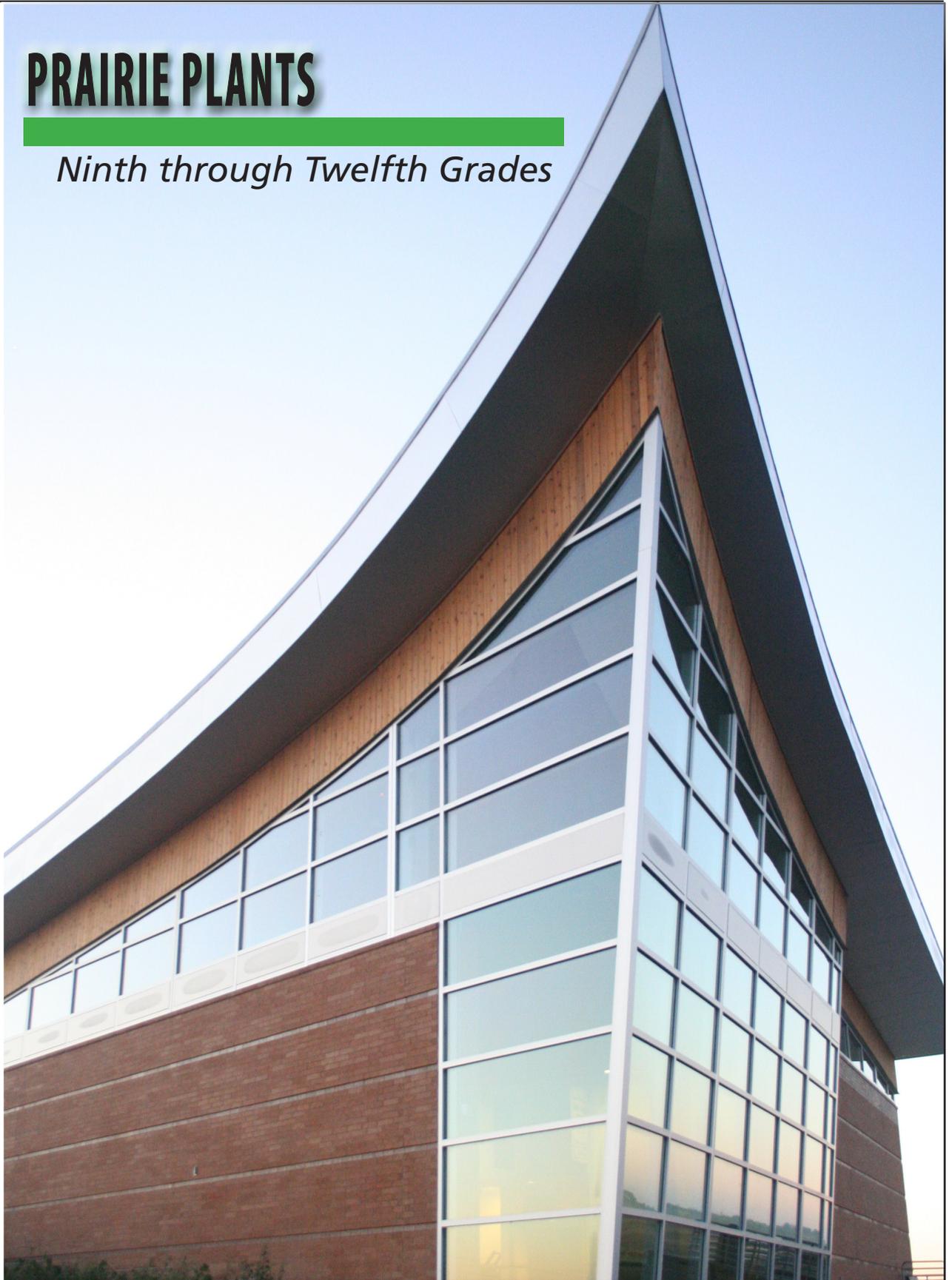


Free Land was the Cry!

PRAIRIE PLANTS

Ninth through Twelfth Grades



Homestead

National Park Service
U.S. Department of the Interior

Homestead National Monument
of America, Nebraska



ACKNOWLEDGEMENTS

Coordinator

Tina Miller, Education Coordinator,
Homestead National Monument of America

Teacher Ranger Teachers

Craig Rafert, Social Studies Teacher at Sutton, NE.
Ellen Janssen, Fourth Grade Teacher at Beatrice, NE.

