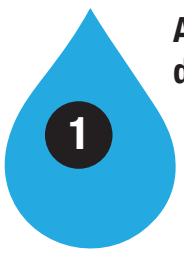
In Culture

Your weekly dish of science

The Science of Snow:

A quick guide to wintry weather in Meadville

How snowflakes are formed

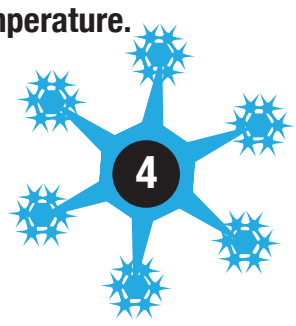


A drop of water freezes around a particle of dust or pollen in the atmosphere.

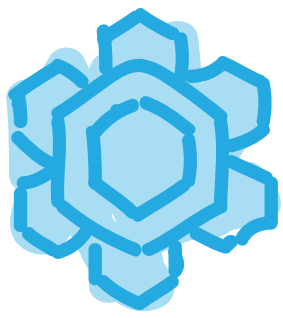
The snowflake begins as a six-sided prism. Eventually, each side forms into a point.

As the snowflake falls through the air, the ambient temperature changes, and new crystal plates form on each side.

Crystals continue to form, and the structure continues to change according to temperature.

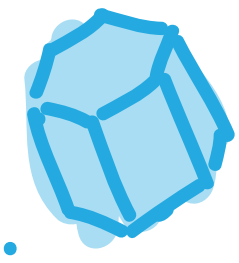


Types of snowflakes



Stellar plates

(Thin, flimsy, plate-like)



Single columns

(The most basic kind of snowflake)

Fernlike dendrites

(Delicate; makes for light, powdery snow)

Temperature and humidity at the time of snowfall determines what a snow crystal will ultimately look like.

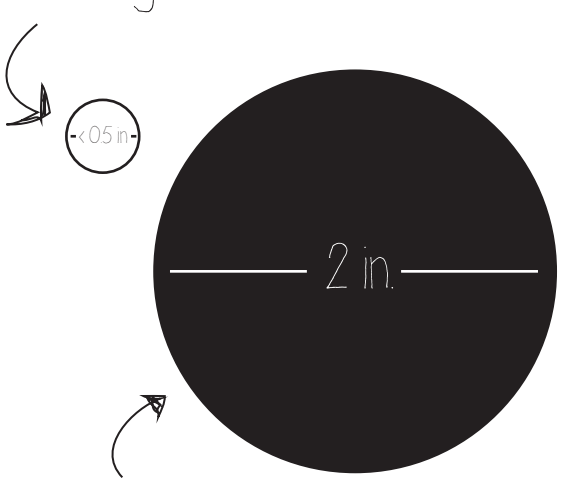
Are snowflakes perfectly symmetrical?

Snowflakes have six sides because ice forms naturally into hexagonal crystalline structures. As a snowflake falls through the air, it moves through many different pockets of air with many different temperatures (ultimately, temperature dictates crystal structure). During this time, each one of the snowflake's six sides forms independently. All sides of the snowflake will form into similar shapes because they pass through the changing temperatures together. The majority of snow crystals form irregularly, however, without much symmetry.

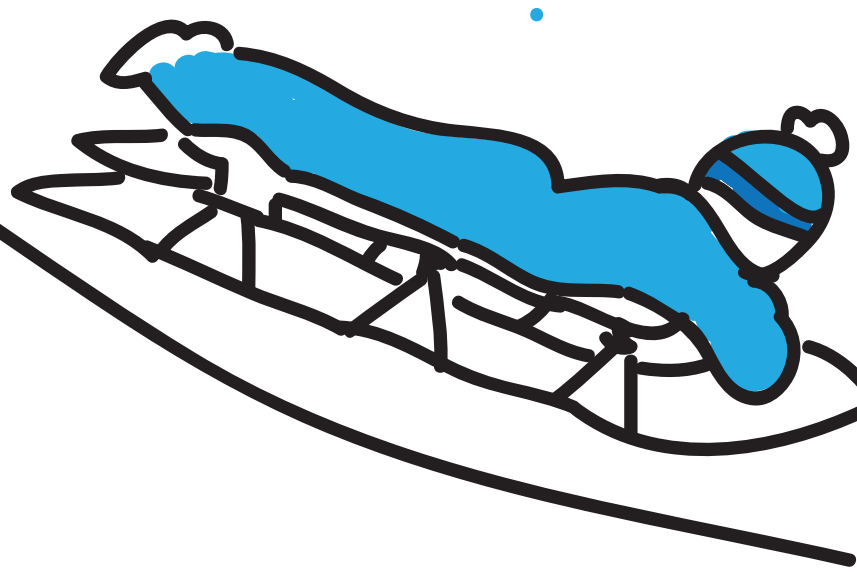
Can any two snowflakes be the same?

There are infinitely many paths for a falling snowflake to take, and therefore infinitely many subtle differences in the way that any particular snowflake will form on its way to the ground. For this reason, it is extremely unlikely that two conplex snowflakes could ever look exactly the same.

Average snowflake size



Maximum snowflake size



Winter break is fast approaching, and with it --the chance of snow for the holidays. Physicists and chemists have long studied the forces that sculpt each individual snowflake into being. By paying close attention to the way that these crystalline structures form in nature, researchers can also learn information about making crystalline materials in industry; everything from computer chips to conductors to lasers depend upon knowledge of the molecular dynamics of crystal structure.