WHAT MAKES THE BEST COKE GEYSER?


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Experiment 1: Does it have to be Mentos or can we use any sweets?

Method

- Half fill 4 boiling tubes with Diet Coke
- TILT THE BOILING TUBE AS YOU POUR SLOWLY
- Drop one of the test sweets into a tube and watch what happens.
- Record the amount of fizz

Variables

Independent variable = type of sweet

Dependent variable = amount of fizz

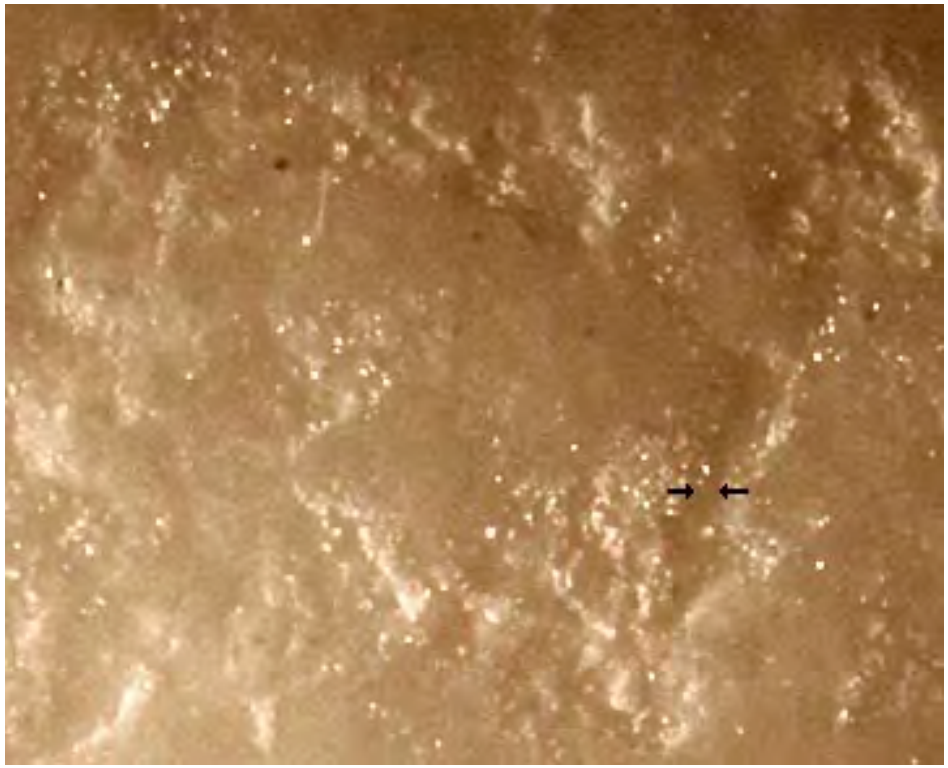
Control variable = volume of diet coke

Type of sweet	Amount of fizz (a lot, a little, none)
Mint Mentos 	a lot
Fruit flavoured Mentos 	a lot
Opal fruit 	none
Polo 	a little

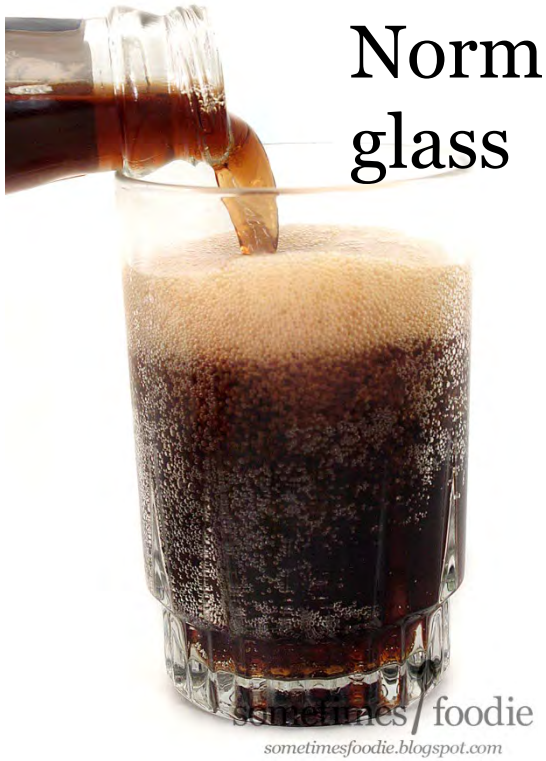
Conclusion

- Opal fruit sweets and Polos were not as good as Mentos sweets at producing fizz.

