



Rock Candy

Primary Audience: 9th – 10th

Description: Learn about crystals by making Rock Candy!

Key Words: Sugar, Crystals

Materials:

- ½ cup cold water
- 1 ½ cups granulated sugar
- 1 tablespoon
- 1 large wooden spoon
- 1 small pan
- 1 piece of clean heavy cotton string (6 in. long)
- A little extra sugar
- Pencil
- Tall glass or jar

Instructions:

1. Start in the morning. Tie one end of the string around the pencil. Lay the pencil across the mouth of the glass or jar so that the string hangs down into the glass. Trim the string so the loose end is about 1 inch above the bottom of the glass. Remove the pencil and string from the glass. Moisten the string with water then roll the string in the extra sugar. Lay this aside to dry (do this in the morning)
2. Place the water in the small pan. Add four tablespoons of sugar and stir until the sugar dissolves (disappears). Keep adding sugar, one tablespoon at a time, until no more will dissolve. Working with an adult, warm the solution slowly on a stove until it is hot, but not boiling. Add the remaining sugar, but do not stir. Continue heating until it boils. Boil for two to three minutes. Cool this solution for fifteen minutes, and then pour it into the glass. Lay the pencil across the top of the glass so the sugar-covered string is suspended in the solution.
3. Cover the glass loosely with a paper towel to keep out dust. Place the glass where it will not be bumped. As this solution cools and water evaporates, sugar crystals will form on the string and on the glass. Check the crystals after three days. What do you see? If there aren't any crystals, check again

the next day. How long did you wait before the crystals formed? What shape are they? How many crystals can you count? Are there different sizes?

What's Going On:

Crystals are a highly organized form of matter. Their atoms are arranged in very definite locations in space. Crystals usually need something to form around to start the growth process. This "something", called seed crystals, comes from the sugar placed on the string. The crystals you grow are sugar crystals. The sugar came from the sugar you dissolved in the water.

Dissolving sugar in water means that the sugar molecules are moving into the spaces between the water molecules. While dissolving the sugar in water, you will reach a point when no more sugar dissolves in the water. You have created a saturated solution; there is no more space for the sugar molecules. By heating the water, you can dissolve more sugar into the water. Heating the water makes more space by causing the water molecules to move farther apart. This makes a super saturated solution; essentially the water has more sugar in it than it can normally hold. This gives a great solution to make crystals. Once you add the seed crystals, the sugar in solution will start to re-crystallize around the seed crystals, making them bigger.

Relevant Ohio Science Content Standards:

Physical Sciences: 9.6, 12.1