

Now We're Cookin'



Name: [scribbled]

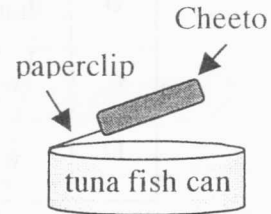
Period: 4th Date: 3-24-06

Purpose: You will measure the amount of heat released from burning a Cheeto by measuring the temperature rise of water. You will examine 4 different conditions.

Safety note: You will be using fire today. Make sure you wear goggles. Tie your hair back. Do not wear loose clothing, especially loose sleeves.

Materials (per pair of students):

- | | |
|-------------------------|---------------------|
| 1 Cheeto | 100–200 mL of water |
| 1 ring stand with clamp | 1 thermometer |
| 6–7 paper clips | aluminum foil |
| 1 empty tuna fish can | matches |
| 1 soda can with tab | tape |



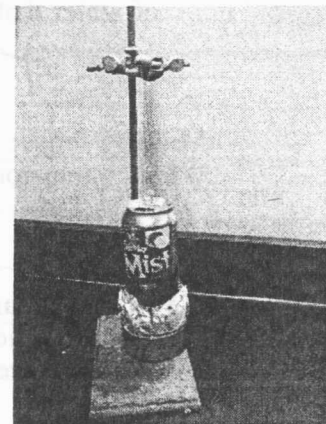
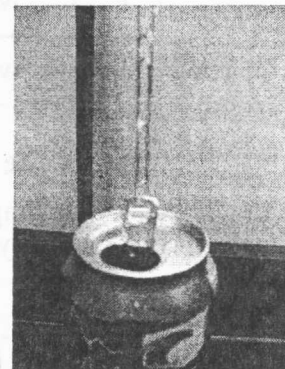
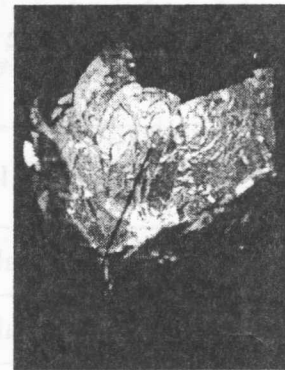
Experimental conditions:

You will work in a team of 8 divided into 4 pairs. The 4 pairs in a team will each examine a different experimental condition.

- Pair A: Test half a Cheeto with 100 mL of water
- Pair B: Test half a Cheeto with 200 mL of water
- Pair C: Test a whole Cheeto with 100 mL of water
- Pair D: Test a whole Cheeto with 200 mL of water

Procedure:

1. Weigh the Cheeto you intend to burn. Record the mass in Data Table 1.
2. Create a Cheeto holder with a paperclip. One end of the paperclip should be pointed at an angle upward as shown in the diagram. Push this end into the Cheeto. Tape the other end of the paperclip to the side of an empty tuna fish can. Put aluminum foil around the soda can as a shield as shown in the picture.
3. Hang a soda can with a paperclip chain from the tab on the soda can to a clamp on the ringstand as shown in the picture. Adjust the height so that the can is about 2 inches above the Cheeto.
4. Fill the soda can with the amount of water you were assigned to heat. Measure the initial temperature (in degrees Celsius) of the water and record the temperature in Data Table 1.
5. Remove the thermometer from the soda can and remove the soda can from the ringstand.
6. Use a match to light the Cheeto on fire.
7. Once the Cheeto is on fire, quickly place the soda can with water directly over the flame. If the flame goes out, relight the Cheeto.
8. After the Cheeto has burned as much as possible, gently stir the water in the soda can and measure the final temperature of the water. Record the temperature in Data Table 1.
9. Weigh what remains of the Cheeto. Record the mass in Data Table 1.
10. Complete the calculations and record them in Data Table 2. Fill out both Data Tables 1 and 2 with data from the other 3 pairs in your team.



Summer 06

Data Table 1: Data Collection

DATA*						
	Fuel	Initial mass of fuel	Final mass of fuel	mL of water	Initial T of water	Final T of water
A	half of a Cheeto	0.79	0.19	100	18°	28°
B	half of a Cheeto	0.8	0.19	200	17°	24°
C	whole Cheeto	1.6	0.2	100	20°	47°
D	whole Cheeto	1.6	0.2	200	17°	28

*Masses and temperatures will vary depending on the experimental set-up.

Data Table 2: Calculations

CALCULATIONS				
	Heat Source	Grams of water	Change in Temp = Final T – Initial T	Mass of fuel burned = Initial Mass – Final Mass
A	half of a Cheeto	100 g	10	0.6
B	half of a Cheeto	200 g	7	0.7
C	whole Cheeto	100 g	27	1.4
D	whole Cheeto	200 g	11	1.9

Answer the following questions:

1. What happened to the temperature change of the water when you doubled the mass of Cheeto you used?

the temperature raised (doubled)

2. What happened to the temperature change of the water when you doubled the amount of water that was heated?

the temperature lowered

Making sense:

What conclusions can you draw based on your experimental results?



the mass of cheeto in smoke

If you finish early...

When you burned your pellets they decreased in mass. What happened to the mass that was lost? Where did it go?

it burned away with the smoke is where it went

	grams water	ΔT	calories transferred	mass of cheeto burner	calor per g. cheetos
A	100g	10°C	1000	0.6g	1666.7 cal/g
B	200g	7°C	1400	0.7g	2000 cal/g
C	100g	27°C	2700	1.4g	1928.6 cal/g
D	200g	11°C	2200	1.4g	1571.4 cal/g

.4 cal.