South Carolina Aquarium

K-2 Helping Habitats Activity

Overview

Focus Question
How can you help your habitat?

Activity Synopsis
Students investigate how people have changed the environment around their school. They design an action project to improve some aspect of the habitats in their schoolyard or local community.

Time Frame
Continuing project

Objectives
The learner will be able to:

- Identify a way people have changed habitats in the local area.
- Identify a way people can help a habitat in the local area.
- Plan and conduct a project to help habitats in the local area.

Student Key Terms

- habitat

Teacher Key Terms

- biodegradable
- impermeable surface

Standards

2014 Academic Standards and Performance Indicators for Science

Kindergarten: K.P.1A.1, **K.P.1A.2**, **K.P.1A.8**, K.L.2A.1, K.L.2A.5, K.L.2A.6
1st Grade: 1.S.1A.1, 1.S.1A.2, 1.S.1B.1, 1.E.4B.2, 1.L.5B.2, 1.L.5B.3
2nd Grade: 2.S.1A.1, **2.S.1A.2, 2.S.1B.1, 2.L.5B.1, 2.L.5B.3**

*** Bold standards are the main standards addressed in this activity**

Kindergarten Performance Indicators
K.P.1A.1 Ask and answer questions about the natural world using explorations, observations, or structured investigations.
K.P.1A.2 Develop and use models to (1) understand or represent phenomena, processes, and relationships, (2) test devices or solutions, or (3) communicate ideas to others.
K.P.1A.8 Obtain and evaluate informational texts, observations, data collected, or discussions to (1) generate and answer questions about the natural world, (2) understand phenomena, (3) develop
models, or (4) support explanations. Communicate observations and explanations using oral and written language.
K.L.2A.1 Obtain information to answer questions about different organisms found in the environment (such as plants, animals, or fungi).
K.L.2A.5 Construct explanations from observations of what animals need to survive and grow (including air, water, nutrients, and shelter).
K.L.2A.6 Obtain and communicate information about the needs of organisms to explain why they live in particular areas.

First Grade Performance Indicators
1.S.1A.1 Ask and answer questions about the natural world using explorations, observations, or structured investigations.
1.S.1A.2 Develop and use models to (1) understand or represent phenomena, processes, and relationships, (2) test devices or solutions, or (3) communicate ideas to others.

1.S.1B.1 Obtain and communicate information to summarize how natural resources are used in different ways (such as soil and water to grow plants; rocks to make roads, walls, or buildings; or sand to make glass).
1.E.4B.2 Obtain and communicate information to explain ways natural resources can be conserved (such as reducing trash through reuse, recycling, or replanting trees).
1.L.5B.2 Develop and use models to compare how the different characteristics of plants help them survive in distinct environments (including deserts, forests, and grasslands).
1.L.5B.3 Analyze and interpret data from observations to describe how changes in the environment cause plants to respond in different ways (such as turning leaves toward the Sun, leaves changing color, leaves wilting, or trees shedding leaves).

Second Grade Performance Indicators
2.S.1A.1 Ask and answer questions about the natural world using explorations, observations, or structured investigations.
2.S.1A.2 Develop and use models to (1) understand or represent phenomena, processes, and relationships, (2) test devices or solutions, or (3) communicate ideas to others.
2.S.1B.1 Construct devices or design solutions to solve specific problems or needs: (1) ask questions to identify problems or needs, (2) ask questions about the criteria and constraints of the devices or solutions, (3) generate and communicate ideas for possible devices or solutions, (4) build and test devices or solutions, (5) determine if the devices or solutions solved the problem, and (6) communicate the results.
2.L.5B.1 Obtain and communicate information to describe and compare how animals interact with other animals and plants in the environment.
2.L.5B.3 Analyze and interpret data from observations to describe how animals respond to changes in their environment (such as changes in food availability, water, or air).

Cross Curricular Standards

South Carolina Social Studies Standards
2-1.2, 2-1.3, 2-1.4

South Carolina College and Career Standards for ELA
Writing (W) – K-2.1, 1-2.1, 2-2.1
Communication (C) – K-1.4, K-1.5, K-3.2, 1-1.4, 1-1.5, 1-3.2, 2-1.4, 2-1.5, 2-3.2

Common Core ELA Standards
Writing – K.1, K.6, K.8, 1.1, 1.6, 1.8, 2.1, 2.6, 2.8
Speaking/Listening – K.1, K.4, K.5, K.6, 1.1, 1.4, 1.5, 1.6, 2.1, 2.4, 2.6
Language – K.1, K.2, K.6, 1.1, 1.2, 1.6, 2.1, 2.2, 2.3, 2.6

Background

Key Points
Key Points will give you the main information you should know to teach the activity.

