

# Reef Restoration with Citizen Science

**Grade Level:** High School or Above, snorkelers and/or divers

**Timing:** Class discussion is 1 hour. Field trip is 3 hours for snorkelers, 4 hours for divers

**Summary:** The citizen science reef restoration program provides students the opportunity to directly participate in local reef restoration efforts. Students spend an hour in the classroom discussing the need for reef restoration and various restoration efforts, including efforts MarineLab instructors assist with in waters of Key Largo. Before leaving the dock, MarineLab instructor will teach the students how to identify outplanted coral and record the necessary data. Students will be taken to one of the Coral Restoration Foundation's coral nurseries for the first site (snorkelers will observe; divers will "clean" coral trees. The students will then collect data on corals that have been outplanted by the Coral Restoration Foundation at a second site. Once back at the dock, data will be submitted via CRF's app.

## Program Objectives:

Students will be able to:

- Name 3 reasons why reef restoration is necessary
- Explain three reef restoration techniques
- Explain two specific restoration techniques used in the Florida Keys
- Provide the Coral Restoration Foundation with scientific data the student collected

## Concepts Covered:

- Human vs. natural influences on the reef
- boat grounding damage
- Ecological Restoration: passive vs. active
- Physical vs. biological restoration efforts
- Pros and cons of reef restoration techniques used locally and worldwide
- MarineLab's role in local reef restoration efforts
- Coral Restoration Foundation
- Coral outplanting procedures

**Vocabulary:** prop wash, ecological restoration, active restoration, passive restoration, physical restoration, biological restoration, fragmentation, biorock, ecoreef, reefball, coral nursery, outplanting, corals of opportunity, coral skinning

**Procedures:** Students will discuss concepts and vocabulary listed above with an instructor in the classroom. At the dock, instructor will explain the data students will be collecting (and how to "clean" coral trees if students are divers). The first site will be to CRF's Elbow nursery and the second to a restoration site to collect data on outplanted corals.

**Resources:** [www.coralrestoration.org](http://www.coralrestoration.org), <http://www.reefball.org/>, <https://www.ecoreefs.com/>, <https://mote.org/research/program/coral-reef-restoration>, <http://sanctuaries.noaa.gov/science/conservation/wellwood2.html>



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# Standards Addressed:

## *Next Generation Sunshine State Standards*

SC.912.L.17.8: Recognize the consequences of the losses of biodiversity due to catastrophic events, climate changes, human activity, and the introduction of invasive, non-native species.

SC.912.L.17.18: Describe how human population size and resource use relate to environmental quality.

## *Ocean Literacy Principles*

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.

g. Everyone is responsible for caring for the ocean. The ocean sustains life on Earth and humans must live in ways that sustain the ocean. Individual and collective actions are needed to effectively manage ocean resources for all.



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