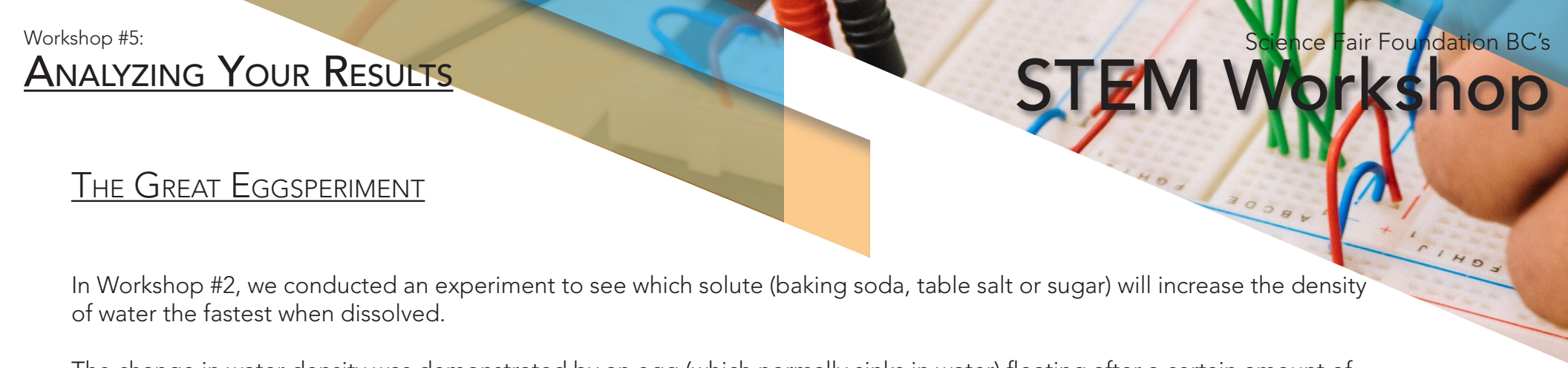


THE GREAT EGGSPERIMENT

In Workshop #2, we conducted an experiment to see which solute (baking soda, table salt or sugar) will increase the density of water the fastest when dissolved.

The change in water density was demonstrated by an egg (which normally sinks in water) floating after a certain amount of solute was added.

Want a refresher? Find Workshop #2 at www.sciencefairs.ca/learn/workshops

Our hypothesis for this experiment was:

If: I add baking soda, salt and sugar to different glasses of water

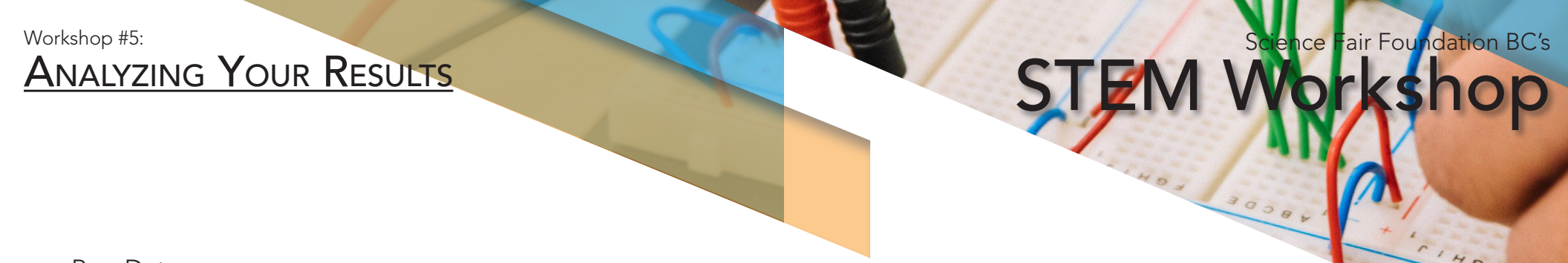
then: I will need the least amount of baking soda to make an egg float

because: baking soda is denser than salt and sugar.

