

Absolute zero



**ASSIGN
BUSTER**

Heat Food Lab * Purpose: * Understand how to calculate calories per gram from burning food in the laboratory. * Understanding how to use the food nutrition label on the back of the package to calculate the calories per gram. * The calculated calories per gram in the laboratory are compared to the calories per gram that were calculated from the nutrition label. Then the % error and % yield are calculated and displayed in table and in a graph. * Students will be able to create a laboratory report in MS word and a MS power point. * Students will to be able to create a data tables and graphs through Microsoft Excel. Hypothesis: If a better calorimeter is built after each trial, then the % error will decrease and the % yield will increase. * Independent variable: The Initial mass of a Cheeto,

The End Mass of that cheeto, The initial temperature of the Water, The End Temperature of the Water. The Amount of Water that is used in the Experiment(Soda-Can) * Dependent variable: The Percent Error, The Percent Yield, calories per Gram. * Trials: 3 sets, And 3 Trials for each set; Total of 9 Trials * Constant: Shape; Form of the can, Glass Flask (200 ml), Form/ Shape of the Thermometer. Control: The Accepted Value Calories (160000), Grams Per Serving (28g), calories per Gram (5714): Estimate] Part 1 Table 1: Data|

	Temp Initial	Temp. Final	Mass of Chip(Start)	Mass of Chip(After Burn	Temp of H2O after Burn	Calories	Serving Size	Volume of H2O (ml)	Trial
#1	10	11	1.19	0.19	14	160	28	200	Trial #1
#2	11	14	1.17	0.16	14	160	28	200	Trial #2
#3	9	14	1.05	0.15	14	160	28	200	Trial #3

Explanation: The Table Above, Shows the Initial and End Temperature of the Water, and The Changes in mass of the Cheeto(Chip).

This Table also shows the Calories, Serving Size and The Volume of H2O used in this experiment. Table 2: Accepted Value | | Calories | Grams per serving| calories per Gram| Trial #1| 160000| 28| 5714. 285714| Trial #2| 160000| 28| 5714. 285714| Trial #3| 160000| 28| 5714. 285714| | | Average| 5714. 285714|

Explanation: Table two Shows the Calories, Grams per Serving, and calories per Gram. Table 3 Measured Value| | Mass of the Cheap| Change Temp. | Specific heat of H2O| Mass of H2O (g)| Heat (cal.)| Heat(cal.)/g| trial 1| 1| 1| 1| 200| 200| 200| rial 2| 1. 01| 3| 1| 200| 600| 594. 059406| trial 3| 0. 9| 5| 1| 200| 1000| 1111. 11111| | | | | Average| 635. 056839|

Explanation: This Table above Shows the Measured Value's of The Mass of The Chip, The Change in Temperature, The Specific Heat of H2O, The Mass of H2O, The Heat (cal), And Heat (cal)/ Gram Table 4 Average Value| | % Error| % Yield| | - 88. 88650532| 11. 113495|

Explanation: The Table Above Shows the Average Value; The Percent error and The Percent Yield of The Experiment. Part 2 Table 1: Data| | Temp Initial| Temp.

Final| Mass of Chip(Start)| Mass of Chip(After Burn| Temp of H2O after Burn| Calories | Serving Size| Volume of H2O (ml)| Trial #1| 24| 31| 1. 94| 0. 35| 14| 160| 28| 200| Trial #2| 22| 25| 1. 04| 0. 26| 14| 160| 28| 200| Trial #3| 9| 14| 1. 05| 0. 15| 14| 160| 28| 200|

Explanation: The Table Above Presents the Initial Temperature and Mass, Also the End Of the Temperature and Mass, The amount of Calories, The serving Size, and the Volume of h20(200ml).

Table 2: Accepted Value| | Calories | Grams per serving| calories per Gram| Trial #1| 160000| 28| 5714. 285714| Trial #2| 160000| 28| 5714. 285714|

Trial #3| 160000| 28| 5714. 285714| | | Average| 5714. 285714| Explanation: The Table above shows the Amount of Calories , Grams Per

serving , And Calories Per Gram. Table 3 Measured Value| | Mass of the Cheap| Change Temp. | Specific heat of H2O| Mass of H2O (g)| Heat (cal.)| Heat(cal.)/g| trial 1| 1. 59| 7| 1| 200| 1400| 880. 5031| trial 2| 0. 78| 3| 1| 200| 600| 769. 2308| trial 3| 0. 9| 5| 1| 200| 1000| 1111. 111| | | | | Average| 920. 2817|

