

Teachers Guide

Prepared by Jack

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Area Schools,

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“Six Slippery Salamanders” Multidisciplinary Classroom Activities

“Six Slippery Salamanders,” by John J. Moriarty. Published in the May–June 2001 Volunteer or visit www.mndnr.gov/young_naturalists/salamanders/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 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 a to suit user needs. Users are encouraged to provide feedback through an online survey at www.mdnr.gov/education/teachers/activities/ynstudyguides/survey.html. Please note that if you are downloading articles from the Web site only Young Naturalists articles are available in PDF.

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Summary

“Six Slippery Salamanders” compares and contrasts amphibians, specifically salamanders, with reptiles. Topics include salamanders’ physical characteristics, habitat, environmental challenges, and life cycle, and descriptions of six native Minnesota species. (Note: The number of salamanders found in Minnesota is now seven. In spring 2001, DNR scientists Carol Hall and Tim Pharis found unusual egg masses in Nemadji State Forest south of Duluth. Suspecting the eggs might have been laid by the spotted salamander—a species never before recorded in Minnesota—they brought one egg mass back to the laboratory. When the eggs hatched, the scientists were able to confirm their identification and add the spotted salamander to Minnesota’s list of native amphibians. Information can be found in the January–February 2002 *Minnesota Conservation Volunteer* or at www.mndnr.gov/reptiles_amphibians/salamanders/spotted.html).

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Suggested reading levels:	Upper elementary through middle grades																												
Total words:	1,505																												
Materials:	Pencils, colored pencils, graph paper, poster board, and print materials from your media center.																												
Preparation time:	About one hour																												
Estimated instructional time:	Two to three 50-minute class periods for study guide and one or two enrichment activities.																												
Minnesota Academic Standards applications:	<p>“Six Slippery Salamanders” may be applied to the following Minnesota Department of Education Academic standards:</p> <table><tr><td>Language Arts</td><td>Science</td></tr><tr><td>I. Reading and Literature</td><td>Grade 4</td></tr><tr><td>A. Word Recognition, Analysis and Fluency</td><td>IV. Life Science</td></tr><tr><td>B. Vocabulary Expansion</td><td>B. Diversity of Organisms</td></tr><tr><td>C. Comprehension</td><td>Grade 5</td></tr><tr><td>II. Writing</td><td>IV. Life Science</td></tr><tr><td>A. Types of Writing</td><td>E. Biological Populations Change Over Time</td></tr><tr><td>B. Elements of Composition</td><td>F. Flow of Matter and Energy</td></tr><tr><td>C. Spelling</td><td>Arts</td></tr><tr><td>D. Research</td><td>Artistic Expression</td></tr><tr><td>E. Handwriting and Word Processing</td><td>D. Visual Arts</td></tr><tr><td>III. Speaking, Listening and Viewing</td><td></td></tr><tr><td>A. Speaking and Listening</td><td></td></tr><tr><td>B. Media Literacy</td><td></td></tr></table> <p>Complete Academic Standards are available at www.education.state.mn.us. Teachers who find other connections to academic standards are encouraged to contact <i>Minnesota Conservation Volunteer</i>.</p>	Language Arts	Science	I. Reading and Literature	Grade 4	A. Word Recognition, Analysis and Fluency	IV. Life Science	B. Vocabulary Expansion	B. Diversity of Organisms	C. Comprehension	Grade 5	II. Writing	IV. Life Science	A. Types of Writing	E. Biological Populations Change Over Time	B. Elements of Composition	F. Flow of Matter and Energy	C. Spelling	Arts	D. Research	Artistic Expression	E. Handwriting and Word Processing	D. Visual Arts	III. Speaking, Listening and Viewing		A. Speaking and Listening		B. Media Literacy	
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Preview

Use the KWL strategy (Ogle, 1986) to find out what your students already know (K) about salamanders, what (W) they would like to learn, and, eventually, what they learned (L) while reading the article and related materials, and through participating in extension activities. You might begin by asking small groups to brainstorm as many facts/ideas as possible. Then combine the groups for a class list. Display your K and W ideas on poster board or paper (see Vocabulary preview). Add to your L list as you read and discuss the article. See www.teach-nology.com/web_tools/graphic_org/kwl for a KWL generator that will produce individual organizers for your students. KWL also gives you the opportunity to introduce interdisciplinary connections you will make during extension activities. For example, if you plan to use the article during science or art you may ask students to review their KWL for concepts that are specific to those disciplines. An appropriate activity for older students involves building categories of knowledge that may be added to as students read the article and complete the study guide. Assign categories to small groups. Allow a few minutes for group discussion and then discuss as a class. Record the categories on posters and display. Add information as it emerges.

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Vocabulary preview

See the copy-ready vocabulary list included in this guide. It is suggested that you break the list into smaller lists because the vocabulary in this article may present significant challenges to your students. You may also wish to add words to or delete words from the list based on your knowledge of your students’ needs. 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 terms have not been included on the list.

