

TEACHERS GUIDE

TO “WILD AND SOMETIMES WOOLLY”

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

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.

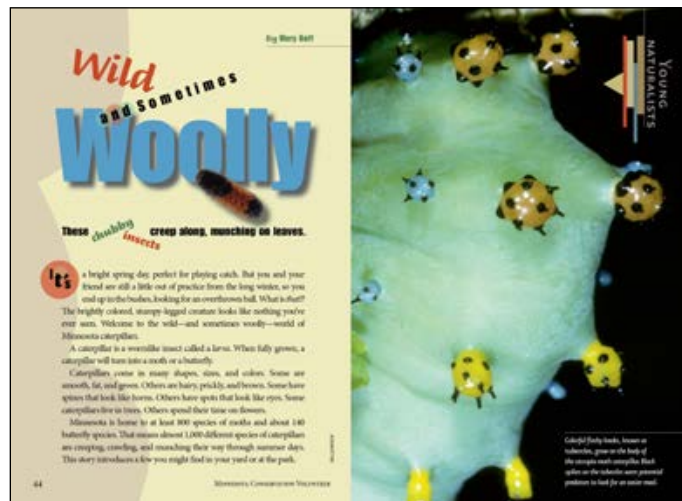
Readers’ contributions keep *Minnesota Conservation Volunteer* alive. It is the only state conservation magazine to claim the distinction of being financially supported by contributions from its readers.

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!

“WILD AND SOMETIMES WOOLLY”

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



SUMMARY. Caterpillars are fascinating critters for children and adults alike. In “Wild and Sometimes Woolly,” young readers learn about the life cycles of several butterflies and moths of Minnesota. Topics include anatomy, instars, metamorphosis, diet, predator defenses, and overwintering.

SUGGESTED READING LEVELS. Third through middle school grades

MATERIALS. KWL organizer, index cards, paper, poster board, colored pencils, crayons, pens, markers, YouTube videos (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. “Wild and Sometimes Woolly” 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 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 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 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

Life Science

3.4.1.1.1; 5.4.1.1.1; 7.4.1.2.1; 7.4.1.2.2; 7.4.2.1.2; 7.4.3.1.3

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) The YouTube videos [Caterpillar to Butterfly](#) or [Life Cycle of a Butterfly](#) can be used to introduce this topic. (2) You might follow with a KWL (Ogle, 1986) activity. To find out what your students already know (K) about caterpillars, 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 or art class, you may wish to focus your prereading activity on academic standards that apply for that class. (3) Download a [brainstorming web](#).

VOCABULARY PREVIEW. See the copy-ready vocabulary list included in this guide. You may 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 might wish to use the study cards found at the end of this guide. Cut along the horizontal line; 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 entire guide 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 caterpillars, butterflies, and moths. 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 caterpillars 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 idea or related (compare and contrast?) 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. “The Magic of Morphing” (YN article with teacher’s guide) is a great companion piece for “Wild and Sometimes Woolly.” See Related Articles below. You may encourage students

- to include content from related articles in evaluation and/or other extension activities.
2. The regal fritillary is one of Minnesota's most beautiful butterflies. Why is it disappearing? See Web Resources for links to get your students started on their research.
 3. What is a gypsy moth, and why are DNR foresters worried about it? See Web Resources for links to help your students answer this question.
 4. See Web Resources for links to some interesting classroom projects. Raise caterpillars into butterflies.
 5. Phenology is the study of rhythmic biological events, such as butterfly migrations and caterpillar emergence in spring, as they relate to climate. Check out "[The Phenology Show](#)" on KAXE radio. Contact the station to find out how your classroom may join the phenology network.
 6. Every species of moth and butterfly described in this article is identified with two names (common and scientific). Learn more about the science of taxonomy and how it helps biologists communicate.

WEB RESOURCES

DNR

www.mndnr.gov/insects/index.html

www.mndnr.gov/insects/monarchbutterfly.html

www.mndnr.gov/treecare/forest_health/ftc/index.html

www.mndnr.gov/rsg/filter_search.html?insect=Y&allstatus=Y&action=doFilterSearch

BUTTERFLIES AND MOTHS

www.youtube.com/watch?v=mQOFh1exp3A

www.ukleps.org/morphology.html

www.butterflyfunfacts.com/chrysalis.php

CLASSROOM CATERPILLAR AND BUTTERFLY PROJECTS

www.raisingbutterflies.org/

<http://bugguide.net/node/view/203352>

www.butterflyschool.org/teacher/raising.html

REGAL FRITILLARY

www.gpnc.org/regal.htm

www.mndnr.gov/rsg/profile.html?action=elementDetail&selectedElement=IILEPJ6040

<https://wisconsinbutterflies.org/butterfly/species/66-regal-fritillary>

GYPSY MOTH

www.mndnr.gov/invasives/terrestrialanimals/gypsymoth/index.html

<http://extension.illinois.edu/gypsymoth/biology.cfm>

www.fs.fed.us/ne/morgantown/4557/gmoth/cycle/

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.eduplace.com/graphicorganizer/pdf/venn.pdf

