



National Wildlife Federation's Schoolyard Habitats® Program and National Standards of Learning: *They Grow Together*



The National Wildlife Federation's Schoolyard Habitats® program has assisted thousands of schools nationwide in the development of outdoor habitat areas designed to protect wildlife and enhance the educational experiences of students, teachers and community members. These schools are recognized for their contributions to habitat conservation, as well as for community involvement in education and use of the outdoors as a cross-curricular teaching tool. Through a certification process, NWF has formally recognized nearly 1,000 Schoolyard Habitats sites nationwide. Teachers who participate in the Schoolyard Habitats program realize that use of these outdoor classrooms is an excellent way to meet the requirements of national and state educational standards.

Schoolyard Habitats projects enhance the teaching and learning of science, math, social studies and English in many ways. Using a habitat-based learning site makes learning more real, fun, hands-on, inter-

disciplinary and relevant. "Young people learn most readily about things that are tangible and directly accessible to their senses — visual, auditory, tactile and kinesthetic. With experience, they grow in their ability to understand abstract concepts.... Concrete experiences are most effective in learning when they occur in the context of some relevant conceptual structure." (*Benchmarks for Science Literacy*)

In today's learning environments, where public schools are required to meet and exceed standards of learning, teachers must be creative in presenting content. The schoolyard can provide a valuable avenue for reinforcing concepts for students. The following pages illustrate how creating and utilizing a Schoolyard Habitats site can help teachers use the outdoors to meet various standards. In fact, teachers can feel confident that time invested in a Schoolyard Habitats project is a wise investment for students' immediate educational needs and future development as good citizens.

Core Subjects and the Schoolyard Habitats Program

Science Standards

A Schoolyard Habitats project serves as a living laboratory where students engage in hands-on inquiries into the natural world.

Math Standards

A Schoolyard Habitats site provides students with the opportunity to apply math concepts to the real world; whether estimating numbers of plants in an on-site plant community or tracking and graphing ongoing wildlife observations, the outdoors is full of mathematical wonders.

In a Fluvanna County, Virginia elementary school, students compare two or more bird species by observing the comings and goings of the birds and by using addition and subtraction. First graders use binoculars to look at the body coverings, body, body shape, beaks, appendages and bird movements. To meet elementary social studies standards, the students use bird migration observations to discuss the "relative location of people, places and things."

"One day in early September, Lorraine Lapsley takes her kindergarten class on a walk around the school. The children notice a beautiful dogwood tree they can see from their room, and they decide to adopt the tree to appreciate it, observe it and get to know it as a special tree." (*Curriculum Standards for Social Studies, pg. 58*)

English Standards

A Schoolyard Habitats project provides a quiet space for creative writing about nature or a research laboratory where students can develop research, writing and communication skills.

Geography and Social Studies Standards

Geography and social studies involve understanding connections between people, social constructs and the environment. The Schoolyard Habitats program can be applied successfully to help teach those connections by assisting students in understanding both space and place.

Science Standards and Schoolyard Habitats Projects

National standards documents referenced: **Benchmarks for Science Literacy**, Project 2061, American Association for the Advancement of Science, 1993, New York, NY; **National Science Education Standards**, National Research Council, 1996, Washington, D.C.



ELEMENTARY APPLICATIONS

Benchmarks K-2: Interdependence of Life

“Students should investigate the habitats of many different

“The physical environment in and around the school can be used as a living laboratory for the study of natural phenomena. Whether the school is located in a densely populated urban area, a sprawling suburb, a small town or a rural area, the environment can and should be used as a resource for science study.”
(NSES, pg. 45)

kinds of local plants and animals including weeds, aquatic plants, insects, worms and amphibians, and some of the ways in which animals depend on plants and on each other.”

< Classify plants and animals in different parts of the schoolyard to discover similarities and differences.

< Determine the number of habitats on the school property, making note of the plants and animals found in each.

< Discuss the pollination process and how specific plants are dependent upon specific pollinators; survey the schoolyard and look for pollinators at work.

NSES Life Science Standard K-4

“During elementary grades, children build an understanding of biological concepts through direct experience with living things, their lifestyles and their habitats. Characteristics of organisms; Life cycles of organisms; Organisms and their environment.”

< Study the life cycle of butterflies first-hand by creating a native plant garden that provides plants for all stages of the cycle.

