

# welcome Back!

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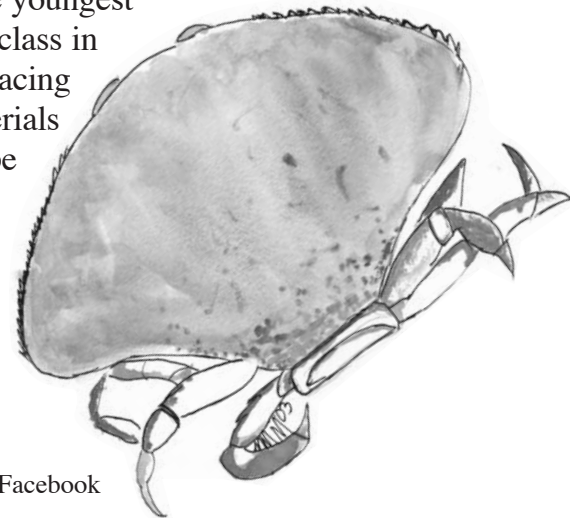
## July 3 - August 10, 2017

**Another summer of Science School awaits you!**

In our on-going effort to be environmentally friendly and ecologically responsible, registration forms can be submitted by email to [registration@childrenschoolofscience.org](mailto:registration@childrenschoolofscience.org). Please be sure to provide your updated email address on our website as most of our communications are sent via email.

The Children's School of Science encourages and develops in children a 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.

Courses are organized into three-week and six-week sessions. Classes meet daily Monday through Friday for ninety 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 if they reach the age of 7 years by the start of the Science School class in which they are enrolling and have finished first grade. We will begin placing students in classes on April 1st. It is important to have registration materials in by this date. Please select alternate courses should your first choice be unavailable. We will make every effort to place children in their first choice classes; however, this will not always be possible. Our goal is to place as many students as possible in a course. Students will be assigned additional classes if space is available. First priority is given to children who have taken courses in previous years.



### 2017 Calendar

- July 3** – First day of classes
- July 3** – Back to School Night 6-7 pm
- July 19** – Open Board Meeting 7 pm
- July 21** – End of session A
- July 24** – Session B begins
- July 25** – Back to School Night 6-7 pm
- July 27** – CSS Picnic Ballpark 5 pm
- August 7** – Annual Meeting 7:30 pm
- August 9** – Open House 5-6:30 pm
- August 10** – End of sessions B and AB



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, Bristol-Myers Squibb Matching Gifts Program, Church of the Messiah of Woods Hole, Clowes Fund, Esther Simon Charitable Trust, Ethel Metz Fund, The Friendship Fund, Marine Biological Laboratory, Memorial Funds in Honor of Past Presidents and Friends of CSS, NOAA Fisheries Service, Woods Hole Historical Museum, Woods Hole Oceanographic Institution, Woods Hole Public Library, Woods Hole Woman's Club.

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

# 2017 COURSES

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

**SEASHORE LIFE (7-8) A, B, AB** Students will explore and study the flora and fauna of the seashore, including dunes, marshes, beaches and shallow water. Activities may include setting up aquaria, experiments, art projects and collections. The six-week version of the course will allow for a more in-depth study of seashore life communities.

**COMPARATIVE HABITATS (8-9) AB** This six-week course will explore the salt and fresh water habitats of Woods Hole by looking closely at fish, birds, insects and crustaceans. Students will learn to identify common species and discuss how they thrive in varied environments including estuaries, salt marshes, ponds and lakes. Students will study the properties of water and the impact of humans on coastal ecosystems.

**WOODS, PONDS, AND FIELDS (8-9) A, B** Students will observe the local habitats of terrestrial plants and animals through outdoor activities and classroom tanks. They may make collections of plants, insects and other natural objects. Separate units will introduce students to botany, entomology, herpetology, geology and limnology.

**ANIMAL BEHAVIOR (8-9) A, B** Have you ever wondered why certain animals live where they do, or behave in particular ways? Through collection, observation and experimentation, this course will study the habits and habitats of local animals.