How does the coke and Mentos trick work?



Do try this at home!



Normal glass

Glass coated with oil

Experiment 2: Does it have to be a sweet?

Method

- Half fill 5 boiling tubes with Diet Coke
- TILT THE BOILING TUBE AS YOU POUR SLOWLY
- Drop one substance into one tube at a time and watch what happens.
- Record amount of fizz

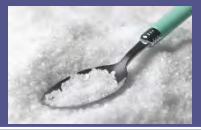
Variables

Independent variable = type of substance

Dependent variable = amount of fizz

Control variable = volume of diet coke

Type of substance

Type of substance	Amount of fizz (a lot, a little, none)
Sugar cube 	a lot
Small piece of sedimentary rock 	a little
A marble 	none
A level teaspoon of coarse salt crystals 	a lot
A level teaspoon of anti-bumping granules 	a lot

Conclusion

- Sugar, salt and anti-bumping granules produced a lot of fizz.

Experiment 3: Does it have to be diet coke?

Method

- Half fill 5 boiling tubes with different drinks
- TILT THE BOILING TUBE AS YOU POUR SLOWLY
- Drop one Mint Mentos into one tube at a time and record amount of fizz

Variables

Independent variable = type of drink

Dependent variable = amount of fizz

Control variable = volume of drink and type of sweet

Type of drink	Amount of fizz (a lot, a little, none)
Diet Coke 	a lot
Still water 	none
Fizzy lemonade 	a lot
Coke Classic 	a lot
Perrier water 	a little

Conclusion

- Still and fizzy water were not good at producing fizz as coke and lemonade

Experiment 4: Does surface area make a difference?

Method

- Add 200 cm^3 of diet coke to a conical flask
- Drop one Mint Mentos
- Measure amount of gas produced
- Repeat with crushed Mint Mentos

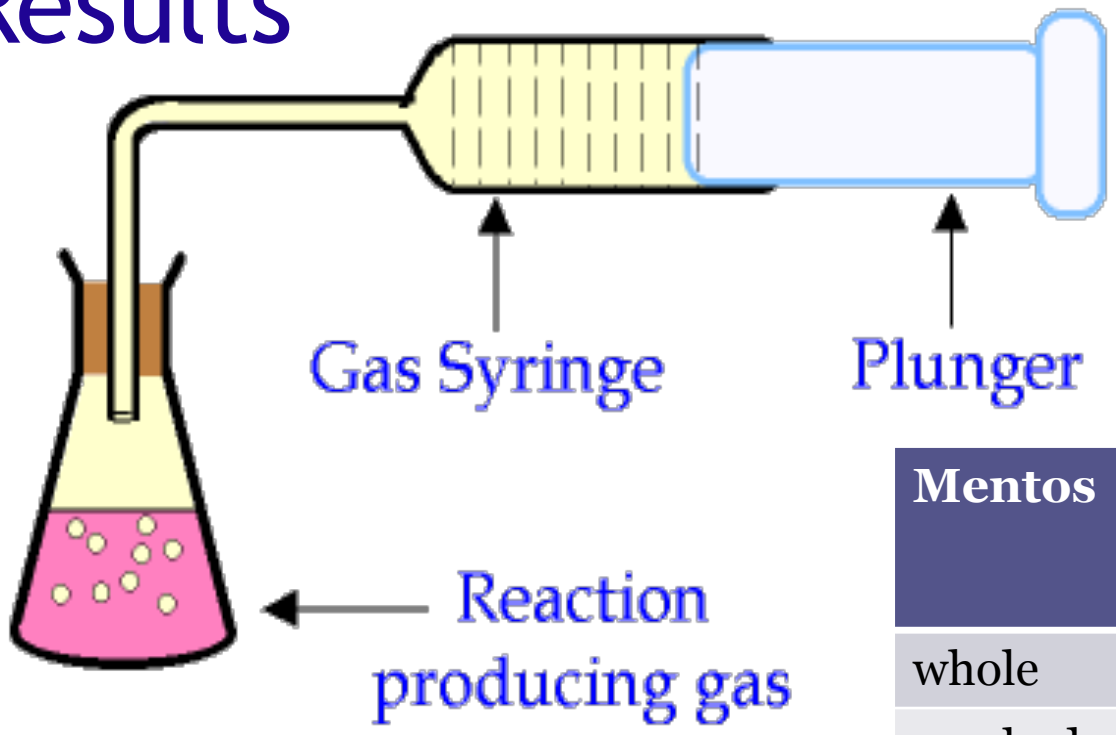
Variables

Independent variable = surface area of Mentos sweet

Dependent variable = amount of gas

Control variable = volume of diet coke

Results



Mentos	Volume of gas (cm^3)
whole	60
crushed	55

Conclusion

- Crushing the Mentos sweets did not increase the amount of gas produced.

