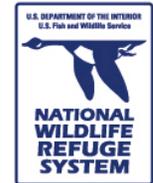


Nature Detectives



Grade: Preschool
Group Size: 1 class

Season: Winter **Time:** 1 hour
Ratio: 1:5, adults: students

For the Teacher:

Overview	Students listen to a short story about animal tracks, and then go outside for a field investigation. They become detectives, look for evidence left behind, use their curiosity and make discoveries about animals that live at the PWLC in winter. At the end of the investigation, students reflect upon what evidence they have found and conclude which animals live at the Prairie during the winter.
Subjects Covered	Science, Language Arts
MN Science Standards Supported	This lesson helps support 14 standards in three domains. For details: see section "Early Childhood Indicators of Progress: MN's Early Learning Standards"
Skills Used	Observing, questioning, investigating, reflecting, interpreting data, using curiosity, socializing in an outdoor/group setting
Performance Objectives	After completing this activity, students will be better able to... <ul style="list-style-type: none"> • Identify tracks of a common winter animals (such as mouse or rabbit) • Name two animals that live at the PWLC during winter • Enjoy exploring outside in winter
Vocabulary	Detectives, tracks, prairie, wetlands, clues, winter

For the PWLC Instructor:

PWLC Theme	The Prairie Pothole Region
Primary EE Message	The prairie pothole region is valuable and in need of restoration and protection.
Sub-message	Habitat: The Prairie Pothole Region is a unique and rare ecosystem.
PWLC EE Objective	Identify the components and functions of a given ecosystem by observing, counting, and describing the animals and plants that live in that ecosystem.
Materials	<u>Making Tracks</u> book; clipboards, pencils, and paper for chaperones, paper and crayons for children
Location	Classroom or dining hall and Mallard Marsh

Background Information

"Snow is the great revealer. It cannot keep a secret.
All through the woods around us it was filled with the gossip of the night."
-- Edwin Way Teale, Wandering Through Winter

The purpose of this program is to provide students with the opportunity to use their sense of wonder to explore the world they live in, specifically the local prairie wetlands environment in winter. Through an outdoor field investigation, students explore and practice being naturalists. A naturalist exhibits many positive qualities useful in the natural world as well as the day to day world we live in. Naturalists are observant, respectful, curious, patient, and full of wonder, qualities that children can apply in other settings their whole life long.

The outdoor classroom is a perfect setting for early childhood education even in winter. At the PWLC preschoolers make discoveries and draw conclusions about the natural world with guidance from adults. The focus is not on information being learned but on

the experience that the child gains. In her book The Sense of Wonder, Rachel Carson spoke about this need for discovery, “It is more important to pave the way for the child to want to know than to put him on a diet of facts he is not ready to assimilate.”

During winter, colder temperatures, snow, and ice force animals and plants to adapt to this dramatically different season. Animals respond in mainly three ways: by leaving the area in fall (migration), by hibernating, or by staying active. The list below provides examples of animals found at the PWLC which remain active all winter. Preschoolers search for these animals and most often actually find the signs they leave behind.

Winter Animals	Most Common Evidence at PWLC
chickadees, crows	calls
great horned owls	pellets, kill sites
deer	tracks, buck rubs, browse
muskrats	huts
mink	tracks, snow tunnels, snow slides
weasels	tracks, snow tunnels
mice	tracks, snow tunnels, scat, urine
grey squirrels	nests
rabbits	tracks, trails, browse, scat, urine
fox, coyotes	tracks, trails, scat

Just how do some of these amazing animals survive in the harsh winter prairie?

