

TEACHERS GUIDE

TO “FLESH EATERS”

Multidisciplinary classroom activities based on the Young Naturalists nonfiction story in *Minnesota Conservation Volunteer*, May-June 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!

“FLESH EATERS”

Multidisciplinary classroom activities based on the Young Naturalists nonfiction story in *Minnesota Conservation Volunteer*, May-June 2019, www.mndnr.gov/mcvmagazine.



SUMMARY. What eats dead things? This feature story introduces young naturalists to the life and times of one kind of animal that does, the burying beetle. Through photos, text, and drawings, readers will learn about what burying beetles eat, how they find their food, how they reproduce, and how they contribute to the cycle of life in nature.

SUGGESTED READING LEVELS. Third through middle-school grades

MATERIALS. KWL organizer; optional resources include access to an outdoor nature space, 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. “Flesh Eaters” activities described below may be used to support 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, 3.1.3.2.1, 5.1.1.1.1, 5.1.1.1.2, 5.1.3.2.1)

Life Science (Benchmarks 3.4.1.1.1, 5.4.1.1.1, 5.4.2.1.2, 5.4.4.1.1, 7.4.2.1.1, 7.4.2.1.2,

7.4.2.2.2, 7.4.4.1.2)

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, 5.2.4.4, 6.5.1.1, 6.5.2.2, 7.5.1.1, 8.5.1.1)

Craft and Structure (Benchmarks 3.2.4.4, 3.2.5.5, 3.2.6.6, 4.2.4.4, 5.2.4.4, 6.5.4.4, 6.5.5.6, 7.5.4.4, 7.5.6.6, 8.5.4.4, 8.5.6.6)

Integration of Knowledge and Ideas (Benchmarks 3.2.7.7, 4.2.7.7, 4.2.8.8, 5.2.7.7, 5.2.8.8)

Writing Benchmarks (Grades 3-8)

Text Types and Purposes (Benchmarks 3.6.1.1, 3.6.2.2, 4.6.1.1, 4.6.2.2, 5.6.1.1, 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 (Grades 3-8)

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, 6.9.4.4, 7.9.4.4, 8.9.4.4)

Language Benchmarks (Grades 3-8)

Vocabulary Acquisition and Use (Benchmarks 3.10.4.4, 4.10.4.4, 5.10.4.4)

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 Process: Perform or Present (Benchmark 0.3.1.5.1)

Artistic Process: Create or Make (Benchmarks 0.2.1.5.1, 4.2.1.5.1, 6.2.1.5.1)

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. Do a [KWL activity](#). Divide students into small groups. Within the groups, have students describe what they already know (K) about insects that eat dead things 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 burying beetles. 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 burying beetles 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. Watch burying beetles in action. Find road kill or another carcass with burying beetles. Without touching it directly, move it to a protected location where you can observe what happens to it. Check it once or twice a day and record your observations. Maintain a record of observations, being careful to distinguish between actual observations and ideas about what was observed. If there is an opportunity to compare observations (either of multiple students observing the same carcass, or students observing different carcasses), invite students to share their observations and then encourage them to think about sim-

ilarities and differences in observations (toward an understanding of why variation in scientific investigation occurs).

2. Search for burying beetles outdoors. When you find one, use [the author's field guide](#) to identify the species.

3. Scientists think the American burying beetle may have disappeared from Minnesota because one of its foods, passenger pigeons, went extinct. Choose another Minnesota animal or plant and prepare a simulated TV or radio news report on its disappearance that includes descriptions how other animals and plants might be affected. This is a good opportunity to introduce students to multi-order effects and systems thinking. This resource might be helpful: <http://www.lindaboothsweeney.net/resources>.

4. A phoretic animal is one that uses another animal for transportation. What other animals beside ticks and burying beetles use this strategy? Brainstorm and research as a group to see how many you can come up with. Then use classification strategies to try to break them into logical groups.

5. What's with the orange? Put on your detective hats and dive into the Internet to find out how orange spots help burying beetles survive. The Young Naturalists story [Color by Nature](#) can provide additional information on aposematic coloration. Learn about other organisms that use this strategy, and use your artistic skills to produce a poster illustrating them.

6. This story contains a lot of unusual and potentially new words (carrion, phoretic, symbiotic, etc.) Look up the etymology of these words, and brainstorm lists of other words with similar root words (e.g., sympathy for symbiotic). This will help students develop skills for inferring the meanings of new words they encounter in the future.

7. About 17 of the estimated 70 species of burying beetles can be found in the U.S. Based on what you learned about their habitat needs and their feeding characteristics (what they eat and how they eat), think of some ideas as to why the other 53 species do not live in the U.S. Then look up more about these other species to find out more about where they live and why the U.S. isn't suited to their needs—or whether it might be, if someone or something brought them here. (Or instead you might speculate as to why Minnesota has more kinds of burying beetles than any other state in the nation, and then investigate further through Internet research to check your guesses.)

8. The story mentioned that Minnesota may soon gain another burying beetle, the Carolina burying beetle. Are there other insects that you've been hearing about that are becoming established in Minnesota? Sometimes gaining a species (increasing biodiversity) in a place is considered a good thing, and other times, it is considered a concern. What makes the difference between whether gaining the species is viewed as a good thing or a concern? Does it matter from whose perspective, and are there examples where there are differing perspectives as to whether or not finding a new species in a place is considered desirable?