**ADAPTATIONS (8-9) B** Have you ever wondered how unrelated animals such as dolphins and sharks evolved similar external features such as fins, tails and streamlined bodies? Or how two closely related rodents, beavers and squirrels, developed different structures such as webbed feet for swimming or clawed feet for climbing? In this class, we will study local species to learn how they have evolved physical adaptations to suit their different environments.

**MARINE BIOLOGY (9-10) A, B, AB** This is a diverse field-oriented course in which students will visit rocky, sandy and marshy ecosystems to study and collect the major groups of animals and plants of the ocean. In the classroom, students will observe marine organisms with dissecting microscopes and will make a shell collection. The six-week version will study these areas in greater depth.

**ECOLOGY OF THE BIKE PATH (9-10) A, B** Bicyclists will study the ecology and geology of the unique aquatic and upland ecosystems along the Shining Sea Bike Path. There will be daily rides with weekly driving field trips to visit more distant destinations. Participants must provide their own bicycles and helmets and be comfortable riding for several miles.

**OCEANOGRAPHY (10-II) AB** In this six week class, students will examine the physical, geological, chemical and biological features that comprise our oceans. They will learn about ocean formation, global ocean circulation, ocean zonation, beach profiles, wave formation, astronomical influences on tides and currents, seafloor mapping as well as gaining an understanding of how the ocean is important to life on Earth as we know it.

**BOTANY (10-II) A** Studying plants opens our understanding of the environment. In botany, we collect and identify local plant species, and learn about their importance in the ecosystem. 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.

**GEOLOGY OF CAPE COD (10-II) B** Students will be introduced to the geological history of Cape Cod. The course will focus on such topics as Cape Cod's rock record and history, fossils, soil and water. Laboratory modeling and fieldwork will help students examine the changes in the environment over past geological periods.

**ICHTHYOLOGY (II-12) AB** 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.

**ETHOLOGY (II-12) A** In this class, we'll study the behavior of animals in their natural environments (ethology) and also do experiments in the classroom with organisms we collect in the field. We'll discover differences between instinct and learned behavior and answer questions like: Why do hermit crabs fight so much? How does a herring gull know that it can open a quahog by dropping it on the road?

**METHODS IN FIELD ECOLOGY (II-12) B** Field biologists aim to understand how animals and plants live in their natural environment. In this course, we will study the aquatic and terrestrial ecosystems around Woods Hole to better understand how organisms interact with each other and their environments and how humans impact these interactions. We will spend considerable time in the field, investigating factors that influence biodiversity, community structure and interactions between species.

**HERPETOLOGY (II-12) B** We will study the reptiles and amphibians of the Woods Hole environs. We'll learn how "herps" are different from other animals, where they live and how to identify them. Through field trips and in class aquaria, we'll investigate their unique life cycles.

**EMBRYOLOGY (12-13) A** How long does it take for an organism to develop? During development, a single cell will divide and produce many different cell types with different shapes and jobs. This course will introduce and explore the changes and stages of embryonic development in organisms through collection and microscopic research.

**NAUTICAL SCIENCE (12-13) A** 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.

**ADVANCED OCEANOGRAPHY (12-13) A** Students in this course will have an opportunity to explore research currently and historically done at the scientific institutions in Woods Hole. Multiple boat trips, visits to labs, presentations by local scientists, and hands-on experiments will enhance the experience of the young oceanographers.

**INVERTEBRATES (12-13) B** Invertebrates — animals without backbones such as worms, echinoderms, mollusks, and arthropods — make up as much as 97% of all animal species. This hands-on class will survey the diversity of invertebrate phyla and explore the evolutionary history of these groups. Students will study internal and external anatomy, reproduction and feeding through observation of live specimens, dissection and field trips to local ecosystems.

**ENVIRONMENTAL SCIENCE (12-13) B** The seven billion person question: How can the earth support this many people? This course will focus on the growing global population and its increasing demand for environmental resources. We will explore technologies that have helped human societies develop but have impacted and exploited the environment. Through experimentation and discussion, students will learn how their own actions in Woods Hole may have a global environmental impact.

