

# TEACHERS GUIDE

## TO “TINY TRAVELERS”

Multidisciplinary classroom activities based on the Young Naturalists nonfiction story in *Minnesota Conservation Volunteer*, September–October 2016, [www.mndnr.gov/mcvmagazine](http://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](http://www.mndnr.gov/mcvmagazine) and click on *past issues*.

**Thank you** for bringing Young Naturalists into your classroom!

# “TINY TRAVELERS”

Multidisciplinary classroom activities based on the Young Naturalists nonfiction story in *Minnesota Conservation Volunteer*, September–October 2016, [www.mndnr.gov/mcvmagazine](http://www.mndnr.gov/mcvmagazine)



**SUMMARY.** You may be familiar with snails found in the water. But did you know that Minnesota has some 90 species of snails that live on land? “Tiny Travelers” describes these land snails — what they look like, where they live, how they reproduce, what they eat, and what eats them.

**SUGGESTED READING LEVELS.** Third through middle school grades

**MATERIALS.** Copies of the KWL organizer (see Preview below), poster board and markers, snail-related print and online resources your media specialist may provide, additional materials for extension activities selected (see Extension Activities below).

**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.** “Tiny Travelers” 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 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

## MATHEMATICS GRADES 3, 5, AND 7

3.1.2.4; 3.1.3.2; 4.1.1.5; 4.1.2.3; 5.1.1.4; 6.1.1.3; 6.1.3.4

## SCIENCE GRADES 3, 5, AND 7

Life Science

3.1.2.4; 3.1.3.2; 4.1.1.5; 4.1.2.3; 5.1.1.4; 6.1.1.3; 6.1.3.4

## 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](http://www.education.state.mn.us). Teachers who find other connections to standards are encouraged to contact *Minnesota Conservation Volunteer*.

**PREVIEW.** (1) Introduce or review the concept of vertebrates and invertebrates. What do snails and other invertebrates have in common with humans and other vertebrates? How are they different from vertebrates? (2) You might follow with a KWL activity focused on snails. To find out what your students already know (K) about snails, 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](http://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) Watch the short video “[Microworlds — The Secret Life of the Snail](#)” to get a close-up look at how snails move, breathe, eat, and sense their environment.

**VOCABULARY PREVIEW.** You can find a copy-ready vocabulary list at the end of this

guide. Feel free to modify it to fit your needs. Share the words with you students and invite them to guess what they think they mean. Tell them you will be reading a story that will help them understand these words so they can use them in the future!

You might wish to use the study cards (adapted from *Strategic Tutoring*) found at the end of the Study Questions for this Young Naturalists feature. On one half of the card, in large letters, is a key vocabulary word or phrase with smaller letters frame the word or phrase in a question or statement. On the other half is the answer to the question or the rest of the statement. Cut along the horizontal line, fold in the middle, and tape or staple, then use like flash cards. We've included a few blanks so you or your students can add new words or phrases if you'd like.

**STUDY QUESTIONS OVERVIEW.** Preview the study questions with your class before you read the article. Then read the story aloud. Complete the study questions in class, in small groups, or as an independent activity, or use them as a quiz.

**ADAPTATIONS.** Read aloud to special needs students. Abbreviate the study questions or focus on items appropriate for the students. Adapt or provide assistance with extension activities as circumstances allow.

**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 snails. See the “learned” list from your **KWL** activity. (2) Have students write multiple-choice, true-false, or short-answer questions based on the article. Select the best items for a class quiz. (3) Have students create posters and presentations 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. Go on a snail hunt! Identify two to three likely places to find ground snails within walking distance of your classroom. Follow the instructions on page 49 to search for and gather snails. Have students use hand lenses to observe the snails. Compare and contrast what you found at the various sites. Return the snails to the correct habitat when you're done.
2. Use one of the resources listed in “Web Resources” below to create a snail terrarium. Gather snails outdoors and add them to the terrarium. Give students opportunities to observe snail activity during the day.
3. Drawing is a great way to enhance observational skills. Invite students to make a pencil drawing of a snail based on one of the photos in the article, an online photo, or a snail you found on your snail hunt). This mini-tutorial provides good guidance on how to start and then fill in the details.

