



Smithsonian
Environmental Research Center

SERC Education Department



Virtual Programs 2021 For Schools and Groups

SERC's new classes include offerings for students and teachers and provide a variety of opportunities and formats for learning and teaching. All programs are designed to be stand-alone but many can be used together to build content, knowledge, and understanding. Most programs can be adapted for a variety of ages and to fit the needs of your group.

Our Environmental Literacy (eLit) series focuses on current topics related to better understanding our world and SERC's research in ecology, biology, chemistry, and science. Costs vary, but the basic rates are below. All classes align with NGSS standards.

Currently all programs are virtual. When SERC reopens we hope to add in-person options to the virtual programming.

TYPES OF PROGRAM OFFERINGS

Program Type	Cost	Max # Students	Notes
1 hour	\$75	30	
1.5 hour	\$100	30	
2 hour	\$150	30	
3 hour	\$225	30	
4 hour	\$300	30	
1 hour	\$120	60	Some can be adapted for larger groups.

1 hour	\$150	99	
Large Event	\$300	150+	Large events include festivals, conferences, and special activities with 150 or more people.
Professional Development/Adult Workshop: one ½ day program	\$150 min or \$40/person	20	½ day programs are 3 hours long and usually include a 10-15 minute break.
Professional Development/Adult Workshop: Two ½ day programs	\$300 min or \$40/person	20	These can be scheduled based on mutual agreement of times/dates.
½ Hour additional project review or mentoring	\$25	30	



Smithsonian Health Connections & River Otters

SERC is a part of a multi-unit Smithsonian initiative called “Smithsonian Health Connections”. The Smithsonian has researchers around the world looking at how humans affect animal health and diseases and vice versa.

The newly formed Chesapeake Bay Otter Alliance (CBOA) is a part of this initiative at SERC. It brings scientists from a variety of disciplines and organizations to learn about the ecology and biology of river otters of the Chesapeake Bay, including the National Zoo, the Smithsonian Conservation Research Center, the National Museum of Natural History, the Arundel Rivers Federation, the Urban Waterways group, Frostburg State University, and private citizens. The Alliance will greatly expand our understanding of how humans impact these otters that live both on land and in water. Research will include the ways transmission of marine diseases and parasites affect entire food webs and ecosystems.

Let us bring real-world science into your classroom with fun hands-on learning. We’ll teach students using scientific research techniques including data literacy (from collection to analysis) with data sets you can use with your classes.

PROFESSIONAL DEVELOPMENT

Teacher Professional Development: Using Game Cameras in and out of the Classroom to Track Animal Abundance

Grades: Teaching grades 3rd-12th

Duration: Two ½ day classes

We’ll cover how to use game cameras in your classroom, school, or location for onsite and remote teaching. We will go through everything from how to choose a camera to setting up and analyzing data with students.

**Also offered as a part of our “Movement of Life” programs about migration and tracking wildlife.



TALK

Introduction to River Otters of the Chesapeake Bay

Grades: Adaptable for bands 3rd-5th, 6th-8th, 9th-Adult

Duration: 1 hour

In this program we will delve into river otter ecology, food webs, and adaptations for living in the Chesapeake Bay. For younger

students we'll focus on river otter adaptations for living in water and on land.

STEM LAB CLASSES

Marine Ecology: Otter Scat Dissection for the Classroom

Grades: Adaptable for 3rd-8th

Duration: 1 hour

Scat analysis offers our SERC scientists a window in the food webs of the Chesapeake Bay, using the remains found in otter poo. In this class we'll learn about otter diets and how to use fish scales like fingerprints. Then our educator will dissect a cleaned and dried poo sample and discuss what is found.

For an additional fee we will send you a sample for your classroom. Cost is \$5 per class plus \$5 shipping. For a sample for each student, the cost is \$20 for a class of 30 plus \$5 shipping. All samples are washed, sanitized, and baked clean.



Game Camera Set-up and Use by Students

Grades: Adaptable for 6th-12th

Duration: 2-4 hours customizable

In this training with your students we'll go over how to place and use game cameras to collect data, and how to process that data. This class can be broken into two sections: a pre-reading component and post class model data sheet. We will also provide you with a list of camera types (ranging from \$40-100) that you can buy for your classroom. Or, for \$80 we will provide you with a camera. **This class is also offered as a part of our "Movement of Life" programs about migration and tracking wildlife.

SCIENCE LITERACY, DATA COLLECTION & BASIC STATISTICS

Animal Behavior Lab: Data Collection 3rd-5th Grade

What Data Can Be Collected from River Otter Camera Videos?

Grades: Adaptable for 3rd-5th

Duration: 1.5 hours

We will learn about river otters of the Chesapeake Bay, and then look at game camera videos from SERC. Students will learn about quantitative and qualitative data, figure out what data they can collect, and then work in teams to collect data from specific data sets of videos. You can take this data with you and use it for your classroom for further lessons.

