Prairie Wetlands Learning Center

Wetland Wonders

Kindergarten Observation Series

Grade Level:
Kindergarten

Time:
1 hour

Season:
Winter

Objectives:
Students will be better able to...

- Use four of their senses (not taste) to explore, observe, describe, and answer questions about the prairie.
- Measure snow depth against their legs.
- Determine what is under the snow on the pond (ice).
- Follow animal tracks and make inferences about the animal that left the tracks behind.
- Pretend to be a quiet rabbit carefully hiding in the cattails.
- Enjoy exploring outside in winter.

Skills Used:
Following directions, listening, cooperating, exploring, describing, observing, measuring, inferring, asking and answering questions, and comparing and contrasting

Summary

Using the KWHL approach, students go on a discovery hike at Mallard Marsh and use their senses of touch, smell, hearing, and sight to explore and observe this wetland in winter. They may measure snow depth on their leg, handle snow crust, feel the texture of cattail seeds, search for and walk on pond ice, find tracks/vents, listen to sounds, smell bergamot if accessible and sit quiet and still to play Fox and Rabbits.

Background

The purpose of this field investigation is to introduce kindergarteners to a winter wetland wonderland and give them an enjoyable first-hand experience. This field investigation would also make a suitable review of a unit on seasons, winter, wetlands, animals, or adaptations.

According to the calendar, the first day of winter is December 21, and last day of winter falls on March 19th. During this timeframe, the sun's position is the farthest possible south of the equator due to the earth's tilted axis and annual path around the sun. At the PWLC, we experience colder air temperatures, wind chill, frozen ponds and prairies, snowfall, and the shortest day-length (photoperiod) of the year. According to the National Weather Service, we experience the following ranges of normal conditions in winter: high temperatures of 15-25 degrees Fahrenheit; low temperatures of -5 to 5 degrees Fahrenheit; less than one-half to one inch of rainfall per month; and five to 15 inches of snowfall per month. Phenology records indicate that Prairie Wetlands Learning Center ponds freeze over mid-to-late November and thaw completely by the last week of March or the first week of April. The first measurable snow falls in the last two weeks of November. In winter, life on the prairie slows down considerably. Reproduction and growth are temporarily

Minnesota Academic Standards

Subjects Covered:
Science and Language Arts

This lesson helps support 9 standards and 11 benchmarks. For details: see section “Minnesota Academic Standards in Science” and “Minnesota Academic Standards in Language Arts.”

Materials:

- ❑ Journal and pencil for leader
- ❑ Ice auger
- ❑ Meter stick

Background, *continued*

suspended, food becomes scarcer, and survival becomes paramount. 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), hibernating, or by staying active (resisting). The lists below provide examples of each for the Prairie Wetlands Learning Center.

Hibernators	Migrators	Resistors
many birds, monarch butterflies, green darner dragonflies, bats	13-lined ground squirrel, most insects. reptiles, amphibians, bats	some birds, deer, muskrats, mink, weasels, mice, gophers, grey squirrels, rabbits, fox, coyotes

Plants respond in mainly two ways: by dying back to ground level, producing seed, and going dormant (perennials and biennials) or by dying completely and producing seed (annuals). Most prairie plants are herbaceous perennials (soft-stemmed grasses and flowering plants which reproduce by seed and re-grow from dormant roots). The lists below name native examples of each at the Prairie Wetlands Learning Center.

Perennials	Biennials	Annuals
Joe pyeweed, prairie cordgrass, cattail, water plantain, swamp milkweed	evening primrose, daisy fleabane, black-eyed Susan	brown-eyed Susan, blanket flower, slender false foxglove

Humans must also respond to the change of seasons. Like fox and rabbits, most of us remain here all winter and are actively resisting winter stressors. At the PWLC, teachers and students alike adapt to the weather and safely explore and enjoy the often overlooked world of winter ecology. Dress in layers and wear insulated boots, winter mittens, scarves, and hats. When needed, to stay warm in the field, we keep moving, sit out of the wind, turn our backs to the wind, make snow angels, walk briskly, do jumping jacks, wiggle our fingers and toes, and/or check each other's cheeks for early signs of frost nip. We shorten our time outside if necessary, and stay inside entirely if the temperature exceeds -15 degrees Fahrenheit. With the challenges of winter addressed, we see winter as an opportunity to explore first-hand the wonders of the season.