4. Snails add new shell material in a spiral shape as they grow. The spiral is an example of a Fibonacci sequence — a mathematical construct that appears repeatedly in nature. Use online resources such as those provided in Web Resources to learn about Fibonacci sequences. What other living things can you find that follow this pattern?

5. What's it like to be a tiny, slow-moving animal that lives among fungi, worms and dead leaves? Invite students to pretend they are a Minnesota land snail and describe a day in the life of a snail in the form of a diary entry written from the snail's perspective. Illustrations welcome!

6. Moose are becoming scarcer and scarcer in Minnesota. What do snails have to do with it? Read the Minnesota Conservation Volunteer Story "Moose Walking in Circles" to find out!

7. Every species of snail 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

### GENERAL TEACHER AND STUDENT RESOURCES

[Minnesota DNR Teachers' Resources](#)

[DNR Kids Page](#)

### VERTEBRATES VS. INVERTEBRATES

[Happy Learning TV: Invertebrate Animals \(video in English and Spanish\)](#)

[Invertebrate vs. Vertebrate](#)

### MOLLUSKS AND SNAILS

[Learn About Mollusks](#)

[FAQs About Land Snails](#)

[Photos of Minnesota land snails](#)

### SNAILS' ROLE IN ECOSYSTEMS

[Nature's Recyclers](#)

[Spring-to-Life Ponds](#)

[Moose Walking in Circles](#)

[Snails Are Going Extinct: Here's Why That Matters](#)

### SNAIL TERRARIUM

[Mother Natured](#)

[Snails & Slugs](#)

### FIBONACCI SEQUENCES

[Math Is Fun](#)

[Wolfram MathWorld](#)

\*All Minnesota Conservation Volunteer articles are [available online](#) in searchable PDF.

## STUDY QUESTIONS ANSWER KEY

1. How do scientists classify land snails? **Land snails belong to a group known as gastropods within the mollusk phylum.**
2. Where are gastropods found? **Gastropods can be found in oceans, lakes, rivers, springs, tundra, rain forests, deserts, and swamps.**
3. How many species of land snails live in North America? **1,200** About how many species of land snails live in Minnesota? **90**
4. Another name for a land snail's tongue is **radula**.
5. Minnesota's smallest land snail is 1/16 inch long and its largest land snail is 2 inches long. How many times longer is the largest snail than the smallest snail?  **$16 \times 2 = 32$**
6. True or false: Snails use gills rather than lungs to breathe. **False. Snails have lungs and breathe air.**
7. How does mucus help a land snail survive? **Mucus provides a smooth surface for the foot to move along. It's used to make a cellophanelike covering called an epiphragm to seal the shell opening during dry or cold spells. It also makes it hard for predators such as mice and birds to get ahold of it and can trap small parasites.**
8. Dead plants provide **food** and **shelter** for snails.
9. What percent of snails and snail species are lost when a fire burns their habitat? **Fire results in the loss of 90 percent of snails and 33 percent (one-third) of snail species.** What are three kinds of animals that eat snails. **Answers may vary. Answers substantiated by the story are mice, birds, and beetles.**
11. Which of these do snails use to help them move around? **E. all of the above**  
*Challenge:* The article tells us that 85 percent of Minnesota land snails are tiny snails. How many times more tiny snails are there than big snails?  **$100 - 85 = 15$ .  $85/15 = 5.7$ . There are 5.7 times as many large snails as tiny snails.**

## MINNESOTA COMPREHENSIVE ASSESSMENTS ANSWER KEY

1. What sense does a snail use most to learn about its world? **A. smell**
2. How does a land snail get rid of body wastes? **Through its skin or out the end of its digestive system.**
3. What does a land snail use instead of teeth for eating food? **Sharp barbs found on its tongue.**
4. What do land snails eat? **Some land snails eat fungi, algae, and lichens. Others eat plants. One Minnesota species eats snails and worms.**
5. How does a land snail's blood get around its body without arteries or veins? **It moves through openings between cells.**