The variables for this experiment were:

Controlled Variable(s) (a condition you keep the same)	Independent Variable (a condition you change)	Responding Variable (a condition that changes due to your actions)
amount of water, egg size, equipment used	type of solute used	buoyancy of the egg

Analyzing Your Results



Raw Data

Trial #	Type of Solute	# tsp of solute added
1	Baking Soda	6
	Table Salt	4
	Sugar	11
2	Baking Soda	8
	Table Salt	4
	Sugar	11
3	Baking Soda	6
	Table Salt	3
	Sugar	10
4	Baking Soda	7
	Table Salt	5
	Sugar	11
5	Baking Soda	8
	Table Salt	3
	Sugar	9
6	Baking Soda	8
	Table Salt	4
	Sugar	12

Calculate the average for each type of solute. To get the average, add all of the values together, then divide by the total number of values you have.

For baking soda, the number of tsp added for each trial were:

6 + 8 + 6 + 7 + 8 + 8 = 43

There are 6 values in total:

43 / 6 = 7.17

The average amount of baking soda added to water is 7.17 tsp.

For table salt: 4 + 4 + 3 + 5 + 3 + 4 = 23

Divide by the total number of values: 23 / 6 = 3.83

The average amount of table salt added to water is 3.83 tsp.

For sugar: 11 + 11 + 10 + 11 + 9 + 12 = 64

Divide by the total number of values: 64 / 6 = 10.67

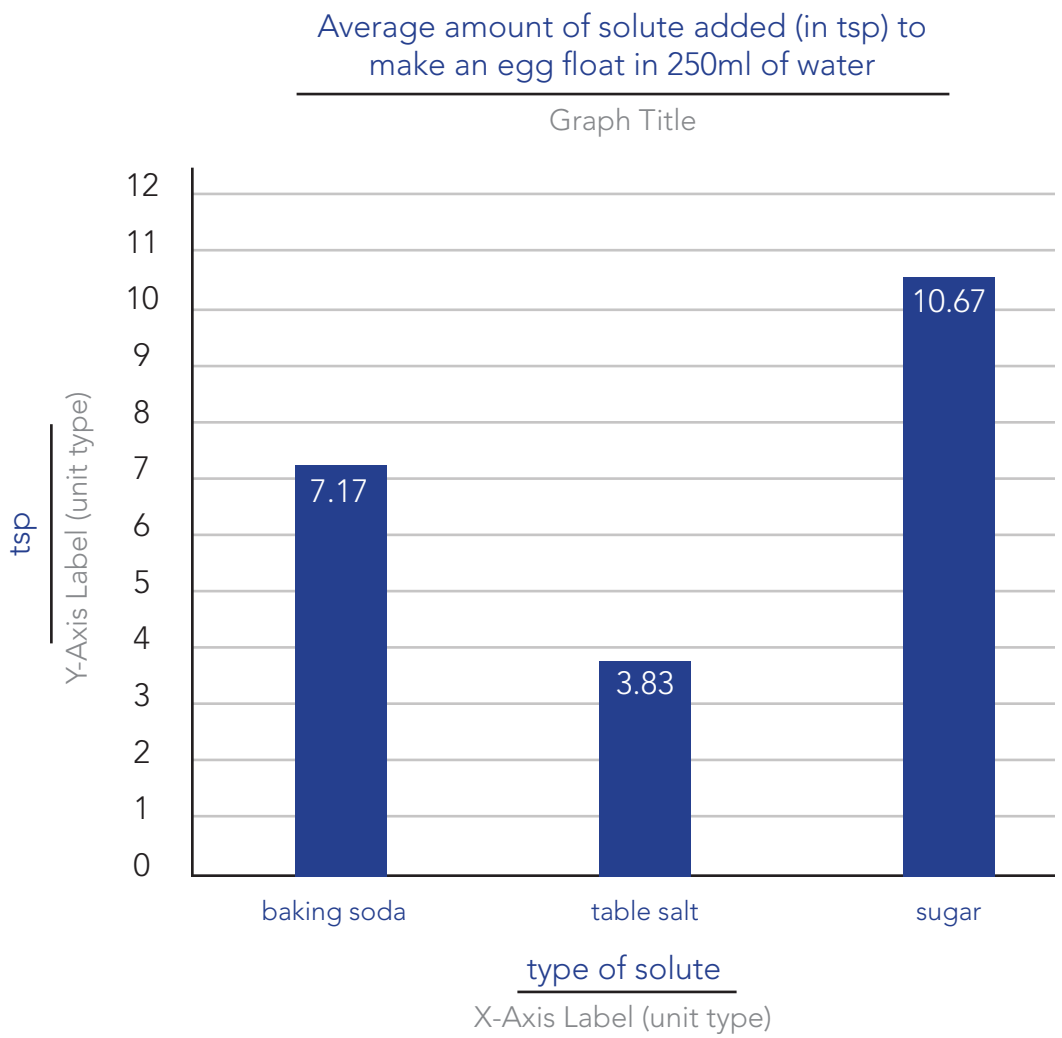
The average amount of sugar added to water is 10.67 tsp.

