Temperature and Sugar Crystals

2nd Grade
(no name on the slide show)

Reminders:
*Students should email safety plans to Mrs. Hwande and obtain approval **before** starting their project. chrishwande@claytonschools.net
*Students should write/type a dated entry in their logbook EVERY time they work on their project. This is a separate document.

Testable Question: 5 pts - The testable question should ask a specific, measurable, cause and effect question.

How does temperature affect how quickly sugar crystals grow?

Prediction: 5 pts - The prediction should highlight a reasonable outcome based on a specific change.

I think crystals will grow faster with a higher temperature. The jar kept at room temperature will have more crystals than the jar in the refrigerator.

Procedure: 5pts - Describe the step-by-step process you have planned in a way that someone else could repeat the same process. Be detailed and as clear as possible. Use as many or as few steps as you need.

1. Mix 3 cups of sugar and 1 cup of water in saucepan
2. Heat mixture on stovetop, while constantly stirring, until it turns clear and starts to bubble
3. Let it cool for 5 minutes
4. Pour equal amounts of mixture into two identical jars
5. Hang an identical string from a pencil at the top of each jar so that the string only touches liquid
6. Place one jar in a place away from windows so the temperature stays constant at 72 degrees
7. Place the second jar in the refrigerator so the temperature stays constant at 38 degrees
8. Observe crystal growth day to day to see which grows more quickly

Background: 5 pts - Describe why this project was selected and share what you found out in your research. Explain why this project is important.

I chose this project because I am interested in rocks, crystals and gems. I thought growing crystals would teach me more about how they form.

In my research I found out that crystals grow faster in warmer temperatures. My jars turned into large clusters of crystals and did not grow on the string. I think this is because of the amount of liquid I put in the jars. It was about 12 ounces each.

This project is important because crystals grow in nature. We saw many crystals in a cave we visited recently. This taught me about how crystals can grow faster or slower if the temperature is high or low.

Constant Conditions: 10 pts - Identify your independent variable, dependent variable, and constant conditions. Be sure to measure in metric measurements.

Independent Variable: Temperature

Dependent Variable: Amount of sugar crystal growth

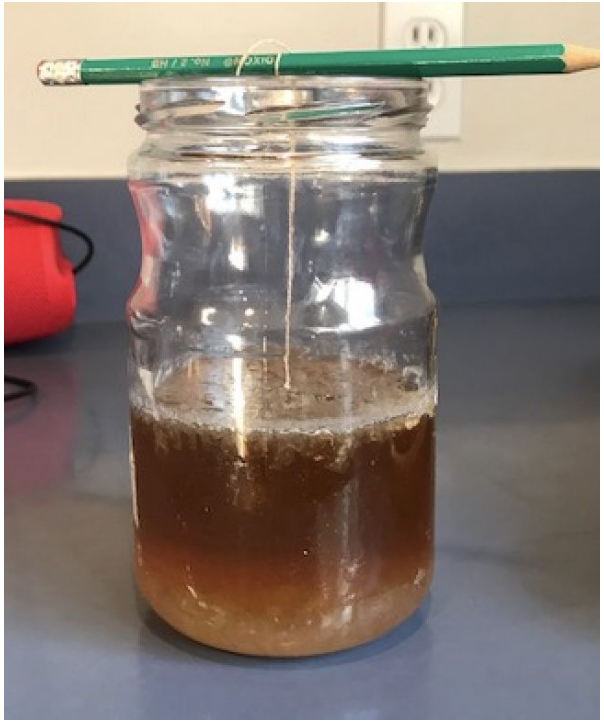
Constant Conditions: Mixture is the same in every way and the jar and string are exactly the same.

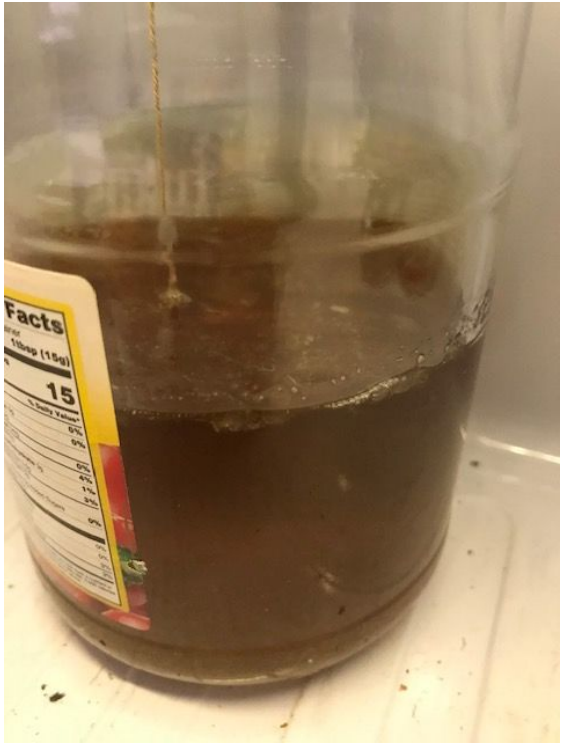
Data and Trials: 15 pts & 5 pts -

Heating the liquid to start experiment (February 16)

Observation 1 February 24

Picture on the left is room temperature. Picture on the right is cold temperature. Crystal growth at top and bottom of room temperature jar is thick and clustered. Cold jar has some floating crystals in liquid.

