2018-2019 Education Programs for Grades PreK-12

Blandy Experimental Farm
an Ecology Research Station of the University of Virginia

Hands-on, STEM learning in our outdoor classroom

We welcome public, private, and home schools.

For more information call (540) 837-1758 Ext. 242
or e-mail schprog@virginia.edu
NOTE TO EDUCATORS:

Blandy Experimental Farm Education programs:
- Virginia Standards of Learning Correlated
- Align with the Next Generation Science Standards
- Emphasize Hands-On, Experiential Learning
- Develop 21st Century skills
- Are Grade Level Targeted & Discipline Integrated
- Incorporate Elements of STEM
- Provide Environmental Literacy Connections
- Generate student interest in career possibilities

A visit to the State Arboretum of Virginia provides authentic learning in an outdoor setting. Our programs feature hands-on learning and investigations to provide children positive and meaningful experiences with the natural world. We are dedicated to engaging your students in exciting place-based science investigative experiences!

All of our programs are designed to meet Virginia Standards of Learning (SOL) requirements; science and math standards are listed in the descriptions. Most programs are offered for a range of grades; rest assured that activities are tailored to your specific grade visiting. We use an integrative scientific approach: our activities incorporate science and math, develop technology and engineering skills, and apply 21st century skills (5Cs). All programs are designed to support your classroom teaching; they can be used to introduce new concepts, explore current lessons, or review a unit. There are many options to provide an optimal learning experience for your students. We look forward to participating with you in providing the best possible STEM learning for your students!

Our facilities include:
- 175-acre Arboretum collection featuring over 1000 species of trees, shrubs, and herbaceous plants
- A variety of outdoor learning locations including wetlands, woodlands, meadows, and thematic gardens
- Designated School Bus Parking area
- Picnic area with tables (seats about 80)
- Three classrooms: Parkfield Learning Center, Peetwood Pavilion for Environmental Education (seasonal, covered outdoor classroom), and Blandy Community Classroom
- Wheelchair-accessible restrooms in the Quarters (our main office building) and Peetwood Pavilion

Program Structure

For 3 to 5 classes visiting Blandy:
Classes rotate through several activity stations. During rotations, Blandy educators and teachers share the responsibility for leading students through the program activities. Schedules are:
- Intended for schools bringing 3-5 classes (from one grade) in one day
- Set up as a series of stations the classes move through using a predetermined schedule
- Planned for maximum student engagement & designed to enhance students’ learning experiences
- Available for ALL programs except: Water Quality Technology, Science Explorations, and Careers at the Arboretum
- Arrival time is 9:40 a.m. for program briefing & restroom visits. Departure times vary based on your schedule.

For 1 to 2 classes visiting Blandy:
Programs are 75 minutes unless otherwise stated in the program description. We can accommodate two classes at one time— one in the Parkfield Learning Center and one in the outdoor classroom, Peetwood Pavilion. Three time slots are available (10:00 a.m., 11:30 a.m., and 1:30 p.m.).

Please plan to arrive 20 minutes before your program is scheduled to allow time for a program briefing and a restroom visit.

To see our Programs at a Glance, go to pages 7-8.
FIELD INVESTIGATION REGISTRATION

To request a program go to:
http://www.blandy.virginia.edu/education/registration

Program Registration

Use the link above to make your registration request online.

A few important notes about registering:

- Please provide the most accurate, anticipated attendance numbers for each program as well as each teacher's name and email address to help us prepare for your visit(s).
- Once you have submitted a registration request, you will receive an email to confirm the program date and time requested or suggested alternative dates. You must respond to this email within 48 business hours to confirm.
- Call us at 540-837-1758 Ext. 242 with any questions you have about program structure, content, registration assistance, etc.

Class size: Minimum class size for a program is 10 students. For groups spanning several grade levels, limit your group to three consecutive grades, e.g. grades 3, 4, & 5 or K, 1, & 2. Please refer to page 2 for program structure details.

