Young Naturalists

Teachers Guide

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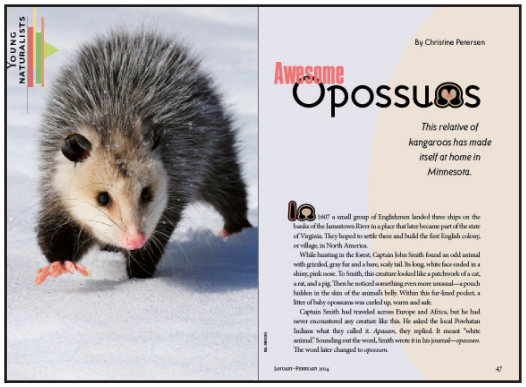
"Awesome Opossums" Multidisciplinary Classroom Activities

Teachers guide for the Young Naturalists article "Awesome Opossums" by Christine Petersen. Published in the January–February 2014 *Minnesota Conservation Volunteer*, or visit www.mndnr.gov/young_naturalists/opossums/index.html



Young Naturalists teachers guides are provided free of charge to classroom teachers, parents, and students. This guide contains a brief summary of the article, suggested independent reading levels, word count, materials list, estimates of preparation and instructional time, academic standards applications, preview strategies and study questions overview, adaptations for special needs students, assessment options, extension activities, Web resources (including related Minnesota Conservation Volunteer *articles), copy-ready study questions with answer key, and a copy-ready vocabulary sheet and vocabulary study cards. There is also a practice quiz (with answer key) in Minnesota Comprehensive Assessments format. Materials may be reproduced and/or modified to suit user needs. Users are encouraged to provide feedback through an online survey at www.mndnr.gov/education/teachers/activities/ynstudyguides/survey.html.*

***All *Minnesota Conservation Volunteer* articles published since 1940 are now online in searchable PDF format. Visit *www.mndnr.gov/magazine* and click on *past issues*.**

Summary

"Awesome Opossums" is about a unique mammal. The Minnesota range of the Virginia opossum, a marsupial, until recently only included southeastern Minnesota. The opossum is quickly extending its range northward. Readers will learn about the opossum's life cycle, its unusual characteristics and behaviors, and what might explain its expanding range.

Suggested reading levels:	Third through middle school grades
Total words:	1,863
Materials:	*The Opossum's Tale* (see References) paper, poster board, colored pencils, crayons, pens, markers, print and online resources your media specialist may provide
Preparation time:	One to two hours, not including time for extension activities
Estimated instructional time:	One or two 50-minute class periods (not including extensions)

Minnesota Academic Standards Applications:

"Awesome Opossums" may be applied to the following Minnesota Department of Education standards:

Language Arts
Reading Benchmarks
Informational Text 3–8
- Key Ideas and Details
- Craft and Structure
- Integration of Knowledge and Ideas
- Range of Reading and Level of Text Complexity

Writing Benchmarks 3–8
- Text Types and Purposes
- Writing Process
- Research to Build and Present Knowledge
- Range of Writing

Reading Benchmarks: Literacy in Science and Technical Subjects 6–8
- Key Ideas and Details
- Craft and Structure
- Integration of Knowledge and Ideas
- Range of Reading and Level of Text Complexity

Writing Benchmarks: Literacy in History/Social Studies, Science and Technical Subjects 6–8
- Text Types and Purposes
- Writing Process: Production and Distribution of Writing
- Research to Build and Present Knowledge
- Range of Writing

Mathematics
Grades 5
- Number and Operation
- 5.1.1.1; 5.1.1.3

Science
Grades 3, 4, 5, 7, and 8
- Life Science
- 3.4.1.1.1; 3.4.1.1.2; 3.4.3.2.2; 4.4.4.2.2; 5.4.1.1.1; 7.4.2.1.1; 7.4.2.1.2; 7.4.3.1.3; 7.4.3.2.1; 7.4.3.2.2; 7.4.3.2.3; 7.4.3.2.4

Earth and Space Science
- 8.3.2.1.3

Arts
Grades K–12
- 1. Artistic Foundations: Visual Arts
- 2. Artistic Process: Create or Make: Visual Arts
- 3. Artistic Process: Perform or Present: Visual Arts
- 4. Artistic Process: Respond or Critique: Visual Arts

