



## Try This at Home Science: Edible Crystals

### Activity Overview:

Create edible crystals using a supersaturated sugar solution.

### Materials:

- Water
- Sugar
- Candy stick or bamboo skewer
- 2 shallow containers
- Medium-sized saucepan
- Measuring cup
- Tablespoon
- Food coloring (optional)
- Flavored drink powder (optional)
- Mason jar or other tall glass container
- Clothespin

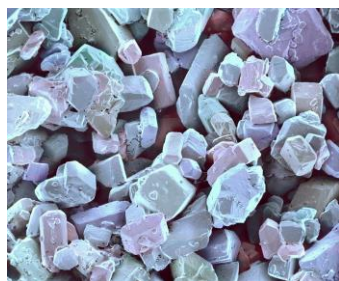
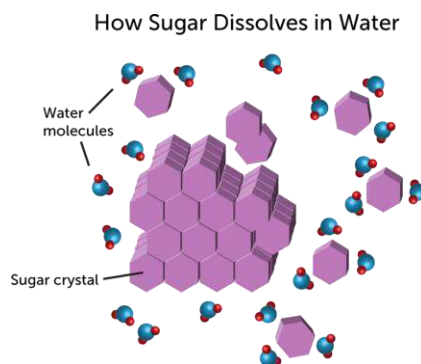
### Try this!

1. Add some water to one container and sugar to the other container
2. Dip a candy stick (or bamboo skewer) into the water, then dip it into the sugar. Set aside to dry, until the sugar has hardened.
3. With parental supervision, heat 1 cup of water in a medium-sized pot. Bring to a simmer.
4. Slowly mix in 2-3 cups of sugar into the hot water. Add sugar in about half a cup at a time until sugar can no longer dissolve in the water. Mix the solution consistently to ensure the sugar is dissolving.
5. Add 1 tablespoon of food coloring to add color. If you have flavored drink mix, add 1 tablespoon to add color AND flavor!
6. Carefully pour the sugar mixture into a mason jar (or tall glass container).
7. Insert the dried sugar-coated candy stick into the sugar solution. Make sure the stick does not touch the bottom of the mason jar.
8. Use a clothespin to hold the candy stick in place.
9. Set aside and avoid mixing for 3-5 days to allow the sugar crystals to grow.
10. Remove the candy stick from the mixture to reveal the sugar crystal.
11. Allow the sugar crystal to hang dry from a mason jar.
12. Once dried, enjoy as a lollipop, in drinks or as a decoration!

### What's happening?

Sugar forms crystals when it is in a solid form. Sugar is the generic name for sweet-tasting, soluble carbohydrates. Carbohydrates come in many forms and are food in all kinds of food, making it our primary source of energy. The table sugar that most of us are familiar with is actually sucrose, whose molecular formula is  $C_{12}H_{22}O_{11}$ . Sucrose is produced by plants through the process of photosynthesis, and most of our sucrose comes from sugar cane or sugar beets.

Sugar is soluble, or dissolvable, in water. When we slowly add sugar to hot water, we can add more sugar to the water to dissolve it than if we were using colder water. We are able to create a supersaturated solution, which ensures that we have lots of sugar for us to work with. But to make sure we get those sugar crystals forming on our stick, we attach some sugar crystals to the stick with some water. These serve as seed crystals, or nucleation sites, that give the sucrose molecules a place to attach to other sucrose molecules. The longer they are in contact and can solidify, the bigger they will grow!



### How does this relate to everyday life?

The process of crystal forming is called crystallization. Crystals often form in nature when liquids cool and start to harden. Certain molecules in the liquid gather together as they attempt to become stable. They do this in a uniform and repeating pattern that forms the crystal. Crystals are all around us. Salt, sugar, snowflakes and even rock candy are examples.

### Now try...

- Experiment using different substances in your home, like salt, borax, baking soda, or other sweeteners. Do different solutions produce different kinds of crystals?
  - NOTE: aside from the salt and sweeteners, these crystals are not edible. Please do not consume crystals made of baking soda or borax
- Use other materials to grow your crystals on, such as string, pipe cleaners, or small rocks.
- Can you grow different sized crystals based on how long they are soaking in the solution?
- Instantly freeze a bottle of water using the concepts of nucleation and seed crystals that we talked about earlier! Learn more [here](#).

### Additional Information

Watch a how-to video for this experiment [here](#).

For information about where sugar comes from and nutritional information, visit [www.Sugar.org](http://www.Sugar.org)

For more “Try This at Home Science” activities, visit [www.mi-sci.org/athomescience](http://www.mi-sci.org/athomescience).