YOUNG NATURALISTS

TEACHERS GUIDE

TO "DANCING WITH GREBES"

Multidisciplinary classroom activities based on the Young Naturalists nonfiction story in *Minnesota Conservation Volunteer,* March–April 2016, www.mndnr.gov/mcvmagazine

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Minnesota Conservation Volunteer magazine tells stories that connect readers to wild things and wild places. Subjects include earth science, wildlife biology, botany, forestry, ecology, natural and cultural history, state parks, and outdoor life.

Education has been a priority for this magazine since its beginning in 1940. "One word—Education—sums up our objective," wrote the editors in the first issue. Thanks to the *MCV* Charbonneau Education Fund, every public library and school in Minnesota receives a subscription. Please tell other educators about this resource.

Every issue now features a Young Naturalists story and an online Teachers Guide. As an educator, you may download Young Naturalist stories and reproduce or modify the Teachers Guide. The student portion of the guide includes vocabulary cards, study questions, and other materials.

Readers' contributions keep *Minnesota Conservation Volunteer* alive. It is the only state conservation magazine to claim the distinction of being financially supported by contributions from its readers.

Find every issue online. Each story and issue is available in a searchable PDF format. Visit www.mndnr.gov/mcvmagazine and click on *past issues.*

Thank you for bringing Young Naturalists into your classroom!

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MINNESOTA CONSERVATION VOLUNTEER

"Dancing With Grebes"

Multidisciplinary classroom activities based on the Young Naturalists nonfiction story in *Minnesota Conservation Volunteer,* March–April 2016, www.mndnr.gov/mcvmagazine

Summary. "Dancing With Grebes" chronicles the life cycle of a unique Minnesota bird. The western grebe is the only nesting bird species that migrates from the Pacific Coast to Minnesota. Text and photos describe this distinctive bird's courtship, nest building, and rearing of chicks. Other topics include diet, predators, and fall migration.

Suggested reading levels. Third through middle school grades

Materials. KWL organizer, index cards, paper, poster board, colored pencils, crayons, pens, markers, online text and videos about western grebes (See Web Resources), and other print and online resources your media specialist may provide.

Preparation time. One to two hours, not including time for extension activities

Estimated instruction time. One or two 50-minute class periods (not including extensions)

Minnesota academic standards applications. "Dancing With Grebes" may be applied to the following Minnesota Department of Education standards:

Language Arts; Reading Benchmarks; Informational Text Grades 3–8
Key Ideas and Details, Craft and Structure, Integration of Knowledge and Ideas, Range of Reading and Level of Text Complexity

Writing Benchmarks Grades 3–8 Text Types and Purposes, Writing Process, Research to Build and Present Knowledge, Range of Writing

Reading Benchmarks: Literacy in Science and Technical Subjects Grades 6–8 Key Ideas and Details, Craft and Structure, Integration of Knowledge and Ideas, Range of Reading and Level of Text Complexity

Writing Benchmarks: Literacy in History/Social Studies, Science, and Technical Subjects Grades 6–8 Text Types and Purposes, Writing Process: Production and Distribution of Writing, Research to Build and Present Knowledge, Range of Writing

Science Grades 3, 5, and 7
3.4.1.1.1; 3.4.3.2.1; 5.4.1.1.1; 7.4.2.1.2; 8.1.3.3.2

Arts Grades K–12
1. Artistic Foundations: Visual Arts
2. Artistic Process: Create or Make: Visual Arts
3. Artistic Process: Perform or Present: Visual Arts
4. Artistic Process: Respond or Critique: Visual Arts

Current, complete Minnesota Academic Standards are at www.education.state.mn.us. Teachers who find other connections to standards are encouraged to contact *Minnesota Conservation Volunteer.*

Preview. (1) See www.youtube.com/watch?v=ZbRrxw-H6xA for a BBC video you can use to introduce this topic. (2) You may follow with a KWL (Ogle, 1986) activity. To find out what your students already know (K) about grebes and other migrating waterfowl, divide the class into small groups to brainstorm their ideas. Give each student a copy of the organizer (see www.teach-nology.com/web_tools/graphic_org/kwl) and encourage each to make notes during the group discussion. Ask what students would like to learn, or what questions they have, about the topic (W). Record their questions on poster board for reference. As you read and discuss the article you will begin to compile the (L) lists, or what they learn while reading the article and related materials and participating in extension activities. KWL gives you the opportunity to introduce interdisciplinary connections you will make during extension activities. If you use the article in science, math, or art class, you may wish to focus your prereading activity on academic standards that apply for that class. (3) See www.teachervision.fen.com/tv/printables/TCR/0743932080_007.pdf for a brainstorming web download.

