

Young Naturalists Teachers Guide

“Write, Sketch, Explore” Multidisciplinary Classroom Activities

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Teachers guide for the Young Naturalists article “Write, Sketch, Explore” by Mary Hoff. Published in the September–October 2021 *Minnesota Conservation Volunteer*.

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Summary. A nature journal is a wonderful tool for exploring the world around us. This Young Naturalists feature encourages students to enrich their explorations of nature by recording what they see, hear, feel, smell, and think as they encounter living and nonliving features of our environment.

Suggested Reading Level. 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 Instructional Time: 30–60 minutes, not including extension activities

Minnesota Academic Standards Applications:

“Write, Sketch, Explore” 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 the 2019 Commissioner approved draft of MN Academic Standards in Science and focuses on the three dimensions from the Framework for K–12 Science Education (NRC, 2012)*

Science and Engineering Practices

1. Asking questions and defining problems
4. Analyzing and interpreting data
8. Obtaining, evaluating, and communicating information

Crosscutting Concepts

1. Patterns
3. Scale, proportion, and quantity
6. Structure and function
7. Stability and change

Disciplinary Core Ideas

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

Life Sciences 3: Heredity: Inheritance and variation of traits

Life Sciences 4: Biological Evolution: Unity and diversity

Earth and Space Sciences 3: Earth and human activity

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

Math

Geometry and Measurement (Benchmarks 3.3.3.4, 6.3.3.1, 6.3.3.2)

Algebra (9th-11th Grade Standard: Understand the concept of function)

Social Studies

Geography (Benchmark 4.3.4.9.1)

Arts

Artistic Process: Create or Make (Benchmarks 0.2.1.5.1, 4.2.1.5.1, 6.1.2.2.1., 6.2.1.5.1)

Artistic Process: Respond or Critique (Benchmark 0.4.1.3.1)

English Language Arts

Reading Benchmarks: Informational Text

Key Ideas and Details (Benchmarks 3.2.1.1, 4.2.1.1, 5.2.1.1, 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, 4.2.7.7, 4.2.9.9, 5.2.7.7, 5.2.9.9, 6.5.7.7, 7.5.8.8)

Writing Benchmarks

Writing Process (Benchmarks 3.6.4.4, 4.6.4.4, 5.6.4.4)

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)

Presentation of Knowledge and Ideas (Benchmarks 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)

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: Literacy in Science and Technical Subjects

Key Ideas and Details (Benchmarks 6.13.1.1)

Writing Benchmarks: Literacy in Science and Technical Subjects

Research to Build and Present Knowledge (Benchmark 6.14.7.7)

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

Preview: Ask your students if they've ever heard of a journal or diary. Give them a chance to share what they know about or even have tried themselves related to keeping a written record of daily life. Based on the information shared, ask them to imagine what a nature journal might be. Then divide them into small groups to do a **KWL** activity. Within the groups, have students describe what they know (**K**) about nature journals and what they wonder (**W**) about them. Give each student a copy of the organizer (see 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 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: Give students a chance to create and use their own nature journal. Encourage them to try the various suggestions offered in this Young Naturalists story. In reviewing their journals, note with appreciation examples of using multiple sentences, creative language, good effort in sketching and recording details, etc. Also note where such things might have been used but were not, and encourage students to expand into that space in the future.

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. Make nature journals and use them! The journal can be as simple as a half-dozen sheets of paper stapled together. Give students a chance to decorate the cover as they wish, then head outdoors with whatever supplies you have on hand. If time and circumstances allow, you might wish to try a few hands-on activities ahead of time, such as using a binoculars and magnifying glass, making a rubbing, using water colors, or [drawing birds and other animals using geometric shapes](#).

2. The opening page of the story shows sketches of three different bird beaks. Use this as a starting point for a discussion about how beaks differ and how the different shapes serve their owners' needs. Consider what lessons bird beaks might hold for humans trying to invent tools to do different kinds of things (poke, probe, hold, etc.). You might find the Young Naturalists feature ["Peck, Pluck, Probe, Preen"](#) useful context for this exploration.

3. If your students are middle-school age, pair them with elementary students to make nature journals of their own. Have them create a book from heavy paper, gather supplies, and talk about the "how" and "why" of nature journaling. Then have buddy

pairs go outdoors (school grounds are fine) and observe and record together. Encourage your students to help the younger ones use multiple senses, ask questions, imagine, etc.

4. One of the recommendations in this article is to use a magnifying glass and binoculars to get a better view of the things you're observing. This is a great jumping-off point for a lesson on optics. Connect the article with a section in your science textbook or use a video such as [Bill Nye Lenses](#) to explore how lenses literally expand our view of our world.

5. When you measure, how should you measure? At home many of us use the English system (inches, feet, pounds, degrees F, etc.). Scientists use the metric system. Learn about the history of the two systems and where in the world each is used. What are the advantage and disadvantages? If you wish, have students participate in a [Lincoln-Douglas debate](#) with the proposition, "The United States ought to convert to the metric system."

6. The illustration on page 57 shows a snail shell. Ask students to describe how the shell changes as it spirals outward. Note that both the width of the coil and the diameter of the tube forming the coil increase. Introduce older students to the concept of the [Fibonacci spiral](#) with a lesson such as [The Fibonacci Sequence](#), then look for examples on your next foray into nature.