Layout Artist

Shayde Goracke-Voller, Graphic Designer

Primary Author

Tina Miller, Education Coordinator, Homestead National Monument of America
Aubrey Streit Krug, University of Nebraska-Lincoln Graduate Student
Tracy Tucker, University of Nebraska-Lincoln Graduate Student

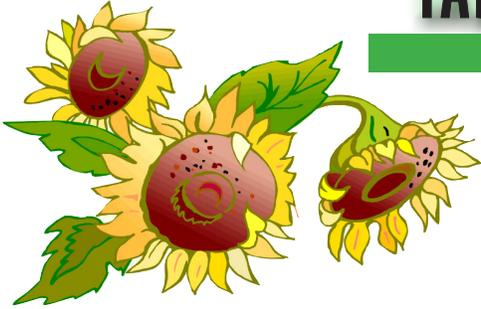
Interns

Sasha Denton, History major at Doane College
Andy Fuxa, Communications major at Nebraska Wesleyan University
Leah Goossen, Art major at the University of Nebraska-Lincoln

Our thanks to the following people
for their contributions to our project:

Merrith Baughman, Chief of Interpretation and Resource Management,
Homestead National Monument of America
Mark Engler, Superintendent, Homestead National Monument of America
Stuart Hollman, proofreader
Tricia Parker, Reading/Writing Director, Nebraska Department of Education
Deb Romanek, Mathematics Director, Nebraska Department of Education
Vicki Scow, World Language Education, Nebraska Department of Education
Summer Stephens, Director of Curriculum and Assessment, Beatrice Public Schools
Larry Starr, Director of Social Studies, Nebraska Department of Education
Jim Woodland, Director of Science, Nebraska Department of Education

TABLE OF CONTENTS



This unit has Pre-Visit Activities for teachers to use to prepare students for a visit to Homestead National Monument of America, a Ranger-Led Experience which will occur during your visit, and Post-Visit Activities for teachers to use to expand students' knowledge of the impact the Homestead Act of 1862 had on America.

Program Description	Page 4
Curriculum Objectives, National Standards	Page 5
Pre-Visit Activity #1: Prairie Plants.....	Page 6
Pre-Visit Activity #2: Exploring Prairie Plants	Page 7
Ranger-Led Experience	Pages 8, 9
Post-Visit Activity #1: Prairie Plants As Biofuel	Page 10
Character Education	Page 11
Additional Resources	Page 12

Some of the ideas in this lesson may have been adapted from earlier, unacknowledged sources without our knowledge. If the reader believes this to be the case, please let us know, and appropriate corrections will be made. Thank you.

PROGRAM DESCRIPTION



What is a tallgrass prairie and which plant species live there? How have these species adapted to survive the harsh conditions of the prairie environment? How has the human understanding of the prairie changed over time? How have humans impacted and used prairie plants?

Activities and field experiences in this program help students answer these questions by exploring the past and future of the plants that make up the tallgrass prairie.

The geologic history of the North American continent shaped the soil and climate that forms the prairies, making a region with high humidity, intense heat, and decreased rainfall. Prairie plants adapted to these environmental conditions (for ex-

ample, with roots that form a dense, rain-holding sod, and with tall leaves and stems that catch sunlight and more water) in order to withstand heat and drought and thrive in an extremely variable climate.

People throughout history have used prairie plants: American Indian cultures found medicinal uses, for instance, and now scientists are researching plants' potential to function as bio-fuel. Human settlement of the tallgrass prairie region has contributed both to the depletion and the restoration of plants in the prairie ecosystem.

By studying plants on the prairie, students not only learn to identify species and adaptive characteristics, but they also begin to understand prairie plants within the wider contexts of ecology and environmental history.

SPECIAL ICONS



Indicates a reproducible handout is included

Science



Indicates an additional science activity

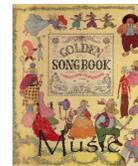


Indicates an additional math lesson

Social Studies



Indicates an additional social studies lesson



Indicates an additional music or art activity



Indicates an additional language arts lesson

CURRICULUM OBJECTIVES

- Students can form and test hypotheses and draw conclusions about the effects of environmental conditions on the growth of prairie plant seedlings.
- Students can participate in the process of scientific inquiry and communicate this process and their findings in a standard lab report.
- Students can identify the features, structure, and adaptations of a particular prairie plant.
- Students can explain how human settlement has impacted specific prairie plants, both in terms of depletion and restoration.
- Students can utilize various methods of research, consulting both textual and digital sources.
- Students can identify characteristics that make prairie grasses potentially suitable for fuel development.