Vocabulary preview. See the copy-ready vocabulary list included in this guide. You may wish to modify the list based on your knowledge of your students' needs or the subject you are teaching. Pretesting vocabulary individually, in small groups, or with your entire class can be an effective vocabulary preview strategy. You may then post-test at the conclusion of this activity (see Assessment section below).

You may wish to use the study cards found at the end of this guide. Cut along the horizontal lines; fold in the middle, and tape or staple. Study cards (see *Strategic Tutoring*, Hock, Deshler, and Schumaker 2000) can be applied to any subject area. On one side of the card, in large letters, write a key word or phrase students are expected to know. In smaller letters, frame the word or phrase in a question or statement. On the other side of the card, in large letters, write the answer to the question. Finally, in smaller letters, frame the answer in a question or statement. Blanks are provided to allow you or your students to add new words or phrases.

Study questions overview. Study questions parallel the story (the answer to the first question appears first in the article, followed by the second, and so on). **Preview the questions with your class before you read the article.** You may wish to read the story aloud and complete the study questions in class, in small groups, or as an independent activity. The questions may be assigned as homework, depending on the reading ability of your students. Inclusion teachers may provide more direct support to special needs students (see Adaptations section). The study questions may be also used as a quiz. Note: Items with an asterisk require varying degrees of critical thinking.

Adaptations. Read aloud to special needs students. Abbreviate the study questions or highlight priority items to be completed first. If time allows, remaining items may be attempted. Peer helpers, paraprofessionals, or adult volunteers may lend a hand with the study questions. With close teacher supervision, cooperative groups can also offer effective support to special needs students, especially for extension activities.

Assessment. You may use all or part of the study guide, combined with vocabulary, as a quiz. Other assessment ideas include: (1) Ask students to describe what they learned about western grebes. See the "learned" list from your **KWL** activity. (2) Students may write multiple-choice, true-false, or short-answer questions. Select the best items for a class quiz. (3) How many big ideas about grebes are in this article? In small groups or as individuals, students may create posters that combine visual art, writing, and oral presentations. Posters may focus on one species, related species, or other big ideas from the story. Posters and presentations are an excellent strategy for allowing students to demonstrate what they have learned.

Extension activities. Extensions are intended for individual students, small groups, or your entire class. Young Naturalists articles provide teachers many opportunities to make connections to related topics, to allow students to follow particular interests, or to focus on specific academic standards.

1. Several YN articles with teachers guides are great companion pieces for "Dancing With Grebes." See Related Articles below. You may encourage students to include content from related articles in evaluation and/or other extension activities.
2. Your students will discover many other articles about migrating waterfowl in the Minnesota Conservation Volunteer archives. Teaching your students how to access archived

stories will open a world of learning opportunities.
3. Compare and contrast Minnesota's state bird, the common loon, with the western grebe. See compare-and-contrast tools in Web Resources.
4. How has waterfowl habitat changed since immigrants from Europe settled Minnesota in the 1800s and 1900s? See Web Resources for maps and articles that will help your students appreciate the significant loss of wetlands, especially in the prairie pothole region.
5. Phenology is the study of rhythmic biological events, such as bird migrations, as they relate to climate. Check out "The Phenology Show" on KAXE radio (www.kaxe.org/programs/phenology.aspx). Contact the station to find out how your classroom may join the phenology network.
6. *Aechmophorus occidentalis* is the scientific name (binomial nomenclature) for western grebe. Learn more about the science of taxonomy and how it helps biologists communicate.

Web resources.

