



The Clifton Institute



K-12 Environmental Education Field Trip Guide

Introduction to the Clifton Institute

The Clifton Institute is an environmental non-profit organization located just north of Warrenton, Virginia. Our mission is to inspire a deeper understanding and appreciation of nature, to study the ecology of our region, to restore habitat, and to conserve native biodiversity. We provide environmental education, restore habitat, and conduct scientific research. Our 900-acre field station, permanently protected under a conservation easement, provides a beautiful and easily accessible location for all of our programs. Our goals in all of our education programs are

- to teach students about Virginia's plants and animals,
- to foster scientific and critical thinking skills,
- to inspire feelings of curiosity, wonder, and compassion for nature,
- to promote healthy bodies through enjoyable, outdoor, physical activity,
- and to promote healthy minds through mindful observations in nature.

In addition to the field trips described below, we also provide free monthly family nature walks, summer camps, and programs for adults. You can learn more about us by visiting our website cliftoninstitute.org, by following us on Facebook @[clifton.institute](https://www.facebook.com/clifton.institute), or by emailing us at info@cliftoninstitute.org.

Field Trips

In 2019, 1,284 K-12 students attended our field trips and we expect over 1,500 students in 2021. Our field trips incorporate topics in science, math, writing, history, and art. Each item below lists the Standards of Learning that the program addresses; we can address other additional SOLs based on teacher requests. The grade levels listed below are suggestions to prevent children from attending the same program multiple years in a row; however, we are flexible about adapting programs for other grade levels upon teacher request. We can accommodate group sizes of 10 to 100 students (or three school buses). A typical program lasts approximately 3 hours and consists of the following three components:

- a **hike** around the field station during which we focus on exploration and observation,
- an **activity or interactive discussion** in which the students develop targeted skills,
- and a **game** during which students are encouraged to be physically active while solidifying their understanding of the topic at hand.

We charge the following **program fees**:

- **\$5** per student for schools (invoice sent upon program conclusion)
- **\$10** per student for homeschool, scout, and other groups (due day-of, at the start of the program)

Please contact us at info@cliftoninstitute.org to schedule a program today.

Elementary School (K-5) Science Programs

Kindergarten

Meet-A-Tree

What is the difference between living organisms and nonliving things? How do we identify living organisms? What do living things need to survive? How do we learn about them and group them into categories? In this program, we will go on a short hike and use our senses to observe plants and nonliving objects on the field station. We will then use three of our senses—sight, touch, and smell—to make observations about trees and communicate them to our friends. During the program, we will discuss why trees are important to our own survival.

Science SOL: K.1, K.2, K.6, K.7, K.9

Skills: observing natural objects and phenomena, asking questions, conducting simple investigations, classifying living and nonliving things, communicating information about the natural world

Home Sweet Habitat

Different animals are adapted to different lifestyles and can be found in different habitats. During this program, we will identify a variety of habitats at the Clifton Institute and around Virginia and we will sort plants and animals into their appropriate habitats. Then we will take a hike around the field station to identify habitats, observe the plants that thrive there, and see if we can find evidence of the animals who call that habitat home. During the hike, students will learn about some of the threats that face the different habitats on our property. At the end of the program, students will contribute to a graph depicting what they learned.

Science SOL: K1, K4, K6, K7

Skills: observing natural objects and phenomena, asking questions, conducting simple investigations, classifying living and nonliving things, communicating information about the natural world

1st Grade

Budding Birders

Birds are living out their amazing lives around us all the time. They are one of the easiest animals to observe on a daily basis. Students will learn about the basics that birds need to survive and learn about some bird behaviors: How do those behaviors help them find what they need? How do factors like weather and the changing seasons affect bird behavior? How do scientists study bird behavior? We will experiment with using binoculars and field guides to identify the species we observe on our hike. During the program, students will discuss some of the ways they can help protect Virginia's birds.

Science SOL: 1.1, 1.4, 1.6, 1.8

Skills: posing simple questions, conducting simple investigations, observing nature, classifying living things, and communicating information about the natural world

Tracks & Scat

What animals live at the Clifton Institute? How do we know if we can't see them? We're not always sure we'll see animals on our hikes, but there is always evidence of their presence to discover. We will learn how to use field guides to identify tracks and scat and we will discuss what we can learn about an animal from what it leaves behind. During winter, small groups of students may have the opportunity to dissect pellets left by some of the raptors on our property. Interpreting the clues left behind by animals is one of the most rewarding skills young naturalists can learn and it's a skill that can last a lifetime.