During this winter visit, students have the chance to view a pond from the inside out, touch pond ice and cattail seeds, smell fresh air and dried flowers, and hear the peaceful winter wind rustling grasses. They walk through a cattail "forest" and find out what it is like for active animals to survive during this extreme season. Since summer nesting is long past, they have the chance to step off-trail and become completely immersed in the relatively undisturbed wintry setting of a prairie wetland.

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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, winter, wetlands, adaptations, or other topics. (See section, "Teacher-Led Extensions and Assessment Ideas.")

• To maximize your time at the Prairie Wetlands Learning Center, please organize students into small groups with chaperones prior to your arrival and everyone wearing nametags.
• Conduct steps 2 through 4 in the section "Field Investigation Procedure" at school. Upon arrival, teachers may provide Prairie Wetlands Learning Center staff with a written list of what students know and wonder for quick review before heading outside.

Prairie Wetlands Learning Center Staff Prep

Organize and prepare materials. Select trail route and check for ice safety according to the Prairie Wetlands Learning Center Ice Safety Plan. Review winter animal tracks in snow and preview the Mallard Marsh site.

Field Investigation Procedure

Introduce the Topic

1. Welcome students, teachers, and chaperones to the Prairie Wetlands Learning Center at the cement sign near the parking lot.

2. Inside the classroom, assemble students into their small groups with chaperones. Each chaperone is responsible for helping their students follow-through with directions and with dispersal and collection of materials.

3. Sit in a large circle as a whole class on the floor. Ask students what season we are in right now. (Winter) What do they know about winter? What happens in a wetland or pond in winter? (This is the K of the KWL model – what do they already *know* about the wetland?) Write down what they know on a paper and clipboard or the white board.

4. Ask students what questions they have about winter wetlands – what do they wonder about them? (This is the W part of the KWL model, *wonder*.) Write their questions down on clipboard. Add one more question: are winter wetlands special places? Today they will have the chance to decide if they think if Mallard Marsh is a special place.

Explore Outside

5. Tell students they will use their senses to explore Mallard Marsh and answer some of their questions. Gesture to illustrated symbols of our senses for a visual aid and review the five senses; invite them to point to each of their senses with you. Invite them to guess which sense is the only one they will not be using (taste).

Procedure, *continued*

6. Before heading out on the trail, review the rules of respect for the trail – just the same as at school, plus special trail rules (such as no picking plants, follow the leader, etc.) Remind students and chaperones to stay together in their small groups while we go exploring.

7. Walk towards Mallard Marsh. While still uphill from the wetland, ask students which habitat they are standing in, prairie or wetland? (prairie) How can they tell? (grasses)

8. Lead students off-trail through the cattails and onto the ice to lead any combination of the following activities, using as many different senses as time and conditions allow.

