

GREEN SPACE METAPHORS

Subject: Science, Social Studies

Skills: Analysis, Discussion, Interpretation, Observation, Public Speaking, Similarity and Differences, Small Group

Duration: 1 class period (or more depending on depth and discussion)

Setting: Classroom

Materials:

- large box or bag
- metaphor items: sponge, doll pillow, soap, small doll cradle, sieve or strainer, paper (coffee) filter, small box of cereal, etc.
- 3x5 cards with pictures to show additional green space metaphors: picture of a zoo, picture of a vacation resort, etc.
- overhead or handouts of **What a Green Space Does**

Note: A metaphoric approach such as this allows a variety of objects or pictures to suggest some appropriate linkage to the basic characteristics of green spaces.

Michigan Curriculum Framework Content Standards and Benchmarks:

- **Science LEC- III.5 e-2:** Strand III. Using Life Science Knowledge, Standard 5. Ecosystems (LEC), Benchmark e-2. Describe the basic requirements for all living things to maintain their existence. (Key concepts: Needs of life- food, habitat, water, shelter, air, light, minerals. Real-world contexts: Selected ecosystems such as an aquarium, rotting log, terrarium, backyard, local pond or wetland, wood lot.)
- **Science LEC- III.5 e-4:** Strand III. Using Life Science Knowledge, Standard 5. Ecosystems (LEC), Benchmark e-4. Describe positive and negative effects of humans on the environment. (Key concepts: Human effects on the environment — garbage, habitat destruction, land management, renewable and non-renewable resources. Real-world contexts: Household wastes, school wastes, waste water treatment, habitat destruction due to community growth, reforestation projects, establishing parks or other green spaces, recycling.)
- **Science II.III.5.MS 5:** LEC Ecosystems, Standard III.5. Describe how materials cycle through an ecosystem. Benchmark MS 5. Explain how humans use and benefit from plant and animal materials.
- **Science II.III.5.MS 6:** LEC Ecosystems, Standard III.5. Describe how materials cycle through an ecosystem. Benchmark MS 6. Describe ways in which humans alter the environment.
- **Social Studies II.2.LE 1:** Strand II. Geographic Perspective, Standard 2. Human/Environment Interaction, Benchmark LE 1. Explain basic ecosystem concepts and processes.
- **Social Studies II.2.MS 4:** Geographic Perspective, Standard 2. Describe, compare, and explain the locations and characteristics of ecosystems. Benchmark MS 4. Explain how humans modify the environment and describe some of the possible consequences of those modifications.

Kent County Collaborative Core Curriculum (KC⁴):

- **Science:** 3:2, 3:5
4:1, 4:2
5:1, 5:4:
- **Social Studies:** 6:3, 6:4, 6:5, 6:10
7:3
8:3, 8:9

OVERVIEW

Students will develop an appreciation for and an understanding of green spaces through the power of “hands-on” metaphors, linking the characteristics and natural functions of green spaces to the familiar realm of everyday life.

OBJECTIVES

After participating in this activity, students will be able to:

- Describe the functions and characteristics of green spaces.
- Demonstrate their understanding of the importance of green spaces to wildlife and humans (necessities of life: food, space, shelter, water).
- Work in small groups to determine a metaphoric function of green spaces.

BACKGROUND

Green spaces are many different things to many different people. Some people have never heard or thought about green spaces. Others are working actively to protect or create green spaces because of their importance.

Green spaces include areas like urban parks, river buffers, prairies, greenways, trails, forests and open space. All green spaces, whether urban or rural, provide special habitats that serve areas far beyond their boundaries. Green spaces are important to plants, animals, humans, and the total environment.




Diverse wildlife requires quality habitat to survive. Green spaces provide habitat requirements such as food, space, water, and shelter. Wildlife species need to roam in order to breed and find food and water. They also need space to nest, rear their young, den, burrow, and overwinter.

The plant life of green spaces serves many important functions. Plants absorb nutrients from the environment and help cycle them through food webs. Through **photosynthesis**, for example, plants release oxygen to the atmosphere and provide food to other life forms. Plants also help keep nutrient concentrations from reaching toxic levels. They help

protect and purify the surrounding environment by slowing down water flow, causing **silt** to settle out.

Of great importance to humans are the flood characteristics of lush green spaces near water and wetlands. When runoff from rains and spring thaws is high, wetland areas help to absorb excess water until it gradually drains through the soil or to nearby streams and rivers. Acting as buffers, healthy green spaces help to prevent flooding and erosion.

