

TEACHERS GUIDE

TO “WILD THINGS IN WINTER”

Multidisciplinary classroom activities based on the Young Naturalists nonfiction story in *Minnesota Conservation Volunteer*, January–February 2020, 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 Naturalists 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. The magazine is entirely financially supported by 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 THINGS IN WINTER”

Multidisciplinary classroom activities based on the Young Naturalists nonfiction story in *Minnesota Conservation Volunteer*, January–February 2020, www.mndnr.gov/mcvmagazine.



SUMMARY. People prepare for winter in many ways, and wild animals do, too. This Young Naturalists feature explores how Minnesota wildlife change their bodies and behavior to thrive in the cold, snowy months.

SUGGESTED READING LEVELS. Third through middle school grades

MATERIALS. KWL organizer; optional resources include dictionaries, art supplies, Internet access and other print and online resources your media specialist may provide.

PREPARATION TIME. 15–30 minutes, not including time for extension activities

ESTIMATED INSTRUCTION TIME. 30–60 minutes, not including extension activities

MINNESOTA ACADEMIC STANDARDS APPLICATIONS. “Wild Things in Winter” activities described below may be used to support some or all of the following Minnesota Department of Education standards for students in grades 3–8:

SCIENCE (*CODING IS BASED ON JUNE COMMISSIONER APPROVED DRAFT OF MN ACADEMIC STANDARDS IN SCIENCE)

Strand 2 Looking at Data and Empirical Evidence to Understand Phenomena or Solve Problems (Benchmarks 0L.2.1.1.3, 5E.2.2.1.2, 7L.2.1.1.1)

Strand 3 Developing Possible Explanations of Phenomena or Designing Solutions to Engineering Problems (Benchmark 2L3.2.1.1)

Strand 4 Communicating Reasons, Arguments and Ideas to Others (Benchmarks, 7L.4.1.2.1, 9L.4.1.1.1)

ARTS

Artistic Process: Create or Make (Benchmarks 0.2.1.2.1, 0.2.1.5.1, 4.2.1.5.1)

Artistic Process: Perform or Present (Benchmarks 0.3.1.3.1, 4.3.1.3.1)

ENGLISH LANGUAGE ARTS

Reading Benchmarks: Informational Text

Key Ideas and Details (Benchmarks 3.2.1.1, 4.2.1.1, 5.2.1.1, 6.5.1.1, 7.5.1.1, 8.5.1.1)

Craft and Structure (Benchmarks 3.2.4.4, 4.2.4.4, 5.2.4.4, 6.5.4.4, 7.5.4.4, 8.5.4.4)

Writing Benchmarks

Research to Build and Present Knowledge (Benchmarks 3.6.7.7, 4.6.7.7, 5.6.7.7, 6.7.7.7, 7.7.7.7, 8.7.7.7)

Writing Process: Production and Distribution of Writing (Benchmarks 3.6.4.4, 4.6.4.4, 5.6.4.4)

Speaking, Viewing, Listening and Media Literacy Benchmarks

Comprehension and Collaboration (Benchmarks 3.8.1.1, 4.8.1.1, 5.8.1.1, 6.9.1.1, 7.9.1.1, 8.9.1.1)

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

Key Ideas and Details (Benchmark 6.13.1.1, 6.13.8.8)

Writing Benchmarks: Literacy in Science and Technical Subjects

Research to Build and Present Knowledge (Benchmark 6.14.7.7)

For current, complete Minnesota Academic Standards, see www.education.state.mn.us. Teachers who find other connections to standards may contact *Minnesota Conservation Volunteer*.

PREVIEW. Talk about winter in Minnesota. How is it different from other times of the year? What special challenges and opportunities does it offer to animals that live outdoors? Then divide students into small groups to do a [KWL activity](#). Within the groups, have students describe what they already know (K) about adaptations that help animals thrive in winter and what they wonder (W) about them. 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. As you read and discuss the article you can compile a list of what they learn (L) while reading the article and related materials and participating in extension activities.

