

Children's School of Science

Woods Hole, Massachusetts

Summer Program
2024



OVERVIEW

COURSES, SCHEDULE, & REGISTRATION

Courses are organized into two three-week sessions. Session A runs from July 1 to July 19, and Session B runs from July 22 to August 8. Classes meet daily Monday through Friday for an hour and 45 minutes. Attendance at every class is expected. Courses are organized according to students' interests and age-appropriate study. Children may enroll in the youngest class (Seashore Life) if they reach the age of 7 years by the time they start Science School, and have finished first grade.

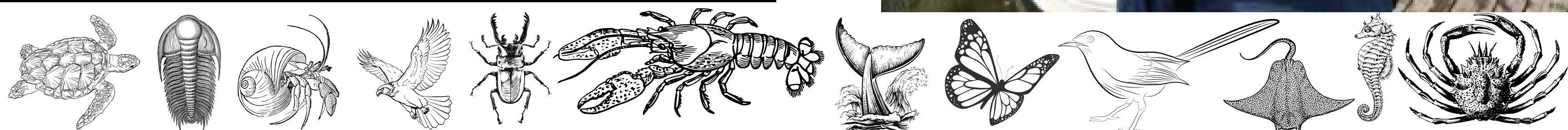


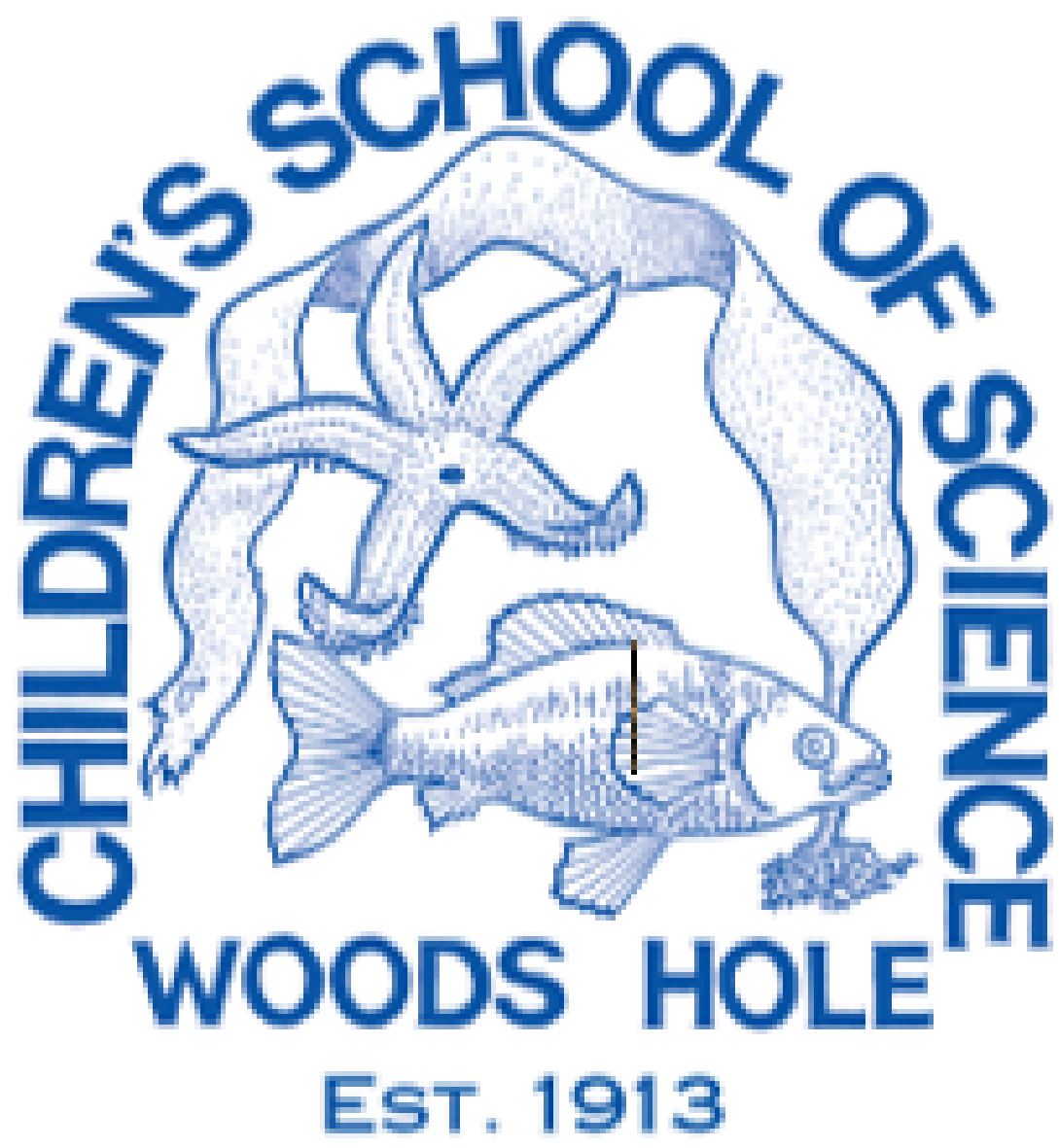
A non-refundable \$40 fee is due at the time of registration. Tuition for each three-week course is \$425. Tuition is non-refundable after May 1. Tuition may be refunded in full less the registration fee through March 1; from March 1 to April 1 up to 50%; April 1- May 1 up to 25% of the tuition amount.

