

[REDACTED]

FIZZING

AND

FOAMING

Written by [REDACTED]

Group: [REDACTED] and [REDACTED]

FIZZING AND FOAMING

EXPERIMENT

SENSE USED: Sight

TITLE: Fizzing and Foaming

AIM: To investigate the sugar levels of different liquids without looking at the ingredients on the back of the bottle. This is done by seeing which liquid fizzes the most when added to baking soda (bicarbonate sodium) and laundry detergent.

HYPOTHESIS: Out of sprite, coke, creaming soda, fanta and water, I think coke will fizz the most because it has a reputation of being one of the most fizziest soft drinks which mean: it has high sugar levels.

EQUIPMENT:

- 15cm^3 (1 tablespoon) of baking soda (sodium bicarbonate)
- 15cm^3 (1 tablespoon) of laundry detergent
- about 180 millilitres ($\frac{3}{4}$ cup) of liquid
- about 60 millilitres ($\frac{1}{4}$ cup) of vinegar
- a 400 millilitre drinking glass or a drinking glass marking the measurements of millilitres on it.
- a water proof (plastic or metal) tray
- a tablespoon

METHOD:

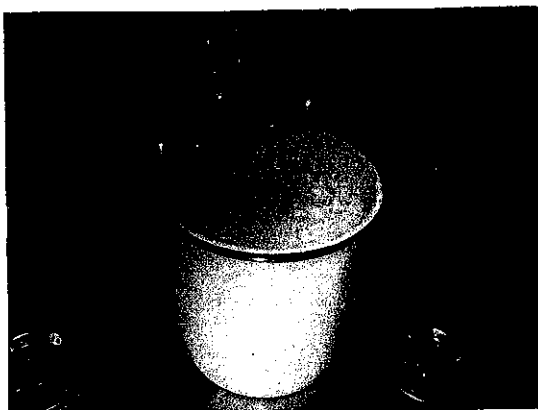
1. Place the drinking glass on the tray.
2. Add a tablespoon each of baking soda and laundry detergent into the glass.
3. Add 180 millilitres of liquid into the drinking glass.

4. Gently stir the mixture to combine the contents of the glass.
5. Quickly after that, pour about 60 millilitres of vinegar into the mixture so you can observe the fizzing and foaming effect.
(The mixture will now foam up and over the brim of the glass, smothering the tray with a layer of froth with tiny bubbles)
6. Measure the amount after it has risen.

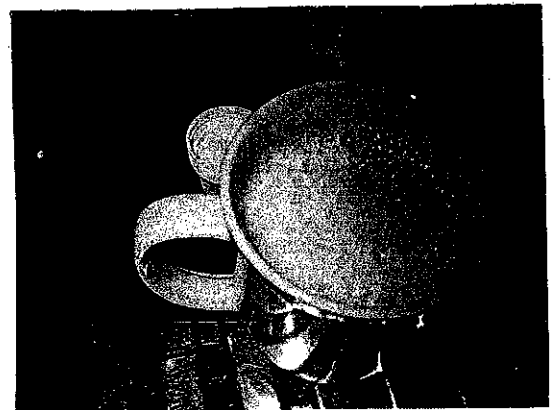
ACTUAL TEST:

Once we finished our pilot testing, we brought more soft drink for the actual testing. Everything was going to plan and most of the results from the pilot testing to the actual test were mostly the same. For the actual test we decided to put 2 tablespoons of vinegar in order for it to rise more than in the pilot tests. After a while, it wasn't working out well so we kept it to 1 tablespoon. We repeated this process 2 more times and recorded the results in our log book. In the end, our results were all correct and everything was going well.

Examples ↴



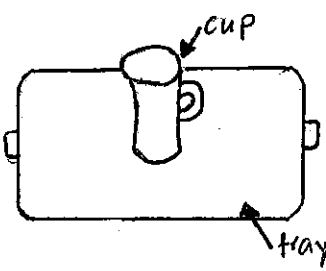
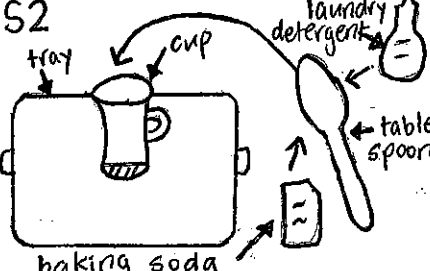
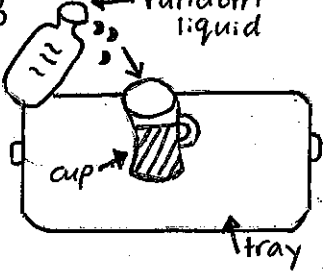
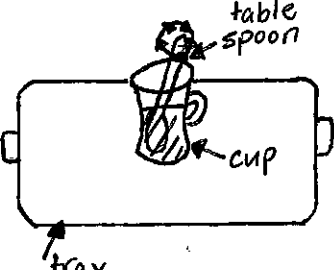
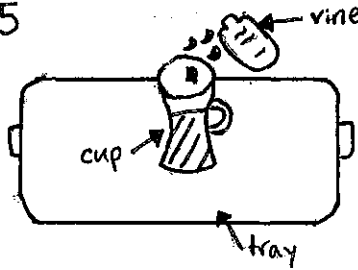
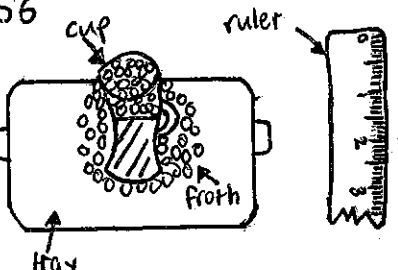
Coke



