

# ADKINS ARBORETUM

## Environmental Education Programs for Elementary Students

### ***Kindergarten: Home for a Bunny***

In this exciting outdoor program, kindergarteners will create models and conduct hands-on investigations to explore the relationship between the needs of different plants and animals and their habitats. Activities include using dip nets in the Arboretum's wetland for an up-close look at wetland food chains, digging for worms in the children's Funshine Garden, scoping out rabbit burrows in the meadow, and searching for squirrels and acorns along shady woodland paths. (NGSS K-ESS3-1.)

### ***First Grade: Trees and Me***

First graders will investigate how the parts of a tree work together in a "build a tree" activity, explore how humans have benefited from trees over time, use magnifying glasses to examine and categorize leaves, and investigate the impact of daylight on plant growth and development. As part of the learning experience, they'll also use tree materials to design a solution to a human problem. (NGSS 1-LS1-1.)

### ***Second Grade: Birds, Bees, and Dandelion Seeds***

How do plants and animals interact to create thriving, diverse habitats? Second graders will use science skills to match pollinators with their plants, explore the four methods of seed dispersal in the classroom and outside, and observe plants and animals in the Arboretum's wetland and forest habitats. They'll also use their imaginations to create models of animal pollinators. (NGSS 2-LS2-2., 2-LS4-1.)

### ***Third Grade: Growing Up Green***

Third graders will compare and contrast the unique and diverse life cycles of four plants and animals through hands-on investigation. Activities include using dip nets and buckets in the Arboretum's wetland to see what frogs look like at each stage of the life cycle, searching for caterpillars and eggs in the butterfly garden, and exploring the Arboretum's woodlands in a tree life cycle scavenger hunt. In culmination, students will create models to describe the similarities and differences among plant and animal life cycles. (NGSS 3-LS1-1.)

### ***Fourth Grade: Native Plants, Native People***

In this hands-on interdisciplinary program, students will explore the interrelationship between nature and the Native American tribes of Maryland. Activities include exploring Three Sisters Companion gardening and participating in a green corn dance at the Funshine Garden, peeking inside model wigwams at First Light Village, examining actual Native American artifacts, and foraging for edible wildlife along scenic woodland paths. (MSDE Social Studies Standards 2Ac, d, 5A2a; NGSS LS2C, ESS3C; Common Core Language Arts Standards RI1, RI3; MSDE Visual Arts Standards 2.0.)

### ***Fifth Grade: Water, Water, Everywhere***

Students will investigate the limited amount of water available for human use and explore the complex factors affecting the water cycle through an environmental game. After making hypotheses about the health of the water in the Arboretum's wetland, students will conduct water sampling and analyze the data they collect. They'll also create model watersheds to examine human impact on the Chesapeake Bay and learn how the Arboretum uses native plants to protect waterways. (NGSS 5-ESS2-2-2, NGSS 5-ESS3-1.)

## Environmental Education Programs for Middle and High School Students

### ***STEM-Tastic***

Students will develop skills in science, technology, mathematics, and engineering through four nature-based learning stations. In *Biomimicry*, they'll learn how engineers use nature for design inspiration and build a glider based on bird wing observations. After reviewing the causes and effects of acid rain in the *What's in the Water* station, they'll review the causes and effects of acid rain and conduct chemical sampling of the Arboretum's wetland to determine pH. In *Farflung*, they'll explore the engineering principles that allow for seed dispersal across ecosystems and design their own seed dispersing machine. In *Fibonacci in Nature*, students will explore the Fibonacci sequence and look for evidence of mathematical patterns in nature.

### ***Nature's Story in the Underground Railroad***

In this inspiring, hands-on program, students will explore the role of nature in the Underground Railroad. They'll attempt to forage for wild edibles in the forest and stream, discuss quotes from actual fugitives, and gain firsthand insight into how fire was both necessary and dangerous. Students will also learn how escaping slaves navigated by the stars and will observe moss growth to determine direction. They'll use natural camouflage to conceal a "runaway," discuss the benefits and risks of waterways to an escaping slave, and examine primary source pictures and documents from slavery times. MSDE Standards for Social Studies 5C4a–c; 6D1c; Science 1A1b, f; 2D1a, b; 6B1a; Language Arts 1E1a; 2.1a ; Visual Arts 3.1a–c; 2.1a; Theatre Arts 3.2a; Music 2.1a; 2.2a–c.)

### ***Two Degrees***

What factors have caused the rise in global temperatures over the past century? How will future climate change impact Maryland's Eastern Shore? In this hands-on exploration of climate change, students will act out the carbon cycle and develop a quantitative model to describe the cycling of carbon among the hydrosphere, atmosphere, biosphere, and geosphere. They'll create models to illustrate the greenhouse effect, collect information to determine their own carbon footprint, and compare two methods to regulate carbon through a cap and trade game. In culmination, students will graph data to examine atmospheric carbon dioxide trends, make predictions about future carbon dioxide emissions, and discuss ways to reduce emissions. (NGSS HESS2-6, HS-ESS3-5.)

### ***Going with the Flow***

This program explores how organisms are linked by the transfer of energy and matter. After a quick review of trophic levels, students will use microscopes to observe plant cells and explore the engineering principles of leaf growth placement to maximize sunlight. They'll continue to delve into the world of producers on a native plant walk while observing the impact of invasive species on native landscapes. At the Arboretum's outdoor classroom, students will examine the interrelationships among producers, consumers, and decomposers in a food web challenge, then delve into decomposition by investigating a decaying log. Human impact on food webs will also be explored through a game of Habitat Hoochikoo. (NGSS HS-LS2-4, HS-LS2-6.)

## Professional Development

### ***Take It Outside!***

Maryland's environmental literacy standards stipulate that students have meaningful outdoor experiences during each school year. How can teachers use their schoolyards to enhance and reinforce curriculum? Adkins Arboretum educators will lead elementary and middle school teachers through a variety of hands-on outdoor education activities that can be used across disciplines and grade levels. Activities are designed to complement Maryland State Curriculum with an emphasis on STEM and Next Generation Science Standards.

*For more information or to schedule an environmental education program, contact Youth Program Coordinator Jenny Houghton at [jhoughton@adkinsarboretum.org](mailto:jhoughton@adkinsarboretum.org) or 410-634-2847, ext. 26.*