Many of the major attributes of green spaces can be explored through the use of **metaphors**. To use a metaphor is to apply a word or phrase to an object or concept that it does not literally denote in order to suggest a comparison between the two. A metaphor represents a concept or idea through another concept or idea. Two examples of metaphors are: “a tree is a home” and “books are windows of thought.” In this activity, a variety of everyday objects are used to represent the natural functions of green spaces. For example:

OBJECT	METAPHORIC FUNCTION
 Cereal or Rice	provides nutrient-rich foods
 Soap	helps cleanse the environment
 Game or ball	provides recreational opportunities (hiking, football, etc.)
 House	provides shelter (game piece)
 Zoo picture	promotes diversity in plant and animal life
 Outer “Space” picture	provides enough space for plants and wildlife to roam
 Sponge	absorbs excess water caused by runoff
 Pillow or bed	is a resting place for migratory animals
 Cradle	provides a nursery that shelters, protects, and feeds young wildlife
 Sieve or strainer	strains silt, debris, etc. from open water and the water table
 Filter	filters smaller impurities from open water and the water table
 Antacid	neutralizes toxic substances

The major purpose of this activity is for students to develop an understanding and appreciation of green spaces through the power of metaphor, linking the characteristics and natural functions of green spaces to the familiar realm of everyday life.

PROCEDURE

1. Prepare a “Mystery Metaphor Container” (box or bag). It should be possible for a student to put his or her hand into the container and pull out an object. You may want to collect as many as one metaphoric object per student, but at least have enough for one per group of four students. Put the container aside to use later.
2. From the background information given, explain and discuss the types of green spaces found in your local area, state, country, etc with the students. Then invite the students to sit quietly and close their eyes. Ask them to picture a green space. Ask them to imagine what it looks like. Ask them to look carefully at the plants and animals, including insects and small creatures. Ask them to imagine walking through the green space, touching the things they see there. What does the air feel like? How does it smell? **OPTIONAL:** Play a tape recording of natural sounds (birds, wind, etc.) during this exercise. Some are available at libraries or commercially in record and nature stores.
3. Invite the students to tell what they imagined. Compile a list of their offerings. Encourage discussion and mutual sharing.
4. With their list as a point of reference, help the students identify which plants and animals are actually most likely to be found in green spaces. If possible, have them classify the plants and animals according to the kind of green space in which they would be found. Help students to expand their understanding of the types of green spaces beyond those with which they have personal experience. Also help them expand their understanding of the variety of life forms present in different types of green spaces. State or federal wildlife officials and representatives of private conservation or nature-related organizations can be helpful. The series of golden nature guides from Western Publishing Company, Inc. may be useful.
5. Next provide the students with additional background information to serve as an overview of the basic ecological activities that characterize green space habitat. For example, you can include the following:
 - Habitat—provides food, water, space, and shelter
 - Diversity—hosts a wide variety of animals and plants
 - Sponge effect—absorbs excess water runoff
 - Filter effect—traps and neutralizes or absorbs silt, toxins, wastes, etc.
 - Nutrient control—absorbs nutrients from fertilizers and other sources that may cause contamination down-

stream

- Natural nursery—provides protection and nourishment for newborn and young wildlife

What a Green Space Does can be used as an overhead for visual aid or as a handout. Suggest that these activities (and many more that they could think of) are taking place in green spaces all the time.

6. Now bring out the “Mystery Metaphor Container.” Tell the students that everything in the container has something to do with a green space. Divide the students into groups of two to four. Announce that when it is their group’s turn, you want a representative of the group to select an object from the container. Then, as a group, they must figure out how the object could represent what a green space is or does.
7. Have the designated student reach into the container and withdraw one object. When each group has an object, ask the members to work as a team to describe the relationships between their metaphoric object and a green space. If students have difficulty with the abstraction of metaphors, review a few other simple examples or prompt them with the question “How is a green space like a _____?” Encourage the students to build on each other’s ideas. You can also assist by strengthening their connections. Note: Allow the students time to discuss their ideas within their group before discussing them with the entire class.
8. Ask each group to describe their ideas to the class.
9. Following discussion and review of the functions represented by each metaphor, ask the students to summarize the major roles that green spaces perform in contributing to habitat and the necessities of life for wildlife.
10. For the final part of the discussion, strengthen the students’ understanding of the connectedness that humans have to green spaces. Point out that humans value green spaces for their beauty, for their utilitarian uses, for the opportunities they provide for recreation and nature study, and for the service they perform in maintaining environmental quality. Point out that human wellbeing requires green space ecosystems. List the ways in which green spaces are important to humans. Why do humans convert green spaces to other uses? When should green spaces be protected or preserved? (Discuss a specific case in your community, if appropriate.) Develop the students’ understanding of how



the condition of green spaces is dependent on the actions of each of us. Ask the students if their own attitudes about green spaces are different now. If yes, how? If not, why not?

11. For additional fun, ask the students to think of additional everyday items that could be used as metaphors for green spaces. Make sure they explain their ideas.

ASSESSMENT OPTIONS

1. Observe and critique the students as they work in groups to explain the metaphors. Look for participation from each student and evaluate cooperation and group presentations.
2. Ask students to write their answers to the following questions and/or add your own questions:
 - Describe three functions or characteristics of green spaces and explain why they are important to people and/or wildlife.
 - Name three different kinds of green spaces and explain why each is important to people and/or wildlife.
 - Have the students select four (or any number you prefer) species of animals and describe how green spaces are important to each.
3. Have students draw a picture of a green space and explain the functions or characteristics they draw.
4. Ask students to explain how green spaces provide habitat (food, water, space, and shelter) and nutrients (air, minerals, and sunlight) required for life.
5. Have students answer the following question: Human activities can be good for green spaces, or they can harm them.

