

Crystal Growing -Primary

Return to [Primary Lesson Plans](#)

Title: Crystal Growing

Level: Middle School

Time: 30 Minutes preparation, 3 hours to several weeks growing time

KERA Goals: 2.1

Background Information: Crystals can be easily grown from alum, sugar, salt, and a variety of commonly available materials.

In this activity, you will examine crystal growth by super cooling and by evaporation.

Materials:

beaker
alum
stirring rod
water
styrofoam cooler
clear plastic bottle
hand lens
flat rock 4" across

Activity:

A. Supercooling

1. Dissolve 20 grams of alum in 100ml of boiling water. Measure the amount of water carefully because it is crucial for the success of the experiment.
2. Place the rock at the bottom of the growth container (plastic bottle) and pour the solution into it.
3. If the plastic container is transparent you can observe how those parts of the solution that have deposited growth material move up and away from the crystal.
4. Place plastic bottle in a styrofoam cooler to minimize temperature fluctuations in the room. Put a cover on the cooler leaving a narrow crack for air circulation. Crystals should begin to grow in 2 to 3 hours. Let the plastic bottle sit undisturbed for three to five days then pour the solution into the container. Put the crystals on a paper towel and let dry for a few days.
5. Examine the crystals with a hand lens or magnifying glass.

B. Evaporation

1. Clean the growth container in experiment A with warm water and then pour

Crystal Growing -Primary

the solution back in.

2. Select the best crystal from experiment A. Tie one end of a thin plastic thread to the crystal. Tie the other end of the thread to the middle of a pencil. Place the pencil across the top of the growth container so that the crystal is suspended in the solution halfway between the surface of the solution and the bottom of the container. Cover the container with a thin cloth to keep dust away from the solution. The cloth will allow water to evaporate. Return the plastic bottle to the cooler. The crystal will grow as the water evaporates over a period of a few days to weeks. Remove the crystal from the solution when the surface of the solution almost touches the tip of the crystal.

Questions:

1. In experiment A, why are most crystals attached to each other?
2. In experiment A, why do you think convection currents form as the crystal grows?
3. Judging from the shape of the crystal in experiment B, to which crystal system do you think the crystal belongs? You may need to check a textbook to learn more about the six crystal systems.

Answers:

1. Crystals will grow on any surface even if that surface is another crystal.
2. As the liquid adjacent to the crystal deposits material for the crystal to grow, it becomes less dense than the rest of the solution. It then floats upward and away from the crystal and dense solution moves in to replace the spent solution.
3. The cubic system because the crystals resemble a cube with beveled corners (the beveled corners are triangular in shape).

Return to [Primary Lesson Plans](#)