resource room

It's Snow Amazing!

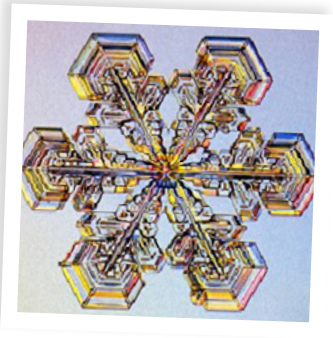
Of all the crystals on Earth, Snowflakes are the most wonderful.

WRITTEN BY ROSEANNE VAN EE, WILDBC FACILITATOR

Roseanne is our long-time facilitator in Vernon. She enthusiastically shares her vast knowledge of the outdoors to help teachers and leaders experience and enjoy nature. Follow her on Facebook for more.

Snow forms when water vapors crystallize in subfreezing clouds high up in the sky. A snowflake is a single ice crystal that has developed around a microscopic nuclei particle of dust, ash, pollen, sea salt, another organic or mineral microorganism, or stuff from outer space. Snowflakes progressively grow into kaleidoscopic hexagonal (six-sided) crystals as they tumble and drift down to Earth.

On their downward journey temperatures may change, they may be buffeted by winds, bump into other flakes and pass through clouds with different temperatures and moisture. Some take hours to reach the ground. Many never get there, but melt or evaporate on their way down.



The complex range of conditions a snowflake slips through as it descends, designs the snowflake's pattern. Why snowflakes grow flat rather than three-dimensionally is a mystery. Each snowflake has its own history, making each one different. No two are alike; like people perhaps.

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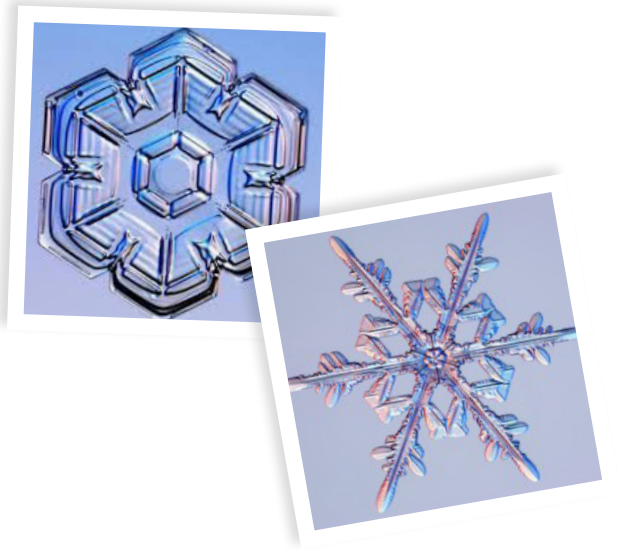
Like plants and animals, snowflakes are classified according to their shapes when landing or through metamorphosis (as below). The term "snowflake" generally refers to the star-shaped stellar dendrites and hexagonal plate snow crystals.

In 1885, Wilson Bentley of Vermont, was the first person to photograph snowflakes with a camera-microscope. In 1931 he published an amazing book with his best photos called Snow Crystals. Kenneth Libbrecht now photographs snowflakes with coloured lights and has published a number of books. He posts gorgeous, intricate photos on *snowcrystals.com*. Take a look!



Snowflakes aren't white; they're clear.

Numerous, multifaceted, minute snowflake crystals act like prisms reflecting light that appears white. Clement C. Moore's infamous poem, *A Visit From St. Nicholas*, magically describes reflecting snow: "The moon on the breast of the new fallen snow gave a luster of mid-day to objects below." Light from the sun is reflected off the full moon onto the snow which reflects through the dark night to light up the scenery. Go out on a snowy moonlit night to experience this and look around. It's spectacular!

Cold (-5C and lower), fresh snow piles often contain up to 95% air.

Over time, wind, air pressure, extra weight, moisture and temperature metamorphises the snowflakes into pieces, graupel (corn snow), and eventually back into water. Or they may vaporize into the air. Mountaineers study the metamorphic sequence and layers of snow, and its characteristics to predict avalanches. Glaciers are ancient deep layers of accumulated snow turned into ice lower down. When you make a snowball, you're punching out the air. Your hands and the crystals' friction creates warmth and moisture. That's why the big snowball at the bottom of a snowman is so heavy.

