Grade Level:
4th Grade

Time:
90 Minutes

Season:
Spring

Objectives:
Students will be better able to...

- Name their home watershed and the PWLC watershed (Otter Tail River)
- Identify a prairie wetland watershed as the wetland plus all of the slope around it
- Map a prairie wetland
- Recognize that the water in prairie wetlands comes mainly from spring snow melt and rain
- Compare and contrast two or more prairie wetlands for size, shape, orientation, relative depth, and elevation
- Locate the Prairie Pothole Region on a map of North America as the northern portion of the prairie biome
- Enjoy observing prairie wetlands

Prairie Wetlands Learning Center

Prairie Wetlands Watersheds

4th Grade Ecology Series

Summary

Students design and conduct a field investigation of one or more wetland watersheds based upon their existing knowledge and questions. They collect and record data and map at least one watershed to help answer their questions. The investigation concludes with students sharing their new discoveries.

Background

Drive through town or country in the PWLC region, and you are likely to see numerous water bodies in city neighborhoods, on farms, and near roadsides and parking lots. However some people would find it tricky to differentiate between a lake and a wetland when viewing these water bodies. The purpose of this field investigation is to broaden students' awareness of the prairie wetlands landscape so they discover first-hand that the watershed of a local wetland includes all of the visible prairie land uphill from it, and that a natural prairie pothole is typically self-contained. Understanding prairie wetlands watersheds involves a combination of subjects, including geography, geology, and hydrology (the presence and movement of water).

Prairie wetlands are found within glacial deposits in the North American prairie. These wetlands are located north from central Iowa through western Minnesota, eastern South and North Dakota, southwestern Manitoba, and southern Saskatchewan to southeastern Alberta, with a pocket in extreme northern Montana. This geographic area is known as the Prairie Pothole Region and is about the size of Texas. In Minnesota, prairie wetlands are found in the tallgrass prairie, the southern and western parts of the state. Prairie wetlands are commonly called sloughs or ponds. They are also known as prairie potholes and are named palustrine wetlands by scientists. A unique wetland type, they are distinguished from other wetlands and from lakes and rivers by the following combination of characteristics.

Minnesota Academic Standards

Subjects Covered:
Science, Art

Helps support 15 standards and 15 benchmarks. See sections "2019 Minnesota Academic Standards in Science" and "2010 Minnesota Academic Standards in Language Arts" for details.

Materials:

- ❑ Harvested prairie seeds and/or classroom set of 6-pack pots soil
- ❑ Rulers
- ❑ Magnifiers
- ❑ Colored pencils

Skills Used:

Investigating, following directions, asking and answering questions, observing, measuring, sketching, reflecting, collecting and analyzing data, restoring habitat, thinking critically, teamwork, organizing

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: Vanessa Jacobson, home school parent and licensed teacher, Fergus Falls; Angela Nord, home school parent/educator, Fergus Falls; and Deb Salberg, 4th-6th grade science and language arts teacher, Red Lake Falls. Photos provided by Molly Stoddard/USFWS.

Background, *continued*

Characteristics	Descriptions
Surface area	Relatively small; ½ acre to 500 acres in size
Water depth	Relatively shallow; less than two meters (six feet) deep; fluctuates over season, year, and multiple years
Surrounding habitat	Grasslands; most likely agricultural lands where prairie has been converted to farmland; lush and diverse restored or native prairie, or urban development/parkland, otherwise
Basin or watershed	Naturally closed, isolated, and self-contained; not connected to other water bodies by rivers or streams; may be deep or shallow
Water quality	Uniform temperature, relatively less oxygenated, still (no current)
Glacial geology	Formed within numerous depressions within glacial deposits in moraines where land slope is slight although hummocky
Geography	No natural, integrated drainage network developed in moraine areas
Upland soil	Dense; deep snow frost/frozen soil (1-1.3m); snow melt and some spring rain do not penetrate soil but run off into prairie wetlands until frost melts, providing their primary water recharge and minimal soil infiltration
Sub-soil	Poorly sorted mix of glacially deposited clay, silt, sand, and gravel with low porosity and permeability
Hydrology	Visible water may or may not be present; water table continuous with water surface of prairie wetlands; water readily held in wetland depressions with relatively little groundwater movement occurring from large areas of potholes to rivers or contributing to steam flow (unless, rarely, prairie wetlands fill and overflow from one to the next); minimal groundwater infiltration; subject to wet-dry cycle

