

TEACHERS GUIDE

TO “HURRAH FOR MUSKRATS!”

Multidisciplinary classroom activities based on the Young Naturalists nonfiction story in *Minnesota Conservation Volunteer*, July–August 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!

“HURRAH FOR MUSKRATS!”

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SUMMARY. Too small for a beaver and too big for a rat — what is that furry creature paddling across the pond? This Young Naturalists story introduces readers to the ubiquitous muskrat and its water-loving life. The next time they see a muskrat, they’ll not only know what it is, but also have a better appreciation than every of nature’s amazing diversity.

SUGGESTED READING LEVELS. Third through middle school grades

MATERIALS. KWL organizer; optional resources for extension activities 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. “Hurrah for Muskrats!” 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 2019 COMMISSIONER APPROVED DRAFT OF MN ACADEMIC STANDARDS IN SCIENCE)

Science and Engineering Practices

2. Developing and using models
6. Constructing explanations and designing solutions
7. Engaging in argument from evidence
8. Obtaining, evaluating, and communicating information

Crosscutting Concepts

2. Cause and effect
3. Scale, proportion, and quantity
4. Systems and system models
6. Structure and function
7. Stability and change

Disciplinary Core Ideas

Life Sciences 2: Ecosystems: Interactions, energy, and dynamics

Earth and Space Sciences 3: Earth and human activity

Engineering, Technology, and the Applications of Science 2: Links among Engineering, Technology, Science, and Society

SOCIAL STUDIES

History (Benchmarks 3.4.1.2.1, 3.4.1.2.2, 5.4.1.2.1, 6.4.1.2.1, 7.4.1.2.1)

Geography (Benchmarks 4.3.1.2.1, 4.3.1.2.2, 4.3.3.6.1, 4.3.4.9.1, 6.3.3.6.1)

LANGUAGE ARTS

Reading Benchmarks: Informational Text

Key Ideas and Details (Benchmarks 3.2.1.1, 3.2.3.3, 3.2.3.3, 4.2.1.1, 4.2.3.3, 4.2.3.3, 5.2.1.1, 5.2.2.2, 5.2.3.3, 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 3.2.7.7, 3.2.8.8, 3.2.9.9, 4.2.7.7, 4.2.8.8, 4.2.9.9, 5.2.7.7, 5.2.8.8, 5.2.9.9, 6.5.7.7)

Writing Benchmarks

Text Types and Purposes (Benchmarks 3.6.2.2, 4.6.2.2, 5.6.2.2, 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)

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 6-12

Key Ideas and Details (Benchmark 6.13.1.1)
Reading Benchmarks: Literacy in History/Social Studies 6-12
Key Ideas and Details (Benchmark 6.12.1.1)
Integration of Knowledge and Ideas (6.12.7.7, 6.12.8.8, 6.12.9.9)
Writing Benchmarks: Literacy in Science and Technical Subjects 6-12
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, 4.2.1.5.1, 6.2.1.5.1)
Artistic Process: Perform or Present (Benchmark 0.3.1.5.1)

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. Ask students if they know what a muskrat is. If some know about muskrats, make a list of any physical traits and behaviors they can share. If no one has heard of a muskrat, invite students to imagine what it might be based on the name. Draw a picture and list the imagined traits they would give to it. After you've finished the exercise, tell students that muskrats are small, furry animals that live in the water. Then divide them into small groups to do a [KWL activity](#). Within the groups, have students describe what they already know (K) about muskrats 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 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.

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.

CURRICULAR ADAPTATIONS. Read aloud or otherwise adapt as appropriate for 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 muskrats. 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) Divide students into two teams. Have teams take turns sharing facts game-show style about muskrats. List facts on the board as they are shared. See which team can come up with the most facts. (4) 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. Do a compare and contrast exercise with muskrats and beavers. What similarities do the two species share? How are they different? What does this tell you about where they might be found and how stressors like hot summers or cold winters might affect them? Students could be asked to construct an explanation using evidence from various sources about strategies each species uses to survive, or they could use this evidence to support a written argument that animals have internal and external structures to support survival, growth, behavior and reproduction.

2. A muskrat lodge may be several degrees warmer in the winter than the outside temperature. Learn about the concept of insulation and how different materials provide protection from changes in temperature. Based on their research, have students design and build model shelters out of everyday materials of their choice. Test their insulating power by moving them from in your classroom to outdoors for 15 minutes, then measuring the temperature within the shelters. Use your findings to brainstorm ways to improve the models’ insulating power, modify the designs, and test again.

3. Some people trap muskrats for their pelts. Learn about the history and current practice of trapping, then hold a [Lincoln-Douglas debate](#) on whether muskrat trapping should be legal in Minnesota.

4. Students could dive more deeply into historical records and maps, practicing historical thinking and geographic inquiry, to answer questions about beaver and muskrat trapping during earlier eras and compare and contrast different accounts. Students

could use their research to explain how natural resources can affect settlement patterns and the growth of cities in different parts of Minnesota.

5. Muskrats have a number of traits that help them survive and thrive in the water — not only webbed feet and slick fur, but also a specialized respiratory system and mechanisms that help them avoid getting too cold when they are wet. Do background research to make a list of and describe the various adaptations to water life. Then brainstorm how people might use this knowledge to design systems that help us survive and thrive under watery or other circumstances.