Scholarships: Need-based scholarships are well-funded and available to families for whom CSS tuition would be a burden. Please indicate need during the registration process, or send a written request for financial aid to scholarship@childrensschoolofscience.org



An initial registration will begin the second week of February. During this time, students may sign up for only one class per session (one class for session A and one class for session B). This will allow more families the opportunity to place a child in a class. Towards the end of February, we will re-open registration and students may enroll in additional classes if space is available. In any case, students under 10 are discouraged from enrolling in more than one class per session.





The Children's School of Science creates enriching experiential learning opportunities with guest speakers and field trips during each three week course.

Teachers, in collaboration with the CSS team, bring diverse perspectives to the classroom through engaging content. Our field trips offer daily walks, weekly curated drives, and captivating special trips—all emphasizing respect for diverse habitats. Whether spontaneous walks or planned adventures, our approach seamlessly integrates into the curriculum. Join us this summer in creating memorable learning experiences for your children!

WHAT WE OFFER

Provide the Woods Hole community with impactful and meaningful learning opportunities.

Experiential Learning

Ignite your child's joy of learning and foster their capacity for inquiry.

Tuition

\$425

3 week course

Our Program

2

Sessions

39

Classes

15+

Educators

Mark Your Calendars

2024 Calendar



Dr. Kate Schafer, Director
kate@childrenschoolofscience.org



Register by visiting
childrenschoolofscience.org website

- July 1** – Session A Begins
- July 2** – Back to School Night 6-7pm
- July 4** – No School
- July 17** – Open Board Meeting 7 pm
- July 19** – End of Session A
- July 22** – Session B Begins
- July 23** – Back to School Night 6-7 pm
- August 5** – Annual Meeting 7:30 pm
- August 8** – End of Session B

2024 COURSE SCHEDULE

Session A
July 1 – July 19

Session B
July 22 – Aug. 8

8:30 – 10:15

Seashore Life (7-8)
Animal Behavior (8-9)
Seaweeds (10-11)
Ornithology (11-12)
Ichthyology (12-13)

Seashore Life (7-8)
Animal Behavior (8-9)
Meteorology (10-11)
Wetland Ecology (11-12)
Ichthyology (12-13)

10:30 – 12:15

Seashore Life (7-8)
Marine Bio (9-10)
Field Geology (11-12)
Film Photography (12-13)
Earth Science (13-16)

Seashore Life (7-8)
Marine Bio (9-10)
Whales, Seals, and Sea Turtles (11-12)
Film Photography (12-13)
Embryology (13-16)

Your paragraph text
12:30 – 2:15

Marine Bio (9-10)
Art, Science, and Nature (10-11)
Oceanography (11-12)
Microbial Life (13-15)
Advanced Marine Bio (14-16)

Woods, Ponds, & Fields (8-9)
Marine Bio (9-10)
Entomology (11-12)
Nautical Science (12-13)
Advanced Marine Bio (14-16)

2:30 – 4:15

Woods, Ponds, & Fields (8-9)
Invertebrates (11-12)
Experiments in Field Ecology (12-13)
ROV (13-15)
Biological Illustration (14-16)

Habits & Habitats (9-10)
Animal Adaptations & Behaviors (11-12)
Botany (12-13)
ROV (13-15)



Children's School of Science

WOODS HOLE, MASSACHUSETTS

2024 Course Descriptions

LETTERS INDICATE THE SESSION(S)

SEASHORE LIFE (7-8) A, B

Students will explore local beaches and salt marshes to observe and learn about marine life and coastal processes. Activities will include the study of seashore communities, learning to identify common invertebrate phyla, collecting organisms in intertidal environments, setting up classroom aquaria, experiments, and art projects.

