

Habitats Bring Your Schoolyard to Life!



Buckeye butterfly
on Tickseed
(*Coreopsis* spp.)
photo by Jan Newton



Stonehouse Elementary School
in Williamsburg, Virginia transformed
an entire courtyard into a Schoolyard Habitat
photo by Jan Newton



Students dig-in to create their outdoor
classroom at Stonehouse Elementary
photo by Jan Newton



Butterfly weed
(*Asclepias tuberosa*)
photo by Carol A. Heiser



Checkered skipper on
Aromatic aster
(*Symphoricarum oblongifolium*)
photo by Jan Newton



Green tree frog
on Cup plant
(*Silphium perfoliatum*)
photo by Callie Newton



Coral honeysuckle
(*Lonicera sempervirens*)
photo by Jan Newton



Creeping phlox
(*Phlox stolonifera*)
photo by Carol A. Heiser



Black-eyed Susan
(*Rudbeckia fulgida*)
photo by Lee Walker



Swamp milkweed
(*Asclepias incarnata*)
photo by Jan Newton



Fritillary on Bee balm
(*Monarda didyma*)
photo by Jan Newton

Native Plants Suitable for Virginia Statewide Use

** The plants in this list have been selected because they are native, common and wide-ranging; they can therefore be planted state-wide. These species are non-invasive, non-harmful to other native plants, and are beneficial to wildlife. Always use the scientific name when seeking plant stock from a nursery. For more information about plants native to your specific region, consult the **Digital Atlas of the Virginia Flora** at www.biol.vt.edu/digital_atlas/ and the **Flora of Virginia** at <http://floraofvirginia.org/>

Trees and Shrubs

Acer rubrum (Red maple)
Alnus serrulata (Smooth or hazel alder)
Betula nigra (Black birch)
Carya (hickory): Pignut (*C. glabra*); bitternut (*C. cordiformis*); mockernut (*C. alba* or *C. tomentosa*)
Castanea pumila (Allegheny chinquapin)
Corylus americana (American hazel, or filbert)
Fagus grandifolia (American beech)
Fraxinus americana (White ash)
Juglans nigra (Black walnut)
Pinus virginiana (Virginia pine)
Prunus (cherry): American wild plum (*P. americana*); black cherry (*P. serotina*)
Quercus (oak): White (*Q. alba*); scarlet (*Q. coccinea*); southern red (*Q. falcata*); chestnut (*Q. prinus*); post (*Q. stellata*); black (*Q. velutina*)
Rosa (rose): Pasture rose (*R. carolina*); swamp rose (*R. palustris*)
Salix (willow): Black willow (*S. nigra*); prairie willow (*S. humilis*)
Ulmus (elm): American elm (*U. americana*); slippery elm (*U. rubra*)
Vaccinium (blueberries): Lowbush blueberry (*V. pallidum*); deerberry (*V. stamineum*)
Viburnum: Maple-leaf viburnum (*V. acerifolium*); blackhaw viburnum (*V. prunifolium*)



Flowering Perennials

Asclepias (milkweed): Swamp milkweed (*A. incarnata*); common milkweed (*A. syriaca*); butterflyweed (*A. tuberosa*); whorled milkweed (*A. verticillata*)
Eupatorium: Common boneset (*E. perfoliatum*); green-stemmed Joe-Pye weed (*E. purpureum*)
Geranium maculatum (Wild geranium)
Helianthus (sunflower): Woodland sunflower (*H. divaricatus*); thin-leaved sunflower (*H. decapetalus*); giant sunflower (*H. giganteus*); paleleaf sunflower (*H. strumosus*)
Ipomoea pandurata (White morning glory)
Iris verna (Dwarf violet iris)
Lobelia (lobelias): Cardinal flower (*L. cardinalis*); downy lobelia (*L. puberula*); indian tobacco (*L. inflata*); great blue lobelia (*L. siphilitica*); palespike lobelia (*L. spicata*)
Lonicera sempervirens (Coral or trumpet honeysuckle)
Oenothera biennis (Evening primrose)
Phlox: Meadow phlox (*P. maculata*); summer or garden phlox (*P. paniculata*)
Rudbeckia (coneflowers): Early, eastern or orange coneflower (*R. fulgida*); black-eyed Susan (*R. hirta*); tall, green-headed or cutleaf coneflower (*R. laciniata*)
Solidago (goldenrods): Canada goldenrod (*S. altissima*); white or hairy goldenrod (*S. bicolor*); wreath goldenrod (*S. caesia*); gray or dwarf goldenrod (*S. nemoralis*); rough-stemmed goldenrod (*S. rugosa*)
Verbena: Blue vervain (*V. hastata*); narrowleaf vervain (*V. simplex*); white vervain (*V. urticifolia*)
Viola (violets): Marsh blue violet (*V. cucullata*); bird's foot violet (*V. pedata*); common blue violet (*V. sororia*)