DNR

files.dnr.state.mn.us/eco/mcbs/birdmaps/western_grebe_map.pdf
www.dnr.state.mn.us/birds/commonloon.html
www.dnr.state.mn.us/eco/nongame/projects/mlmp_state.html
www.dnr.state.mn.us/nature_viewing/index.html
www.dnr.state.mn.us/prairierestoration/index.html
www.dnr.state.mn.us/wetlands/index.html

Western Grebe

www.allaboutbirds.org/guide/Western_Grebe/id
birdweb.org/birdweb/bird/western_grebe
www.audubon.org/field-guide/bird/western-grebe

Common Loon

www.allaboutbirds.org/guide/Common_Loon/id
www.audubon.org/field-guide/bird/common-loon

Minnesota wetlands

https://webapps8.dnr.state.mn.us/volunteer_index/past_issues/article_pdf?id=5171
https://webapps8.dnr.state.mn.us/volunteer_index/past_issues/article_pdf?id=1963
https://webapps8.dnr.state.mn.us/volunteer_index/past_issues/article_pdf?id=1962
https://webapps8.dnr.state.mn.us/volunteer_index/past_issues/article_pdf?id=20
http://water.usgs.gov/nwsum/WSP2425/history.html
www.bwsr.state.mn.us/wetlands/wca/history.html
http://mrbdc.mnsu.edu/wetlands
www.mngeo.state.mn.us/chouse/water_wetlands.html

Taxonomy

www.biology4kids.com/files/studies_taxonomy.html
www.kidsbiology.com/biology_basics/classification/classification1.php
www.ducksters.com/science/scientific_classification.php

Compare and contrast

www.edhelper.com/compare_and_contrast.htm
www.readwritethink.org/files/resources/printouts/CompareContrast.pdf
www.eduplace.com/graphicorganizer/pdf/venn.pdf

Minnesota DNR Teacher Resources

www.mndnr.gov/education/teachers/index.html
www.mndnr.gov/dnrkids/index.html

*Note: All websites were active at the time of this guide's publication. However, some may no longer be active when this guide is accessed.

Related articles.

In addition to the related articles listed below, every *Minnesota Conservation Volunteer* article published since 1940 is now online in searchable PDF. See www.mndnr.gov/mcvmagazine. Young Naturalists articles and teachers guides are found at www.dnr.state.mn.us/mcvmagazine/young-naturalists.

March–April 2003
"Let's Go Birding" (YN article with teachers guide)
files.dnr.state.mn.us/mcvmagazine/young_naturalists/young-naturalists-article/birding/birding.pdf

January–February 2004
"The Nature of Feathers" (YN article with teachers guide)
files.dnr.state.mn.us/mcvmagazine/young_naturalists/young-naturalists-article/feathers/feathers.pdf

March–April 2004
"Special Delivery" (YN article with teachers guide)
files.dnr.state.mn.us/mcvmagazine/young_naturalists/young-naturalists-article/eggs/eggs.pdfhttps://webapps8.dnr.state.mn.us/volunteer_index/past_issues/article_pdf?id=1935

March–April 2005
"The Parenting Game" (YN article with teachers guide)
files.dnr.state.mn.us/mcvmagazine/young_naturalists/young-naturalists-article/parenting/baby_animals.pdf

January–February 2007
"Nature's Calendar" (YN article with teachers guide)
files.dnr.state.mn.us/mcvmagazine/young_naturalists/young-naturalists-article/phenology/phenology.pdf

July–August 2007
"Hoot, Tremolo, Yodel, and Wail" (YN article with teachers guide)
files.dnr.state.mn.us/mcvmagazine/young_naturalists/young-naturalists-article/loons/loons.pdf

September–October 2007
"Who's that Navigator?" (YN article with teachers guide)
files.dnr.state.mn.us/mcvmagazine/young_naturalists/young-naturalists-article/navigator/navigator.pdf

January–February 2011
"The Greatest of Feet" (YN article with teachers guide)
files.dnr.state.mn.us/mcvmagazine/young_naturalists/young-naturalists-article/feet/feet.pdf

March–April 2012
"How do Birds Fly?" (YN article with teachers guide)
files.dnr.state.mn.us/mcvmagazine/young_naturalists/young-naturalists-article/bird_flight/bird_flight.pdf

September–October 2015
"Splendid Flyers" (YN article with teachers guide)
files.dnr.state.mn.us/mcvmagazine/young_naturalists/young-naturalists-article/bird-migration/sepoct2015_young_naturalists.pdf

References.