Fanta

PILOT TEST:

Our pilot tests were actually a bit more different than the actual test. For a start, we thought that instead of having the order of putting the ingredients into the cup as baking soda, laundry liquid, fizzy drink or water and vinegar, we decided to change it to fizzy drink or water, baking soda, laundry liquid and finally vinegar. Unfortunately, it was proved unsuccessful so we stuck to the old order. We did many pilot tests to determine whether the test was going to work. Altogether, we are pretty lucky that we had done so many pilot tests or otherwise we would have made so many mistakes.

STEPS TO MAKE EXPERIMENT !		
<p>S1</p> 	<p>S2</p> 	<p>S3</p> 
<p>Place the drinking glass on the tray.</p>	<p>Add a table spoon each of baking soda and laundry detergent into the glass.</p>	<p>Add 180 millilitres of any liquid into the drinking glass.</p>
<p>S4</p> 	<p>S5</p> 	<p>S6</p> 
<p>Gently stir the mixture to combine the contents of the glass.</p>	<p>Quickly after that, pour about 60 mls of vinegar into the mixture so the fizzing effect is created.</p>	<p>Measure the amount after it has risen.</p>

RESULTS

PILOT TEST :

The results we got from the pilot tests were somewhat confusing because for example, our test 1 and test 2 of pilot tests went from 390 millilitres to 340 millilitres. We found this very unusual because usually a liquid (especially fizzy drink) will not decrease by 50 millilitres.

For the results from sprite, we got 390 millilitres for our first pilot test and for the second, we got 340 millilitres. Like I said before these results were quite surprising. Our coke results was a bit more consistent than sprite. For the first pilot test, we got 320 millilitres and for the second one, we got 280 millilitres. We were actually shocked about these results because that means sprite had higher results than coke which means sprite has more sugar than coke. That also means that our hypothesis was wrong too.

Our next pilot test results were on creaming soda. The results for the first test was 220 millilitres and the second one was 250 millilitres. These results were quite normal and we were satisfied with these results. The next liquid we tested was fanta. Its first test was measured as 300 millilitres and the second was 320 millilitres. Fanta actually turned out really well and was better than we expected. Our final liquid we tested was water. Water's results came in as a low 210 millilitres for test 1 and 220 millilitres for test 2. At least the 2 tests left only a small margin between the two which means it is more precise.

In the end, most of our results were quite consistent and accurate except for one or two.

ACTUAL TEST:




Most of the results for our actual test were mostly good except for a few. Still we were expecting a little bit more than it was.

