

Ice Crystals Extraordinaire - Snowflakes

Snowflakes are an amazing example of crystal formation. It's not easy to make real snowflakes at home but there is a great place to see snowflakes on the internet at <http://www.its.caltech.edu/~atomic/snowcrystals>

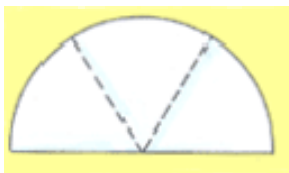
One thing you probably noticed from looking at the beautiful snowflake pictures was how symmetrical each snowflake crystal is. Whatever happens on one side of the snowflake always happens in a symmetrical way on the other side. You can make your own symmetrical snowflakes out of paper and real crystal in the activity below!

Materials:

- Colored construction paper
- Paper or plastic cup
- Wax paper
- Scissors
- Hot water
- Teaspoon
- Salt
- Cotton swabs

Procedures:

1. Place 1 teaspoon of hot tap water in a cup. Add 1 teaspoon of salt and swirl until no more salt will dissolve. There will be undissolved salt in the bottom of the cup.
2. Use the bottom of a cup to make a circle on the paper and then cut it out.
3. Fold the circle in half and then in thirds, along the dotted lines as shown.



4. Cut out the colored areas of the folded paper as shown.



5. Open the paper to reveal a beautiful snowflake pattern. Place the snowflake on the wax paper.
6. Dip a cotton swab all the way into the cup and scoop out some undissolved salt. Spread the salt in a thin layer over the entire surface of the paper snowflake. Allow the snowflake to dry overnight.
7. Repeat steps 2-6 to make 3 or 4 more snowflakes. After the snowflakes are dry and recrystallized, hang them from strings in a window or make a mobile. When the sunlight hits them, they should sparkle!

Think about this ...

If each snowflake is a tiny ice crystal and ice is clear and colorless, why does snow always look white? The answer has to do with the way light is reflected and scattered off all the tiny little pieces, sections, parts, and angles of each snowflake.

Where's the Chemistry?

Snowflakes grow in a symmetrical way for many of the same reasons that other crystals do. The crystal shape of a snowflake is caused by the shape that water molecules arrange themselves in when they freeze. The different shapes of snowflakes have to do with the conditions of temperature and the amount of moisture in the air while they are forming.



The American Chemical Society develops materials for elementary school age children to spark their interest in science and teach developmentally appropriate chemistry concepts. The *Activities for Children* collection includes hands-on activities, articles, puzzles, and games on topics related to children's everyday experiences.

The collection can be used to supplement the science curriculum, celebrate National Chemistry Week, develop Chemists Celebrate Earth Day events, invite children to give science a try at a large event, or to explore just for fun at home.

Find more activities, articles, puzzles and games at www.acs.org/kids.

Safety Tips

This activity is intended for elementary school children under the direct supervision of an adult. The American Chemical Society cannot be responsible for any accidents or injuries that may result from conducting the activities without proper supervision, from not specifically following directions, or from ignoring the cautions contained in the text.

Always:

- Work with an adult.
- Read and follow all directions for the activity.
- Read all warning labels on all materials being used.
- Wear eye protection.
- Follow safety warnings or precautions, such as wearing gloves or tying back long hair.
- Use all materials carefully, following the directions given.
- Be sure to clean up and dispose of materials properly when you are finished with an activity.
- Wash your hands well after every activity.

Never eat or drink while conducting an experiment, and be careful to keep all of the materials used away from your mouth, nose, and eyes!

Never experiment on your own!

For more detailed information on safety go to www.acs.org/education and click on "Safety Guidelines".

