

Teachers Guide

Prepared by Jack

Judkins, Bemidji

Area Schools,

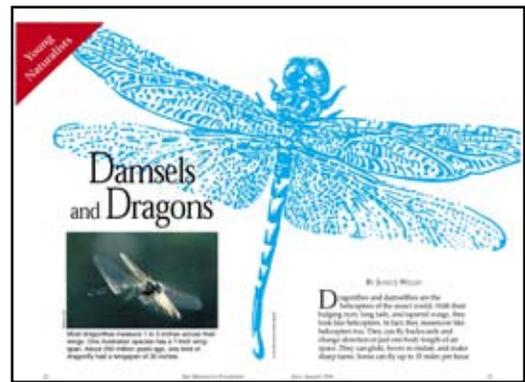
Bemidji, Minnesota

“Damsels and Dragons”

Multidisciplinary Classroom Activities

Teachers guide for the Young Naturalists article “Damsels and Dragons,” by Janice Welsh. Published in the July–August 1996 *Volunteer*, or visit www.dnr.state.mn.us/young_naturalists/dragons/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 to suit user needs. Users are encouraged to provide feedback through an online survey at www.mdnr.gov/education/teachers/activities/ynstudyguides/survey.html.



Summary

“Damsels and Dragons” describes the physical and behavioral characteristics of dragonflies and damselflies. Eighty-six species of dragonflies occur throughout Minnesota. Students also learn about a dragonfly’s life cycle as it metamorphoses from egg to adult, and about a Minnesota Department of Natural Resources naturalist, Mark Carroll, who has done research on dragonflies.

Suggested reading levels:

Upper intermediate through high school

Total words:

773

Materials:

Copies of article, study guide, drawing paper, colored pencils, pencils, glue, string, scissors

Preparation time:

About one hour

Estimated instructional time:

Two to three 50-minute class periods for preview, study guide, and assessment

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Minnesota Academic Standards applications:

“Damsels and Dragons” may be applied to the following Minnesota Department of Education Academic standards:

I. Reading and Literature

- A. Word Recognition, Analysis and Fluency
- B. Vocabulary Expansion
- C. Comprehension

II. Writing

- A. Types of Writing
- B. Elements of Composition
- C. Spelling
- D. Research
- E. Handwriting and Word Processing

III. Speaking, Listening and Viewing

- A. Speaking and Listening
- B. Media Literacy

Science

Grade 4

IV. Life Science

- B. Diversity of Organisms
Grade 5

IV. Life Science

- E. Biological populations change over time
- F. Flow of Matter and Energy
Grades 7, 9-12

IV. Life Science

- B. Diversity of Organisms
- C. Interdependence of Life
- E. Biological Populations Change Over Time
- F. Flow of Energy and Matter

Arts

Artistic Expression: Visual Arts

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

Preview

Ask students to compare and contrast dragonflies with helicopters (see attached illustration). Why are dragonflies called the helicopters of the insect world? Do your students think dragonflies inspired engineers to create the helicopter? Why or why not? Copy the illustrations and make a transparency for use during preview. Use the KWL strategy (Ogle, 1986) to find out what your students already know (K) about odonata, 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. You may wish to modify 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).

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 students 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. Also, preview the study questions for unfamiliar terms.

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 2, 5, 11, and 13 and the Challenge require varying degrees of critical/analytical thinking.

Adaptations

Read aloud to special needs students. Abbreviate the study guide or highlight priority items to be completed first. For example, highlight questions 1, 3, 6, 8, 11, and 13. Special needs students may try these first and then, if time allows, try the others. Peer helpers, teaching assistants, or adult volunteers may lend a hand with the study guide. Study guide and/or extension activities may also be done in small groups.

Assessment

You may use all or part of the study guide, combined with vocabulary, as a quiz. Other assessment ideas include: (1) Students may write an essay describing the dragonfly/damselfly life cycle, body structure, flight characteristics, or habitat. (2) Ask students to explain how wetland preservation/restoration affects dragonfly and damselfly survival. (3) Students may draw and label dragonfly/damselfly body parts. (4) Poster presentations may illustrate/describe the life cycle of dragonflies and damselflies and relationships with other organisms.

Extension activities

1. Students draw, color, and cut out dragonflies and damselflies that may then be suspended from the ceiling. There are a number of excellent sites on the Internet regarding dragonflies and damselflies. See the North American Dragonfly Migration Project for high-quality pictures of several species.