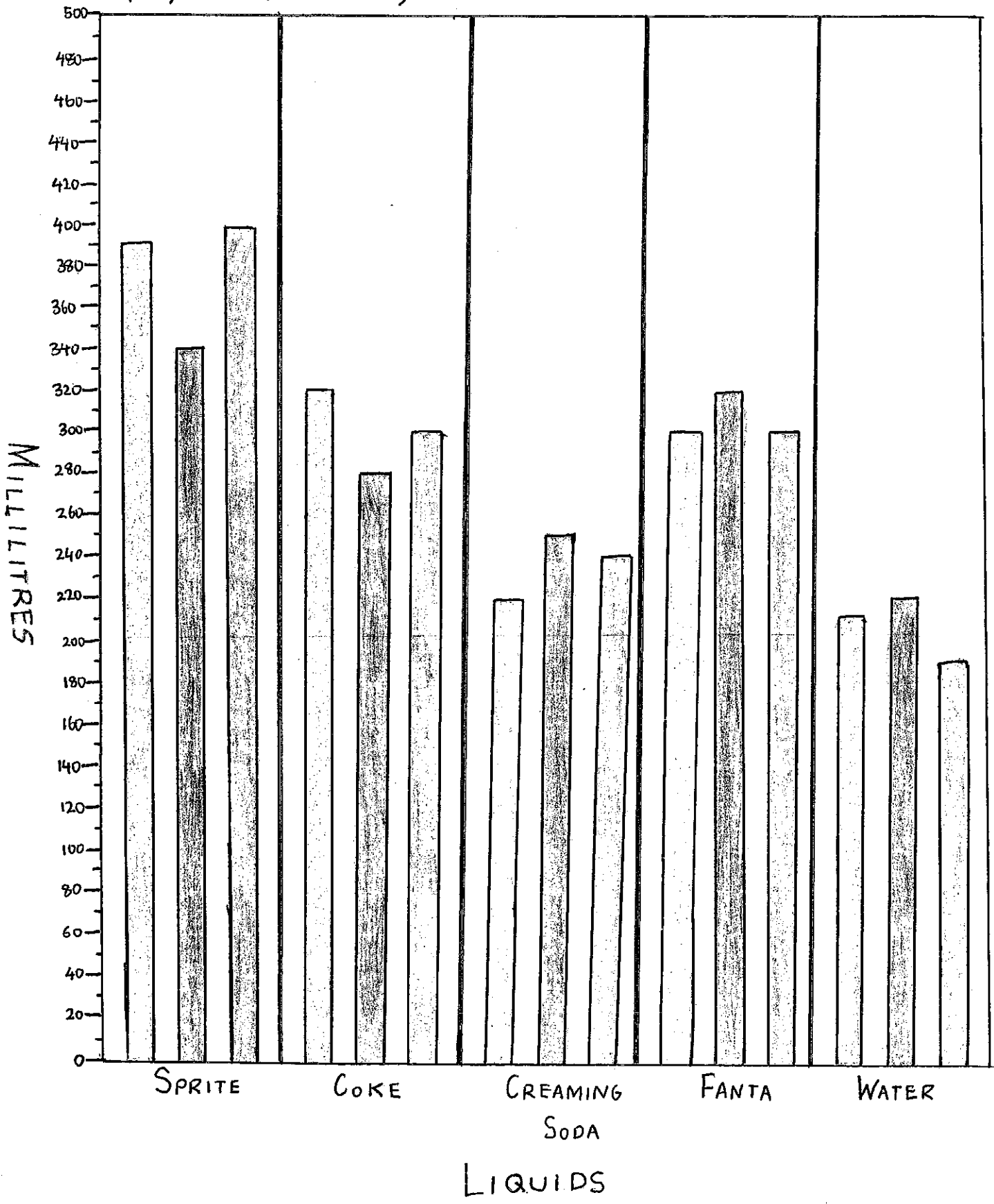
Firstly starting off with sprite. The results for the actual test was 400 millilitres. We were actually pleased with these results because it was even higher than both our 2 pilot tests. It also fizzed up well and for once brimmed over the top. The next test we did was coke. Coke rose up to a height of 300 millilitres. We were happy with these results but we were still expecting a little more.

The third liquid we tested was creaming soda. Creaming soda measured to 240 millilitres. Altogether including pilot tests, creaming soda actually didn't go very well at all. It is even close to the results of water. Next, we started testing fanta. Fanta ended up reaching to 300 millilitres which is a great achievement. I never knew that fanta would have the same sugar levels of coke! Finally, we tested water. Water was quite disappointing because it became even less than both the pilot tests. It went down to 190 millilitres.

In conclusion, the liquids we just tested was the actual test so these are the most accurate and the results we are going to be using throughout our whole ~~experiment~~ experiment.

GRAPH

KEY:  Test 1 (Pilot test) |  Test 2 (Pilot test) |  Test 3 (Actual Test)



RESULTS FROM GRAPH:

Sprite:

Test 1 - 390 millilitres

Test 2 - 340 millilitres

Test 3 - 400 millilitres

Coke:

Test 1 - 320 millilitres

Test 2 - 280 millilitres

Test 3 - 300 millilitres

Creaming Soda:

Test 1 - 220 millilitres

Test 2 - 250 millilitres

Test 3 - 240 millilitres

Fanta:

Test 1 - 300 millilitres

Test 2 - 320 millilitres

Test 3 - 300 millilitres

Water:

Test 1 - 210 millilitres

Test 2 - 220 millilitres

Test 3 - 190 millilitres

DISCUSSION

PILOT TEST:

An interesting fact I should mention is that the results for our pilot tests were not consistent and in fact would be around 10-20 millilitres more or less than the actual test. This seemed to us a little bit strange because how could the results be so different. Well this is why.

When we first started doing the testing, we misread table spoon for teaspoon. This made the results go haywire because it was barely even fizzing up. It was only after a couple of days since we realised our mistake.