The overall prairie wetland water budget balance is negative because more evaporation removes water than is added by precipitation. Prairie wetlands receive irregular inputs of water from their surroundings, directly from rain and snow fall and indirectly through surface runoff of snowmelt and rainwater. Prairie wetlands typically fill in spring as snowmelt runs off frozen upland soil. Other water is added during erratic, isolated, summer cloudbursts. Evapotranspiration is the main route for water loss besides groundwater. Their basins are permeable but their groundwater flow is extremely slow. As a result, an enormous quantity of water can be collectively stored in these millions of small depressions until summer, fall, or multi-year droughts dry them up.

Background, *continued*

As a result of the characteristics and water balance described above, specialized animals and plants live in prairie wetlands such as duckweed, lily pads, water striders, dragonflies, frogs, turtles, ducks, muskrats, weasels, and mink. Prairie wetland plants and animals are able to live in this watery world for several reasons:

- Because of unusual adaptations for obtaining oxygen and for locomotion through water (such as water boatmen and damselfly larvae);
- Because they can adjust to changing moisture conditions by moving from wetland to wetland; (such as waterfowl)
- Because they live part of their life cycle on land (leopard frogs and painted turtles);
- And/or because they can survive in a dormant state for cold or dry periods of time (scuds and fairy shrimp).

Some of these reasons underscore the importance for wildlife to have a matrix of wetlands of various sizes/depths within the local landscape and the value that overall landscape complex include upland prairie habitat between wetlands.

Prairie wetlands and their wildlife are also affected directly or indirectly by the land use activities which take place uphill from them. A prairie wetland watershed is defined as all of the land area that contributes surface runoff to the wetland. Like wetlands, watersheds also filter sediment, stabilize banks and shores, and recharge aquifers. These functions are influenced by climate, elevation, soil and vegetation types, slope, orientation to the sun, and watershed size.

Humans significantly influence how well and how poorly prairie wetland watersheds function. Land use activities impact vegetation and soil which in turn affects the quantity, timing, and quality of water moving through the watershed. The purpose of good watershed management is to maintain desirable and abundant vegetative cover so that water enters the soil, can be stored within the soil, and slowly released into water bodies over an extended period of time.

Fergus Falls Wetland Management District staff work together with local urban and rural residents to lessen the impact we may have on prairie wetlands as participating members of the land community. Rural landowners can work with the District to restore prairie wetlands and their grassland watersheds on their property through the Partners for Fish and Wildlife program. Since 1985, the District has restored 1,750 wetlands on private land in its five county area, totaling nearly 5,200 acres. For more information, please visit our web site or call 218-739-2291.



Prairie Wetlands Learning Center

Background, *continued*

Other ways to improve the water quality of prairie wetlands includes:

- Keep minnows, bait fish, and other fish out of prairie wetlands.
- Practice low impact recreation.
- Maintain native vegetation buffer strips along shorelines.
- Use contour tillage and grassy waterways.
- Practice conservation, no-till, and minimum tillage.
- Use silt fencing for construction sites.
- Compost fruit and vegetable scraps.
- Garden and landscape organically.
- Landscape with native plants.
- Maintain motor vehicles properly.
- And work with communities to implement wise land use practices.

In addition, students or classes can purchase federal duck stamps to help improve water quality and increase the amount of wetlands available for wildlife. One duck stamp costs $25, and for every dollar spent, 98 cents is used to purchase habitat for wildlife. The habitat of the Prairie Wetlands Learning Center is an example of the duck stamp in action as some of it was purchased with duck stamp funds. Duck stamps can be purchased on-line and locally where ever hunting licenses are sold. Students can also help by sponsoring a river for clean-up through the Minnesota Department of Natural Resources Adopt-a-River program.

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 wetlands, watersheds, the water cycle, mapping, or other topics. We believe such integration enhances student motivation for learning in other curricular areas. Please see section, "Teacher-Led Extensions and Assessments."

- To maximize outdoor classroom time at the PWLC, teachers may
  - Lead steps two through five with students at school. 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.
  - Organize students into small groups at school, each led by one chaperone, everyone wearing nametags.
- Please help save paper. Bring your students' science notebooks or journals to record their field data and discoveries in.

