

Rock Candy Crystals

Overview:Candy, anyone? That’s what you’ll make today, and you’ll learn about crystals as you go! Yum!

What to Learn:You’ll find out how to make a supersaturated solid solution by heating up water and adding more and more sugar. Once your crystals form, you’ll see the regular repeating pattern that all crystals have.

Materials

- sauce pan
- spoon
- stove or other heating apparatus
- 8 cups granulated sugar
- 3 cups water
- measuring cup
- glass jar (cleaned out pickle, jam or may jars work great)
- aluminum foil
- wooden skewer (string or yarn will also work)
- tape
- food coloring is optional but fun!

Experiment

1. Place 3 cups of water in a sauce pan. Add 8 cups of sugar, and stir over medium heat approximately 4-7 minutes. You should be able to get all the sugar to dissolve. You can add more sugar until you start to see undissolved bits at the bottom of the pan. If this happens, just add a bit of water until they disappear. This is called a supersaturated solid solution.
2. Add food coloring to the water, if desired.
3. Allow solution to cool to about 130°, and then pour into the jar.
4. Place an aluminum foil “lid” on the jar. Poke a small hole in the middle and place a wooden skewer (or piece of string) through the hole. Make sure the stick doesn’t touch the sides or bottom of the jar. Attach skewer in place with a piece of tape. (OPTIONAL: Before placing skewer in jar, “seed” a wet stick by sprinkling sugar over it then inserting up through bottom of aluminum foil lid so sugared end is resting in the solution.)
5. Put the whole thing aside in a warm, quiet place for 2 days to a week to get started. Some crystals will take up to six months for form large structures (as seen in image).

Reading

Crystals are formed when atoms line up in patterns and solidify. There are crystals everywhere — in the form of salt, sugar, sand, diamonds, quartz, and many more! To make crystals, you need to make a very special kind of solution called a supersaturated solid solution. This means a solution has been made more concentrated than normally possible.

Answers to Exercises

1. Why was it necessary to make a supersaturated solid solution to get crystals? (With a normally saturated solution, the sugar crystals would simply dissolve in the water to make hot sugar water. When it cooled, it would make cool sugar water. With a supersaturated solution, the sugar “falls out” of solution as it cools, because it can no longer hold all of the sugar, and crystals are formed)
2. A solute is the material you dissolve. And a solvent is what you dissolve something in. What was the solute in today’s experiment? (sugar) What was the solvent? (water)
3. Sometimes when this experiment is done, students end up with a huge chunk of sugar right away. What could have happened? (they dissolved too much sugar in the water)
4. What might be the problem if crystals don’t form, or take weeks and weeks to form? (not enough sugar was added; the solution was not supersaturated)