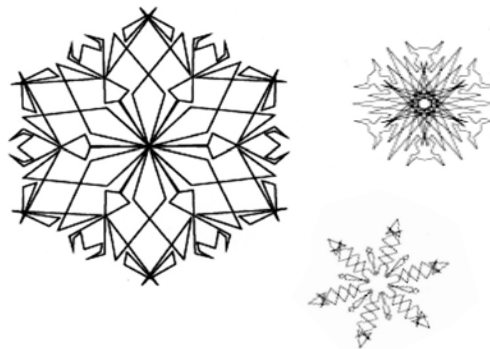


# NATURE DETECTIVES

Winter 2010



## Snow Dust

Think of words to describe snow... You might come up with words like *sparkly*, *white* or even *pure*. Would you be surprised to learn each *pure*, *sparkly white* snowflake actually begins with a particle of dust? Whether it is a speck of pollen, bacteria, salt, ash or dirt, the dust particle forms the core of each snow crystal.

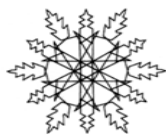
The speck of dust floats up into the air and gets very cold. When a little water vapor touches the cold dust, it freezes into a tiny ball. More water vapor sticks to the frozen ball and starts to form a six-sided ice crystal. Ice crystals are always six-sided. As more water vapor attaches to the crystal, it grows. The corners grow fastest, forming the beautiful, intricate shapes we admire on our sleeves and mittens on a snowy day.

Snowflakes are not frozen raindrops. Raindrops are liquid water. When raindrops freeze, they fall as sleet. Snow crystals start with water vapor, which is water in invisible gas form. When water vapor becomes snow crystals, light scattering off the ice edges makes them look white.

## Growing Snowflakes

Snow crystals get blown around inside a cloud, colliding with more water vapor. Each new bit of water vapor makes the icy crystals bigger. Soon the snow crystals are too heavy to stay afloat and down, down they fall to earth. On the way down, they might stick to other snow crystals and make big snowflakes.

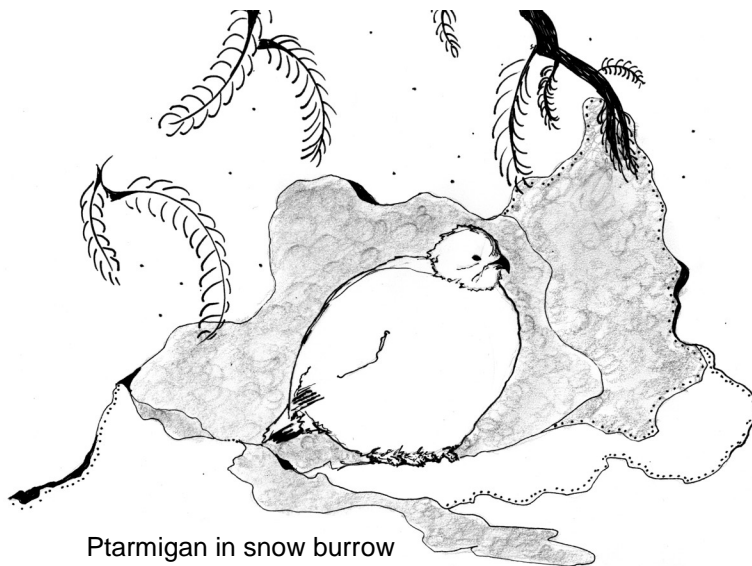
## First Snow



Snow  
makes  
whiteness  
where it falls.

The bushes look like popcorn balls.  
And places where I always play,  
Look like somewhere else today.