NATIONAL STANDARDS

NS.9-12.1 SCIENCE AS INQUIRY

As a result of activities in grades 9-12, all students should develop

- Abilities necessary to do scientific inquiry
- Understandings about scientific inquiry.

NS.9-12.5 SCIENCE AND TECHNOLOGY

As a result of activities in grades 9-12, all students should develop

- Abilities of technological design
- Understandings about science and technology.

NS.9-12.6 PERSONAL AND SOCIAL PERSPECTIVES

As a result of activities in grades 9-12, all students should develop understanding of

- Personal and community health
- Population growth
- Natural resources
- Environmental quality
- Natural and human-induced hazards
- Science and technology in local, national, and global challenges.

NS.9-12.7 HISTORY AND NATURE OF SCIENCE

As a result of activities in grades 9-12, all students should develop understanding of

- Science as a human endeavor
- Nature of scientific knowledge
- Historical perspectives.

NL-ENG.K-12.3 EVALUATION STRATEGIES

- Students apply a wide range of strategies to comprehend, interpret, evaluate, and appreciate texts. They draw on their prior experience, their interactions with other readers and writers, their knowledge of word meaning and of other texts, their word identification strategies, and their understanding of textual features.

NL-ENG.K-12.7 EVALUATING DATA

- Students conduct research on issues and interests by generating ideas and questions, and by posing problems. They gather, evaluate, and synthesize data from a variety of sources (e.g., print and nonprint texts, artifacts, people) to communicate their discoveries in ways that suit their purpose and audience.

NSS-G.K-12.1 THE WORLD IN SPATIAL TERMS

As a result of activities in grades K-12, all students should

- Understand how to use maps and other geographic representations, tools, and technologies to acquire, process and report information from a spatial perspective.
- Understand how to use mental maps to organize information about people, places, and environments in a spatial context.
- Understand how to analyze the spatial organization of people, places, and environments on Earth's surface.

NSS-G.K-12.2 PLACES AND REGIONS

As a result of activities in grades K-12, all students should

- Understand the physical and human characteristics of places.
- Understand that people create regions to interpret Earth's complexity.
- Understand how culture and experience influence people's perceptions of places and regions.

NSS-G.K-12.5 ENVIRONMENT AND SOCIETY

As a result of activities in grades K-12, all students should

- Understand how human actions modify the physical environment.
- Understand how physical systems affect human systems.
- Understand the changes that occur in the meaning, use, distribution, and importance of resources.

Pre-Visit Activity #1 (suggested)

PRAIRIE PLANTS

Experimenting With The Environment of Prairie Plants

Evaluate students' prior knowledge about prairie plants and the prairie environment. If it is limited, assign a reading such as Bragg's "The Physical Environment of Great Plains Grasslands."

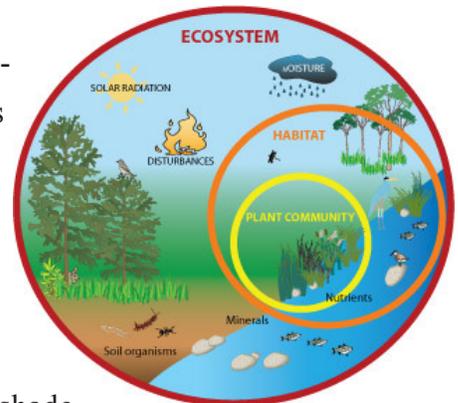
Design or guide students in designing an experiment to test hypotheses about how prairie plants react to different conditions or events within their environment. Students can help identify materials needed, steps in the experiment, and a timeline.

For example: after making hypotheses about the results, students could germinate seedlings and then using control groups, subject

seedlings to different variables such as shade

of a canopy, fire, grazing/mowing, etc. After documenting the effect

upon the growth rate and survival of these seedlings, students should draw conclusions about the validity of their hypothesis. Finish the project by having students write a standard lab report of hypothesis, methods, observations and data, and conclusion.



For a sample version of an experiment to adapt to your classroom, see the PBS activity "Growing Prairie" at <http://www.pbs.org/saf/1106/teaching/teaching.htm>.



