PROJECT *OCEANOLOGY*

Introduction to Oceanology: NGSS Alignment
4th Grade

Overview

This 2.5 hour boat program is one of our most popular and versatile offerings. Students will literally and figuratively get their hands wet as they investigate the living and nonliving components of Long Island Sound! Your students will study living organisms in the stern of the boat by hauling a trawl net, doing a plankton tow, pulling a lobster pot, and (on some trips) sorting through a mud grab. In the bow of the boat, they'll learn how to use a wide range of oceanographic equipment as they investigate physical and chemical aspects of the water column and the bottom. We'll save their data as part of our flagship environmental monitoring program. Project Oceanology students have been collecting data on the living and nonliving components of ecosystems in Long Island Sound and Fishers Island Sound for more than thirty years, and our data are used by scientists at the University of Connecticut and elsewhere to understand long-term environmental trends.

Alignment with NGSS

Performance Expectations

4-LS1-1. Construct an argument that plants and animals have internal and external structures that function to support survival, growth, behavior, and reproduction.

Students will use the otter trawl net to obtain a sample of organisms from the benthic community and observe their various internal and external structures. Students will then construct an argument to determine which animals have adapted to be successful in Long Island Sound using evidence from their observations to support their claims.

Science and Engineering Practices

Developing and Using Models

Students will collect empirical data and then work collaboratively to use those data to construct a vertical profile of the water column, showing how each variable changes with depth.

Analyze and Interpret Data

Students will share their findings with the group, and then work together to analyze the results and make an assessment of whether the ecosystem is healthy.

Using Math/Computational Thinking

Students will use simple geometry and algebraic thinking to calculate the depth of seafloor based on the amount of line they let out for trawling. They will also read scientific instruments and then perform calculations to characterize the physical environment.

Engaging in Argument From Evidence

Students will gather empirical data on the physical and biological aspects of Long Island Sound, use this information to make an assessment about the success of various species amongst the ecosystem, and then defend their assessment using the evidence that they gathered.

Crosscutting Concepts

Systems and System Models

Students will identify and describe the relationships among various living and nonliving components within the Long Island Sound ecosystem.

Disciplinary Core Ideas

LS1.A: Structure and Function. Plants and animals have both internal and external structures that serve various functions in growth, survival, behavior, and reproduction.

Students will observe both internal and external structures of various marine organisms and discuss their functions.

LS1.D: Information Processing. Different sense receptors are specialized for particular kinds of information, which may be then processed by the animal's brain. Animals are able to use their perceptions and memories to guide their actions.

Students will discuss the different techniques marine species have adapted to perceive and process information using the animals caught in the trawl net as examples.