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

Preview

(1) Read *The Opossum's Tale* to your class. (2) Ask students to peruse the photos in the article. What do they predict they will learn? (3) Another preview strategy is **KWL** (Ogle, 1986). To find out what your students already know (**K**) about opossums and/or marsupials ask small groups to brainstorm their ideas. Then combine the groups' data to make a class list. Repeat step one by asking what students would like to learn (**W**). As you read and discuss the article you will begin to compile the (**L**) list, or what they learn while reading the article and related materials and participating in extension activities. Display your **K** and **W** ideas on poster board or paper. See www.teach-nology.com/web_tools/graphic_org/kwl for a KWL generator that will produce individual organizers for your students. KWL gives you the opportunity to introduce interdisciplinary connections you will make during extension activities. If you use the article in science or art class, you may wish to focus your prereading discussion on academic standards that apply for that class. (4) Another strategy for accessing prior knowledge is a brainstorming web. You may download a printable web at www.teachervision.fen.com/tv/printables/TCR/0743932080_007.pdf.

Vocabulary preview

See the copy-ready vocabulary list included in this guide. You may wish to modify the list based on your knowledge of your students' needs or the subject you are teaching. Pretesting vocabulary individually, in small groups, or with your entire class can be an effective vocabulary preview strategy. You may then post-test at the conclusion of this activity (see Assessment section below). Italicized words are not generally included on the list or in the study cards.

You may wish to use the study cards found at the end of this guide. Cut along the horizontal line, fold in the middle, and tape or staple. Study cards (see *Strategic Tutoring*, Hock, Deshler, and Schumaker 2000) can be applied to any subject area. On one side of the card, in large letters, write a key word or phrase students are expected to know. In smaller letters, frame the word or phrase in a question or statement. On the other side of the card, in large letters, write the answer to the question. Finally, in smaller letters, frame the answer in a question or statement. Blanks are provided to allow you or your students to add new words or phrases.

Study questions overview

Study questions parallel the story (the answer to the first question appears first in the article, followed by the second, and so on). **Preview the entire guide with your class before you read the article.** You may wish to read the story aloud and complete the study questions in class, in small groups, or as an independent activity. The questions may be assigned as homework, depending on the reading ability of your students. Inclusion teachers may provide more direct support to special needs students (see Adaptations section). The study questions may be also used as a quiz. Note: Items with an asterisk require varying degrees of critical thinking.

Adaptations

Read aloud to special needs students. Abbreviate the study questions or highlight priority items to be completed first. If time allows, remaining items may be attempted. Peer helpers, paraprofessionals, or adult volunteers may lend a hand with the study questions. With close teacher supervision, cooperative groups can also offer effective support to special needs students, especially for extension activities.

Assessment

You may use all or part of the study guide, combined with vocabulary, as a quiz. Other assessment ideas include: (1) Students may compare and contrast marsupials with placental mammals. See compare and contrast tools in Web resources. (2) Students may write multiple-choice, true-false, or short-answer questions. Select the best items for a class quiz. (3) Students may write essays describing how opossums are unique mammals or why omnivores have advantages over competitors that eat limited diets. (4) Poster presentations may supplement or take the place of essays. Students may work in small groups, with each group focusing on a different main idea from the article.

Extension activities

1. "Proliferating Possums" (see Related Articles) makes a great companion piece for "Awesome Opossums." It was written more than 20 years ago, when observers were beginning to take notice of the opossum's range expansion.
2. Marsupials are among the most interesting organisms on Earth. Encourage your students, in small groups or as individuals, to learn more about other marsupial species and to report their discoveries to the class in writing, orally, or in poster presentations.
3. Is the opossum considered a nonnative or invasive species? If so, what may be the consequences of its presence on the ecosystem it is moving into?
4. What does the opossum shrimp have in common with the Virginia opossum?
5. The evolution of marsupial species is a fascinating and puzzling story. Challenge your students to learn more about marsupial adaptations. This may be combined with extension 2.
6. Is climate change related to the opossum's northward expansion? If so, how? If not, why not?
7. What is rabies? Many students will be familiar with rabies through their pets' vaccinations. Why aren't people vaccinated against rabies?