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Extension activities continued

2. Spring is a great time to study dragonflies, especially if your school is near a wetland. Have your class conduct a dragonfly watch during May and June. Identify the species and date of first observation. Note other flying insects present when dragonflies are observed.
3. Contact the Minnesota Odonata Survey Project (www.mndragonfly.org/). Your students can get involved in this DNR-supported project, which can be extended over future grades.
3. Compare the life cycle of mosquitoes and biting flies to dragonflies. See “What’s Eating You?” by Larry Weber in the July–August 2001 *Conservation Volunteer* (www.dnr.state.mn.us/young_naturalists/biting_bugs/index.html).
4. Discuss why groups all over the world are working to preserve dragonfly and damselfly habitat and to protect dragonflies.

Web resources

Insects

members.aol.com/YESbugs/bugclub.html
www.bugbios.com/entophiles/index.html

Dragonflies

www.hennepinparks.com/themes/2002.cfm
www.npwrc.usgs.gov/resource/distr/insects/dfly/index.htm
tolweb.org/tree?group=Odonata&contgroup=Pterygota

Related articles

Many related *Minnesota Conservation Volunteer* articles are available online at www.mndnr.gov/volunteer/articles/index.html, including:

May–June 2008

“Spring to Life Ponds”

www.dnr.state.mn.us/young_naturalists/ponds/index.html

March–April 2008

“The Magic of Morphing”

www.dnr.state.mn.us/young_naturalists/magic_morphing/index.html

July–August 2006

“Regal Fritillary (*Speyeria idalia*)”

www.dnr.state.mn.us/volunteer/julaug06/mp.html

July–August 2004

“Buggy Sounds of Summer”

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

March–April 2004

“Special Delivery”

www.dnr.state.mn.us/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

Teachers guide for the Young Naturalists article “Damsels and Dragons,” by Janice Welsh. Published in the July–August 1996 *Volunteer*, or visit www.dnr.state.mn.us/young_naturalists/dragons/index.html.

Name _____ Period _____ Date _____

1. Compare the flight patterns of dragonflies and helicopters. How are they similar? _____

2. Imagine you are describing a damselfly or dragonfly to someone who has never seen one. Include its physical appearance as well as its behavior. _____

3. Explain why a dragonfly is classified as an insect. _____

4. Draw a resting dragonfly and damselfly. Show how they are different. Label the legs, wings, head, thorax and abdomen. (Draw on attached sheet or on back of study guide.)

5. Where is the skeleton of a dragonfly? _____ How does its skeleton differ from yours? _____

6. How many species of dragonflies and damselflies are there around the world? _____

7. What is a dragonfly called immediately after it hatches from its egg? _____

8. The transformation from egg to adult is called what? _____

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9. How long can this transformation take for some dragonflies? _____

10. What do growing dragonflies eat? _____

11. Why should we work to preserve dragonfly habitat? _____

12. What do entomologists study? _____

13. Who is Mark Carroll and how did his interests as a child lead to his present occupation? _____

14. Think about your own interests. Might they prepare you for a future career? _____

How and in what field? _____

Challenge: Why do you suppose dragonflies have survived for 250 million years? _____

Study Questions Answer Key

Teachers guide for the Young Naturalists article “Damsels and Dragons,” by Janice Welsh. Published in the July–August 1996 Volunteer, or visit www.dnr.state.mn.us/young_naturalists/dragons/index.html.

1. Compare the flight patterns of dragonflies and helicopters. How are they similar? **Both can hover and fly in all directions.**
 2. Imagine you are describing a damselfly or dragonfly to someone who has never seen one. Include its physical appearance as well as its behavior. **Answers will vary, and may include that dragonflies and damselflies are insects with six legs, three body parts, and two pairs of wings; that they look and fly like helicopters; that they eat other flying insects.**
 3. Explain why a dragonfly is classified as an insect. **It has three body parts, six legs, two pairs of wings, and two antennae.**
 4. Draw a resting dragonfly and damselfly. Show how they are different. Label the legs, wings, head, thorax, and abdomen. (Draw on attached sheet or on back of study guide.) **Dragonflies rest with wings out (perpendicular to body). Damselflies rest with wings folded (in line with body).**
 5. Where is the skeleton of a dragonfly? **On the outside of its body** How does its skeleton differ from yours? **Answers will vary. Students may observe that dragonflies lack bones, and that they shed their exoskeletons during metamorphosis.**
 6. How many species of dragonflies and damselflies are there around the world? **5,500** How many in Minnesota? **86**
 7. What is a dragonfly called immediately after it hatches from its egg? **Nymph**
 8. The transformation from egg to adult is called what? **Metamorphosis**
 9. How long can this transformation take for some dragonflies? **Two years**
 10. What do growing dragonflies eat? **Tadpoles and minnows**
 11. Why should we work to preserve dragonfly habitat? **Dragonflies and damselflies help control mosquito populations. Other animals eat dragonflies and damselflies.**
 12. What do entomologists study? **Insects**
 13. Who is Mark Carroll and how did his interests as a child lead to his present occupation? **He is a DNR naturalist. He is still interested in insects.**
 14. Think about your own interests. Might they prepare you for a future career? How and in what field? **Answers will vary.**
- Challenge: Why do you suppose dragonflies have survived for 250 million years? **Answers may include that dragonflies have been well adapted to changing climate and habitat; that they have been able to find a variety of insect prey.**

