MarineLab
Marine Resources Development Foundation
Marine Science education in the Florida Keys

Core Curriculum

MarineLab's marine ecology core curriculum is focused on the interconnection of the primary habitats found in the waters of the Florida Keys. The core curriculum was developed for grades 5-12; we have advanced versions of each core program for groups who are visiting with us with previous knowledge of the content covered.

Seagrass Ecology

There is lots of life to see in a seagrass bed but correct snorkeling techniques and knowing what to look for are key to snorkeling this habitat. We purposely incorporate a classroom discussion before taking the students snorkeling so that they can fully enjoy and appreciate our unique seagrass beds; we discuss identification of plants and associated animals, ecological importance of the habitat, along with threats. During the snorkel, a MarineLab instructor will be in the water to assist snorkelers, point out underwater life and collect seagrass and algae samples for students to see once back on the boat.

Advanced Option: The seagrass survey program was created to give students experience with in-water data collection. Survey protocols and techniques will be discussed in the classroom before students practice on land. Once confident, we will go to the survey site where students will have time to conduct a survey and enjoy a seagrass snorkel. Student data will be analyzed and discussed before being entered into MarineLab's database.

Mangrove Ecology

The mangrove ecology program allows the staff to truly use the outdoors as a classroom. The ecology of this habitat will be discussed on the boat on the way to a snorkel site. We 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. With an understanding of how to properly snorkel in the shallow FL Bay waters and of what animals to be looking for, students will join a MarineLab instructor to snorkel amongst the mangrove roots. The instructor will collect a sample of representative animals that he/she will bring back to the boat for observation and discussion.

Advanced Option: Sediment Analysis Lab. During the mangrove program, students will collect and analyze a sediment core from two different mangrove zones.

Coral Reef Ecology

Students discuss coral reef ecology with a MarineLab instructor before boarding the boats to snorkel the coral reefs off of Key Largo. While always dependent on conditions, we generally snorkel two sites. MarineLab staff will be in the water and on the boat to lifeguard, point out marine life, and discuss observations.

Advanced Option 1: Coral Bleaching and Disease Monitoring. While in the classroom, protocols for observing coral bleaching and disease will be reviewed and practiced. Students will discuss data once on the boat and data will be entered into an online database used by scientists at Mote Marine Lab.

Advanced Option 2: Coral Reef Ecology II: A Closer Look. This program was created for students that have already participated in MarineLab's coral reef ecology program; the concepts build on the ideas introduced during our core coral reef ecology program. Through incorporating recent coral reef research, the program includes a more complex approach to observing the coral reef habitat. After a classroom discussion, students have the opportunity to snorkel two different coral reef sites with a checklist of specific organisms, behaviors, symbioses and environmental impacts to look for.

Fish Identification

Students will learn the best field marks to use to identify a fish, behavioral characteristics of fish families, and how to identify fish species that we commonly see on Key Largo's reefs. The students are then taken out into the water to put what they learned into practice!

Advanced Option 1: Parrotfish feeding survey. For this program, students will be taught the proper protocols for data collection for the study they will be participating in and the reasoning behind the study. The students are then taken out to a reef to put what they learned into practice! During the snorkel, each pair of students will spend 6 minutes recording parrotfish feeding data.

Advanced Option 2: REEF fish surveys. During this program, students will learn the "roving diver" technique employed by REEF survey volunteers. Once in the water, the students will be equipped with underwater slates and REEF fish survey sheets in order to record all fish they can identify and count. Students can take his/her data sheet home, register at reef.org and enter his/her data.

Zooplankton Lab

Students will be introduced to plankton, with a focus on zooplankton, and the overall role of plankton in the ecosystem. A MarineLab instructor will lead a discussion discussing concepts below while another tows for plankton in Largo Sound. Bioluminescence is showed off and discussed, samples are filtered and slides are made. Students work in pairs with stereoscopes to ID zooplankton in their slide. Select slides will then be projected for all to see and discussed to confirm identifications.

Advanced Option: Phytoplankton Monitoring/HAB Lab. The hands on portion of the lab will be preceded by a powerpoint presentation where students will learn about plankton, the importance of phytoplankton in the marine ecosystem, sources and impacts of HABs and how to identify phytoplankton. Students will then participate in data collection for NOAA's Phytoplankon Monitoring Network by filtering and analyzing water samples collected from water adjacent to Key Largo.

Invertebrate Diversity Lab

Students will briefly be introduced to the concept of diversity and how stable diversity is generally indicative of a stable, healthy habitat before getting their hands wet. Students will explore live rock collected from Largo Sound, identifying each invertebrate they find. The lab concludes by staff projecting a sample of every species found for all to see and discuss.

Advanced Option: Diversity Indexing Lab. This two hour long lab begins with a discussion relating biodiversity to ecosystem health and stability. Students work in pairs to count and identify every invertebrate he/she can find on a live rock freshly collected from Largo Sound. Each pair calculates a diversity index for their rock. Discussion continues regarding application to true scientific studies and the need for increased sample size. Students use raw data from all rocks in the lab to calculate an "overall" diversity index and numbers are compared and discussed. The lab concludes with a discussion regarding the validity of the study overall. What are the "pros" and cons of utilizing a mathematical measurement of biodiversity? What is the study lacking?