Web resources

DNR
www.dnr.state.mn.us/mammals/virginiaopossum.html

Opossums in the news
www.herald-journal.com/farmhorizons/2012-farm/opposums.html
www.startribune.com/sports/outdoors/133666428.html
www.mprnews.org/story/2011/03/09/climate-change-virginia-opossum

Opossum images
www.enchantedlearning.com/subjects/mammals/marsupial/Vaopossumprintout.shtml

Opossum video
www.youtube.com/watch?v=Sc1FYJKBhyk

National Opossum Society
www.opossum.org

Opossum tracks
www.bear-tracker.com/opossum.html

Marsupials
www.ucmp.berkeley.edu/mammal/marsupial/marsupial.html
animal.discovery.com/mammals/marsupials.htm
www.enchantedlearning.com/coloring/marsupial.shtml
animaldiversity.ummz.umich.edu/accounts/Metatheria/
animals.about.com/cs/mammals/a/aa061901a.htm
science.discovery.com/tv-shows/mutant-planet/videos/mutant-planet-marsupial-evolution.htm
www.pbs.org/wnet/nature/episodes/kangaroo-mob/marsupials-the-evolution-backstory/7464/

Rabies/viruses
www.uskidsmags.com/blog/2011/03/21/adc-what-is-a-virus/

Climate
www.climate.gov/
climatekids.nasa.gov/
www.epa.gov/climatestudents/
www.c2es.org/science-impacts/basics/kids
www.ns.umich.edu/research/climate_08/story_myers.html

Web resources continued

Compare and contrast
www.readwritethink.org/files/resources/interactives/compcontrast/
www.manatee.k12.fl.us/sites/elementary/samoset/rcccon1.htm
www.readingquest.org/strat/compare.html

Minnesota DNR teacher resources
www.mndnr.gov/education/teachers/index.html
www.mndnr.gov/dnrkids/index.html

*Note: All websites were active at the time of this guide's publication. However, some may no longer be active when this guide is accessed.

Related Articles

In addition to the related articles listed below, every *Minnesota Conservation Volunteer* article published since 1940 is now online at *webapps8.dnr.state.mn.us/volunteer_index*

July–August 1985
"The Extraordinary Journey of the Opossum Shrimp" [PDF]
https://webapps8.dnr.state.mn.us/volunteer_index/past_issues/article_pdf?id=501

September–October 1991
"Proliferating Possums" [PDF]
https://webapps8.dnr.state.mn.us/volunteer_index/past_issues/article_pdf?id=1238

January–February 1996
"Busy Biomes" (YN article with teachers guide)
https://webapps8.dnr.state.mn.us/volunteer_index/past_issues/article_pdf?id=288 [PDF article]
www.dnr.state.mn.us/young_naturalists/biome/index.html [teachers guide]

March–April 2000
"Nature's April Fools" (YN article)
https://webapps8.dnr.state.mn.us/volunteer_index/past_issues/article_pdf?id=1029 [PDF]

March–April 2005
"The Parenting Game" (YN article with teachers guide)
www.dnr.state.mn.us/young_naturalists/parenting/index.html

July–August 2009
"Nature's Recyclers" (YN article with teachers guide)
www.dnr.state.mn.us/young_naturalists/natures_recyclers/index.html

References

Duval, D. l., and Jacob, M. *The Opossum's Tale*. Albuquerque: University of New Mexico Press, 2005.
Hock, M.F., Deshler, D.D., and Schumaker, J.B. *Strategic Tutoring*. Lawrence, Kan.: Edge Enterprises, 2000.
Ogle, D.S. K-W-L Group Instructional Strategy. In A.S. Palincsar, D.S. Ogle, B.F. Jones, and E.G. Carr (Eds.), *Teaching Reading as Thinking: Teleconference Resource Guide*, pp.11–17. Alexandria, Va.: Association for Supervision and Curriculum Development, 1986.

Study Questions

Teachers guide for the Young Naturalists article "Awesome Opossums" by Christine Petersen. Published in the January–February 2014 *Minnesota Conservation Volunteer*, or visit www.mndnr.gov/young_naturalists/opossums/index.html