Hock, M.F., Deshler, D.D., and Schumaker, J.B. *Strategic Tutoring*. Lawrence, Kan.: Edge Enterprises, 2000.

Ogle, D.S. K-W-L Group Instructional Strategy. In A.S. Palincsar, D.S. Ogle, B.F. Jones, and E.G. Carr (Eds.), *Teaching Reading as Thinking: Teleconference Resource Guide*, pp. 11–17. Alexandria, Va.: Association for Supervision and Curriculum Development, 1986.

Study questions answer key.

Teachers guide for the Young Naturalists article "Dancing With Grebes." Published in the March–April 2016 *Minnesota Conservation Volunteer*, or visit www.mndnr.gov/mcvmagazine.

1. Why are western grebes unique among Minnesota birds? **Western grebes are the only nesting bird species in Minnesota that migrate in an east-west direction.**
*2. Are female and male western grebes identical? Explain your answer. **While they appear identical, the male is larger, with a thicker bill.**
*3. Why does the author describe western grebes as wearing "feathered tuxedos?" **Western grebes' black, gray, and white feathers are formal looking, like a tuxedo.**
4. Where does this story take place? **This story takes place on Lake Osakis.**
5. What do western grebes eat? **Western grebes eat small fish, insect larvae, and crustaceans. Chicks also eat feathers.**
6. Where do western grebes choose to nest? **Floating nests are tethered to cattails or bulrushes in protected places.**
7. What materials do they use to build their nests? **Nests are made of soggy materials from the lake bottom, such as algae and moss, and fresh-cut stems of aquatic plants.**
*8. Why do you think western grebes take turns incubating their eggs? **Answers will vary. By cooperating, the parents give the eggs a better chance of hatching.**
9. When a chick pips, what is it doing? **When a chick pips it breaks out of its shell.**
10. Where do chicks go immediately after hatching? **As soon as it hatches the western grebe chick burrows into its parent's feathers.** Why? **The sheltered place keeps it warm and safe.**
11. What predators does a western grebe chick have to watch out for? **Baby grebes have to watch out for northern pike, snapping turtles, and mink.**
12. What is back-brooding? **Grebe chicks ride on their parents' backs. When threatened, they burrow out of sight into their parents' feathers.**
13. Something interesting happens to chicks when they are hungry. What? **When a chick is hungry a spot on top of its head turns bright red.** Who eats first? **The loudest, pushiest chick eats first.**
14. Why do western grebes gather in large flocks at night? **A large flock, with some grebes keeping a lookout, offers protection from predators.**
*15. Describe how western grebes dive differently in smooth and rough water. How do you explain these behaviors? **To dive in smooth water the bird lies flat on the surface, pushes its head under the water and kicks with both feet. In rough water it springs forward and then down. By springing forward the grebe is able to fight through the waves.**
*Challenge: Draw a picture of a western grebe's profile as it swims or dives. Pay close attention to the location and design of its feet. **Encourage students to study the photo on page 41. You may provide other photos from Web Resources.**

Minnesota comprehensive assessments answer key.

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1. What is a ratchet call? **C. Ratchet calls are loud, harsh trills made during the mating ritual.**
2. The large bare patch of skin on grebe's belly is used for **B. incubating eggs.**
3. Describe bob-shaking. **During mating the male and female grebe bring up plants from the bottom of the lake. With weeds in their bills they bump chests and shake their heads from side to side.**
4. Western grebe chicks have a tiny white **C. egg tooth on their bills.**
5. Why does the mother grebe have to work so hard to feed her chicks? **She only brings one food item at a time. She must make many trips to keep her hungry chicks alive.**

Vocabulary answer key.

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aquatic plants plants that live in water or in soil that is permanently saturated with water (wetlands)

bulrushes also called reeds, these grasslike aquatic plants can grow up to 10 feet tall

courtship a set of behaviors that attract a mate

crustaceans hard-shelled, mostly aquatic animals with segmented body parts, such as crayfish or shrimp

dominant most important or strongest

elegant graceful or stylish

embryo unborn or unhatched offspring

forage search for food

incubate sit on eggs in order to keep them warm

juvenile an immature animal that is not an infant but also not an adult

larva wormlike immature insect that hatches from an egg

migration movement from one area to another