YOUNG NATURALISTS

# TEACHERS GUIDE

## to "Hidden Tracks"

Multidisciplinary classroom activities based on the Young Naturalists nonfiction story in *Minnesota Conservation Volunteer,* May-June 2026, 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 Naturalists stories and reproduce or modify the Teachers Guide. The student portion of the guide includes a vocabulary list, study questions, and other materials.

**Readers' contributions** keep *Minnesota Conservation Volunteer* alive. The magazine is entirely financially supported by its readers.

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

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YOUNG NATURALISTS

BY Christine Petersen

## Hidden TRACKS

Canada lynx are among the most MYSTERIOUS residents of Minnesota's northern forests.

Minnesota's north woods are true wilderness, with dense forests, boggy wetlands, and deep winter snows that have always made it hard for people to enter. But animals know the way, and this realm is full of life. Day and night, through summer's heat and winter's chill, wildlife follow hidden trails through thick stands of trees, around moss-covered boulders, over fallen logs, and across frozen creeks.

Visit the north woods and you might be lucky enough to see a moose, black bear, or porcupine. Perhaps you'll even catch the distant song of howling wolves. But there is another creature wandering these trails, one so rare that few people ever catch a glimpse of it: the Canada lynx.

True to their name, most of these graceful wildcats live in the remote forests of Canada or Alaska. Small populations are also found in several northern states—including Minnesota—and high in the mountains of some western states.

Until about 20 years ago, any lynx spotted in Minnesota were assumed to be visitors, not residents. Now, biologists are revealing a different story: Canada lynx are a small but important part of the wild community in our state.

*The Canada lynx is a cat made for the north woods.*

MICHAEL S. NOLAN



**SUMMARY.** Washing hands, brushing teeth, and taking baths are routine activities for humans. But what do animals do to stay clean and healthy? This Young Naturalists feature shared how animals use the tools they have—claws, bills tongues, and more—to tidy up.

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

**MATERIALS.** Young Naturalist story and Study Guide; additonal resources for extension activities as noted.

**PREPARATION TIME.** 5–10 minutes, not including time for extension activities.

**Estimated instruction time.** 45–60 minutes, not including extension activities.

**Minnesota academic standards applications.** "Hidden Tracks" and its accompanying Study Guide may be used to support the following Minnesota Department of Education English language Arts (ELA, 2010) standards for students in grades 3-8. (*For additional story-related opportunities to support Minnesota Academic Standards across subject areas, see the "Extension Activities" section of this guide.

**Reading Benchmakrs:** Reading Benchmarks: Informational Text
Key Ideas and Details (Benchmarks 3.2.1.1, 3.2.2.2, 3.2.2.2, 4.2.1.1, 4.2.2.2. 4.2.3.3, 5.2.1.1. 5.2.2.2., 5.2.3.3, 6.5.1.1, 6.5.2.2, 7.5.1.1, 8.5.1.1)
Craft and Structure (Benchmarks 3.2.4.4, 3.2.5.5, 4.2.4.4, 5.2.4.4, 6.5.4.4, 7.5.4.4, 8.5.4.4)
Integration of Knowledge and Ideas (Benchmarks 3.2.7.7, 4.2.8.8, 5.2.8.8, 6,5.7.7)

**Writing Benchmarks (Grades 3-8)**
Text Types and Purpose (Benchmarks 3.6.2.2, 4.6.2.7, 5.6.2.2, 6.7.2.2, 7.7.2.2, 8.7.2.2)
Research to Build and Present Knowledge (Benchmarks 3.6.7.7, 4.6.7.7, 5.6.7.7, 7.7.7.7, 8.7.7.7)

**Language benchmarks**
Vocabulary Acquisition and Use (Benchmarks 3.10.4.4, 4.10.4.4, 5.10.4.4, 6.11.4.4, 6.11.6.6, 7.11.4.4, 7.11.6.6, 8.11.4.4, 8.11.6.6)

**Reading benchmarks** Literacy in Science and Technical Subjects (Grades 6-12)
Key Ideas and Details (Benchmarks 6.13.1.1, 6.13.2.2)

**Speaking, Viewing, Listening, and Media Literacy Benchmarks**
Comprehension and Collaboration: 3.8.1.1; 3.8.2.2; 4.8.2.2; 5.8.1.1; 5.8.2.2; 6.9.1.1; 7.9.1.1; 8.9.1.1

**Preview.** Introduce students to the Young Naturalists' story, "Hidden Tracks," using the "4 Ps" (Preview, Predict, Prior Knowledge, and Purpose). First, invite students to preview the article's text features, such as the title, headings, and images, for clues as to what the story will be about. Then, based on the text features, ask students what they predict they will learn. Next, help students make connections to their prior knowledge and experiences by asking questions such as, What do you already know about Canada lynx? Do the images and headings remind you of anything you have experienced, seen, or read? What would you like to learn about lynx? Finally, invite students to think about the author's intended purpose for the story. The following questions may be helpful: Why do you think the author wrote this story? What do you think the author hopes you will think about or do after reading this?

