



My nature connection

SNOWFLAKE SCIENTISTS

GRADES: K - 4, 6
TIME: 45 min.

WHY DOES IT SNOW?

Snow is a great indicator that winter is on its way, and in Minnesota, we get a lot of it! Water can exist in three different forms: solid (ice), liquid (water), and gas (water vapor).

When water vapor reaches high altitudes, it sometimes attaches to dust particles. When the temperature reaches below 32 degrees Fahrenheit, those particles freeze into a solid form which eventually falls to the earth's surface in the form of snowflakes.

WHAT YOU'LL NEED

- 1 Piece of Paper
- Scissors
- Pencil or Pen

SNOWFLAKE SHAPES

We now know how snowflakes form. But how do they develop into unique and beautiful shapes? For that answer, we'll have to look a little bit closer.

Water molecules are made up of positively charged hydrogen atoms and negatively charged oxygen atoms. Just like in magnets, atoms with the same charge repel each other, meaning that two positive atoms cannot bond, and two negative atoms cannot bond.

This means that the positive hydrogen atoms of one water molecule must bind to the negative oxygen atoms of another water molecule. For the correct bonds to form, each snowflake appears as six water molecules bonded in a hexagonal (6-sided) shape as pictured here.

THE FIRST FLAKE PHOTOS

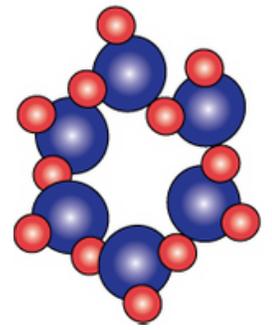
In 1885, a 19-year-old farmer named Wilson Bentley placed a snowflake under a microscope and carefully positioned his camera over the eyepiece. He then took the first known photograph of a snowflake. Throughout his life, Bentley continued to take 5,000 more photos of snowflakes!



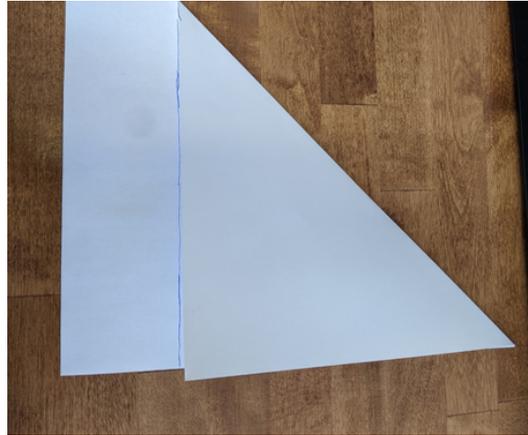
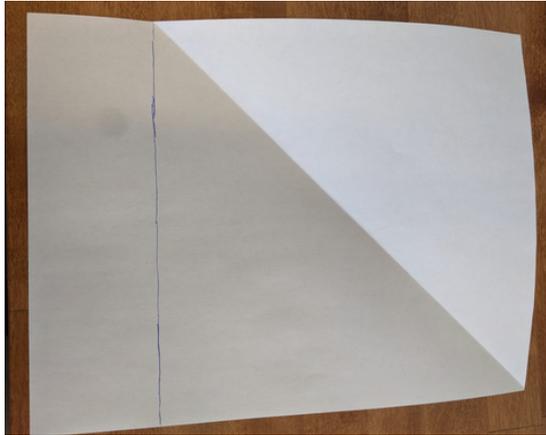
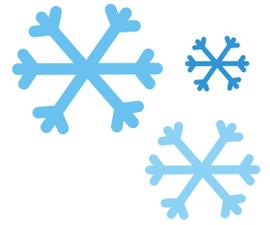
One of Bentley's first photographs

CREATE YOUR OWN SNOWFLAKE

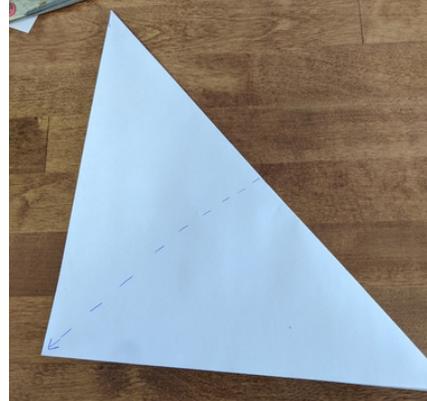
Now, it's time to make our own snowflakes from paper. Your paper snowflake will have six sides, just like a real snowflake, and can also be unique to you! Follow the steps below to make your own snowflake.



