

TEACHERS GUIDE

TO “THESE DOGS ARE WILD”

Multidisciplinary classroom activities based on the Young Naturalists story in *Minnesota Conservation Volunteer*, January-February 2021, 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 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 mndnr.gov/mcvmagazine and click on *past issues*.

Thank you for bringing Young Naturalists into your classroom!

“THESE DOGS ARE WILD”

Multidisciplinary classroom activities based on the Young Naturalists nonfiction story in *Minnesota Conservation Volunteer*, January-February 2021, mndnr.gov/mcvmagazine.



SUMMARY. Domestic dogs have some really wild relatives—right here in Minnesota. This story introduces the gray wolf, coyote, red fox, and gray fox to Young Naturalists and compares and contrasts traits our pets exhibit with those that characterize these four species of wild dog.

SUGGESTED READING LEVELS. Third through middle school grades

MATERIALS. KWL organizer; optional resources include dictionaries, video viewing equipment, 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. “These Dogs Are Wild” 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 THE 2019 COMMISSIONER APPROVED DRAFT OF MN ACADEMIC STANDARDS IN SCIENCE)

SCIENCE AND ENGINEERING PRACTICES

2. Developing and using models.

7. Engaging in argument from evidence

8. Obtaining, evaluating, and communicating information

CROSSCUTTING CONCEPTS

- 2. Cause and effect
- 4. Systems and system models
- 6. Structure and function
- 7. Stability and change

DISCIPLINARY CORE IDEAS

- Life Sciences 2: Ecosystems: Interactions, energy, and dynamics
- Life Sciences 3: Heredity: Inheritance and variation of traits Life Sciences 4: Biological Evolution: Unity and diversity
- Earth and Space Sciences 3: Earth and human activity

SOCIAL STUDIES

- History (Benchmarks 3.4.1.1.1, 5.4.1.1.1, 8.4.1.2.1)
- Geography (Benchmarks 3.3.1.1.2, 4.3.1.1.1, 5.3.1.1.1, 6.3.1.1.1, 7.3.1.1.1)

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, 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, 4.2.7.7, 4.2.9.9, 5.2.7.7, 5.2.9.9, 6.5.7.7)

WRITING BENCHMARKS

- Text Types and Purposes (Benchmarks 3.6.1.1, 3.6.2.2, 3.6.3.3, 4.6.1.1, 4.6.2.2, 4.6.3.3, 5.6.1.1, 5.6.2.2, 5.6.3.3, 6.7.1.1, 6.7.2.2, 7.7.1.1, 7.7.2.2, 8.7.1.1, 8.7.2.2)
- 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)

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)
- Presentation of Knowledge and Ideas (Benchmarks 3.8.4.4, 4.8.4.4, 5.8.4.4)

LANGUAGE BENCHMARKS

- Vocabulary Acquisition and Use (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, 6.13.2.2)

Integration of Knowledge and Ideas (Benchmark 6.13.8.8)

WRITING BENCHMARKS: LITERACY IN SCIENCE AND TECHNICAL SUBJECTS

Text Types and Purposes (Benchmark 6.14.1.1)

Research to Build and Present Knowledge (Benchmark 6.14.7.7)

ARTS

Artistic Process: Create or Make (Benchmarks 0.2.1.5.1, 0.2.1.5.2, 0.3.1.2.1, 0.3.1.2.2., 4.2.1.5.1, 4.2.1.5.2, 6.2.1.5.1, 6.2.1.5.2)

Artistic Process: Perform or Present (Benchmark 0.3.1.5.1)

For current, complete Minnesota Academic Standards, see the [Department of Education's website](http://education.mn.gov) (education.mn.gov). Teachers who find other connections to standards may contact *Minnesota Conservation Volunteer*.