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! As your students encounter these

vocabulary words in the 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. Students also could be encouraged to compare their inferences as to what the words mean with their earlier guesses and with the definitions from the vocabulary list.

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 with smaller letters framing the word 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 bison. 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, podcasts, or videos to share their new knowledge about bison with others.

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. Play charades. Have students act out the adaptations of one of the animals in the story and see if other students can guess which animal and which adaptation is being depicted.
2. Many of the changes that animals undergo to prepare for winter happen before the snow falls and the weather gets cold. How do they know it's time to get ready? For older students, use this article as a launchpad to learn about about how daylength, the brain, and hormones interact to help animals "plan ahead." Students could collect data, such as sunrise and sunset times, during the weeks preceding winter and look for patterns in day length they can use to predict seasonal changes in wildlife behavior.
3. Find and follow animal tracks for clues about animals around you that stay active in

winter. Have your nature detectives observe how far apart tracks are, what direction they are going, etc. What kind of animal is it? (You can use [this guide](#) to help figure that out.) Was it moving fast or slowly? Where did it go? Did it stop, scurry around, lie down? What do your observations tell you about what that animal does to survive in winter? Observations could be recorded over time to allow students to look for patterns in their recorded data and toward thinking about the meaning of those patterns. (When do they see the most tracks, the least tracks? Does the variety of tracks seen over winter increase or decrease?)

4. Put winter survival strategies to music! If percussion instruments, recorders, or other musical instruments are part of your classroom, invite students to choose an animal from the story and compose a short piece that characterizes that animal's winter survival strategy. Have students share their compositions and see if others can guess which animal is being depicted.

5. A birdfeeder or other animal feeder offers a great opportunity to observe how animals behave under different types of weather conditions. Observe the feeder at the same time(s) and for the same time period each day, recording the weather conditions (temperature, cloud cover, wind, etc.) when you do. What animals are there? (Remember to watch for squirrels, shrews, etc., as well as birds.) What are they doing? After several weeks, analyze the data you've collected to see if you can identify any patterns.

6. What does climate change mean for animals' ability to survive Minnesota winters? Learn what scientists are predicting for Minnesota's future climate and how that will affect temperatures and habitat. Can animals evolve physical traits quickly enough to adapt to new conditions? If not, how else might they adapt (e.g. behaviorally, changing location)? Students could be asked to construct an explanation based on evidence regarding how climate change may influence wildlife populations in Minnesota, or an argument supported by evidence regarding the impact of climate change on wildlife populations. Climate change predictions and potential impact on habitat and temperatures also could be a springboard for high school life science students to evaluate evidence of the role of group behavior, such as migration and/or herding, on individual's and species' chances of survival.

7. The European Space Agency has been studying how artificially induced hibernation might help humans travel long distances through space. Take a look at what they (and others) have learned. Why would hibernation be beneficial? How has what we know about hibernation in wild animals contributed to the research? What ethical considerations are there? You might also read a sci-fi book that includes human hibernation in space travel.

8. Invite students to write haiku poetry for the animals described in the story. You can combine this with an art project by having students create a watercolor wash on a piece of heavy paper and write their haiku on the paper after it dries. Display the art in your hallway at student eye level to get others thinking about animals in winter!

WEB RESOURCES

GENERAL TEACHER AND STUDENT RESOURCES

[Minnesota DNR Teachers' Resources](#)

[DNR Kids Page](#)

RELATED MCV ARTICLES

[Family Camping Come Winter](#)

[Winter's Woodpeckers](#)

[Snow and Ice and Everything Nice](#)

ANIMALS IN WINTER

[How Do Squirrels Remember Where They Buried Their Nuts?](#)

[A Cache of Sticks and a Tail that's Thick: How Beavers Survive Winter](#)

CURRICULUM

[Survivor: Minnesota Winter](#)

OTHER

[Winter Bird Feeding Tips](#)

