



Highlands Biological Station & Nature Center
Outreach Programs



HIGHLANDS BIOLOGICAL STATION'S

Highlands Biological Station (HBS) introduces children and adults to the rich biological diversity and ecology of the southern Appalachian Mountains. Through its exhibits, hands-on educational science programs, and immersive biological field experiences HBS seeks to instill a greater awareness, understanding, and appreciation of the natural world.

School Programs

Highlands Biological Station and Nature Center provides more than 50 different science enrichment programs for public, private, or homeschool groups in grades K-12. These outreach programs are correlated with the North Carolina science Essential Standards for each grade level, and supplement existing lessons by bringing additional resources to the classroom and by providing immersive, experiential education opportunities for students.

Programs can take place in the classroom or in natural outdoor settings, and are designed to provide hands-on learning experiences through activities, games, observations, and field studies. Most classes can be modified and presented at your school or facility, as well as at HBS. Each program lasts approximately 45 minutes, unless specific circumstances require adjustments to the schedule.

Nature Center & Botanical Garden Tour (all grades)

Students will be shown the Nature Center's exhibits including live reptiles and amphibians, a 400+ year old hemlock tree, geology and archaeology specimens, and mounts of birds and mammals. Interactive exhibits include microscopes and our Touch and Learn table. A guided walk in the Botanical Garden features labeled plant species and trails to various habitats including hemlock forests, streams, a mountain bog, and Lindenwood Lake. This program is free of charge.

*Discovery Hikes (grades 3-12)**

Hikes take place along a trail of your choosing (such as Siler Bald, Whiteside Mountain-Devil's Courthouse, etc.). Students will explore mountain habitats and learn about regional plants and animals, ecology, and geological features. Hikes may take several hours; please bring a sack lunch, water, rain gear, and wear appropriate shoes. *Students should be in good physical condition.

Birds & Flight (all grades)

This class focuses on shape and color of specific birds, marks used for identification in the field, bird songs, habitat and diets, and bird anatomy. Additionally, it will cover the concepts of flight including lift, force, and aerodynamics. Weather permitting, students will also learn techniques to attract birds for better viewing in the field.

Botany (grades 1-8)

Topics may include groups of plants, types of leaves, parts of trees, and photosynthesis. We may also discuss pollination including the parts of flowers, seeds, and fruit; or what happens to trees in autumn. Students may also be given an opportunity to identify various tree species.

Compass & Orienteering (grades 4-12)

Students are introduced to the use of a compass. They will learn such concepts as direction and bearing, degrees in a circle and angles, and how one might use a compass to find their way. This class is a good supplement to lessons in geography and geometry/math.

Experimental Design & the Scientific Method (grades 6-12)

This workshop is specifically designed for students developing independent field research projects. Participants will review the steps of the scientific method, and will work together to plan the protocols for a hypothetical research project involving stream salamanders. Time will be spent in the field collecting data, followed by a detailed discussion of the pitfalls and potential sources of error when designing similar field experiments. Classroom option is also available.

Forestry Methods (grades 6-12)

Students will develop math skills measuring such things as diameter, height, and basal area of trees to determine the importance of different species to the forest community, and will use these values to evaluate the quality of the habitat for wildlife. Alternate versions give students opportunities to survey levels of infestation by the invasive hemlock woolly adelgid, or quantify lichen growth on trees as indicators of air quality.

Forest Study (grades K-8)

This class provides students with an opportunity to explore the various layers of a forest (soil layer, shrub layer, and canopy) and the living things found in each. Students will participate in various activities as they are led on an interpretive forest walk. Topics include plant and animal species diversity, adaptations and niche, forest microhabitats, soils, decomposition and nutrient cycling, forest succession, and conservation.

Group Dynamics (grades 4 - 12)

This class features a series of fun team challenges that illustrate the importance of using effective social skills in group interactions. Concepts include communication and active listening, teamwork, leadership, cooperation, and group decision making and problem solving. Can be repeated with new discussion topics.



OUTREACH PROGRAMS

Insects (grades K-8)

This class focuses on the difference between insects and other invertebrate groups, anatomy, and life cycles. Students will collect examples of live insects using various field techniques.

Keys & Classification (grades 5-12)

Students will be introduced to the biological classification system, and the use of dichotomous keys in separating biological groups and identifying specimens based upon their characteristics. Activities may include creating a key to the members of their classmates or insects, using keys to identify trees, or either a bird or reptile & amphibian "hide and seek" using keys to navigate the Station's trails.

Mammals (all grades)

Students will learn what makes something a mammal, examples of different types of mammal groups, and examples of mammal tracks. Students will have the opportunity to see and touch skins and skulls of various mammal species. Concepts include predator/prey adaptations and diet. **Shorter programs on individual mammal groups are also available (see reverse for list).**

Nature Games (grades pre-K - 2)

Students will play a variety of fun games that illustrate various ecological concepts such as food chains, predators and prey, habitat, and animal behavior. *Can be repeated with different games and topics.*

Nature Observation (grades K-8)

This class encourages creativity, discovery, and appreciation for nature as students learn how to observe plants and animals in different ways. While exploring nature, they may sketch images of things they find, describe behaviors of animals, make leaf and bark rubbings, or make a "sound map." Older students may learn ways of collecting data, or be encouraged to write short stories or poems.

