

CRYSTAL GROWING SCIENCE: ROCK CANDY STICKS

WHAT YOU NEED:

- 1 1/2 cups of white sugar
- 1 cup of water
- Small plate
- A spoon
- A glass
- Wax paper
- Saucepan
- Stove
- Several 250 ml beakers or small clean jars or small clean jars
- Cake pop sticks or wooden skewers
- Food coloring pack (optional)
- An adult to help you

Get ready to watch some cool crystals grow! And when you're done, you can eat them or give them away as Christmas gifts!

WHAT YOU DO:

1. Fill a glass with water, pour some sugar on a small plate, and lay out a sheet of waxed paper. Dip one end of each stick (cut pointed ends off if you use skewers) into the water and then roll it in the sugar, tapping it gently to remove excess. Set each stick to dry on the waxed paper.
2. Pour the cup of water into the saucepan and add 1/2 cup sugar. Stir it well until no more sugar will dissolve. Add more sugar (1/2 cup at a time) until you can't get any more to dissolve even after stirring for several minutes. You should end up with about 1 1/2 cups sugar dissolved in the saucepan. It's OK if there is some undissolved sugar at the bottom of the pan. (You now have a saturated sugar solution.)
3. Ask an adult to help you heat the sugar mixture on the stove until it boils, stirring the whole time. Turn the heat to medium-low and keep stirring until all the sugar dissolves. (Now you have made a supersaturated solution!)
4. Keep cooking the liquid and stirring it until it becomes clear, but not for more than 5 minutes, or it will get too hot and turn into hard candy! Turn off the stove as soon as it starts to look clear.
5. Move the pan off the heat and allow it to cool down until the pan is no longer hot (the sugar solution will still be slightly warm).
6. Have an adult slowly pour the thick sugar solution into the jars. Fill each about 2/3 full, or enough so that sugar solution will cover several inches of your sugar-coated sticks. Add 5-6 drops of food coloring to each jar and stir. (Optional: Only do this step if you want to make different colors of rock candy!) Once the solution is cool and the sugar-coated sticks are completely dry, place several sticks into each jar.
7. Carefully move the jars to a place where they won't be disturbed. Check them every other day and gently stir the sticks around in the sugar solution to break up any large crystals forming on the surface.



8. Within a few days, you should start to see crystals growing on the sticks. After about one week, you will probably have a lot of crystals. When your “rock candy” crystals are as big as you want them to be, take them out of the jars and set each color of candy in a clean glass to dry.

9. Once they are dry, you can wrap in cellophane food wrap and tie with ribbon for a sweet Christmas gift!

WHAT HAPPENED:

In step two you made a saturated solution—there was so much sugar in the water that it couldn't dissolve any more sugar and some was left in the bottom of the pan. Once the saturated solution started to heat up, the water was able to dissolve even more sugar and a supersaturated solution was formed in step three. Then, as the solution cooled, the sugar molecules in it started to join with the sugar molecules on the sticks. The sugar on the sticks are called “seed” molecules and the sugar molecules in the solution attached themselves to the seed molecules.

Meanwhile, the water in the solution started to evaporate or dry up into the air, leaving only sugar molecules behind. More sugar molecules gradually joined with the ones already on the stick, forming larger crystals. Because all of the solute molecules are the same (they are all sugar), they all form the same shape of crystals and they all stick together, making a big chunk of sugar crystals that are pretty to look at and tasty to eat!

Note that this is a special science project that is safe to eat because you only used food products, not chemicals. Plus, you used clean dishes from your kitchen. Never eat any experiment unless it is made entirely out of food and you only used clean dishes to prepare it!

Note: You can make Rock Candy without sticks. Use a piece of clean cotton string or thread. Follow steps 2-7 below then dip the string into the solution so that half of the string is coated. Take the string out and let it dry. Once the string has dried, tie the clean end around a pencil and put the dipped end back into the glass of sugar water solution, balancing the pencil across the rim of the glass. Make sure the string does not touch the bottom or the sides of the glass, or your crystals will not form right! When your piece of “rock candy” is as big as you want it to be (about one week), take it out of the glass, let it dry, and enjoy!