Cancellation Fee: If you cancel your program(s) within 3 weeks of your scheduled date, you will be charged the minimum program fee (equivalent to ten students) for each program. (For example, the cancellation fee for one class of Let's Sprout would be $40. The cancellation fee for three classes of Watershed Investigations would be $180). We are unable to fill timeslots vacated within 3 weeks of a program date due to the lead time needed for schools to schedule visits to the Arboretum. Programs will be held rain or shine, except for severe weather. If weather conditions are questionable, we will contact you.

Chaperones: There is no charge for adult chaperones. Adult to student ratio is 1:5 (preK-5th), 1:7 (6th– 8th) and 1:9 (9th-12th). Please limit chaperones to not more than 1 per 5 children. Exceptions to the maximum chaperone limit are special needs and teacher assistants. All chaperones must be registered and approved per the visiting school’s policy. Click here for our Chaperone Guidelines.

Special Needs: Please advise us if you have students with special needs (i.e. allergies, physical limitations, behavioral or developmental exceptionalities, etc.). We will make every effort to accommodate your students. NOTE: We are not able to provide on-site transportation for students with crutches or other physical limitations.

Be Prepared: Maximize your students’ experiences at Blandy! Call or email us to schedule a program preview. We also provide pre- and post-program resources that can be used in your classroom to reinforce or introduce program concepts. Access these resources at: http://blandy.virginia.edu/education/education-resources As our activities are outdoor based, activity location(s) may change to maintain a safe learning environment for students and teachers. Blandy Education Instructors maintain first aid certifications.

Restrooms: Allow 20 minutes for your entire class to visit the restroom. Restrooms are located in our Quarters Building and Peetwood Pavilion.

Picnic Grove: Seats about 80 people. First-come, first-serve basis; no reservations are taken.

Who is in charge?
Teachers and Chaperones are expected to manage students behavior at ALL times. Please abide by arboretum rules and etiquette.

Click here for Directions
Early Explorers (PreK- K)
Choose one of the following themes for your young scientists. In each, students investigate and explore parts of our watershed using their senses and powers of observation through a variety of activities.
- **Plants and Trees**– Examine trees and plants up close and personal! This program incorporates literacy and observation elements to learn about animals that live on & use trees.
- **Weather**– Observe clouds, wind, and how the weather affects animals and nature. This program highlights weather observation skills and tools.

VA Foundation Blocks for Early Learning
Science Block 1, 3, 4, 6 Mathematics Block 3, 4, 5, 6
Fee: $4 per student

Mammals (preK–2nd)
Students learn about Virginia mammals native to the Chesapeake Bay Watershed. They investigate mammal life needs and use critical thinking to analyze and compare mammal tracks, applying geometry and counting skills. Students explore Blandy looking for signs mammals leave behind. This program also focuses on the senses mammals use to find food, seek prey, and define territories.

Science SOL:  K.1, K.2, K.4, K.6, K.7, K.9; 1.1, 1.5, 1.7; 2.1, 2.4, 2.5, 2.7
Math SOL: K.2, K.4, K.11, K.13; 1.7, 1.12, 1.13, 1.14; 2.1, 2.4, 2.12, 2.13, 2.15, 2.17
 Fee: $4 per student

Let’s Sprout (K-2nd)
The imagination of your budding young scientists will be captured as they explore the wonders of germination and plant growth. We investigate plant life cycles through models. Scientific observations are conducted and results are communicated. Outdoor exploration of the plant world reinforces student understanding of plant parts, functions, and roles in the watershed. Students select appropriate tools for planting seeds and provide care for their seeds.

Science SOL:  K.1, K.2, K.6, K.7, K.9, K.10; 1.1, 1.4, 1.5, 1.7; 2.1, 2.4, 2.7, 2.8
Math SOL: K.2, K.11, K.12 K.13; 1.13, 1.14; 2.1, 2.4, 2.15, 2.16
 Fee: $4 per student

What teachers say about our programs:
“Many thanks! Everything was so well organized, content was relevant to curriculum, and you made learning fun for the kids! Top notch all around.”
Elementary (2nd – 4th)

It’s for the Birds (2nd–4th)
Birds have adaptations that allow them to survive in a multitude of environments in a watershed. Students consider strategies that help birds secure shelter and find food, and explore how bird beaks are adapted for gathering and eating specific foods. Outdoors, fledgling ornithologists use binoculars to observe birds in their natural habitats, and collect data to interpret and share in citizen science projects as part of civic responsibility. This program is available year round!