- The number one cause of extinct or endangered species is loss of **habitat**.
- Anything that affects an organisms' ability to get the air, food, water, shelter and space that it needs is a loss of habitat. This includes pollution in the air and water, the removal of plants and/or animals used for food or shelter and the development of natural land.
- Individuals have the ability to help wildlife habitats by being conscientious of the behaviors they engage in on a day-to-day basis.

Detailed Information
Detailed Information gives more in-depth background to increase your own knowledge, in case you want to expand upon the activity or you are asked detailed questions.

K-2 Helping Habitats Activity

One of the characteristics of living things is their ability to alter their environment. Rabbits can dig holes in the ground. Beavers build dams on streams that flood the surrounding area. Plant roots can break rock apart as well as hold soil in place, preventing it from eroding when it rains. Plants and animals both release and draw gases from the atmosphere during respiration, subtly altering the composition of the atmosphere.

Of all living things, none has shown more capacity to alter their environment than man. Every time a tree is cut, land is paved, a field is plowed, a dam is built, a mineral is dug up or gas is released through the burning of fossil fuels, man is altering his environment. Man's ability to alter his environment is easily seen almost anywhere. For this reason, a walk around the schoolyard can be a good introduction to young students to show how **habitats** can be changed by man.

Any time land is developed, it usually results in the removal of many of the plants that inhabited the land. By removing vegetation, not only are the plants rendered lifeless, but habitat for a variety of animals is removed as well. Removing trees and underbrush takes away the homes and food sources of a variety of birds, insects, amphibians, mammals and reptiles. This loss of vegetation also removes the cover that helps many animals to hide from predators. This development results in losses of food and shelter for many animals.

The loss of certain plants will affect other plants. Removing tall trees will change the vegetation underneath. Many small plants that grow in forests are adapted to living in low sunlight. By taking out taller trees, available shade below is reduced and many of the smaller plants do not do well in direct sunlight. Plants adapted to sunlight may now out-compete other sun-intolerant species and soon replace them, changing the habitat.

Usually when land is cleared, if it is not paved or built upon, the vegetation is usually replaced by one species of plant, be it a farmer's field of wheat or a lawn full of grass. By allowing one species to predominate, biodiversity receives a drastic cut. Where once many species may have flourished, one species aided by lawn mowers, plows, herbicides, weeding and fences, now dominates the land. This results in a major loss of habitat for a number of different plants and animals.

Paving and building are also major alterations of habitat. No plants can find root in a parking lot and any animal found in one is probably just passing through. Some birds, insects and small mammals can find homes in buildings, but they are usually considered pests. Besides loss of habitat, pavement and buildings also create changes in rain runoff. The ground now has an **impermeable surface** over it. The water that once could seep in the ground now must run along the street until it reaches the permeable soil or a man-made drain. In a place such as downtown Charleston, where much of the land area is now impermeable surfaces, this can lead to flooding as the rainwater collects in the streets.

These surfaces can also create problems with pollution. As the rainwater flows over the streets, anything in the street is likely to be picked up by the water. For example, as cars age they tend to start leaking fluids, such as oil, gasoline and antifreeze. Anyone who has ever seen the rainbow coloration of a puddle in a parking lot has witnessed this type of pollution. These leaked fluids can sit on the road until the rain comes and then picks the fluids up to eventually be carried into local rivers, streams or lakes or to seep into the water in the ground. This contamination of water can be detrimental to many organisms as it has a negative effect on one of their habitat needs.

Litter and garbage disposal can also alter a habitat. Many of the products that are used by people are composed of synthetic materials that are not **biodegradable**. If these are thrown on the side of the road, they may take hundreds of years to decompose, and so can become a longtime fixture of a habitat. Even throwing things away is not the best solution. Americans produce approximately 441 billion pounds of garbage per year, roughly four pounds per person per day. Most trash or garbage is buried in landfills, which fill up quickly and can then contaminate the air, water and soil.

All of these alterations of habitats have allowed humans to have a very high standard of living. In altering these natural habitats, people have created habitats for themselves that have allowed them to have comfort, convenience and long, healthy lives. The question is how do people take what they need from the environment without making it unlivable for the other species that live on the planet, and eventually for the people themselves? This is now a matter of world debate, and decisions are being made regarding this question that will have global consequences. One does not need to be a national government or a major industry to affect the environment. Individuals can and do make decisions that affect the environment in both positive and negative ways every day. With a

little effort, individuals can develop habits and projects which can help to lessen their impact on the environment, or even give back to the environment a little bit of what was taken away. These projects can be undertaken by even the youngest kindergarten student.