PREVIEW. Start by asking students to describe dogs they know. What do they look like? What do they do? Write the comments on the board and see if they group together into similar kinds of observations. Discuss how some traits might be specific to individual dogs and others might be what dogs in general are alike. Then introduce the concept of wild dog relatives of our pets. Then divide students into small groups to do a [KWL activity](#). Within the groups, have students describe what they know (K) about cavity nesters and what they wonder (W) about them. Give each student a [copy of the organizer](http://teach-nology.com/web_tools/graphic_org/kwl) (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 share what they think they mean. Tell them you will be reading a story that will help them understand these words so they can own 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.

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 cavity nesters. 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 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. Invite a speaker from the DNR, the International Wolf Center, the Wildlife Science Center, or another canid-focused organization to visit or teleconference with your class. Have each student prepare three questions ahead of time. Following the speaker, ask students to summarize in writing what they learned.

2. Scientists think wild dogs were domesticated 11,000 years ago or more, but they don't know exactly how. Research what the world was like 11,000 years ago, then invite students to write a story (and illustrate, or even perform it as a play, if they'd like) about how a human first tamed a wolf ancestor. Older students could be encouraged to read about another theory, self-domestication, that wolves largely domesticated themselves among hunter-gatherer people (see [How Accurate is Alpha's Theory of Dog Domestication?](#)). Which theory, human domestication of wolves or wolves' self-domestication, has stronger scientific evidence? Using this story as a springboard, students could be asked to apply the evidence presented in the Smithsonian story and other scientific ideas to construct an explanation for the anatomical similarities and differences among modern dogs and/or between modern dogs and their wild ancestors.

3. Humans have benefited from dogs' remarkable sense of smell in many ways, such as tracking down lost children and sniffing out mercury in buildings or illegal substances at airports. Ask students to research the many ways we have used and are using dogs to help sniff out trouble. What other uses can students dream up for this remarkable talent?

4. Using a map of the world, have students identify the range of at least one wild canid species on as many of the continents as they can. What geographic factors may be affecting the population distribution of these wild canid species? Which continent or continents do not have native canids? Why do they think that is? Have them check their

guess through a bit of online research!

5. [Five wild canid species](#) are considered critically endangered or endangered by the International Union for the Conservation of Nature (IUCN). Learn about the IUCN and its system for categorizing the degree of threat various living things face. Why are these species endangered? Why do people want to protect them from extinction? What are people doing to try to help them? Have students select one of the five wild canid species and conduct further research, exploring the kinds of habitat resources it needs and the impact humans are having on its ability to thrive in the wild.”

6. Students who have had a chance to observe dogs may have noticed some interesting behaviors. Why do dogs pant? Why do they circle around before lying down? Why do they sometimes look like they’re running in their sleep? Why do they lick their butts? Invite teams of three to four students to come up with a canine mystery to solve, then put on their Internet detective caps and solve it! Students could be asked to share what they learned through visual or media arts, or through a creative performance.

7. Encourage students to select a dog breed of interest (the American Kennel Club may be a good starting point for selecting a dog breed). Have students think about and discuss why their still could be variation within their selected breed, even though they have traits in common with the parents and with their wolf ancestors.

8. Wolf hunting has long been a controversial topic in Minnesota. Have students research the various arguments for and against, using a variety of sources from various special interest groups. Invite them to formulate their own opinion and present it in the form of a “written argument” that supports their claim with logical reasoning and credible evidence.

9. Biologists use a tool called phylogenetic analysis to study the genetic relationships among species. They can create a phylogenetic “tree” showing the evolutionary relationships among various species based upon similarities and differences in their physical or genetic characteristics. Older students can be prompted to locate online a phylogenetic tree that shows relationships among wolves and dogs, or among wolves and other mammals. Did you know that a similar thinking process is being applied to study the evolution of folktales? Folktales evolve into “oikotypes,” or locally distinctive forms of folktales adapted to different cultural and ecological contexts. Just as new species emerge in biological evolution, new versions of folktales also evolve and emerge. And similar to the challenges that scientists encounter when trying to construct species linkages through fossil records, literary scholars also have challenges trying to piece together little bits of evidence about the relationships among early folktales, especially since many have been shared mostly through oral means. Have students select a fairy tale and trace linkages to other folktales, or the evolution of the tale into varying cultural versions, creating a

“tree” to show the relationships.