Minnesota Comprehensive Assessments Practice Items

Teachers guide for the Young Naturalists article “Damsels and Dragons,” by Janice Welsh. Published in the July–August 1996 *Volunteer*, or visit www.dnr.state.mn.us/young_naturalists/dragons/index.html.

Name _____ Period _____ Date _____

1. Mark Carroll’s mother made him

- A. stop collecting bugs.
- B. a butterfly net.
- C. an old shoe box.
- D. promise not to get his feet wet.

2. Some other names for dragonflies include

- A. damsel flies and biddies.
- B. deer flies and darners.
- C. horse stingers and bee hawks.
- D. darning needles and bombers.

3. Dragonflies form a _____ with their legs in order to _____.

- A. basket; catch food
- B. basket; land on water
- C. web; perch on reeds
- D. point; dive into water

4. Explain how a dragonfly nymph’s lower jaw works. _____

5. A dragonfly’s top speed is _____ miles per hour.

- A. 75
- B. 55
- C. 35
- D. 15

Minnesota Comprehensive Assessments Answer Key

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1. Mark Carroll’s mother made him **B. a butterfly net**.
2. Some other names for dragonflies include **C. horse stingers and bee hawks**.
3. Dragonflies form a **A. basket** with their legs in order to **catch food**.
4. Explain how a dragonfly nymph’s lower jaw works. **The nymph’s lower unhinges and slides out like a drawer so it can eat big prey like tadpoles or minnows.**
5. A dragonfly’s top speed is **C. 35** miles per hour.

Vocabulary

Teachers guide for the Young Naturalists article “Damsels and Dragons,” by Janice Welsh. Published in the July–August 1996 *Volunteer*, or visit www.dnr.state.mn.us/young_naturalists/dragons/index.html.

abdomen hindmost or third insect body part

aquatic living in or near water

antennae pair of long, slender feelers on an insect’s head

biology study of living things and life processes

exoskeleton tough, protective outer body covering

hover fly in place as if suspended

metamorphosis a complete change in form

molt sheds skin or feathers

naturalist person who studies plants and animals in their natural surroundings

nymph young, incompletely developed insect

species similar animals that are able to breed with one another

thorax chest; middle of three insect body parts

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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.

An insect’s
abdomen
is its

FOLD HERE

An insect’s
**hindmost or
third body part**
is its

What does **aquatic** mean?

FOLD HERE

A plant or animal that
depends on water is

An insect’s
antennae
are

FOLD HERE

A **pair of long, slender
feelers on its head**
are an insect’s

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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.

The science of
biology
is the

FOLD HERE

The **study of living things**
and **life processes**
is called

An **exoskeleton** is

FOLD HERE

A **tough, protective outer**
body covering is an

To **hover**
means to

FOLD HERE

To **fly in place as**
if suspended is to

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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.

A dragonfly’s
metamorphosis is

FOLD HERE

When a dragonfly undergoes
a complete change in form
it is called a

When a damselfly
molts

FOLD HERE

When a damselfly
sheds its skin it

A **naturalist**
is a person who

FOLD HERE

A person who **studies plants
and animals in their
natural surroundings**
is called a

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Vocabulary Study Cards

Teachers guide for the Young Naturalists article “A Most Amazing River” by Mary Hoff. Published in the July–August 2008 *Volunteer*, or visit www.mndnr.gov/young_naturalists/mississippi

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.

An insect **nymph** is

FOLD HERE

A **young or incompletely developed** insect is a

A **species** is a group of

FOLD HERE

Similar animals that are able to breed with one another are a

An insect’s **thorax** is its

FOLD HERE

An insect’s **chest, or middle of three body parts** is its

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Vocabulary Study Cards

Teachers guide for the Young Naturalists article “A Most Amazing River” by Mary Hoff. Published in the July–August 2008 *Volunteer*, or visit www.mndnr.gov/young_naturalists/mississippi

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.

FOLD HERE

FOLD HERE

FOLD HERE