Analyzing Your Results

Bar Graph

Overall results of our experiment:

Average tsp of solute dissolved in water	Baking Soda	7.17
	Table Salt	3.83
	Sugar	10.67



Analyzing Your Results

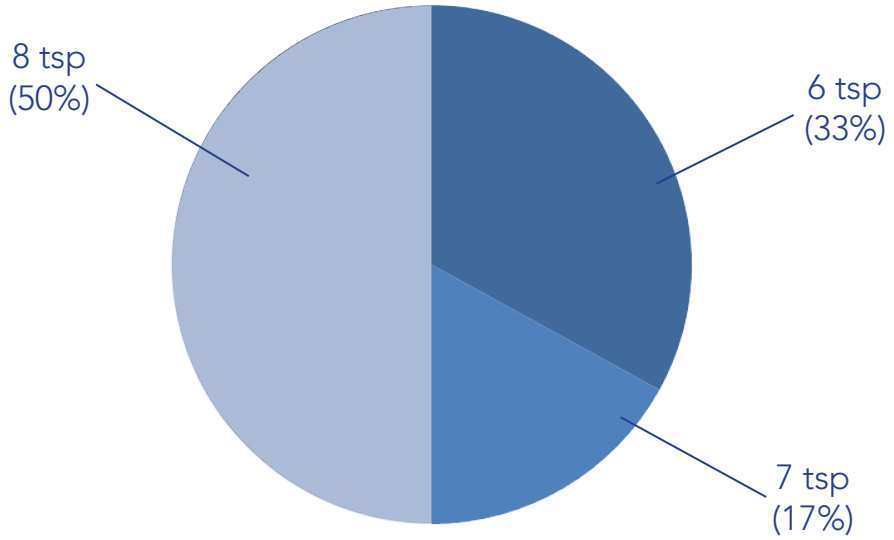
Pie Chart

Comparing our trials together:

# of tsp of Baking Soda used to make egg float	6 tsp	33%
	7 tsp	17 %
	8 tsp	50 %

Type of Solute	Trial #	# tsp of solute added
Baking Soda	1	6
	2	8
	3	6
	4	7
	5	8
	6	8

How often an egg will float after dissolving 6 tsp, 7 tsp and 8 tsp of baking soda in 250ml of water



To calculate the percentage, divide the value by the total number of values, then multiply by 100.

What percentage was 6 tsp enough to make the egg float?

2 / 6 = 0.33 * 100 = 33%

7 tsp?