WEB RESOURCES

MINNESOTA DNR

GENERAL TEACHER RESOURCES

[Minnesota DNR Teachers' Resources](#)

RELATED MCV ARTICLES

[The Wolves of Camp Ripley](#)

[Can People and Timber Wolves Co-exist?](#)

[Coyote \(Canis latrans\)](#)

[Elusive Coyote](#)

[Gray Fox](#)

[Fabulous Fox Family](#)

LESSON PLANS/CLASSROOM ACTIVITIES

[Natural Selection: Wolves to Dogs](#) (American Kennel Club)

[Dogs and More Dogs](#) (Nova Teachers)

DOG DOMESTICATION

[Ancient Dog DNA Reveals Their Enduring Connection With People](#)

[Interactive: See How Your Favorite Dog Breeds Are Related To Each Other](#)

DOGS AROUND THE WORLD

[Wildlife Journal Junior: Canidae](#)

[Animal Diversity Web: Canidae](#)

WOLF MANAGEMENT

[Updating Minnesota's Wolf Plan](#)

STUDY QUESTIONS ANSWER KEY

1. How many species of wild dogs are there in the world? **Almost three dozen.**
2. What are two senses are especially well-developed in dogs? **Hearing and smell.**
3. Where are scent glands located in a dog?
 - a. Inside its long snout
 - b. Under its tail**
 - c. In its poop
 - d. In its wet nose
4. Which wild canid is most similar to domestic dogs?
 - a. gray wolf**
 - b. coyote
 - c. red fox
 - d. gray fox
5. How do gray wolves protect their territory?
 - a. By peeing and pooping
 - b. With guard hairs
 - c. By howling
 - d. By squeaking
 - e. a & c**
 - f. a & b
6. True or false: Wolves can go months without eating. False. **But they can go for weeks!**
7. Name three adaptations that help gray wolves thrive in Minnesota's cold and snowy winter. **Thick fur coat, guard hairs, big paws, special blood vessels in feet.**
8. What are three ways coyotes and wolves are different? **Answers will vary, but might include coyotes are smaller, coyotes are more likely to live alone, coyotes have a more diverse diet.**
9. True or False. Coyotes have one distinct call. **False. They make five different sounds: bark, yip, lone howl, and group howl.**
10. Put the following steps in raising young from first to last:
The parents starting feeding the pups solid food.
The mother gives birth to the pups.
The parents start to teach the pups to hunt.

11. Match the species to the trait:

Gray wolf	Minnesota's largest canid
Coyote	Has the best sense of hearing of any wild dog
Red fox	Come in a variety of colors
Gray fox	Can climb trees

12. Name three animals that eat canids. **Answers may vary, but the story mentions cougars, lynx, coyotes, and bobcats.**

Challenge Question: Approximately what percent of the 36 Canidae species live in Minnesota? **Around 36 species total, four in Minnesota (counting *Canis lupus familiaris* as a subspecies of *Canis lupus*), $4/36 \times 100 = 11\%$.**

MINNESOTA COMPREHENSIVE ASSESSMENTS ANSWER KEY.

1. Name four traits that help dogs be good predators. **Answers may vary but can include a long snout, good sense of smell, wet nose, pointed ears, reflective eye membrane, long legs, big teeth, strong jaws.**

2. What are three ways coyotes and wolves are similar? **Answers will vary, but might include: both are canids, both eat other animals, both live in Minnesota, both communicate with sound, both have territories.**

3. Name Minnesota's four wild canids in order of adult size, from smallest to biggest. **Gray fox, red fox, coyote, gray wolf.**

4. Which Minnesota canids howl?

- a. wolves
- b. wolves and foxes
- c. wolves and coyotes**
- d. all four species

VOCABULARY LIST

Aggression – behavior aimed at dominating or harming another

Companionship – friendship

Descended – came from

Domestic – tame

Elaborate – complex

Omnivore – an animal that eats both plants and animals