



Science Unit: *Weather and Seasons*

Lesson 1: *Winter Season*

School Year: 2009/2010

Developed for: Sir Guy Carleton and Sir Sandford Fleming Elementary Schools, Vancouver School District

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Grade level: Presented to grades K and 1/2; appropriate for grades K – 5 with age appropriate modifications

Duration of lesson: 1 hour and 20 minutes

Objectives

1. Learn about the effects of winter on animals and plants.
2. Discover how to make frost and compare frost and dew.
3. Look at adaptations of Inuit and First Nations to winter (snowshoes, snow goggles)

Background Information

Many places on Earth experience four seasons each year. Seasons occur due to the tilt of the Earth's axis as it revolves around the sun. In the temperate and polar regions seasons are marked by changes in the intensity of sunlight that reaches the Earth's surface. As parts of the Earth are tilted away from the sun, they become colder and darker and experience winter. At the same time, the opposite sides of the Earth are tilted toward the sun, receiving more light and heat, which is summer. During the winter months, decreases in temperature and light intensity can cause some animals to go into hibernation or to migrate, and some plants to die or become dormant. In tropical and subtropical regions, there are two seasons per year: the rainy and dry seasons.

Vocabulary

Tilt: To lean to one side.

Seasons: Four periods of the year, each with specific weather conditions, called spring, summer, fall and winter, experienced in the temperate and polar regions.

Atmosphere: The envelope of gases that surrounds a planet. Earth's atmosphere is made up of mostly nitrogen and oxygen.

Weather: Condition of the atmosphere in a specific place at a particular time.

Climate: The average weather in a region over a long period of time.

Frost: Light deposit of small thin ice crystals on cold objects. Formed when water vapour sublimates.

Dew: Water droplets formed when atmospheric moisture condenses on cool surfaces.

Hibernation: State of deep sleep of animals for the winter, during cold weather when there is very little to eat.

Dormancy: A period of inactivity in an organism's lifecycle, winter dormancy is seen in some plants



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and animals due to lack of light, heat and available food.

<u>Snowshoes:</u>	Traditional footwear for distributing one's weight over a large surface to prevent sinking into snow. Inuit and First Nations snowshoes were traditionally made from hardwood and rawhide lacings.
<u>Snow goggles</u>	Traditional Inuit and First Nations eyewear to prevent snow blindness. These goggles were carved of bone, shell or wood.
<u>Mukluks:</u>	Traditional Inuit boots made from sealskin or reindeer skin, very light and warm, ideal for hunters to move quietly.

Materials

- Plastic cups or clean, empty tin cans
- Rock salt
- Stir sticks
- Crushed ice
- Magnifying glasses
- Egg cartons
- Decorative material (beads, sequins, feathers, waterproof paint)
- Knife
- String

In the Classroom

Introductory Discussion

1. What makes seasons? When we have winter, what season is the southern part of the world experiencing? What do we do to prepare for winter? What about Inuit or First Nations people, long ago? What do animals do in the winter? What about plants?
2. What do you notice about your breath on cold mornings? (Your breath comes out like little clouds of mist.) What about when we breathe on cold windows? We can try it in the classroom.
3. On some mornings grass and leaves may be very damp even though it hasn't rained during the night. Where does this water come from? (It comes from the air. As the air cools, moisture in the air also cools and condenses as dew.)
4. On some cold winter mornings you have to scrape ice off your car's windshield. Where did the ice come from? (moisture in the air, freezing on contact with the cold windshield).
5. We are going to make frost. Does anyone know what we might need to make frost in the classroom?

Science Activity/Experiment

The students will be doing two activities: 1. Making frost and 2. creating snow goggles to take up to Mt. Seymour on the winter snowshoe field trip.



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1. Students will work in pairs. Each student pair will need a plastic cup or tin can, crushed ice to fill the cup 3/4s full, 4 Tbsp rock salt, stir stick, and enough water to fill up the cup. Before students begin, they can make predictions about how long it will take to make frost, and what will their cups look like?
2. Students will fill up their cups with ice, then add in salt and water and stir mixture quickly. Cups should then be left on the desk for observation. As the cups are getting cold, the students can breathe on the outside of the cups
3. After about 20 minutes, students can observe frost on the outside of their cups. They can use magnifying glasses to look at ice crystals.
4. While students wait for the frost to form, or after making frost, students can begin making snow goggles using egg cartons. Each student will get two adjoining egg cups, cut from the carton. Using a pair of scissors they can poke a thin slit across each egg cup (eye slits). Then cut out a triangle between the cups so the goggles can fit over the nose. Poke holes at the edges of the goggles to tie on a string or elasticized string.
5. Now the goggles can be decorated or painted with waterproof paint, sequins, feathers, ribbons, etc. These goggles can be brought up the mountain (Lesson 2) or used on a snowy day, outside.

Closure Discussion

1. Were your predictions correct? Why did the frost form on the outside of the cup? Where did the water droplets come from on the outside of the cup?
2. What did you learn? What surprised you about making frost?

References:

Levine, Shar and Leslie Johnstone. 2003. Wonderful Weather: First Science Experiments. Sterling Publishing Co. New York.

VanCleave, Janice. 1995. Weather: Spectacular Science Projects. John Wiley and Sons, Toronto.

Wyatt, Valerie. 1990. Weather Watch. Kids Can Press, Toronto.

www.bom.au/Student_Teachers



Making Frost

Name of Weather Scientist_____

Date:_____

I need:

I predict:



I observed: (draw and label)



I learned:
