Taste Test**

37 out 38 enjoyed the Nutella popcorn who tasted it

97% liked it

# Discussion and Conclusion

 Mitchell team’s hypothesis was that if our popcorn is better than most of the competitors and it fits all of the restrictions of public law 54 it will sell to the customer easier. It turned out that the hypothesis was correct. They determined this by testing the nutritional values, calorie count, and conducting taste tests with classmates.

 To achieve the hypothesis this team had to use several different tests. They had to test for four different types of macromolecule. They couldn’t do a certain test for calories because their product had chocolate in it so it wouldn’t burn, so they had to us simple math to add and subtract the calories from what they used from the Nutella and the popcorn. For the taste tests they walked around the class room and had 38 people taste it and out of those 38 only one person didn’t like, but that person doesn’t like chocolate, and when Mitchell’s team did the taste test there were some comments such as; “This is way better than our popcorn,” or “ I wish our popcorn tasted this good.”

In Conclusion, the product for this team reach all of the expectations for their hypothesis. It fit all of the restrictions for public law 54 as well. Since this is a healthy option for vending machines and it taste good it could help the scourge know as obesity and/ or diabetes.Acknowledgements

This team would like to acknowledge the teachers Mr. Bastin and Mr. McGown for guiding Mitchell’s team through this project. And to all the people that were in the taste tests for tasting Mitchell’s team’s popcorn.

# Literature Cited

All of the recipes and ideas were home-made by students within this team, therefore they didn’t use any cites.