- SIGHT: Catch snow on mitten. What shape is it? How big is it? Does each snowflake look exactly alike?
- SIGHT: Ask students which habitat they are standing in now, prairie or wetland? (wetland) How can they tell? (cattails is the most likely answer)
- TOUCH: Invite everyone to rub a cattail seed head against their cheeks. Make a face to show how it makes you feel. How would you describe the texture you feel?
- TOUCH: Ask students what they think is under the snow? How could they find out the answer? (dig down under the snow) Demonstrate how to dig with your boot down to the ice and allow students to do so. What did they find? (ice) What color(s) is it? What texture do they feel? Does everyone's ice look and feel the same? Why or why not? If students originally wanted to find out how thick the ice is, now is a good time to show them using the ice auger.
- SIGHT: Walk along the outside edge of the cattails single-file. Search for signs of animals that have left their tracks or other evidence behind. Ask students what kinds of animals they think were here. (most likely ones are mice, weasels, mink) What do these animals need to survive in winter?
- SOUND: Sit with eyes closed and listen to sounds around you. Count on fingers each time a different sound is heard. How many different sounds did they hear? How would they describe the sounds? (shrill, bubbly, loud, soft, quiet) What made the sounds? (likely candidates include geese, wind, people, traffic) How do these sounds make you feel? (relaxed, peaceful, excited, curious)
- SIGHT: Invite students to step off the snow-packed trail into the fresh snow and measure the depth of the snow against their legs. How far up does the snow go? (to my ankle, shin, knee, thigh)
- SIGHT: Lie down on Mallard Marsh and look up at the sky. Which way is the wind blowing? How can they tell?
- TOUCH: Feel the pond under your entire body. How does it feel? Make snow angels!
- SMELL: Smell dried wild bergamot (also called Monarda). What does it smell like? (mint, perfume) What part of the plant was it in summer? (flower)
- TOUCH: Examine fresh snow carefully with your eyes and mittens. What kind of texture does it have? (fluffy, sandy, crunchy). Does it have just one layer or more than one? If possible, pick up and compare/contrast the upper crust layer with the snow beneath it. Which layer is thicker?
- ALL: Based on all of the observations they made outside, how would they describe the weather at the wetland today? (air temperature, wind speed, wind direction, sky) Use a thermometer, wind meter, and sky chart to first predict together and then collect actual weather data.

Procedure, *continued*

9. Play Fox and Rabbits. Choose one student to be the hungry fox. Place the rest of the students (rabbits) at the edge of the cattails, sitting. They must sit quietly and still or else the hungry fox will see or hear them and eat them up! (they're out) Walk with the fox along the cattail edge and look closely at the rabbits. Did they move or talk? The fox may call them out, but they cannot help the fox with his hunting. They should stand quietly with the teacher instead. At the end, ask the fox how it felt to be on the prowl looking for rabbits. How did the rabbits feel? What helped them avoid being eaten? (still and quiet) What helped the rabbit capture any rabbits? If time allows, play the game again, and choose a new fox based upon who has the next birthday coming up. When the game is over, county how many rabbits were caught and call the remaining hidden rabbits to come join you. Ask the fox how it felt to be the hungry predator and ask the rabbits how they felt to be hidden in the cattails. What helped the fox find the rabbits? (movement, sounds) What helped the rabbits stay hidden? (sitting still and quiet) Explain that real rabbits really use the cattails for cover – we know this because we have seen their tracks and scat in the cattails. Also, real foxes hunt for them – we know this, too, because we have seen fox trails along the edge of the PWLC wetlands.

Reflect Together

10. Stand together as a whole class outside (or sit inside) and share what was smelled, saw, heard, and touched. Answer the questions that students generated as recorded on the clipboard. Ask them what they discovered today about wetlands and winter that they never knew before. (This is all the L part of the KWL model – what did they *learn?)* Ask them what they decided about Mallard Marsh -- is it a special place, and if so, why?

11. 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 and make discoveries! With companionship from a responsible adult, students can explore a wetland near their 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. Prairie Wetlands Learning Center staff makes every effort to make your bus travel worthwhile despite the weather and prepare indoor, age-appropriate plans. Prairie Wetlands Learning Center 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 observe snow depth, snow crystals, mouse vents, etc.

• Walk around and in Center Pond and conduct a few of the activities outlined in the Field Investigation Procedure above.

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Weather Alternatives, *continued*

- Tour the exhibit area and watch prairie wetlands videos with the objective of observing what happens in winter.
- Read *In the Snow, Who's Been Here?* by Lindsay Barrett George. Which of the animals depicted in the story might be found at the PWLC? Bring furs or bones for students to explore and draw.
- Bring snow inside in dish pans for students to touch and examine.
- Place cattail seeds in a Ziploc bag and bring inside for students to touch. Allow each student to glue a pinch of seeds on a paper and then use it to draw a picture. For example, the seeds might become the hair of a person or animal, or a muskrat house, or whatever their imagination creates.
- Bring cattail leaves inside for students to examine with hand lenses and dissect with their finger. What does it look like inside a cattail leaf? Draw pictures and share discoveries.
- Provide latex tracks and stamp pads for students to create animal tracks on paper. They should write the name of their animal on the paper, too. Can that animal be found at the PWLC? Draw a picture of it leaving its tracks behind.

