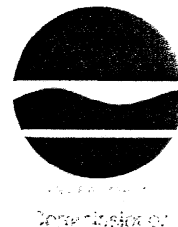


# New York State Department of Environmental Conservation

## Five Rivers Environmental Education Center

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Dear Teacher,

We're glad you have scheduled your students for a **Winter** class at Five Rivers! This is an exciting, hands-on lesson, and we hope your students will enjoy it. This class will begin with an indoor session during which your students will have the opportunity to handle animal pelts and feathers, as they discuss how animals survive the winter cold. The students will participate in an exercise that helps them learn to identify animal tracks. Then they will go outdoors to look for tracks, gnawings, nests, holes, and many other signs of wildlife.

Here are a few suggestions for a successful visit:

Students will be **indoors for the first 40 minutes of the lesson**, so there's no need to bundle up as you get off the bus. Students will go directly to a classroom and the instructor will suggest that they take off hats, coats and mittens so as not to get overheated indoors.

At the conclusion of the forty-minute indoor presentation, students will go **outdoors for an hour and twenty minutes**. (In the event of severely cold temperatures, the instructor may decide to come back indoors early.) It is essential that students are properly clothed for the outdoors. Warn the chaperones, too! Students who are not appropriately dressed may not be allowed to participate in outdoor activities.

Warm, waterproof **boots** are a necessity. Two pairs of **socks** may be worn for extra warmth—wool socks are best! Dress in layers. Layered clothing allows for maximum flexibility. Students can add or remove layers before becoming chilled or overheated. Warm **headgear** is a must! A large percentage of body heat is lost through the head when it is unprotected. Wear well-insulated **gloves or mittens**.

We ask you to copy and hand out the enclosed letter which advises students on the proper clothing to wear. Please have the students wear **nametags**.

The success of the program depends a great deal on the chaperones, who should be dressed for the outdoors and prepared to participate fully in all activities. We ask that chaperones not smoke, chat, or use cell phones during the class. Teachers and chaperones are responsible for the discipline of the group. **There must be at least one adult provided by the school for each group of 15 students**; two adults are recommended.

Please contact us if you have any questions or concerns about the class, and we will be happy to talk with you. If there is anything we can do to help your visit be a great experience, or if your class has special needs, we'd like to hear about it! We look forward to seeing you at Five Rivers.

## TEACHERS!

Please copy this letter and give one to each of your students so that they will be prepared to go outdoors and study the ecology of winter!

Thanks!

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Dear Friend,

You're about to begin an outdoor adventure. During your field trip to Five Rivers you will be going outdoors into the winter woods and meadows to discover how animals survive during the winter. You'll search for animal tracks, gnawings, nests, holes, and many other clues that wildlife leave. But, like any adventure, you'll enjoy it more if you're prepared.

**What the well-dressed scientist wears in the winter:**

1. Wear well-insulated, low-heeled **boots** that will keep your feet warm and dry.
2. **Wool socks** will keep your feet warm even if they get wet. Two pairs of socks are better.
3. Wear a warm **jacket or snowsuit** with warm clothes underneath—sweater and long underwear. Wearing layers of clothing allows you to add or remove layers before becoming chilled or overheated.
4. If your feet are cold, put on a **hat!** A large percentage of body heat is lost through the head when it is unprotected. Wear a warm hat to cover the head and ears.
5. Wear well-insulated gloves or **mittens**. Fingers and hands should be well protected.

We look forward to seeing you at Five Rivers!

Sincerely,

**Your Fellow Scientists at Five Rivers**

## A Story to Share With Your Students

*The Tracker is the autobiography of a young man who learned tracking skills from a Native American and from his own nature observations. Tom Brown has used his amazing tracking skills to observe and learn about wildlife, and has even been called in to assist the authorities in solving criminal cases or finding missing persons.*

### **The Ultimate Track From The Tracker, by Tom Brown, Jr. Berkley Books, ©1978**

The first track is the end of a string. At the far end, a being is moving; a mystery, dropping a hint about itself every so many feet, telling you more about itself until you can almost see it, even before you come to it. The mystery reveals itself slowly, track by track...it will tell you the intimate details of its life and work, until you know the maker of the track like a lifelong friend. The mystery leaves itself like a trail of breadcrumbs, and by the time your mind has eaten its way to the maker of the tracks, the mystery is inside you, part of you forever...

Tracks fascinate me. I watch my own tracks constantly. They go like a dog with a curious nose always catching scent of something unidentifiable hovering just out of reach. If I go to the store for milk, my trail winds a quarter of a mile to go a block and a half. Even in a small New Jersey town, the landscape is as full of invisible animals as a child's puzzle.

One winter after a moderate snow, I went out to get milk and found the track of a small gray bird called a Junco... Birds are always mysteries. They leave their track in the air most of the time and I don't have the nose to follow it. Their tracks on the ground were irresistible.

I crouched down and looked at them... The tracks went from seed to seed in an easy zig-zagging line. Looking close I could see where the bird had stopped and leaned a little to one side, breaking down the side of its print while it ducked and then craned its head up. I saw where it gave a little defensive hop as something that seemed threatening must have gone by overhead.

