

TEACHERS GUIDE

TO “WHAT POOPED HERE?”

Multidisciplinary classroom activities based on the Young Naturalists nonfiction story in *Minnesota Conservation Volunteer*, January-February 2019, 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!

“WHAT POOPED HERE?”

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SUMMARY. Scat can tell us a lot about the animals around us: what species they are, what they’ve been eating, where they live, and what they’ve been doing. This Young Naturalists feature introduces readers of all ages to the study of scat and provides information they can use to read the clues in scat they encounter on a hike or in their own backyard.

SUGGESTED READING LEVELS. Third through middle-school grades

MATERIALS. KWL organizer; optional resources include cameras, balloons, papier-mache, slide show or video editing and production software, poster paper and writing materials, internet access and online resources your media specialist may provide.

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

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

MINNESOTA ACADEMIC STANDARDS APPLICATIONS. “What Pooped Here?” activities described below may be used to achieve some or all of the following Minnesota Department of Education standards:

SCIENCE (GRADES 3-8)

Nature of Science and Engineering (Benchmarks 3.1.1.2.3, 5.1.1.1.4, 5.1.3.2.1)

Physical Science (Benchmarks 6.2.1.2.1, 8.2.1.1.2, 8.2.1.2.2)

Life Science (Benchmarks 4.4.4.2.1, 5.3.4.1.3, 5.4.2.1.2, 5.4.4.1.1, 7.4.2.1.2, 7.4.2.2.2,

7.4.2.2.3, 7.4.4.1.2, 7.4.4.2.1, 7.4.4.2.2, 7.4.4.2.4)

SOCIAL STUDIES (GRADE 4)

Geography (Benchmark 4.3.4.9.1)

ENGLISH LANGUAGE ARTS (GRADES 3-8)

Reading Benchmarks: Informational Text (Grades 3-8)

Key Ideas and Details (Benchmarks 3.2.1.1, 3.2.2.2, 4.2.1.1, 4.2.2.2, 5.2.1.1, 5.2.2.2, 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)

Integration of Knowledge and Ideas (Benchmarks 4.2.9.9, 5.2.7.7; 5.2.9.9)

Writing Benchmarks (Grades 3-8)

Research to Build and Present Knowledge (Benchmarks 3.6.7.7; 3.6.8.8, 4.6.7.7, 4.6.8.8, 5.6.7.7, 5.6.8.8, 6.7.7.7, 7.7.7.7, 8.7.7.7)

Language Benchmarks (Grades 3-8)

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

Reading Benchmarks: Literacy in Science and Technical Subjects (Grades 6-8)

Key Ideas and Details (Benchmarks 6.13.1.1, 6.13.2.2)

Writing Benchmarks: Literacy in Science and Technical Subjects (Grades 6-8)

Research to Build and Present Knowledge (Benchmark 6.14.7.7)

ARTS (GRADES 3-8)

Artistic Foundations (Benchmarks 6.1.1.3.3, 6.1.2.1.2, 6.1.2.2.2)

Artistic Process: Perform or Present (Benchmarks 0.2.1.5.1, 0.3.1.3.1, 6.3.1.3.1)

Artistic Process: Create or Make (Benchmarks 4.2.1.3.1, 6.2.1.2.1, 6.2.1.5.1)

HEALTH (GRADES 3-8)

National Health Education Standard 1 (CC)

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

PREVIEW. (1) Invite students to share stories of any experiences they have had with animal scat. (2) Use the discussion about past experiences as a springboard for a [KWL activity](#). Divide students into small groups. Within the groups, have students describe what they already know (K) about scat and what they wonder (W) about scat. 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 activ-

ities. Another option for introducing students to the article's content is viewing this [introductory video](#) on scat made by naturalists at Wolf Ridge Environmental Learning Center. It may spark students' recollection of times they have seen scat in nature, as well as prompt motivation toward reading article and learning more about scat.

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 your students and invite them to guess what the words 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 or phrase with smaller letters framing 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 scat. 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 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 article cautions students not to touch or get too close to scat, because it could carry diseases. Have students choose a disease carried by scat to learn about and report on.
2. Go on a class hike, observe and take photos or videos of different scat piles, identify

them, and create an educational slide show or video to share with other students. You might wish to use the helpful scat identification key provided by the New Mexico Outdoor Classroom Program (see page 5 of the [Can You See the Signs](#) activity).

3. Take a deep dive into rumination. What animals process their food in this way? How do the structure and function of their digestive tracts differ from ours? Students can build a model of a four-chambered stomach using papier-mâché and balloons and use it to demonstrate how rumination works.

4. Often we think about scat as being from birds or mammals, but other animals, like insects, also poop. Insect scat is called *frass*. Worm scat is called *castings*. Invite students to learn why farmers and gardeners like castings. Older students might look into why scientists are studying invasive earthworms and how their castings chemically alter soil composition, and why that may be of concern.

5. Be wildlife detectives! Use scat as a launching pad for a broader investigation into how we can use clues animals leave behind to learn about them. Other signs to explore include footprints, damage to vegetation, hair, and scents. Have students make a field guide to animals signs that other students can use around the schoolyard.