Pond Life (all grades)

Students will discover the diverse fauna of the Station's Lindenwood Lake, or other local pond. We will examine samples of pond mud for various live insects and other creatures and discuss their adaptations, and see how the species found can indicate water quality. Older students may also perform chemical analyses of the water such pH and dissolved oxygen.

Population Genetics (grades 7-12)

Students will do activities designed to simulate the effects of natural selection and mutation as agents of genetic change in moth populations over time. Additional concepts include adaptations, speciation, biogeography, alleles, genotypes, phenotypes, and evolution.

Predators & Prey (grades K-8)

This class features activities that teach such concepts as diet, food chains, predators, prey, and camouflage. Students may examine skulls of carnivores and herbivores, discuss physical and behavioral adaptations, and learn how predators and prey use these adaptations in different ways.

Reptiles & Amphibians (all grades)

This class focuses on differences between reptiles and amphibians, life histories, habitat, and anatomy. Students will have the opportunity to see and touch examples of live animals to gain a greater understanding of these creatures and their needs, and to dispel common misconceptions. **Shorter programs on individual reptile & amphibian groups are also available (see reverse for list).**



"Highlands Biological Station regularly provides valuable enrichment programs to our rural school that support our state and national science goals. These experiences go far beyond textbook learning and will have a lasting impact on the lives of our students."

-1st Grade Teacher

*Storybook Science / (Short Lessons)** (grades pre-K - 8)*

****Available for older grades, without the story.**

Students will be given a shorter (30 min) presentation on single nature topic, accompanied by a reading of a related storybook to reinforce the lesson's concepts. Some examples of subjects include beavers, frogs, bears, trees, turtles, insects, snakes, groundhogs, opossums, owls, bats, etc. *Can be offered repeatedly with different topics and stories. See reverse for topic list.*

Streamside Salamander Communities (grades 4-12)

Students will collect, measure, and identify salamanders, and analyze and/or graph data to examine how species use the stream habitat in different ways. Topics include adaptations, habitat, communities, niche, competition, and predation. An alternate version focuses on using salamanders as biological indicators of water quality. *Bring shoes appropriate for wading.* Can also be modified for the classroom using previously-collected data.

Watersheds (grades 3-12)

Students will learn what a watershed is, and how its condition affects the water downstream. Activities demonstrate topics such as watershed delineation and function, components and movement of the water cycle, and different sources of water pollution.

Wildlife Habitat (grades 4-8)

Students will learn how animal populations are influenced by the availability of habitat resources. Activities teach concepts such as the needs of wildlife, types of population growth, the role of predators, interdependency and connectedness, carrying capacity, limiting factors, conservation and endangered species. Results may be graphed so that lessons are learned by observing what happens in various situations.

NC Wildlife Programs (grades 6-12)

A wide variety of presentations, labs, or field-based workshops featuring data collection. *Visit website for program offerings.*

"In the end, we will conserve what we love, we will love only what we understand, and we will understand only what we are taught."

-Baba Dioum, Senegalese ecologist and poet



FOR THE VERY YOUNG

Children of ages pre-K to 2nd grade are recommended to participate in our wide range of "Storybook Science" programs. These are shorter, simpler lessons focusing on a single topic, accompanied by a reading of a related children's storybook. Programs are also available for older grade levels without the story.

Animal Signs

Animals in Winter

Bats

Bears

Beavers

Birds

Camouflage

Cats & Dogs

Deer

Earthworms

Fall Leaf Colors

Frogs & Toads

Fungi

Habitats

Insects

Leaves/Tree ID

Moles & Shrews

Opossums

Owls

Predators & Prey

Rabbits

Salamanders

Seeds & Flowers

Snails & Slugs

Snakes

Squirrels/Groundhogs

Tree Life Cycles

Turtles

William Bartram

STEM EDUCATION

STEM (Science, Technology Engineering & Math) education is an interdisciplinary approach to learning that couples rigorous academic concepts with real-world experiences. Informal science education offered by museums and nature centers extends student learning beyond the classroom through hands-on activities that let students discover and practice STEM concepts. Such programs inspire and educate youth and adults and raise student interest, confidence, achievement, and desire for science careers. Highlands Biological Station's STEM programs integrate multiple subject areas and correlate with NC science Essential Standards.

COSTS

The requested fee for school programs is only 50¢ per student, but may be waived. Fees for lectures, workshops, and public programs with general admission are typically a flat rate based on the expected number of participants and program length. Tours of the Nature Center and Botanical Gardens are free, but contributions are greatly appreciated.

OTHER GROUPS

School programs are available for groups such as scouts, churches, 4-H, libraries, other community organizations, and the general public. Special request programs can be accommodated. Lectures and workshops for adults are available on a variety of topics, as are teacher and informal educator workshops for science CEU and NC EE Criteria II or III credit.

FOR MORE INFORMATION

Descriptions and details of each program offering, including correlations to the North Carolina Essential Standards Science Curriculum, are available on our website. For additional information or to schedule a program, please contact the HBS Outreach Office.



HIGHLANDS
BIOLOGICAL STATION

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