

SNOWFLAKE SCIENCE

Learn how snowflakes form, then create your own

Have you ever wondered why snowflakes have the shapes they have? Did you know that their shapes tell the story of how they formed?

Snowflakes start to form when cold water droplets grab onto dust particles then freeze into ice crystals. Exactly how these ice crystals stick together to make specific snowflake shapes has to do with the conditions up in the clouds where the snowflakes are being born—in particular, how much moisture is available and how cold it is.

Have a look at the chart below. When humidity is low and the temperature is not too cold, snowflakes form in the shape of simple plates. A little colder, and these plates stick together to form solid prisms. Add more moisture at that temperature and you will get needles. When it gets both colder and more humid, snowflake plates stick together side by side to form "sectored plate" snowflakes. With even more moisture, needles stick to plates to form the most iconic of all snowflakes—the "dendrite" snowflake.

Whatever their size or form, all snowflakes will have six sides, a shape called a hexagon. This is because of the way water molecules come together when they form ice.

By the time a snowflake has fallen out of the clouds and onto your jacket, there will be one more thing to consider: the temperature and humidity of the air it fell through. If it was warm and wet, the edges might have melted a bit and stuck to other snowflakes. If it was cold and dry, then there will be powdery snow that does not stick together. But if the snowflakes fall through a layer of warmer air, they may melt and reach the ground as rain, or refreeze and become ice pellets.

Snowflake sleuth

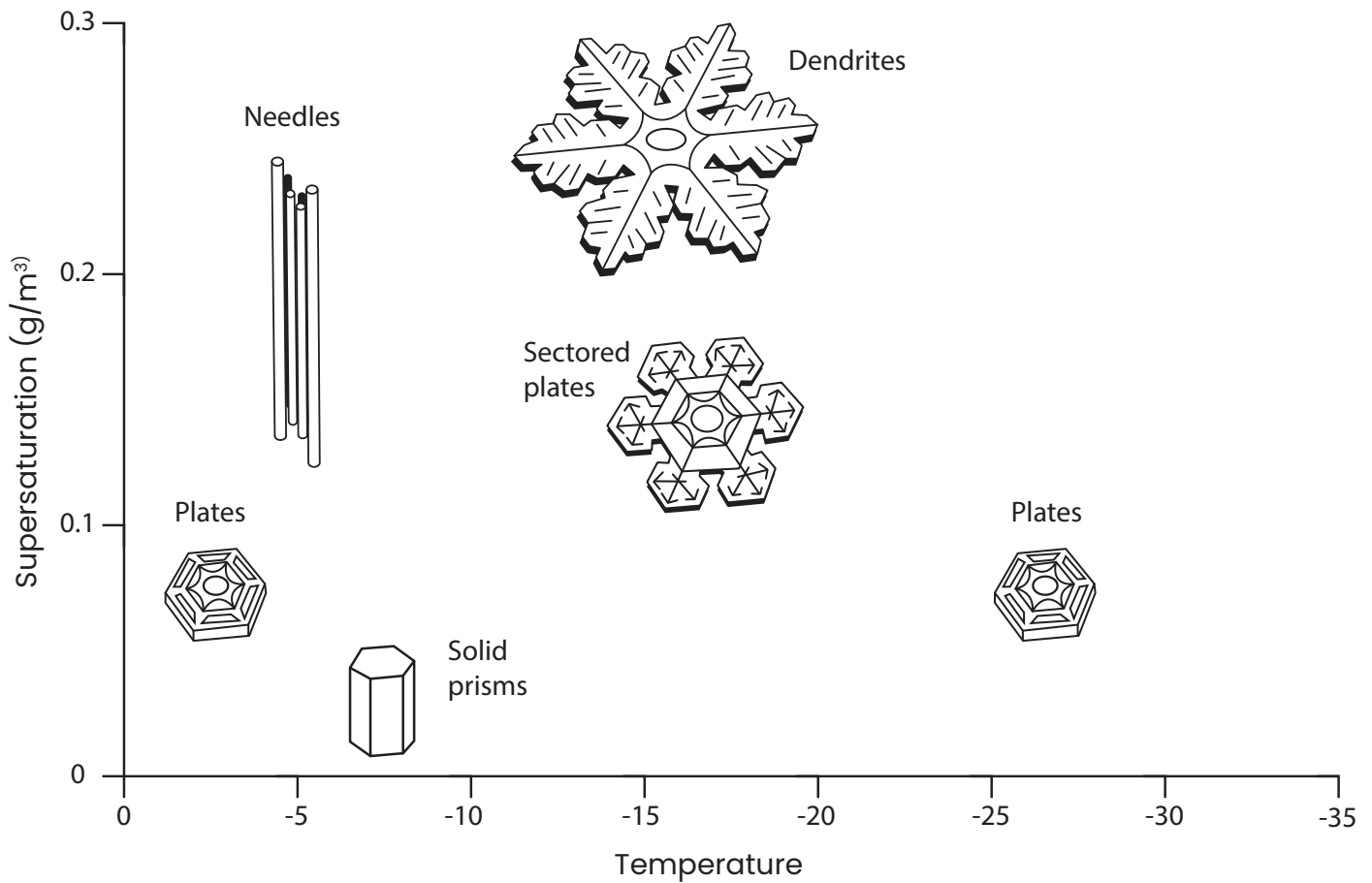
When it is snowing, put on a dark coat or grab a piece of dark cloth and go outside. Let the snowflakes land on your sleeve or on your cloth. Pay attention to their shapes. Using the chart below, try to work out what conditions were like in the cloud where the snowflake was born and in the air the flakes have fallen through.



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The more humid the air, the more water available to create ice crystals.



The colder it gets, the less moisture the air can hold, making it harder for snowflake components to join together.



MAKE A SIX-SIDED SNOWFLAKE



What you'll need:

- Paper (thin paper is best)
- Pencil
- Ruler
- Scissors
- Protractor (optional)
- Markers, crayons, pencil crayons, paint, glitter (optional)

Activity setup:

1. Start with a square piece of paper. You can make your paper square using a ruler, a pencil and scissors. Be careful—scissors are sharp!
2. Fold the square in half diagonally, to form a triangle.
3. Fold your triangle in half again, to make a smaller triangle.
4. Divide the triangle into three equal sections. You can use a protractor to measure three 30° angles.
5. Fold the left section towards the front and keep it there.
6. Then fold the right section towards the front and keep it there too.
7. Flip your paper over so that the side with the horizontal edge is facing up.
8. Cut along the horizontal edge—cutting off the pointy tips—so that you end up with a wedge.
9. While keeping the wedge folded, cut shapes out of its edges. But sure to leave some of the folds intact.
10. Unfold your snowflake carefully. Can you see how your snowflake has six parts that are the same? Real snowflakes have six-sided symmetry as well—just like your paper snowflake.
11. Colour, paint or add glitter to your snowflake—or leave it plain.

