**Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Food Power: upload full lab**

**Background Information:** Energy is trapped inside your food so that you can use it throughout the day. The energy can be measured in Joules, but we more commonly use calories for food. One calorie equals 4.18 J so the specific heat of water in calories is one. But the calories we eat are **C**alories, or kilocalories. In order to find out how many calories are in common foods, you must burn the food and trap the heat produced. You will use the formula q=mcΔT to calculate the calories.

**Guiding Questions:** How many calories are trapped in common snacks? Are all snacks calories equal?

**Materials:** 2 food materials, matches, stand

**Pre-Lab Questions:**

1. If a person should eat 2000 Calories a day on average, calculate the number of calories they would eat.
2. Explain the direction of the heat flow while the sample is being burned.
3. If you eat 100 Calories in a snack, and 4.18J= 1calorie, how many Joules did you eat?
4. Circle the word(s) that best describe your understanding of heat. Then write a scientific explanation to defend the prediction you chose.

**Prediction:** Burning the marshmallow and the cheese doodle for approximately the same length of time will result in (the same/ different) temperature changes of the water.

**Reasoning:** \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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**Procedure: For each food sample…** Mass the food. Obtain 20.00mL of water and add it to the test tube. Find the temperature of the water. Burn the food and allow it to extinguish itself. Find the new temperature of the water and the final mass of the food.

| **Food** | **Initial Mass of food** | **Volume of water** | **Initial Temperature of water** | **Final Temperature of water** | **Final Mass of food** |
| --- | --- | --- | --- | --- | --- |
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|  |  |  |  |  |  |

**Calculations:** All calculations for each food! Label your answers.

1. Find the heat calories absorbed by the water for each of the food samples.



1. Find the heat calories released by the food for each of the food samples. Remember, whatever heat the water absorbed, was from the food burning and releasing it.



1. Find the kilocalories of heat released by each food.



1. Find the kilocalories per gram of heat released by each food.



1. Calculate the percent error of each of the food samples using the calories reported on the container.



1. Why were your experimental values so different from the reported values?

1. Construct a **claim** that supports or contradicts the prediction made in the pre-lab questions. Provide **evidence** that supports your claim. Use your **reasoning** skills to explain why your evidence is relevant.
2. Using the values in question 4, and the conversion 4.18J = 1 calorie, how many Joules were burned by each food?