1 / 6 = 0.17 * 100 = 17 %

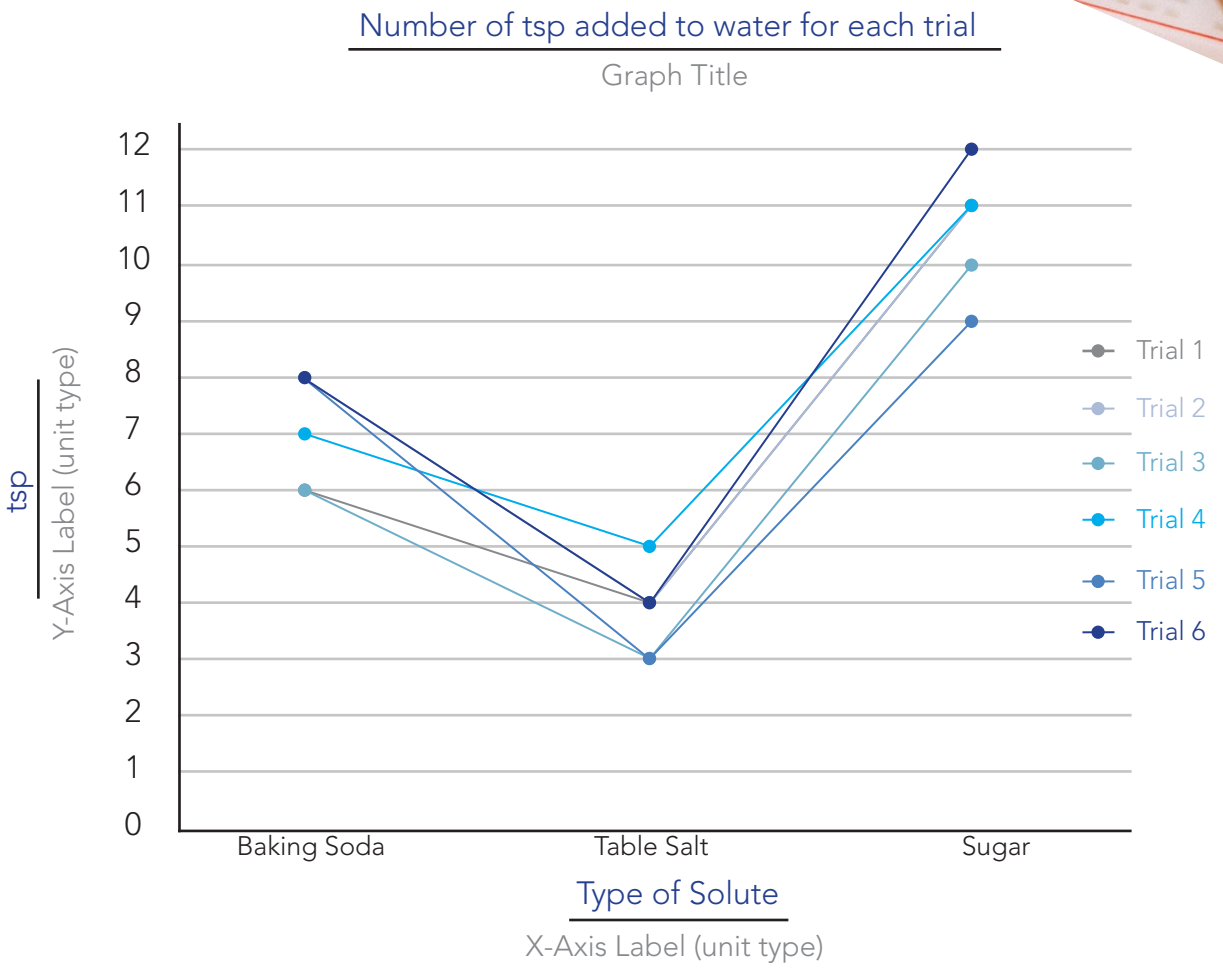
8 tsp?