6. Using the information in the story about the size of muskrat territories and spacing of lodges, students can make models based on this information (or observational data!) that show the not only the muskrat's habitat, but also how the geosphere, biosphere, hydrosphere, and atmosphere interact with each other.

7. Muskrats are an important ecological indicator, since they are highly sensitive to changing hydrologic conditions. They also are a good indicator for measuring habitat loss because their houses are located in areas that are more susceptible to drying out, and their houses show up on satellite imagery and can easily be counted, allowing for comparisons overtime. Using [this story](#) as a launching point, have older students design a method for monitoring local wetlands. Students also could design and evaluate solutions to reduce the impact of humans on wetland habitat.)

8. The muskrat plays an important role in the Ojibwe creation story. Invite an Ojibwe storyteller to share the creation story with your students, or [watch a video like this one](#) of a storyteller telling the story. Use this experience to explore and discuss the role of storytelling in Ojibwe culture and the role of storytelling in general in communities and societies.

WEB RESOURCES

GENERAL TEACHER AND STUDENT RESOURCES

[Minnesota DNR Teachers' Resources](#)

[DNR Kids Page](#)

MUSKRAT BIOLOGY AND NATURAL HISTORY

[Minnesota DNR: Muskrat](#)

[NatureWorks: Common Muskrat](#)

[BioKids: Muskrat](#)

[Eek! Muskrat](#)

VIDEOS

[Muskrats](#)

[Beavers vs. Muskrats](#)

RELATED MCV ARTICLES

[Modern-Day Trappers](#)

STUDY QUESTIONS ANSWER KEY

1. Where in North America do muskrats live? **In marshes, ponds, and streams across most of the U.S. and Canada.**

2. What kind of animal is a muskrat?

a. rodent

b. amphibian

c. primate

d. canid

3. According to the article, what is one trait all rodents share?

Rodents' incisor teeth continue to grow through the animal's life.

4. True or false: muskrats have webbed feet that help them swim. **True.**

5. How does a muskrat's underfur help it survive?

a. It helps keep the skin warm and dry

b. It traps air bubbles, helping the muskrat stay above water

c. It gives off a "musky" scent that scares away predators

d. a and b

6. How does a muskrat's furless tail help it control its body temperature? **In hot weather the muskrat sends more blood into its tail, where it can release extra heat into the environment. In cold weather the muskrat sends less blood into its tail to conserve the heat for the rest of its body.**

7. What does the "musk" in muskrat refer to? **Muskrats produce a musky scent they use to mark their territory.**

8. Name four things a muskrat eats. **Answers may vary and include aquatic plants and small animals. The story specifically mentions cattails, reeds, wild rice, water, snails, crayfish, and fish.**

9. The story tells us that 15 muskrats may live on an acre of land and water. If seven muskrat pairs set up housekeeping on a pond and each had three litters of six kits, how many muskrats would there be by the end of the breeding season? **126**

10. True or false: Muskrats hibernate in the winter. **False. Muskrats stay active, foraging for food all year round.**

11. Why isn't the world overrun with muskrats? **Because people trap them, and other animals eat them.**

12. Name three ways in which a muskrat affects its environment. **Answers may vary. Broadly, muskrats cut down vegetation for food and shelter. They create mini-habitats that other animals perch on or use for shelter. They provide food for other animals, including minks, snapping turtles, raccoons, foxes, lynx, and owls.**

13. 13. True or false: Muskrats make their lodges from small tree trunks and branches. **False. Muskrats make their lodges from plants such as cattails, reeds and water lilies.**

14. Which of these is not true about muskrats?

- a. They are born blind.
- b. They have scales.
- c. They can stay underwater without breathing for more than 10 minutes.
- d. They eat snapping turtles.**

Challenge: The story tells us that muskrats space their houses about 60 feet apart. How might this help muskrats survive and thrive? **Answers may vary. In general, territories help animals ensure they have sufficient resources available to successfully raise their young.**

MINNESOTA COMPREHENSIVE ASSESSMENTS ANSWER KEY.

1. If an animal is aquatic, what does that tell you about it? **That it spends most of its time in the water.**

2. Name two ways in which a muskrat's tail helps it survive. **1. The tail helps the muskrat control its body temperature. 2. The tail helps the muskrat change direction when it's swimming.**

3. What is a baby muskrat called?

- a. pup
- b. kit**
- c. larva
- d. nestling

4. True or false: A young muskrat learns how to swim before it can walk. **False. Young muskrats learn to swim soon after they learn to walk.**

5. Would a muskrat be more likely to swim under water going upstream or downstream? Explain your answer. **Upstream. According to the story, a muskrat sometimes swims beneath the surface of moving water to avoid having to use extra energy to swim against the current. It would not need to use extra energy to swim with the current, so it would be less likely to swim under water while going downstream.**

6. How does a muskrat use the space between its front and back teeth? **It uses it to carry long pieces of plants.**

7. Why does a muskrat have “rat” in its name?

a. It has a tail like a rat

b. It is a kind of rat

c. It makes a rat-a-tat-tat sound with its teeth

d. It steals things from other animals

VOCABULARY LIST

frostbite – injury caused by freezing part of the body

habitat – the setting a creature is part of

pelt – animal skin

rank – relative order of importance or power

scaly – having scales

torpedo – tube-shaped weapon shot through the water