

DIY Air Force Activities: Candy Crystals



Materials:

- 2 cups water
- 4 cups + 1 tsp granulated sugar
- glass or mason (2 cups water should fill it at least half way)
- clothespin
- bamboo skewer (can substitute a popsicle stick or a clean piece of cotton string)
- paper towel and rubber band
- cooking pot
- optional: food coloring or flavor



Crystals are beautiful, but how are they formed? When a chemical transitions from its liquid state to its solid state we call that process crystallization. For chemists, crystallization is often essential in either the separation or purification steps of a chemical reaction. Crystals can be grown using a variety of methods, but always involve two major events: nucleation and crystal growth. Nucleation occurs when enough molecules cluster together to create a “seed.” Once the cluster reaches a “critical cluster size” this seed can begin to grow into a beautiful crystal! Crystals can be a variety of shapes and sizes. Follow these instructions to grow your own delicious sugar crystals!

Directions:

1. Have an adult bring 2 cups of water to a boil. Then have them stir in 4 cups of sugar. Continue to boil this solution until all the sugar disappears. At this point you can add a few drops of flavor or color as desired. You can also leave it clear!
2. Allow the solution to cool completely to room temperature.
3. Next take your wooden stick or string and make it damp. This is what you will be growing your crystals on! We will “seed” our support by rolling it in the remaining granulated sugar. **Allow it to completely dry** before moving to step 5.
4. Now pour the cooled sugar solution into your glass or jar. Place paper towel over the top and wrap the rubber band around it to create a lid. Poke a hole in the center.
5. Once your stick (or string) has dried, feed it through the hole and secure with clothes pin (see image to left). Place your glass in a cool, quiet place where it will not be disturbed. Check each day and watch the crystals grow. This may take as long as 2 weeks, you can document the process! Once they are large enough, remove them from the glass and allow them to dry on wax paper. Observe the crystal shape! Then enjoy eating them! You can also try this experiment with salt (although it will not be as tasty) and compare the crystal shape.

Air Force Associations:

The Air Force Research Lab (AFRL) is growing special gallium oxide crystals to use in cutting edge electronic devices. This material will allow devices to be smaller, lighter, and more powerful. The crystalline material can handle higher operating voltages, and will be useful in modernizing aircraft as well many consumer electronics.