



Grade Level:
Kindergarten

Time:
60 Minutes

Season:
Spring

Objectives:
Students will be better able to...

- Use four of their senses (not taste) to explore, observe, describe, and answer questions about a wetland
- Measure the height of cattails against their body height
- Recognize a wetland habitat based upon common characteristics such as cattails, water, ducks, muck, or other specialized organisms
- Enjoy exploring a wetland

Materials:

- Clipboard, paper, and pencil for instructor use
- Pond nets
- Tubs



Prairie Wetlands Learning Center

Wetland Awareness

Kindergarten Observation Series

Summary

Guided by a KWL approach, students use their senses of touch, sight, hearing, and smell to explore, observe and make discoveries about a wetland. They ask and answer questions about the wetland based upon what they already know and what they experience while investigating.

Background

The purpose of this lesson is to introduce kindergarteners to wetlands and give them an enjoyable first-hand wetland experience. This program would also make a suitable review of a unit on habitat and the senses.

What exactly is a wetland? Unlike rivers and streams, wetlands are shallow water bodies that lack a current. Unlike lakes, wetlands are often smaller in dimension and have uniform water temperature. However, wetlands may be associated with lakes, rivers, and streams. In wetlands, water is the main factor controlling the environment and the plants and animals living there. Water is at or near the surface of the land and may be visible all or part of the year or not at all. In these shallow water bodies, water depth may be as great as six feet and typically fluctuates over time. Wetland soils are often water-logged and deprived of oxygen. As a result of these and other factors, specialized animals and plants live in wetlands such as duckweed, lily pads, water striders, dragonflies, frogs, turtles, ducks, muskrats, weasels, and mink.

Wetland plants and animals are able to live in a watery world for several reasons:

- Because of unusual adaptations for obtaining oxygen and for locomotion through water;
- Because they can adjust to changing moisture conditions by moving from wetland to wetland;
- Because they live part of their life cycle on land;
- and/or because they survive in a dormant state for a period of time.

Minnesota Academic Standards

Subjects Covered:
Science

Helps support 12 standards and 14 benchmarks. See section "2019 Minnesota Academic Standards in Science" and "2010 Minnesota Academic Standards in Language Arts."



Background, *continued*

Skills Used

Listening and following directions, observing with senses, examining, socializing, cooperating, exploring, matching, asking and answering questions, thinking critically

Wetlands are among the most biologically productive ecosystems on earth because of availability of moisture and nutrients for plant growth. Wetlands can capture large quantities of energy from the sun and store it as chemical energy in their sheer mass of vegetation. Lance-shaped cattail leaves standing vertically, for example, maximize the surface area exposed to the sun for photosynthesis. Cattails and other emergent plants like bulrushes store energy and nutrients in their extensive roots and rhizomes. Nutrients in the wetland are efficiently released for use by grazing animals like muskrats and ducks or through decomposition by detritivores like bacteria, fungi, clams, snails, and aquatic earthworms.

A rhythmic cycle of drying out and re-flooding brings in new nutrients or improves access to them and helps keep wetlands oxygenated. This wet-dry cycle seems to trigger higher productivity as nutrients are released from muck when decomposing – wetlands efficiently recycle what is produced. The longer wetland water is stagnant, the less productive it becomes compared to wetlands with periodic flooding and refreshed water. In terms of biomass, cattail marshes are the most productive type of wetland, surpassing grasslands and forests. High plant productivity in prairie potholes is the basis for high production consequently of ducks, muskrats, and other wildlife. Their basins flood with snow melt runoff in spring and rainfall but dry out with summer and even fall droughts. Successive years of high water or drought draws out this cycle on a longer time frame of five to 20 years. Wetlands are important for so many reasons besides production of plants and animals. Wetlands control floodwaters, recharge groundwater, filter pollutants, and store carbon. They are the nurseries and kidneys of the land.

