



## Children's School of Science 2022

The Children's School of Science encourages and develops in children love and appreciation of science. Inquiry, direct observation, and understanding of nature guide our instructional philosophy. Frequent field trips and hands-on classroom study give students the opportunity to explore nature, become adept at observation, and discover the rules that govern natural processes. The world-famous scientific community of Woods Hole offers additional opportunities to learn about research in different fields. The unusual complexity of the waters, geology, and biology of the greater Falmouth area provides a uniquely well suited "live" learning environment.

We are delighted this summer to return to our base level of pre-COVID course offerings, with four class sessions per day, and five classes per session for most time slots. In addition, after experimenting with longer classes last summer (with a much more limited schedule) we have decided, based on community feedback, to lengthen class times to one hour and 45 minutes from the pre-COVID norm of 90 minutes. Of course, our continued priority is the health and safety of students, faculty, staff, and the wider community, and we will adopt necessary and reasonable COVID-related precautions based on the latest available guidance. **This summer, we are requiring students, faculty, and staff to have a full course of a COVID vaccine and at least one booster shot (assuming age-eligibility).**

Courses are organized into two three-week sessions, with two courses running for the entire six weeks. Session A runs from July 5 to July 22, and Session B runs from July 25 to August 11. 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. An **initial registration** will begin by early April. During this time, students may sign up for only **one class per session** (one class for session A and one class for session B, or one session AB class). This will allow more families the opportunity to place a child in a class. After one week, 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. A non-refundable **\$35 fee** is due at the time of registration. **Tuition for each three-week course is \$340, and six-week classes are \$680.** Tuition is non-refundable. **Scholarships:** Partial or full scholarships are available to those in need. Please send a written request for financial aid to [general@childrensschoolofscience.org](mailto:general@childrensschoolofscience.org).

### 2022 Calendar

**July 5** – Session A Begins

**July 6** – Back to School Night 6-7pm

**July 20** – Open Board Meeting 7 pm

**July 22** – End of Session A

**July 25** – Session B Begins

**July 26** – Back to School Night 6-7 pm

**August 8** – Annual Meeting 7:30 pm

**August 11** – End of Session B

Note that some of these events may be held virtually or cancelled, depending on COVID guidelines.

Find us on Facebook



The Children's School of Science is made possible through the cooperation and collective generosity of dedicated parents, teachers and benefactors. CSS gratefully acknowledges all contributions from its many friends and families. CSS also gives thanks to Anonymous Donors, Church of the Messiah of Woods Hole, Clowes Fund, Elaine Noe Memorial Fund, Esther Simon Charitable Trust, The Friendship Fund, Marine Biological Laboratory, Memorial Funds in Honor of Past Presidents and Friends of CSS, NOAA Fisheries Service, Woods Hole Foundation, Woods Hole Historical Museum, Woods Hole Oceanographic Institution, Woods Hole Public Library, Woods Hole Woman's Club.

**Visit [childrensschoolofscience.org](http://childrensschoolofscience.org) to learn more about the school.**

## CSS ADMINISTRATIVE OFFICERS 2022

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**Assistant Administrator (Interim):** Jessica Rencher  
**Curriculum Chair:** Becky Lash  
**Teaching Assistants Chair:** Josh Olins  
**Recording Secretary:** David Epstein

### OFFICERS of the BOARD of DIRECTORS

**President:** Roger Colinvaux  
**Vice President:** Ronnie Cooperstein  
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### BOARD OF DIRECTORS

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**CHILDREN'S SCHOOL OF SCIENCE**  
**P.O. BOX 522 • WOODS HOLE, MA**  
**02543**

