

Crystal chemistry

About snow

Snowflakes are water ice crystals. They form in clouds when the temperature falls below 0 °C. Snowflakes will fall on land if the air temperature at ground level is also below 0 °C. Water molecules form a regular crystalline lattice based on a hexagon, so most snowflakes are six-sided. Depending on the temperature and other conditions, the basic hexagon can grow into flat star shapes, or long columns and needles as shown.

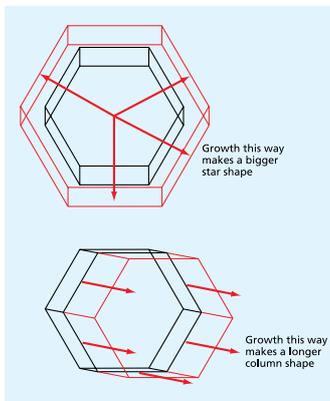
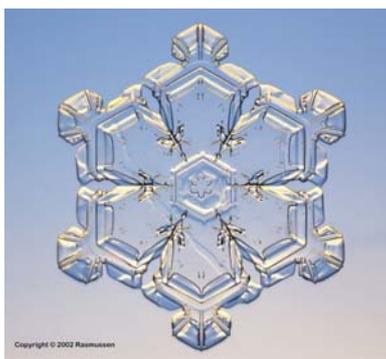


Figure 1 Growth of snow crystals

symbolic representation	EXAMPLES	NAME	SYMBOL
		plate	F1
		stellar crystal	F2
		column	F3
		needle	F4
		spatial dendrite	F5
		capped column	F6
		irregular crystal	F7
		graupel	F8
		ice pellet	F9
		hailstone	F0

Figure 2 Snow crystal classification



Snow crystals
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Kenneth Libbrecht www.snowcrystals.net.

The classic star-shaped snowflakes are made at about -15 °C. They form around a tiny dust particle. We learn from an early age that 'no two snowflakes are alike'. This was first suggested by a farmer called Wilson 'Snowflake' Bentley, who lived in Vermont in north east USA. He was born in 1865 and died in 1931. Bentley was the first person to photograph a snow crystal in 1885 and took about 5000 pictures of snowflakes in total during his lifetime. He said 'Under the microscope, I found that snowflakes were miracles of beauty; and it seemed a shame that this beauty should not be seen and appreciated by others. Every crystal was a masterpiece of design and no one design was ever repeated. When a snowflake melted, that design was forever lost. Just that much beauty was gone, without leaving any record behind.'



Wilson A. Bentley snow crystal photomicrograph
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Questions

1. Is it true that 'no two snowflakes can be alike'? How could this be tested?
2. Use a model kit to make water molecules and investigate why snowflakes are usually hexagon-shaped.