



PROJECT OCEANOLOGY



Rocky Intertidal Shore Exploration

Overview

The rocky intertidal shore is a complex community where living organisms face unique challenges for survival. These challenges are driven by tidal movement, pounding waves and variations in both salinity and temperature. Living organisms exist in four different zones within the rocky intertidal, each defined by the average amount of air and water exposure of the rocks in that area. In this lesson, students replicate a diagram of the rocky intertidal's vertical zonation using knowledge about the features of this ecosystem. Students are challenged to identify the different zones within the rocky intertidal and its inhabitants. Students will explore the rocky intertidal shore outside to collect animals and algae and observe the obstacles faced by marine life in this environment. Students will investigate which organisms live on our rocky shore and observe how they've adapted to the conditions of the zone that they live in.

Alignment with NGSS

Performance Expectations (High School)

HS-LS4-4 Biological Evolution: Unity and Diversity: Construct an explanation based on evidence for how natural selection leads to adaptation of populations. *Students examine how animals have adapted to survive in certain zones of the rocky intertidal due to different limiting factors.*

Science and Engineering Practices

Asking Questions/Defining problems: *Students will observe and define the challenges of the rocky intertidal's living conditions and observe live organisms to identify possible adaptations.*

Developing and using models: *Students will create their own rocky intertidal shore diagram based on their knowledge of each zone's characteristics and utilize their knowledge to determine which organisms live in each zone.*

Construct Explanations and Design Solutions: *Students will generate explanations for the animal adaptations they observed during their investigations of rocky shore organisms and support their observations with evidence from their knowledge of the rocky intertidal's features.*

Analyzing and interpreting data: *Students will use their findings and observations of organisms in our rocky shore habitat to determine local inhabitants of each zone.*



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Crosscutting Concepts

Cause and effect: mechanism and explanation

Students will investigate how tidal movement impacts salinity, temperature, light, and desiccation and in turn, how these factors affect which organisms live in this environment.

Energy and Matter

Students will discuss the living and nonliving parts of this ecosystem and the interactions between organisms who compete for food and space in this narrow, harsh, rocky habitat.

Stability and change

Students will explore how changes in temperatures and salinity occur in tide pools as part of natural processes such as tidal movement.

Disciplinary Core Ideas

HS-LS4.C: Adaptation. Natural selection leads to adaptation, that is, to a population dominated by organisms that are anatomically, behaviorally and physiologically well suited to survive and reproduce in a specific environment. That is, the differential survival and reproduction of organisms in a population that have an advantageous heritable trait leads to an increase in the proportion of individuals in future generations that have the trait and to a decrease in the proportion of individuals that do not.

Students will use what they know about the rocky intertidal's characteristics to observe and identify advantageous animal adaptations in this environment.