

TEACHERS GUIDE

to “Lost Thunder”

Multidisciplinary classroom activities based on the Young Naturalists nonfiction story in *Minnesota Conservation Volunteer*, March-April 2026, 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 words, 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!

“Lost Thunder”

Multidisciplinary classroom activities based on the Young Naturalists nonfiction story in *Minnesota Conservation Volunteer*, March-April 2026, mndnr.gov/mcvmagazine.



SUMMARY. Passenger pigeons once flew in great flocks across Minnesota. While they are now extinct, their story and its lessons live on. Readers of “Lost Thunder” will learn how humans caused the dramatic loss of this pigeon and what we are doing differently today to help prevent the loss of other species.

SUGGESTED READING LEVELS. Third through middle school grades

MATERIALS. [Young Naturalist story](#) and student study guide; Internet access, and other print and online resources your media specialist may provide; and additional optional resources for extension activities.

PREPARATION TIME. 5–10 minutes, not including time for extension activities.

Estimated instruction time. 45–60 minutes, not including extension activities.

MINNESOTA ACADEMIC STANDARDS APPLICATIONS. “Lost Thunder” activities described below may be used to support the following Minnesota Department of Education standards for students in grades 3–8.

LANGUAGE BENCHMARKS

Vocabulary Acquisition and Use (Benchmarks 3.10.4.4, 3.10.6.6, 4.10.4.4, 4.10.6.6, 5.10.4.4, 5.10.6.6, 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: Informational Text

Key Ideas and Details: 3.2.1.1; 3.2.2.2; 3.2.3.3; 4.2.1.1; 4.2.2.2; 4.2.3.3; 5.2.1.1, 5.2.2.2; 5.2.3.3; 6.5.1.1; 6.5.2.2; 7.5.1.1; 8.5.1.1

Craft and Structure: 3.2.4.4, 3.2.5.5; 3.2.6.6; 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: 3.2.7.7; 4.2.8.8; 5.2.8.8; 6.5.7.7

SPEAKING, VIEWING, LISTENING AND MEDIA LITERACY

Comprehension and Collaboration: 3.8.1.1; 3.8.2.2; 4.8.1.1; 4.8.2.2; 5.8.1.1; 5.8.2.2; 6.9.1.1; 7.9.1.1; 8.9.1.1

READING BENCHMARKS: Literacy in Science and Technical Subjects 6-12

Key Ideas and Details: 6.13.1.1; 6.13.2.2

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*.

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Preview. Introduce students to the Young Naturalists’ story, “Lost Thunder” using the three “4 Ps” (Preview, Predict, Prior Knowledge, and Purpose). First, invite students to *preview* the article’s text features, such as the title, headings and images, for clues as to what the story will be about. Then, based on the text features, ask students what they *predict* they will learn. Next, help students make connections with their *prior knowledge and experiences* by asking questions as as, What do you already know about passenger pigeons? Do the images and headings remind you of anything you have experienced, seen, or read? Finally, invite students to think about the author’s intended *purpose* for the story.

VOCABULARY PREVIEW. Share the vocabulary words below with your students, indicating that these words will appear in the story and may be unfamiliar to them. Invite them to refer to the beginning of the Student Guide, first looking at each word and thinking about its meaning and then writing down a possible definition for each.

VOCABULARY

Epic – impressive or grand

Domestic - animals that rely on humans for food, protection, or companionship

Extinct – no longer in existence

Keystone species – a species that if removed, the ecosystem would drastically change

Mast – nuts, seeds, berries, and fruits produced by trees and shrubs that are an important food source for wildlife

Amplify – plentifully, more than enough

Guano – poop of birds, bats, or seals that has piled up over time

Squab – a young pigeon

Fledge – when a young bird grows its feathers and muscles enough to fly and leaves the nest for the first time

Restore – to bring something back to its original, healthy condition

Reintroduce – to introduce or bring back something after a period of time

Commotion – a noisy disturbance

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.

Answer Key: 1. a; 2. c; 3. False; 4. b; 5. b; 6. The translation of the name of the older sister, colored glass beads, metal awl tip from the trader; 7. c; 8. When the birds arrived, and whether or not the crops were in the fields; 9. d; 10. b; Challenge: Answers will vary. Humans can interact with other species in ways that can be harmful or helpful, and these interactions can change over time. Some hunters didn't disturb the pigeons sitting on eggs to help ensure that there would be enough birds to eat the following year, but others were less responsible, taking more than they needed and hunting in disrespectful ways that contributed to the extinction of the passenger pigeon. By looking back, we can learn from our mistakes. We should pay attention to the signs of nature around us, so that we notice "warnings" before it is too late.

ASSESSMENT. The completed vocabulary and study questions on the Student Guide can serve as an assessment of students' learning. Additionally, the Student Guide includes MN Comprehensive Assessment (MCA) practice items. Other assessment ideas include: (2) Have students create a concept map or web that summarizes and organizes the main ideas and story details. (3) Have students write a summary of the main ideas from the story. Then have students "share and compare" their work with a partner to self-assess their learning. As they share, students can think about or respond to questions such as: How were the summaries alike and different? What ideas did you include that were different from your partner's?

EXTENSION ACTIVITIES. These activities can be used to deepen or extend the learning of individual students, small groups, or your entire class. The following activities provide examples of ways to make connections to related topics, while supporting academic standards and/or benchmarks.

