

Bench to Bedside Action Research Proposal

Title: The impacts of biotechnology lessons taught during the chemistry unit of ninth grade Physical science class on students' knowledge and attitude/interest in biological sciences.

Abstract: This action research will present the findings of the impact of biotechnology lessons taught during the chemistry unit of ninth grade Physical science class on students' knowledge and attitude/interest in biological sciences. Biotechnology activities from the 3-D Molecules water curriculum will be utilized to address the properties of water standard. The students will be given a pre/post-test to assess knowledge and pre/post survey to assess attitude/interest in the biological sciences. The teacher will keep a journal of the unit activities and observations made during the biotechnology unit.

Rationale: I am currently assigned to teach Physical Science and Biology I on-level. FCAT level 1 and 2 readers are usually assigned physical science during their ninth grade year as a preparation course for Biology I on-level during their tenth grade year. Beginning in the fall of 2012 all entering ninth graders will be required to pass the Biology I end-of the-course exam to receive their high school diploma. To help prepare lower performing students for the biology end-of-course exam, they should be introduced to as many of the biological concepts that will be measured on the test early in their high school career. By incorporating biotechnology rich lessons to the entire chemical, physics, and biological content areas of a physical science course, ninth grade students will be better prepared for the biology principals covered on the end-of-course exam during their tenth grade year. The purpose of this study is to describe the impacts of biotechnology lessons taught during the chemistry unit of ninth grade Physical science class on students' knowledge and attitude/interest in biological sciences. *References will be added.*

Action Research Intervention: Having compared the Florida Sunshine State Standards of Physical Science, Chemistry, and Biology, I have chosen to focus on the SC.912.L.18.12 standard that emphasizes the properties of water. This standard is covered in all three classes. As I cover this standard in the Physical Science courses, I will add the biotechnology activity from the Water Kit curriculum. My students will be given a pre-survey to assess their current confidence and attitude towards biological sciences like Biology and a content pretest to assess their current understandings of water and its physical and biological properties. At the end of the biotechnology enhanced water chemistry lesson, students will be given a post survey and post content test to measure any differences in attitude and knowledge. As the multi-day lessons are being reviewed with the students, I will keep a daily journal. In my journal entries I will note student comments and participation during the activities.

Connections to Bench to Bedside summer Institute: I will use the 3-D Molecular Designs Water Kit equipment locker from the UF CPET program. I will also emphasize how structure and function as related throughout the sciences by including the notion that current biotechnology research is focused on studying the structure of molecules to predict the function or vice versa. For example, the function

of the biological marker protein, GFP, was discovered first, then scientist began investigating the structure to be used in a variety of biomedical techniques.

Literature Cited: Reference list to be added

Budget and Budget Justification: The following materials will be required for my action research:

- 12 3-D Water Kits- CPET equipment locker
- "Extraordinary Measures" \$20.00

Permisions: No permissions are necessary; however my principal will be informed of my action research procedure and results.

Action Proposal –Group Presentation Chart Chanda Leon-Martin County High School

What?	The impacts of biotechnology lessons taught during the chemistry unit of ninth grade Physical science class on students' knowledge and attitude/interest in biological sciences.
Who?	Ninth grade Physical science class
Why?	Ninth graders will be required to pass the Biology I end-of the-course exam to receive their high school diploma. To help prepare lower performing students for the biology end-of-course exam, they should be introduced to as many of the biological concepts that will be measured on the test early in their high school career. By incorporating biotechnology rich lessons to the entire chemical, physics, and biological content areas of a physical science course, ninth grade students will be better prepared for the biology principals covered on the end-of-course exam during their tenth grade year.
Where?	Martin County High School, Stuart, Florida
	Have a great rest of your summer!!! ☺