The prairie is North America's grassland biome. It extends from central Canada to Texas, from the Rocky Mountains to Ohio. The prairie pothole region is defined geographically as the northern portion of the prairie. This region has the greatest density of wetlands in North America. About the size of Texas, it covers approximately 300,000 square miles within five states and three Canadian provinces including the western edge of Minnesota, about half of Otter Tail County, and all of Fergus Falls. The prairie and its potholes, rivers, and lakes are the place we call home, the landscape that our cities, roads, and farms are built upon, the land of which remnants can be found in places like the Prairie Wetlands Learning Center (Prairie Wetlands Learning Center). The Prairie Wetlands Learning Center has 330 acres of prairie with 28 wetlands embedded within. Each wetland is unique in its size, shape, depth, and variety of plants and animals. Besides prairie potholes, Minnesota's most common wetlands also include forested wetlands and bogs.

Spring is an excellent time to explore wetlands. The peaceful winter months have melted away, and many bird species are migrating through our area. Some stay to nest, noisily calling to competitors





Background, *continued*

and mates. Thawing wetlands means frogs are stirring from their long hibernation, ready to sing out to attract a mate. The refreshing smell of water long locked in ice floats on the air once again, soothing human skin covered all too long by layers of clothes. Students witness the renewal of life and greening of the waterscape including cattail spears piercing through soil and water, duckweed floating on the surface, and coontail submerged beneath it. They may watch a muskrat silently swim by or a painted turtle play peek-a-boo, poking its head out of the water. They can listen to a symphony of bird sounds from marsh wrens, red-winged blackbirds, Canada geese, and mallards. A full sensory experience, they can find beauty, delight in the discoveries they make, and benefit from the exercise and fresh air in their classroom without walls and ceiling, the prairie wetlands.

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 wetlands, habitat, nature, senses, or other topics. We believe such integration enhances student motivation for learning in other curricular areas. Please see section, “Teacher-Led Extensions/Adaptations/Assessment Ideas.”

- To maximize outdoor classroom time at the Prairie Wetlands Learning Center, teachers may
- Conduct steps 3 and 4 in the section “Field Investigation Procedure” at school. Upon arrival at the Prairie Wetlands Learning Center, the Prairie Wetlands Learning Center instructor may conduct a quick review before proceeding, allowing for more time in the outdoor classroom.
- Organize students into small groups, each group led by a chaperone, everyone wearing nametags. Each chaperone is responsible for helping their students to follow-through with directions and with dispersal and collection of materials.

Prairie Wetlands Learning Center Staff Prep

- Prepare and organize materials. Select wetland location, either Adams Pond or Mallard Marsh.





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. Sit in a large circle as a whole class on the floor.
3. Ask students if they know what the second word in our name means? What is a wetland? How do you know you are in a wetland and not a forest or prairie? (This is the K of the KWL model – what do they already know about wetlands?)
4. Ask students what questions they have about wetlands – what do they wonder about them? (This is the W part of the KWL model.) Write their questions down on a paper and clipboard. Add one more question: are wetlands special places? Students who think they are may stand; those who don't may remain seated; and those who don't know may kneel. On the clipboard, record how many students answer yes, no, and I don't know. Today they will have a great chance to think more about if wetlands as special places.
5. Tell students they will use their senses to explore a wetland and answer some of their questions. Review the five senses together and gesture to illustrated symbols of the senses for a visual aid.
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, be kind to animals, etc.)

Exploring the Outside

7. Before reaching the wetland, take a moment to observe and describe the weather together (sky, air, wind)
8. Walk to a nearby wetland with water access. Lead any combination of the following activities, using as many different senses as time and conditions

allow. Lead the whole class initially, and then each chaperone may follow-through with their small groups. As needed, float from small group to small group to provide assistance, to encourage active searching, and to answer questions.