WOODS, PONDS, AND FIELDS (8-9) A, B

Students will learn about the natural history of animals and plants that live in terrestrial and freshwater environments. Through explorations in the field, collections, and by setting up terraria and aquaria in the classroom, the kids will be introduced to concepts of entomology, botany, ornithology, herpetology, limnology, and ecology.

ANIMAL BEHAVIOR (8-9) A, B

Animals are born with innate behaviors, already knowing how to do lots of things. A fox has the instinct to chase prey, and that same kind of instinct is seen when a dog chases a ball. Animals also have learned behaviors. Herring Gulls learn to drop clams onto the road to crack them open by watching other gulls do it. Students will observe animals to learn about what they do and why they do it. They will set up experiments to demonstrate behaviors and to find out how animals learn.

MARINE BIOLOGY (9-10) A, B

This is a diverse field-oriented course in which students will visit rocky shores, sandy beaches, and marsh ecosystems to explore and to observe the organisms that live there. The kids will collect animals and plants to learn to identify them and learn about how they live. In the classroom, students will keep aquariums for a better look at animals they find. Microscopes and dissections will be used for close study.

HABITS and HABITATS (9-10) B

In this course we will explore a variety of land-based and seashore environments and learn about the animals and plants that live there. What are the characteristics of different habitats? How does an animal's habitat determine its behaviors and how it survives? We'll make observations in the field, and carefully collect animals and plants to set up aquaria and terraria in the classroom. We'll observe the animals closely to help us answer those questions.



2024 Course Descriptions

LETTERS INDICATE THE SESSION(S)

ART, SCIENCE, AND NATURE (10-11) A

This course blends science, nature, and the visual arts. Students will use various materials to create forms of art while learning about ecological relationships between organisms and local natural environments. Students will explore different habitats along the seashore, in the woods, in freshwater wetlands, and in the suburban backyards of Woods Hole. Through sketches, sculptures, and other projects, students will showcase the connections among animals, plants, and their environments as well as our interactions with them.

METEOROLOGY (10-11) B

Weather is easy to study because it's around us every day and is always changing. But what is weather, what causes it, and how can we predict it? Solar energy input, temperature differences, and pressure variations in the atmosphere drive the weather. Students will learn about the components of weather, and they will use and construct instruments that will demonstrate concepts and collect data of temperature, atmospheric pressure, wind speed and direction, humidity, precipitation, and cloud cover. Students will become adept at identifying cloud types and recording data and looking for patterns in changing weather conditions ...and maybe even predict what tomorrow's weather will be without consulting the internet!

SEAWEEDS (10-11) A

Did you know that we most likely consume some form of seaweed everyday without even knowing it? Come find out why seaweeds are so common. Over the course of three weeks, students will immerse themselves in hands-on activities that cover such topics as: form and function, growth and light, photosynthesis and respiration, eutrophication and pollution, ocean acidification, and aquaculture. Students will learn how to identify local species using identification guides, examine ecological interactions between seaweeds and their surroundings, press seaweeds, eat seaweeds, and design a kelp farm in a fish tank.

OCEANOGRAPHY (11-12) A

Students will learn about the physical and chemical properties of seawater and take measurements of salinity, temperature, and pH. We'll learn about ocean zonation, beach profiles, and wave formation and about how ocean currents are affected by the earth's rotation. We'll collect data on tidal currents and tides and learn how they are caused by the interaction of Earth, sun and moon. Students will investigate how changes in ocean chemistry that are due to natural processes (such as biological activity or geology) or are caused by human activities (such as pollution) may impact both marine and terrestrial life.