EXPLORING PRAIRIE PLANTS

Pre-Visit Activity #2 (suggested)

Deep Maps of Prairie Plants

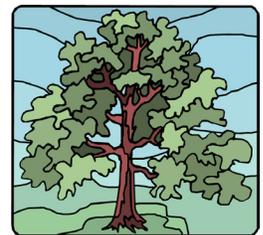
Assign individuals or small groups to collaborate on researching a single prairie plant: big bluestem, bur oak, milkweed, etc. They should draw research from a variety of sources—scientific guidebooks, literary and historical studies, books and web pages, etc.—to compile an interdisciplinary “deep map” of knowledge about their chosen plant. (For examples of sources on various plants, see Additional Resources.)

A “deep map,” according to Wikipedia, is “an emerging practical method of intensive topographical exploration.” Deep maps can combine visual representations with text that incorporates research from a variety of disciplines. Deep maps focus on a particular, small place, but seek to explore the deep, numerous layers of stories and facts that make up that place. For more information, see http://en.wikipedia.org/wiki/Deep_map.

For this activity, students’ “deep map” should illustrate and describe:

- 1) the plant’s features and structure;
- 2) its adaptations to its environment;
- 3) historical and modern understandings, connotations and uses of the plant (American Indians, homesteaders, present culture); and
- 4) the status of the plant’s population and its habitat, including restoration efforts.

The deep map could be in the form of a collage/poster display with text, and could be presented to the class or displayed. Students could also write a narrative about the process of “deep mapping” itself to reflect upon their learning and their research style/capabilities.



RANGER-LED EXPERIENCE



RANGER-LED EXPERIENCE

Homestead's Restored Tallgrass Prairie

Most of the native prairie sod in the United States was plowed up for farm land by early farmers. There still exist some scattered remnants of native prairie, but they are few. The tallgrass prairie at Homestead National Monument of America is a restored tallgrass prairie. When Congress established the site in 1936, the uplands of the monument were eroded due to continual plowing and the drought of the 1930s.

The National Park Service decided to restore the tallgrass prairie to give visitors an idea of what homesteaders found in the "Great American Desert." The restoration continues and the National Park Service manages this area as a prairie.

Students will watch a PowerPoint while a Ranger explains how the tallgrass prairie was restored and how it is currently being maintained. Next the students will go on a Ranger-led hike.

Note: Explain to students that they can not pick or remove any plants from the Monument as it is a protected area.

Explain that if we let

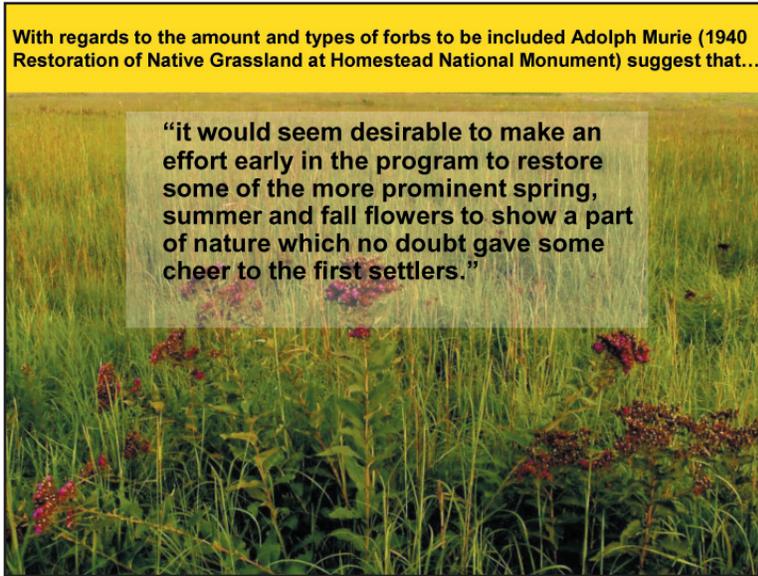
everyone who came to visit the Monument pick a grass or a forb, then eventually there would be none left. Ask students if they can think of other reasons why not to pick the plants on the prairie.

An additional activity would be to have students bring a notebook or sketchbook to record their thoughts and observations.

(photo on left) A post and rail fence through the restored tallgrass prairie marks the boundary of the Freeman homestead.

With regards to the amount and types of forbs to be included Adolph Murie (1940 Restoration of Native Grassland at Homestead National Monument) suggest that...

"it would seem desirable to make an effort early in the program to restore some of the more prominent spring, summer and fall flowers to show a part of nature which no doubt gave some cheer to the first settlers."



Homestead National Monument of America is proud to be a pioneer in distance learning technology.

Contact the Education Coordinator at (402) 223-3514 to schedule your virtual field trip on Prairie Plants.

