

Names: _____

Hour: _____

Calculating Caloric Value Lab

INTRODUCTION

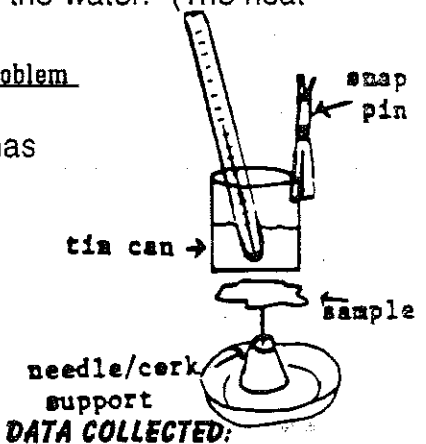
To find how many calories are in food, you will combust a substance and use the heat generated to warm water. Knowing the number of grams of water that were warmed and the number of degrees increase in the temperature, it is possible to calculate an estimate of the amount of calories in the food substance.

MATERIALS:

1. tin can
2. one thermometer
3. clothes pin
4. cork support with foil and pin
5. assorted food samples

PROCEDURE

1. Measure 50 ml of tap water into the empty tin can.
2. **RECORD THE TEMPERATURE OF THE WATER** (use Celsius Scale, only).
3. Carefully place a small food sample onto the needle in the foiled covered cork.
4. Combust the food by using the match as directed. Once the food has ignited, place the tin can with the water above the burning food using the clothes pin as a holder. (see image)
5. **AFTER** the sample has finished burning, record the temperature of the water. (The heat generated from the burning will go into heating the water).
6. Calculate the calories using the data collected. Follow the sample problem for directions.
7. Begin again with a new sample. Empty the old water because it has been heated and refill with water from the tap. Repeat the steps 1-6.



SAMPLE PROBLEM

Fifty grams of H₂O at 25 °C are heated to 31 °C.
Calculate how many calories are used.

amount of H₂O used 50 ml = 50 grams

temp. of H₂O before burning 25 °C

temp of H₂O after burning 31 °C

difference in temp. of H₂O = 6 C

calories = 6 C temp. difference x 50 grams

calories = 300

DATA COLLECTED:	
grams of H ₂ O	<u>50</u>
Temperature of H ₂ O (before)	<u>25 C</u>
Temperature of H ₂ O (after)	<u>31 C</u>
Temp. change	<u>6 C</u>
Calories	<u>300</u>

Names: _____ Hour: _____

<i>Sample #1</i> Peanut	<i>Sample #2</i> Cheerio
amount of H ₂ O used _____ ml = _____ g	amount of H ₂ O used _____ ml = _____ g
temp. of H ₂ O before burning _____ °C	temp. of H ₂ O before burning _____ °C
temp of H ₂ O after burning _____ °C	temp of H ₂ O after burning _____ °C
difference in temp. of H ₂ O = _____	difference in temp. of H ₂ O = _____
calories = _____ temp. difference x _____ g	calories = _____ temp. difference x _____ g
calories = _____	calories = _____

	<i>Sample #3</i>	<i>Sample #4</i>	<i>Sample #5</i>	<i>Sample #6</i>	<i>Sample #7</i>	<i>Sample #8</i>
grams of H ₂ O	_____	_____	_____	_____	_____	_____
temp. of H ₂ O before	_____	_____	_____	_____	_____	_____
temp of H ₂ O after	_____	_____	_____	_____	_____	_____
diff. in temp.	_____	_____	_____	_____	_____	_____
calories	_____	_____	_____	_____	_____	_____

1. If it takes 1000 of the calorie you are working with to make 1 Calorie that are used in diets, how many whole peanuts would be needed to give you your daily diet of 2000 Calories?

How many whole cheerios would be needed to give you your daily diet of 2000 Calories?

2. Which food sample would you eat to keep "warm" on a cold day?

Why would you eat that food sample?

3. Suppose you lit two candles of the height. One burned away in six hours. The other burned away in three ours. How much time passed away before one candle was twice as long as the other?