Name_____Period _____ Date_____

1. Why do you think John Smith thought the opossum was odd? _____

_____

_____

2. How did the opossum get its name? What would you have named it? Why? _____

_____

_____

_____

3. If a penny weighs 2.5 grams, how much does a newborn opossum weigh? _____

_____

_____

4. The author states, "…the baby opossum has strong instinct to survive." Explain. _____

_____

_____

_____

5. How many days after a joey is born is it ready to survive on its own? _____

_____

6. What does your hand have in common with an opossum's foot? _____

_____

_____

7. Why do opossums rarely get sick with diseases that affect other wildlife? _____

_____

_____

_____

8. Why doesn't the opossum spend much time or energy on home building? _____

_____

_____

9. When are you most likely to see an opossum? Why? _____

_____

_____

_____

10. Give several examples from the opossum's omnivorous diet. _____

_____

_____

11. What dangerous animal does the opossum prey on? _____

12. Is "playing possum" an effective survival strategy? Why or why not? _____

_____

_____

13. Give an example of how people play possum. _____

_____

_____

14. When and where was the opossum first observed in Minnesota? _____

_____

15. How far north has the opossum expanded it range? What might explain its northward march?

_____

_____

_____

Challenge: How is the opossum's brain different from yours? Make an argument for the opossum's intelligence.

_____

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_____

_____

Study Questions Answer Key

Teachers guide for the Young Naturalists article "Awesome Opossums" by Christine Petersen. Published in the January–February 2014 *Minnesota Conservation Volunteer*, or visit www.mndnr.gov/young_naturalists/opossums/index.html

1. Why do you think John Smith thought the opossum was odd? **It was his first experience with a marsupial.**

*2. How did the opossum get its name? What would you have named it? Why? **Opossum is a mispronunciation of the Powhatan word "apasam." Answers will vary. Encourage students to justify their answers.**

*3. If a penny weighs 2.5 grams, how much does a newborn opossum weigh? **Sixteen newborn opossum weigh the same amount as a penny. Divide 2.5 by 16. A newborn opossum weighs about 0.16 grams.**

*4. The author states, "…the baby opossum has strong instinct to survive." Explain. **Answers will vary. It is remarkable that such a tiny newborn is able to climb up the outside of its mother's body and into her pouch and then find a nipple.**

*5. How many days after a joey is born is it ready to survive on its own? **Four months is about 120 days.**

6. What does your hand have in common with an opossum's foot? **Both have an opposable digit (thumb) that makes it possible to grasp objects.**

7. Why do opossums rarely get sick with diseases that affect other wildlife? **We don't know for sure, but it could be because their body temperature is cooler than that of other animals. Most viruses need warmer conditions to survive.**

8. Why doesn't the opossum spend much time or energy on home building? **The opossum moves frequently, so it doesn't make sense to build elaborate homes.**

9. When are you most likely to see an opossum? Why? **After dark, because opossums are most active at night (nocturnal).**

10. Give several examples from the opossum's omnivorous diet. **The opossum will eat just about anything, including earthworms, grasses, crayfish, nuts, fruits, vegetables, insect larvae, slugs, and dead animals.**

11. What dangerous animal does the opossum prey on? **Poisonous snakes, such as the timber rattlesnake.**

*12. Is "playing possum" an effective survival strategy? Why or why not? **Playing possum seems to work well, since the opossum would have little chance to fight off a larger predator.**

*13. Give an example of how people play possum. Answers will vary. **Playing possum means pretending to be dead or asleep. Can students think of a time they played possum? There are many instances of soldiers playing dead on battlefields or players feigning injury during games.**

14. When and where was the opossum first observed in Minnesota? **The opossum was first seen in southeastern Minnesota about 100 years ago.**

*15. How far north has the opossum expanded it range? **What might explain its northward march?**

The opossum has extended its range into central Minnesota. Answers will vary. **A warming climate, ready sources of food, and larger urban areas all appear to have influenced the opossum's steady march northward.**

Challenge*: How is the opossum's brain different from yours? Make an argument for the opossum's intelligence. **Answers will vary. See the sidebar on page 49. Encourage students to contrast the obvious differences in the opossum's central nervous system with humans and then to consider the opossum's adaptability.

Minnesota Comprehensive Assessments Practice Items

Teachers guide for the Young Naturalists article "Awesome Opossums" by Christine Petersen. Published in the January–February 2014 *Minnesota Conservation Volunteer*, or visit www.mndnr.gov/young_naturalists/opossums/index.html

Name _____Period _____Date_____

1. The opossum's brain is missing the
   A. left hemisphere.
   B. right hemisphere.
   C. brain stem.
   D. corpus collosum.