## SCHEDULE OF CLASSES 2022

<b>Session AB</b> <b>July 5 – Aug 11</b>	<b>Session A</b> <b>July 5 – July 22</b>	<b>Session B</b> <b>July 25 – August 11</b>
<b><u>8:30 – 10:15</u></b> Animal Behavior (8-9)* Introduction to Film Photography (12-13)	<b><u>8:30 – 10:15</u></b> Animal Behavior (8-9) Ecology of the Bike Path (9-10) Chemical Oceanography (10-11) Ichthyology (12-13)	<b><u>8:30 – 10:15</u></b> Animal Behavior (8-9) Ecology of the Bike Path (9-10) Seaweeds (10-11) Ichthyology (12-13)
<b><u>10:30 – 12:15</u></b> Seashore Life (7-8) Advanced Marine Biology (14-16)*	<b><u>10:30 – 12:15</u></b> Marine Biology (9-10) Ecological Art (9-10) Geology of Cape Cod (10-11) Advanced Marine Biology (14-16)	<b><u>10:30 – 12:15</u></b> Seashore Life (7-8) Marine Biology (9-10) Entomology (11-12) Advanced Marine Biology (14-16)
<b><u>12:30 – 2:15</u></b>	<b><u>12:30 – 2:15</u></b> Seashore Life (7-8) Woods, Ponds, and Fields (8-9) Botany (11-12) Robotics/ROV (13-15) Microbial Life (14-16)	<b><u>12:30 – 2:15</u></b> Woods, Ponds, and Fields (8-9) Nautical Science (11-12) Embryology (13-14) Robotics/ROV (13-15) Biological Illustration (14-16)
<b><u>2:30 – 4:15</u></b> Biodiversity and Climate Change (14-16)*	<b><u>2:30 – 4:15</u></b> Seashore Life (7-8) Invertebrates (12-13) Biodiversity and Climate Change (14-16)	<b><u>2:30 – 4:15</u></b> Field Ecology (10-11) Vertebrate Zoology (12-13) Biodiversity and Climate Change (14-16)

\* May be taken as a six-week class, or for three weeks during either Session A or Session B

# 2022 COURSE DESCRIPTIONS

*Numbers listed in parentheses indicate ages for each class; letters indicate the session(s).*

## **COURSE DESCRIPTIONS**

### **SEASHORE LIFE (7-8) A, B, AB**

Students will explore local beaches and salt marshes to observe and learn about the animals and plants that live there. Activities will include collecting in intertidal environments, setting up classroom aquaria, experiments, and art projects. The six-week version of the course will allow for a more in-depth study of seashore communities and invertebrate phyla.

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

Students will learn about animals and plants of terrestrial and freshwater environments through outdoor activities and collections and by setting up terraria and aquaria in the classroom. Separate units will introduce students to plants, insects and spiders, reptiles, amphibians, and birds.

### **ANIMAL BEHAVIOR (8-9) A, B, AB**

Animals are born with innate behaviors, already knowing how to do lots of things. A fox has the instinct to chase prey, like a rabbit, and that same kind of instinct is seen in a dog when it 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. In this class, we will observe animals to learn about what they do and why they do it. We will also set up some experiments 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, sandy and marshy ecosystems to collect animals and plants and learn about what they are and how they live. In the classroom, students will keep organisms in aquaria for a closer look and use microscopes for close study.

### **ECOLOGY OF THE BIKE PATH (9-10) A, B**

Riding bicycles lets students reach the unique aquatic and upland ecosystems along the Shining Sea Bike Path. During daily rides, students will do ecological studies of the distinct habitats and environments along the bike path. Participants must provide their own bicycles and helmets, and be comfortable riding for several miles and in a straight line. A skills test will be administered on the first day of class. (Enrollment limited to 14 students)

### **ECOLOGICAL ART (9-10) A**

Students will use various materials to create forms of art while learning about ecological relationships between organisms and local natural environments. Each week students will explore different habitats along the seashore, in the woods, in freshwater wetlands, and in 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.

### **FIELD ECOLOGY (10-11) B**

In this class we will learn about species of plants and animals in their natural habitats and environments while making observations, learning life histories of animal species, identifying populations, setting up experiments, doing projects, collecting data, and presenting results. Woodlands, meadows, gardens, and freshwater ponds are among the habitats that will be explored.