Animal Behavior Lab: Data Collection & Class Project 6th-12 Grade

Video Analysis and Data Collection of Game Camera Footage of River Otters & Raccoons

Grades: Adaptable for 6th-12th

Duration: 2 hour program in class and suggested one hour homework time

We will learn about river otters of the Chesapeake Bay, and then look at game camera videos from SERC. Students will learn about quantitative and qualitative data and figure out what data they can collect. They will then be broken out in teams and given two data sets of videos (45 sec. each), one for 2020 and one for 2021. Students will answer the question, "What is the difference in animal abundance, and activity, of raccoons and
Updated 9-2021

otters in the same months of 2020 and 2021?” Students will start their project in class, and then work independently to analyze the data from their data sets. You can take this data with you and use it for your classroom for further lessons and presentations.

Basic Statistics 5th-8th Grade

Understanding Statistics Using Game Camera Footage of Otters

Grades: Adaptable for 5th-8th

Duration: 1-2 hour class, customized

This class is designed to be either a stand-alone or to support the animal behavior labs where students collected data from river otter videos. In this class students will statistically analyze game camera video data of river otters and raccoons on our SERC Docks. Based on where your class is mathematically, we can cover, mean, median, mode, relative abundance, and a simple T-test, if time allows. We will provide a data set for the students if you don't have one from the animal behavior labs.

Science Literacy

How to Read a Scientific Paper about River Otter Behavior

Grades: Adaptable for 8-12 th

Duration: 1.5 hours

Let us help your students better understand the best way to read a scientific paper for understanding. We will learn about the abstract, how to pick out key information, and how to find information without needing to be a science expert. We'll focus on a SERC research paper that analyzed game camera data on our Chesapeake Bay river otters.



Movement of Life: Sharks and Rays

Around the world Smithsonian Scientists are tracking the movement and migration of animals and how that movement, and the animal's populations, are affected by humans and climate change. At SERC we are tracking the movement of fish, sharks, and cownose rays. We can teach you to track the migration and movement of life around your location using game cameras as well as sharing how our scientists track and follow animals such as sharks and rays that visit the Chesapeake Bay and move into the Atlantic Ocean.

PROFESSIONAL DEVELOPMENT

Teacher Professional Development: Using Game Cameras in and out of the Classroom to Track Animal Abundance

Grades: Teaching grades 3rd-12th

Duration: Two ½ day classes

We'll cover how to use game cameras in your classroom, school, or location for onsite and remote teaching. We will go through everything from how to choose a camera to setting up and analyzing data with students. **Also offered as part of our "One Health Program" and the Chesapeake Bay Otter Alliance project.

STEM CLASSES

Game Camera Set-up and Use by Students

Grades: Adaptable for 6th-12th

Duration: 2-4 hours customizable

In this training with your students we'll go over how to place and use game cameras to collect data, and how to process that data. This class can be broken into two sections: a pre-reading component and a post class model data sheet. We will also provide you with a list of camera types (ranging from \$40-100) that you can buy for your classroom. Or, for \$80, we can provide you with a camera. **Also offered as part of our "One Health Program" and the Chesapeake Bay Otter Alliance project.

Movement of Life: Sharks of the Chesapeake Bay Virtual Interactive Field Trip

Grades: Adaptable for 3rd-7th

Duration: 1 hour

Did you know that SERC scientists study sharks and rays of the Chesapeake Bay? We'll introduce you to sharks and shark anatomy, the species that live in our region and the research that our scientists are doing. This includes a draw and share activity.

Movement of Life: Sharks of the Chesapeake Bay & Eugenie Clark Story Book Reading and Discussion

Grades: Adaptable for 3rd-5th

Duration: 1 hour

We'll introduce you to sharks and shark anatomy, the species that live in the Chesapeake Bay, and the research that our scientists are doing. Afterwards we'll read a story book together about the famous woman pioneer shark scientist, Eugenie Clark, and discuss the book.

Movement of Life: How do You Follow a Shark?

Grades: Adaptable for 3rd-7th

Duration: 1 hour

How exactly do you follow a shark or ray from the Atlantic Ocean to the Chesapeake Bay? In this program we'll introduce students to the sharks of the Bay, SERC's research into shark and ray migration, and the different methods scientists use to track sharks. We'll even try our hand at designing and drawing our own shark tag.

Environmental Literacy: Forest Ecology & Climate Change

Forests and plants sustain life on Earth and our scientists at SERC are studying how they are changing as the climate changes. One way is comparing modern trees to trees from millions of years ago. Another is by looking at native orchids of North America and seeing how their mutualism with fungus is affected by humans. Using a technique developed by scientists, we can show you how to study climate change simply using the leaves from the forests outside. We can also share with you an introduction to Native Orchids of Maryland and the orchid-gami 3D models created for SERC and the North American Orchid Conservation Center.



