



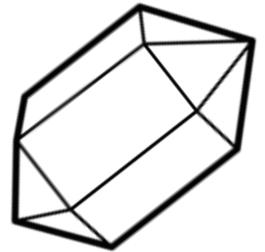
## Investigate Minerals with Homemade Crystals

### Science Activity

*Rocks are mixtures of minerals and minerals form crystals. Every mineral has its own unique crystal form. You can explore different crystal forms by growing your own crystals.*

#### What you need:

- Boiling water
- Sugar
- Salt (table or sea salt)
- Drinking glasses
- Magnifying glass
- Measuring cup
- Clean string or thread
- Clean paperclips
- Pencils, popsicle sticks, or sticks
- Paper towel



#### What you'll do:

Rock Candy:

1. Mix one cup of sugar and 1/2 cup of water in a saucepan. Stir the mixture over low heat until the sugar dissolves. Add more sugar until it no longer dissolves, creating a supersaturated solution. Boil this solution for one minute without stirring.
2. Pour this syrup into a clear glass.
3. Tie your clean string or thread to the middle of a pencil. Then tie a clean paperclip to the end of the string. The string should be long enough that the paperclip will not touch the bottom of the glass, but will hang in the solution.
4. Wet the string and paper clip with water and brush them with dry sugar so that grains of sugar stick to the string and paperclip. The grains of crystals that you added to the string acts as 'seed crystals' or a starting point for the crystals to grow, but you can grow the crystals without the seed crystals... it will just take longer.
5. Place the pencil across the rim of the glass so that the paperclip and string are in the syrup. Or use a popsicle stick instead of a string but wet it and coat with sugar to create some 'seed crystals.'
6. Set the galss in a place where it will not be disturbed. Cover lightly with a paper towel to keep the dust out.

MIX

Salt Crystals:

1. Bring water to a boil (enough that it will almost fill a drinking glass).
2. Add salt to the water and stir. Continue adding salt until no more salt will dissolve in the water and a few grains are floating in the water or on the bottom of the pan. This is a supersaturated solution.
3. Follow steps 3-6 in the rock candy directions.
  - Check on your crystals every couple of hours or the next day (speed of growth varies with different conditions). Is one growing faster than the other? Why do you think that is?
  - After your crystals have grown, look at them with a magnifying glass. How do salt crystals look different from sugar crystals?
  - Minerals are made up of elements and those elements come together to form different crystal structures. Crystals often form when liquid cools, for example a snowflake is a crystal of ice. You have seen a few crystal structures grow in this activity. Minerals form crystals that fall into one of seven different crystal systems. Do a little research to discover what systems salt and sugar crystals belong to.



## Sugar Glass:

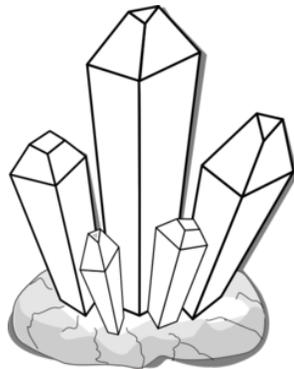
1. Grease a baking sheet and put it in the freezer to chill.
2. Put 1/2 cup of sugar in a saucepan. Over low to medium heat stir the sugar until it is melted.
3. When sugar is melted, remove the baking sheet from the freezer and pour the melted sugar on it. Put the baking sheet back into the freezer.
4. After a few minutes, remove the baking sheet and look at the sugar glass you have made. Compare it to your rock candy. What do you think caused the difference in the way the sugars formed?

In nature, melted lava hits the air and sometimes cools so fast crystals have no time to form. This rock is called obsidian. The sugar glass cools so fast crystals did not have a chance to form.

## Add on:

The salt crystals are cubed like dice. The sugar crystals are more like rectangles with pointed ends. You can experiment with other substances to see what crystal shapes they form. Try Epsom salt, and baking soda, using the same methods above to create a supersaturated solution.

COMPARE



CREATE