Science SOL: 2.1, 2.5, 2.7; 3.1, 3.4, 3.5, 3.10; 4.1, 4.5, 4.9
Fee: $4 per student

Incredible Insects (2nd–3rd)
Explore the diversity of crawling, flying, and hopping insects with this program! Students discover insect survival mechanisms, such as mimicry and camouflage. They investigate insect life cycles and use magnification tools to examine insects up close and personal. Young entomologists develop an appreciation for the diversity of insects in our watershed habitats as they collect data and communicate their observations about insects and non-insects.

Science SOL: 2.1, 2.4, 2.5, 2.7; 3.1, 3.4, 3.8
Math SOL: 2.15, 2.16; 3.15, 3.16
Fee: $4 per student

Virginia Natives (3rd–4th)
Students evaluate Virginia’s native food webs and energy flow in watershed systems as they investigate the relationships among producers, consumers, and decomposers in the forest layers of the Arboretum’s Native Plant Trail habitat. Students apply critical thinking skills collecting and analyzing data on native and non-native organisms. Through observations and sketches, your ecosystem scientists collaborate to investigate interdependencies and organism interactions within their ecosystem.

Science SOL: 3.1, 3.4, 3.5, 3.6, 3.8; 4.1, 4.4, 4.5, 4.9
Math SOL: 3.3, 3.15, 3.17; 4.7, 4.14
Fee: $4 per student

This is a GREAT program for the FALL!

What teachers say about our programs:
“This was a wonderful experience for the students - they loved it! It was a great supplement to our watershed curriculum. It was very organized and the staff were enthusiastic and engaging.”
**Scoop On Soils (3rd)**

With this investigative program, students realize that soil is more than just dirt! In collaborative groups, your soil scientists conduct an experiment to test soil porosity and explore soil particle size in a kinesthetic game. The science process skills of data collection, measurement, observation are reinforced. In the field, we examine and identify different soil layers and look for evidence of organisms living in the soil. The impacts of erosion in watersheds are discussed. This program is recommended for winter as well as other times of the year.

Science SOL: 3.1, 3.7, 3.10  
Math SOL: 3.1, 3.3, 3.7, 3.9, 3.15, 3.17  
Fee: $4 per student

**Snake Savvy (3rd-5th)**

As long as you know about snakes, there is no reason to be wary of them! Developing herpetologists use non-fiction resources to investigate snakes. Students compare characteristics that differentiate Virginia’s venomous and non-venomous snakes. They measure and compare the lengths and patterns of snakes then communicate their knowledge. Students also study how snakes use defensive behaviors such as mimicry, camouflage, and temperature regulation to defend themselves.

Science SOL: 3.1, 3.4, 3.5; 4.1, 4.9; 5.1, 5.5  
Math SOL: 3.1, 3.7; 4.8  
Fee: $4 per student

**Flower Functions (4th)**

Learn about the mysterious world of flowers and their structures and functions. Plant scientists dissect flowers using hand lenses and dissecting microscopes to observe and identify floral parts. Outside, they discover and collect flower and pollinator data as they examine the fascinating adaptations plants and their animal partners have developed with one another. Using critical thinking skills, they interpret the data they have collected. Students develop appreciation for the diversity of flowers in the Chesapeake Bay Watershed.

Science SOL: 4.1, 4.4, 4.5, 4.9  
Math SOL: 4.15, 4.5  
Fee: $4 per student

**Rocks Talk! (5th)**

What do the rocks at the Arboretum tell us about the geologic history of the Chesapeake Bay watershed? Student geologists identify common Virginia rocks and the distinctions among igneous, metamorphic, and sedimentary rocks. Collaborating in teams, students carry out rock density investigations. Outdoors, they look for evidence of tectonic plate movement, weathering, and erosion. This program is recommended for winter as well as warmer times of the year.