2. The main idea of the first paragraph on page 48 is
   A. the Virginia opossum is a marsupial.
   B. the Virginia opossum is a mammal.
   C. the Virginia opossum's babies live in a pouch.
   D. the Virginia opossum feeds milk to its young.

3. The opossum has more _____ than any other North American mammal.
   A. brains
   B. teeth
   C. feet
   D. fur

4. Omnivores eat
   A. meat.
   B. fruit.
   C. vegetables.
   D. A, B, and C

5. Joeys are the babies of
   A. kangaroos.
   B. preying mantises.
   C. opossums.
   D. A and C

Minnesota Comprehensive Assessments Answer Key

Teachers guide for the Young Naturalists article "Awesome Opossums" by Christine Petersen. Published in the January–February 2014 *Minnesota Conservation Volunteer*, or visit www.mndnr.gov/young_naturalists/opossums/index.html

1. The opossum's brain is missing the **D. corpus collosum.**
2. The main idea of the first paragraph on page 48 is **A. the Virginia opossum is a marsupial.**
3. The opossum has more **B. teeth than any other North American mammal.**
4. Omnivores eat **D. A, B, and C**
5. Joeys are the babies of **D. A and C**

Vocabulary

Teachers guide for the Young Naturalists article "Awesome Opossums" by Christine Petersen. Published in the January–February 2014 *Minnesota Conservation Volunteer*, or visit www.mndnr.gov/young_naturalists/opossums/index.html

climate	average pattern of weather in a particular area over a period of time
eon	two or more eras of geologic time; vast amount of time
evolve	to develop over generations from an earlier biological form
instinct	inborn pattern of behavior shaped by biological necessities, such as survival and reproduction
larvae	wingless, wormlike forms of many insects that develop into another stage before becoming adults
litter	group of animals born at the same time from the same mother
mammal	warm-blooded vertebrate animal with hair that feeds its young milk secreted by the female
marsupial	mammal that bears immature young that develop in a pouch on the mother's abdomen
range	area where an organism is normally found
predator	animal that kills and eats other animals
prey	animals that are killed and eaten by other animals
rabies	often fatal disease caused by a virus; transmitted in the saliva of the infected animal
slug	terrestrial mollusk with no shell
species	group of organisms that resemble each other and may reproduce
virus	submicroscopic particle that cannot grow outside a host cell; not an independent living organism

Vocabulary Study Cards

Teachers guide for the Young Naturalists article "Awesome Opossums" by Christine Petersen. Published in the January–February 2014 *Minnesota Conservation Volunteer*, or visit www.mndnr.gov/young_naturalists/opossums/index.html

Cut along the horizontal lines, fold in the middle and tape or staple. Blanks are provided to allow you or your students to add new words or phrases.

What is **climate**?	FOLD HERE	**The average pattern of weather in a particular area over a period of time** is the
What is an **eon**?	FOLD HERE	**Two or more eras of geologic time (a vast amount of time)** is an
To **evolve** is to	FOLD HERE	To **develop over generations from an earlier biological form** is to
An **instinct** is	FOLD HERE	An **inborn pattern of behavior shaped by biological necessities, such as survival and reproduction,** is an

What are **larvae**?	The **wingless, wormlike form of many insects that develop into another stage before becoming adults** are called
A **litter** is	**A group of animals born at the same time from the same mother** is a
What is a **mammal**?	**A warm-blooded vertebrate animal with hair that feeds its young milk secreted by the female** is a
What is a **marsupial**?	**A mammal that bears immature young that develop in a pouch on the mother's abdomen** is a
What is a **range**?	**An area where an organism is normally found** is its

FOLD HERE

FOLD HERE

FOLD HERE

FOLD HERE

A **predator** is	FOLD HERE	**An animal that kills and eats other animals** is a
What are **prey** animals?	FOLD HERE	**Animals that are killed and eaten by other animals** are
What is **rabies**?	FOLD HERE	**An often fatal disease caused by a virus that is transmitted in the saliva of the infected animal** is called
A **slug** is	FOLD HERE	**A terrestrial mollusk with no shell** is a
What is a **species**?	FOLD HERE	**A group of organisms that resemble each other and may reproduce** is a

What is a **virus**?

FOLD HERE

A submicroscopic particle that cannot grow outside a host cell; not an independent living organism is a

FOLD HERE

FOLD HERE

FOLD HERE

FOLD HERE