all plant photos above by Dot Field

Grasses

Schizachyrium scoparium (little bluestem)

Native plant list compiled by the Division of Natural Heritage, Virginia Department of Conservation and Recreation.

Where can I find more information about the plants in the list above?

Virginia Native Plant Society - <http://vnps.org/home>
 USFWS Native Plant Center - www.nativeplants.org
 United States Department of Agriculture Natural Resources Conservation Service - <http://plants.usda.gov/>
 Lady Bird Johnson Wildflower Center at the University of Austin - www.wildflower.org/
 Flora of North America - www.fna.org/

More Schoolyard Habitat Examples

Tuckahoe Elementary (click on "Discovery Schoolyard") - www.apsva.us/tuckahoe/site/default.asp
 Waddell Elementary ("Roots and Shoots School Garden") - www.rootsnshoots.info
 St. Paul High School ("Wetlands Estonoa Learning Center") - www.estonoa.org
 Find more habitat tips at Dept. of Game & Inland Fisheries - www.dgif.virginia.gov/habitat



Lunch Buddies Lesson Plan

Objectives: Students will: 1) will understand interdependence in ecological systems; 2) will describe examples of symbiotic relationships between plants and animals.

Method: Students research native plants and animals associated with those plants and play a card game to explore the interdependence between them.

Materials: Index cards (4 per group); copies of master cards (one per small group); field guides and other reference materials.

Background: Virginia is home to thousands of species of plants and wildlife. Many of them depend upon each other. Consider the zebra swallowtail butterfly whose exclusive larval food is the paw paw tree. Our native wildlife species evolved over time to feed on native plants. Leaves, shoots, berries, nuts or nectar are available at crucial times during migration or when young are born. Some of the relationships are so specific, specific; scientists consider the relationship to be interdependent. Although non-native plants may also provide food and shelter they may not be best suited for Virginia soils and climate or provide the nutrition or other specific requirement needed by some species. This activity matches wildlife to one of the plants they depend upon. The plants and species in this activity is only a sample of the variety found in Virginia. Most can be found in each region of the state. Some are suited for schoolyard gardens and habitats; others are best avoided although they are great for wildlife are not suitable for schoolyards. Teachers and students are encouraged to add to this list by conducting their own research in the library or on-line.

Procedure:

- ✎ As a class; research a list of native plants in the area using field guides and the internet creating a master list of plants - www.biol.vt.edu/digital_atlas/, www.wildflower.org/explore, www.dcr.virginia.gov/natural_heritage/index.shtml, www.nativeplantcenter.net/
- ✎ Divide students into pairs or groups of 3.
- ✎ Each group chooses one plant from the master list. The team then researches a wildlife species dependent upon the plant.
- ✎ For a list of Virginia wildlife species visit - <http://www.dgif.virginia.gov/wildlife/>. Your class can research individual birds at www.allaboutbirds.org
- ✎ Some plants are eaten by several species and the classroom will need to discuss and decide which species to highlight for each plant. Once completed the class should have 12-15 pairs of plants and animals.
- ✎ Provide each team with four 4x6 index cards. Instruct the team to cut the cards in half creating a card that is 3"x 4" ; information about the plant is written on one half of the index card and information about the animal on the other half. They should duplicate the information forming 4 identical sets of cards. These will be used in creating 4 full decks of Lunch Buddy cards for the class to complete the activity.
- ✎ Collect all the cards from each team and divide into decks. Hint: if you provide each team with 4 different color cards you can easily create the 4 separate decks of Lunch Buddy cards.
- ✎ Add one card to each deck with the words "Lunch Buddy" this card will not have a match.

