

Mangrove Ecology Program

Grade Level: All

Timing: 3 hours

Summary: The mangrove ecology is a component of our core program and allows the staff to truly use the outdoors as a classroom. Mangrove forests make up the majority of the natural coastal habitat in the Florida Keys. Mangroves provide an important habitat and play a vital role in the ecological functioning of other associated habitats in the keys. Students will learn about mangrove ecology during a discussion on the boat on the way to the mangrove snorkel site. Boat will stop at various locations en route so instructors can point out any animals to identify (birds!), examples of mangrove adaptations, the identifying characteristics of the three species of mangroves and unique habitats created by the mangroves. Students will snorkel and get a hands on lesson with marine invertebrates collected by the instructor.

**** service learning option available ** (all ages; marine debris removal)**

**** advanced option available** (high school or above; sediment core field techniques and analysis lab)**

Program Objectives:

After completion, students will be able to:

- Identify three mangrove species and explain their identifying characteristics
- Explain the role of the mangrove habitat within the FL Keys marine ecosystem
- List five invertebrates found in the mangroves
- List three threats to the mangrove habitat
- List four adaptations that mangroves possess to allow them to live in salt water

Concepts Covered:

- Three species of mangroves in the FL Keys and their identifying characteristics
- Mangrove adaptations
- Bird identification
- Interconnectedness of mangrove habitat within the overall Florida Keys subtropical marine ecosystem
- biogenic and abiogenic limestone making up the Florida Keys
- detritus based food web
- abiotic factors controlling geographical distribution and zonation of mangroves

Vocabulary: detritus, prop root, propagule, pneumatophore, lenticels, tannin, facultative halophyte, adaptation, aerial root, zonation, vivipary, salt exclusion/excretion, exotic species, mutualism

Procedures: The entire program is run from the water. The students will board the boat for a mangrove ecology lesson, using adjacent trees as examples. Students will snorkel to view prop root community. The program includes collection, identification and discussion of representative organisms from mangrove root habitat.

Extensions: if interested mangrove restoration, talk to the staff! We have a long term restoration effort adjacent to MarineLab's campus we would be happy to discuss. <https://www.cbd.int/doc/case-studies/ttcc/ttcc-00159-en.pdf>; Florida Bay Survey citizen science program

Resources: <http://floridakeys.noaa.gov/plants/mangroves.html>, <http://mangroveactionproject.org/>, <https://marinelabresearch.wordpress.com/2012/10/15/mangrove-restoration-update/>



© MarineLab Environmental Education
A Marine Resources Development Foundation Program
PO Box 787 Key Largo, FL 33037
(800) 741-1139 Fax (305) 451-3909
www.marinelab.org
Last Updated: 8/26/2019

Standards:

Next Generation Sunshine State Standards

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.L.14.2: Compare and contrast the function of organs and other physical structures of plants and animals, including humans, for example: some animals have skeletons for support -- some with internal skeletons others with exoskeletons - while some plants have stems for support.

SC.6.L.15.1: Analyze and describe how and why organisms are classified according to shared characteristics with emphasis on the Linnaean system combined with the concept of Domains.

SC.7.L.17.2: Compare and contrast the relationships among organisms such as mutualism, predation, parasitism, competition, and commensalism.

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.17.4: Describe changes in ecosystems resulting from seasonal variations, climate change and succession.

SC.912.L.17.6: Compare and contrast the relationships among organisms, including predation, parasitism, competition, commensalism, and mutualism.

Ocean Literacy Principles

Principle 2. The ocean and life in the ocean shape the features of Earth.

a. Many earth materials and geochemical cycles originate in the ocean. Many of the sedimentary rocks now exposed on land were formed in the ocean. Ocean life laid down the vast volume of siliceous and carbonate rocks.

Principle 5. The ocean supports a great diversity of life and ecosystems.

d. 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.

i. Estuaries provide important and productive nursery areas for many marine and aquatic species.

Principle 6. The ocean and humans are inextricably interconnected.

d. Humans affect the ocean in a variety of ways. Laws, regulations and resource management affect what is taken out and put into the ocean. Human development and activity leads to pollution (point source, non-point source, and noise pollution), changes to ocean chemistry (ocean acidification) and physical modifications (changes to beaches, shores and rivers). In addition, humans have removed most of the large vertebrates from the ocean.