Students can help to recreate habitat in their schoolyard by planting trees, flowers and other vegetation. Plants, provide food, shelter and cover, as well as produce oxygen, for a variety of animals and thus can increase the biodiversity of the schoolyard. By choosing plants that are native species, and not introduced or exotic species, one can return a little of the original habitat back to the space. Flowers can also be useful educational tools, allowing students first-hand experience of insects and birds at work. Students can also create butterfly gardens allowing students daily observations of these graceful creatures.

Students can also recreate habitat by putting up birdhouses and feeders and bat houses. Birdhouses and bat houses provide shelter and bird feeders provide food, two of the major habitat requirements. By having these on the schoolyard, students will have the opportunity to observe these animals closely. Cheap bird feeders and bird and bat house kits can be found in many places such as the *Carolina Science and Math* catalog.

Students can also help with garbage disposal issues. Students can do a litter-pickup on or around the schoolyard. This a good way to make students aware of how much litter can collect in an area. Students can also start composting and recycling programs in the classroom and/or in the school. By composting vegetable, fruit and bread remains from the school cafeteria, students will be reducing the amount of wastes that are sent to landfills. The composted remains of this food can then be spread on the schoolyard to provide needed nutrients for the plants that grow there. Recycling also helps reduce the amount of waste that will end up in local landfills as well as reduce the amount of resources that need to be taken from the earth to make more of the product that was recycled.

One of the best ways to promote conservation of habitats is through education. Informed people are more likely to make good decisions. Students can contribute to this by educating other students and staff. This can be done by creating posters showing ways to help local habitats or by allowing students to visit other classrooms to talk about what they have been doing.

Because humans are the only living things we know of with the ability to make decisions based on something else besides survival needs, we have a responsibility to look out for the other living things that inhabit the earth with us. Since all living things depend on their habitats for survival, it is through preserving habitats that we can do the most to ensure their survival. By teaching this to our children, we are helping to preserve our own future.

Procedures

Materials

- To be determined by the students and the teacher

Procedure

1. Take the students outside to walk around the school grounds. Have the students look at the buildings, the pavement, the cars, the mowed grass, the fences, the amount of trash in the trash cans, the amount of food being thrown out by the cafeteria and think about how these may have affected and changed the habitat that was there. Have them consider these questions: What do you think this area looked like before there was a school here? What habitat and what animals and plants may have been here? How have people changed the natural habitat? Are there still some animals and plants that use this habitat? Can we help make the schoolyard habitat better for wildlife? Students will brainstorm how they can make the area better. The teacher can help them by suggesting some of the ideas below.

2. Have students choose one or two project ideas and work together to form a plan to develop their chosen project(s). Students should consider what they will need to do, what materials they will need, whose help they may need to get and how much time it might take.

3. Students will follow the procedures of their plan to conduct their project. Take pictures during any work that is done to document the project. The students will create a poster to hang in the hall for their projects. Posters should include photographs, text and illustrations to show what the class did as part of conducting the project.

Outdoor projects ideas

- Do a litter pick-up somewhere in the community
- Plant native plants (wildflowers, trees, etc.) on the schoolyard to create habitat such as a butterfly garden
- Set up birdfeeders, birdhouses or bat houses on the schoolyard to create habitat
- Create a compost center for placing leftover cafeteria food

Indoor project ideas

- Start education campaign in school to educate other students about habitat conservation issues (create posters, presentations or educational skits for other classes, etc.)
- Start recycling program in the school
- Participate in a national conservation agencies student involvement programs such as the *National Wildlife Federation Schoolyard Habitats Program*: http://www.nwf.org/habitats/schoolyard/program.cfm

Assessment

Students will create a poster explaining the project they conducted to help local habitats. In the poster, students will use text, pictures and photographs to identify a problem affecting local habitats and show what the students did to help these local habitats. Students will hang the poster somewhere where other students can see it.

Scoring rubric out of 100 points

Create poster	**20 points**
Identify a problem in the local area affecting wildlife habitats	**30 points**
Use text and pictures to show what they did to help local habitats	**40 points**
Display poster where others can see it	**10 points**

Cross-Curricular Extensions

STEM Extension
Have students create a powerpoint, Keynote or Google slide presentation to present to the PTA of their school. The presentation should include the project design as well as the budget for completing the project and plan to get it done. Have them advocate for why they need help to complete the project as well as why it would be good for the school.

Social Studies Extension
Have students write a letter to the mayor or a town council member explaining ways these officials could help habitats in the local area. Have students volunteer to participate in any community activity that is proposed.

Language Arts Extension
Read *The Lorax* by Dr. Seuss with the students. Have the students think about which living things had become locally extinct in the book (truffula trees, brown bar-ba-loots, swomee-swans, humming-fish and lorax). Have students determine what happened to their habitat that caused them to go extinct and what could have been done to prevent their extinction.