TEACHER MEMOS

Adaptations/Extensions

1. Conduct the lesson while sitting in a green space, or allow students to personally visit a green space to verify the appropriateness of the metaphors explored in the classroom. Have them expand their understanding of these metaphors and green spaces by:
 - Identifying and discussing any limitations to the appropriateness of these metaphors.
 - Identifying what seem to be the most compelling attributes of the metaphors in helping to understand the characteristics and nature of the green space. Which two or three metaphors describe the most important characteristics of the green space they see. (Note: answers will vary for different sites and value systems.)
 - Identifying new and appropriate metaphors!
2. Have the students identify, locate, and map the green spaces in their community. Require them to categorize and describe the different kinds of green spaces.

Computer Extensions

1. Great Lakes Greenfields Exchange. Feb. 2002. 14 Mar. 2002. <<http://www.glc.org/green/>> Provides links to greenfields and farmland preservation resources in the Great Lakes region.
2. Labaree, Jonathan M. How Greenways Work: A Handbook on Ecology. National Park Service's Rivers and Trails Conservation Assistance Program and QLF/Atlantic Center for the Environment, 1992. 14 Mar. 2002. <<http://www.qlf.org/greenways/>> The entire handbook is available on-line.
3. NationalGeographic.Com. Green Spaces. 1994 Geography Awareness Week teacher's handbook. 2000. 14 Mar. 2002. <http://magma.nationalgeographic.com/education/gaw/pop/pop_58_teacher.html> A lesson plan provided for teachers to help students map the green spaces near their school.

SOURCE

Adapted with permission from Project WILD Aquatic, "Wetland Metaphors," Western Regional Environmental Education Council, Inc. 1992. Pg. 54-67. Worksheets developed by Anne Williamson, curriculum consultant for *United Growth for Kent County*, a grant project of Michigan State University Extension.

ADDITIONAL RESOURCES

Contacts:

American Planning Association (APA) or the Michigan Chapter of the APA
Ducks Unlimited
Great Lakes Information Network (GLIN)
Land Conservancy of West Michigan
Michigan Department of Environmental Quality
Michigan Department of Natural Resources
Michigan Land Use Institute
The Nature Conservancy
Tip of the Mitt Watershed Council
U.S. Environmental Protection Agency (EPA), Env. Ed. Program

References and Teacher Resources:

Chesky, Edward. Habitat Restoration: A Guide to Proactive Schools. Kitchener, Ontario, Canada: Waterloo County Board of Education, 1993.

Harris, L.D. The Fragmented Forest: Island Biogeography Theory and the Preservation of Biotic Diversity. Chicago University of Chicago Press, 1984.

Saunders, D. A., R. J. Hobbs and C. R. Margules. "Biological consequences of ecosystem fragmentation: A review." Conservation Biology, 1991: 5 (1): 18-32.

Soulé, M. E. "Land use planning and wildlife maintenance: Guidelines for conserving wildlife in an urban landscape." APA Journal, 1991: 57 (3): 313-323.

"In a Town Where Lawns Are Banned, Wildlife and Community Pride Flourish." National Wildlife Magazine, June/July 1999, p. 14-15. Web address: <www.nwf.org/habitats> 1997.

Additional Lessons

Viewfinders: A Visual Environmental Literacy Curriculum: "A Natural Blend: Take One Part Nature and One Part Built..." Pg. 41-44.

Landscaping for Wildlife, by Wisconsin DNR. - Describes plants that provide habitat and food for a variety of bird and wildlife species. Students can use this resource to compare the amount of wildlife use that could be expected in a natural area vs. a built environment.

Project Learning Tree: "I'd Like to Visit a Place Where..." Pg. 188-190.

CONCEPTUAL FRAMEWORK REFERENCE

IIA2,IIC2,IID1,IVA,IVB

What a Green Space Does

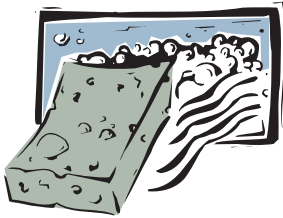
- **Habitat** - provides food, water, space, and shelter



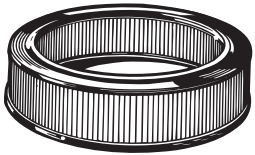
- **Diversity** - hosts a wide variety of animals and plants



- **Sponge effect** - absorbs excess water runoff



- **Filter effect** - traps and neutralizes or absorbs silt, toxins, wastes, small impurities, etc.



- **Nutrient control** - absorbs nutrients from fertilizers and other sources that may cause contamination downstream

- **Natural nursery** - provides protection and nourishment for newborn and young wildlife



Wetlands Function as a Filter

Wetlands catch and filter pollutants: sediment becomes trapped among the plants or settles out of the water. Excess nutrients are taken up and used by the plants. Some toxic substances are caught and stored in the soil matrix.