VIDEO

[How do Birds Survive Minnesota Winters?](#)

[Will Snowshoe Hares Win a Race Between Evolution and Climate Change?](#)

STUDY QUESTIONS ANSWER KEY

1. True or false: Red squirrels are scatter hoarders. **False. Red squirrels are larder hoarders – they store their food in piles called middens.**

2. Match the animal with a food source mentioned in the story:

gray squirrel – **nuts**

red squirrel – **cones**

Canada jay – **insects, berries, seeds, ticks**

beaver, snowshoe hare – **twigs**

owls – **snowshoe hares and short-tailed weasels**

coyotes – **deer**

3. Why do beavers stick twigs into the mud at the bottom of a pond?

a. to make the foundation for a beaver den

b. so they can grow into new trees in the spring

c. to provide shelter for turtles

d. to stash them away for food later in the winter

4. Name three things a beaver does to get ready for winter. **Answers may vary and may include: it stores twigs in the bottom of a pond, it eats lots of food, it puts on extra fat, it puts on extra fur.**

5. How does white fur help a snowshoe hare survive in winter? **It helps hide from predators in the snow.**

6. The Isabella tiger moths overwinters as a:

a. caterpillar

b. hemolymph

c. cocoon

d. egg

7. Where do snapping turtles spend the winter? **At the bottom of a lake or pond.**

8. Name three Minnesota mammals that hibernate. **Answers may vary, but may include four bat species, chipmunks, woodchucks, black bears.**

9. Name three Minnesota mammals that don't hibernate. **Answers may vary, but may include red squirrels, gray squirrels, white-tailed deer, and beavers.**

10. Match the number with the fact from the story:

Number of times per hour a wintering wood frog's heart beats – **0**

Number of times per minute a hibernating bat might breathe – **1**

Number of bat species that hibernate in Minnesota in winter – **4**

Number of times thicker than its summer coat that a deer's winter coat is – **5**

Number of calories a Canada jay eats in a day – **50**

Length of time a wood frog can stay frozen and still survive – **200**

Number of nuts a squirrel might hide to get ready for winter – **3,000**

CHALLENGE: The article states the hibernating little brown bat inhales and exhales about once a minute. If a bat hibernates for all of November and December 2019 and January, February, and March 2020, how many breaths would the bat have taken in that time? **218,880** (Extra Challenge: If you take 15 breaths per minute, about how many breaths would you have taken during this same amount of time? **3,283,200**)

MINNESOTA COMPREHENSIVE ASSESSMENTS ANSWER KEY.

1. Which animals in this story might you find in January motionless in a pile of dead leaves? **woolly bear caterpillar, wood frog**
2. What are three things white-tailed deer do to survive in winter? **Grow thicker coats, grow darker coats, move into deer yards**
3. What are three benefits deer get from each other when they gather in deer yards? **They can stay warmer, better avoid being eaten, and walk around more easily than if they were out in the snow and cold alone.**
4. Why does a snowshoe hare eat different food in winter than it does in the summer? **In winter, the grass and other green things it likes to eat are not available.**
5. Migration is one strategy animals use to survive winter. The article described several other strategies animals use. What are they? **stash food, change bodies or behaviors, snooze the season away**
6. Why do “goosebumps” not help humans stay warm, but do actually help some furry animals stay warm? **Cold activates tiny muscles at the base of hairs, causing the hairs to stand upright in a way that increases the insulating power of the fur. Humans have little hair, so goosebumps do little to help us stay warm.**
7. If you were walking in the forest during the winter, and you came upon a pile of pine cone scales, what type of squirrel might you see nearby, and what is this food stash called? **red squirrel, midden**

VOCABULARY LIST

antifreeze – a substance that makes it harder for a liquid to freeze

droppings - poop

frigid – extremely cold

hoarder – something or someone who stores things

insulate – separate from

larder – a place to store food

plummet – drop quickly

predators – animals that kill and eat other animals

stash – a hidden supply