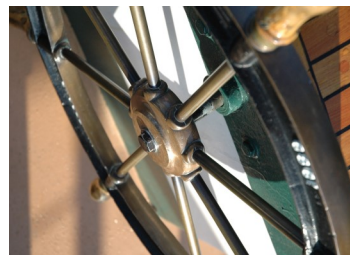# BaySail

EXPLORE YOUR WORLD

The Great Lakes are under heavy stress. We aim to foster environmental stewardship in our next generation of problem solvers, through hands-on exploration of watershed phenomena aboard a tall ship or in the classroom.

Program	Grades	Time	Accommodations and Cost		
Bay City Shipboard Science Under Sail See reverse for Detroit, Port Austin and East Tawas	3-12	3.5 hours	Appledore V (18 Students) $425*	Appledore IV (32 Students) $850*	Bay City occasionally accommodates up to 52 students at once
Dockside Science Under Sail	K-2	2 hours	Up to 32 students: $10/student (min. $150)		
History Under Sail	3-12	3.5 hours	Appledore V (18 Students): $375	Appledore IV (32 students): $750	
Classroom & Land-Based Sessions	Pre K—12	3 hours**	$100 + Mileage. **Can be split into multiple sessions. Approximately 30 students recommended per session.		

Inquiry-Based   **Ecology & Life Sciences**   **STEM-Focused**   **Nautical & Physical Sciences**

BaySail, a 501c3 non-profit, launched its flagship STEM program, Science Under Sail, in Bay City in 1998 with the founding of the organization and the acquisition of the schooner Appledore IV. Twenty years later, BaySail continues to deliver our award-winning Science Under Sail program to students across Michigan from the decks of Appledore IV and Appledore V.

*See reverse for Science Under Sail pricing by port.

Contact: Emily Nummer, Director of Education | program@baysailbaycity.org | 989-895-5193

Science Under Sail Program Options

PORT	DATES	SUGGESTED TRIP TIMES*		CAPACITY	COST	# OF MODULES
		AM	PM			
BAY CITY	April 22—October 18	8:30 – Noon	1:00 — 4:30	*18/32 students*	$425/$850	6
DETROIT	April 29—May 3	9:30 – Noon	1:00 — 3:30	*32 students*	$750	4
PORT AUSTIN	Sept 17– Sept 19	9:00 — 11:30	12:30 — 3:00	*18 students*	$375	4
EAST TAWAS W/lighthouse tour	May 20– May 31	9:00 — 11:30	12:30 — 3:00	*18 students*	$450	4

Arrive 15 minutes prior to trip departure time

Freshwater Ecology

❉ **Plankton (D)** – Use a plankton net to collect samples and later analyze plankton under a microscope while studying their role in the food web.

❉ **Benthic (D)** – Explore the benthic zone by taking a bottom sample with a petite ponar dredge and later search for and identify organisms that indicate water quality.

❉ **Invasive Species (D)** – Identify invasive aquatic species and explore their impact on the Great Lakes.

❉ **Wetland/River Observation (B)** – Use binoculars to observe wildlife and describe the ecosystem services of wetlands.

❉ **Marine Debris (D)** – Identify sources of debris, predict decomposition rates and discuss effects on aquatic life.

❉ **Watershed (D)** – Use a model to observe surface water flow and its impact on pollution in the watershed.

❉ **Pollution Solutions (D)** – Discuss water pollution sources and engineer and test solutions for an oil spill.

❉ **Water Chemistry (U, D)** – Collect a water sample with an alpha water bottle and later analyze samples for pH, dissolved oxygen, turbidity, nitrate, and phosphate levels to determine water quality.

Nautical Sciences

❉ **Knots (D)** – Learn how to tie commonly used nautical knots and what each is used for.

❉ **Navigation (D)** – Learn about longitude and latitude and how to read a compass while investigating navigational charts.

❉ **Forces in Sailing (U, D)** – Learn the points of sail, and how sails are trimmed relative to wind direction. Identify forces acting on and with sailboats.

❉ **Buoyancy (D)** – Explore buoyancy while competing to engineer small vessels designed to carry a load.

❉ **Simple Machines (D)** – Identify the six simple machines and their application to sailing. Find examples of each in use on the ship.

❉ **Weather (D)** – Interpret cloud structures and use electronic and historical devices to measure weather variables such as wind speed/direction, temperature and humidity.

(U) Designed for middle and high school students only.
(B) Only available for Bay City departures.
(D) Available for a dockside program.

Whole Group

❉ **Ship Tour (D)** – Get the chance to explore above and below decks, and learn what life aboard a schooner is like!

❉ **Food Web (D)** – Explore the interconnected relationships within food webs.

❉ **Drop in the Bucket (D)** – Review sources of water on the earth, discuss how little freshwater is available for human use and propose ways to conserve this precious resource.

❉ **Bioaccumulation (D)** – An interactive food web model that introduces the concept of bioaccumulation.