3 / 6 = 0.50 * 100 = 50 %

Analyzing Your Results

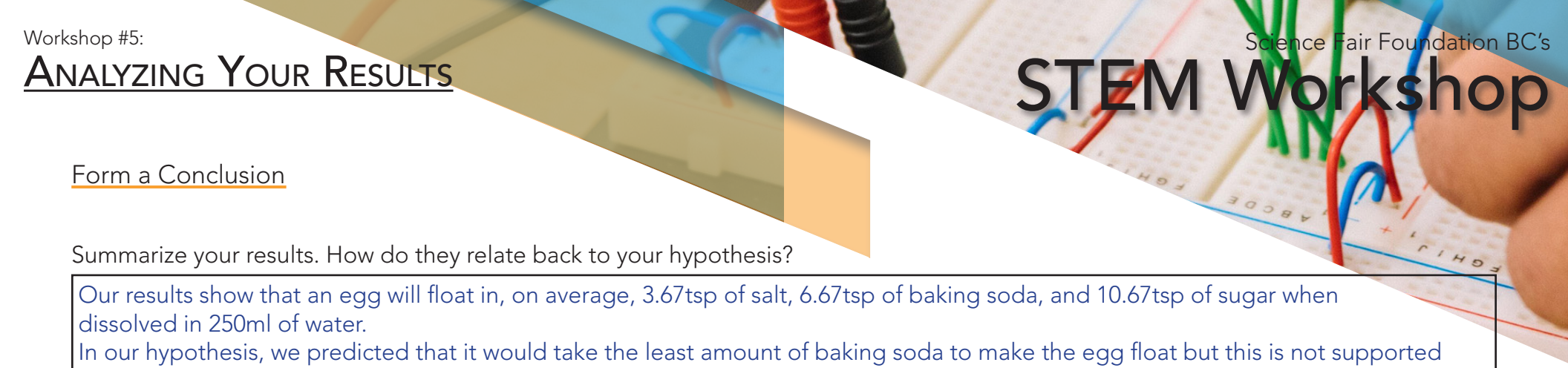
Line Graph

Trial #	Type of Solute	# tsp of solute added
1	Baking Soda	6
	Table Salt	4
	Sugar	11
2	Baking Soda	8
	Table Salt	4
	Sugar	11
3	Baking Soda	6
	Table Salt	3
	Sugar	10
4	Baking Soda	7
	Table Salt	5
	Sugar	11
5	Baking Soda	8
	Table Salt	3
	Sugar	9
6	Baking Soda	8
	Table Salt	4
	Sugar	12



The data from our Eggsperiment is not well-suited to create a line graph. Can you figure out why?

Analyzing Your Results



Form a Conclusion

Summarize your results. How do they relate back to your hypothesis?

Our results show that an egg will float in, on average, 3.67tsp of salt, 6.67tsp of baking soda, and 10.67tsp of sugar when dissolved in 250ml of water.
In our hypothesis, we predicted that it would take the least amount of baking soda to make the egg float but this is not supported by our results. According to our results, salt requires the least amount when dissolved in water to make the egg float.

Do your results support or contradict your hypothesis? Or do your results meet your design criteria (for innovations)?

Our results do not support our hypothesis. We thought the baking soda would make the water denser the fastest, but it didn't, the salt did. We noticed the baking soda did not fully dissolve in the water, even after additional stirring, which may have reduced how effective the baking soda was at increasing the water's density compared to the same amount of salt.

What is the relationship between the independent and dependent variables (if applicable)?

Our independent variable was the type of each substance (baking soda, table salt or sugar) added to the water.
Our dependent variable was the buoyancy of the egg.
When we increased the amount of substance in the water, this impacted the buoyancy of the egg, resulting in the egg floating after enough substance is added to the water.

How was your project experiment/design effective at testing your hypothesis? How could it be improved?

Our experiment was effective at showing how different solutes, when dissolved in water, can affect the density of water, as presented in the buoyancy of an egg. Our experiment could be improved by using smaller increments of measurement, or using weight instead of volume to measure solutes, to provide more accurate measurements.

If you were to take this project further, what would be your next step? How would you continue?

If we were to continue this project, we would try different solutes with a wider range of densities. We would also do more research into the solubility of the substances we're using in water.