Activity:

- ✎ Divide students again into groups of 4-5. Separate the members of the first research groups so you have experts on the different pairs in each new group.
- ✎ Game is played similar to Old Maid.
- ✎ The Lunch Buddy Deck is dealt out completely to the group of students. Since there will be an odd number of cards at least one player will receive an extra card.
- ✎ Players remove all matches from their hand. They may discuss matches at this time, each person having the opportunity to share what plants the animals depend upon.
- ✎ The remaining cards should be held in the player's hands so other players can not see the information.
- ✎ The player who is wearing the most green (or other color) goes first. Teachers may choose the starting player if desired.
- ✎ The first player picks a card from the player to his/her right, checks for a match and then completes his/her play. Next player picks from the person on their right and so on until one player is left holding the "Lunch Buddy" card and all matches have been made.
- ✎ The player with the most matches wins unless they end up with the Lunch Buddy card in which case the next highest number of matches wins.

Alternate Activity:

- ✎ If you do not have time for the students to conduct their own research and create the decks of cards you can use the activity cards downloadable from www.deq.virginia.gov/education/loveatree.html.
- ✎ Copy the Lunch Buddies cards and paste onto index cards or card stock, make one set of cards for every 4 – 5 students. Teachers may also want to provide each player with a master list of all the matches and review the table below before playing the game.
- ✎ Play the game as described above.

Evaluation:

- ✎ Students define interdependence using specific examples.
- ✎ Students discuss the following: 1) How might non-native or invasive species "shrink" habitat?; 2) How might non-native plants (and animals) affect an ecosystem?; 3) How might the class improve the surrounding habitat?

Lesson plan developed by the Virginia Department of Game and Inland Fisheries (adapted from Project WILD).

To download the complete lesson, including activity cards, go to www.deq.virginia.gov/education/loveatree.html.

Top Picks for Schoolyard Learning



Schoolyard Habitats: A How-To Guide, [K-12], c. 2001, National Wildlife Federation. www.nwf.org/Get-Outside/Outdoor-Activities/Garden-for-Wildlife/Schoolyard-Habitats/Create/How-To-Guide.aspx

✎ **Field Investigations: Using Outdoor Environments to Foster Student Learning of Scientific Processes**, [K-12], c. 2007, by A. Ryken, P. Otto, K. Pritchard and K. Owens; Association of Fish and Wildlife Agencies' North American Conservation Education Strategy. www.fishwildlife.org/files/CEStrategy-Field-Investigations_1.pdf



✎ **Schoolyard Habitat Project Guide**, 2nd Edition, [K-12], c. 2011, by Carolyn Kolstad; U. S. Fish and Wildlife Service. www.fws.gov/cno/pdf/HabitatGuideColor.pdf



✎ **Schoolyard Biodiversity Investigation Educator Guide**, [K-12], c. 2010, by Erica Baker; Pacific Education Institute. www.landscape.org/washington/bio_ed/projects/schoolyard/



✎ **Toolkit for Schoolyard Habitat Program Development**, [K-12], c. 2009, by Karen Kelly Mullin; U.S. Fish and Wildlife Service, NOAA Bay Watershed Education and Training Program, and Maryland Association for Environmental and Outdoor Education. www.fws.gov/chesapeakebay/SCHOOL/pdf/SchoolyardProgramToolkit.pdf

✎ **"The MINTS Book"—Model Inquiries into Nature in The Schoolyard: An Inquiry Field Guide**, [K-12], c. 1997, by F. Taylor, A. Raflo and L. Sharp; Virginia Tech Museum of Natural History. www.outreach.geos.vt.edu/programs/programs.html



More book titles and resources available at www.deq.virginia.gov/education/loveatree.html!

Book list compiled by the Virginia Department of Game and Inland Fisheries.



photo by Doug Smith