

- Start Up:** Winter animals poster, winter twig, globe, evergreen boughs
(5-10 min) **Ice Experiment**-As the students arrive, have them pair up to crush an ice cube. Place the crushed ice in a cup, and an uncrushed ice cube into another cup. Set the cups in a spot handy for observation. Use some cardboard or foil to cover the cups to minimize evaporation (from McIntyre).
- Welcome/** Staff/Volunteer Names
Introduction: **Today's Topic-Winter Wonders**
1 min. **Question: Can snow help animals survive the winter?**
- Opener:** **Gently Falling Snowflakes** (trust game based on "Pass the Person", Sanborn)-
15 min. The group makes a snug shoulder-to-shoulder circle with one student on the inside. Student inside the circle crosses arms across chest & closes eyes, then leans backwards to be caught by the others, who "pass" the student around the circle by gently pushing them back and forth. (Works best w/groups of 8-10.)
- Background/** **Why Winter?** (Caduto)-Using a globe or poster of the earth, briefly show students
Exploration: how the sun's rays hit our part of the earth more directly in the spring/summer, and
30 min. indirectly in the fall/winter. Explain how the abundance, then lack, of solar energy due to the tilt of the Earth's axis causes a change in seasons every year.
- Activity:** **Ice & Snow Experiments** (McIntyre)-
Remind the students to repeatedly observe the crushed and uncrushed ice cubes. Which one melts first? How much water makes an ice cube?
- ♣ Fill a clear cup with snow (Students can pair up to do this also).
 - ♣ Draw a line at the top of the snow with a marker.
 - ♣ Use some cardboard or foil to cover the cup to minimize evaporation.
 - ♣ After it melts, observe how much water it took to make a cup full of snow.
 - ♣ Ask the students about the differences between snow and ice.
 - Ice has more volume than water. Snow takes up even more space.
 - ♣ What is frost? (frozen condensed water from the air)
- Winter challenges**-Ask the students how winter makes it hard for plants.
- ♣ Water is frozen at very cold temperatures-plants can't use it (like a desert).
 - ♣ Plants get damaged with too much freezing and thawing.
 - ♣ Heavy snow can break branches.
- Deciduous trees & shrubs conserve moisture by losing their leaves and going dormant. Their growing parts for next spring are covered by bud scales which protect them.
Show students an example of a winter twig with visible bud scales.
- Evergreen trees & shrubs have small, wax-coated, or needle-like leaves.
Show students an example of an evergreen bough.
Some plants with broad evergreen leaves curl up when it's very cold to save/conserve water.

Ask students how winter makes it harder for animals.

- ♣ Cold-blooded animals (frogs, turtles) are sluggish. They can't move in the cold. They hibernate underground (under the frost line).
- ♣ Insects go dormant in protected places like dead leaves, bark, & tree hollows. Some over-winter as eggs or pupae.
- ♣ Birds can fluff their feathers to stay warmer when they rest (or must migrate).

- ♣ Warm-blooded animals grow thicker winter coats & eat more to build up a fat layer. The layer of fat helps insulate them from the cold.
 - Some warm-blooded animals hibernate or go dormant, others stay active.
 - It is hard for animals to find food in the winter, especially if there is snow.
 - Rodents like squirrels store food for the winter, deer & turkeys do not.

How do people survive the winter?

(heat our homes & cars, wear coats, stay inside more)

Activity:

5 min.

Insulating with fat (*Junior Girl Scout Badge Book*)-

Have the students coat one index finger with petroleum jelly.

Ask them to put the index fingers of both hands into a dish of cold/ice water.

Can you feel a difference? Discuss the students' findings.

Wipe off the "fat" with paper towels.

Prepare to go Outside:

10 min.

Restroom break. Dress for weather.

Bring some magnifying glasses & black paper.

Look at any winter or snow related displays before going outside.

Trail Rules (see The First Program).

What we will look for-Animals and their signs (in the snow).

Predictions-What animals, plants will we find? What will it be like?

OUTDOOR

Remind students that they can see their breath by exhaling into the cold air.

EXPLORATION: Who can make the biggest amount of fog? Explain condensation.

60-90 min.

Kinds of snow-Encourage the students to name and find/describe different kinds of snow. (fluffy, crusty, sleety, powdery, etc.)

Activity:

Snowflake observation-If there is snow on the ground, give each student a chilled piece of black paper.

Scoop up small amounts of snow and gently shake some out on the paper.

Give the students magnifiers and help them discover the structure of snow and snowflakes.

- ♣ Snow is made of small ice crystals formed into patterns.
- ♣ Snowflakes are six-sided, or hexagonal.
- ♣ No two snowflakes are alike.

Lead the students on a hike to look for animals (birds) and their signs.

Note any tracks in the snow or mud.

Follow the track trails of a couple different animals.

Try to figure out which direction the animal was moving, how fast it was moving, and the size of each animal.

Share with the students how having snow cover can be an advantage in winter:
Deep snow is good because it keeps dormant plants at a constant temperature.
Snow can be good for animals.