Post-Visit Activity #1 (suggested)

PRAIRIE PLANTS AS BIOFUEL

In small groups or individually, students will utilize both textual and digital sources to explore research on native prairie grasses and biofuel development.

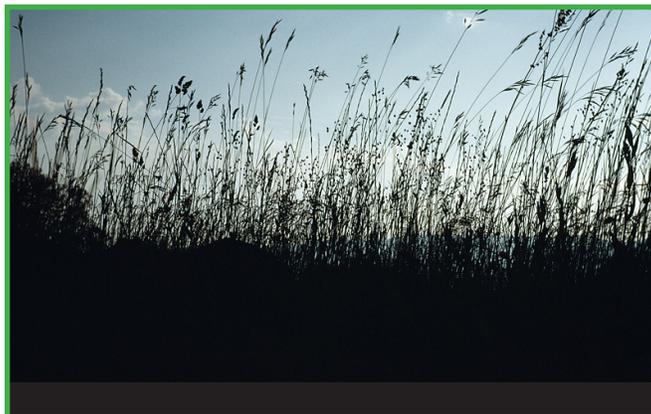


For an article on biofuels' potential to convert even more grassland to cropland; consideration of prairie species as biofuel source visit here: <http://www.sciencedaily.com/releases/2009/10/091001081307.htm>

A guide for farmers considering planting native species for biofuel crops. An in depth look at the process; students would be able to make some judgments about feasibility and outcomes with this information: http://mnproject.org/publications/Biofuels_from_New_Prairies_BSchneider.pdf

Students should take notes of the sources they read in order to gain the necessary knowledge to develop their own contribution to the public discussion on this topic.

For example, a student might craft a well-supported argument in the form of an op-ed, a letter to the editor, an informational PowerPoint or web page, etc.



CHARACTER EDUCATION

CARING

Caring students help, give, love, and are kind. You can tell a person is caring by what she or he does. They are caretakers of people, pets, plants, possessions and our planet, Earth.

5 Minute Focus

Biologists have found that as many as thirty different insects may live part of their life on a particular prairie plant.

- Why should prairie land be saved or restored?
- Are there still plants and animals to be discovered?
- What uses might there be for prairie plants?
- How can I become involved in caring for plants in my community?

ADDITIONAL RESOURCES

Bragg, Thomas B. “The Physical Environment of Great Plains Grasslands.” *The Changing Prairie: North American Grasslands*. Ed. by Anthony Joern and Kathleen H. Keeler. New York: Oxford UP, 1995. 49-81.

A thorough and somewhat technical examination of the geography and physical characteristics of the prairie, including precipitation and water cycle (including evapotranspiration and soil conditions) as well as fire on the prairie, plants, and the intersection of all of these. Charts and maps further clarify.

Cain, Kathleen. *The Cottonwood Tree: An American Champion*. Boulder: Johnson Books, 2007.

<http://herb.umd.umich.edu/>

Ethnobotany site; input prairie plant names, database returns American Indian uses for the plant, along with tribal affiliation.

http://mnproject.org/publications/Biofuels_from_New_Prairies_BSchneider.pdf

A guide for farmers considering planting native species for biofuel crops. An in depth look at the process; students would be able to make some judgments about feasibility and outcomes with this information.

<http://www.pbs.org/saf/1106/teaching/teaching.htm>.

A sample version of an experiment to adapt to your classroom would be this PBS activity “Growing Prairie”

<http://www.sciencedaily.com/releases/2009/10/091001081307.htm>

An article on biofuels’ potential to convert even more grassland to cropland; consideration of prairie species as biofuel source.

Knopp, Lisa. “In the Corn.” *Interior Places*. Lincoln: University of Nebraska Press, 2008. 103-119.

Knopp, Lisa. “The Memory of Trees.” *The Nature of Home*. Lincoln: University of Nebraska Press, 2002. 29-38.

Ladd, Doug. *Tallgrass Prairie Wildflowers 2: A Field Guide to Common Wildflowers and Plants of the Prairie Midwest* (Falcon Guides Wildflowers).Falcon, 2005.

Gruchow, Paul. *Grass Roots: The Universe of Home*. Minneapolis: Milkweed Editions, 1995.

Least Heat Moon, William. *PrairyErth (a deep map)*. Boston: Houghton Mifflin, 1991. “With the Grain of the Grid,” 279-287 (Osage Oranges). “In Kit Form: The Cottonwood Chapter,” 326-333 (cottonwoods). “Beneath a Thirty-Six-Square Grid,” 194-201 (grasses). “Ex Radice,” 237-243