Prairie Wetlands Learning Center Staff Prep

Select which wetlands students will visit, observe, and map. Organize and prepare materials.

Prairie Wetlands Learning Center

Field Investigation Procedure

Introduce the Topic

1. In the classroom, welcome students, teachers, and chaperones to the Prairie Wetlands Learning Center.
2. Inform students that today they will investigate one or more prairie wetland watersheds. To prepare the investigation, ask them to open their science notebooks or journals to the next blank page. Title that page Prairie Wetlands Watersheds, add the date and location (PWLC).
3. Ask them what they already know about watersheds. Begin a list on the white board titled "Know," and record their responses. This column represents the K in the KWHL visual organizer – what do we already know about our topic? If needed, help them with prompting questions such as, "Where does the water in a prairie wetland come from?" "Where does it go?" "Is it important for them to know about watersheds?" They should record these notes in their science notebook or journal.
4. Ask them what questions they have about watersheds? What would they like to find out about them today, outside? If needed, refer them back to what they know and suggest they build upon that. Record their responses in a second column, titled "Wonder." They should also record these notes.
5. Help students select three questions that can be answered in the field as part of their investigation.
6. In a third column, called "How," record how students think their questions could be answered. What will they need to do outdoors to discover the answers? What kinds of tools will they need to bring along? How should those tools be used? How will the class be organized?
7. On the white board, help them create data page(s) they can copy onto the next blank page(s) in their notebooks or journals. Each page should have a
   - title (Prairie Wetland Watershed)
   - date
   - location (PWLC and the name of the wetland)
   - space to map one wetland per page
   - a key with symbols for the following features: water, slope, hilltop or ridge, shoreline, and direction of watershed.
   - a compass rose
   - a wildlife list
   - You may also include the sentence starters on the bottom of the page: "Water enters Mallard Marsh from (snowmelt and rain)." The other sentence is, "Water leaves this wetland through (plants and evaporation)." They don't need to complete the sentences until later.
8. 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, stay on the trail, be quiet, be kind to animals, etc.)

Explore Outside

9. In the field, visit and map at least one wetland and its watershed. Suggested wetlands and vantage points include:
   a. Center Pond – view from the deck.
   b. Mallard Marsh – view from trailhead, Butterfly Garden, oak savannah, and/or the Mallard Marsh Trail.
   c. Frog Pond – view from Tatanka Trail in two locations as the trail winds up the hill
   d. Adams Pond – view from the dock and/or from the Wetland Way Trail.

Procedure, *continued*

e. Prairie Pothole – view from the Tatanka Trail in two locations (north or south and west

10. At each wetland, begin by making sure the compass rose in students' field journals is oriented correctly with the landscape. Provide compasses for them to share in pairs or trios.
11. Guide them in making their map.
    a. Ask students to pretend they are a bird flying over the wetland and looking down. What do they see? What shape is it? Suggest they first draw a symbol (such as a solid line) for the shoreline in their key and then draw an aerial view of the shoreline of the wetland in the center of the page using that symbol. They can also add a symbol for open water to the key and map (such as wavy lines).
    b. Next students draw a symbol for the ridgeline around the wetland and add it to the key (such as a dashed line). Then they look for the ridgeline above the wetland, the highest points of land, and draw that feature on the map.
    c. The fourth map symbol represents the land or slope between the shore line and ridgeline (such as shading). Add that symbol to both the key and the map. What is the name of that habitat? (prairie)
    d. The fifth and last symbol represents the direction of runoff in the wetland (such as arrows). These arrows all point from the ridgeline to the shoreline. Does all the water runoff into the wetland? (no) Where else does the water go? (soaks into soil, taken up by plant roots, evaporates)
12. Provide students with time to make observations and collect data needed to answer questions selected for the investigation, including wildlife sightings.
13. Direct students in writing (or completing) two sentences in any remaining space. One sentence is, "Water enters Mallard Marsh from (snowmelt and rain)." The other sentence is, "Water leaves this wetland through (plants and evaporation)." Write them on a small white board and allow them to finish the sentences, providing help or brief explanation if needed. For more of a focus on language arts, teachers may use the grammar/spelling in their sentences as part of their grade.
14. From Center Pond to Mallard Marsh, Frog Pond, and Adams Pond, help students see the slight change in elevation between each wetland. Ask them what they think happens to prairie wetlands during of high water or flooding (water depth increases and water overflows to the next wetland). What do they think happens in times of drought? (water depth decreases and shallower wetlands dry up) What happens to those prairie wetlands like Prairie Pothole, which are completely isolated from other wetlands?

