



INTRO TO INVERTEBRATES

If you're looking for a field experience that does not include a boat trip or snorkeling, we have the program for you! Our marine science instructors will guide your students in learning marine invertebrates without ever leaving land. MarineLab's coastal campus and mangrove lagoon provide ready access to learn about abundance and diversity in our environment.

COST: \$53 per student, minimum of 9 students. One chaperone per 9 students is required; there is no charge for chaperones up to 2 adults per 9 students. **FUNDING AVAILABLE FOR TITLE I SCHOOLS.**

TIME	ACTIVITY
8:30 AM	Arrive, orientation
9 AM – 10 AM	LAB: Water Quality Abiotic water parameters determine the health and the community of any fresh or saltwater system. Primary water quality parameters will be discussed as well as the best tools and methods to measure each parameter. Students will have hands on opportunity to use all of the tools in preparation for water quality field collection and analysis.
10:15 AM – 11:15 AM	DISCOVERY: Invertebrate Diversity 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.
11:15 – 11:45 AM	Bag lunch from home
12:00 – 1:00 PM	Plankton Races! Students will be given a brief introduction to phytoplankton and the need for morphologic adaptations. They will use the concepts of surface area, density, mass and volume in order to determine the shape that allows a phytoplankton to sink as slowly as possible. After creating, testing, and modifying a model plankton, the students will race their models to see which sinks the slowest.
1:15 – 2:15 PM	DISCOVERY: Invertebrate Behavior Marine invertebrates exhibit a variety of behavioral and morphological adaptations which allow them to survive in various habitats within the marine environment. Students will observe some of these adaptations firsthand while conducting short experiments with macroinvertebrates collected from the mangroves. Students will conduct experiments and will share observations with peers. The observations are meant to allow students to draw conclusions regarding the invertebrates' in situ behavior but also make the students begin to ask questions. The importance of observation in the scientific method is emphasized.
2:30 PM	Depart

MarineLab One Day Programs – Intro to Invertebrates Continued

Next Generation Sunshine State Standards Addressed

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.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.1.1 Define a problem, use appropriate reference materials to support scientific understanding, plan and carry out scientific investigations of various types such as: systematic observations, experiments requiring the identification of variables, collecting and organizing data, interpreting data in charts, tables, and graphics, analyze information, make predictions, and defend conclusions.

SC.5.N.1.3: Recognize and explain the need for repeated experimental trials.

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.5.P.8.1: Compare and contrast the basic properties of solids, liquids, and gases, such as mass, volume, color, texture, and temperature

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.6.P.12.1: Measure and graph distance versus time for an object moving at a constant speed. Interpret this relationship.

SC.6.N.1.2: Explain why scientific investigations should be replicable.

SC.6.N.1.4: Discuss, compare, and negotiate methods used, results obtained, and explanations among groups of students conducting the same investigation

SC.6.N.1.5: Recognize that science involves creativity, not just in designing experiments, but also in creating explanations that fit evidence.

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

SC.7.N.1.1: Define a problem from the seventh grade curriculum, use appropriate reference materials to support scientific understanding, plan and carry out scientific investigation of various types, such as systematic observations or experiments, identify variables, collect and organize data, interpret data in charts, tables, and graphics, analyze information, make predictions, and defend conclusions.

MarineLab One Day Programs – Intro to Invertebrates Continued

SC.7.N.1.2: Differentiate replication (by others) from repetition (multiple trials).

SC.8.N.1.1: Define a problem from the eighth grade curriculum using appropriate reference materials to support scientific understanding, plan and carry out scientific investigations of various types, such as systematic observations or experiments, identify variables, collect and organize data, interpret data in charts, tables, and graphics, analyze information, make predictions, and defend conclusions.

SC.8.N.1.2: Design and conduct a study using repeated trials and replication.

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.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.17.5: Analyze how population size is determined by births, deaths, immigration, emigration, and limiting factors (biotic and abiotic) that determine carrying capacity.

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

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.

SC.912.N.1.1: Define a problem based on a specific body of knowledge, for example: biology, chemistry, physics, and earth/space science,

SC.912.N.1.6: Describe how scientific inferences are drawn from scientific observations and provide examples from the content being studied.

SC.912.N.1.7: Recognize the role of creativity in constructing scientific questions, methods and explanations.