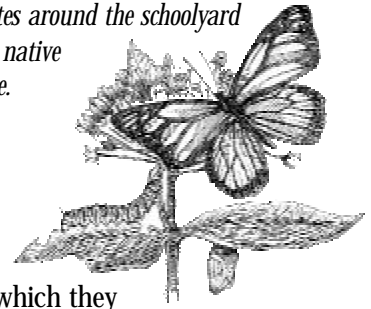
< Conduct ongoing field observations of schoolyard wildlife; create field guides for the wildlife that visits the schoolyard.

Benchmarks 3-5: Scientific Inquiry

“Scientific investigations may take many different forms, including observing what things are like or what is happening somewhere, collecting specimens for analysis, and doing experiments.”

< Study insect populations in the habitat area over time. What plants serve as “hosts”? What factors affect population size?

< Conduct soil tests at different sites around the schoolyard to determine the best site to plant a native prairie or other native ecosystem type.



Benchmarks 3-5:

Interdependence of Life

“Students should explore how various organisms satisfy their needs in the environments in which they are typically found. They can examine the survival needs of different organisms and consider how the conditions in particular habitats can limit what kinds of living things can survive. Their studies of interactions among organisms with an environment should start with relationships they can directly observe.”

< Compare wildlife observations in the habitat area to observations made at different sites around the schoolyard. Which site had the most biodiversity and why?



MIDDLE SCHOOL APPLICATIONS

NSES Life Science 5-8

Students can investigate “populations and ecosystems” and “diversity and adaptation in organisms.”

< Study your schoolyard ecosystem. How does this ecosystem function? Who are the predators and who is the prey?

< Observe birds visiting feeders and fruit/seed bearing shrubs in the schoolyard. How have the beaks of the species adapted to their different feeding strategies?

Benchmarks 6-8: Interdependence of Life

“In all environments...organisms with similar needs may compete with one another for resources, including food, space, water, air and shelter.... Two types of organisms may interact with one another in several ways: They may be in a producer/consumer, predator/prey, or parasite/host relationship...”

< Study the Schoolyard Habitats site and identify examples of predator/prey relationships.

< Find an example of parasitism in your habitat area.

< Identify native “host” plants for butterfly species in your area and add them to your habitat area.

“...Early science experiences can be designed to bring out one aspect of the belief in the unity of nature. Students should sometimes repeat observations and investigation in the classroom, and then, when possible, do so again in the schoolyard and at home.”
(Benchmarks for Science Literacy, pg. 6)

Mathematics Standards and Schoolyard Habitats Projects

National standards document referenced: **Curriculum and Evaluation Standards for School Mathematics** National Council of Teachers of Mathematics, 1989, Reston, VA.



ELEMENTARY APPLICATIONS

Math Standard 4: Mathematical Connections K-4
Students should use math in their daily lives; "...measurement situations should continually be part of the program."

< *Research migration routes and calculate number of miles traveled for butterflies and birds visiting the habitat area.*

< *Create a base map of the school property; calculate the total area of the habitat site.*

Math Standard 4: Mathematical Connections K-4
Students should use math in other curriculum areas.

< *Graph results of ongoing habitat observations, such as number of bird species visiting feeders in a day, month and year.*

< *Start a plant from seed; observe and measure shoot and leaf growth.*

Math Standard 9: Geometry and Spatial Sense K-4
"Geometry helps us represent and describe in an orderly manner the world in which we live... Spatial sense is an intuitive feel for one's surroundings and objects in them."

< *Look for patterns in nature such as tree shapes, leaf shapes and colors of flowers.*

Math Standard 10: Measurement K-4
Use measurements in problems and everyday situations.

< *Count the number of trees and shrubs found on the schoolyard; "adopt" one tree and calculate height, age, and girth.*

< *Calculate the cost of buying plants for the habitat project.*



MIDDLE SCHOOL APPLICATIONS

Math Standard 4: Mathematical Connections 5-8
"Many opportunities to show the connection between mathematics and other disciplines are missed in school. For example, the study of maps is an excellent time to also study scaling and its relation to the concepts of singularity, ratio and proportion."

< *Develop a map of the schoolyard. What is the ratio of paved areas to unpaved areas?*

< *Make numerical predictions about the future growth of plants after collecting data.*

Math Standard 8: Patterns and Functions 5-8
"Students should be encouraged to observe and describe all sorts of patterns in the world around them; plowed fields, haystacks, leaves on trees."

