



The Science of Snowflakes

From www.SnowCrystals.com and Kenneth G. Libbrecht, Caltec Professor of Physics

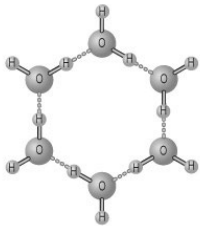
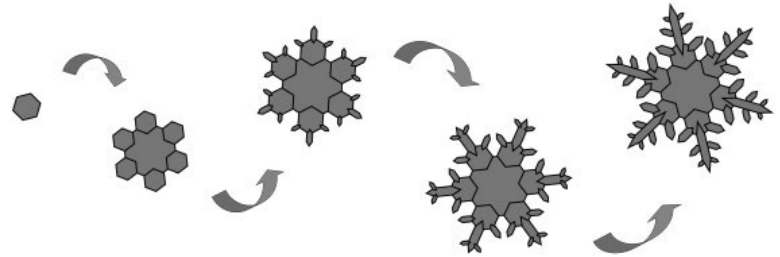
What is a snowflake?

When people say snowflake, they often mean snow crystal. The latter is a single crystal of ice, within which the water molecules are all lined up in a precise hexagonal (or six-sided) array. Snow crystals display that characteristic six-fold symmetry we are all familiar with.

Why such complex, symmetrical shapes?

A stellar snow crystal begins with the formation of a small hexagonal plate, and branches sprout from the six corners when the crystal grows larger. As it tumbles through the clouds, the crystal experiences ever changing temperatures and humidities, and each change makes the arms grow a bit differently.

The exact shape of the final snow crystal is determined by the precise path it took through the clouds. But the six arms all took the same path, and so each experienced the same changes at the same times. Thus the six arms grow in synchrony, yielding a complex, yet symmetrical shape. And since no two snow crystals follow the exact same path through the clouds as they fall, no two look exactly alike.



Why six?

The six-sided symmetry of snowflakes comes from the hexagonal lattice structure of ice. When water freezes, the Hydrogen and Oxygen molecules connect together and always form hexagons.

Snowflake Sizes

The smallest snowflakes are called Diamond Dust crystals, and they might be as small as the diameter of a human hair. The faceted crystals sparkle in sunlight as they float through the air, which is how they got their name. They are somewhat rare, appearing in bitter cold weather.

The image on the right shows the sizes of a variety of stellar snowflakes when compared to a penny. It includes the largest snow crystal ever photographed, measuring 10 mm (0.4 inches) from tip to tip.




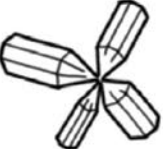


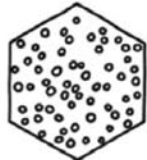
For more information on snowflakes and to see some actually growing in the lab visit

www.SnowCrystals.com



How to identify snowflakes.

Now head outside with a magnifying glass and a black piece of paper to find snowflakes! How many different types can you identify? How many types are in the coloring book?

				
Simple Prisms	Solid Columns	Sheaths	Scrolls on Plates	Triangular Forms
				
Hexagonal Plates	Hollow Columns	Cups	Columns on Plates	12-branched Stars
				
Stellar Plates	Bullet Rosettes	Capped Columns	Split Plates & Stars	Radiating Plates
				
Sectored Plates	Isolated Bullets	Multiply Capped Columns	Skeletal Forms	Radiating Dendrites
				
Simple Stars	Simple Needles	Capped Bullets	Twin Columns	Irregulars
				
Stellar Dendrites	Needle Clusters	Double Plates	Arrowhead Twins	Rimed
				
Fernlike Stellar Dendrites	Crossed Needles	Hollow Plates	Crossed Plates	Graupel

Types of Snowflakes

From www.snowcrystals.com