

FOREST GRUMP: Examining How Deforestation Affects Plants and Animals of the Canadian Boreal

BASED ON THE ARTICLE:

For Billions of Birds, an Endangered Haven, By JAMES GORMAN, September 24, 2003 URL: http://www.nytimes.com/learning/teachers/featured_articles/20030924wednesday.html

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GRADES: 6-12

SUBJECTS: Geography, Science

OVERVIEW OF LESSON PLAN:

In this lesson, students consider the definition of an ecosystem as it relates to the Canadian boreal, discover how deforestation is affecting this forest and recreate ecosystems found in this forest. Then, students will write persuasive letters urging politicians or business people to help save the forest.

SUGGESTED TIME ALLOWANCE:

1 hour

OBJECTIVES:

Students will:

1. Consider the definition of an ecosystem, its parts, and how these parts can be affected when the ecosystem is endangered.
2. Examine dangers being faced by the Canadian boreal forest by reading and discussing "For Billions of Birds, an Endangered Haven."
3. In pairs, create dioramas illustrating a variety of ecosystems found in the Canadian boreal.
4. Individually, write persuasive letters convincing politicians or business people to help save the boreal.

RESOURCES / MATERIALS:

- pens/pencils
- paper
- classroom blackboard
- copies of "For Billions of Birds, an Endangered Haven" (one per student)
- resources about ecosystems in forests (science textbooks, computers with Internet access, etc.)
- empty shoeboxes (one per pair)
- colored paper or crafts materials (enough for students to share)

- glue
- scissors

ACTIVITIES / PROCEDURES:

1. WARM-UP/DO NOW: In their journals, students respond to the following prompt (written on the board prior to class): "According to Merriam-Webster Dictionary (http://www.m-w.com), an ecosystem is 'the complex of a community of organisms and its environment functioning as an ecological unit.' In your own words, what does this mean? What factors may affect an ecosystem? What specifically could be affected if the ecosystem is endangered?" After a few minutes, allow students to share their responses. Based on the responses, ask the class to focus their attention on forests and the dangers that they face today. Explain that deforestation is a large issue that is currently being addressed at the 12th World Forestry Congress.

2. As a class, read and discuss the article "For Billions of Birds, an Endangered Haven," focusing on the following questions:

- What organisms are leaving the forests of Canada?
- Where will they go?
- How large is the Canadian boreal?
- What is the goal of conservationists at the 12th World Forestry Congress?
- What do three major conservation groups hope to achieve through this congressional meeting?
- What is being compared to the percentage of forested land being lost each year in a report by Keith A. Hobson?
- Where is the boreal forest?
- What do the Canadian boreal forest and the Amazon and Congo forests have in common?
- What types of ecosystems exist in the boreal forest?
- What percentage of the boreal is water?
- How many acres have been logged in the forest since 1975?
- Which five organizations or groups are hopefully going to be a part of Greenpeace's initiative?
- What habits can people develop to help protect the boreal?
- What is Alberta-Pacific Forest Industries doing to help protect the boreal?
- What three man-made activities affect the boreal the most?

3. In pairs, students will create dioramas illustrating the various ecosystems that can be found in the Canadian boreal. Assign each pair a water or "wet" ecosystem, such as bogs, fens, wetlands, ponds, marshes, or a "dry" ecosystem, such as black spruce/redwood stands, deciduous forests (aspen, birch, maple, oak), or coniferous forests (spruce, white pine, red pine, fir tree). If desirable, students can differentiate within these forests, looking at different layers that can be explored, such as canopies, or by location or status in the forest, such as open woodland, forest edge, old growth, or secondary growth. Explain that each system is home to specific plants and animals. Be sure to include species that are listed in the New York Times article. Besides searching

for physical illustrations of the plants and animals to include in their dioramas, encourage students to answer the following questions:

- Where in the Canadian boreal is this ecosystem located?
- How does the weather affect your ecosystem?
- What animals and plants are native to your assigned ecosystem?
- How is this ecosystem affected by logging, mining and drilling?
- What can be done to help your ecosystem?

Students should use the crafts materials to complete and decorate their dioramas. If necessary, students may provide labels to explain their diorama depictions. When finished, dioramas should be displayed around the classroom.

4. WRAP-UP/HOMEWORK: Students should copy the following before leaving class (written on the board for easier student access): "Write a letter to a local government official, or member of the oil, gas or paper industry, persuading them to help save the boreal forest. Be sure to explain both short and long term problems, as well as the benefits of supporting this cause." In a future class, students may share their letters with their peers. Also, if desired, students may send their letters to their subjects.

DISCUSSION QUESTIONS:

--How do birds know when to migrate?

--Why have industries like logging, mining and drilling for oil and gas grown so much?

--What factors are contributing to the decline of tropical rain forests?