- This is probably because the crushed sweets did not fall into the coke quickly compared to the whole Mentos.

Experiment 5: Does temperature make a difference?

Method

- Add 200 cm^3 of diet coke to a conical flask
- Drop one Mint Mentos
- Measure amount of gas produced
- Repeat with warmed up coke (40^oC)

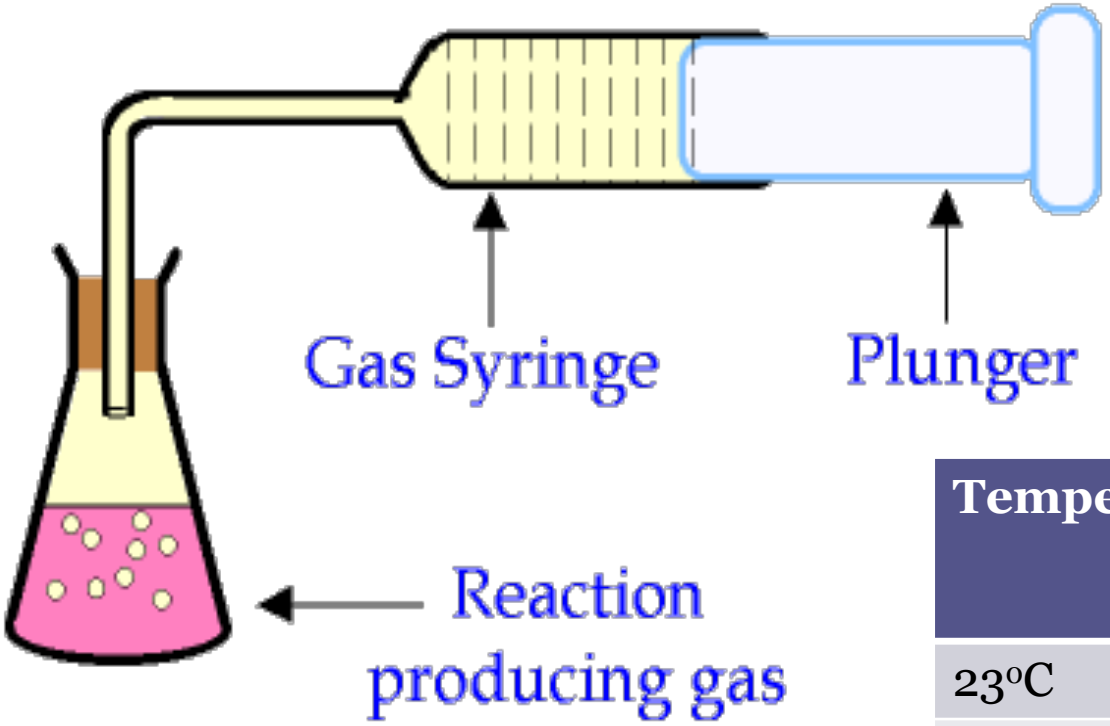
Variables

Independent variable = temperature

Dependent variable = amount of gas

Control variable = volume of diet coke

Results



Temperature	Volume of gas (cm^3)
23°C	60
40°C	50

Conclusion

- Warming the diet coke did not increase the amount of gas produced.

- This is probably because some of the dissolved CO_2 escaped when the coke was warmed up

Experiment 6: Can you reuse the Mint Mentos sweet?