2024 Course Descriptions

LETTERS INDICATE THE SESSION(S)

ANIMAL ADAPTATIONS AND BEHAVIORS (11-12) B

An adaptation is a physical or behavioral characteristic that has evolved to help an organism survive in its environment. Webbed feet help ducks and bullfrogs move efficiently in water. Squid and octopuses have chromatophores that allow them to change color to match their surroundings and escape predators. A squirrel's long tail helps it balance as it walks on branches and jumps from tree to tree. How does evolution happen? We will answer this question and learn about natural selection as we set up some experiments and observe animals' behaviors in local habitats.

WETLAND ECOLOGY (11-12) B

Students will explore and compare local wetlands: ponds, streams, marshes, swamps, freshwater, brackish and saltwater. We'll measure physical parameters such as salinity, temperature, turbidity, and pH. We'll look at substrate and water quality. We'll be collecting organisms from these environments and setting up terraria and aquaria to help us get to know the animals and plants of various wetlands and learn about the ecological relationships between the organisms and their environments.

FIELD GEOLOGY (11-12) A

Did you know that Cape Cod and the Islands were formed by a huge ice sheet over ten thousand years ago? Students will be introduced to the geological history of Cape Cod through field work, experiments, and classroom modeling. The class will visit and observe landforms that the glaciers left behind when they retreated. Field trips will take us to see cliffs, outwash plains, moraines, knob and kettle terrain, and kettle holes and learn about the processes that formed them. Please be aware that there may be additional field trips or slightly longer trips to visit landforms that are beyond what we can see right in Woods Hole.

CETACEANS (whales), PINNIPEDS (seals) and SEA TURTLES (11-12) B

Students will learn to identify the marine mammal and sea turtle species most common to our waters. Whales, dolphins, porpoises, seals and sea turtles can be found all around Cape Cod. Some can be easily seen from shore, even in Woods Hole. We'll look at their adaptations for life in the ocean. We'll learn about the many threats these animals face from ocean debris - like fishing line, nets, rope and plastic bags - and about the great dangers posed by ship strikes and boat propeller injuries. Local biologists who work in the field of marine animal rescue and rehabilitation will visit us in the classroom and we will have the chance to visit animals in rehab facilities. A driving trip to the National Marine Life Center in Bourne will take an extra half hour of class time, and a visit to the New England Aquarium's sea turtle hospital in Quincy will be scheduled as an extended field trip for a Saturday or Sunday afternoon.



2024 Course Descriptions

LETTERS INDICATE THE SESSION(S)

ENTOMOLOGY (11-12) B

Students will learn about the major groups of insects: their habits, growth and development, and the important roles they play in terrestrial and aquatic ecosystems. Many of our activities will involve collecting insects in fields, woods, ponds, and backyards, and rearing them in the classroom. We will pay special attention to important relationships between insects and plants.

INVERTEBRATES (11-12) A

Invertebrates dominate the animal world. They include diverse organisms such as sponges, cnidarians, worms, echinoderms, mollusks, and arthropods. This hands-on class will survey the diversity of invertebrate phyla and explore the evolutionary relationships between these groups. Field trips to local natural areas will give the class the chance to collect animals to bring back to the classroom where aquaria and terraria will be set up for close study and observations of anatomy, reproduction, feeding, and behavior.

NAUTICAL SCIENCE (12-13) B

Explore boat design and build a seaworthy model boat, learn to navigate by chart and compass, experiment with the principles of buoyancy and displacement, and delve into nautical terminology and practical seamanship. Classes will take trips to the working waterfront and by boat through Woods Hole Passage.

INTRODUCTION TO FILM PHOTOGRAPHY (12-13) A, B

Students will learn the science behind photography, and how to use a 35-mm SLR film camera. The class will learn to develop film and use enlargers in the darkroom to enlarge and print photographic images. They'll learn about the chemical reactions that take place when film and photo paper are exposed to light, and about how darkroom chemicals like developer, stop bath and fixer work. Students will explore how to artistically capture nature through a lens. CSS will provide each student with an SLR film camera to use for the class. Space is limited to 10 students. Materials Fee: \$40

ICHTHYOLOGY (12-13) A, B

Students will learn to fish using different baits and lures, as well as by setting traps and using seines. They'll study the characteristics of fish species that are found in local North Atlantic and freshwater habitats, and learn about fish anatomy and adaptations they have developed for life and survival in aquatic environments.