**Vocabulary preview.** Using the Study Guide, introduce students to the story's vocabulary words, indicating that these words may be unfamiliar to them but will appear in the story.

Invite them to look at each word, think about its meaning, and then write down a possible definition for each. Alternatively, this could be done as a whole group activity, with students working together to share and record what they think the words mean. As your students encounter these words in the Young Naturalists story, you may want to encourage them to infer meaning using context clues, such as other words in the sentence or the story's illustrations.

### Vocabulary list

Felid – a member of the cat family
Predator – an animal that hunts, catches, and eats other animals for food
Prey – the animal being hunted and eaten
Canid – a member of the dog family, such as foxes, wolves, dogs, coyotes
Massive – very large and solid
Conifer – a type of tree or shrub that produces cones and has needle-shaped leaves
Deciduous – a type of tree that loses all its leaves every fall and grows new ones in the spring
Understory – layer of plants, shrubs, and small trees growing in a forest beneath the main, tall canopy
Thicket - a small, thick patch of bushes, shrubs, or small trees growing close together
Teensy – very tiny
Grooming – an animal cleaning itself, such as a cat licking its fur
Thrive – to flourish or do really well

**Study questions overview.** Preview the study questions from the Study Guide 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.

Answer Key: 1. c; 2. d; 3. False; 4. c; 5. a; 6. Massive jaw muscles and sharp teeth; muscular legs for leaping and pouncing; 7. a; 8. b; 9. c; 10. d; Challenge: "Hidden Tracks" is figurative language. The tracks of lynx aren't really hidden; instead, lynx leave distinctive tracks that are quite large and have fur indentation. Lynx are elusive and kind of mysterious; they are not often seen, which might be why the author uses "hidden" in the title.

**Assessment.** The completed vocabulary and study questions on the Study Guide can serve as an assessment of students' learning. Additionally, the Study Guide includes MN Comprehensive Assessment (MCA) practice items. (*MCA Practice Items Answer Key: 1.c; 2.b; 3. c; 4 1; 5. b; 6. a.*) Other assessment ideas include: (1) Have students write multiple-choice, true-false, or short-answer questions based on the article. Select the best items for a class quiz. 2) Use a "Round Robin Retell" format, with students sitting in a circle, and each student paraphrases a main idea or supporting detail from the story. Each must listen carefully to the ideas shared to avoid repeating something that was already shared. (3) Have students create a concept map or web that summarizes and organizes the main ideas and story details. (4) Have

students write a summary of the main ideas from the story. Then have students "share and compare" their work with a partner to self-assess their learning. As they share, students can think about or respond to questions such as: How were the summaries alike and different? What ideas did you include that were different from your partner's?

**Extension Activities.** These extension activities serve to deepen or extend the learning of individual students, small groups, or your entire class. The following activities provide examples of ways to make connections to related topics, while supporting academic standards and/or benchmarks.

1. Invite students to re-read the section, "The Cycle Continues," on the last page of the "Hidden Tracks" story. Using this PBS video, invite students to learn more about the relationship between snowshoe hares and Canada lynx. How does snowshoe hare reproduction change in times of high predation? What happens to the lynx when their food supply decreases? Additionally, students can learn more about population fluctuations through a tag game, such as Alberta Park's Snowshoe Hare and Lynx game, or the Syilx Okanagan Nation Alliance's Predator-Prey Interactive Role Play. Beyond graphing populations, older and/or advanced students can explore how scientists make predictions about future populations through the mathematics of predator-prey relationships. Additionally, encourage students to reflect on the impact of human actions on habitats, which in turn can influence predator-prey relationships and population fluctuations. Students can use what they have learned to construct an evidence-based explanation for how environmental factors influence the growth of populations. [Science (2019). Dimension 1: 2. Developing and using models, 4. Analyzing and interpreting data, 5. Using mathematics and computational thinking, 6. Constructing explanations; Dimension 2: 1. Patterns, 2. Cause and effect; Dimension 3: LS 2. Ecosystems; *Math (2007)*. Data Analysis: 3.4.1.1, 4.4.1.1, 5.4.1.2; Algebra 7.2.4.1, 9.2.4.2]

2. Invite students to read "Protecting the Protectors," by Staci Lola Drouillard, a Grand Portage Ojibwe direct descendant. Ask students to compare this story with "Hidden Tracks," noticing similarities and differences across the two stories (for example, the author's purpose, main idea, and key details). Then ask students to identify from Drouillard's story the three key factors that influence the continued presence of *bizhiw* in the north woods. Encourage students to think about actions humans can take to help protect our animal relatives, such as the *bizhiw* (lynx) and *gidagaa-bizhiw* (bobcat). Students can create posters that illustrate these actions. If feasible, students' posters can be displayed for International Lynx Day (June 11), a day that highlights the need to protect the lynx from threats like habitat loss and poaching, while promoting habitat connectivity and coexistence. [*Science (2019)*. Dimension 1: 8. Obtaining, evaluating, and communicating information; Dimension 2: 2. Cause and effect; Dimension 3: LS 2. Ecosystems; English Language Arts (2010). Reading Benchmarks-Informational Texts:

