



Critters in the Cold!

Winter Tale Skits

Objective: To explore and illustrate the winter survival strategies of a variety of animals.

Divide the class into small groups. Give each group a winter scenario that identifies an animal and its winter survival strategy. Provide time for the groups to plan and practice skits that show what their animal does in winter. Encourage students to use props and sound effects. After each skit, have the rest of the classroom try to guess the animal and its winter survival method. Use the winter scenarios provided or create your own.

- **Monarch Butterflies:** We fly to Mexico, away from all the cold and snow. There we gather together in clusters and hang from trees, while we bask in the warm sun.
- **Canada Geese:** Listen for our honking in the fall and look up to see us flying in V-formation, winging our way south to winter near the seacoast.
- **Honeybees:** In winter we cluster around our queen inside the hive. Those of us on the outside of the cluster warm the hive by vibrating our wings at high speeds. Then we trade places with the other bees in the center and eat the honey we have stored to feed us all winter.
- **Beavers:** We keep busy, felling trees and storing branches underwater near our lodge. Once the pond freezes over, we stay warm and dry inside our lodge, munching on these stored branches.
- **Wood Frogs:** We hop about in the leaf litter catching insects to eat. When it gets cold, we burrow under the leaf litter to spend the winter in the deep freeze, waiting for spring rains to thaw us out.
- **Woodpeckers:** Finding our favorite meal is the same, fall, winter, spring, or summer. Listen for us tapping on tree trunks and dining on insects that we find under the bark.
- **Cottontail Rabbit:** I have a nice coat of thick brown fluffy fur that keeps me warm in the cold. In winter I try to stay hidden in dense brush to stay warm and hide from predators who can see my brown fur against the snowy background. I forage mostly at night for bark, twigs and buds on shrubs.
- **Gray Squirrel:** I do not hibernate and because I cannot conserve enough energy to survive long periods without food, I must eat every day. In winter I eat mainly tree bark and fungi and the extra nuts I collected and buried in the ground during the Fall. When I am not eating, I sleep in my well-insulated, waterproof nest up in a tree.

- **Eastern Screech Owl:** To survive the winter, I put on fat and try to store extra food I catch inside holes. During winter I hunt and eat small mammals and birds. For extra warmth, I share a nest inside a tree hole with my mate.

Adapted from: *Hands-On Nature* – Vermont Institute of Natural Science

Animal Signs and Tracks

Objective: To discover and observe signs of animal activity outdoors

Divide the class into small groups and have them look for and record the following:

- Animal tracks in the snow or mud from at least three different animals. What animals do you think they were? Are the tracks closely spaced together or far apart? Were the animals running or walking?
- Five potential food sources. Who might eat them? Draw some pictures.
- Signs of animals having eaten. What did they eat?
- Homes or shelters for 2 or 3 animals. Can you find a good place to take shelter from a storm?
- Stop, look and listen. What other signs of animal activity do you notice? Record those in your notebook.

Adapted from: *Hands-On Nature* – Vermont Institute of Natural Science

Insulation Investigation

Objective: To compare the insulating properties of different materials

Divide the class into small groups and have each group experiment with a different insulating material and then share their results.

Materials: (one set for each group)

- A large coffee can
 - 2 small cans
 - Thermometer
 - Insulating materials (feathers, shredded foam, pillow fill, wool, packing peanuts, etc.)
1. Have each group select a type of insulating material and place it in the coffee can until the can is half full
 2. Fill the small cans with hot tap water and place one in the center of the large coffee can. Leave the other can uninsulated.
 3. Add more insulating material to the coffee can until it is filled to the top of the small can.
 4. With the thermometer, take a temperature reading from each small can and record it.
 5. At ten-minute intervals, take the temperature of each small can. Be sure to let the thermometer stay in the can until it gets a steady reading.
 6. Take temperatures every ten minutes for an hour. Record and share your results.

Analyzing your Results:

What materials let the water cool the fastest? What materials kept the water warm the longest? Why do you think each material cooled at the rate it did? Which materials were the best insulators based on your data?

- Extension: Using ten-minute intervals as the x-axis and the temperature as the y-axis, have students graph the temperature of their material over time.
- Extension: What do you think would happen if more insulation were packed into the coffee can? Experiment and find out.
- Extension: How does this experiment relate to how animals stay warm in the winter or in cold places? What type of insulating materials do animals use to stay warm?

Life Under the Snow

Objective: To learn and measure how snow is insulating and can help tiny non-hibernating animals survive the winter underneath the snow.

Small non-hibernating animals such as mice, voles, and shrews take advantage of snow's insulating capabilities by tunneling beneath the surface. When the air temperature is 10°F, the temperature underneath a thick layer of snow can be 20 degrees warmer.

On a cold day when there is at least one foot of snow, have students measure and record the temperature on the surface of the snow and under the snow at ground level. To measure the snow at ground level, dig a hole into the base of the snowbank and place an outdoor thermometer inside the space. Which area is warmer? Ask students how snow's insulating property can help animals survive in the winter. Even people have used snow and ice to help stay warm in the winter – igloos!

Hungry Penguins Game

Objective: To continue role playing as penguins while applying math concepts

This game gives children practice with number concepts including counting, one-to-one correspondence, addition, and subtraction. The game also develops problem-solving and story-problem skills. The Hungry Penguins Game can be adapted to your student's abilities by adjusting the number of fish you use.

Materials:

- Fish-shaped crackers
 - 1 sheet of blue paper per player
 - 1 paper cup per player
1. Fill a cup with fish crackers for each player. Give each student a sheet of blue paper. Have the children pretend the blue paper is the ocean and the crackers are fish.
 2. Tell the children a story similar to the story below. Invite the children to follow along and play the role of hungry penguins.
 - One day there were two fish swimming in the ocean. (Have each player place two fish in their oceans.)
 - As the fish were swimming, two more fish joined them. (Have players add two more fish to the ocean.) Ask, "How many fish are there in the ocean now?" [four]
 - As the fish were swimming, a hungry penguin dove into the water and ate one of the fish. (Have players eat one of the fish crackers.) Ask, "How many fish are left?" [three]

- Two more fish joined the three fish that were left. (Students add two more fish crackers.) Ask, “How many fish are there in the ocean?” [five]
- A very hungry penguin dove into the ocean and ate three fish. (Have the children eat three fish from their ocean.) Ask, “How many fish are left?” [two]
- A hungry penguin dove into the ocean to eat some fish. The fish all got away! Ask, “How many fish are left?” [two]

As you model the story, try to have the hungry penguin eat various numbers of fish, but not all of them. Increase or decrease the number of fish depending on the abilities of your students. After the students are familiar with the game, they can take turns continuing the story, helping to develop their language and math skills.

Extensions:

- Have two children start with a small number of fish in the ocean. Have one child close their eyes while another child takes some fish away. The first child opens their eyes and guesses how many were taken away.
- As you tell the story, have students record the data of the number of fish being eaten by the penguins as equations. After each equation is completed be sure to rewrite the answer, as it will be the first part of the next equation and the number of fish that should be on each child’s ocean. This will tell the story in numbers.

Adapted from: *Penguins and Their Young* – Gems Teacher Guide