Snow is part of the great continual water cycle.

To paraphrase Bentley, "Of all the forms of water, the tiny six-pointed crystals of ice called snow…are incomparably the most beautiful and varied." Charlie English writes in The Snow Tourist: "Our lives, like those of snow crystals, are transient moments within a succession of other transiences. We resemble those crystals in another way, too. Like them, we are made mostly of water. When we die, the water in us will find its way to the sea, where in time it will be lifted up by the sun, to fall again as snow."

Some great books on snowflakes:

- *The Story of Snow* by Mark Cassino & Jon Nelson – nice, simple, clear descriptions and illustrations of snowflakes. Good for all ages, even "little ones".
- *The Secret Life of a Snowflake* by Kenneth Libbrecht – gorgeous colour snowflake photos and clear descriptions.
- *Wild BC – Below Zero* – available in a Below Zero workshop in English or French. Has snowflake discovery activities and snowflake information.

Speakers and resource people:

May know how to read snowflakes and can explain or show a snow profile – to observe snow layers and metamorphosis of snow to determine weakness between layers for potential avalanches.:

- BCAdventureSmart: *www.adventuresmart.ca*
- Alpine Cub of Canada: *www.alpineclubofcanada.ca/web*
- Local Search and Rescue group: *www.bcsara.com*

When you breathe out on a cold day, that's a small water vapor cloud. Want to make snow? Quickly toss a spray of hot water from a cup into the air outside on a very cold day (-25C or colder).

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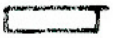
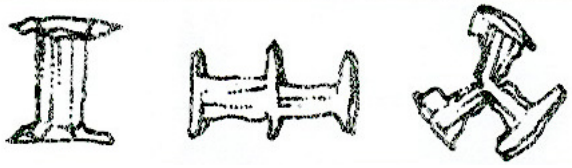
Snow crystals chart

Snowflake name	Symbol	Shapes
Hexagonal plates		
Stellar crystals		
Needles		
Spatial dendrites		
Capped columns		
Irregular columns		
Irregular crystals		

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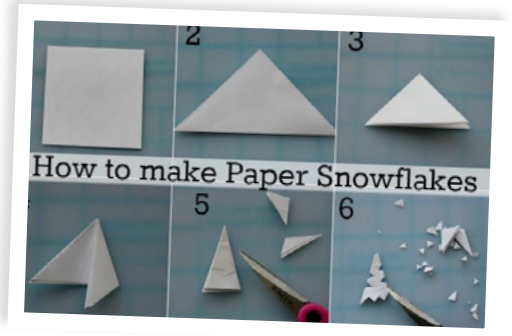
Neat Snowflake activities

- **Collect snowflakes** on mitts or sleeve outside when it's snowing. Solid dark colour is best. Use a magnifying glass to enlarge.
- **Read snowflakes** – take a laminated black paper or a dark plastic board, a wood, plastic or metal tool, like a popsicle stick or blunt knife, to separate snowflakes,a magnifying glass and a snow crystals chart. Keep everything cold – do not breath towards snowflakes.
- **Make a paper Snowflake:**
    1. Fold a square paper in half diagonally to make a triangle. With letter size paper (8.5"x11") take one corner and fold it down to the long side to make a triangle. Cut off the single bottom rectangle.
    2. Now, fold the triangle in half so the pointy corners meet.
    3. Fold your triangle in thirds.
    4. Cut across the bottom of your paper so it is straight.
    5. Cut out pieces along the edges to create your snowflake.
    6. Then unfold it gently.
    7. Make more! Practice makes perfect.
- **Go play in the snow!** It's truly a winter wonderland. If there's not enough snow in your area, head up to a ski hill or snowshoe area. There's lots there! Snowshoeing is the best way to manoeuvre, learn about and enjoy snow. Dress warmly and well.
- **Take a Below Zero winter workshop** *(www.hctfeducation.ca/product/below-zero)*. Join other educators playing in the snow to discover winter ecology and how plants and animals adapt to survive winter.



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