9. As you learned in the story, entomology is the study of insects, and the author of the story, Christopher Smith, is an entomologist. Some people study how insects have in-

fluenced human culture, from stories to music, as well as in religion, folklore, myth, and even fashion! Such people are called cultural entomologists. It can be quite interesting to learn more about how insects appear in the arts and in other aspects of human cultures. For example, in ancient Egypt, Egyptians noticed how the dung beetle rolled a ball of manure along the ground and thought that every day a giant dung beetle in the sky rolled the sun across the sky. The beetle was celebrated as a symbol of rebirth and immortality. Images of the dung beetle were incorporated into Egyptian art and religion, and even were commonly used in jewelry. Do beetles make appearances in other stories, movies, or music? Are they important symbols in other cultures? Think of some other insects that have rich symbolism (butterflies representing beauty and joy, for example, or flies representing evil). Create and present a piece of art (painting, jewelry, decorative item) that reflects the symbolism of an insect.

10. Explain how the author uses reasons and evidence to support his view that beetles are fascinating rather than disgusting. Why do you think some people find insects disgusting or gross, and others find them fascinating? Why do you think so many people are afraid of insects? Draw on information from the Internet to check your guesses. Or write an opinion piece, supporting your point of view regarding insects with reasons and information.

WEB RESOURCES

GENERAL TEACHER AND STUDENT RESOURCES

[Minnesota DNR Teachers' Resources](#)

[DNR Kids Page](#)

RELATED MCV ARTICLES

[The Universe Underfoot](#)

[Color by Nature](#)

[The Magic of Morphing](#)

GENERAL BURYING BEETLE INFORMATION

[Illustrated Key to the Burying Beetles \(*Nicrophorus* spp.\) of Minnesota](#)

[American Burying Beetle \(St. Louis Zoo\)](#)

VIDEO

[Burying Beetles Turn Carcass into Baby Food | National Geographic](#)

STUDY QUESTIONS ANSWER KEY

1. This story mentions three kinds of insect that eats dead things. What are they? **burying beetles, carrion beetles, maggots (fly larvae)**

2. Name three things besides dead animals burying beetles eat. **poop, rotting vegetation, insects**
3. How does a burying beetle find its meal?
- It flies around looking for a dead animal.
 - It flies around searching for the scent of a dead animal.**
 - It hitchhikes on the back of a mite.
 - It hides in a trap under a tree until an animal falls in and dies.
4. True or false: Dozens of burying beetles work together to bury and eat a carcass. **False. The beetles that find the carcass battle each other until one pair wins and takes possession.**
5. How does burying its meal benefit a burying beetle? **It keeps the dead animal away from other scavengers.**
6. Why would a scavenger beetle run away if feel vibrations? **They could be made by another carcass eater that might also eat them.**
7. How do mites benefit burying beetles?
- They help dig a hole for the carcass.
 - They eat fly eggs and maggots that compete for the carcass.**
 - They create the smell that lets beetles know where to find a carcass.
8. A win-win relationship between two kinds of living things is called a _____.
Symbiotic relationship.
9. True or false: burying beetles use their antennae to detect the scent of a carcass. **True**
10. What happens to the carcasses that burying beetles break down? **They become part of the soil.**
11. What two ways does the author use to find burying beetles? **1) looks for dead things and rolls them over 2) buries buckets and puts dead things in them.**
12. Why do scientists think we can no longer find American burying beetles in Minnesota? **Because passenger pigeons, which presumably provided an abundant food supply for them, became extinct.**

CHALLENGE: Name three ways burying beetles benefit other living things. **Answers may vary. Benefits described in the article include carrying mites from one meal to the next, transferring nutrients from dead things into the soil, helping to prevent**

the spread of disease.

MINNESOTA COMPREHENSIVE ASSESSMENTS ANSWER KEY.

1. Why are burying beetles called burying beetles? **They dig out the soil from beneath a carcass so it sinks into the ground.**
2. Name three kinds of scavengers mentioned in the story. **Answers may vary; animals mentioned in the article include vultures, raccoons, burying beetles, carrion beetles, maggots (fly larvae).**
3. How do phoretic mites help burying beetles? **They eat fly eggs and maggots, reducing competition for the carcass.**
4. How do burying beetles benefit the mites? **They carry them from one carcass to another.**
5. Put the four life stages of a burying beetle in order, starting from egg. **egg, larva, pupa, adult.**
6. The way that burying beetles feed their young is most like the way:
 - a. people feed their young
 - b. birds feed their young**
 - c. fish feed their young
7. What do burying beetles do during the winter?
 - a. they hibernate**
 - b. they fly south
 - c. they overwinter as pupae
 - d they keep finding and eating dead things, because things die all year round.
8. Why might you need a strong stomach to identify burying beetles? **Because they are most often found on dead things, which can smell and look unpleasant.**
9. Which of the following is one of the main ideas of the story:
 - a. Kids like insects more than adults do.
 - b. You can get sick if you touch dead things.
 - c. Burying beetles are part of a complex system that helps recycle dead animals.**
 - d. Scientists can use traps to catch insects.

VOCABULARY LIST

casualty something that was injured or killed

chemosensor a body part that senses the presence of specific chemicals

corpse dead body

habitat the place where something lives

microbes bacteria and other living things too small to see without a microscope

nutrients parts of food that living things need to survive

regurgitating throwing up

scavenger an animal that eats garbage and dead things

vegetation plants