Connections to vocabulary in the article may also be made during KWL. If students are not familiar with some of the terms, include them in the W list. Other terms may be added to the W list as they read the article. Eventually they can be moved to the L list. You may write vocabulary from the article in green ink, while other ideas are written in black. Notes: Some of the words in the vocabulary list definitions may require further explanation.

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 that 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

Questions in the study guide parallel the story. That is, the answer to the first question occurs first in the story, followed by the second, and so on. Read the study guide with your class before reading the story. Depending on the reading ability of the class, teachers might wish to read the story aloud and complete the study guide as a class or in small groups. Inclusion teachers might wish to provide direct support as their students read the story and complete the study guide. The study guide may also be used as a quiz. Note that items 1,3, 5, and 7 and the Challenge require varying degrees of critical/analytical thinking.

Adaptations

Read aloud to special needs students. Abbreviate study guide or highlight priority items to be completed first. For example, highlight questions 2, 4, 8, and 9. These questions concern basic salamander facts. Special needs students may try these first and, if time allows, try the others. Peer helpers, teaching assistants, or adult volunteers may lend a hand with the study guide. Study guide and enrichment/extension activities may also be done in small groups.

Assessment

Students may write a paragraph summarizing the life cycle of the tiger salamander. Students may compose a position paper on the declining salamander population, including causative factors and suggestions to restore populations (see #4 in Extension Activities). Ask students to write five questions not addressed in the study guide. Questions should require not only finding of facts, but also analysis-synthesis thinking (see Study Guide numbers 1, 3, and 5). Post-test vocabulary. Ask students to complete the L of KWL (see Preview).

Extension activities

1. Using colored pencils, students may draw one or more of the salamander species native to Minnesota. Graph paper will help students make life-size drawings.
2. Using the key word salamanders, students will find a wealth of information on the Internet. There are more than 350 known species worldwide. Students may compare and

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Extension activities continued

- contrast native Minnesota species with others from around the world.
3. Diagram the life cycle of salamanders with emphasis on change of habitat from larval to adult stages.
 4. Make a poster and give a presentation to the class about the threats to salamanders and what can be done to promote salamanders’ long-term survival. This makes a good small group project.
 5. Dig into the mystery of the spotted salamander in Minnesota. What does its discovery mean?
 6. Salamanders and newts make interesting pets. Keeping a salamander as a classroom pet allows students to observe physical characteristics and behavior. See Internet sources or local pet shops for more information.

Web resources

Salamander photos

www.mister-toad.com/photos/salamander/salamanderphotos.html

Minnesota amphibians

www.herpnet.net/Minnesota-Herpetology/

Amphibian checklist and identification guide

www.npwrc.usgs.gov/resource/herps/amphibid/index.htm

Spotted salamander in Minnesota

www.mndnr.gov/reptiles_amphibians/salamanders/spotted.html

Chicago Herpetological Society

www.inhs.uiuc.edu/cbd/herpdist/species/am_tigrinu.html

Eastern Tiger Salamander

http://herpcenter.ipfw.edu/index.htm?http://herpcenter.ipfw.edu/outreach/accounts/amphibians/salamanders/E_Tiger_Salamander/index.htm&2

Teacher resources

www.mndnr.gov/education/teachers/index.html

Related articles

Many related *Minnesota Conservation Volunteer* articles are available online at www.dnr.state.mn.us/volunteer/articles/index.html, including:

May–June 2008 (YN article with study guide)

“Spring to Life Ponds”

www.mndnr.gov/young_naturalists/ponds/index.html

“Four-toed Salamander”

January–February 2007

www.mndnr.gov/volunteer/janfeb07/mp.html

“Special Delivery”

March–April 2004 (YN article with study guide)

www.mndnr.gov/young_naturalists/eggs/index.html

References

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.

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Study Questions

“Six Slippery Salamanders,” by John J. Moriarty. Published in the May–June 2001 *Volunteer* or visit www.mndnr.gov/young_naturalists/salamanders/index.html.

Name _____ Period _____ Date _____

1. Why do you think Kentucky has more species of salamanders than does Minnesota? _____

2. Salamanders are _____. Lizards are _____.

3. Compare and contrast salamanders and lizards. How are they:

Similar? _____

Different? _____

4. Where in Minnesota can you find all six species of salamanders native to our state? _____

5. Why are salamanders disappearing? _____

6. Describe the life cycle of the tiger salamander. _____

7. What do you think would be a good nickname for salamander larvae? _____

8. If you are a tiger salamander larva, what predators must you watch out for? _____

9. If you are a lucky salamander, how long might you live? _____

10. Why is humidity important for salamanders? _____

Challenge: Pick one of the six species of salamanders native to Minnesota. Describe what it looks like, where you might find it, and any characteristics that make it unique. _____

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Study Questions Answer Key

“Six Slippery Salamanders,” by John J. Moriarty. Published in the May–June 2001 *Volunteer* or visit www.mndnr.gov/young_naturalists/salamanders/index.html.