5.2.6.6; *Arts (2018)*. Visual Arts: 5.3.3.5.1]

3. The story describes the lynx as a powerful predator, built for stealth and speed. One of its traits is triangular ears that work like antennae, helping it track sounds coming in from different directions. This can be a good launching point for students to use internet sources to find clues as to why the triangular ears and ear tufts assist the lynx in hunting its prey. Then, students can design and test their own ears, looking at different animal ears for clues about what helps improve the auditory sense. This activity guide, Ears: Do Their Design, Size and Shape Matter?, from Scientific American, is a fun and helpful guide to further students' exploration! [Science (2019). Dimension 1: 1. Asking questions and defining problems, 2. Developing and using models, 8. Obtaining, evaluating, and communicating information; Dimension 2: 6. Structure and function; Dimension 3: LS 3: Heredity: Inheritance and variation of traits; *English Language Arts* (2010). Writing: 3.6.7.7, 4.6.7.7, 5.6.7.7, 6.7.7.7, 7.7.7.7, 8.7.7.7]

4. Have students look at the DNR map of Minnesota's Canada lynx DNA locations (p. 17). Ask them to interpret the data displayed through the map. Then ask students to look at a map that shows the range for bobcats in Minnesota. Ask students to use clues from "Hidden Tracks" to explain why these two species have different geographic ranges. Ask students to think about whether or not they share a similar ecological role. Then guide students in thinking about that while they share similar ecological roles as predators, they have evolved distinct adaptations to different habitats. Ask students to think about which one is the specialist and which is the generalist. Then prompt discussion regarding advantages and/or disadvantages of being a specialist v. generalist during changing environmental conditions (such as habitat loss or climate change). Younger students can be asked to construct an argument about the strategies lynx use to survive. Older students can be asked to write an argument to support a claim using clear reasons and relevant evidence that generalist species have advantages over specialists during changing environmental conditions. [*Science (2019*). Dimension 1: 1. Asking questions, 4. Analyzing and interpreting data, 6. Constructing explanations, 7. Engaging in argument from evidence; Dimension 2: 2. Cause and effect, 7. Stability and change; Dimension 3: LS 2: Ecosystems, LS 4: Biological evolution; *English Language Arts (2010)*. Writing: 3.6.1.1, 4.6.1.1, 5.6.1.1, 6.7.1.1, 7.7.1.1, 8.7.1.1]

5. Lynx and bobcats are closely related. They are in the same genus (Lynx) and family (Felidae). When people see a lynx or bobcat in the wild or on a trail camera, they often post photos on social media platforms like Facebook, Instagram, and specialized apps for help in identifying the species. "Hidden Tracks" provides some key details that can help differentiate the lynx from the bobcat. Using details from the story, including the figure on pages 46-47, as well as additional online research, ask students to create a model of each to highlight key characteristics that can help people differentiate between the two species. Older students can also be asked to apply scientific ideas to construct

an explanation for the anatomical similarities and differences to infer evolutionary relationships. [*Science (2019*). Dimension 1: 2. Developing and using models. 6. Constructing explanations; Dimension 2: 6. Structure and Function, 7. Stability and change; Dimension 3: LS 4. Biological evolution: Unity and diversity]

6. Lynx are elusive and mysterious; they are not often seen, which might be why the author uses "hidden" in the story title. "Hidden" also could be in reference to its role in folklore, where the lynx sees what others cannot. The lynx often plays the part in these stories of revealing or unraveling hidden truths. In other mythological traditions, the lynx is known as the "keeper of secrets" or as being very insightful, not only seeing what lies outside but also what arises from inside. Using these characteristics as inspiration, invite students to write a fictional story or a folktale that has a purpose of entertainment and/or moral instruction, set anywhere, that begins with "Once upon a time." [*English Language Arts (2010)*. Writing: 3.6.3.3, 4.6.3.3, 5.6.3.3, 6.7.3.3, 7.7.3.3, 8.7.3.3].

## Web Resources

### Minnesota DNR Web pages

MN DNR Canada Lynx
Lynx Canadensis: Canada Lynx Rare Species Guide

### Web Resources:

Canada Lynx (U.S. Fish and Wildlife Service)

### Related Young Naturalists articles

Wildcats
Minnesota is Hopping with Hares and Rabbits

### Videos

Lynx-Shadows of the Forest
Canada Lynx-Silent Hunter of the North

### Curricula and Supporting resources

Get to Know Lynx (Sierra Club BC)
Wápupxn - Lynx Lesson Plans and Teacher Resource Guide