Even if we figured out that it was a table spoon not a teaspoon, the results weren't still very consistent to what they should have been. For example, our first pilot test for sprite was 390 millilitres but then our second pilot test went down to 340 millilitres. We checked if it was anything to do with our ingredients or measurements but it wasn't.

We are not precisely sure of the real reason but we have a few theories. Firstly, ~~the bottles~~ and some other classmates shook the bottles one day when we were testing. This incident may have affected the results of some of our tests because when we used it, it was very fizzy and almost came out of the bottle. Also, it got moved around a lot when taking it home.

Another theory is that the weather affecting the results of the tests. On the first day, it was quite sunny but on the next, it was more cooler and windier than the first day. This means that the temperature could have made mixture react differently or Sprite had something in it that was affected by the cooler and windier temperature.

In conclusion, our pilot tests were a bit varied and confusing but luckily our actual test worked out to be a success.

ACTUAL TEST:

Before we started the actual test, we decided to do a few more practice experiments before we do the real one. In the practice tests, the results seemed to be steady so we decided to go ahead with the actual test.

Because our actual test was the test that is the most important one and these were going to be the results we were going to use as our final results, we thought of buying new bottles of every liquid so we have the most accurate results. When we started with sprite, everything was going well. It was fizzing up just as it should and surprisingly the results were quite close to the pilot tests. This was definitely good news. We realised that the answer to most of our problems were because of the freshness of the ingredients.

The sprite was so good, it even overflowed a lot over the brim of the cup which was very exciting to watch.

The only strange occurrence was the water results. Obviously, the results for water were definitely going to be low because water has barely any sugar in it but water went even lower. This was disappointing to see so we sat down and had a discussion on what the possible answers for this could be. We thought maybe we got something wrong in the measurements but we remembered clearly that we didn't do anything wrong.

Finally, we came to a conclusion to restart the test again. We put everything into the cup and measured it extra carefully this time. Suddenly, a miracle had happened. The mixture had fizzed up to 190 millilitres. Even though that is not much, it is pretty decent for a liquid like water.

In conclusion, like our pilot tests, everything got resolved in the end. Even though we didn't know the cause of the first results, at least the second one worked.

PROBLEMS WE FACED

The main problem we faced was the weather conditions during our testing. Some of the days that we started testing, it was very sunny but later on, it became more cloudy and rainy. Also, another factor was the storage of the ingredients. We kept our ingredients in the bag-room but we realised that was not a good idea. We found a solution to this though. Everyday after the experiment is complete, we took it home and put it in the fridge so it is okay to use for the next day.

Another problem was that we expected it to fizz up all the way over the brim of the glass but not all of them did. So instead of measuring how high the froth climbed up to, we decided to measure the whole mixture including the liquid we tested. This was a really good way to measure the experiment.

Something else that we thought would have an impact on the test was how much liquid was actually in the original bottle before it has been poured. For example, the fanta bottle was smaller than the coke bottle which could have changed the sugar levels per serving in each bottle.

Altogether, most of our problems were solved in the end.

WHAT COULD BE CHANGED NEXT TIME?

This test could have been fine tuned by finding out how much sugar was already in the liquids and then putting it in the same ratio of sugar in correspondence to how much liquid is in the bottle. This strategy could have made the test much more accurate.

We could have also tried buying the drinks at exactly the same time so we make sure it is actually a fair test.

Also, to make the test more better, we could have set a particular time of the day to do our experiment and also check that we had around the same temperature when we are doing it.

I think we should have been a bit more organised with how much time we had. Because of that, we could only do 3 tests of each liquid when we were hoping to complete about 4 or 5 of each liquid. Also, if we finished it all on the same day, this would mean the temperature and light conditions would be constant.

Something else that could be changed next time is the storage conditions. When we realised that we should take it home and put it in the fridge, we should have thrown those bottles away and buy new ones just to make sure of accuracy.

In conclusion, if we did have a second chance to make our experiment better, I would definitely use it wisely.

CONCLUSION

Most of the results of our tests were almost the same except for a few. We also thought that the flavouring of the liquid might have been a factor to make the liquids fizz more. If this assumption is true, it could be a bit unfair for water.

We never thought that sprite was the best out of all of them. Even after all the tests were finished, we decided to do the experiment again with the left overs and they were still the same.

Most of our results were a little bit inconsistent each time we did the test. Also the amount of fizz when added to the ingredients was much less than we expected.

We are not exactly sure about why this happened but we do have a couple of theories.

These are:

1. There could be other compounds and ingredients that could have changed the liquids fizziness.
2. The amount of each ingredient we put into our experiment could have changed the results because it might not have been exactly accurate.

In conclusion, our whole experiment altogether was definitely a success and also we had so much fun doing it as well.

The results from most fizziest to least fizziest is sprite, coke/ fanta (tie), creaming soda and water.