Baltimore County Public Schools
Outdoor Science

Maryland Green Schools
Best Management Practice – Structures for Environmental Learning
Grade Level – 1
BCPS Unit – I Am a Scientist: Eco-Explorers

Voluntary State Curriculum
Standard
3.0 Life Science – The students will use scientific skills and processes to explain the dynamic nature of living things, their interactions, and the results from the interactions that occur over time.

Topic
B. Cells
Indicator
1. Describe evidence from investigations that living things are made of parts too small to be seen with the unaided eye.
Objectives
a. Use magnifying instruments to observe parts of a variety of living things, such as leaves, seeds, insects, worms, etc. to describe (drawing or text) parts seen with the magnifier.
b. Use information gathered from observations to compare the descriptions (drawings or text) of the different parts seen.
c. Describe some of the ideas or questions that might result from examining organisms more closely.
Indicator
2. Provide evidence that all organisms are made of parts that help them carry out the basic functions of life.
Objectives
a. Gather information and direct evidence that humans and other animals have different body parts used to seek, find, and take in food.
b. Investigate and identify parts of the body that alert humans and other animals to danger and help them to fight, hide or get out of danger.
c. Describe some parts of plants and describe what they do for the plant.
d. Respond, giving reasons to support the response, to the statement "All living things are made of parts."

Introduction
There are seven BMP's offered as choices for the Green School application. As a school, you are required to select four different BMP's to obtain Maryland Green School status. This document provides three possible projects for the Structures for Environmental Learning BMP. The projects are given for a specific grade level and are based on the BCPS curriculum and the VSC indicators. They execute the *Extension* piece of the 5E

format for science curriculum fulfilling the Green School criteria for Best Management Practices through instruction as they broaden the existing science units.

Time will need to be allotted for implementation of these projects. The amount of time will vary with the complexity of the project. Your project might be defined as on-going activities (e.g., curbside recycling) or an annual event (e.g., Earth Day Celebration or a unit specific project). Teacher discretion will determine how to facilitate the project. Factors including student needs, time management, and available resources will need to be taken into consideration.

The three projects described below are only a few of the many possible projects that fulfill your school's BMP requirement. Please do not feel that you are limited by these suggestions.

BMP – Structures for Environmental Learning

Structures for environmental learning include physical structures that help support and assist in environmental education. These structures can be created for use in the traditional or outdoor classroom. They can be a means for instruction (e.g., outdoor seating), viewing nature (e.g., wildlife blinds), or holding materials for nature study (e.g., bird seed bins), just to name a few.

BMP Project 1 – Wildlife Blind

Background

Wildlife blinds are structures that allow students to observe wildlife up close without scaring the animals away. It can be as simple as a large cardboard box that is placed outside prior to the observation time or as complicated as an elaborate wooden structure built from plans. Wildlife blinds allow for observation of animals that live in or around the schoolyard habitat in hopes of gaining more knowledge and a greater appreciation of nature.

Resources

- Department of Natural Resources
  580 Taylor Avenue
  Annapolis, Maryland 21401
  1-877-620-8DNR (8367)
  http://www.dnr.state.md.us

- Chesapeake Bay Foundation: *Steps for Creating a Schoolyard Habitat Plan*
  http://www.cbf.org/site/DocServer/steps_syh.pdf?docID=3288

- U.S. Geological Survey: *Building Nest Structures, Feeders, and Photo Blinds for North Dakota Wildlife*
  http://www.npwrc.usgs.gov/resource/wildlife/ndblinds/a_frame.htm

- U.S. Fish and Wildlife Service: *Viewing Blind*
  http://www.fws.gov/twoponds/blind.htm

- Ohio Department of Natural Resources: *Building Bird Blinds, Fun for Kids!* http://www.dnr.state.oh.us/tabid/6047/default.aspx

Cross Curriculum Connections

- Math: Students could tally the number of animals they observe through the wildlife blind on a chart created by the teacher.

- Technology: Students could use a digital camera to take photos of the animals they observe. A photo journal could be created using the photos and student-generated text.

- Language Arts: Students could write an acrostic poem for a word representing an animal they observed using a wildlife blind.

- Art: Students could draw plans for wildlife blinds. Encourage creative use of materials and ways to use the blinds.

Tips for Implementation

- Be sure to work with local agencies as a means of support. Ask local home improvement centers for possible donations or reduced cost building materials. Media coverage and newsletter acknowledgement can be motivating and encourage community involvement and business partnerships.

- Ask members of the school community to share their abilities. Most communities have members who are builders, artists, and/or possess other hands-on talents.

- Place a notice in the school newsletter asking for appliance boxes to create portable wildlife blinds. This type of blind can be easily made by cutting out one side for access and cutting out a viewing panel on another side for wildlife observation.

