**Calorimetry Case Studies**

**DIRECTIONS:** Use the formulas below to fill in the missing squares in the chart. Show your work in the space provided.

Conversion: 1 mL water = 1 gram water

*Formula 1:* calories = change in temp. \* volume of water

*Formula 2:* kilocalories = calories / 1000

*Formula 3:* kcal/mass = kilocalories / mass of food

**Note:** The volume of water used for all calorimetric experiments below was 50 mL.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Food | Mass (g) | Initial Temp. of Water (°C) | Final Temp. of Water (°C) | Change in Temp. of Water (°C) | Calories/ gram |
| Cheez-It | 1.3 g | 23.1 °C |  | 5.9 °C |  |
| Dorito |  | 24.2 °C | 33.2 °C |  | .225 Cal/g |
| Cashew | 1.9 g |  | 36.9 °C | 12.5 °C |  |

Show work here:

|  |  |  |
| --- | --- | --- |
| **Cheez-It:** | **Dorito:** | **Cashew:** |

**Analysis Questions:**

Directions: Read and brainstorm the answers to these questions with your group and jot down notes on the back. Then, answer in complete sentences on lined paper and staple it to this sheet.

1. Is the process of burning foods through calorimetric analysis an endothermic or exothermic reaction? Explain your answer.
2. While burning the Dorito for calorimetric analysis, it was dripping a yellowish liquid. What does this tell you about the nutrient in Doritos? If you think about the likely ingredients used to make Doritos, which ingredients are responsible for adding this nutrient?
3. The cashew had the greatest change in temperature of its water. Why is that?  
   Compare the Calories/gram results between the cashew and the other two foods. What conclusions can you draw from this data?
4. Does a food that has fewer calories than another food make it healthier? Can we use calories alone to judge nutrition? What does a calorie actually represent? Use your knowledge of the number of calories in 1g of protein and carbs vs. 1g of fat to support your answer.
5. When you hear the word “Calories” what comes to mind? How has your perception of Calories changed after taking this class?

**Brainstorming**

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| **#1** |
| **#2** |
| **#3** |
| **#4** |
| **#5** |