- Small rodents make tunnels under the snow to find food and travel around.
- They are insulated, out of the wind and hidden from predators.
- Snow can give rabbits a boost to reach twigs that are higher.
- Some rabbits get extra fur on their feet to make hopping on top of the snow easier.
- Birds like pheasants rest under the snow to keep warm. It is a “blanket” to them.
- Some animals adapt to winter by getting a white fur coat-snowshoe hares & weasels.

Help the students look for rodent tunnels in the snow or dead grass.
Help the students look for twigs clipped by munching rabbits.

Activity: **Track stories** (Lingelbach)-Divide the students into two or more groups.
Ask one group to close their eyes/turn around while the others walk, jump, run, across the snow.
Let the first group guess what kind of motion each set of tracks represents.
Switch groups and repeat.

Game: **Wolves in the Snow** (Sisson)-Choose a student to be the “lead wolf”.
10 min. The other student “wolves” must follow the leader by stepping in his/her tracks.
Ask the students if it is easier for the followers to walk in the already made tracks.
Is it easier for wolves? Discuss conservation of energy by animals in the winter.
(This activity can be done anytime along the hike.)

Spend some time watching active animals like squirrels and birds. What are they doing?

Closing: We can help birds survive the challenges of winter by feeding them.
Discuss what kinds of seeds and food are good for our feathered friends.

Send Off: Goodbye!
Next Month-Maple Syrup Time

Take Home: Parent Outline
Snow related activities

Vocabulary

Deciduous, evergreen, hibernate, dormant, insulation, crystal, hexagonal, condensation, evaporation, season

Background and Activity References for Naturalists and Parents

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- Experience Iowa Wetlands: A Field Activity Guide*. Ed. K. Hodges and L. Riley Resource Enhancement And Protection. P. 65 Track sheet
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- Lingelbach, Jenepher. 1986. *Hands-On Nature: Information and Activities for Exploring the Environment with Children*. Vermont Institute of Natural Science, Woodstock, VT. Pp. 88-97 Animals in winter, snug in the snow; p. 91 Jello freezing activity; p. 96 mammal play; p. 192 Track Detectives
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- Milord, Susan. 1989. *The Kid's Nature Book*. Williamson Publishing, Charlotte, VT. P. 22 Snow
- Ranger Rick's Naturescope: Birds, Birds, Birds!* 1992. National Wildlife Federation, Washington, D.C. Centerfold has numerous feeder diagrams
- Sanborn, Jane. 1984. *Bag of Tricks: 180 Great Games*. Search Publications, Florissant, CO. P. 24 Pass the Person
- Sisson, Edith A. 1987. *Nature with Children of All Ages*. The Massachusetts Audubon Society-Prentice Hall Press, New York. Pp. 146-156 Winter activities-snow gauge, icicle making for send home; p. 151 Wolves in the Snow, Fox & Geese games

Snow-For snow to form, the temperature at cloud level is at or below freezing. Wet clumpy snow falls when the temperature near the ground is warmer, dry powdery snow falls when the ground temperature is colder. Snowflakes are six-sided crystals of ice; no two are exactly alike. Each crystal forms when cold water vapor freezes around a speck of dust in a cloud. In the late 1800s, a Vermont farmer named Wilson Bentley photographed thousands of snowflakes. His photos were enjoyed all over the world.

Extensions/Alternate Activities/Rainy Day

With snow on the ground, you can also have different students measure the temperature at different levels of a snowdrift. Where would an animal go to keep warm under the snow?
Measure the depths of different drifts. Where do the deepest drifts occur?

Make up some colored water in spray bottles for students to paint the snow with.
They could leave trails of "tracks" for other students to follow. (Use flour trails if there is no snow.)

Play **Fox & Geese** (Sisson)-Stomp down the snow in the shape of a large wheel with spokes. Choose a "fox" to chase the other student "geese". All players must stay on the stomped paths.

Use an animal sign/home hunt sheet to spark student interest in what they find on the hike. Observe changes since the last program.

Tell a story about seasonal changes, "Spring Defeats Winter" (Caduto).

Help the students make a bird feeder out of a 20 oz bottle or other reusable materials (*Ranger Rick*).

Paper Snowflakes-Fold paper circles in half, then in thirds, then in half again to snip cutouts with scissors.

Collect falling snowflakes by catching them on a chilled plate of glass sprayed with chilled hairspray or artists fixative (Milord).

Let the students try snowshoes if you have some and there is enough snow.

Supplies:	Winter animals poster	Twig w/large bud scales
	Black paper squares	Evergreen bough
	Magnifying glasses	Clear plastic cups (1/student)
	Ice cubes	Black marker
	Washcloth/dish towel	Foil or cardboard squares
	Hammers-2	Globe or inflatable globe or Earth poster
	Food coloring	Flashlight
	Spray bottles	Track sheets (<i>Experience Iowa Wetlands</i>)
	Winter storybook	Paper towels
	Flashlight	Petroleum jelly
		Bowl of cold water

Advance Preparation: Cut squares of black paper for each student. Refrigerate them until use.

Ice Experiment-Gather some clear cups. Cut some cardboard or foil to cover the cups. Have a washcloth or dish towel handy to wrap ice cubes in before breaking them up.

Clip a winter twig and evergreen bough.

Use food coloring to dye water in several spray bottles for snow painting.

Gather supplies for making bird feeders if you will do this activity.