BMP Project 2 – Habitat Model

Background

A habitat model is used to demonstrate aquatic or terrestrial ecosystems. The habitat model could contain live plants and/or animals, depending on the purpose for learning and the level of involvement. The habitat model could be as simple as potted plants in a terrarium or a hermit crab habitat set up in an aquarium or cage. The model could be as complicated as a woodland terrarium or a multi-leveled aquarium. Habitat models provide an opportunity for students to view organisms on a regular basis. It allows them to take responsibility for monitoring the model and recording data as defined by the teacher.

Teachers Please Note: Please refer to the BCPS Office of Science PreK-12 "Animal Guidelines" for more information. These are located at the following website: www.bcps.org/offices/science. Follow the links to "Animal Guidelines."

Resources

- Chesapeake Bay Foundation
  Philip Merrill Environmental Center
  6 Herndon Avenue
  Annapolis, MD 21403
  http://www.cbf.org

- Baltimore County Public Schools: *Animal Guidelines*
  www.bcps.org/offices/science

- Drs. Foster and Smith: *Pet Education*
  http://www.peteducation.com/category_summary.cfm?cls=16&cat=1980

- North Carolina Office of Environmental Education: *Making and Observing a Mini-Woodland Terrarium*
  http://web.eenorthcarolina.org/content/ee/docs/terrarium_lesson.pdf

- Washington State Leadership and Assistance for Science Education Reform: *Observing Woodland Plants*
  http://www.wastatelaser.org/_support/toolkits/stc/organisms/lesson4.asp

- Fish Lore: *How to Set Up a Freshwater Aquarium*
  http://www.fishlore.com/FirstTankSetup.htm

- eHow: *How to Set Up a Freshwater Aquarium*
  http://www.ehow.com/how_5794_set-freshwater-aquarium.html

Cross Curriculum Connections

- Math: Students could collect and record real time data of the habitat model's "climate" including air temperature, water temperature, and/or salinity, as deemed applicable to your set-up.

- Technology: Students could use the *Microsoft Word* draw tool to create plans for the habitat model. After the basic plans are printed, students could add hand-drawn details and labeling.

- Language Arts: Students could write instructions for how much water, soil, food, or other applicable materials are needed to start and maintain the habitat model.

Tips for Implementation

- Many pet stores offer discounts for purchases made by teachers for curriculum related projects.

- Consider the type of ecosystem for your model as a means to facilitate learning. This initial decision will define the materials needed for the project and the timeline necessary to create the model.

- Refer to the BCPS Office of Science PreK-12 "Animal Guidelines" for more information on which animals are permitted in the classroom and details on their maintenance and care.

BMP Project 3 – "Bucket Seats"

Background

Bucket seats are simply large buckets that when turned upside down are used as a place for students to sit. They are frequently used for outdoor seating. The bucket seats are beneficial because they are inexpensive, waterproof, can be used to carry materials outside, and keep students reasonably comfortable during an outdoor education experience.

Resources

- Pat Ghingher
  Team Leader/Teacher Naturalist
  BCPS Office of Science/Outdoor Education
  410-294-0426
  pghingher@bcps.org

- United States Plastic Corporation: *Five Gallon Buckets*
  This site sells a variety of plastic containers. It could be used to view the type of buckets recommended for outdoor seating when soliciting free, empty buckets from the community or as an actual vendor.
  http://www.usplastic.com/catalog/product.asp?catalog_name=USPlastic&category_name=20327&product_id=9715&clickid=land

Cross Curriculum Connections

- Math: Students could make a budget for purchasing buckets needed for outdoor seating. If more than one vendor is contacted, students could compare the prices of the buckets to determine the best value.

- Language Arts: Students could create a nature observation journal to record information while outdoors. They can use the bucket as a means of carrying the journal to the outside classroom.

- Art: Students could decorate the buckets to designate them as environmental friendly.

Tips for Implementation

- The recommended size for the buckets is 5 gallons.

- The buckets could be previously used paint or spackle buckets. These are sturdy and large enough to serve the purpose of an outdoor seat.

- The buckets can be used as a means for carrying supplies outdoors and then turned over to be used as a seat.

Additional Project Ideas for the Structures for Environmental Learning BMP

- Place shallow pans outside on the ground, each with a different source of food/energy. For example, the pans could be filled with sunflowers seeds, berries, fruit slices, etc. Students should observe the pans to see what animals are attracted to each food and record their observations. Rocks may be used in pans to prevent them from blowing over.

- Place a window bird feeder on the outside of a classroom window. These feeders are easy target for vandalism/theft so it should to be placed on a second story window or a window that is inside of a courtyard, or the feeder should be removed each evening.

- Clear an area of ground so that only soil remains. Break up soil to create a soft, smooth surface where animal tracks could easily be seen. Another option is to place a large shallow container filled with finely packed soil on the ground. Ideally, the container should be placed level with the ground in an open area near or in a forest. Leave container/cleared areas overnight. Check for animal tracks the following day.

- Build an outdoor classroom on the school grounds. Many times, scouts are seeking projects such as this to fulfill scout level requirements. The outdoor classroom can simply be a few backless benches or could contain a large platform for instruction along with built-in seating.