7. Nature has many wonderful and diverse sounds that can be a part of nature journaling. Musicians, and especially composers, throughout history have been inspired by nature's music. After listening to and journaling about sounds in nature, encourage students to imagine how they would turn those sounds into a piece of music. Listen to the examples of musical compositions from [Classical Kids](#) for inspiration. Students also might be prompted to listen to each piece (without knowing the title of the composition) and guess what the composer was inspired by or composing about.

8. The story mentions the nature journals of Aldo Leopold and Edith Holden. You may be surprised to realize that scientists still consult nature journals that are decades or even more than a century old! For example, conservation organizations that restore land to conditions prior to human influence (for example restoring a farm to tall grass prairie) can consult historic nature journals to have a better idea of what plants and wildlife were there before. Another example is Henry David Thoreau's nature journals, where he carefully and systematically observed the first flowering dates for more 500 species of wildflowers in Concord, Massachusetts in the 1850s. His journals are now being used by researchers at Boston University in climate change research. Encourage students to read more about how Thoreau's careful records of Walden Pond are helping scientists track ecological impacts of a changing climate.

9. A lesser-known nature journalist is Susan Fenimore Cooper, daughter of novelist James Fenimore Cooper. She is the author of *Rural Hours*, which is a record of a year

around the town where she lived (Cooperstown, New York), and it's considered to be the first American book of place-based nature observations. Her writings were a source of information and inspiration for Thoreau. Ask students to think about and speculate how her nature journal could be used today by ecologists, anthropologists, historians, and others as a source of information for their work. Students might also be encouraged to discuss other benefits (individual benefits as mentioned in the story, as well as collective or societal benefits) from nature journaling.

Web Resources: Check out the following if you'd like to dive deeper into some of the topics covered by this Young Naturalists feature.

Minnesota DNR Web Pages

General Teacher and Student Resources

[Minnesota DNR Teachers' Resources](#)

[DNR Kids Page](#)

Nature Journaling

[How to Teach Nature Journaling](#)

[Nature Journaling and Field Sketching](#)

[Nature Journaling](#)

[The Nature Journal Club](#) (Facebook group)

Related Young Naturalists Features (just a sampler – see [this](#) page for lots more!)

[Peck, Pluck, Probe, Preen](#)

[What Pooped Here?](#)

[Squeaks and Whistles, Grunts and Hums](#)

[Ask a Rock](#)

[Look Down in the Woods](#)

*All Minnesota Conservation Volunteer articles, including past Young Naturalists stories and accompanying teachers guides, are [available online](#) in searchable PDF.

Study Questions

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Name _____ Date _____

1. What four reasons does the article give for keeping a nature journal? **To discover patterns, capture complexity, keep a record, give your heart a chance to sing.**
2. True or false: You should have special supplies to keep a nature journal. **False. You can use whatever you have.**

3. Why might you close your eyes before you write in your nature journal? **To give your senses of hearing, smell, and touch a chance to tell you what they are observing without having your sense of sight get in their way.**

4. Name three kinds of things you might include in your nature journal. **Answers will vary but might include what you observe; what you feel, think, imagine, wonder; date; time; location; time of year; weather; descriptions and/or drawings of what you see, hear, smell, feel.**

5. What does the article say you should do when you get home from your nature journal adventure?

a. Take a shower

b. Check for ticks

c. Have cookies and milk

d. a and b

e. none of the above

6. What is the most important part of nature journaling? **Doing whatever it is that you want to do.**

7. True or false: A person keeping a nature journal should be a good artist. **False. Anyone can keep a nature journal, whatever their talents!**

8. Name three characteristics of a sound you might record on your sound map. **Direction, high or low, melodic or mechanical, near or far, loud or soft.**

9. What reason does the story give for visiting the same place more than once?

a. So you can compare observations over time.

b. Because it is the only available place.

c. Because it is safer to visit a familiar place.

d. So you don't disturb too much nature.

10. Match the trait to the famous nature journal keeper:

Edith Holden

- **lived in Great Britain**

- **lived in the early 1900s**

- **was an artist**

Aldo Leopold

- **lived in the early 1900s**

- **lived in Wisconsin**

- **was a naturalist**

Charles Darwin

- **lived in the early 1800s**

- **traveled the world**

- **was a naturalist**

Challenge Question: Why does the story recommend writing down the date, time of day, weather, and description of the setting? **This takes some inference to answer. This information is helpful for discovering patterns, one of the four reasons given for keeping a nature journal.**

Minnesota Comprehensive Assessments Practice Items

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1. What is one thing the story tells us NOT to do in order to stay safe while nature journaling? **Taste things**
2. How might you find an answer to a question you have while nature journaling?
 - a. look it up
 - b. ask an expert
 - c. do an experiment
 - d. **all of the above**
3. Why is it fun to record when seasonal events happen? **You can compare the timing from year to year.**
4. How will keeping a nature journal help you? **It will make you a better observer of nature.**
5. How often should you write in your nature journal?
 - a. every day
 - b. every week
 - c. when someone tells you to
 - d. **regularly**

Vocabulary

“Write, Sketch, Explore” by Mary Hoff. Published in the September–October 2021 *Minnesota Conservation Volunteer*.

acrostic – a type of poem made from the first letters of a word

customize – make specific to a purpose, person, or thing

haiku – a type of poem that typically has three lines with five, seven, and five syllables each

melodic – like a melody

mechanical – of or related to machines

rubbing – an image made by rubbing a writing utensil across paper over an object

texture – the way a surface looks or feel.

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