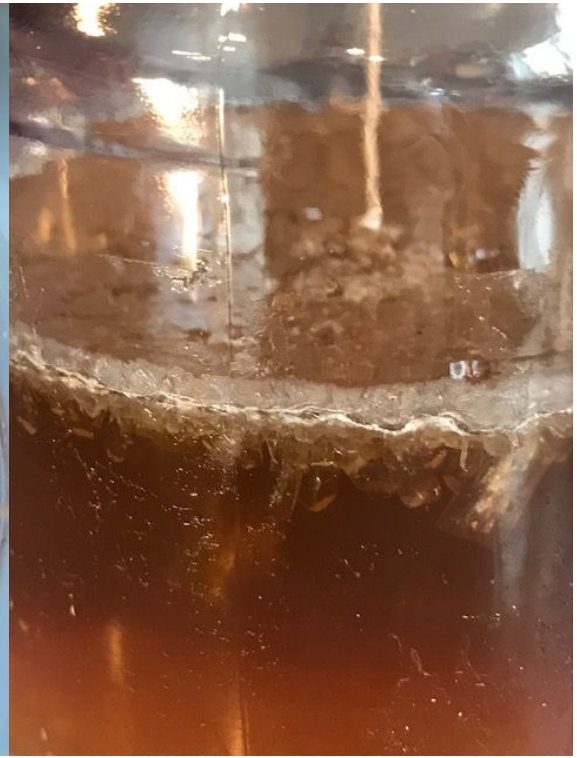




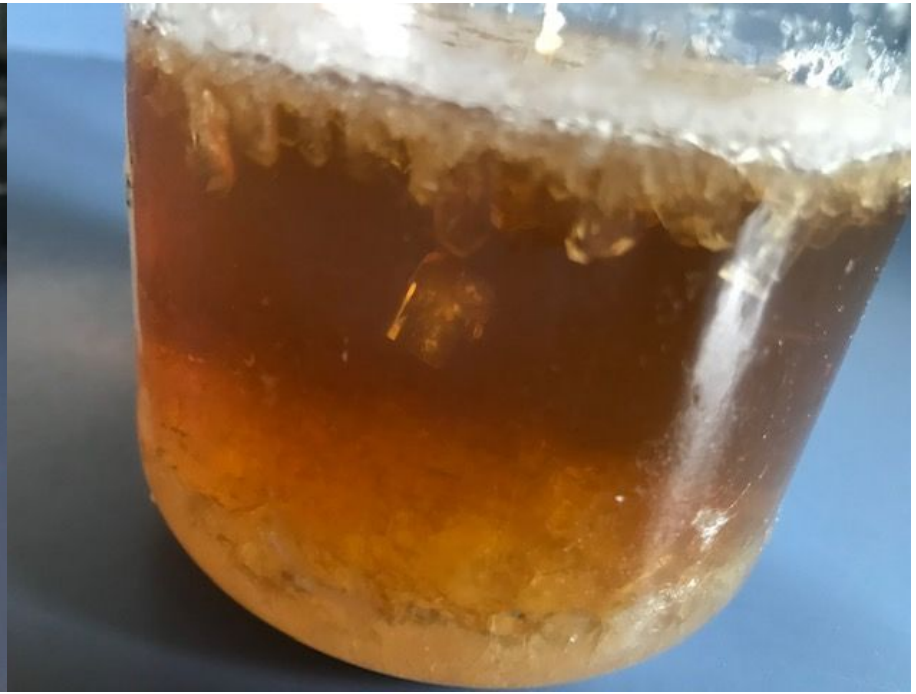
Observation 2 March 3

Picture on left is room temperature. The jar is full of hard crystals. No liquid remains in the jar.

Picture on the right is cold jar. There are more crystals at the top of the jar but there is still liquid in the jar.



Observation 3 March 9



Observation 3 March 9

Jar on the right is room temperature jar. You can see the full crystals in the whole jar. The top and the bottom of the jar have a lot of large crystals on them.

Jar on the left is the cold temperature jar. You can see crystal growth on the top of the liquid. It is a solid top of crystals with liquid beneath it. There are small crystals at the bottom of the jar.

There is much less crystal growth in the cold temperature jar.

Conclusion and Reflection: 10 pts - Share what you learned. Were there any surprises? What would you do differently or to continue the project?

I found out that crystals grow more and also grow larger in warmer temperatures. Cold temperatures slow crystal growth.

I was surprised that the jars both turned into big chunks of crystals. I thought that crystals would grow smaller on the strings.

If I did this project again I would add less liquid so crystals might grow on the strings and not filling the whole jar.