Crystals are a unique molecular structure called a crystal lattice. Crystals are seen in many places in nature. Not only are they found in some kinds of rocks, but they also make up snowflakes and even living creatures such as coral! With this activity, you can grow and observe your own crystals at home.

MATERIALS

- Piece of black construction paper
- Sugar or table salt
- Optional: Epsom Salt
- Hot plate or stove
- Stirrer (spoon or butter knife)
- Tablespoon
- Metal or glass pie pan or other flat dish with an edge
- Science notebook or paper
- Something to write with
- Magnifying glass
  **Alternative:** Some iPhones have a magnifying feature. Click Settings → Accessibility → Magnifier to turn on)

PROCEDURE

- Place a small amount of sugar, salt or Epsom salt spread apart on the dark paper.
- Examine all the samples with a magnifying glass, or zoom in to get a closer look with a phone camera or magnifier. Look at the shape of each individual grain, what do you notice that is similar and different between the grains of each substance? Draw a sketch of what you see in your science notebook.

Experiment continued on next page...
PROCEDURE continued...

CREATE A SOLUTION:
This could take up to 30 minutes, so be patient. Get an adult to help with this part of the activity.

- Bring 1 cup of water to a boil.
- While stirring rapidly with the stirrer, start adding the sugar (or salt) one tablespoon at a time. Continue adding until you notice that the added sugar won’t dissolve any more. This should be about 2 cups of sugar. Water should remain boiling during this step.
- You’ve now made a **supersaturated solution**—a solution that contains more than the maximum amount of solid that is capable of being dissolved at a given temperature.

EXPERIMENT SETUP:

- Cut the construction paper so it fits snugly into the base of the pie pan.
- Pour supersaturated solution into pie pan until just covering construction paper.
- Place setup near a window, in the sunshine if possible.
- As solution evaporates, crystals should form on the construction paper.
- Depending on how warm it is, this process can take 10–60 minutes
- Depending on your supersaturated solution, the crystals might not be very big. Try gently feeling the crystals with your finger. What do you notice?
- Use the magnifying glass to examine the crystals close up once the solution has been evaporated and your paper is dry. What do you notice about the crystals? Do they look similar or different than the crystal grains you observed earlier? Try to sketch the crystals in your science notebook.

TRY THIS
Try this experiment with a different supersaturated solution (using sugar, salt or Epsom salt). Do the crystals look different? Does one solution create bigger crystals?

Experiment continued on next page...
DID YOU KNOW

Crystals form from small materials dissolved in fluids. Sometimes only one crystal forms, and sometimes a large network of crystals can form. A crystal’s “habit” is its visible external shape. The habit of a crystal is determined by the crystal structure, chemical bonds, and the conditions under which the crystal formed.

What are the habits of the crystals you observed?
3–5 GRADE EXPLORATION

Explore the following questions and write your observations in your science notebook.

- Go outside with an adult and observe or collect 5–10 different looking rocks. Make observations about the rocks. What did you notice? Make a few sketches in your notebook. Do you see any patterns?

- Look closely, how many are all the same mineral type (based on color, shape, etc) and how many have multiple types of minerals? If a rock contains one mineral that humans use (such as copper), how easy would it be to extract? What if the rock has multiple minerals? You can set up your own mining experiment by trying to extract all the chocolate chips out of a chocolate chip cookie. What happened to the rest of the cookie as you mined out the chips?