The movement from a hop to a better balanced stance said there had been danger. The way the toes went into the snow and curled under told me that more weight had been forward on the foot, as it would have been if the bird were ducking its head and then swiveling it to look up.

I had learned what track is made by that gesture the only way it can be learned, by watching a similar bird do a similar thing on the ground and then going over to see what the track looked like. By doing this time after time with bird after bird, animal after animal, person after person, I became a tracker.

Since I began tracking at the age of eight, I have never seen a track being made without wanting to go over and examine it. With each track I add a little information to what I have been able to gather so far. Bit by bit, I learn to track more completely the mystery at the end of every track.

The tracks painted in the living picture of a bird, a picture indistinct at first but clearer with every track, until I could see the small, sleek, gray head swiveling, swiveling as he picked up the seed and looked for cats, dogs, children, cars, birds after his prize, and bigger, hungrier things looking for an easy meal. His tracks hopped forward and I could see, as I crouched, the brushings of his wings in the snow as he took off. He was gone from the ground, but I could still see him in my mind, darting through the air. I looked in a straight line for the most prominent tree and walked toward it...

Birds are a delicacy on almost every predator's menu, and when the Junco lands, he hops around watching and watching, pecking and dropping half of what he pecks at because his head comes back up so fast to see what's after him next.

I brushed the pecked and dropped seeds aside. With a mouthful, he had gone flapping off toward the tree, and when I got to it, there were seeds at the foot of the tree that were like the ones where he had taken off. There was a fresh dust of snow around the seeds and beneath some of them, where he had knocked snow down off the branch as he landed. He must have felt safe sitting there ten feet above half the things that would like to eat him....

When he changed the position of the seeds in his gullet, he dropped some of them down over the snow that had fallen from the branch. There were hop marks where he had come down to get the dropped seeds later, but the fact that there was a fine dusting of snow on some of the seeds indicated that he had probably come to that branch before to swallow what he had grabbed from the ground.

There were other hop marks under the snow dust when I blew it away, and they seemed to have the same jittery prudence that the other tracks had had. Of course, I knew the bird, I had seen it around my own feeder. Every species has its specific behaviors, but every individual performs them differently. They're as unlike as people.

I recognized the jittery little tremors, the half steps thought about but left untaken. I had gone out and examined his other tracks after I had watched him one day from my window. I could see him pecking and ducking in that jittery, cocky style of feeding that was as individual as a human gait. I checked how the lighter dust of snow from his takeoff had scattered behind him. I guessed that the bird had taken off in the opposite direction sending the branch back and down as it left and dusting the snow further out than the first fall.

Since it was all I had to go on, I went as I had been taught from the track to the trail, looking far ahead to see where it might be going. I could read the identity from the individual print, but I needed the context in which the trail occurred to make sense of it entirely. The bird was feeding, the branch fall indicated he had flown in the direction of my house, and when I walked back there, I found that same jittery Junco near my own feeder, looking in my dining room window for my return. I sat down to watch him pecking-watching-pecking-watching-pecking-watching-pecking-watching, until someone finally came out of the house and asked me where the milk was.

## THE COMPOSITION OF SNOW

**Objectives:** Students will be able to describe the composition of snow. They will be able to define the word “insulate,” and be able to tell why snow makes a good insulating medium, and why ice makes a poor insulating medium. They will be able to give some examples of insulating materials, both natural and artificial.

**Method:** Students measure the amounts of air and water present in snow, and use the information to learn about insulating materials.

**Materials:** 2 measuring cups; a hot plate or heat source; snow.

**Procedure:** Ask students what a snowflake looks like. It usually has lots of points, in a star shape. When millions of these tiny flakes accumulate, at first they do not pack together tightly. Snow is composed of frozen crystals of water, some particles of dirt, and lots of air. When snow packs down, the air is compressed out. (Compare snowflakes to a box of cornflakes. How much cereal would you get if you crunched down a whole box full of cornflakes?)

Scoop up some fluffy snow in a container. Measure it in its fluffy state. Melt it down, and measure the remaining water. Compare the difference in volume. Why was there such a big difference? (Loss of air spaces.)

Save this container of water. Take a second container and cram it with as much crunched-down snow as you can get into it until you have reached the same volume as you initially had in the first container. Melt this down. Compare the new difference in volume. Was there as large a difference this time?

Suppose you melted a container of ice next. How would the resulting volume of water compare with the initial volume of ice? (It should be close to equal.) Why? (There aren't many air spaces in ice.)

***Insulation: to protect something, especially from the cold.***

Air is a good insulator; therefore anything that has air spaces in it provides good insulation. Discuss with the students why fur and feathers make good animal body coverings. (They contain lots of air spaces.) Ask the students to compare materials of their winter jackets for “compression” to see which contain the most air spaces. Make a list of various linings, including ranking them in order of squeeze-ability.

Ask students whether, by this logic, snow would make a good insulator. Snow, although we think of it as cold, is actually a good insulator, and some animals find warmth and shelter under the snow.

# Invent A Winter Animal

Use your imagination to invent an animal that can survive the winter. Remember that your animal must be able to find shelter, keep warm, and move around to find food and water all winter long. Draw your animal and describe how it meets its needs in the winter.