PROJECT OCEANOLOGY

Nearshore Fish Study Elementary NGSS Alignments

Overview

Fish use estuaries for breeding and as safe nursery areas. Small nearshore fish are also an important part of the diet for larger fish important to shallow subtidal ecosystems as well as to recreational anglers and commercial fishers. In this 2.5 hour program, students will use seine nets to collect nearshore organisms. They will study diversity, abundance, and population size structure of nearshore organisms from one or more locations. They will also collect data on shoreline water chemistry at each seining location, and discuss how variation in water chemistry might affect fish populations.

Performance Expectations

3-LS2-1 Construct an argument that some animals form groups that help members survive.
   Students will sort anatomy cards (body, shape, size, tail) by different similarities and differences that contribute to survival

3-LS4-2 Use evidence to construct an explanation for how the variations in characteristics among individuals of the same species may provide advantages in surviving, finding mates, and reproducing.
   Students will observe and discuss similarities and differences in nearshore communities that promote success in survival.

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 identify variations in body shape, size and tail shape/size.

Science and Engineering Practices

Planning and Carrying Out Investigations
Students will discuss how to use a seine net and propose hypotheses on what animals will be observed. Students will then each be given the opportunity to seine to explore nearshore marine communities

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Engaging in Argument from Evidence
Students will discuss different traits observed in their collected samples and identify species based on evidence (classification using dichotomous key).

Analyzing and Interpreting Data
Students will gather data on populations and site chemistry and discuss what each means for the ecosystem.

Obtaining, Evaluating, and Communicating Information
Students will obtain their data and discuss their findings and connect what these findings mean to nearshore ecosystems.

Crosscutting Concepts

Cause and Effect
Students will compare the collected site water chemistry and fish data to discuss the cause and effect relationships water chemistry has on nearshore communities.

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 examine their samples from the seine net and explore different structures of nearshore species and discuss how these traits contribute.

LS2.D: Social Interactions and Group Behaviors. Being part of a group helps animals obtain food, defend themselves, and cope with changes. Groups may serve different functions and vary dramatically in size.
   Students will observe different sizes within their data collection, and discuss how this contributes to social interactions and behaviors.

LS2.B: Variation of Traits. Different organisms vary in how they look and function because they have different inherited information.
   Students will compare and contrast inherited traits among different species within nearshore communities.

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LS4.B: Natural Selection. Sometimes the differences in characteristics between individuals of the same species provide advantages in surviving, finding mates, and reproducing.
  Students will make connections between species size and success in the immediate environment and food web.

Nature of Science

Scientific knowledge assumes an order and consistency in natural systems
Students will explore first hand the order and consistency of a natural nearshore fish community, investigating population abundance, species richness, size distributions, and interactions key to survival.