Method

- Add 200 cm^3 of diet coke to a conical flask
- Drop one Mint Mentos
- Measure amount of gas produced
- Repeat with used Mint Mentos sweet

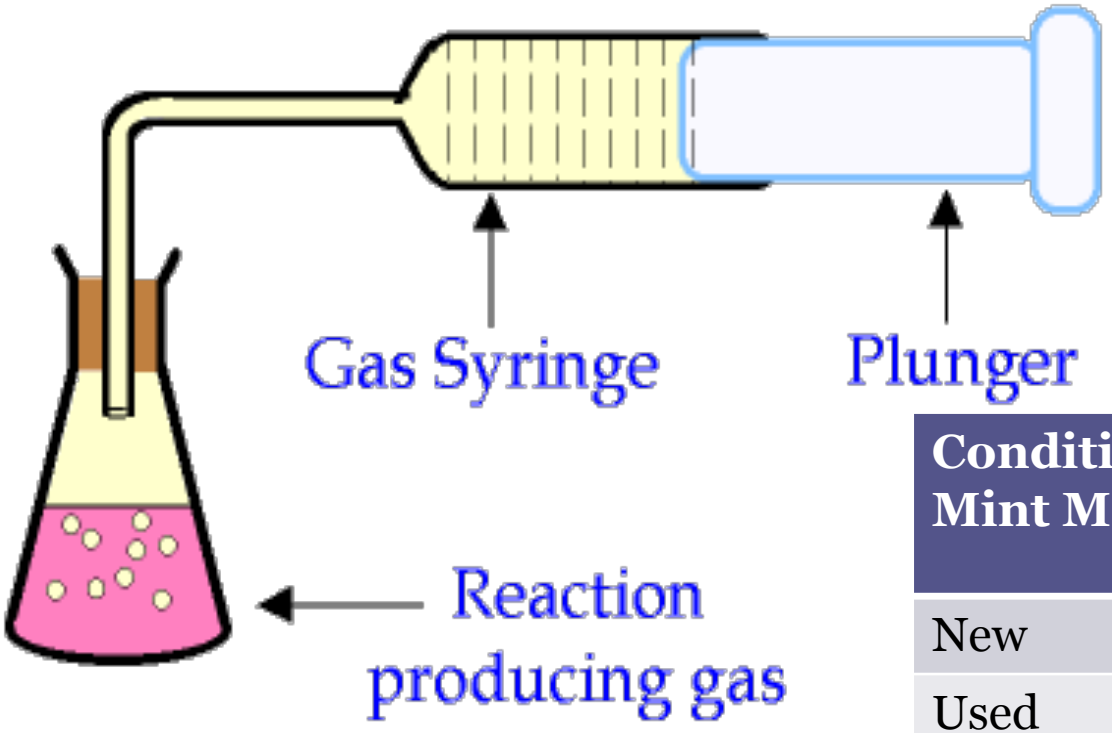
Variables

Independent variable = condition of Mint Mentos

Dependent variable = amount of gas

Control variable = volume of diet coke

Results



Condition of Mint Mentos	Volume of gas (cm^3)
New	60
Used	20

Conclusion

- A new Mint Mentos sweet worked much better than a used sweet
- This is probably because the outside of the sweet dissolves very quickly

Decision time

- From the results of our experiments we decided that to continue with Diet Coke (less sticky) and new Mint Mentos each time

Final plan

Cost ££££

- Large bottle of diet coke (£1.98 per bottle)
- Small bottle of diet coke (£1-1.25 per bottle)
- Packet of Mint Mentos (£0.85)

Mess

- Large bottle (big mess)
- Small bottle (small mess)

We decided to continue with small bottles of coke and Mint Mentos as it was less expensive and there was a smaller mess to clean up.

Experiment 7: How many sweets do you need?

Method

- Take a small bottle of Diet Coke
- Drop one Mint Mentos
- Measure height of geyser
- Repeat with 2-7 Mint Mentos sweets

