



# 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 the rocky shore and observe how they've adapted to the conditions of the zone that they live in.

### Alignment with NGSS (Middle School)

#### Performance Expectations

**MS-LS2-3** Develop a model to describe the cycling of matter and flow of energy among living and nonliving parts of an ecosystem. *Students will investigate the flow of energy in rocky intertidal shore zones and differentiate the characteristics and boundaries of each zone.*

#### Science and Engineering Practices

**Developing and Using Models:** Develop a model to describe a phenomena. *Students will describe the influence of abiotic factors on biotic factors. Students will explain the species distributions across the rocky intertidal zones.*

#### Crosscutting Concepts

**Energy and Matter:** The transfer of energy can be tracked as energy flows through a natural system. *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.*

**Scientific Knowledge Assumes and Order and Consistency in Natural Systems:** Science assumes that objects and events in natural systems occur in consistent patterns that are understandable through measurement and observation. *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. Students will determine adaptations and form/function of organisms inhabiting each zone.*



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## Disciplinary Core Ideas

**MS-LS2.B: Cycle of Matter and Energy Transfer in Ecosystems.** Food webs are models that demonstrate how matter and energy is transferred between producers, consumers and decomposers as the three groups interact within an ecosystem. Transfers of matter into and out of the physical environment occur at every level. Decomposers recycle nutrients from dead plant or animal matter back to the soil in terrestrial environments or to the water in aquatic environments. The atoms that make up the organisms in an ecosystem are cycled repeatedly between the living and nonliving parts of the ecosystem. *This lesson focuses on the influence of the rocky intertidal's various sub-zones on interactions between organisms and the transfer of energy. Students will learn about resource and space competition. Students will also study species distribution, migration patterns, and invasive species.*