



Newspapers In Education

The Seattle Times



Inspiring Students To Learn

Seasons of Life and Land

THE ARCTIC NATIONAL WILDLIFE REFUGE



A Newspapers In Education program for grades 7 – 10



SCIENCE

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"Arctic National Wildlife Refuge: Seasons of Life and Land"

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NIE Program Evaluation

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The Burke Museum Education Division and Newspapers In Education is committed to providing educators with high quality resources. To help us better serve your needs, please take the time to fill out this survey and return it to one of the addresses below. Feel free to add any advice or comments to this page.

1. Number of students _____ and classes _____
_____ served by this curriculum

2. Grade level _____ and subject _____
_____ (i.e.: 8th grade social studies)

3. In what county is your school located? _____

4. This curriculum's contents...
(1=disagree strongly; 3=neutral; 5=agree strongly)

a) were practical and informative
 1 2 3 4 5

b) were appropriate for my grade level
 1 2 3 4 5

c) were what you expected
 1 2 3 4 5

d) helpful in reaching the state's standards
 1 2 3 4 5

7. How did you learn about this material ?
 word of mouth mailings/brochure
 museum visit Web site
 paper/media
other: _____

8. Did the use of the newspaper enhance your students' learning experience?
 Strongly Agree
 Agree
 Disagree
 Strongly Disagree
 Don't Know
Comments: _____

9. Do you feel that the newspaper-based activities in the in-paper NIE articles helped support the learning objectives of the program?

- Strongly Agree
- Agree
- Disagree
- Strongly Disagree
- Don't Know

Comments: _____

10. How often did you use the newspaper with this program?

- Daily
- Three times a week
- Twice a week
- Once a week

Other: _____

Please! Even if you don't answer anything else ...

GENERAL COMMENTS

Return completed evaluation form ...

By mail: NIE The Seattle Times Company P.O. Box 70 Seattle, WA 98111	Or by fax: 206/515-5615
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Thank you.



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About the Program

Welcome to *Seasons of Life and Land — The Arctic National Wildlife Refuge*, a cooperative effort of The Seattle Times Newspapers In Education (NIE) and the Burke Museum of Natural History and Culture. The following lesson plans tie into the traveling exhibit, **Arctic National Wildlife Refuge: Seasons of Life and Land**, which is at the Burke from June 23 to December 31, 2005. The exhibit focuses on one of the nation's most controversial landscapes, the 19.8-million-acre Arctic National Wildlife Refuge (the Refuge). Located in the northeast corner of Alaska, the Refuge has one of the richest diversities of animal life in the circumpolar north, as well as some of the most spectacular and wild scenery. It also may contain large reservoirs of petroleum, which some say are essential for the United States to lessen dependence on foreign oil.

People have been debating protection or development of the Refuge for more than 50 years. The arguments boil down to a battle between oil and wilderness: is the oil under the Refuge worth destroying a landscape that is one of the country's best examples of wilderness? Subhankar Banerjee's photographs address this debate explicitly by showcasing the land's beauty and the great diversity of life that lives in and visits the Refuge. In particular, his winter photographs reveal that the area has a year-round richness that few had seen and fewer had photographed.

These lesson plans introduce students to the cultural and natural history of the Refuge. They can be used by teachers of grades 7 to 10. Each lesson is self-contained, with background material, a detailed plan of action and all necessary handouts. The goal of this curriculum is to encourage students to focus on the Refuge and the stories the land and people tell. Students will have the chance to work individually, in small groups and as a classroom. They will be challenged; these lessons often require them to draw on their previous experiences and to seek out additional material.

The lessons can be used in any order, although Activity 5, Drama in the Refuge, is oriented toward

tying together the various natural, cultural and political issues in the debate over the future of the Refuge. The lessons relate to articles that appear in The Seattle Times between October 25, 2005 and December 6, 2005.

In developing this curriculum, we have chosen not to focus on the controversial aspects of the Refuge. The concepts and ideas in the activities could apply to many areas in the Arctic. We do, however, encourage teachers and/or students to delve deeper into the Refuge's controversies and have tried to include a thorough list of Web sites and books for further research, which could be used to foster debate. We have chosen not to use the acronym, ANWR, as a place name in this curriculum. The Arctic Refuge is a National Wildlife Refuge, federally protected for the purpose of preserving unique wildlife, wilderness and recreation values, and to remind ourselves of its rarity we refer to it as the Refuge.

The lessons in this guide have been developed to draw from multiple disciplines, such as art, science, drama and writing; address different learning styles; and help your students meet Washington State's Essential Academic Learning Requirements (EALRs). You can help us develop future projects by sending us your thoughts and comments on the Evaluation Form we have provided with this packet. Your students' comments and feedback are encouraged as well. You may return this to either the Burke Museum or The Seattle Times NIE program.

