Snowflake Science

What is a Snowflake?

Every snowflake begins as a single, microscopic ice crystal, formed from water vapor high in the atmosphere. When temperatures are below freezing, water molecules collect on tiny particles of dust or pollen, but instead of forming water droplets, the molecules freeze into a solid, arranging themselves into a six-sided shape called a hexagon. These tiny ice crystals grow larger and larger, collecting more water molecules as they fall through the air. These larger crystals are called snow crystals. Each has six sides or six points and form the familiar shapes we call snowflakes. Snow crystals are still very small — no bigger than a few millimeters. Those big fluffy snowflakes that we see falling from the sky may be clusters of hundreds or even thousands of snow crystals.

Activity 1: Watching Crystals Form

Ice crystals form when it is very cold, and they melt quickly so they aren't easy to observe. But we can look at other kinds of crystals to better understand how crystals form and grow. In this activity, you will use magnesium sulfate, also known as Epsom salts, to grow crystals on a piece of paper or foil. Watch closely as tiny crystals form and spread across the paper.

Supplies:

* 1 tablespoon Epsom salts
* 1 tablespoon hot tap water
* 2 small containers or cups
* spoon
* half sheet of black paper or smooth sheet of aluminum foil
* Paper towels
* Plate or bowl for catching drips
* eyedropper or pipette (optional)
* magnifying glass (optional)

Instructions:

1. Pour 1 tablespoon of Epsom salts into a small container
2. Using the hottest water from your faucet, add 1 tablespoon of water to the Epsom salts
3. Stir for 1-2 minutes to dissolve as much of the solid as you can.
4. Pour the liquid into a clean container, leaving any undissolved Epsom salts behind. This is your Epsom salt *solution*.
5. Set the black paper or foil on some paper towels. Use an eyedropper, pipette, or spoon to drip some of the Epsom salt solution onto the paper or foil.
6. Tilt the paper or foil to spread the solution (try not to touch the wet areas with your fingers or it will disturb the crystal formation), then pour the extra liquid off onto a plate or bowl.
7. Watch closely with a magnifying glass to observe the crystals forming. This typically starts within 1-3 minutes at the edges of the wet areas, then spread across.
8. Keep observing as the liquid evaporates, and check back often to see what has changed.
9. **Save the rest of the liquid for the next activity.**

Activity 2: Make a 6-pointed Snowflake

Snowflakes have six sides or points. In this activity, you will make a six-pointed paper snowflake and grow crystals on it to make it sparkle!

Supplies:

* Remaining Epsom salt solution from Crystal activity
* Dropper, pipette, or spoon
* round coffee filter or other absorbent paper cut into a large circle (a paper towel will do)
* Sheet of waxed paper or foil
* Paper towels or cloth towel

Making the snowflake:

1. Fold the coffee filter or paper towel in half
2. Fold in half again and make a small crease on the folded edge to mark the middle
3. Using the crease as a guide, fold he edges across the middle so they overlap evenly, forming a narrow triangle or cone shape.
4. Use scissors to cut and remove shapes from the edges.
5. Unfold to reveal your finished snowflake

Adding the crystals

1. Place your cut snowflake flat onto a piece of waxed paper or foil. You may want to lay it on a towel or p aper towels in case of drips
2. Using a pipette, eyedropper, or spoon, carefully drip Epsom salt solution all over the snowflake until there are no dry spots and the entire snowflake is soaked with liquid.
3. Leave to dry for several hours to allow crystals to form, then remove from the waxed paper or foil and place your snowflake flat on a paper towel to finish drying.