2024 Course Descriptions

LETTERS INDICATE THE SESSION(S)

BOTANY (12-13) B

Plants provide the foundation for all life on earth. Students collect and identify plant species and learn about their importance in ecosystems. Through experiments, microscopy, dissection, and field work, students gain a hands-on appreciation for botanical concepts and the dynamic role that plants play in the world around us.

EXPERIMENTS IN FIELD ECOLOGY (12-13) A

Students will explore various habitats around Woods Hole - woodland, seashore, marsh, unmowed fields - to learn about the animals and plants that live there and to learn ecological concepts about the ways that organisms interact with each other and their environments. Students will come up with questions about plant/animal/environmental relationships and strategies for survival. Questions like: Are there more aphids on a plant when ants are present? Why do some beaches have more hermit crabs than other beaches? Experiments will be designed to collect data and test hypotheses in the field.

ROBOTICS/ROVs (13-15) A, B

Students will focus on the technical, economic, and environmental aspects of real-world marine engineering and electronics. Through project design and data analysis, students will explore principles such as buoyancy, propulsion, and energy. There will be frequent field trips to Woods Hole labs to observe and learn about real-world ROVs (remotely operated vehicles). Students will build and test functional underwater ROVs. Materials Fee: \$40

MICROBIAL LIFE (13-15) A

How many organisms live in a single drop of pond water? Or in a teaspoon of soil? To find out, students will gain skills in microscopy while observing and learning about bacteria, protists, microfungi and other microorganisms. Discover how they survive and thrive and how they change and shape environments. Students will collect samples in local habitats to bring back to the classroom for study.

EARTH SCIENCE (13-16) A

The planet Earth is 4.6 billion years old. Earth science is geology, meteorology, climatology, oceanography, and environmental science. Also called geoscience, earth science studies the processes that form and shape Earth's surface, and how water and ecosystems are interconnected. We'll learn about earthquakes and volcanoes and go out into the field to learn first-hand about minerals, soils, oceans, freshwater, fossils, atmosphere, weather, and hydrology.



2024 Course Descriptions

LETTERS INDICATE THE SESSION(S)

BIOLOGICAL ILLUSTRATION (14-16) A

Illustration can be a useful and beautiful method of recording information. In this class we will become familiar with basic techniques of biological illustration, while examining the structure, anatomy and function of local organisms. This course will also compare historically important methods of illustration with modern techniques such as photomicrographs and data-based animations.

EMBRYOLOGY (14-16) B

During development, a single cell will divide and produce many different cell types with different shapes and jobs. How does this happen? How long does it take? This course will introduce and explore the changes and stages of embryonic development in organisms through collection and microscopic research. We'll look at embryonic development in vertebrates and invertebrates.

ADVANCED MARINE BIOLOGY (14-16) A, B

Through hands-on exposure, students will delve into the biology and ecology of marine vertebrates and invertebrates, their evolution and classification, anatomy and physiology, behaviors, and habitats. This course will include snorkeling field trips to explore different marine ecosystems around Woods Hole. Students must provide their own mask, snorkel and fins. A swim test will be administered requiring students to swim 50 ft and tread water for 2 minutes. Space is limited to 14 students.



Philosophy, Background, & Donors

Rooted in the philosophy of experiential learning — the commitment to direct observation of nature remains steadfast. Since its inception under the guidance of Frances C. Lillie and Dr. Lillian V. Morgan, the teaching staff, then as now, is meticulously selected for their scientific competence and teaching expertise. They are free to organize the details of the courses according to their particular skills and the interests of the students. As a result, the instruction is on a higher level than is usually possible for children of these ages.

Founded in 1913 on Penzance Point, the Children's School of Science (CSS) in Woods Hole began as the Summer School Club, evolving into a cooperative nature-focused school by 1919. Using the 1865 schoolhouse, CSS provided diverse activities, later emphasizing structured science courses led by Dr. Morgan. Except for a 1916 hiatus and the summer 2020 virtual program, CSS has operated every summer since, becoming a nonprofit in 1952. Guided and funded by parents and friends, CSS maintains affordable tuition, embodying a century-long commitment to enriching education in Woods Hole.

A huge part of the Children's School of Science opening its doors each and every summer is through the cooperation and collective generosity of dedicated parents, teachers and benefactors.