- a) SOUND: Near the wetland, stand 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 crickets, ducks, geese, wind, people, traffic)
- b) SIGHT: Watch the cattails blow in the wind. Which way is the wind blowing from? To? What do the cattails remind them of?
- c) SIGHT, TOUCH: On the bridge, stop where cattails grow on both sides. Who is taller, the cattails or the students? How about the adults? Touch the leaves – what do they feel like? Where are the roots? What are the seed heads made out of? How do the seeds feel?
- d) SIGHT: Out over the open water, search for muskrats, birds, turtles.
- e) SIGHT: Lie on the bridge and look into the water. What colors do they see? Any creatures? What are they doing? Any plants?
- f) TOUCH, SIGHT: Chaperones may help to fill dish pans with about half full with water. Students may use nets to scoop up bugs and plants and place them in the tubs. Watch them swim – do they all swim the same way? Are they all the same size? What colors do they see? Are they all the exact same color? Do the plants have roots, leaves, stems, flowers?
- g) TOUCH, SMELL: On the way back through the cattails, each chaperone may scoop up some muck for students to touch and smell. What does it feel like? What color is it? How does it smell?





Procedure, *continued*

Reflect Together

9. To wrap-up, sit together as a whole class back in the classroom and share what they smelled, saw, heard, and felt. Answer the questions that students generated as recorded on the clipboard. Ask them what they discovered today in

the wetland that they never knew before. (This is the L part of the KWL model – what did they learn?) Take a vote again as in step 5. Compare their numbers to the first “vote.” Did anyone change their minds? How can they be a friend of wetlands? Thank them all for coming!



Vocabulary
wetland, habitat
muck, cattail, soil,
texture, senses,
question, observe

Weather Alternatives

Field investigations take place rain or shine. Everyone should dress appropriately for the weather. In the event of unsafe weather (lightning, high winds) or pouring rain, everyone must come indoors. Prairie Wetlands Learning Center staff make every effort to make your travel worthwhile despite the weather and prepare indoor, age-appropriate plans. Prairie Wetlands Learning Center staff welcome 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 look and listen for wetland animals and plants.
- Tour the exhibit area and watch prairie wetlands videos with the objective of answering the questions generated for the investigation.
- Read *Here is the Wetland* by Madeleine Dunphy. Ask students to help you by repeating the last phrase on each page, “Here is the wetland.” You may also incorporate actions and sounds for each new item on each page and repeat the previous ones. See the chart below for examples.





Weather Alternatives, *continued*

Word from story	Sound	Action
Water	Drip-drop!	Tilt head to right and left
Cattails	Meow!	Fingers pull on “whiskers”
Muskrat	Munching	Fingers near mouth
Mink	Splash!	Move hand downward
Bass	Glub-glub	Fish lips
Heron	Ah-ronk!	Flap arms slowly
Frog	Ribbit!	Jump up
Snake	(silence)	Stick tongue in and out
Blackbirds	Konk-a-ree!	Elbows up
Bulrushes	Weeee!	Sway back and forth
Coots	Pidder-patter	Wiggle fingers, move hand across
Ducks	Quack!	Flap arms quickly

Teacher-Led Extensions and Adaptations

Try these activities at school to extend your visit!

School Connections

- Read books about wetlands before and after your visit. See section “Reference and Resources,” for possible titles.
- If your students also visited the Prairie Wetlands Learning Center in fall, ask them to compare and contrast prairie and wetland habitats. Make a t-chart or a Venn diagram. Which one is wetter/dryer? Are the same plants and animals in both? Do both have shade? If so, where? Where is the sun the brightest, the wind the strongest? In both?

Neighborhood Connections

- Go for a walk to a neighborhood pond or marsh. Search for examples of animals and plants from the book(s) you read. Do the same plants and animals live in this wetland as the Prairie Wetlands Learning Center wetland? Why? Visit the wetland through the seasons and observe changes in weather, plants, animals, and water.





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 – Habitat: The Prairie Pothole Region is a unique and rare ecosystem.

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

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.

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 problem

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.

Benchmark OE.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.*





2010 Minnesota Academic Standards in Language Arts

Strand READING

Substrand Informational Text K-5

Standard Read closely to determine what the text says and to make logical inferences from it; cite specific textual evidence when writing or speaking to support conclusions drawn from the text.

Benchmark 0.2.1.1 With prompting and support, ask and answer questions about key details in a text.

Standard Interpret words and phrases as they are used in a text, including determining technical, connotative, and figurative meanings, and analyze how specific word choices shape meaning or tone.

