

Diversity Indexing Lab

Grade Level: High School or Above (correlates with APES standards)

Summary: Biodiversity can be calculated using Simpson's Diversity Index to give a measurement of the overall health of an ecosystem. This lab is an extension of our basic invertebrate diversity lab. The diversity indexing lab takes our "rock shake" lab a step further by having the students not only identify and count invertebrates on live rock to determine health of Largo Sound, but to also calculate a diversity index. The purpose of diversity indexing is discussed and data is submitted into MarineLab's in house database.

Program Objectives:

- Students will practice using the common characteristics of the common marine phyla to identify specific species of invertebrates
- Students will understand the association of a healthy, diverse community and a healthy, stable environment
- Students will understand the scientific purpose of using a diversity index
- Students will participate in an ongoing study
- Students will calculate biodiversity using Simpson's Diversity Index with an understanding of what the number represents

Concepts:

- Environmental impact studies
- Biodiversity and its indication on the health of an ecosystem
- Use of mathematical measures of diversity; strengths and weaknesses
- Applicability of biodiversity measurements to "real life" science
- Importance of sample size
- Characteristics of common marine phyla and identification of frequently seen marine invertebrates
- Strengths and weaknesses of diversity indices
- Students will understand the idea that biodiversity can be an indication of overall health of an ecosystem

Vocabulary: invertebrate, diversity, abundance, diversity index, biodiversity, species richness, species evenness, Simpson's Diversity Index, Ecosystem Health, sample size, random sampling, indicator species

Procedures: The 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. Each pair calculates a diversity index for their rock. Discussion continues regarding application to science in the field 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" of the particular study? What is the study lacking?



Extensions: Often, students that participate in the Diversity Indexing Lab, follow up with a Rodriguez Key field trip. The field trip provides a second opportunity for students to calculate a diversity index. Numbers can be compared and discussed.

Resources: Long term data that students have collected during this particular lab are accessible to teachers before or after field trip to MarineLab for use in the classroom



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