PROJECT *OCEANOLOGY*

Seal Watch Program

Overview

Long Island Sound is a dynamic, seasonally-driven estuary and is the temporary home of many migratory species. In the colder months of the year, Harbor Seals (*phoca vitulina*) make their way to a Long Island Sound to enjoy the benefits of the milder winter, limited predation and abundant food supply. Several clusters of rocks near the northern shore of Fishers Island make ideal observation locales for scientists. During this program, students will identify mammalian physical and behavioral adaptations in seals, discuss population dynamics, and collect data on seal numbers at 4 sites in Fishers Island Sound. Students will also gain an understanding of human impact and management, including a focus on the Marine Mammal Protection Act.

Alignment with NGSS

Performance Expectations (Middle School)

MS-LS1-4 Use argument based on empirical evidence and scientific reasoning to support an explanation for how characteristic animal behaviors and specialized plant structures affect the probability of successful reproduction of animals and plants respectively. *Students will study the migration pattern of the harbor seal, and discuss behavior strategies related to reproductive success.*

MS-LS2-1 Analyze and interpret data to provide evidence for the effects of resource availability on organisms and populations of organism in an ecosystem. *Students will view records of ecosystem changes and relate them to measured populations of seals in Long Island Sound. Students will also discuss haul-out rocks as a limited resource for seals in Fisher's Island Sound.*

MS-LS2-4 Construct an argument supported by empirical evidence that changes to physical or biological components of an ecosystem affect populations. *Students will have access to 20 years of seal count data in Long Island Sound, and will be able to argue cogently about the impact of physical and biological changes on seal populations.*

Science and Engineering Practices

Using mathematics and computational thinking: *Students will calculate mean, median, and mode for seal data collected by their class, and discuss the pros and cons of different ways to summarize the information.*

Analyzing and interpreting data*: Students will use mathematical representations and graphical to view their data. They will draw conclusions based on comparisons of multiple data sets.*

Constructing Explanations/Designing Solutions: *Students will be able to explain their data and work with teammates to design management plans.*

Crosscutting Concepts

Patterns *Students will identify patterns of seal behavior, and relate them to patterns of environmental variation in Fishers Island Sound.*

Scale, proportion, and quantity *Students are able to compare their data to historical data to identify trends and make predictions on a larger scale.*

Structure and Function *Students will relate physical adaptations in seals to survival needs and reproductive success.*

Stability and change *Students will analyze historical data to draw conclusions about the shifts and changes in Long Island Sound.*

Disciplinary Core Ideas

MS-LS1.B Growth and Development of Organisms Animals engage in characteristic behaviors that increase the odds of reproduction. *Students will recognize adaptations for reproductive advantage.*