Explanation: This table show the mass of the cheap after burned, changing temperature, and many more that we measure Table 4 Average Value| % Error| % Yield| | -83. 8951| 16. 10492931| Explanation:

The Table On the Left shows the Average; Percent Yield and Percent Error. |

PART 3| | | | | | | Table 1: Data| | Temp Initial| Temp. Final| Mass of Chip(Start)| Mass of Chip(After Burn| Temp of H2O after Burn| Calories | Serving Size| Volume of H2O (ml)| Trial #1| 21| 26| 0. 54| 0. 06| 14| 160| 28| 200| Trial #2| 19| 25| 0. 79| 0. 17| 14| 160| 28| 200| Trial #3| 19. 5| 27| 1. 1| 0. 15| 14| 160| 28| 200|

Explanation: The Table Above shows the Temperatures, The masses, the amount of Calories, The Serving Size, The Volume of H2O.

Table 2: Accepted Value| | Calories | Grams per serving| calories per Gram| Trial #1| 160000| 28| 5714. 286| Trial #2| 160000| 28| 5714. 286| Trial #3| 160000| 28| 5714. 286|

Explanation: The Table Shows the Calories, The Grams per serving, and the calories per gram. Table 3 Measured Value| | Mass of the Cheap| Change Temp. | Specific heat of H2O| Mass of H2O (g)| Heat (cal.)| Heat(cal.)/g| trial 1| 0. 48| 5| 1| 200| 1000| 2083. 333| trial 2| 0. 62| 6| 1| 200| 1200| 1935. 484| trial 3| 0. 95| 7. 5| 1| 200| 1500| 1578. 947| | | | | Average| 1865. 922|

Explanation: The table above shows The Mass of The Chip The Change of Temp The Specific heat of H2O the mass of H2O, The Heat (cal) the Heat

(cal)/Gram Table 4 Average Value | | % Error| % Yield| | -67. 3464| 32. 65363|

Explanation: Explanation: The Table of Shows the Percent Error and Percent

Yield. Calculation: I)Accepted Value $160000/28g = 5714.289cal/g$ 1serving |

28g| | 1serving| = $28g \cdot 160Cal | 1000cal | | 1Cal | = 160000cal$ 1)2)3)

II)Measured Value 1)Mass of the cheap === $1.19 - 0.19 = 1g$ 2) $T = Temp .$

final -temp Initial==== $14^{\circ}C - 10^{\circ}C = 4^{\circ}C$ 3) $200ml | 1g | | 1ml | = 200g$ Water

4)Specific heat of water = $1Cal/g^{\circ}C$) $T = CM T = 1(200)(4) = 800cal/g$

6) $800cal/1g = 800cal/g$ 7)Average $880.5031 + 769.2308 + 769.2308 = 920.$

2817 Set 1 can In our First Trial of the First part in our experiment, Jerick and

I tried out this method of burning. This method only gave us inaccurate

results and we had to develop a better System, Rig or Build. The Reason why

we were unable to achieve better Data, was that we were losing heat from

multiple attempts of burning. C C In our Second Set we've made Way a

Better Calorimeter, We've used different materials, Also we've used two

cans, and Even used Aluminum Foil.

Set 2 Can BC A Set 3 Can In our third set I've built A calorimeter that's

different from the Other two That I've made. With this we were able to

achieve much better results and more idea's added onto the experiment. |

%Error| %Yeild| Part 1| -88. 8865| 11. 11349| Part 2| -83. 8951| 16. 10493|

Part 3| -67. 3464| 32. 65363| Graph Paragraph The Graph Above is

measuring the differences in the Accepted, Average, and measured Values of

this experiment. I've set the Graph in an orderly fashion, only using one

graph for both the Percent Error and Percent Yield.

I've achieve both Very Low and Very high Values in Both Percent Error and

Percent Yield. In percent yield the Lowest Value in 11. 11%, in percent error

the highest is 88.88%. The Trend I've noticed In this experiment would be the Positive trend shown in the Graph(s). In the End I realized that Building a better Calorimeter will only set you off in many different directions, Although in all of My Trials, I did achieve better results. Conclusion This Experiment was to Understand how to calculate calories per gram from burning food in the lab.

The major findings Of the entire experiment was that I had found that You can possibly Boil Water While using Chips as your source of Fire. The Data did approve and It definitely helped my whole experiment. I didn't expect the Spontaneous Burnings, to produce that Much Smoke, I really think that most of the smoke came from burning the tape, or the can itself. Anything to improve this experiment would be the use of better materials and something better than a Tin Can. For further Studies I'd recommend a Clean workspace, Better tools and Much more Fluent Burning in this Experiment.