### **SEaweEDS (10-11) B**

Did you know that we most likely consume some form of seaweed every day without even knowing it? Come find out why seaweeds are so popular lately. 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.

### **CHEMICAL OCEANOGRAPHY (10-11) A**

Students in this class will learn about the chemical properties of sea water, such as salinity, Temperature, and pH. They may investigate how changes to ocean chemistry due to natural processes (such as biological activity or geology) or human activities (such as pollution) may impact both marine and terrestrial life.

### **GEOLOGY OF CAPE COD (10-11) A**

Did you know that Cape Cod and the Islands were formed by a huge ice sheet thousands of years ago? In this class, students will be introduced to the geological history of Cape Cod through field work, experiments, and classroom modeling. The class will also cover topics such as fossils, soil, and water.

### **BOTANY (11-12) A**

Plants provide the foundation for all life on Earth. In botany, we collect and identify local 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.

### **NAUTICAL SCIENCE (11-12) 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 through Woods Hole Passage.

### **ENTOMOLOGY (11-12) B**

In this class we will learn about the major groups of insects; about their habits, growth and Development; and about 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 be working in the garden outside the school, learning to create sustainable habitats for insects and other animals. (Did you know that one third of every bite of food we eat is dependent on insect pollinators?)

### **ICHTHYOLOGY (12-13) A, B**

In this class, students will learn to fish using different baits and lures, as well as by setting traps and using seines. They will study the characteristics of species found in local North Atlantic and freshwater habitats, including their diverse forms and survival strategies.

### **INVERTEBRATES (12-13) A**

Invertebrates dominate the animal world. They include 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 among these groups. Students will study internal and external anatomy, reproduction, feeding, and behavior through observation of live specimens, dissection, classroom experiments, and field trips to local ecosystems.

### **VERTEBRATE ZOOLOGY (12-13) B**

Vertebrates make up many of the animals we see daily: birds, reptiles, amphibians, fish, and mammals. In this class, we will investigate the anatomy, form, function, and behavior of numerous vertebrates to determine which characteristics are common to all vertebrate classes (groups) and which are unique to specific groups.

### **INTRODUCTION TO FILM PHOTOGRAPHY (12-13) AB**

Welcome to photography! We will learn how to use a film camera, understand the science behind photography, composition, and printing photos in the dark room. This class will introduce the balance of light and time, developing film, and printing photos. We will explore how to artistically capture nature through our lens. CSS will provide each student with an SLR film camera to use for the class; enrollment is limited to 10 students. **Materials Fee: \$40**

### **EMBRYOLOGY (13-14) 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.

### **ROBOTICS/ROVs (13-15) A, B**

Students will focus on the technical, economic, and environmental aspects of real-world marine engineering and electronics. Through frequent field trips to Woods Hole labs, project design, and data analysis, students will explore principles such as buoyancy, propulsion, and energy. Students will build a functional remotely operated vehicle (ROV). **Materials Fee: \$40.**

### **ADVANCED MARINE BIOLOGY (14-16) A, B, AB**

Through hands-on exposure, students will delve into the biology and ecology of marine vertebrates and invertebrates, their evolution and classification, anatomy and physiology, and behaviors and habitats. This course will include snorkeling field trips to different 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. (Enrollment limited to 14 students)

### **MICROBIAL LIFE (14-16) A**

Microbes profoundly impact our external environment as well as our personal biome. Learn about the strange and fascinating world of bacteria, protists, and fungi through microscopic observation and experimentation, both in the classroom and in various Woods Hole ecosystems.

### **BIOLOGICAL ILLUSTRATION (14-16) B**

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.

### **BIODIVERSITY AND CLIMATE CHANGE (14-16) A, B, AB**

Climate change is altering ecosystems around the globe, and Cape Cod is being affected in profound ways. In this course we will develop a scientific understanding of how and why the climate is changing and then explore the impact that these changes are having on the biodiversity of ecosystems on the Cape and beyond. We will learn from experts who are conducting research on these topics and use a systems approach to learning how climate change is impacting both natural and human systems.