Reflect Together

15. Back indoors, answer the investigation questions together. Ask students to list the discoveries they made about prairie wetland watersheds. (This is the L part of the KWHL chart – what have they learned?) Invite three students to read their discoveries to the class. Ask students if they think prairie wetlands watersheds are important, and if so, why? (prevent flooding and erosion, ease drought, home for wildlife, etc.) What is the connection between wetlands and the surrounding prairie? What might happen if the wetland was drained – where would rain and snowmelt go? What might happen if the prairie was plowed, paved, or built on – where would the soil and water go? What might happen to the wildlife that needs both habitats? Do they know that we are wetland rich because we are within the Prairie Pothole Region? Show them a map and aerial photo and

Procedure, *continued*

provide a little information about how much freshwater this part of the North America contains. Encourage students to continue to study prairie wetland watersheds when traveling by car or exploring on foot. It's free, fun, and interesting, and healthy! Collect equipment and thank everyone for coming before dismissal.

Vocabulary

Watershed, slope, wetland, pothole, runoff, snowmelt, precipitation, water cycle, investigation, collection, sketch, compare, contrast, orientation, depth, elevation, biome, Prairie Pothole Region, North America, continent

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 makes every effort to make your travel worthwhile despite the weather and prepare indoor, age-appropriate plans and 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 Center Pond and Mallard Marsh. These wetlands could also be viewed from the dining hall or dorm lounge windows.
- Tour the exhibit area and watch prairie wetlands videos with the objective of observing the water cycle through the seasons. Where does the prairie snow go at the end of winter when it melts? What happens to the water in wetlands through the seasons?
- Watch Bill Nye the Science Guy's video, *Wading Into Wetlands*. What do wetlands do? What are they good for? Do we need wetlands?
- Demonstrate how watersheds and wetlands work using the EnviroScape watershed model.
- Collect prairie and wetlands soil samples for students to touch, smell, and make rubbings of. Record observations. Which abiotic factor is absent from most wetland soils but not from prairie soils? (air or oxygen)

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 Objective Use scientific methodology to explore the environment (ask questions, hypothesize, collect data, analyze data, form conclusions, make recommendations). (Wildlife and Habitat)

Teacher-Led Extensions and Adaptations

Try these activities at school to extend your visit!

School Connections

- Crumple up a large sheet of paper (craft or newsprint end roll). Open it up part way. The paper represents a landscape. Where is the highest point of "land?" The lowest? Ask students to predict what will happen when you make it "rain." Use a spray bottle to make it rain and observe what happens. Where does the water go? (downhill) Where does it collect? (in low spots) What do you call all of the land around a low spot? (its watershed) How is this model not like real life? (some water also soaks into the soil)
- Conduct the activity "Watershed" from Aquatic Project WILD with older or advanced students.
- Study the water cycle. Listen to the song "Water (with Recycled story)" by David Stokes on his music CD called *Sun's Chorus*. Listen to Tom Wisner's music CD called *Made of Water* as you narrate the water cycle and students creatively move to the music and your description.
- Read books about wetlands before and after your visit. See section "Reference and Resources," for possible titles.
- Search the Internet for rain gardens and learn more about how they help prevent urban storm water pollution. Make a rain garden at your school! Where and what is the rain garden's watershed?

Neighborhood Connections

- Walk to a local, wooded park and expand this investigation to include a third habitat. Make fresh copies of the checklist to record your data there. Compare and contrast the results of this excursion with those gathered at the Prairie Wetlands Learning Center. Did you find the same kinds of animals in both locations? Did they have the same characteristics? Why or why not?

Extensions and Adaptations, *continued*

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. Visit the wetland through the seasons and observe changes in weather, plants, animals, and water.
- Study the characteristics, features, and wildlife of wetlands. Brainstorm two lists of the functions and values of wetlands. Do as much of this by visiting and observing a local wetland as possible. Compare and contrast wetland habitat with other habitats like forest and prairie.
- As a class, adopt a river site near you through the Minnesota Department of Natural Resources.