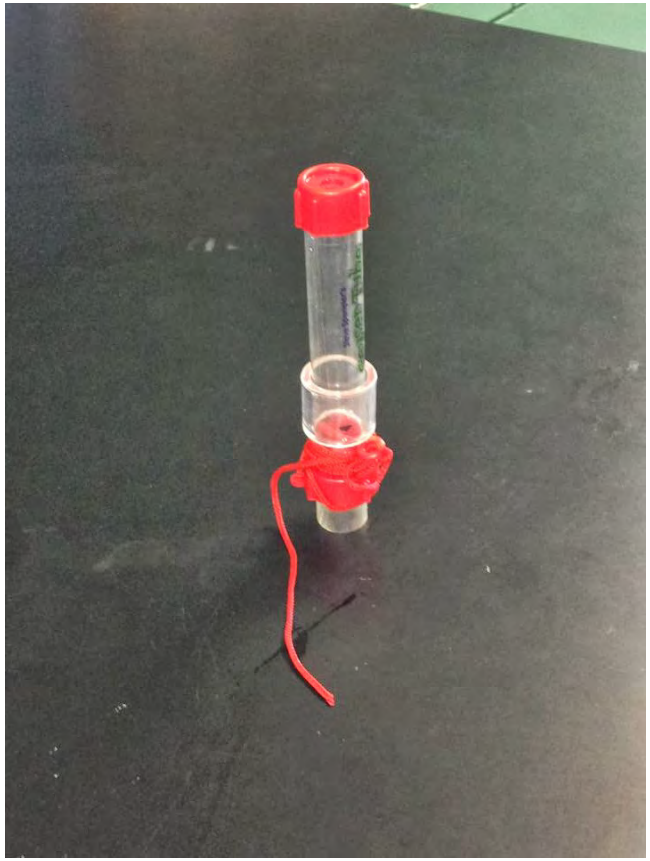
Variables

Independent variable = number of Mint Mentos

Dependent variable = height of geyser and volume of coke left in the bottle

Control variable = volume of diet coke (250 cm^3)

Mentos dispenser



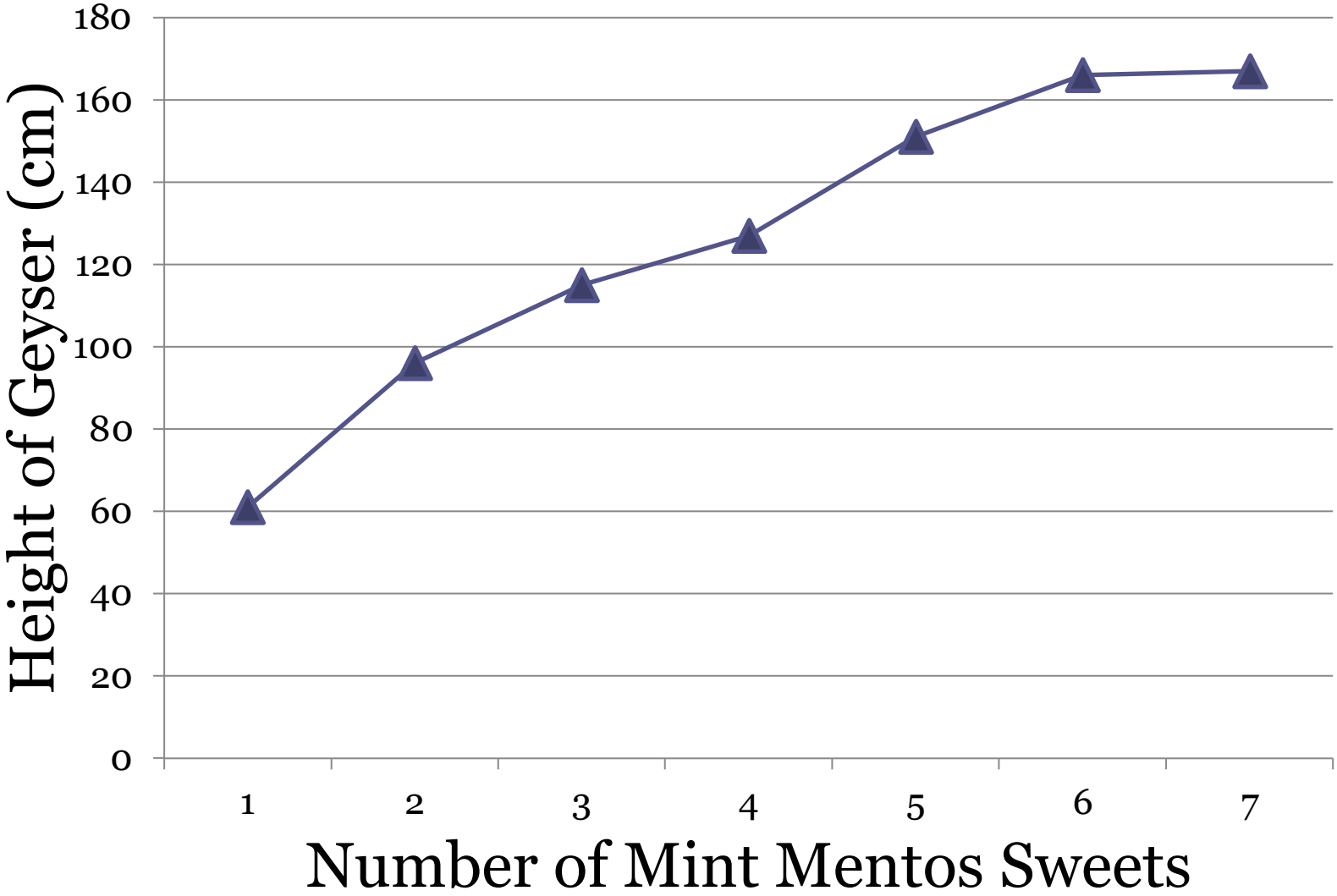
We used a mentos dispenser in order to drop our mentos into the bottle quickly