< *Use field guides and a key to classify leaves and flowers.*

< *Have students develop their own field guides and keys for the habitat area.*

English Language Arts Standards and Schoolyard Habitats Projects

National standards document referenced: **Standards for the English Language Arts**, National Council of Teachers of English and International Reading Association, 1996, Urbana, IL.

ELEMENTARY APPLICATIONS

English Standard 7

"I believe that every child begins with the drive to explore the world he or she is born into, that curiosity is indeed native. Speech becomes its principle instrument." — James Brittan (*Standards for the English Language Arts*, pg. 38)

"Everyday life provides abundant raw materials from which students develop their investigative language competencies."

< *Move reading time outdoors to the habitat area*

< *Write poems or haikus about plants and animals found on the schoolyard*

< *Create a Schoolyard Habitats journal that includes observations on one side of the page and questions on the other*

MIDDLE SCHOOL APPLICATIONS

English Standard 7

"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 ... to communicate their discoveries in ways that suit their purpose and audience."

< *Turn the Schoolyard Habitats site into a site for research and understanding of larger societal issues such as population growth, pollution and use of resources, issues which can then be communicated through posters, presentations and collaborative reports.*

< *Compile results of schoolyard investigations in written reports; students present findings to other students for peer review.*

< *Students design and write a Schoolyard Habitats newsletter to share with other classes, students and the general public.*

Social Studies/Geography Standards and Schoolyard Habitats Projects

National standards documents referenced: **Curriculum Standards for Social Studies: Expectations of Excellence**, National Council for the Social Studies, Bulletin 89, 1994, Washington, D.C.; **Geography for Life: National Geographic Standards**, Geography Education Standards Project, 1994, National Geographic Research & Exploration, Washington, D.C.



ELEMENTARY APPLICATIONS

Social Studies Strand III: People, Places and Environments

“This area of study helps the learner make informed and critical decisions about the relationship between human beings and their environment.... In the early grades, young learners draw upon immediate personal experiences as the basis for exploring geographic concepts and skills.”

< Study the history of the school property to find out what it was before the school was built; students interview neighbors and other community members.

Social Studies Strand III: People, Places and Environments — Middle Grades

“Describe physical system changes such as season, climate, weather and the water cycle.”

< Set up a weather station in the habitat area; track rainfall, temperature and other elements over time; students identify patterns and how they affect the habitat.

< Study topography and waterflow on the schoolyard. Where does the water go? How does your schoolyard affect the watershed?



MIDDLE SCHOOL APPLICATIONS

Social Studies Strand III: People, Places and Environments — Early Grades

“Describe how people create places that reflect ideas, personality, culture, and wants and needs as they design homes, playgrounds, classrooms and the like.... Describe personal connections to a place, especially place as associated with immediate surroundings.”

< Students conduct a school-wide survey to determine priorities for property use that could include play areas, playing fields, future buildings for expansion of the school population, and the protection of natural areas.

Social Studies Strand VIII: Science, Technology and Society — Early Grades

“Suggest ways to monitor science and technology ... to protect the physical environment, individual rights and the common good.”

< Join an on-line wildlife monitoring program; have students share data collected in the Schoolyard Habitats area with other schools and scientists. (See www.nwf.org for a list of programs)

Geography Standard I: The World in Spatial Terms — Grades 5-8

“The geographically informed person knows and understands how to use maps and other geographic representations, tools and technologies to acquire, process and report information from a spatial perspective.”

< Research different types of maps including topographic maps, geologic maps, GIS maps, and biological cover maps; have students create their own maps depicting what is found on their schoolyard; create a 3-D topographical map of the schoolyard.

< Using GIS software, students collect, report and map data on their schoolyard, community and watershed.

Schoolyard Habitats sites provide teachers of all subject areas with unique, hands-on opportunities for meeting and exceeding standards of learning requirements. This document merely scratches the surface as to the many ways in which a habitat-based learning area can be utilized to meet educational requirements, while offering students unique learning opportunities that cannot be duplicated in the traditional, indoor classroom setting. Many students need more than books, worksheets and carefully contrived experiments; they need hands-on experience in a vibrant setting that illustrates to them the “real world” context of their education. A Schoolyard Habitats project can provide the setting, the subject material and the process skills to make learning come alive for students.



For information about the Schoolyard Habitats program, please visit our web page at:
www.nwf.org/habitats/schoolyard



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