Benchmark 0.2.4.4 With prompting and support, ask and answer questions about unknown words in a text.

Standard Read and comprehend complex literary and informational texts independently and proficiently.

Benchmark 0.2.10.10 Actively engage in group reading activities with purpose and understanding, including the appropriate selection of texts for personal enjoyment, interest, and academic tasks.

Substrand Foundational Skills

Benchmark 0.3.0.1 Demonstrate understanding of the organization and basic features of print.

- a. Follow words from left to right, top to bottom, and page by page.
- b. Recognize that spoken words are represented in written language by specific sequences of letters.
- c. Understand that words are separated by spaces in print.
- d. Recognize and name all upper- and lowercase letters of the alphabet.

Benchmark 0.3.0.4 Read emergent-reader texts with purpose and understanding

Strand SPEAKING, VIEWING, LISTENING AND MEDIA LITERACY

Substrand Speaking, Viewing, Listening and Media Literacy K-5

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.
- d. Follow basic oral directions

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.





Language Arts Standards, *continued*

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.

b. Use frequently occurring nouns and verbs.

d. Understand and use question words (interrogatives) (e.g., who, what, where, when, why, how).

e. Use the most frequently occurring prepositions (e.g., to, from, in, out, on, off, for, of, by, with).

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.

a. Sort common objects into categories (e.g., shapes, foods) to gain a sense of the concepts the categories represent.

c. Identify real-life connections between words and their use (e.g., note places at school that are colorful).

Standard Acquire and use accurately a range of general academic and domain-specific words and phrases sufficient for reading, writing, speaking, and listening at the college and career readiness level; demonstrate independence in gathering vocabulary knowledge when encountering an unknown term important to comprehension or expression.

Benchmark 0.10.6.6 Use words and phrases acquired through conversations, reading and being read to, and responding to texts.





References and Resources

For Children

- *A Wetland Habitat (Introducing Habitat)* by Molly Aloian and Bobbie Kalman
- *Come Out Muskrats* by Jim Arnosky
- *Here is the Wetland* by Madeleine Dunphy
- *Near One Cattail: Turtles, Logs, and Leaping Frogs (Sharing Nature With Children Book)* by Anthony D. Fredericks
- *Peek at a Pond* by Neecy Twinem
- *Squish! A Wetland Walk* by Nancy Luenn
- *Wetland Animals: Animals in Their Habitats* by Francine Galko
- *Wetland Food Chains* by Bobbie Kalman and Kylie Burns
- *Wetlands: Soggy Habitat* by Laura Purdie Salas

For Adults

- *A Guide to Common Freshwater Invertebrates of North America* by J. Reese Voshell, Jr.
- *Animal Habitats! Learning About North American Animals Thru Art, Science, and Creative Play* by Judy Press
- *Aquatic Project WILD, Aquatic Education Activity Guide* by the Western Association of Fish and Wildlife Agencies and the Western Regional Environmental Education Council
- *Discover Nature in Water and Wetlands, Things to Know and Things to Do* by Elizabeth P. Lawlor
- *Natural Wonders: A Guide to Early Childhood for Environmental Educators* by the Minnesota Early Childhood Environmental Education Consortium, Marcie Oltman, editor.
- *Nature for the Very Young: A Handbook of Indoor and Outdoor Activities* by Marcia Bowden.
- *Project WET Curriculum and Activity Guide* by The Watercourse and Western Regional Environmental Education Council
- *Sharing Nature with Children* by Joseph Cornell
- *The National Audubon Society Nature Guides: Wetlands* by William A. Niering
- Biomes of Minnesota on the Department of Natural Resources website

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 Deb Strege for reviewing this lesson. Thanks to the following teachers for reviewing this lesson plan: Shelley Schoeneck, Morning Sun Christian School, Fergus Falls; Sharon Tungseth, McKinley Elementary, Fergus Falls; and Angela Nord, home school parent/educator, Fergus Falls. Photos provided by Jenny Martin, Aaron Heimann, other interns, and Molly Stoddard/USFWS.