Coke geysers!

The effect of Mentos on height of geyser?
Odd or anomalous results were left out

Number of Mentos	Height of fizz (cm)			
	1	2	3	average
1	63	59	40	61
2	97	95	47	96
3	110	65	120	115
4	115	129	137	127
5	136	149	167	151
6	168	159	170	166
7	121	170	164	167

Effect of number of sweets on height of geyser



Conclusion

- The height of the coke geyser increased when the number of sweets were increased up to 6.
- There was no difference between 6 and 7 sweets.

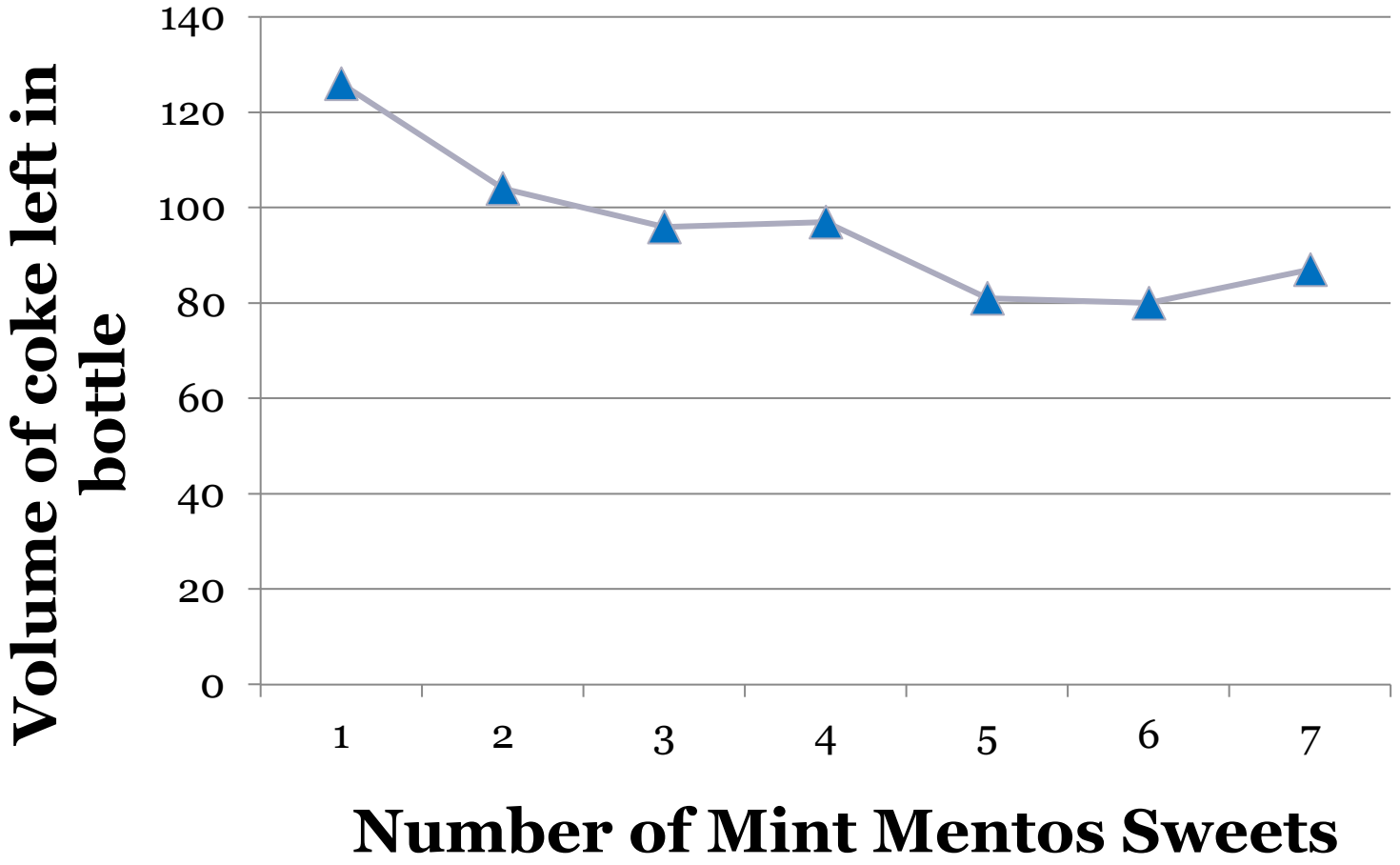
How much coke is left in the bottle?