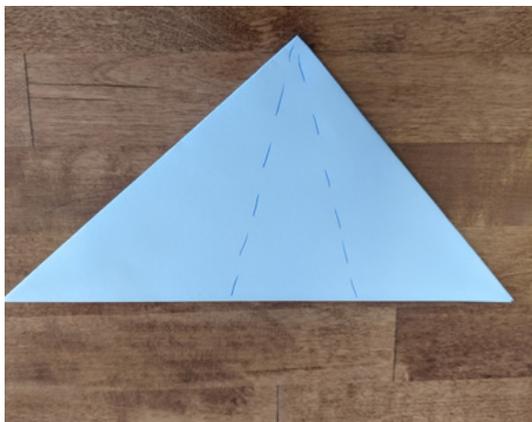
Step 1: Take a sheet of printer paper and fold the corner down to where the blue line is on the image. Once you have folded your paper, cut along the blue line to be left with a square of paper.



Step 2: Fold one corner of your paper square to the opposite diagonal corner to create a triangle. Next, fold your triangle paper into thirds along the dotted lines so that the new triangles overlap.



Step 3: Then, fold your triangle paper into thirds along the dotted lines shown in the image below so that the new triangles overlap.



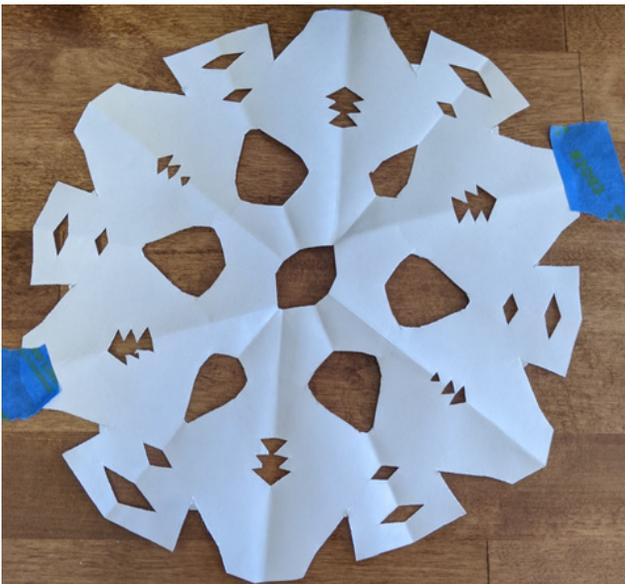


Step 4: Cut along the dotted line pictured here to remove the two points at the top of your snowflake.

Step 5: Draw shapes on the edges of your snowflakes and carefully cut them out with your scissors. The shapes shown in the image are just examples. Be creative and add your own designs!



Step 6: Unfold your paper to enjoy your six-sided and completely unique snowflake. There will never be another exactly like the one you made!



EDUCATION STANDARDS

Social Emotional Learning Competency:

Grade Level

Science Education Standard

Grade K

0.3.2.2.1 Monitor daily and seasonal changes in weather and summarize the changes.

Grade 1

1.1.3.2.1 Recognize that tools are used by people, including scientists and engineers, to gather information and solve problems.

Grade 2

2.3.2.2.1 Measure, record and describe weather conditions using common tools.

Grade 3

3.1.3.2.2 Recognize that the practice of science and/or engineering involves many different kinds of work and engages men and women of all ages and backgrounds.

Grade 4

4.3.2.3.1 Identify where water collects on Earth, including the atmosphere, ground, and surface water, and describe how water moves through the Earth system using the processes of evaporation, condensation and precipitation.

Grade 6

6.2.1.2.3 Use the relationship between heat and motion and arrangement of particles in solids, liquids, and gases to explain melting, freezing, condensation and evaporation