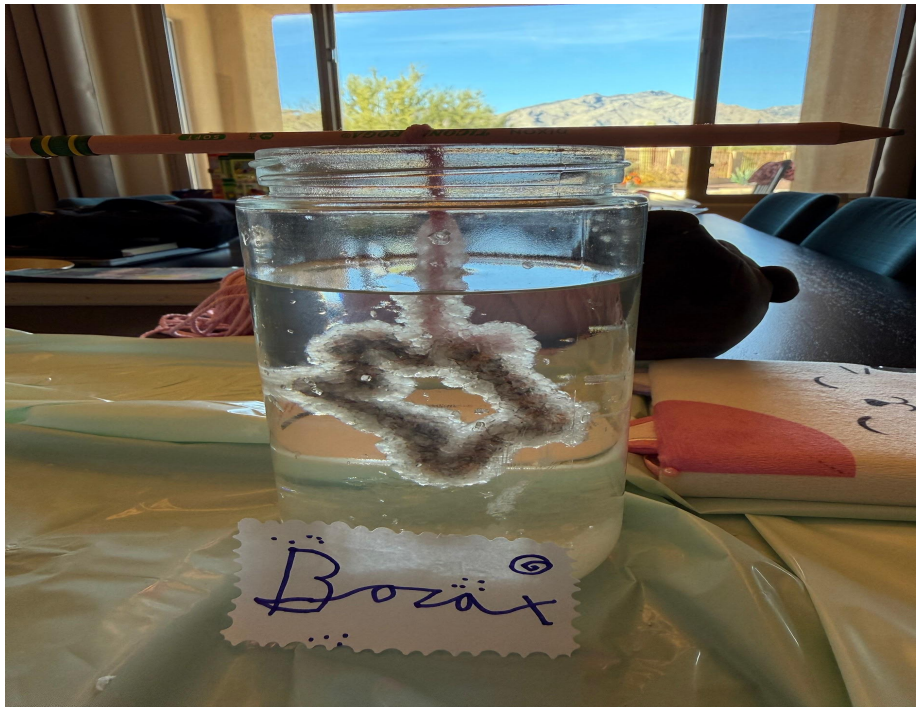
Crystal Creations

Introduction

I chose to grow crystals because all my life I thought they were beautiful and maybe even a little magical. This was a wonderful chance to grow my own crystals and, in the process, learn more about them.



The big question

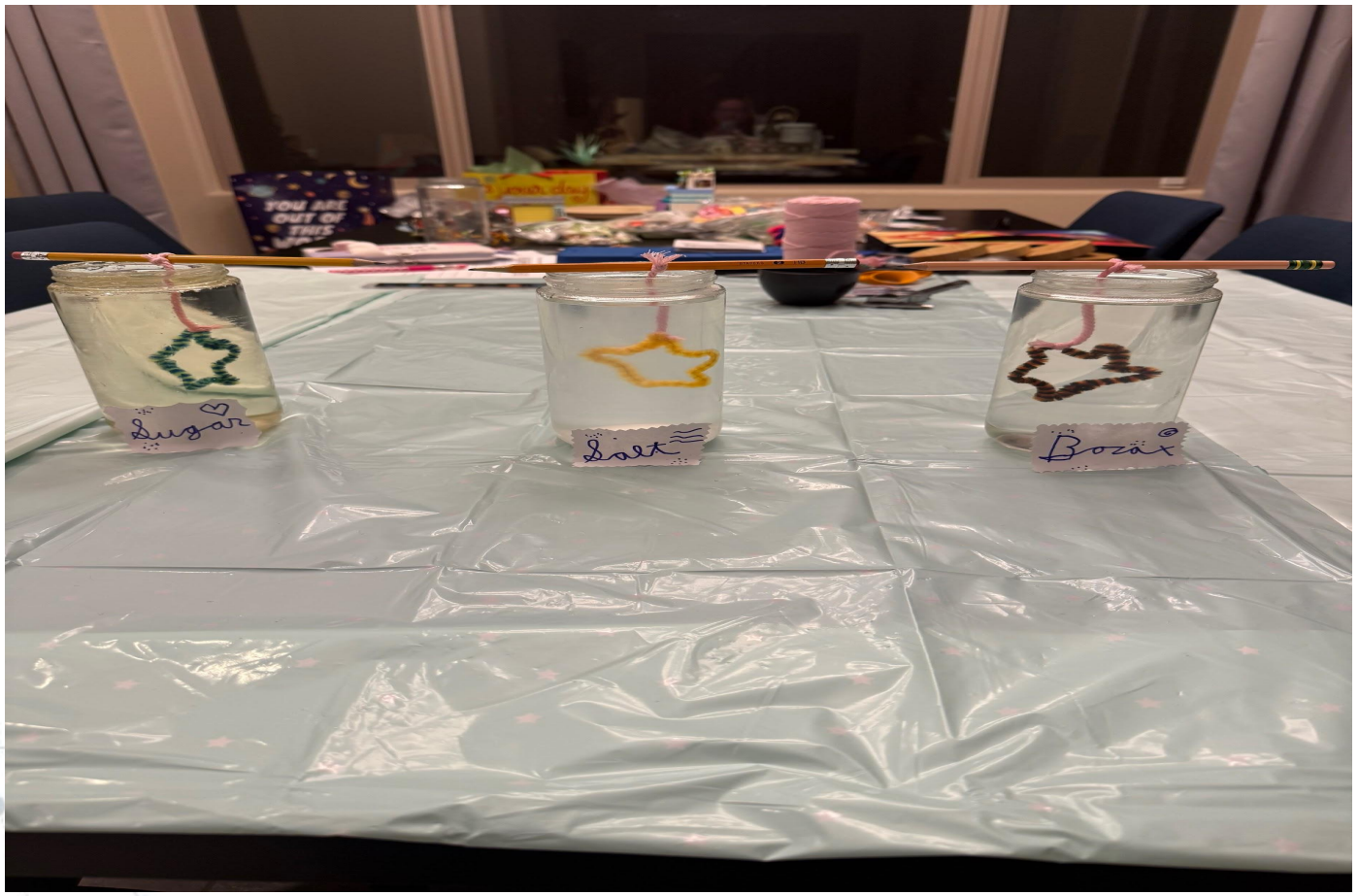
When growing crystals, which solution will produce the biggest crystals under the same conditions: Sugar, Salt, or Borax?