- **Black-capped chickadees** are often found in the oak savanna, protected from wind. They form mixed flocks with nuthatches and downy woodpeckers where each individual spends less time and energy looking for food and predators. Chickadees survive the night by finding their own little shelter to sleep in. Their bodies go into a regulated hypothermia which requires less energy to keep warm.
- **Coyotes** change their diet so they eat mainly mammals in winter due to the lack of other food sources. They tend to scavenge carcasses that they find rather than use up energy to hunt down prey.
- **Deer mice** spend the winter in underground burrows they make under the snow, nesting together for warmth. Instead of shivering, they gain brown fat, which they can use directly as a heat source. Their diet consists mainly of seeds as fresh green plants now lie dormant.
- **White-tailed deer** stay in a limited area called a deer yard in which they make a network of trails in deep snow for easier locomotion. Their winter diet consists of woody twigs and buds because green vegetation is not available. The coat of the deer changes in winter, becoming thicker and lighter in color, camouflaging them with trees, bare shrubs, and dried grasses. Their hollow hairs provide insulation from the cold, trapping dead air space in each strand.

From searching for tracks in snow and examining each shape and size to imagining who walked or hopped there earlier and hoping to see a winter animal -- there are many opportunities for preschoolers to “keep alive their inborn sense of wonder” (as Rachel Carson writes) while they become nature detectives and solve animal mysteries during

the colder winter months.

Teacher Preparation

- We highly recommend conducting one or more of the suggested extensions before your visit in order to integrate this field investigation into the classroom study of animal life. (See section, “Teacher-Led Extensions/Adaptations/Assessment Ideas.”)
- To maximize your time at the PWLC, please organize students into small groups with chaperones prior to your arrival and with students and adults wearing nametags.
- Upon arrival at the PWLC, teachers may provide PWLC staff with a written list of what students know and wonder for quick review before heading out into the prairie.

PWLC Staff Preparation

Organize and prepare materials. Select trail route and check for ice safety according to the PWLC Ice Safety Plan.

Field Investigation Procedure

1. Greet the class outside. Once inside the classroom welcome students, teachers, and chaperones to the Prairie Wetlands Learning Center. Invite them to remove their hats, mittens, and scarves, but to leave the rest of the winter gear on.
2. Assemble students into their small groups, each led by a chaperone. Give each chaperone a clipboard, paper and a pencil.
3. Inform students that they will be nature detectives today. Ask students what a detective does. (Solves mysteries using clues). What does a nature detective do? (A nature detective looks for clues left behind by animals). What kind of clues do animals leave behind? (Tracks, scat, homes, etc...) (This is the K of the KWHL model - what do we know?)
4. Read Making Tracks by David Hawcock to the class. Have them sit on the floor in a circle as you sit on either the floor or a chair to read to them. Invite them to guess the identity of each animal picture. Show them how the book unfolds into a circle. Read it together again (unfolded).
5. Tell students that they will be looking for evidence left behind by animals out on the prairie. Ask them to make predictions of clues they might find. (Eastern cottontail, red fox, coyote, deer mouse). Give chaperones the opportunity to take note of each child’s predictions on their clipboards. Invite chaperones to share aloud with the whole group.
6. Ask what we could find out about animals in winter by going outside today? Again, chaperones take note of each child’s question. Invite chaperones to share aloud with the whole group. (This is the W of the KWHL model-What do we wonder?)
7. After lining everyone up at the door in their small groups, ask them how should they behave in the field? (Follow the field leader, walk on trail, be quiet, stay with your adult, and be respectful, curious, patient.)

8. Outdoors in fresh snow near the barn, make a circle with the children and walk around inside the circle while they stay put. How many footprints are made for each complete set of tracks? (two) Are the tracks close together or far apart? (close) Is the pattern a straight line or zigzag? (straight) Run in the circle – how do the tracks change? (far apart) Play Follow the Leader! Each child must try their best to step in the footprints in front of them. Vary the steps for walking, long strides, tip-toe, hopping, and running. Reflect together: what did they discover? How might they apply their discoveries to animal tracks?
9. On the trail or pond, stop the children and make a new set of footprints. Challenge them to watch and walk next to the footprints without stepping on them. Check with the last person in line – did they see your footprints?
10. Next, search for evidence left behind by animals. (Examples may include: owl pellets, fur, scat, tracks.) Chaperones can record their observations. While searching ask students prompting questions, such as, who do they think left the clues behind? Which way were they going? Do they look like old clues or fresh ones? What might the animal be doing right now? (Hiding, sleeping, hunting, eating) Avoid discussing species identification which can be difficult and frustrating for young children.
11. Return to the classroom and allow each group a chance to share their discoveries. Briefly review their questions -- which can they now answer?
12. In reflection, ask them a few questions such as, what did you discover about animals in winter? What clues did you use? What surprised you? What did you enjoy most? What new questions do you have? Why might the prairie be an important place? Invite the children to create drawings and dictate words to a chaperone to write on their papers. They may take these drawings home to share their experience with their parents.
13. Thank everyone for coming to the Prairie Wetlands Learning Center and invite them to return again. Encourage them to keep going outside in winter to explore, make discoveries, and solve animal mysteries! With permission from a responsible adult, you can do this in your own yard at home.