Art Extension
Have students take before and after photographs of changes made to a habitat, such as a habitat before and after a litter pick-up. Take a photograph of another habitat or developed area. Have students draw pictures of how this habitat might be changed to better support wildlife.

Second Grade Language Arts extension by SCA Master teacher, Barbara Kulisek.

Resources

Teacher Reference Books

Hacker, Randi and Jackie *Kaufman. Habitats: Where the Wild Things Live,* John Muir Publications, New Mexico,1992.
Describes ten habitats found on earth and the life supported by them. Also includes ideas for preserving habitats.

Hickman, Pamela M. *Habitats: Making Homes for Animals and Plants,* Addison-Wesley, Massachusetts, 1993.
This book is geared toward children but offers wonderful ideas for creating indoor habitats for the classroom.

Stokes Birdhouse Book: The Complete Guide to Attracting Nesting Birds. Little, Brown and Co., Boston, 1990.
Use this field guide to learn how to attract nesting birds to your yard.

Stokes Bird Gardening Book: The Complete Guide to Creating a Bird-Friendly Habitat in Your Backyard, Little, Brown and Co., Boston, 1998.
Use this field guide to learn how to create a bird-friendly habitat.

The Hummingbird Book: The Complete Guide to Attracting, Identifying and Enjoying
Little, Brown and Co., Boston, 1989.
Use this field guide to learn how to attract hummingbirds to your backyard habitat.

The Bird Feeder Book: An Easy Guide to Attracting, Identifying, and Understanding Your Feeder Birds Little, Brown and Co., Boston, 1987.
Use this field guide to learn how to attract, identify and understand the feeder birds in your backyard habitat.

The Butterfly Book: An Easy Guide to Butterfly Gardening Identification and Behavior
Little, Brown and Co., Boston, 1991.
Use this field guide to learn how to create a butterfly habitat and identify the butterflies it attracts.

Teacher Reference Websites

National Wildlife Federation
http://www.nwf.org/
Information on environmental education and other websites for creating backyard habitats.

The Ornithology Website
www.birdwebsite.com/
This site provides details for creating backyard habitats for birds, butterflies, frogs and toads. It also includes links to other sites.

Student Reference Books
The following books may be too difficult for younger children to read but should be understood when read aloud.

Cone, Molly. *Come Back, Salmon,* Sierra Club Books for Children, San Francisco, 1992.
Learn how the students of Jackson Elementary School in Everett, Washington, cleaned a nearby stream, stocked it with salmon and protected it from pollution.

Fleming, Denise. *Where Once There Was a Wood,* Henry Holt and Company, New York, 1996.
The reader learns how animals are displaced as their habitat disappears as well as strategies for creating backyard and schoolyard habitats.

Hoff, Mary and Mary M. Rodgers. *Our Endangered Planet: Atmosphere,* Lerner Publications Company, Minneapolis, 1995.
This book explains the purpose of the atmosphere, how humans have impacted it, and ideas for protecting it.

Liptak, Karen. *Saving Our Wetlands and Their Wildlife,* Franklin Watts, New York, 1991.
This book describes the different types of wetlands and the wildlife found there. It also includes ideas for protecting wetland habitats.

McVey, Vicki. *The Sierra Club Kid's Guide to Planet Care & Repair,* Sierra Club Books for Children, San Francisco, 1993.
Learn how daily activities effect the environment. Includes tips for improving our environment and classroom activities for students.

Student Fiction Books

Cherry, Lynne. *Flute's Journey: The Life of a Wood Thrush,* Gulliver Books/HBJ, San Diego, California, 1997.
This is the story of Flute, a wood thrush, and the trials and tribulations he encounters as he migrates.

Cherry, *Lynne. The Great Kapok Tree,* Gulliver Books/HBJ, San Diego, California, 1990.
When a man with an ax tries to chop down a great kapok tree, animals depending on the tree try to convince him of its importance.

Cherry, Lynne. *A River Ran Wild,* Gulliver Books/HBJ, San Diego, California, 1992.
Follow the environmental history of the Nashua River, from its discovery to present day. Learn how it was polluted during the Industrial Revolution but has since been cleaned.

Online Curricula

Activities Integrating Math and Science (AIMS)
This wonderful resource provides various activities for classroom use. The activities are designed for third through sixth grades but can be adapted for younger students.
Visit the AIMS website for ordering information: http://www.AIMSedu.org/

Project WILD
Project WILD is an interdisciplinary curriculum for K-12 teachers on a broad range of environmental and conservation topics.
For more information click on: http://www.projectwild.org