Science SOL: 5.1, 5.7  
Math SOL: 5.1, 5.4, 5.9  
Fee: $4 per student
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<thead>
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<th>Technology</th>
<th>Engineering</th>
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<td>Diversity of Life; Life Cycles</td>
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<td>Microscopes, Hand lenses, Metric rulers</td>
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<td>Botanist, Florist, Botanical Illustrator</td>
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<td>Animal Behavior 3.1, 3.4, 3.5; 4.1, 4.9; 5.1, 5.5</td>
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<td>Watershed Science 6.1, 6.5, 6.7, 6.9</td>
<td>Microscopes, Dichotomous keys, , Thermometers, Turbidity tubes</td>
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<td>Interdependency of Life LS.1, LS.6, LS.7, LS.8, LS.9, LS.10, LS.11, LS.13</td>
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**Middle School (6th—8th)**

**Arbor Sleuth (5th-8th)**
What are the important features that distinguish one tree family from another? Students hone their observation skills as they explore the Arboretum using hand lenses and dichotomous keys to identify mystery trees. Emerging tree scientists also explore human impacts on tree populations in the Chesapeake Bay watershed system. They critically compare chestnut hybrids as they learn about American Chestnut restoration efforts.

Science SOL: 5.1, 5.5; 6.1; LS.1, LS.4, LS.5, LS.11, LS.12
Math SOL: 5.2, 5.9, 6.2
Fee: $6 per student

**Watershed Investigations (6th)**
Students investigate watershed science during this meaningful watershed education field experience. They learn about Blandy’s local watershed as they collect, measure, record, and analyze water quality indicators such as temperature, turbidity, dissolved oxygen, pH, and nitrates. Your watershed scientists identify macroinvertebrates of Blandy’s wetlands and assess what these organisms tell us about the health of an aquatic ecosystem and their civic responsibility to understand human effects on these systems.

Science SOL: 6.1, 6.5, 6.7, 6.9
Math SOL: 6.6
Fee: $6 per student

**Young Ecologists (7th)**
Students are taught about the interdependence of life in an ecosystem; additionally, during this program, they delve into what interdependence means. On the road to becoming ecologists, students investigate our replica skull collection to explore how specific traits influence individual and population behaviors. Using critical thinking, they assess the biotic and abiotic factors of a wetland environment, determine an organism’s role in a watershed system, and if that ecosystem can support particular organisms. By the end of the program, your young ecologists will have a meaningful understanding of habitat, diversity, and biological interdependence.

Science SOL: LS.1, LS.6, LS.7, LS.8, LS.9, LS.10, LS.11, LS.13
Math SOL: 7.1
Fee: $6 per student

**Professional Development Opportunities at Blandy!**
The Blandy Education Team offers a variety of teacher professional development opportunities. We offer national environmental education programs (such as Project WET, Project WILD, Project Underground, Project Learning Tree, and Flying WILD). We also can provide teaching practice in integrated curriculum, including meaningful watershed education experiences (MWEE) tailored to your school’s unique needs. For more information about workshop possibilities, visit our webpage! [http://blandy.virginia.edu/education/professional-development](http://blandy.virginia.edu/education/professional-development)
Science Explorations (9th-12th)

A day-long investigation! Student researchers use critical thinking to conduct scientific investigations as they: define a problem, develop a hypothesis, interpret data, and communicate their results. Previous explorations include: animal and plant adaptations, the effect of abiotic factors on lichen, the impact of non-native species in a wetland, and worm diversity in different habitats. Call (540) 837-1758 Ext. 242 to discuss possibilities.