Science SOL: 1.1, 1.5, 1.8

Skills: posing simple questions, conducting simple investigations, observing nature, classifying living things, and communicating information about the natural world

2nd Grade

Wonders of Virginia Wildlife

What makes an animal different from other types of living organisms? Why do some animals look so similar and others look so different? Can we classify animals based on what they look like and where they live? In this program, we will start with an interactive discussion in which we guide the students towards answering these questions. We will then use that knowledge as we go on a short hike around our ponds, looking for the wild animals who live here in the Virginia piedmont. Finally, we will learn about the wonders of Virginia's native animals by challenging the students to stand on one leg as long as a Great Blue Heron, flap their wings as fast as a Ruby-throated Hummingbird, jumping as far as a jumping spider, and more!

Science SOL: 2.1, 2.4, 2.5, 2.7, 2.8

Skills: posing simple questions, planning and conducting simple investigations, observing, classifying, and communicating information about the natural world

Growing Up on the Piedmont

In this program students will explore the stages of the life cycles of native animals and understand that all living things change and grow. How does a caterpillar become a butterfly? Is a frog and a tadpole the same animal? What is the difference between complete and incomplete metamorphosis? We will explore all of these questions and more as we ponder the amazing changes animals go through

throughout their lives. On our walk, we will look for as many life stages as we can find!

Science SOL: 2.1, 2.4, 2.5, 2.7, 2.8

Skills: posing simple questions, planning and conducting simple investigations, observing, classifying, and communicating information about the natural world

3rd Grade

Wonderful Web of Life

What do plants and animals need to survive? How do plants and animals affect each other? How do plants and animals change as they grow? In this program, we will explore how all living things are interconnected by discussing herbivores, omnivores, carnivores, scavengers, and decomposers. We will use this knowledge as we go on a short hike, during which we will observe the web of life up close and discuss our findings with each other. At the close of the program, we will come back together to discuss what we've learned, including how humans also depend upon these webs.

Science SOL: 3.1, 3.4, 3.5, 3.6, 3.8

Skills: posing questions, predicting outcomes, planning and conducting simple investigations, collecting and analyzing data, constructing explanations, communicating information about the natural world

Amazing Animal Adaptations

What are adaptations and why are they important? All animals have adaptations which help them survive in the environments in which they live. Different habitats are suitable for different species that have adapted to those specific conditions. We will explore different types of animal adaptations such as camouflage, hibernation, migration, and types of teeth for eating various diets, and discuss whether they are structural or behavioral. Students will get to interact with model skulls and other natural objects in our collections. Finally, students will also go for a hike to identify the ways in which the plants and animals we encounter have adapted to their habitat.

Science SOL: 3.1, 3.4, 3.5, 3.8

Skills: posing questions, predicting outcomes, planning and conducting simple investigations, collecting and analyzing data, constructing explanations, communicating information about the natural world

4th Grade

Beautiful Butterflies

Butterflies are fascinating creatures. They have undergone metamorphosis, they have delicate scaly wings, and some species travel in long and arduous migrations. What is it like to be a butterfly? What do they eat? What is the difference between

a butterfly and a moth? Do they really die if you touch their wings? Why are they important for pollination? In this program, we will explore all these curious facts about butterflies through games and activities, and then search some of these beautiful insects on our hike. Additionally, students will discover some of the ways they can protect native pollinators. *This program should be scheduled in early fall or late spring to maximize the opportunity to observe butterflies.*

Science SOL: 4.1, 4.2, 4.3, 4.4, 4.8

Skills: using reasoning and previous knowledge to answer questions, collecting data, analyzing results, reflecting on the significance of what they have learned, using evidence to support an explanation, making observations, forming and stating opinions, constructing explanations, communicating information about the natural world

Water, Water Everywhere

How does water move through the landscape? Why is the water cycle important? Students will see the water cycle in person as we hike downhill, following our stream as it collects in vernal pools and eventually flows into the lower pond. Along the way, students will discover plants and animals that rely on the water source, and they will observe how the presence of water shapes the landscape. We provide a demonstration of how various pollutants affect water and how to detect water pollution. Students will test the water of one of our ponds or creeks to determine its quality and discuss what they can do to keep our watersheds clean and healthy!

Science SOL: 4.1, 4.5, 4.6, 4.9

Skills: using reasoning and previous knowledge to answer questions, collecting data, analyzing results, reflecting on the significance of what they have learned, using evidence to support an explanation, making observations, forming and stating opinions, constructing explanations, communicating information about the natural world

5th Grade

Critter Classification

What is a species anyway? In this program, students will learn how to classify living organisms using a variety of anatomical and behavioral characteristics out on the trail and through our collection of biofacts. Students will practice using field guides, dichotomous keys, and other tools to classify plants and animals into taxonomic groups. On the hike, we will look for as many species as we can and gain a deeper appreciation for Virginia's amazing biodiversity.