POETRY RESOURCES

www.poemfarm.amyiv.com/2011/04/rhyming-couplets.html

www.kidzone.ws/poetry/haiku.htm

http://pbskids.org/arthur/games/poetry/free_verse.html

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. Browse more Young Naturalists articles and teachers guides.

July–August 1996

“Damsels and Dragons” (YN article with teachers guide)

March–April 2004

“Special Delivery” (YN article with teachers guide)

November–December 2006

“Wild Engineers” (YN article with teachers guide)

July–August 2004

“Buggy Sounds of Summer” (YN article with teachers guide)

September–October 2005

“Wild Vision” (YN article with teachers guide)

January–February 2007

“Nature's Calendar” (YN article with teachers guide)

May–June 2007

“Ants” (YN article with teachers guide)

March–April 2008

“The Magic of Morphing” (YN article with teachers guide)

May–June 2008

“Spring to Life Ponds” (YN article with teachers guide)

November–December 2013

“Beetlemania!” (YN article with teachers guide)

March–April 2015

“Color by Nature” (YN article with teachers guide)

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

- *1. Caterpillars are worms that turn into insects. True **False**
2. Describe how caterpillars differ one from the other. **Answers may vary, but should include: shapes, sizes, colors, textures, and unique features.**
3. About how many species of moths **800** and butterflies **140** are native to Minnesota?
4. The scientific name for moths and caterpillars is **lepidoptera**.
5. Sketch a caterpillar in the space below and label its head, thorax, abdomen, and horn.
See page 46.
6. What is an instar? **An instar is a caterpillar’s stage of growth.**
- *7. Most caterpillars grow into moths and butterflies. True **False** (Explain your answer.)
Most caterpillars are eaten by predators.
8. What are spinnerets and why are they important? **Spinnerets are body parts near the caterpillar’s jaw that allow it to spin the silk with which it makes its cocoon or the silk pad the chrysalis hangs from.**
- *9. Describe **in detail** what happens to the pupae of moths and butterflies during metamorphosis. **Answers may vary. During metamorphosis the pupa’s tissues dissolve into soupy mush. Imaginal discs in the mush grow the adult insect’s body parts (e.g., legs, wings). After about two weeks the butterfly comes out of the chrysalis, or the moth out of its cocoon, and flies away.**

10. Place each species in its correct category: *Synchlora aerata*, *Papilio polyxenes*, *Hyles lineata*, *Malacosoma disstria*, *Danaus plexippus*, *Pyrrharctia isabella*, *Hyalophora cecropia*, *Limenitis arthemis arthemis*

Moth

Pyrrharctia isabella
Malacosoma disstria
Hyles lineata
Hyalophora cecropia
Synchlora aerata

Butterfly

Danaus plexippus
Papilio polyxenes
Limenitis arthemis arthemis

11. How do woolly bear caterpillars survive Minnesota winters? **They find a sheltered spot, such as in a pile of leaves, to spend the winter. A chemical in a woolly bear's blood keeps it from freezing.**

12. I can't eat as an adult. What species am I? I am *Hyalophora cecropia*.

13. I migrate all the way to Mexico for the winter. What species am I? I am *Danaus plexippus*.

14. Robert Dana has always been fascinated by **insects**.

15. How does the black swallowtail caterpillar protect itself from predators? **It pops out a foul-smelling antler-shaped body part from behind its head.**

*Challenge: Create a poem about caterpillars. You may use a rule-based form, such as haiku; a rhyme form, such as couplet; or free verse. **See Web Resources for poem starters and other helpful information.**

MINNESOTA COMPREHENSIVE ASSESSMENTS ANSWER KEY.

1. What species forms a leaf into a tube for its winter home? **B. *Limenitis arthemis arthemis***

2. The stemmata are a caterpillar's **C. eyes**.

3. How do you think the forest tent caterpillar got its name? **It got its name from the silk mats it makes that attach tree branches together.**

4. Caterpillars spend most of their time **B. eating**.

5. What are prolegs and what is their function? **Prolegs are soft body parts located behind the caterpillar's legs. They help with gripping and crawling.**