

Teachers Guide

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“Busy Biomes”

Multidisciplinary Classroom Activities

Teachers guide for the Young Naturalists article “Busy Biomes,” by Jan Welsh, with illustrations by Vera Ming Wong. Published in the January–February 1996 *Volunteer*, or visit www.dnr.state.mn.us/young_naturalists/biome/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

“Busy Biomes” gives readers a brief overview of Minnesota’s three plant and animal communities (biomes): prairie, deciduous forest, and coniferous forest. It serves as background knowledge for other articles in the January–February 1996 issue, which highlight Minnesota’s biomes (see Related Articles). Descriptions include geographic location and landforms, human history, and major plant and animal inhabitants. Detailed illustrations (see PDF version) invite close examination to discover the native plants and the animals hidden within them. Each section includes a question that may require some research to answer.

Suggested reading levels:

Third through eighth grades

Total words: 581

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Materials: DNR Biomes poster (see Preview), tagboard, markers, colored pencils, teachers’ resources at www.mndnr.gov/biomes/index.html, tag board, blank map of Minnesota (www.50states.com/maps/minnesota.htm).

Preparation time: One hour, not including time for extension activities

Estimated instructional time: Two 50-minute class periods (not including extensions)

Minnesota Academic Standards applications: “Busy Biomes” may be applied to the following Minnesota Department of Education 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 3

IV. Life Science

- B. Diversity of Organisms
 - C. Interdependence of Life
- 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

IV. Life Science

- B. Diversity of Organisms
- C. Interdependence of Life

Social Studies

II. Minnesota History

Grades 4–8

- A. Pre-contact to 1650
- B. Contact and Fur Trade 1600–1810
- C. Early Settlement and Statehood 1810–1860
- D. Civil War and Dakota War 1860–1864

V. Geography

Grades 4–8

- B. Globes and Maps
- C. Physical Features and Processes
- D. Interconnections

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*.

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Preview In preparing to teach “Busy Biomes,” teachers are encouraged to request the DNR Biomes poster, available free of charge at the DNR Information Center (651-296-6157 or 888-646-6367). Display the poster a few days before you read the article. Post a large piece of tagboard next to the poster and ask students to make notes on how Minnesota’s biomes differ. Begin your preview of the article by asking the class to imagine they are traveling from Luverne (in the far southwestern corner of Minnesota) to Ely (in the Arrowhead region). The students would traverse all three Minnesota biomes. Invite students to study the illustrations on pages 54–55 (prairie), 55–56 (deciduous forest) and 57–58 (coniferous forest). Challenge them to discover how topography, climate, plants, and animals change as they move from one biome to the next.

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 (the answer to the first question appears first in the article, followed by the second, and so on.) This is an important organizational tool for students and should be emphasized before you begin working on the study guide. Preview the entire guide with your class before you read the article. You may wish to read the story aloud and complete the study guide in class or in small groups. The questions may be assigned as homework, depending on the reading ability of your students. Inclusion teachers may provide more direct support to special needs students (see Adaptations section). The study guide may be also used as a quiz. Note: Items 3, 4, 7, 9, and 10 require varying degrees of analytical thinking.

Adaptations Read aloud to special needs students. There is no need to abbreviate the study guide or highlight priority items to be completed first, as is suggested in other YN teacher’s guides. Peer helpers, paraprofessionals, or adult volunteers may lend a hand with the study guide. Cooperative groups with close teacher supervision can also offer effective support to special needs students, especially for extension activities.

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Assessment You may use all or part of the study guide, combined with vocabulary, as a quiz. Other assessment ideas: (1) Ask students to write an essay comparing and contrasting prairie, deciduous forest and coniferous forest biomes. How are they different? How are they similar? (See www.mndnr.gov/biomes/comparison.html for a downloadable chart.) (2) Students may delineate and label the biomes on a blank map of Minnesota. (3) Ask students to select a plant or animal from the article. Design a poster that illustrates how that plant or animal is adapted to the biome(s) it inhabits. (4) Ask students to write three open response, true-false, or short answer questions from the article. Select the best questions to make a quiz written by students for students.

- Extension activities**
1. Invite a DNR naturalist to visit your classroom to discuss the biome in which your community is located. You may consult with the naturalist to develop a presentation that connects with your curricular goals.
 2. Visit a state park near you to discover firsthand the characteristics of the biome in your region of the state. If you are fortunate enough to live near the border of two biomes (teachers in northwestern Minnesota are a short drive from all three biomes), you may visit parks in each biome.
 3. Are there really four biomes in Minnesota? See www.myminnisotawoods.umn.edu/minnesota/minn_biomes.html for a University of Minnesota Extension Web site devoted to Minnesota’s four biomes. Students may present written, verbal, and/or graphic evidence in support of or against the inclusion of a fourth biome.
 4. Invite students to compare and contrast Minnesota’s biomes with North America, Central and South America, and the rest of the world. See Web sites below.
 5. This article fits well with Minnesota history academic standards A through D with respect to knowledge of Minnesota’s indigenous peoples and the impact of European settlement on their lives. Students may want to learn more about the Indian nations mentioned in the article. Several excellent resources are available (see Print Resources).