1. Why do you think Kentucky has more species of salamanders than does Minnesota? **Kentucky has a habitat more favorable to salamanders.**
 2. Salamanders are **amphibians**. Lizards are **reptiles**.
 3. Compare and contrast salamanders and lizards. How are they similar? How are they different? **Answers will vary. They are both cold blooded, have four legs and long tails and lay eggs. They may share the same habitat at times. Salamanders have moist skin, while lizards, which are reptiles, have scales. Reptiles lay eggs with shells on land, while amphibians lay shell-less eggs in water.**
 4. Where in Minnesota can you find all six species of salamanders native to our state? **All six species can be found in northeastern Minnesota.**
 5. Why are salamanders disappearing? **Salamanders are disappearing due to loss of habitat and predation by fish.**
 6. Describe the life cycle of the tiger salamander. **Adult tiger salamanders hibernate in the winter. In the spring they move to ponds and wetlands, where they mate. The females lay thousands of eggs on the pond bottom. After 14 days the eggs hatch. The larvae live in the water for three to four months, during with time they morph into air-breathing animals. They spend the rest of their lives on land.**
 7. What do you think would be a good nickname for salamander larvae? **Answers will vary.**
 8. If you are a tiger salamander larva, what predators must you watch out for? **Dragonfly larvae, great blue herons, and even other salamander larvae prey upon salamander larvae.**
 9. If you are a lucky salamander, how long might you live? **Salamanders have been known to live 25 years.**
 10. Why is humidity important for salamanders? **Salamanders must keep their skin moist.**
- Challenge: Pick one of the six species of salamanders native to Minnesota. Describe what it looks like, where you might find it, and any characteristics that make it unique. **Answers will vary.**

Minnesota Comprehensive Assessments Practice Items

“Six Slippery Salamanders,” by John J. Moriarty. Published in the May–June 2001 *Volunteer* or visit www.mndnr.gov/young_naturalists/salamanders/index.html.

Name _____ Period _____ Date _____

1. The first salamander the author found in Minnesota was a _____.

- A. mudpuppy
- B. spotted salamander
- C. four-toed salamander
- D. tiger salamander

2. Why is the eastern newt considered dangerous? _____

3. Which of Minnesota’s six salamanders might you catch on a hook and line?

- A. The four-toed salamander
- B. The mudpuppy
- C. The tiger salamander
- D. The eastern newt

4. What makes mudpuppies unique among Minnesota salamanders? _____

5. If you wanted to take a salamander tour of the United States, where would you find the greatest variety?

- A. In the southern Appalachian Mountains
- B. Near Lake Superior
- C. In the high plains states
- D. At the New York City Zoo

Minnesota Comprehensive Assessments Answer Key

“Six Slippery Salamanders,” by John J. Moriarty. Published in the May–June 2001 *Volunteer* or visit www.mndnr.gov/young_naturalists/salamanders/index.html.

1. The first salamander the author found in Minnesota was a **A. mudpuppy**
2. Why is the eastern newt considered dangerous? **Its skin is toxic.**
3. Which of Minnesota’s six salamanders might you catch on a hook and line? **B. the mudpuppy**
4. What makes mudpuppies unique among Minnesota salamanders? **It has gills and lives in water its whole life.**
5. If you wanted to take a salamander tour of the United States, where would you find the greatest variety? **A. In the southern Appalachian Mountains**

Vocabulary

“Six Slippery Salamanders,” by John J. Moriarty. Published in the May–June 2001 *Volunteer* or visit www.mndnr.gov/young_naturalists/salamanders/index.html.

- Appalachian Mountains** low, wooded mountains ranging from New York to Georgia
- aquatic** living in or near water
- courtship** ritual mating behaviors displayed by one member of a species toward another
- hibernate** to spend the winter in a resting state
- larva** early form of an animal that must metamorphose into its adult form
- mammal** warm-blooded animal that feeds milk to its young
- metamorphosis** change in the form or structure of an animal from one life stage to the next
- mucous** membranes the lining of body passages, such as the sinuses
- species** similar animals that are able to breed with one another
- toxic** harmful, poisonous

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Vocabulary Study Cards

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

Where are the
Appalachian Mountains?

FOLD HERE

What are the
**mountains ranging from
New York to Georgia** called?

What does
aquatic
mean?

FOLD HERE

To **live in or near water**
is to be

What is
courtship?

FOLD HERE

What is **ritual mating
behavior displayed
by one animal toward
another** called?

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Vocabulary Study Cards

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

To
hibernate
is to

FOLD HERE

To spend the winter in a
resting state is to

What is
a larva?

FOLD HERE

What is an **early form**
of an animal that must
metamorphose into
its adult form called?

What is a
mammal?

FOLD HERE

A **warm-blooded animal that**
feeds milk to its young is a

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

What is
metamorphosis?

FOLD HERE

The change in the form or structure of an animal from one life stage to the next is called?

What are
mucous membranes?

FOLD HERE

Another name for the lining of body passages, such as the sinuses is?

A
species
is a

FOLD HERE

A group of similar animals that are able to breed with one another is a?

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Vocabulary Study Cards

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

To be
toxic
is to be

FOLD HERE

To be
harmful or poisonous
is to be?

FOLD HERE

FOLD HERE