Science SOL: CH.1, Bio.1 and others depending on the inquiry chosen
Math SOL: A.6; PS.1, PS.2, PS.3, PS.8, PS. 9, PS.10

Fee: $9 per student

Water Quality Technology (9th-12th)

This Meaningful Watershed Education Field Experience focuses on measuring water quality indicators using technology. Environmental scientists use hand-held colorimeters to explore the effects that temperature, pH, dissolved oxygen, nitrate, and other indicators have on water quality. Students evaluate their results and communicate their water quality assessment with others. Assessments can be shared with your local community to exercise civic responsibility. This program is for motivated students. It is designed to take two hours in groups of no more than 15.

Science SOL: ES.1, ES.8; BIO.1, BIO.2, CH.1

Fee: $6 per student

Careers at the Arboretum (9th-12th)

Are your students curious about career opportunities at an arboretum? Students explore aspects of the science background knowledge and diverse skills necessary to succeed in specific careers and partner with our arboretum staff to gain first-hand experience learning what each job entails. Please select one arboretum career you would like to experience for each program. Learn what it means to be a horticulturalist, an invasive species specialist, an arborist, or an ecological research scientist. Program requests will be arranged based on staff specialist availability. Please contact Candace Lutzow-Felling, Director of Education, to schedule this program: (540) 837-1758 ext. 230

Fee: $9 per student

High School (9-12)

What teachers say about our programs:

- “The material presented was geared right to the level of our children. We felt that our children (and the adults) learned a lot and we’ll be eager to return again. Thanks for creating such an informative and engaging program!”
- “You can tell the instructors love their job, working with children, and they give the students an added excitement toward that subject area!”
Interested in a self-guided exploration of Blandy and the Arboretum? Reserve a backpack full of engaging, self-directed activities! We have four backpack themes. A themed set consists of four backpacks with activity instructions, equipment and all necessary materials for up to 24 students. Use the on-line program registration system to reserve a set of backpacks for your class. For more information, contact schprog@virginia.edu

Fee for each Backpack Set: $15

**EARTH TALKS**
Grades 6-8

Through geologic explorations, your students examine rocks and soils of Blandy with identification guides and hands-on investigations. They learn about Virginia fossils and the geology that shaped our world today.

**USE SOME SENSE!**
Pre-School & Kindergarten

Visit Blandy to develop students’ senses as they observe the natural world around them. Hands-on activities include:
- Leaf scavenger hunt using students’ sense of touch; using color paddles to explore primary and secondary colors; practicing reading and listening skills with the *Butterfly Alphabet* book; and more!

**WILD THINGS!**
All Grades

Observe the wildlife that makes their home at the Arboretum! Using Peterson Flash Guides, binoculars, and grade level specific hands-on activities, students hone observation and identification skills as they look for wildlife signs. Mammal tracking, bird and insect observations and identification, and a bird and insect relay are a few of the activities in this set.

**GREEN AND GROWING**
Elementary

Students study the plants, trees, and herbs at Blandy to explore tree and plant life cycles, plant and pollinator interactions, plant uses, as well as organism life needs. They use Peterson Flash Guides, hand lenses, and observation skills with these hands-on activities.
21st century skills, defined as, “...a set of abilities that students need to develop in order to succeed in the information age.”¹ are at the forefront of education. These learning and innovation skills, essential to functioning in an ever-changing world, are integral to the Profile of a Virginia Graduate and the Next Generation Science Standards.

Our programs address the 5Cs, core content areas, 21st century skills, and various 21st century themes (among them global awareness, civic literacy, and environmental literacy). Use Blandy field investigations as performance assessment tools, as part of a project-based unit, or to focus on life and career skills. Weaving field explorations into your school classroom curriculum provides deep contextual learning for students. “The best learning occurs when basic skills are taught in combination with complex thinking skills.”² Our programs help your students connect outdoor field studies with their classroom learning as they apply skills and knowledge during scientific investigations.

We designed several interdisciplinary lesson clusters based on our programs to integrate students’ outdoor classroom field experiences with their classroom learning. Each cluster includes before– and after– field investigation activities designed to provide real-world connections for students as they gain global awareness and experience interdisciplinary themes.