1. Invite students to re-read the passage about passenger pigeons as keystone species (p. 47), and then show students this video, [How the Passenger Pigeon Changed North American Forests](#). As they watch, ask them to make a list of cause-and-effect relationships and then construct a written argument supported by evidence that passenger pigeons were a keystone species. [Science. Dimension 1: 7. Engaging in argument from evidence, Dimension 2: 2. Cause and effect, 4. Systems, Dimension 3: LS 2. Ecosystems; English Language Arts. Writing: 6.7.1.1, 7.7.1.1, 8.7.1.1]

2. The story mentions two types of scientists who have contributed to what we know about the life of the passenger pigeon – paleontologists and archaeologists. The story author, David Mather, is a zooarchaeologist. Zooarchaeology, sometimes called archaeozoology, combines the fields of zoology and archaeology to focus on the analysis of animal remains within archaeological sites. After learning about each of the three types of scientists through a brief teacher explanation followed by individual or collective student research, ask students to write an opinion piece regarding which of the three career fields is of most interest to them. Students should support their point of view with reasons and information. (Teachers may find this [scientific paper by David Mather](#) of interest as an example for older students of the work of a zooarchaeologist.) [English Language Arts. Writing: 3.6.1.1, 3.6.7.7, 4.6.4.4, 4.6.7.7, 5.6.1.1, 5.6.7.7, 6.7.7.7, 7.7.7.7, 8.7.7.7]

3. An earlier story in the MN Conservation Volunteer, [The Legacy of Names](#), reminds us that our sense of place is richly expressed in our names for places. A good place name tells something of the land - a place's shape or the animals that inhabit it, or stories of the people who settled it, shaped it, and or fought for it. Have students look at a map of Minnesota and make a list of places (towns, cities, rivers, lakes, etc.) that have “pigeon” as part of their name. Using clues from the story, data from the [Minnesota Biodiversity Atlas](#) and the [Minnesota Bird Breeding Atlas](#), and some internet research, encourage students to speculate if that particular place name may have been named after the passenger pigeon. [Social Studies. Geography: 4.3.1.2.1, 4.3.2.3.1]

4. The story author uses three stories within his main story to help readers understand the dramatic decline of the passenger pigeon and recognize and even feel the impact of its loss. Naturalist and author John Greenberg uses his writings to help ensure the

lesson of the passenger pigeon is not forgotten, describing it as a powerful cautionary tale that even the most common species can be lost if humanity is not careful. Aldo Leopold poetically writes about the lesson of the passenger pigeon in the Sand County Almanac: “We grieve because no living man will see again the onrushing phalanx of victorious birds, sweeping a path for spring across the March skies, chasing the defeated winter from all the woods and prairies of Wisconsin. Men still live who, in their youth, remember pigeons. Trees still live who, in their youth, were shaken by a living wind. But a decade hence only the oldest oaks will remember, and at long last only the hills will know.” Invite students to consider the lesson of the passenger pigeon that should not be forgotten, asking them to reflect on what they think that lesson is and what they think people should know and remember. Have students communicate that lesson through writing, drawing, or some other form of media. If students need additional background information, the PBS video [Species Extinction: Why Should You Care?](#) can provide some additional supporting information for them to consider. For students who need idea starters, here are a few possible directions: the importance of biodiversity, paying attention to signs in nature, examples of specific actions or success stories, etc. [Social Studies. Geography: 4.3.4.9.1; Arts. Artistic Process: 0.2.1.2.1, 0.2.1.5.1, 4.2.1.2.1, 4.2.1.5.1, 6.2.1.2.1, 6.2.1.5.1.]

5. The passenger pigeon is widely recognized as the first documented extinction of a species due to human action. It became a wake-up call, prompting significant wildlife protection legislation and spurring a conservation movement that is underway today. After watching this [short video from the Cincinnati Zoo](#) about Martha, the last passenger pigeon, have students select a federal conservation law that protects wildlife or wildlife habitat. After researching their selected legislation, students can communicate what they learned to the class through a short oral summary or a more formal presentation. Alternatively or additionally, students can investigate, through internet research, efforts by wildlife organizations and agencies to restore species whose numbers have declined. Have students select an animal that was brought back from the brink of extinction, such as the whooping crane feature in the Conservation Volunteer story, [Magnificent Journey](#). As students present their conservation success stories, they can make comparisons across stories to deepen their understanding of species restoration and reintroduction (Are there similarities in the what caused the decline and the “warning sign” that prompted action? Are there similarities in who was involved in the restoration and reintroduction work? Are there similarities in the types of actions taken? Etc.) [Science. Dimension 1: 8. Obtaining, evaluating, and communicating information, Dimension 2: 1. Patterns, 2. Cause and effect, 4. Systems, Dimension 3: LS 2. Ecosystems; English Language Arts. Speaking, Viewing, Listening and Media Literacy: 3.8.4.4, 3.8.6.6, 4.8.4.4, 4.8.6.6, 5.8.4.4, 5.8.6.6, 6.9.4.4, 6.9.6.6, 7.9.4.4, 7.9.6.6, 8.9.4.4, 8.9.6.6]

WEB RESOURCES

YOUNG NATURALIST STORIES

[Thunder on the Plains](#)

[Splendid Fliers](#)

GENERAL TEACHER AND STUDENT RESOURCES

[Minnesota DNR Teachers' Resources](#)

MINNESOTA CONSERVATION VOLUNTEER STORIES

[Epitaph for the Passenger Pigeon](#)

[Magnificent Journey](#)

[Life and Death in Bird Art](#)

WEBSITE RESOURCES

[Project Passenger Pigeon](#)

CURRICULA RESOURCES

[National Geographics Mass Extinctions Infographic](#)

[California Academy of Sciences' Conservation Island Lesson Plan](#)

Video

[PBS Species Extinction: Why Should You Care?](#)

[From Billions to None: The Passenger Pigeon's Flight to Extinction](#)