Prairie Wetlands Learning Center Connections

- From students' lists of discoveries generated at the end of their Prairie Wetlands Learning Center visit, ask them to write complete sentences about them. Use those sentences to practice writing paragraphs. Illustrate each paragraph with color drawings and display them for others to see.
- Make a food chain of prairie wetlands organisms observed in the field.
- 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-table 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?

Otter Tail River Connections

- Read *Ollie's Otter Tail River Adventure* by Fergus Falls author Tim Rundquist. Is the story fiction or non-fiction? What facts did the author use to help create the story? Take a trip to visit locations in the book, such as Wahpeton, Orwell Dam, downtown Fergus Falls along the river walk, Phelps Mill, Otter Tail Lake, Big Pine Lake, Tamarac National Wildlife Refuge, and Elbow Lake. Just like Ollie and his friends, do something to help the river, like pick up litter, clear a path, plant trees near the river, or build bird houses. Photocopy the last page in the book for students to record how and where they helped the river.

2019 Minnesota Academic Standards in Science

This lesson helps support the following state standards:

Strand 1 Exploring phenomena or engineering problems

Substrand 1.1 Asking questions and defining problems

Standard 1.1.1 Students will be able to ask questions about aspects of the phenomena they observe, the conclusions they draw from their models or scientific investigations, each other's ideas, and the information they read.

Prairie Wetlands Learning Center

Science Standards, *continued*

Benchmark 4E.1.1.1.2 Ask questions about how water moves through the Earth system and identify the type of question. (P: 1, CC: 5, CI: ESS2) Emphasis is on the processes of evaporation, condensation, and precipitation. Examples of types of questions may include those that can be tested by an experiment, and questions that may answered from a text.

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 4E.1.2.1.1 Make observations and measurements to provide evidence of the effects of weathering or the rate of erosion by the forces of water, ice, wind, or vegetation.* (P: 3, CC: 2, CI: ESS2) Emphasis is on predicting the rate of change when variables are changed. Examples of variables to test may include angle of slope in the downhill movement of water, amount of vegetation, speed of wind, relative rate of deposition, cycles of freezing and thawing of water, cycles of heating and cooling, and volume of water flow.

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 4E.1.2.1.2 Plan and carry out fair tests in which variables are controlled and failure points are considered to improve a model or prototype to prevent erosion.* (P: 3, CC: 2, CI: ESS2, ETS1; ETS2) Examples of prototypes to prevent erosion include retaining walls, wind breaks, use of shrubs or other vegetation, and drainage systems.

Strand 2 Looking at data and empirical evidence to understand phenomena or solve problems

Substrand 2.2 Using mathematics and computational thinking

Standard 2.2.1 Students will be able to use mathematics to represent physical variables and their relationships; compare mathematical expressions to the real world; and engage in computational thinking as they use or develop algorithms to describe the natural or designed worlds.

Benchmark 4E.2.2.1.1 Interpret charts, maps and/or graphs of the amounts of salt water and fresh water in various reservoirs to provide evidence about the distribution of water on Earth.** (P: 5, CC: 4, CI: ESS2) Emphasis is on oceans, lakes, rivers, glaciers, ground water, and polar ice caps.

Strand 3 Developing possible explanations of phenomena or designing solutions to engineering problems

Substrand 3.1 Developing and using models

Standard 3.1.1 Students will be able to develop, revise, and use models to represent their understanding of phenomena or systems as they develop questions, predictions and/or explanations and communicate ideas to others.

Science Standards, *continued*

. **Benchmark 4E.3.1.1.1** Develop a model based in part on student observations or data to describe ways the geosphere, biosphere, hydrosphere, and atmosphere interact. (P: 2, CC: 4, CI: ESS2) Emphasis is on how rock, living things, water, and/or air are individual systems that make up the larger Earth system and interact with each other.