Weather Alternatives

Field investigations take place rain or shine. Everyone should dress appropriately for the weather. In the event of unsafe weather (extreme cold) everyone must come indoors. PWLC staff makes every effort to make your bus travel worthwhile despite the weather and prepare indoor, age-appropriate plans. PWLC staff welcomes teacher input into these plans. Some possible alternatives might include:

- Go outside for a very short amount of time, even if only under the deck, to investigate and search for clues in the prairie around Center Pond.
- Bring tubs of snow inside for students to make tracks in using the latex track sets.
- Read a second story about tracks called In the Snow: Who's Been Here? by Lindsay Barrett George. Students create their own PWLC track guide with latex tracks to use in future exploration. They could include a drawing of each animal as well.
- Read Making Tracks or In the Snow: Who's Been Here? and include animal furs

that students can touch and see during the story. Give them large magnifying glasses for up-close examination. Provide time after the story for students to ask questions about the differences and similarities between the furs.

Teacher-Led Extensions/Adaptations/Assessment Ideas

- Explain to students that animals respond to the cold of winter in mainly three ways: by leaving the area in fall (migration), by hibernating, or by staying active. Ask them if people do any of these things. Do they know people who go south for the winter? Do some people stay inside their houses all winter? Are some outside and active in winter, ice skating, sledding, or building snowmen? At PWLC, we are going to be outside and active, too, as we explore the prairie and wetlands.
- Bring your camera to the PWLC and capture each of your students in a photo during the visit. Upon return to school, print the photos and send each child home with their own picture. Attach a note describing the trip and providing discussion prompts for parents such as those stated in step 10, above.
- Explore the nature of winter.
 - Make predictions and then blow bubbles outside. What happens to the bubbles?
 - Read Stranger in the Woods by Carl R. Sams II and Jean Stoick. Make a snow man. Decorate it with dried plants, apple slices, carrot nose, and sunflower seeds. Use spray bottles filled with water and food coloring to color the snow man. Watch who comes to have a snack at the snowman.
 - Bring a pan or cups of snow inside and observe. What happens to the snow? Does it look perfectly clean? Does the melted water take up as much space as the snow? Make snowballs and put some in the freezer, others in the refrigerator. What happens? Save the freezer snowballs to play with on a hot summer day!
 - Catch snow on mittens and closely examine the shapes and sizes. Count the points. Can you find any that are exactly the same? Back inside, draw pictures of them in a snowflake journal, repeating every time there is snowfall. Is each snowfall the same?
 - Set up bird feeders and watch who comes to lunch. Draw pictures of each kind of bird. Compare and contrast their sizes, shapes, and colors. Do they all eat seeds the same way?
- Encourage students to bring their parents to the PWLC on the weekend. Students can find clues with their parents to continue being nature detectives.
- Ask students to carefully examine their pet's feet at home. Do they have claws? Pads? How many? Can they walk or hop like their pet?
- Chickadees survive the night by finding their own little shelter to sleep in. Their bodies go into a regulated hypothermia which requires less energy to keep warm. Invite your students to stand or sit in a sheltered place outside or in the classroom. Ask them to close their eyes and pretend they are a chickadee going to bed at night and slowly slowing down their heart rates, now their legs get tingly, then their wings, then they fall into a deep sleep,,,,, and use less energy.... They can ONLY do this because the shelter protects them from the wind and cold air. Allow them to slip into nap time or guide them into sunrise and waking up by reversing the

process. Lastly, it's daytime and they can be hungry, active chickadees "flying" around the classroom, looking for their snack!

