



SNOWFLAKE SAFARI

Activity Summary

Location:

Anywhere outdoors while it is snowing. Or, inside a car if it is extremely cold or windy.

Time Required:

5 minutes – ½ an hour.

Materials Needed:

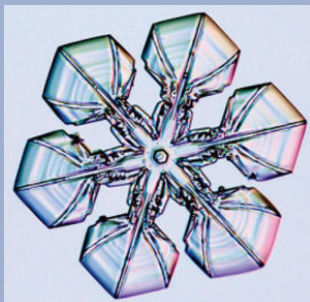
Black sock, magnifying glass, warm clothes.

Set-Up:

Wait for it to snow. Get dressed in warm clothes. Put black sock on one hand. Grab magnifying glass. Go outside.

Purpose:

To discover the different and fascinating shapes that snowflakes take.



Introduction:

Have you ever looked at a snowflake and wondered how it formed or why it looked the way it did? In this activity, you will look closely at snowflakes and discover some of the forms that they take.

Snowflakes form in clouds which consist of water vapor (gas). When it gets colder than 32° Fahrenheit (0° C), the water vapor begins crystallizing into snowflakes. The shape the snowflake becomes is affected by various conditions such as temperature, air currents, and humidity. Even dirt and dust particles floating in the air affect a snowflake's shape. During its lifetime a snowflake's shape constantly changes as it faces different environmental conditions, sometimes growing larger, sometimes melting.

Generally, snowflakes form into six-sided hexagonal crystals with colder temperatures producing sharper tips and branched arms (called dendrites). Snowflakes that form under warmer conditions are generally smoother and less intricate. What conditions do you think the snowflakes pictured on the left were formed under?

Many snowflakes appear to be symmetrical (the same on all sides). This is because as water freezes, it bonds together in an ordered arrangement to maximize the attractive forces that it together. This bonding (called hydrogen bonds) creates the symmetrical, hexagonal shapes of the snowflake. However, not all snowflakes are symmetrical. Uneven temperatures, dirt, and other factors may cause some snowflake to be lopsided.

Like fingerprints, no two snowflakes are identical. This is because so many factors affect the snowflake's structure, and since the snowflake's structure is constantly changing with changing environmental conditions, it is improbable to find two identical snowflakes.

Directions:

The next time it's snowing outside go for a snowflake safari. Be sure to get dressed in warm clothes so that you can have fun discovering snowflakes as long as possible. Put a black sock on one hand and hold a magnifying glass with the other. Gently try to catch a falling snowflake on the black sock without smashing the snowflake by letting it land on your hand. Then, before it melts, use your magnifying glass to examine the snowflake crystal.

What does your snowflake look like? Does it have sharp ends? Does it have branches on its arms (look like lace)? Or is it needle or column like? Is it flat, lopsided, symmetrical, or smooth? Memorize the way your snowflake looks and draw a sketch of it in your nature journal. Make a hypothesis about where your snowflake formed (high in the sky or at a lower elevation) and what factors (temperature, air currents, particles, etc...) made it look the way it does. Then use the extensions section below to learn more about snowflake formation. Was your hypothesis correct?

Note: If it is really windy or cold outside, it could be best to sit inside a car and view the snowflakes that land on the car's windows. Simply clean off the window before getting in and use your magnifying glass to examine the snowflakes as they land.

Extensions:

Here are a few websites where you can find some cool information about snowflakes:
www.sciencefriday.com/videos/watch/10263.

<http://chemistry.about.com/od/moleculescompounds/a/snowflake.htm>

<http://www.seacoastonline.com/articles/20100107-LIFE-1070337>