Measuring the coke left in the bottle

The effect of Mentos on volume of coke left?
Odd or anomalous results were left out.

Number of Mentos	Volume of coke left (cm^3)			
	1	2	3	average
1	124	128	126	126
2	106	102	119	104
3	100	90	98	96
4	93	102	96	97
5	82	92	80	81
6	78	82	80	80
7	106	84	82	83

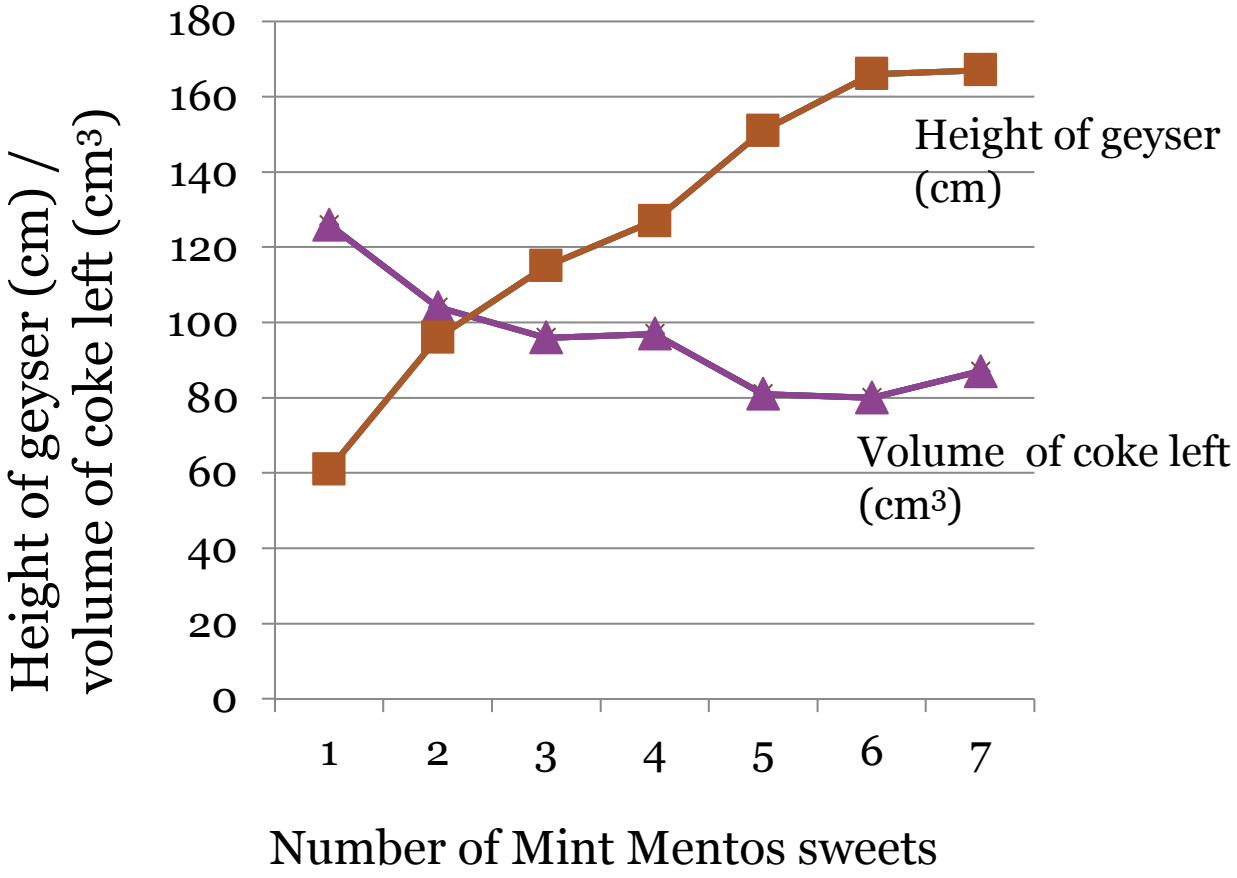
Effect of number of sweets on amount of coke left in the bottle



Conclusion

- The amount of coke left decreased when the number of sweets were increased up to 5.
- There was no further decrease when the number of sweets was increased to 6 and 7 sweets.