6. Humans also leave signs, including footprints and litter. While we usually enjoy seeing signs that wildlife leave behind, it's not always enjoyable to see signs of humans in places like state parks or other natural areas. [Leave No Trace](#) is a set of seven principles to help people make good decisions about protecting the special places they visit in the outdoors. Have students read more about Leave No Trace principles. Which principle provides useful guidance for human scat? What is the principle and what does it advise?

7. Scat has other definitions. What does it mean if you tell someone to "scat?" Another definition of scat is in music, where singers improvise (make up music as they go), singing random syllables instead of words. "Scatting" can also be where the singer copies the sound of a musical instrument with his or her voice. Louis Armstrong was one of the first performers to make scat singing popular. Have students listen to recordings or watch YouTube videos of scat singing, such as those by Louis Armstrong or Ella Fitzgerald. Practice your own scat singing by improvising (making up your own sounds and words) on the refrain section of familiar songs.

WEB RESOURCES

GENERAL TEACHER AND STUDENT RESOURCES

[Minnesota DNR Teachers' Resources](#)

[DNR Kids Page](#)

RELATED MCV ARTICLES

[Looking for Sign](#)

[Moose Mystery](#)

[Raccoons Carry Deadly Parasite](#)

Moose Walking in Circles

GENERAL SCAT INFORMATION

10 Cool Facts About Animal Poop

Animal Scat Notes

VIDEOS

Animal Scat! (Wolf Ridge Environmental Learning Center)

Why Do Some Animals Eat Poop? (MinuteEarth)

STUDY QUESTIONS ANSWER KEY

1. Name three things you can learn by studying scat. **Answers may include: what kind of animal left it behind, what the animal eats, where the animal lives, how healthy the animal is.**
2. Why should you avoid touching scat? **Scat can carry diseases.**
3. How does eating its own scat help a rabbit? **It allows it to absorb more nutrition from the food it eats.**
4. Why would you be more likely in the summer to find moose scat near lakes and rivers than in a forest? **Moose spend a lot of time near water in the summer because they like to eat water plants.**
5. What clue would tell you that a scat likely does not belong to a bobcat? **Since bobcats only eat meat and occasional bits of grass, pieces of fruit, berries, or seeds would suggest a scat came from another animal.**
6. Name two animals that use scat to mark their territory. **Answers may vary, but might include coyote and wolf.**
7. How many wolves live in Minnesota? **More than 2,600.**
8. Eastern cottontails, white-tailed deer, moose, and ruffed grouse all have pellet-shaped scat. What do we know about what they eat that might help explain this similarity? **All are plant eaters.**
9. Why might bear scat smell good? **Because it contains fruit and other sweet-smelling items.**
10. What three things make up the waste that a bald eagle produces? **Poop, urine, and uric acid.**
11. Why is it easier to find grouse scat in the winter than in the summer?
 - a. Because grouse don't poop in the summer
 - b. Because grouse scat looks like other things you find on the forest floor in summer**
 - c. Because the catkins grouse eat in winter make their scat smell sweet
 - d. Because grouse can't hide their scat from predators when snow is on the ground
12. Match the animal with its scat-related trait:
Eastern cottontail – eats its own scat
White-tailed deer – has harder droppings in winter than in summer

Moose – poops up to 21 times per day

Bobcat – scats are 3 to 5 inches long

Coyote – contents vary a lot because they eat so many different kinds of food

Wolf – hard to tell apart from coyote, but likely to contain more meat and less fruit and seeds

American black bear – often smells sweet

Bald eagle – combines poop with urine and uric acid

Ruffed grouse – slightly curved with a white coat

CHALLENGE: Bald eagles and ruffed grouse are both birds, but their poop is very different. Why? **The characteristics of waste are most likely related to the very different diets of the two species—animal vs. vegetable. However, accept any answer that indicates the student has thoughtfully considered differences in traits between the two types of birds.**

MINNESOTA COMPREHENSIVE ASSESSMENTS ANSWER KEY.

1. Name four kinds of animals that use rumination to digest their food. **Moose, elk, cattle, white-tailed deer**

2. True or false: Fawns eat their own poop to avoid being detected by predators. **False. The mother deer eats the fawns' poop.**

3. Name two ways bear scat and coyote scat are similar and two ways they are different. **Answers may vary. Both consist of what's left after the animal digests its food. Both many contain berries and other plant material. Both vary according to what they've eaten. Coyote scat is usually smaller than bear scat and rope-shaped rather than splat-shaped. Coyote scat is more likely to contain bones.**

4. Think of a sorting rule you can use to categorize the various kinds of scat presented into this story into two or three groups, then list the animals represented in each group. **Answers will vary. Some possibilities include scat from mainly plant-eaters vs. mainly meat-eaters, pellet-shaped scat vs. tube-shaped scat vs. shapeless scat, etc. Accept any reasonable attempt to logically categorize scat.**

5. For several animals featured, scat looks different at different times of the year. Why? **The animals eat different foods at different times of the year, depending on what animals, plants, and plant materials are available.**

VOCABULARY LIST

chambers separate spaces

devoid lacking

insulator something that prevents the travel of heat, electricity, or sound

nutrition what a living thing gets from food

oblong a shape that is longer in one direction than in the others

regularly at set intervals

re-ingest eat again