Vocabulary

the five senses, measure, winter, weather, tracks, ice, pond, wetland

Teacher-Led Extensions and Assessments

Try these activities at school to extend your visit.

Human Connection

- Ask students to point to and name the five senses. Which one did they not use at the prairie? What did they discover with the four senses they did use? Did they use one the most?

Prairie Wetlands Learning Center Connection

- Encourage students to bring their parents to the Prairie Wetlands Learning Center on the weekend to explore wetland wonders together.

Home Connection

- Bring your camera to the Prairie Wetlands Learning Center, 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.

School Connection

Explore the nature of winter together indoors and outside.

- Search for animal tracks in the school yard. Who left them behind? Are they the same animals or different from the PWLC? Why?
- How deep is the snow at school compared to Mallard Marsh? Measure and compare/contrast. Which is deeper? Does the snow at school have crust? What is the texture like? What's under the snow at school? Dig down to find out.
- Search for seeds in the school yard. Touch and smell them. How do they compare to the cattail seeds and bergamot at the PWLC?
- Listen to the sounds of nature in your school yard. Are they the same or different as the PWLC? Why?
- Lay on the ground at school. What is the sky doing today?
- What kinds of habitats do students see at school? Where could they play Foxes and Rabbit there?

For the Prairie Wetlands Learning Center Educator

Prairie Wetlands Learning Center Theme – the Prairie Pothole Region

Primary Environmental Education Message - The prairie pothole region is valuable and in need of restoration and protection.

Sub-message - Wildlife: The prairie pothole region is home to a variety of resident and migratory wildlife.

Prairie Wetlands Learning Center Environmental Education Objective– Identify the components and functions of a given ecosystem by observing, counting, and describing the animals and plants that live in that ecosystem.

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2019 Minnesota Academic Standards in Science

This lesson helps support the following state standards.

Strand 1 Exploring phenomena or engineering problems
Substrand 1.2 Planning and carrying out investigations
Standard 1.2.1 Students will be able to design and conduct investigations in the classroom, laboratory, and/or field to test students' ideas and questions and will organize and collect data to provide evidence to support claims the students make about phenomena.
Content Area Life Science
Benchmark 0L.1.2.1.2 Make observations of plants and animals to compare the diversity of life in different habitats. (P: 3, CC: 1, CI: LS4) *Emphasis is on the diversity of living things in a variety of different habitats and patterns across those habitats.*

Strand 2 Looking at data and empirical evidence to understand phenomena or solve problems
Substrand 2.1 Analyzing and interpreting data
Standard 2.1.1 Students will be able to represent observations and data in order to recognize patterns in the data, the meaning of those patterns, and possible relationships between variables.
Content Area Physical Science
Benchmark 0P.2.1.1.1 Sort objects in terms of natural/human-made, color, size, shape, and texture, then communicate the reasoning for the sorting system. (P: 4, CC: 2, CI: PS1) *Emphasis is on using observations to describe patterns and/or relationships in the natural and designed world in order to order to answer scientific questions and solve problems.*

Strand 2 Looking at data and empirical evidence to understand phenomena or solve problems
Substrand 2.1 Analyzing and interpreting data
Standard 2.1.1 Students will be able to represent observations and data in order to recognize patterns in the data, the meaning of those patterns, and possible relationships between variables.
Content Area Earth and Space Science
Benchmark 0E.2.1.1.2 Make daily and seasonal observations of local weather conditions to describe patterns over time.** (P: 4, CC: 1, CI: ESS2) *Examples of qualitative observations may include descriptions of the weather (such as sunny, cloudy, rainy, and warm). Examples of quantitative observations may include numbers of sunny, windy, and rainy days in a month. Examples of patterns may include that it is usually cooler in the morning than in the afternoon and that different months have different numbers of sunny days versus cloudy days in different months.*