Background research

The primary engineering problem in this experiment was how to produce crystals using different chemical solutions, but under the same, exact conditions. I had to factor in many things, such as container size, length of the experiment, temperature of the water, and many other factors which had to be identical for each solution.

Hypothesis

If I grow crystals using salt, sugar, and borax solutions under the same conditions for one week, then the borax solution will grow the biggest crystals, because borax crystals grow faster and larger than salt or sugar crystals.



Procedure

Step 1. Get three glass jars that are the same size, and label them “Salt”, “Sugar”, and “Borax”.
Step 2. Heat 3 cups of water for each jar with help from my dad.
Step 3. Stir sugar into the first jar, salt into the second jar, and borax into the third jar until no more will dissolve in the solution.
Step 4. Tie a piece of string to a pencil, and place one string into each jar so it hangs in the water and does not touch the bottom or the sides.
Step 5. Place all 3 jars in the same spot in the room so they receive identical light and temperature.
Step 6. Every 24 hours, look at the crystals and measure how big they are using digital calipers (all measurements in millimeters).
Step 7. Write down all measurements and observations each day for one week.
Step 8. At the end of one week, compare the crystals from all three jars and determine which solution grew the biggest crystals.

Materials

Sugar

Salt

Borax

Hot water

3 same-size glass jars

3 pieces of string

3 pencils

Measuring cup

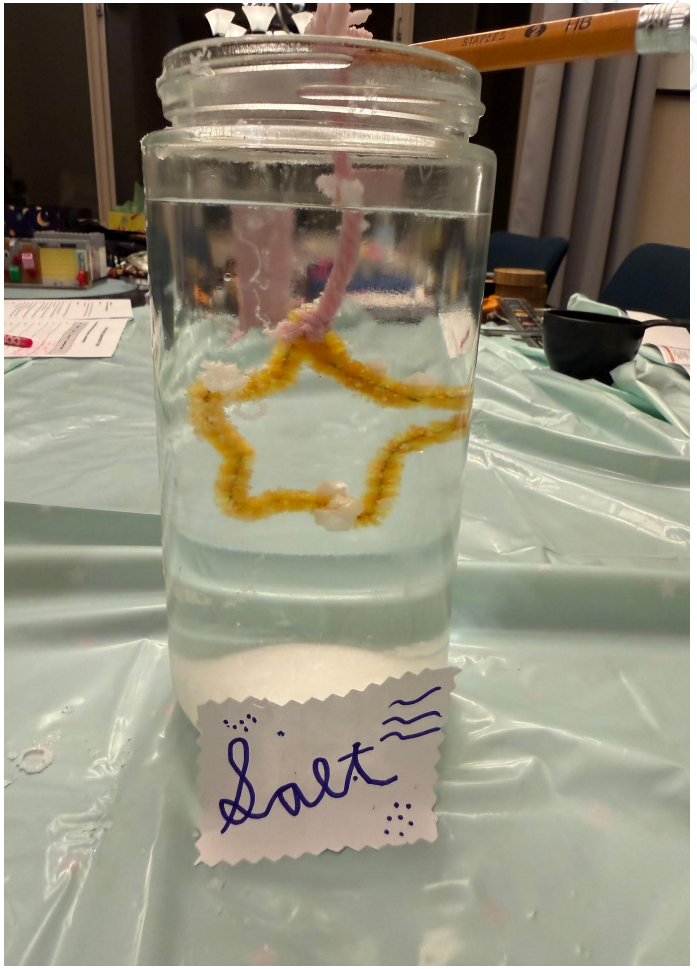
Measuring spoons

Spoon for stirring

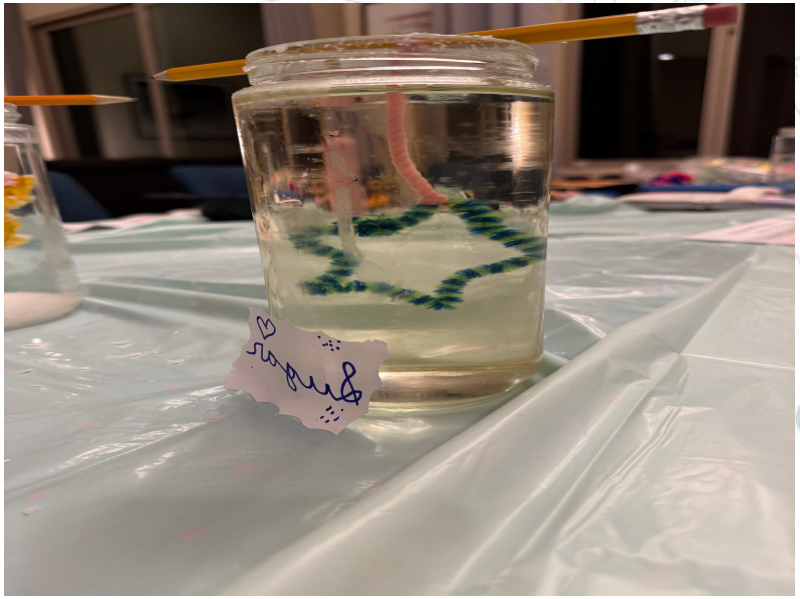
Ruler

Labels and marker

Notebook or paper for recording data



Results: Sugar

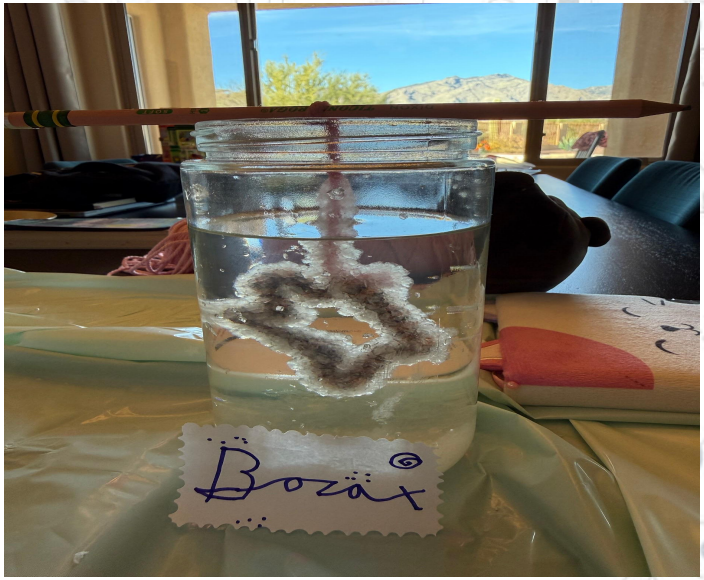


Day	mm	What Happened
1	0.00	I mixed 5 cups of sugar into the water
2	0.00	No crystals formed
3	0.00	No crystals formed
4	0.00	No crystals formed
5	0.00	No crystals formed
6	0.00	No crystals formed
7	0.00	No crystals formed

