

CCE LTER- Limiting Nutrients and Phytoplankton Growth- Days #3-8

Teacher: <i>Mrs. Jennifer Ogo: Kearny High School SCT</i>
Date: <i>January 2013</i>
Previous Lesson: Marine Food Web/Trophic Levels
Title: Limiting Nutrients and Phytoplankton Growth
Subject / grade level: <i>Marine Science, Marine Biology, Biology or AP Environmental Science- High School</i>
Materials: Spectrophotometer, compound microscopes, grided microscope slides, stock phytoplankton solution, stock nitrate, phosphate and iron solutions, erlenmeyer flasks, grow lights/sunlight
Lesson objective(s): Students will design an experiment to test the effect of nutrients on phytoplankton growth. They will determine which nutrients will help phytoplankton grow faster versus phytoplankton with no added nutrients.
Differentiation strategies to meet diverse learner needs: Students will be conducting the experiment in either partners or small groups. They will work together to design the experience and determine which variables they will manipulate.
ENGAGEMENT: What kind of questions should the students ask themselves after the engagement?: Students will learn about iron fertilization of the ocean and some active research on the topic. This could be either through a <i>guest speaker, teacher presentation or science article</i> on the topic of Iron Fertilization. See website: http://www.whoi.edu/oceanus/viewArticle.do?id=34167
EXPLORATION Describe what hands-on/minds-on activities students will be doing: List “big idea” conceptual questions the teacher will use to encourage and/or focus students’ exploration: The big ideas of this lesson is experimentation and nutrient cycling.
EXPLANATION Student explanations should precede introduction of terms or explanations by the teacher. What questions or techniques will the teacher use to help students connect their exploration to the concept under examination? Teacher can tie in students’ prior knowledge of nutrient needs of organisms. Students can brainstorm what nutrients plants may need and why. They can relate this to phytoplankton growth in the ocean.
ELABORATION Describe how students will develop a more sophisticated understanding of the concept: Students will analyze the results of the experiment and share out the results. In addition, students will discuss how they can improve the experiment if they were to repeat it.
EVALUATION How will students demonstrate that they have achieved the lesson objective?: Students will be expected to do a formal laboratory report.