Science SOL: 5.1, 5.5

Skills: posing questions and predicting outcomes, planning and conducting investigations, collecting and analyzing data, constructing explanations, and communicating information about the natural world

Fascinating Forests

Trees are the foundation of our forest ecosystems and the focus of this program that blends math with science. Students begin by exploring plant anatomy and using a dichotomous key to identify common tree species. Then students will set up forest plots, investigate the trees within their plot, and use introductory geometry concepts to age their trees. Emphasis will be placed on making estimates, taking measurements, and creating graphs and charts. Throughout students will get to experience the beauty and majesty of Virginia's forests and will learn about the value of Virginia's native trees to other plants and animals, as well as to humans.

Science SOL: 5.1, 5.8, 5.9

Skills: posing questions and predicting outcomes, planning and conducting investigations, collecting and analyzing data, constructing explanations, and communicating information about the natural world

Elementary School Math, History, Writing, and Art Programs

Nature Math: Patterns on the Piedmont (Grades 3-8)

Patterns are all around us. Fibonacci numbers appear in flowers and pinecones, bees and wasps use hexagons to build their nests, and trees grow in fractal patterns. On our hike around the field station, students will be challenged to notice patterns and numbers in plants, animals, and rocks. Afterward, we will explore even more patterns in some of our curated specimens and discuss why some of the patterns appear the way they do. At the end of this program, students should no longer be tempted to ask "Why do we bother learning math?" It's because it helps us appreciate nature, of course!

Math SOL: Vary by grade level

Skills: Vary by grade level

Virginia History (Grade 4)

There is a lot of history at the Clifton Institute! From Native American culture to the history of enslaved people, this program will emphasize the contributions made by people of diverse cultural and ethnic backgrounds. We will tour our partially restored log kitchen and slave dwelling from the 1820s. Students will apply geographic, economic, and civic concepts to examine the influence of physical and cultural geography on Virginia history. Furthermore, to connect learning to the biodiversity of the natural landscape, we will discuss how different groups of people

throughout history used the land to survive and reflect on our own relationships with nature.

Science SOL: 4.3, 4.8

History SOL: VS1, VS2, VS4, VS7

Skills: analyzing and interpreting artifacts to understand events in Virginia history, analyzing the impact of geographic features on people, places, and events to support an understanding of events in Virginia history, interpreting charts, graphs, and pictures to determine characteristics of people, places, or events in Virginia history, recognizing points of view and historical perspectives, comparing and contrasting ideas and cultural perspectives in Virginia history, explaining connections across time and place

Nature Writing (Grades 3 and up)

Writing is a creative and fun way to connect with the natural world. Writing exercises can focus our observations and challenge our minds to think about nature in diverse ways. In this program, we will make a nature journal and then set out to hike around the property. On our walk, we will experiment with different forms of creative writing as we enjoy and connect with the natural world around us.

SOL: Vary by grade level

Skills: printing in manuscript and/or cursive, writing in various forms, self-editing, creative writing, poetry, observation, communicating information about the natural world

Nature Art (Grades K-5)

Nature has inspired artists throughout human history. During this program, students will soak up the beauty of the Virginia Piedmont and express themselves creatively in response to their observations and experiences. We will use nature as inspiration, as a medium, and as a source for our art materials. Nature and art go together like Van Gogh and Starry Night!

SOL: Vary by grade level

Skills: visual communication and production, use steps of design process, communicate ideas through art, use a variety of media, art critique, describe aesthetic qualities of works of art

Middle School (Grades 6-8) Science Programs

Building a Better Ecosystem

What is a healthy ecosystem? What biotic and abiotic factors impact the health of the ecosystem? Are humans part of an ecosystem? What resources do we need, and

how do our actions impact ecosystems? Students will explore the property and participate in a variety of games and activities to lead to a better understanding of how organisms interact with each other and how all life is influenced by the nonliving environment.

Science SOL: 6.1, 6.2, 6.8, 6.9, 6.11, LS1, LS4, LS5, LS6, LS7, LS8, LS9, BIO1, BIO2, BIO6, BIO8, CH5, ES8

Skills: posing questions and predicting outcomes, planning and conducting investigations, collecting and analyzing data, constructing explanations, and communicating information about the natural world

Plants and Animals and Fungi—Oh my!

This program focuses on how scientists classify living organisms and how classification systems help us understand the world around us. Students will have the opportunity to explore a variety of habitats in search of examples of organisms from the different kingdoms of life and will sharpen their observational skills by using field guides and dichotomous keys to identify their finds. Depending on the time of year, students will examine replica skulls of native animals, plant specimens, and / or lichen specimens to practice identifying similarities and differences between living organisms and using differences to learn about how different organisms make their living.