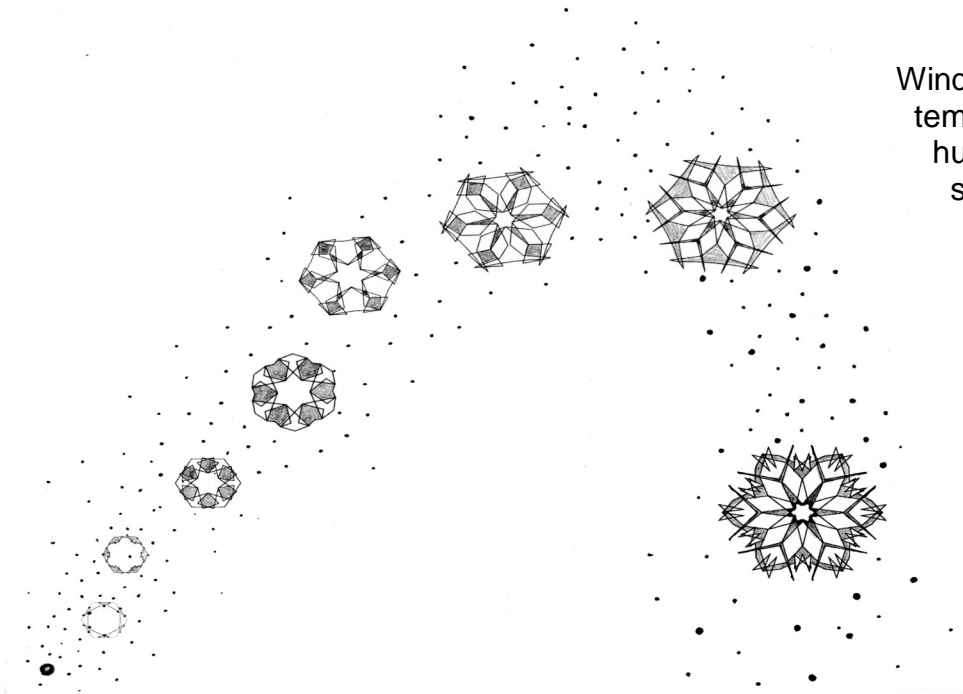
By Marie Louise Allen



Ptarmigan in snow burrow

## Each Snow Crystal Is Unique

Two snow crystals are unlikely to follow exactly the same wind-driven path through a cloud as they are being formed. Each randomly enlarges by coming into contact with water vapor, and odds are you will never find two precisely alike. Snow crystals formed under the same conditions in a cloud may look similar, but their shapes will likely vary, even if just slightly.



Wind, air pressure, temperature and humidity affect the size and shape of snow crystals.

## Two Crystals (or More) Make a Flake

Snow crystals stop growing once they fall out of their cloud because water vapor is no longer being added. As they fall to earth, they often collide with other crystals to form snowflakes. Single snowflakes are made when at least two snow crystals stick together on their way to the ground. Snowflakes can have hundreds or even thousands of tiny snow crystals stuck together into one snowflake. Most people call single snow crystals *flakes*, too, and that's okay.

Ice crystals are very fragile. Edges can break off as they are tossed by the wind or collide on their way to the ground. Edges can start melting in warm air, too. Watch a snowflake disappear in seconds on your mitten as you blow on it.

## Snowflake Bentley

How could you photograph something so fragile? Wilson Bentley is famous as the first person to successfully photograph snow crystals using a microscope. He was just a teenager when he built the special photo equipment, but he continued taking pictures of snowflakes for almost 50 years, starting in 1885. His 5000 pictures of snow crystals have inspired artists and scientists, and earned Wilson the nickname Snowflake Bentley.

Check out the award-winning book by Jacqueline Briggs Martin, titled Snowflake Bentley, from your library.

## Fowl Weather Sledding

There is no doubt snow crystals are beautiful, but maybe the best thing about snow is that it can be fun, and humans are not the only animals that seem to enjoy playing in snow. River otters sometimes slide down snowy riverbanks into the water and do it over and over again. Ravens have also been seen playing in the snow, rolling and sliding. Ravens, owls, crows, finches, kinglets and ptarmigans also seem to like taking bird baths in the snow.



## Snow Cozy

Snow can also be life saving for ptarmigans during freezing nights in the alpine tundra. The birds burrow into deep snow, which insulates them from the cold air. If the next day is extra cold or snowy, they will sometimes linger inside their self-made snow cave. Once they leave it, they won't return, but will make a new burrow next time they need extra protection from freezing temperatures.