Strand 2 Looking at data and empirical evidence to understand phenomena or solve problems
Substrand 2.1 Analyzing and interpreting data
Standard 2.1.1 Students will be able to represent observations and data in order to recognize patterns in the data, the meaning of those patterns, and possible relationships between variables.
Content Area Life Science
Benchmark 0L.2.1.1.3 Record and use observations to describe patterns of what plants and animals (including humans) need to survive.** (P: 4, CC: 1, CI: LS1) *Examples of patterns may include that animals need to take in food, but plants do not; different animals need different kinds of food; plants require light; and that all living things need water.*

2010 Minnesota Academic Standards in Language Arts

This lesson helps support the following state standards:

Strand SPEAKING, VIEWING, LISTENING, AND MEDIA LITERACY
- **Substrand** Speaking, Viewing, Listening, and Media Literacy
  - **Standard** Prepare for and participate effectively in a range of conversations and collaborations with diverse partners, building on others' ideas and expressing their own clearly and persuasively.
    - **Benchmark 0.8.1.1** Participate in collaborative conversations with diverse partners about kindergarten topics and texts with peers and adults in small and larger groups.
      a. Follow agreed-upon rules for discussions (e.g., listening to others and taking turns speaking about the topics and texts under discussion).
      b. Continue a conversation through multiple exchanges.
      c. Listen to others and name emotions by observing facial expression and other nonverbal cues.
      d. Follow basic oral directions.
  - **Standard** Integrate and evaluate information presented in diverse media and formats, including visually, quantitatively, and orally.
    - **Benchmark 0.8.2.2** Confirm understanding of a text read aloud or information presented orally or through other media (e.g., poems, rhymes, songs) by asking and answering questions about key details and requesting clarification if something is not understood.
  - **Standard** Evaluate a speaker's point of view, reasoning, and use of evidence and rhetoric.
    - **Benchmark 0.8.3.3** Ask and answer questions in order to seek help, get information, or clarify something that is not understood.
  - **Standard** Present information, findings, and supporting evidence such that listeners can follow the line of reasoning and the organization, development, and style are appropriate to task, purpose, and audience.
    - **Benchmark 0.8.4.4** Describe familiar people, places, things, and events and, with prompting and support, provide additional detail.
  - **Standard** Adapt speech to a variety of contexts and communicative tasks, demonstrating command of formal English when indicated or appropriate.
    - **Benchmark 0.8.6.6** Speak audibly and express thoughts, feelings, and ideas clearly, and respond to poems, rhymes, and songs.

Strand LANGUAGE
- **Substrand** Language K-5
  - **Standard** Demonstrate command of the conventions of standard English grammar and usage when writing or speaking.
    - **Benchmark 0.10.1.1** Demonstrate command of the conventions of standard English grammar and usage when writing or speaking.
      d. Understand and use question words (interrogatives) (e.g., who, what, where, when, why, how).
      f. Produce and expand complete sentences in shared language activities.
  - **Standard** Demonstrate understanding of figurative language, word relationships and nuances in word meanings.
    - **Benchmark 0.10.5.5** With guidance and support from adults, explore word relationships and nuances in word meanings to develop word consciousness. c. Identify real-life connections between words and their use

References and Resources

Books for Children

- *In the Snow: Who's Been Here?* by Lindsay Barrett George
- *It's Winter (Celebrate the Seasons)* by Linda Glaser
- *Snow* by Cynthia Rylant
- *The Snowy Day* by Ezra Jack Keats
- *Winter is the Warmest Season* by Lauren Stringer

Books and Web Sites 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* web site

Credits

This field investigation was developed and written by Prairie Wetlands Learning Center Staff, U.S. Fish and Wildlife Service. ***Thanks*** to Prairie Science Class naturalist Trista Kitzman for reviewing this lesson plan. Thanks to the following teachers for reviewing this lesson plan: LaRae Mikkelson, Ellen Hopkins Elementary, Moorhead; Deb Strege, licensed teacher, Fergus Falls; Dawn Ackley, Sharon Tungseth, and Kathy Bjork, McKinley Elementary, Fergus Falls. Photos provided by Dave Ellis and Molly Stoddard, U.S. Fish and Wildlife Service.

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