**FILM PHOTOGRAPHY (13-16) A** Discover the science behind the unique, creative qualities of black and white film photography. In this intensive three-week class, students will review the basic principles of photography including the balance of light and time, composition, and darkroom procedures for developing and printing film. Space permitting, returning students are welcome to take the class. Students must provide their own SLR film camera; space is limited to 10 students. Materials Fee: \$30.

**SUSTAINABLE AGRICULTURE (13-16) A** This class will focus on the social, economic and environmental impacts of food and agriculture. Through studies of plant, soil and microbial sciences, students will study local food systems including aquaculture. Students will participate in the daily workings of a local farm during extended field trips. Bring your curious appetite! *Extended field trips until 4:30 pm on the 2nd and 3rd Mondays of the class.*

**ROBOTICS/ROVs (13-15) 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, 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 should be competent swimmers and provide their own mask, snorkel and fins.

**CLIMATE CHANGE AND CAPE COD (14-16) A** This course will take an in-depth look at the term "climate change" and what it means for the Cape. Students will take field trips, hear presentations from guest researchers and study the nature of the changing Cape Cod landscape. What is the relationship between climate change and erosion? How do weather patterns and precipitation accelerate coastal changes? Are local species impacted? Students will learn ways to positively impact the future of ecosystems on Cape Cod and beyond.

**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.

**EXPERIMENTS IN WOODS HOLE (14-16) B** For more than a century, Woods Hole has been an international center for research, education and training in biology and ocean sciences. This class will introduce students to the diversity of research done in Woods Hole through trips to working labs and classroom visits from research scientists. Students will also have an opportunity to design and conduct their own experiments.

# SCHEDULE OF CLASSES 2017

<b>SESSION AB</b> July 3 – August 10	<b>SESSION A</b> July 3 – July 21	<b>SESSION B</b> July 24 – August 10
<b>8:30 – 10:00</b> Seashore Life (7–8) Marine Biology (9–10) Ichthyology (11–12)	<b>8:30 – 10:00</b> Nautical Science (12–13) Film Photography (13–16)	<b>8:30 – 10:00</b> Adaptations (8–9) Invertebrates (12–13)
<b>10:15 – 11:45</b> Comparative Habitats (8–9) Advanced Marine Biology (14–16)	<b>10:15 – 11:45</b> Ecology of the Bike Path (9–10) Ethology (11–12) Embryology (12–13) Advanced Marine Biology (14–16)	<b>10:15 – 11:45</b> Ecology of the Bike Path (9–10) Methods in Field Ecology (11–12) Robotics/ROVs (13–15)
<b>12:00 – 1:30</b> Oceanography (10–11)	<b>12:00 – 1:30</b> Seashore Life (7–8) Animal Behavior (8–9) Marine Biology (9–10) Climate Change & Cape Cod (14–16)	<b>12:00 – 1:30</b> Seashore Life (7–8) Animal Behavior (8–9) Marine Biology (9–10) Experiments in Woods Hole (14–16)
	<b>1:45 – 3:15</b> Seashore Life (7–8) Woods, Ponds and Fields (8–9) Botany (10–11) Advanced Oceanography (12–13) Sustainable Agriculture (13–16)	<b>1:45 – 3:15</b> Woods, Ponds and Fields (8–9) Geology (10–11) Herpetology (11–12) Environmental Science (12–13) Biological Illustration (14–16)

## CSS ADMINISTRATIVE OFFICERS 2017

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**Assistant Administrator:** Aaron Sloboda  
**Curriculum Chairs:** Karen Dell, Christine Field  
**Registrar:** Crickett Warner  
**Teaching Assistants Chair:** Apple Stephen  
**Website and Facebook Administrator:** Aaron Sloboda

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**Co-Vice Presidents:** Ronnie Cooperstein, Jennifer Sheetz  
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