CSS gratefully acknowledges all contributions from its many generous friends and families over the years. CSS also gives special thanks for recent support from Church of the Messiah of Woods Hole, the Clowes Fund, The Friendship Fund, Marine Biological Laboratory, Memorial Funds in Honor of Past Presidents and Friends of CSS, NOAA Fisheries Service, Woods Hole Foundation, Penikese Island School, Woods Hole Historical Museum, Woods Hole Oceanographic Institution, Woods Hole Public Library, and Woods Hole Woman's Club. Finally, we are deeply appreciative of Teaching Assistants Chair, Josh Olins; Ways and Means Committee Chairs, Emily Yang and Gail Diamond; and our retiring Recording Secretary, David Epstein



Meet Our Team!



DIRECTOR

Kate Schafer's lifelong love of the oceans and marine life was sparked in Woods Hole as a student in Bettina Dudley's Advanced Marine Biology at CSS. A few years later she attended Stanford University, where she graduated with a Bachelor of Science in Biology. While living in Jamaica after graduation, she became fascinated with the incredible diversity of life on coral reefs, so she returned to California to earn her Ph.D. in integrative biology at UC Berkeley. Her dissertation research was largely spent in Belize, studying mantis shrimp and pygmy octopuses. While in Belize, she witnessed a coral bleaching event at her study sites. This experience and others have led her to commit to doing everything she can to stave off the climate crisis's worst impacts and advocate for sustainability at every level. Kate has taught high school biology and environmental science for 18 years, and now teaches at Sequoyah School in Pasadena. Her summers bring her to Woods Hole, for many years as a CSS instructor, and now as the school's Director, where she enjoys getting to share her love of science and nature with a new generation of students.



ASSISTANT DIRECTOR

Jessica Rencher joins the CSS team from the Rocky Mountains. She instructs teaching candidates at Colorado State University. Her Early Childhood Education courses focus on K-3 literacy, science, and math. Previously, Jessica dedicated her talent as a first-grade teacher in Fort Collins, Colorado, a zip-line guide in the coastal Redwoods in Santa Cruz, California, and an advisor to international students at The American School in Switzerland in Lugano, Switzerland. However, of all these adventures, teaching science in Woods Hole remains her all-time favorite experience. CSS gave Jessica her first teaching job in 2010. She enjoys giving back to a community that has given her so much. Jessica graduated with a B.S. in Biology with an emphasis in teaching from California Polytechnic State University and earned a M.Ed. from Colorado State University. Currently, she's a Human Resources and Education doctoral candidate at CSU. Jessica enjoys spending time with family and friends, playing the violin, traveling, reading, skiing, and hiking with her Siberian Husky.



CURRICULUM CHAIR

Becky Lash is often endearingly referred to as the 'keeper of the school.' She has been involved with the Children's School of Science almost every summer since 1963, when she was just a wee lass in Seashore Life. She is passionate about science education and creating engaging experiments! Becky's teaching career started at CSS in 1977, with some summers off here and there. Among her favorite classes to teach are Entomology and Ornithology. Before her extensive teaching career, Becky went to Penn and Cornell, where she earned her degrees. Recently, the CSS Board convinced her to join the leadership team. She plays an instrumental role in developing innovative courses while honoring the long-standing traditional CSS classes. Becky considers teaching in Falmouth Public Schools, being an aquarist at the Woods Hole Science Aquarium, and being a gardener three of her most enjoyable jobs. She is currently obsessed with being part of the New England Aquarium's sea turtle rescue and rehab team. Chat with Becky about sea turtles when you get the chance!



Meet the Officers of the Board of Directors

President: Virginia Land McGuire
Vice President: Catherine Cramer
Treasurer: Ronnie Cooperstein
Clerk: Chris Kinkade

BOARD of DIRECTORS Term ending 2024

Elizabeth Chappell
Roger Colinvaux
Joe DeGiorgis
Christine Field
Virginia Land McGuire

BOARD of DIRECTORS Term ending 2025

Ronnie Cooperstein
Chris Kinkade
Jennifer Sheetz
Aminta Steinbach

BOARD of DIRECTORS Term ending 2026

Susan Burke
Catherine Cramer
Eric Hines
Eve Weiss