EVALUATION / ASSESSMENT:

Students will be evaluated based on initial journal entries, class and group discussions, thoughtful research and completion of dioramas, and effective letters persuading officials to involve themselves in the fight to save the boreal.

VOCABULARY:

vast, boreal, moratorium, logging, endangered, aurora borealis, hardwood

EXTENSION ACTIVITIES:

- Create an illustrated glossary of birds mentioned in the article, "For Billions of Birds, an Endangered Haven." For each species, be sure to include their migration schedule and destinations.
- Design a presentation introducing peers to one of the organizations mentioned in the article, such as Greenpeace, Natural Resources Defense Council, or Forest Ethics. Include the organization's history, major players and main concerns, including their role in preventing the deforestation of the Canadian boreal. Also explain with which part of the national government this organization works most closely.
- Create a world map and color-code the largest forests. Label what types of forests are in those regions.

- Write a research paper examining what would happen if no action is taken in the boreal. How would different parts of the ecosystem be affected? How would the world be affected? What agencies or individuals play large roles in affecting the future of the boreal?

INTERDISCIPLINARY CONNECTIONS:

Economics- Create a presentation examining the North American logging industry. How large is it? What is its annual revenue, profits, or losses? What are the major companies involved? How many trees are cut down annually? How many acres are affected? What industries or products benefit from or are hindered by logging? Also examine the practice of reforestation and include who is involved in this movement. Locate statistics comparing the North American industry to the international industry.

Media Studies- Create an awareness campaign for your peers advertising issues in the environment and how they can help save this aspect of the environment. Come up with a slogan and submit your ideas to an organization mentioned in the article.

Social Studies- Write a research paper examining the role Native Americans play in preserving (or jeopardizing) the livelihood of the boreal forest.

Technology- Create a model illustrating the process by which paper is made. Include a "How it Works" poster examining how paper is then recycled and made into paper again.

NATIONAL CONTENT STANDARDS:

Grades 6-8

Geography Standard 8- Understands the characteristics of ecosystems on Earth's surface. Benchmarks: Understands the distribution of ecosystems from local to global scales; Understands the functions and dynamics of ecosystems; Knows changes that have occurred overtime in ecosystems in the local region; Knows the potential impact of human activities within a given ecosystem on the carbon, nitrogen, and oxygen cycles (CTSS - 'social', '6-8', 'geo3')

Geography Standard 16- Understands the changes that occur in the meaning, use, distribution and importance of resources. Benchmarks: Understands the reasons for conflicting viewpoints regarding how resources should be used; Knows strategies for wise management and use of renewable, flow, and nonrenewable resources; Knows world patterns of resource distribution and utilization; Understands the consequences of the use of resources in the contemporary world (CTSS - 'social', '6-8', 'geo5')

Science Standard 7- Understands how species depend on one another and on the environment for survival. Benchmarks: Knows how an organism's ability to regulate its internal environment enables the organism to obtain and use resources, grow, reproduce, and maintain stable internal conditions while living in a constantly changing external environment;

Knows factors that affect the number and types of organisms an ecosystem can support; Knows relationships that exist among organisms in food chains and food webs

(CTSS - 'science', '6-8', '7')

Science Standard 16- Understands the scientific enterprise. Benchmarks:

Knows that people of all backgrounds and with diverse interests, talents, qualities, and motivations engage in fields of science and engineering; Knows various settings in which scientists and engineers may work; Understands ethics associated with scientific study; Knows ways in which science and society influence one another

(CTSS - 'science', '6-8', '16')

Grades 9-12

Geography Standard 8- Understands the characteristics of ecosystems on Earth's surface. Benchmarks: Understands how relationships between soil, climate, and plant and animal life affect the distribution of ecosystems; Knows ecosystems in terms of their biodiversity and productivity; Knows the effects of both physical and human changes in ecosystems

(CTSS - 'social', '9-12', 'geo3')

Geography Standard 16- Understands the changes that occur in the meaning, use, distribution and importance of resources. Benchmarks:

Understands the relationships between resources and exploration, colonization, and settlement of different regions of the world;

Understands programs and positions related to the use of resources on a local to global scale

(CTSS - 'social', '9-12', 'geo5')

Science Standard 7- Understands how species depend on one another and on the environment for survival. Benchmarks: Knows how the interrelationships and interdependencies among organisms generate stable ecosystems that fluctuate around a state of rough equilibrium for hundreds or thousands of years; Knows ways in which humans can modify ecosystems and cause irreversible effects

(CTSS - 'science', '9-12', '7')

Science Standard 16- Understands the scientific enterprise. Benchmarks:

Understands that individuals and teams contribute to science and engineering at different levels of complexity; Understands the ethical traditions associated with the scientific enterprise and that scientists who violate these traditions are censored by their peers; Understands that science involves different types of work in many different disciplines

(CTSS - 'science', '9-12', '16')