Is there a correlation?



Conclusion

- The amount of coke that was left did not show an absolute correlation with the height of geyser.
- The speed with which the gas is produced is probably an important factor.

Clearing the mess

Conclusion

- The record is

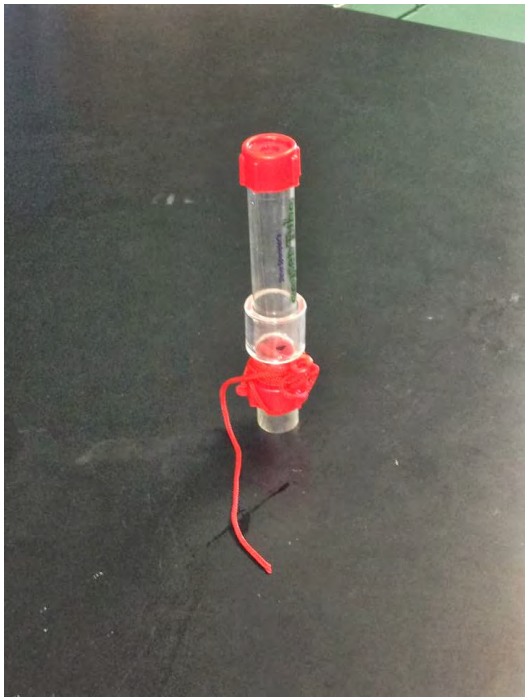
2000 cm^3 coke bottle = 5.5 m geyser

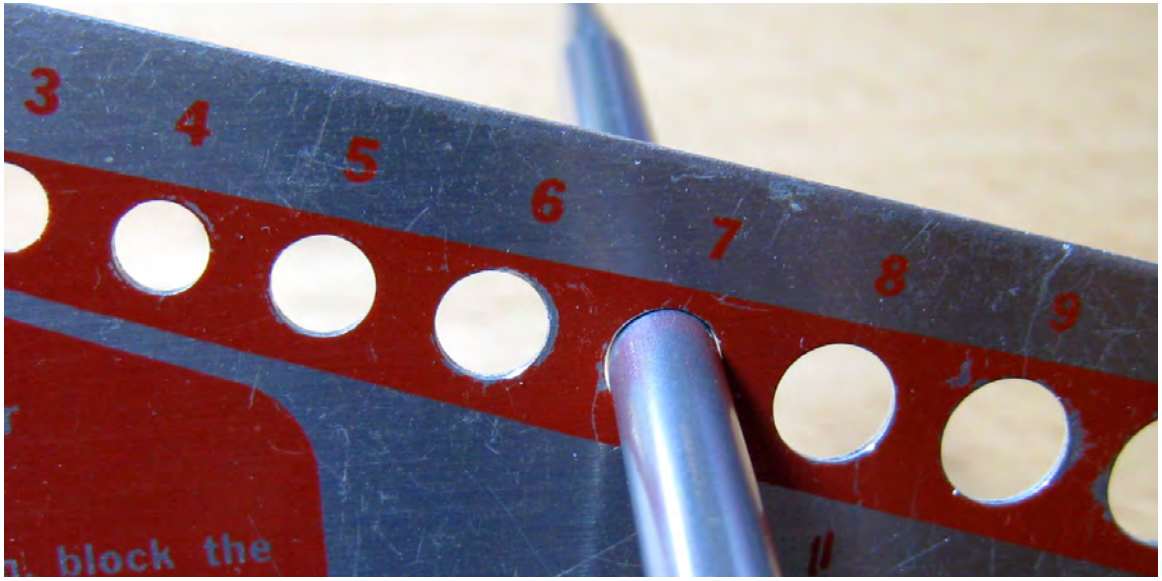
- Our results

250 cm^3 coke bottle = 1.7 m geyser

If we had more time …..

- Check if making the hole where the coke leaves the bottle smaller makes the geyser higher






THANK
YOU!