For teachers who want to explore additional aspects of the Refuge, the Burke Education division offers tours of the traveling exhibit, **Arctic National Wildlife Refuge: Seasons of Life and Land**. The Burke Museum also offers hands-on, classroom study collections on the Arctic containing artifacts, slides, video and other materials. Additionally, a series of public programs and lectures have been scheduled throughout the fall of 2005, all suitable for your students. Program information is available at www.burkemuseum.org.



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About the Curriculum Designer:

David B. Williams is a freelance writer based in Seattle. He writes about the natural world for local and national publications and is the author of the recently published "The Street-Smart Naturalist: Field Notes from Seattle" and "The Naturalist's Guide to the Canyon Country." He works part-time at the Burke Museum, teaching and writing curriculum.

This curriculum was developed by the education staff at the Burke Museum of Natural History and Culture, with contributions from Rebecca Blacher and Timothy Stetter. The following people provided critical advice and support, and without them this set of lesson plans would not have been possible: Subhankar Banerjee, Brooke Boswell, Nate Mantua, Diane Quinn, David Secord and Andrew Whiteman.

ABOUT THE SPONSORS

The Burke Museum

The Burke Museum's mission is to create a better understanding of the world and our place in it. The museum is responsible for Washington state collections of natural history and cultural heritage, and for sharing the knowledge that makes them meaningful. The Burke welcomes a broad and diverse audience and provides a community gathering place that nurtures life-long learning and encourages respect, responsibility and reflection.



The Seattle Times Newspapers In Education

The Seattle Times Newspapers In Education program is dedicated to building literacy and supporting kindergarten through college-level educators in the Puget Sound community. We offer FREE newspapers and learning materials in a variety of subjects, including literacy, social studies/current events, science and life skills. To find out more about our programs, visit seattletimes.com/nie. To have our Outreach Specialist, Gloria Hiten, come to your classroom, call 206/652-6341. She can conduct staff development sessions on how to use the newspaper or lead a newspaper-based activity with your students.



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Essential Academic Learning Requirements

The activities in this guide use the following EALRS to meet Washington State learning objectives.

Writing

1. The student writes clearly and effectively.

To meet this standard, the student will:

- 1.1 Develop concept and design. Develop a topic or theme; organize written thoughts with a clear beginning, middle and end; use transitional sentences and phrases to connect related ideas; write coherently and effectively.
- 1.2 Use style appropriate to the audience and purpose. Use voice, word choice and sentence fluency for intended style and audience.

2. The student writes in a variety of forms for different audiences and purposes.

To meet this standard, the student will:

- 2.2 Write for different purposes, such as telling stories, presenting analytical responses to literature, persuading, conveying technical information, completing a team project and explaining concepts and procedures.
- 2.3 Write in a variety of forms, including narratives, journals, poems, essays, stories, research reports and technical writing.

Reading

1. The student understands and uses different skills and strategies to read.

To meet this standard, the student will:

- 1.1 Use word-recognition skills and strategies to read and comprehend text.
- 1.2 Use vocabulary (word meaning) strategies to comprehend text.

2. The student understands the meaning of what is read.

To meet this standard, the student will:

- 2.1 Demonstrate evidence of reading comprehension.
- 2.3 Expand comprehension by analyzing, interpreting and synthesizing information and ideas in literary and informational text.

3. The student reads different materials for a variety of purposes.

To meet this standard, the student will:

- 3.1 Read to learn new information.
- 3.2 Read to perform a task.
- 3.4 Read for literary/narrative experience in a variety of genres.

Geography (High School)

2. The student uses maps, charts and other geographic tools to understand the spatial arrangement of people, places, resources and environments on Earth's surface.

To meet this standard, the student will:

- 2.2.3 Analyze how social, cultural and economic influences shape the physical features of places and regions.

3. The student observes and analyzes the interaction between people, the environment and culture.

To meet this standard, the student will:

- 3.1 Identify and examine people's interaction with and impact on the environment.



