



P.O. Box 787  
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## Adaptation Station: Mangrove Invertebrates

*Instructors will anchor in Florida Bay to show off our beautiful mangroves. Students will better understand adaptation by observing live organisms that inhabit the mangrove habitat, identifying structures and behaviors of these organisms, and explaining possible benefits of these observations in terms of survival. Plenty of time will be provided for Q + A with mangrove “critters” such as sea stars, flatworms and sea slugs.*

**Grade Level:** 4-12

**Timing:** 45-60 minutes

**Materials:**

worksheet (or a blank piece of paper) and a pencil

### STANDARDS SUPPORTED

**Next Generation Science Standards:**

Featured Science Practice → constructing explanations

Featured Cross Cutting Concept → structure and function

Disciplinary Core Ideas → LS1.A. Structure and Function, LS2.A. Interdependent Relationships in Ecosystems, LS4.B-C Natural Selection and Adaptation

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

MS-LS4-4. Construct an explanation based on evidence that describes how genetic variations of traits in a population increase some individuals' probability of surviving and reproducing in a specific environment

MS-LS1-5. Construct a scientific explanation based on evidence for how environmental and genetic factors influence the growth of organisms.

HS-LS4-4. Construct an explanation based on evidence for how natural selection leads to adaptation of populations.



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**Next Generation Sunshine State Standards:**

SC.4.L.16.3 Recognize that animal behaviors may be shaped by heredity and learning.

SC.4.N.1.7 Recognize and explain that scientists base their explanations on evidence.

SC.5.L.15.1 Describe how, when the environment changes, differences between individuals allow some plants and animals to survive and reproduce while others die or move to new locations.

SC.5.L.17.1 Compare and contrast adaptations displayed by animals and plants that enable them to survive in different environments such as life cycles variations, animal behaviors and physical characteristics.

SC.5.N.2.1 Recognize and explain that science is grounded in empirical observations that are testable; explanation must always be linked with evidence

SC.7.L.15.3 Explore the scientific theory of evolution by relating how the inability of a species to adapt within a changing environment may contribute to the extinction of that species.

SC.8.N.1.6 Understand that scientific investigations involve the collection of relevant empirical evidence, the use of logical reasoning, and the application of imagination in devising hypotheses, predictions, explanations and models to make sense of the collected evidence.

SC.912.L.15.1

Explain how the scientific theory of evolution is supported by the fossil record, comparative anatomy, comparative embryology, biogeography, molecular biology, and observed evolutionary change.

SC.912.L.17.2

Explain the general distribution of life in aquatic systems as a function of chemistry, geography, light, depth, salinity, and temperature.

SC.912.L.17.3

Discuss how various oceanic and freshwater processes, such as currents, tides, and waves, affect the abundance of aquatic organisms.

SC.912.N.1.6



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Describe how scientific inferences are drawn from scientific observations and provide examples from the content being studied.

**Ocean Literacy Principles:**

5d: Ocean biology provides many unique examples of life cycles, adaptations and important relationships among organisms (symbiosis, predator-prey dynamics, and energy transfer) that do not occur on land.