- Enjoy singing this song, "Winter's Coming,"
<http://kindernature.storycounty.com/display.aspx?DocID=20051131224>
- Read the picture story about going outside in winter found on page 88 in the book Nature for the Very Young, a Handbook of Indoor and Outdoor Activities by Marcia Bowden. Read the first part when getting ready to go outside and students can put on their gear as it is described. Then read the rest of the story outside and students can do each of the actions described. Repeat this many times to help children learn the routine of dressing well for winter conditions and for enjoying winter outdoors.
- Eastern cottontail, coyote and red fox coloring sheets could be done before or after your visit to the PWLC to encourage the students to think about animals that live on the prairie.

2005 Early Childhood Indicators of Progress: Minnesota Early Learning Standards

The lesson supports the following state standards.

Domain II: Approaches to Learning

CURIOSITY

Children show progress in curiosity when they:

1. Show eagerness and a sense of wonder when they learn.
2. Show interest in discovering new things.
3. Think about events and experiences and apply this knowledge to new situations.

REFLECTION AND INTERPRETATION

Children show progress in reflection and interpretation when they:

1. Think about events and experiences and apply this knowledge to new situations.
2. Generate ideas, suggestions, and/or make predictions.

Domain III: Language and Literacy Development

LISTENING

Children show progress in listening when they:

2. Listen with understanding to stories, directions, and conversations.

Domain V: Cognitive Development

SCIENTIFIC THINKING AND PROBLEM-SOLVING

Children show progress in scientific thinking and problem-solving when they are:

Observing

1. Use senses to explore materials and the environment.
2. Identify and/or describe objects by physical characteristics.

Questioning

3. Express wonder about the natural world.
4. Ask questions and seek answers through active exploration.
5. Make predictions about objects and natural events.

Investigating

7. Make comparisons between objects that have been collected or observed.

SOCIAL SYSTEMS UNDERSTANDING

Children show progress in scientific thinking and problem-solving when they are:

Understanding the World

5. Share responsibility in taking care of the environment.
7. Identify characteristics of the places where they live and play within their community.

References and Resources

For Children

- Big Tracks, Little Tracks: Following Animals Prints by Millicent E. Selsam
- Everyone Poops by Taro Gomi
- In the Snow; Who's Been Here? by Lindsay Barrett George
- Making Tracks/A Circular Pop-up Story by David Hawcock
- North Country Night by Daniel Souci
- Someone Walks By: The Wonders of Winter Wildlife by Polly Carlson-Voiles
- Stranger in the Woods by Carl R. Sams II and Jean Stoick
- Eastern cottontail, coyote and red fox coloring sheets,
<http://www.broadbentwildlife.org/colorsheets.html>

For Adults

- A Guide to Nature in Winter by Donald Stokes
- Book of Family Nature Activities by Page Chichester
- Explore Winter! 25 Great Ways to Learn About Winter by Maxine Anderson
- Field Guide to Tracking Animals in Snow by Louise R. Forrest
- Nature for the Very Young, a Handbook of Indoor and Outdoor Activities by Marcie Bowden
- The Sense of Wonder by Rachel Carson
- Wandering Through Winter by Edwin Way Teale
- KinderNature, <http://kindernature.storycounty.com/default.aspx>

Credits

This field investigation was developed and written by Prairie Wetlands Learning Center Staff, U.S. Fish and Wildlife Service. Thanks to the following teachers for reviewing this lesson plan: Susan Leopold, Western Community Action Head Start; Karan Hanan, Fergus Falls Early Childhood and Family Education; and Debbie Walter, Morning Son Christian School, Fergus Falls.