STEM LABS

Leafy Thermometers Leaf Lab

Grades: Adaptable for 5th-12th

Duration: 1-1.5 hours, customizable

In this lab students will be asked to collect leaves, or take photos, and then we will calculate your region's temperature using leaf margins or edges, a technique used by Smithsonian Scientists and archaeologists. We will discuss how this tool can be used to measure forest make-up and climate change of the past and how it might be used for the future.

Leafy Thermometers Lab Student Challenge

Grades: Adaptable for 5th-12th

Duration: 2 hours

Do you want to challenge your students to understand climate change using techniques like our scientists? In this activity our staff have set up a leafy thermometer challenge, where students will be given sets of leaves from around the US. They must use a basic ratio to figure out regional temperatures, using leaf margins, and then create a simple line of best fit for their data, then explain what it means. Students will be broken out into teams and if there is time given the opportunity to share their findings.

TALKS & STEAM

Introduction to Native Orchids of Maryland Talk

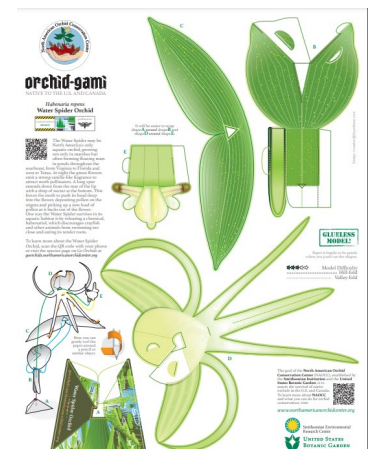
Grades: Adaptable for 8th-Adult

Duration: 1 Hour

Orchids are found all over North America, including here in Maryland. In this talk we'll examine the types of orchids found here, SERC's research into their relationship to mycorrhizal fungi, and why they are "canaries in the coal mine."

Introduction to Native Orchids and Orchidgami for Students

Updated 9-2021



Grades: Adaptable for 5th-8th

Duration: 1 hour

In this program we'll introduce your students to what orchids are, flower anatomy, and orchid's relationship with fungus, which our SERC scientists are studying. We will provide your class with a set of orchid-gami or folding orchid cards, which you can distribute, and then we'll fold them together using art and science to learn. Extra class fee for supplies of \$0.50 per student.

Environmental Literacy: Marine Ecology



Plankton sampling with SERC Scientists (Photo: Kristin Larson)

Scientists at SERC are studying how humans impact the land and water, this includes the life that lives in the water (plankton) and the animals that live there too, from oysters and mud crabs to river otters. Let us introduce your students to the superpowers of plankton and river otter food webs. Soon we'll be adding more programs about oysters and blue crabs too!

Introduction to Plankton Interactive Program

Grades: Adaptable for 3rd-8th

Duration: 1 hour with customizable USB microscope addition

Have you ever thought of plankton as the superheroes of Earth? They are, and in this superhero themed interactive program we will explore the world of phytoplankton, zooplankton, and their importance to life on the Chesapeake Bay and our planet.

We also offer a customizable option if you would like to purchase USB microscopes for your class. We can recommend the type for Chrome books, macs and PCs, and we can walk your class through how to use them. Requires 1 additional hour, and each microscope costs roughly \$22 online.

Marine Ecology: Introduction to SERC Research & Careers in Science

Grades: Adaptable for 6th-Adult

Duration: 1 hour program

SERC has over 22 research laboratories, 100 people, and 2,600 acres of land. We are the world leader in research related to climate change, wetlands, and the land-sea connection. We'll share with you our diverse range of research, up to date findings, and resources where you can find more about what we do. We can also customize the program to talk about different types of jobs and careers in science.

Marine Ecology: Otter Scat Dissection for the Classroom

Grades: Adaptable for 3rd-8th

Duration: 1 hour program

Scat analysis offers our SERC scientists a window in the food webs of the Chesapeake Bay, using the remains found in otter poo. In this class we'll learn about otter diets, how to use fish scales like fingerprints, and then our educator will dissect a cleaned and dried poo sample live with students and discuss what we find. For an additional fee we can also send you a sample for your classroom (\$5 a class plus \$5 shipping, or a vial/sample for each student which is \$10/class of 30 plus \$5 shipping for a set). All samples are washed, sanitized, and baked clean. **Also offered as part of our "One Health Program" and the Chesapeake Bay Otter Alliance project.

Marine Ecology: Introduction to Terrapins & Visit With a Live Terrapin

Grades: Adaptable for 2nd-6th

Duration: 1 hour program

Terrapins are an important part of the history and ecology of the Chesapeake Bay. In this program we'll talk about terrapin anatomy and adaptations to live in brackish water, to only turtle to do so. For younger students we'll ready a story book after, and for older students we'll work on aging a turtle using scute rings, understanding shell anatomy, and talk more in depth about food webs.