Results: salt

Day	mm	What Happened
1	0.00	I mixed 1 cup of salt into the water
2	7.86	A few small salt crystals formed
3	10.55	More crystals formed and grew bigger
4	12.89	Crystals kept growing
5	14.82	Crystals spread up the string and pencil
6	14.82	Crystals stopped growing but spread more
7	14.82	No more size growth

Results: borax

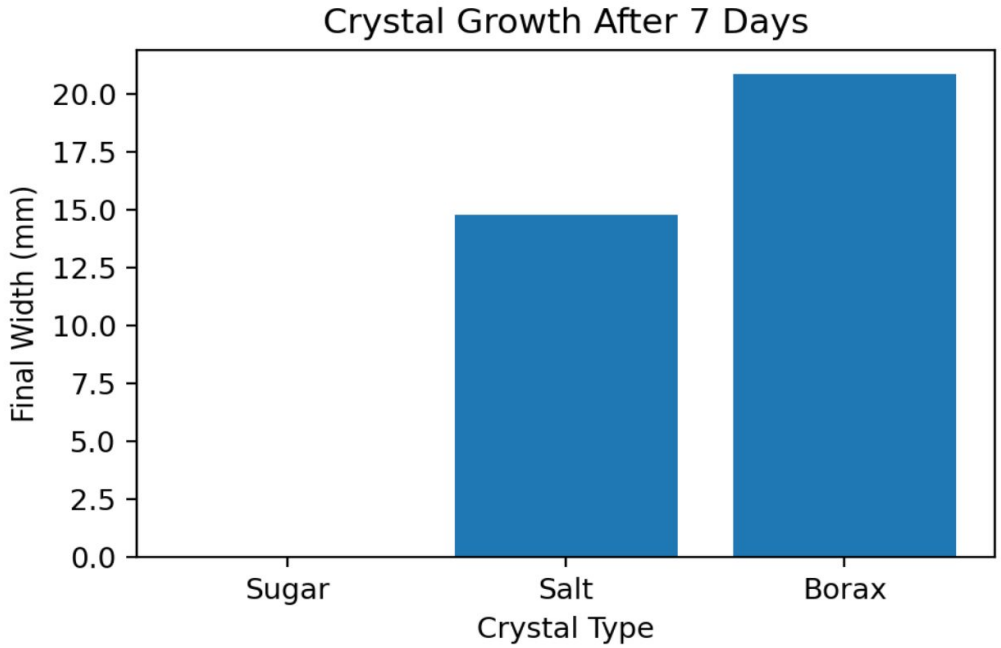


Day	mm	What Happened
1	0.00	I mixed 10 tablespoons of borax into the water
2	15.97	Crystals grew very fast and very large
3	17.52	Crystals kept growing but slower
4	18.59	Crystals got bigger
5	20.05	Crystals continued to grow
6	20.88	Crystals almost stopped growing
7	20.88	Crystal growth stopped

Discussion and interpretation

Based on the data of my experiment, borax grew the widest crystals proving my hypothesis correct. Salt grew medium-width crystals. Sugar did not grow any crystals at all in my experiment. This shows that different materials grow crystals in different

Crystal Growth Bar Chart



Implications and ideas future research

Implications & Future Research

This project matters because crystals are used in real life, like in medicine, food, and science labs. Learning how crystals grow can help scientists understand how to make them better.

In the future, I would try changing the room temperature, letting the crystals grow for more time, or mixing the sugar solution differently since no sugar crystals grew in my experiment.

My final message is that even when something doesn't work, like the sugar crystals, it still helps us learn and ask better questions next time.

References

Bibliography

- *30 Interesting Crystal Facts For Kids*. CoolKidFacts.com, 30 Nov. 2025, https://www.coolkidfacts.com/crystal-facts-for-kids/. Accessed December 15, 2025.

- *Crystals - Science for Kids*. Ducksters, https://www.ducksters.com/science/crystals.php. Accessed December 15, 2025.

- *Crazy Crystal Creations: How to Grow the Best and the Largest Crystals*. ScienceBuddies.org, https://www.sciencebuddies.org/science-fair-projects/project-ideas/Chem_p082/chemistry/how-to-grow-the-best-and-the-largest-crystals. December 15, 2025.