Science SOL: 6.1, 6.2, 6.8, 6.9, 6.11, LS1, LS4, LS5, LS6, LS7, LS8, LS9, BIO1, BIO2, BIO6, BIO8, CH5, ES8

Skills: posing questions and predicting outcomes, planning and conducting investigations, collecting and analyzing data, constructing explanations, and communicating information about the natural world

Invertebrate Investigation

Native and non-native invertebrates can be found in abundance in the fields, forests and wetlands of Clifton. This tremendous variety and abundance of species offers an accessible and engaging community in which to explore the interdependence of organisms. Students will use invertebrate sampling protocols to document the biodiversity on our property. Students will also evaluate the impacts of non-native species and discuss the costs and benefits of conservation practices. This program can focus on butterflies, dragonflies, katydids and other orthoptera, or aquatic macroinvertebrates depending on interest. *This program should be scheduled in early fall or late spring to maximize the opportunity to observe a diverse sample of invertebrates.*

Science SOL: 6.1, 6.2, 6.8, 6.9, 6.11, LS1, LS4, LS5, LS6, LS7, LS8, LS9, BIO1, BIO2, BIO6, BIO8, CH5, ES8

Skills: posing questions and predicting outcomes, planning and conducting investigations, collecting and analyzing data, constructing explanations, and communicating information about the natural world

High School (Grades 9-12) Science Programs

Field Scientist for a Day

This program offers students the opportunity to experience what it's like to be a field scientist. This program can be scheduled for either three hours or a full day. Either way, we will complete a mini science project over the course of the program, starting with developing a research question, moving on to collecting data, and finishing by analyzing our data. We will also introduce students to citizen science projects they can continue to participate in after the field trip is over. You can choose an area of study that best supports classroom learning or we can provide suggestions based on what we've seen on the property recently. Our staff scientists love sharing their expertise with young people and training the next generation of scientists!

Example research questions include:

- How do waterfowl spend their time? How do different species of waterfowl interact with each other on our ponds? (only in winter)
- How does the species composition and structure of the forest change as it ages? What animals are found in forest plots of different ages?
- Do native plants have more or fewer insects on them than non-native plants?
- How do native plants respond to prescribed burns?

Science SOL: Varies depending on program focus

Skills: posing questions and predicting outcomes, planning and conducting investigations, collecting and analyzing data, constructing explanations, and communicating information about the natural world

Guided Hikes for All Grades

Groups of any age interested in a less-structured experience may schedule a two-hour hike, led by one of our naturalists. We have trails through forest, grassland, and shrub field habitats, around ponds, and to vernal pools. We'll learn about whatever we discover along the way! This is essentially a private version of our family hikes, which we offer for free once monthly. Program fees apply.

Virtual Program Options for All Grades

We charge a flat fee of \$50 for the following online programs that last approximately one hour. Each program can be adapted for grade levels 2-12. Our educator works with teachers to customize the program to the needs of your class and provides follow-up activities to facilitate student learning beyond the online lesson.

Wonders of Virginia Wildlife (Grades K-5)

In this program, we will lead an interactive discussion about the wild animals who live here in the Virginia piedmont, their habitat requirements, and the feelings people have about different native species. Students will discover some of the ways their day-to-day activities impact species survival and what they can do to protect local wildlife!

How to Nature Journal (Grades K-12)

Nature journaling is a creative and fun way to connect with the natural world. The practice helps focus our observations and challenges our minds to think about nature in diverse ways. During this program, students will experiment with journaling through words, pictures, and numbers using guided prompts.

Camera Trap Science (Grades 2-12)

In this class, students will learn about how scientists use camera traps to study wildlife and analyze real photographs taken on the Clifton Institute property to answer research questions in this lesson that integrates math, science, and technology. We provide the instruction, the datasheets, and the photographic data.

Introduction to Animal Behavior (Grades 6-12)

This class will introduce students to methods used in studying animal behavior and the ethics of ethology. We also provide resources and training for students to practice data collection and analysis while observing wildlife in their own backyards.

Phenology: Monitoring Seasonal Changes (Grades 6-12)

This class will introduce students to methods for studying phenology, provide examples of what ecologists can learn from understanding long-term seasonal changes of natural phenomena, and provide resources and training for monitoring tree phenology in students' own schoolyards and backyards.

Or...Check out our YouTube channel!

<https://www.youtube.com/channel/UCe8xulz6b1TFYATcN6TYuWA>

We have a selection of free videos of varying lengths on topics including nature journaling, hexagons in nature, frog jump lengths and origami, beaver adaptations, an interview with a turtle, and more! You can find a 20-minute virtual field trip recording here: <https://www.youtube.com/watch?v=tUmKjIw1X0>.



We hope we'll see you soon!