2010 Minnesota Academic Standards in Language Arts

This lesson helps support the following state standards:

Strand READING
- **Substrand** Informational Text K-5
  - **Standard** Analyze how and why individuals, events, and ideas develop and interact over the course of a text.
    - **Benchmark** 4.2.3.3 Explain events, procedures, ideas, or concepts in a historical, scientific, or technical text, including what happened and why, based on specific information in the 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 4.2.4.4** Determine the meaning of general academic and domain-specific words or phrases in a text relevant to a grade 4 topic or subject area.
  - **Standard** Integrate and evaluate content presented in diverse media and formats, including visually and quantitatively, as well as in words.
    - **Benchmark 4.2.7.7** Interpret information presented visually, orally, or quantitatively (e.g., in charts, graphs, diagrams, time lines, animations, or interactive elements on Web pages) and explain how the information contributes to an understanding of the text in which it appears.
  - **Standard** Delineate and evaluate the argument and specific claims in a text, including the validity of the reasoning as well as the relevance and sufficiency of the evidence.
    - **Benchmark 4.2.8.8** Explain how an author uses reasons and evidence to support particular points in a text.

Strand WRITING
- **Substrand** Writing K-5
  - **Standard** Conduct short as well as more sustained research projects based on focused questions, demonstrating understanding of the subject under investigation.
    - **Benchmark 4.6.7.7** Conduct short research projects that build knowledge through investigation of different aspects of a topic.
  - **Standard** Draw evidence from literary or informational texts to support analysis, reflection, and research.

Language Arts Standards, *continued*

Benchmark 4.6.9.9 Draw evidence from literary or informational texts to support analysis, reflection, and research. b. Apply grade 4 Reading standards to informational texts (e.g., "Explain how an author uses reasons and evidence to support particular points in a text").

Standard Write routinely over extended time frames (time for research, reflection, and revision) and shorter time frames (a single sitting or a day or two) for a range of tasks, purposes, and audiences.

Benchmark 4.6.10.10 Write routinely over extended time frames (time for research, reflection, and revision) and shorter time frames (a single sitting or a day or two) for a range of discipline-specific tasks, purposes, and audiences.

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 4.8.1.1 Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grade 4 topics and texts, building on others' ideas and expressing their own clearly.

a. Come to discussions prepared, having read or studied required material; explicitly draw on that preparation and other information known about the topic to explore ideas under discussion.
b. Follow agreed-upon rules for discussions and carry out assigned roles.
c. Pose and respond to specific questions to clarify or follow up on information, and make comments that contribute to the discussion and link to the remarks of others.
d. Review the key ideas expressed and explain their own ideas and understanding in light of the discussion.
e. Cooperate and problem solve as appropriate for productive group discussion.

Standard Evaluate a speaker's point of view, reasoning, and use of evidence and rhetoric.

Benchmark 4.8.3.3 Identify the reasons and evidence a speaker provides to support particular points.

Strand LANGUAGE

Substrand Language K-5

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 4.10.6.6 Acquire and use accurately grade-appropriate general academic and domain-specific words and phrases, including those that signal precise actions, emotions, or states of being (e.g., quizzed, whined, stammered) and that are basic to a particular topic (e.g., wildlife, conservation, and endangered when discussing animal preservation).

References and Resources

Books and Web Sites for Adults

- *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
- *Minnesota Wetlands Report 1999-2000* by Minnesota Board of Soil and Water Resources
- *Minnesota's Natural Heritage, an Ecological Perspective* by John R. Tester
- *Northern Prairie Wetlands edited* by Arnold Van Der Valk
- *Prairie, a Natural History* by Candace Savage
- *Project WET Curriculum and Activity Guide* by the Watercourse and the Western Regional Environmental Education Council
- *Rain Gardens, a How-To Manual for Homeowners* by Wisconsin Department of Natural Resources
- *WOW! The Wonders of Wetlands, An Educators Guide* by Environmental Concern Inc. and The Watercourse
- Fergus Falls Wetland Management District web site
- Minnesota Department of Natural Resources web site
- U.S. Fish and Wildlife Service web site, Small Wetlands Program

Books and Video for Children

- *A Wetland Habitat (Introducing Habitat)* by Molly Aloian and Bobbie Kalman
- *Here is the Wetland* by Madeleine Dunphy
- *Near One Cattail: Turtles, Logs, ,and Leaping Frogs (Sharing Nature With Children Book)* by Anthony D. Fredericks
- *Ollie's Otter Tail River Adventure* by Tim Rundquist
- *Squish! A Wetland Walk* by Nancy Luenn
- *Wading Into Wetlands (video), Bill Nye the Science Guy*
- *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