Web resources

Minnesota biomes

www.mn150years.org/biomes.html

www.cotf.edu/ete/modules/msese/earthsysflr/biomes.html

www.umcrookston.edu/academics/NatR/documents/Revisedbrochure_Layout1.pdf

Biomes in North America

www.uen.org/utahlink/tours/tourFames.cgi?tour_id=14051

fp.bio.utk.edu/botany120lect/Biomes/biomemap.htm

questgarden.com/48/08/3/070318080426/index.htm

www.lernerbooks.com/cgi-bin/books.sh/lernerpublishing.p?navaction=f6_series.w&navvalue=Series,0x0000000003125b80

Biomes of the world

www.dwm.ks.edu.tw/bio/activelearner/54/swfs/ch54c1.swf

users.rcn.com/jkimball.ma.ultranet/BiologyPages/B/Biomes.html

American Indian nations

www.bigorrin.org/cree_kids.htm

www.bigorrin.org/chippewa_kids.htm

Teacher resources

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

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Related articles

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

July–August 1998

“Last Stands of Big Woods”

www.mndnr.gov/volunteer/julaug98/bigwoods.html

January–February 1999

“Tallgrass Aspen Parkland”

www.mndnr.gov/volunteer/janfeb99/parkland.html

July–August 2005

“A Place Apart”

www.mndnr.gov/volunteer/julaug05/placeapart.html

Print resources

Levine, M. *The Ojibwe*. Minneapolis: Lerner Publishing, 2007.

Levine, M. *The Sioux*. Minneapolis: Lerner Publishing, 2007.

Regguinti, G. *Sacred Harvest*. Minneapolis: Lerner Publishing, 1992.

Robinson, D. *The Cree of North America*. Minneapolis: Lerner Publishing, 2002.

Waterman Wittstock, C. *Ininatig’s Gift of Sugar*. Minneapolis: Lerner Publishing, 1993.

References

Hock, M.F., Deshler, D.D. & Schumaker, J.B. *Strategic Tutoring*. Lawrence, Kan.: Edge Enterprises, 2000.

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Study Questions

“Busy Biomes,” by Jan Welsh, with illustrations by Vera Ming Wong. Published in the January–February 1996 *Volunteer*, or visit www.dnr.state.mn.us/young_naturalists/biome/index.html.

Name _____ Period _____ Date _____

1. Name two landforms for which Minnesota is famous. _____
2. List Minnesota’s three biomes from west to east: (1) _____
(2) _____ (3) _____
3. How did settlers from Europe change the prairie biome? _____

4. What are prairie potholes, and why are they important? _____

5. How does the climate change as you travel from the southwest to the northeast in Minnesota? _____

6. Maple, oak, and basswood are _____ trees
7. How did Native Americans’ use of the deciduous forest differ from that of people from Europe? _____

8. In the far north of Minnesota, what kind of trees grow? _____
9. Why do you think the north woods have remained wilder than the prairie or deciduous biomes have?

10. Can you name the biome in which your community is located? How do you know? Give at least three pieces of evidence to support your conclusion. _____

Challenge: How many plants and animals can you find in the illustrations on pages 54–55, 56–57, and 58–59? Work with a partner and keep and list.

Study Questions Answer Key

“Busy Biomes,” by Jan Welsh, with illustrations by Vera Ming Wong. Published in the January–February 1996 *Volunteer*, or visit www.dnr.state.mn.us/young_naturalists/biome/index.html.