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- 3.1.3a Analyze and evaluate the positive benefits and negative consequences of people's different uses of the environment (Human/Environment Interaction, Region).
- 3.1.3b Analyze how environmental knowledge and responsible action can encourage species' survival in the midst of air, water and land issues (Human/Environment Interaction, Region).
- 3.2 Analyze how the environment and environmental changes affect people.
 - 3.2.3a Detect and interpret how changes in the physical environment enhance or diminish its capacity to support human activity.
 - 3.2.3b Analyze how technological innovation may both solve environmental problems and create new ones.
- 3.3 Examine cultural characteristics, transmission, diffusion and interaction.
 - 3.3.3a Evaluate how the numerous subcultures that comprise a national culture interact and examine the consequences of their interaction.
 - 3.3.3b Analyze how peoples' responses to policy debates are shaped by cultural influences.
- 1.2.1 Analyze how systems function, including the inputs, outputs, transfers, transformations and feedback of a system and its subsystems.
 - (7) Describe the flow of matter and energy through a system (i.e., energy and matter inputs, outputs, transfers, transformations).
 - (8) Describe the interactions and influences between two or more simple systems.
 - (9) Describe the function of a system's parts or subsystems.
 - (9) Explain inputs, outputs, transfers, transformations and feedback of matter, energy and information in a system.
 - (10) Explain the interconnections between a system's parts or subsystems.
- 1.2.10 Understand how organisms in ecosystems interact with and respond to their environment and other organisms.
 - (7) Describe how energy flows through a food chain or web.
 - (7) Describe how substances such as air, water and mineral nutrients are continually cycled in ecosystems.
 - (7) Explain the role of an organism in an ecosystem (e.g., predator, prey, consumer, producer, decomposer, scavenger, carnivore, herbivore, omnivore).
 - (7) Describe how a population of an organism responds to a change in its environment.
- 1.3.10 Analyze the living and nonliving factors that affect organisms in ecosystems.
 - (9) Describe how population changes cause changes in the

Science

1. **Systems: The student knows and applies scientific concepts and principles to understand the properties, structures and changes in physical, earth/space and living systems.**

To meet this standard, the student will:

- 1.2.1 Analyze how the parts of a system interconnect and influence each other.
 - (6) Explain how the parts of a system interconnect and influence each other.
- 1.3.10 Analyze the living and nonliving factors that affect organisms in ecosystems.
 - (9) Describe how population changes cause changes in the



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cycle of matter and the flow of energy in ecosystems.

- (9) Describe the living and nonliving factors that limit the size and affect the health of a population in an ecosystem.

2. Inquiry: The student knows and applies the scientific ideas, skills, processes of investigation and the nature of science.

To meet this standard, the student will:

2.1.1 Understand how to generate and evaluate questions that can be answered through scientific investigations.

- (9, 10) Generate a new question that can be investigated with the same materials and/or data as a given investigation.
- (9, 10) Generate questions and critique whether questions can be answered through scientific investigations.

3. Application: The student knows and applies science ideas and inquiry to design and analyze solutions to human problems in societal contexts.

To meet this standard, the student will:

3.1 Design Solutions: Apply knowledge and skills of science and technology to design solutions to human problems or meet challenges.

3.1.1 Analyze local, regional, national or global problems or challenges in which scientific design can be or has been used to design a solution.

- (9, 10) Explain how science and technology could be used to solve all or part of a human problem and vice versa (e.g., understanding the composition of an Earth material can be useful to humans, such as copper ore being used to make copper wire).
- (9, 10) Describe an appropriate question that could lead to a possible solution to a problem.

3.1.3 Evaluate consequences, constraints and applications of solutions to a problem or challenge.

- (9, 10) Explain the consequences of the solution(s) to the problem or challenge (e.g., doubling the fertilizer will probably not double the plant growth and could cause harm to the ecosystem).
- (9, 10) Compare and evaluate the effectiveness of different solutions to a problem or challenge based on criteria, using scientific concepts and principles.

3.2 Science, Technology and Society:

Analyze how science and technology are human endeavors, interrelated to each other, to society and to the workplace and the environment.

3.2.1 Analyze how scientific knowledge and technological advances discovered and developed by individuals and communities in all cultures of the world contribute to changes in societies.

- (9) Explain how life has changed throughout history because of scientific knowledge and technological advances from a variety of peoples.
- (10) Compare the impacts of diverse cultures and individuals on science and technology.

3.2.4 Analyze how human societies' use of natural resources affects the quality of life and the health of ecosystems.

- (6, 7, 8) Discriminate between renewable and nonrenewable resources in an ecosystem.
- (6, 7, 8) Explain the effects that the conservation of natural resources has on the quality of life and the health of ecosystems.
- (6, 7, 8) Explain the effects of various human activities on the health of an ecosystem and/or the



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ability of organisms to survive in that ecosystem (e.g., consumption of natural resources; waste management; urban growth; land use decisions; pesticide, herbicide or fertilizer use).

- 3.2.4 Analyze the effects human activities have on Earth's capacity to sustain biological diversity.
- (9, 10) Explain how the use of renewable and nonrenewable natural resources affects the sustainability of an ecosystem.
 - (9, 10) Explain how human activities affect Earth's capacity to sustain biological diversity (e.g., global warming, ozone depletion).