

## Coral Reefs in the Classroom: 5E Lesson Plan #2- Density/Salinity Pre-Setup Lab

Date: July 23, 2014

Subject / grade level: Seventh Grade STEM, Seventh Grade Science, Eighth Grade Physical Science, Math 7-8

Materials: iPads, laptops, desktops, computer/internet access, Media Center, books and periodicals related to coral reef study, [www.aquarius.fiu.edu](http://www.aquarius.fiu.edu), <http://www.seafloorexplorer.org>, , [www.ocearch.org](http://www.ocearch.org), [www.seaturtle.org](http://www.seaturtle.org), [www.teens4oceans.org](http://www.teens4oceans.org),

### Standards:

Life: S7L4.e. Describe the characteristics of Earth's major terrestrial biomes (i.e. Tropical rain forest, savannah, temperate, desert, taiga, tundra, and mountain) and aquatic communities (i.e. Freshwater, estuaries, and marine).

### ENGR-STEM4 -

- (a) Work cooperatively in multi-disciplinary teams.
- (b) Apply knowledge of mathematics, science, and engineering design.
- (c) Demonstrate strategies for identifying, formulating, and solving technological problems.
- (d) Demonstrate techniques, skills, and knowledge necessary to use and maintain technological products and systems.

ENGR-STEM7 – Students will develop leadership and interpersonal problem-solving skills through participation in co-curricular activities associated with the Technology Student Association.

- (a) Demonstrate effective communication skills.
- (b) Participate in teamwork to accomplish specified organizational goals.
- (c) Demonstrate cooperation and understanding with persons who are ethnically and culturally diverse

### Physical Science:

SCSh8. Students will understand important features of the process of scientific inquiry

S8CS4. Students will use tools and instruments for observing, measuring, and manipulating equipment and materials in scientific activities utilizing safe laboratory procedures.

- a. Use appropriate technology to store and retrieve scientific information in topical, alphabetical, numerical, and keyword files, and create simple files.

Lesson objective(s): Students are to gain a comprehensive understanding of the coral reef ecosystem, the biomes it exists within, and the life that exists there from micro to macro. Focus on oceanography and introduction to Coral Reef Tank Project.

### Differentiation strategies to meet diverse learner needs:

- Research Rubric
- Posted prior completed assignments for student examples
- Copies of power point for students needing this assistance
- Microscope availability to provide student understanding of microscopic/macrosopic differences

## ENGAGEMENT

- Students are asked to view the two saltwater tanks in the room for two minutes. After the timer sounds, students return to their seats and are asked to list each item they saw within the tank and to define the item as being biotic or abiotic.
- Students create a side by side drawing of what they see in the classroom tank and how this scene would look in a natural ecosystem in the sea.
- Students should ask the following questions: Why do we need these animals? What does their survival have to do with human survival? How does human impact effect these creatures and their environments?

## EXPLORATION

- Students will use discuss the tanks and animals in the tanks?
- Students will go through a process of defining the tank and its various biotic and abiotic contributors.
- Students will create diagrams of the tank ecosystem and a diagram of what they speculate the ecosystem will look like in nature.
- Students will research the different life in the tank and report in detail to the class on their results.

### Big Idea Questions:

- What is an ecosystem?
- What are biotic and biotic factors?
- What are the levels for organization of living organisms in saltwater systems?
- Why are Coral Reefs important to the Marine Biome?
- What is the value of having a classroom coral reef?

## EXPLANATION

- Students will create a concept map of the following terms: Ecosystem, Biome, Habitat, Population, Community, Individual, Biosphere, Biotic, Abiotic, Human Impact. The concept will be made using one of the following websites: Popplet, bubbles, Google docs
- Students will journal within a nature journal daily discoveries or assignments. The journal will be a collection of drawings, writings, and discoveries made throughout the school year.
- Students will be assessed on all content areas covered in alignment with the standards.

List higher order thinking questions which teachers will use to solicit *student* explanations and help them to justify their explanations.

- Explain differences in the ecosystems of Earths oceans.
- Why is it important for humans to be aware of the reefs and all of the individual organisms living there.
- How does the salinity in our tanks matter to the animals?
- Classify organisms from Domain to Species.

## ELABORATION

- By using a comparative approach to the in-class tanks and the natural environment of these organisms, students will gain an enduring understanding of the importance of understanding the world's oceans.
- Students will be able to relate organisms in a more profound manner as they are able to actually touch, feed, and care for the animals in the classroom. This will allow them to better relate to the animals as they study them through their research projects.
- The vocabulary will be introduced through different activities depending on the level of the learner. The vocabulary will be used in the lesson and definitions and examples will be brought forward by the students during work sessions. Students will create a mind map or concept map explaining and providing examples of all vocabulary in the lesson.

- How is the knowledge applied in our daily lives? Students will use the tank set-up to gain an enduring understanding of the biotic and abiotic factors in an ecosystem.
- How is the knowledge applied in our daily lives? Students will be required to compare and contrast the numbers of animals in four different locations around the world through a sampling. They will then devise a debate to present the most reasons for these differences in population numbers.

#### **EVALUATION**

- How will students demonstrate that they have achieved the lesson objective?
  1. Nature Journal Entries
  2. Completed concept maps on vocabulary
  3. Power Point for Coral Reef Tank Creatures Project
  4. Completed lab activities, including observe, list, and diagram and sampling activity of ocean ecosystem coral reef populations.
- This should be embedded throughout the lesson as well as at the end of the lesson