1. Name two landforms for which Minnesota is famous. **Lakes and rivers**
2. List Minnesota’s three biomes from west to east: **(1) Prairie (2) Deciduous forest (3) Coniferous forest**
3. How did settlers from Europe change the prairie biome? **Answers may vary, but should include plowing the native grasses and planting crops. Changing the habitat led to the disappearance of large herd animals, such as the bison. Farming also conflicted with the Native American nomadic lifestyle.**
4. What are prairie potholes, and why are they important? **Prairie potholes are small lakes and marshes. They provide habitat for aquatic birds and animals.**
5. How does the climate change as you travel from the southwest to the northeast in Minnesota? **The climate becomes cooler and wetter as you travel from the southwest to the northeast.**
6. Maple, oak, and basswood are **deciduous** trees.
7. How did Native Americans’ use of the deciduous forest differ from that of people from Europe? **Answers may vary, but should include that Native Americans used natural sources of food, such as wild rice and maple sugar, while Europeans cut the trees for lumber and plowed the land for farming.**
8. In the far north of Minnesota, what kind of trees grow? **Aspen and birch, as well as coniferous trees like pines, spruces, and firs.**
9. Why do you think the north woods have remained wilder than the prairie or deciduous biomes have? **Answers may vary, but should include that the land and climate are not good for farming, so the region has not attracted as many people as farther south and west.**
10. Can you name the biome in which your community is located? How do you know? Give at least three pieces of evidence to support your conclusion. Answers will vary. **Students may cite a location on a map, a plant or animal that is unique to the region, climatic characteristics of the biome, or human activities that capitalize on the resources found there.**

Minnesota Comprehensive Assessments Practice Items

“Busy Biomes,” by Jan Welsh, with illustrations by Vera Ming Wong. Published in the January–February 1996 *Volunteer*, or visit www.dnr.state.mn.us/young_naturalists/biome/index.html.

Name _____ Period _____ Date _____

1. Spruce grouse are found in
 - A. the prairie biome.
 - B. the deciduous forest.
 - C. the coniferous forest.
 - D. southwestern Minnesota.
2. Cree Indians once lived near
 - A. the Canadian border.
 - B. the Iowa border.
 - C. the South Dakota border.
 - D. St. Paul, Minnesota.
3. True or false: Four million species of plants and animals live in Minnesota.
True False
4. The five-lined skink lives in the _____ biome.
 - A. coniferous forest
 - B. prairie
 - C. deciduous forest
 - D. none of the above - it is extinct
5. At one time elk lived in the _____ biome.
 - A. prairie
 - B. deciduous forest
 - C. coniferous forest
 - D. A and C

Minnesota Comprehensive Assessments Answer Key

“Busy Biomes,” by Jan Welsh, with illustrations by Vera Ming Wong. Published in the January–February 1996 *Volunteer*, or visit www.dnr.state.mn.us/young_naturalists/biome/index.html.

1. Spruce grouse are found in **C. the coniferous forest.**
2. Cree Indians once lived near **A. the Canadian border.**
3. True or false: Four million species of plants and animals live in Minnesota. True **False**
4. The five-lined skink lives in the **B. prairie biome.**
5. At one time elk lived in the **B. deciduous forest biome.**

Vocabulary

“Busy Biomes,” by Jan Welsh, with illustrations by Vera Ming Wong. Published in the January–February 1996 *Volunteer*, or visit www.dnr.state.mn.us/young_naturalists/biome/index.html.

- biome** region of vegetation that grows in a particular climate
- climate** average weather in a region over a period of years
- coniferous** trees with needles instead of leaves that produce seeds in cones
- Cree** large American Indian nation, living along the Minnesota-Canadian border and across Canada
- Dakota** largest tribe of the Sioux nation, living across southern and central Minnesota
- deciduous** trees with leaves that produce seeds in flowers
- Ojibwe** large American Indian nation, living in Michigan, Wisconsin, Minnesota, and southern Canada
- prairie** treeless, grass-covered plain

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.

What is a
biome?

FOLD HERE

**A region of vegetation that
grows in a particular
climate is a**

What does **climate**
mean?

FOLD HERE

**The average weather in a
region over a period of years
is the**

A **coniferous**
forest has

FOLD HERE

A forest with
**trees with needles instead
of leaves that produce
seeds in cones is**

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.

Who are the **Cree**
and where do they live?

FOLD HERE

**A large American Indian
nation living along the
Minnesota-Canadian border
and across Canada
is known as the**

Who are the
Dakota
and where do they live?

FOLD HERE

**The largest tribe of the Sioux
nation, living across
southern and central
Minnesota is known as the**

A **deciduous**
forest has

FOLD HERE

A forest with
**trees with leaves that
produce seeds in flowers is**

Vocabulary Study Cards

“Busy Biomes,” by Jan Welsh, with illustrations by Vera Ming Wong. Published in the January–February 1996 *Volunteer*, or visit www.dnr.state.mn.us/young_naturalists/biome/index.html.

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.

Who are the **Ojibwe** and where do they live?

FOLD HERE

A large American Indian nation living in Michigan, Wisconsin, Minnesota, and southern Canada is called the

A prairie biome is a

FOLD HERE

A treeless, grass-covered plain is a

FOLD HERE

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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.

FOLD HERE

FOLD HERE

FOLD HERE