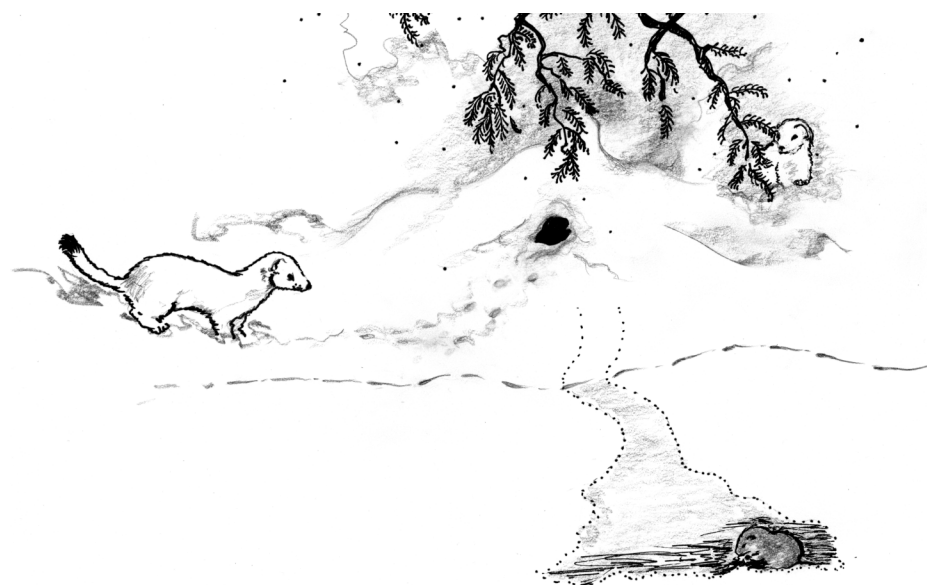


Mice, voles and pocket gophers take advantage of deep snow for an almost perfect winter hideout. They tunnel under the snow near the ground, staying sheltered from frigid weather and out of sight of predators. Hidden under the snow, they scurry around eating berries, twigs, young bark and some insects. They will sleep in their snow lairs and even build snug nests and raise babies.

Of course, they are not completely safe from predators like coyotes, foxes and owls. These keen-eared predators can detect the rodents below the snow and break through the crust to snatch a furry dinner. Weasels with their slender bodies can slink right behind rodents in the snow tunnels to catch them off guard.

Weasels are small predators that can become prey for bigger animals. The weasels' winter white fur is good camouflage for hunting and for hiding.

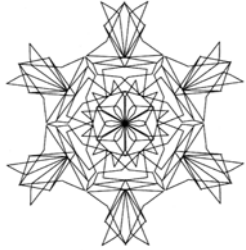
Ptarmigans also trade their summer browns for winter white for better hiding, as do snowshoe hares.



## Icy Snow Crystals Up Close



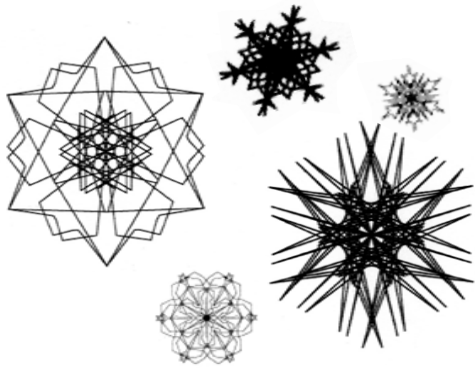
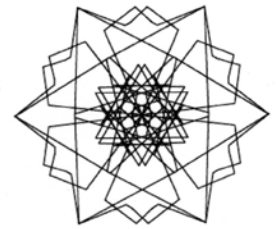
To see snow crystals in close-up detail, it helps to look at them through a magnifying lens. The best viewing is on the coldest days when you'll have more time before the crystals melt away.



The simplest method is to wear dark-colored mittens or gloves and look at snowflakes through a hand lens or magnifying glass as they land on your hands. Stand outside for a few minutes first to make sure your mittens are as cold as the air or your snowflakes will be gone as soon as they touch the fabric.

### Make It An Experiment

A piece of black construction paper or black felt works well to catch snowflakes. Once you have a few snowflakes on your paper, try to shield it from more snow so you don't get too many crystals, which would make it hard to see the individual shapes. Use your magnifier to look at the crystals. You and a friend might enjoy this activity together.

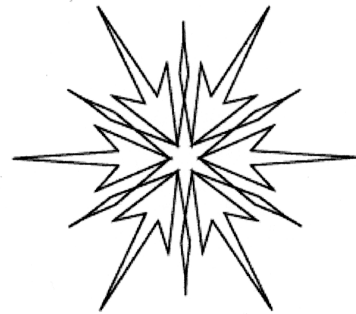
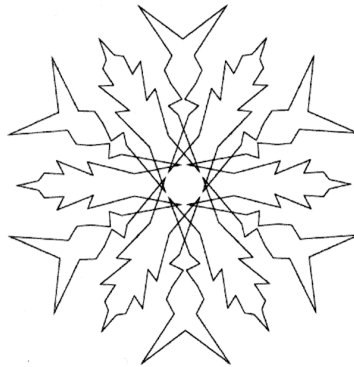
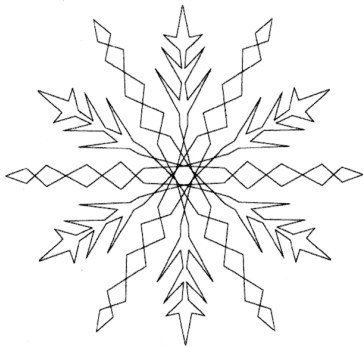


You could also draw the crystals you see.

Jot down the air temperature beside your drawing and add words to describe the wind and weather.

If you collect your snow crystal drawings from different days, you could see if the weather conditions affect the shape of the crystals you find.

Snow crystals can be stars, teeny pencil-shaped columns, stinging sharp needles and or plain-looking plates, but all are formed with six sides.



You can even try to find a rare twelve-sided snowflake that forms when two snow crystals stick together in just the right way.