**Classroom Implementation Strategy – Amber Lancaster**

*Teaching / Learning Goals (Big Picture Thoughts!)*

* I want students to engage in more investigative experiments that they design. Through that process, I want them to understand the difficulties of doing science and also the joy of discovery.
* I want my students to connect their own lives to large scientific issues, especially climate change and how it will impact their community.
* I want students to be able to realize their ability to create change in their community on important issues.
* I want my students to consider science as a possible career choice through exposure to current scientists.
* I want my students to spend more time being in nature and learning about the natural world.

*Classroom Activities*

**Biology/Environmental Science (2 year cycle)**

* Introduction to Polar Regions
  + Presentation about my cruise in Antarctica
  + Presentation by Dr. Julia Smith in classroom
* Current LARISSA cruise
  + Students will read journals and conduct interviews over the satellite phone with researchers on the vessel
  + Interactive marine sediment core exploration involving what information can be learned from two meters of mud
* Park Exploration
  + Students will keep a detailed journal of their explorations of their space
  + Students will create an action plan to present to community leaders about possible changes to the nearby park
* Climate Change Exploration
  + Students will keep a scientific journal of their explorations and create a poster suggesting their recommendations for stopping climate change

**Marine Biology**

* Several applied research field trips
  + Sand crab monitoring at Ocean Beach (Fall & Spring)
  + Boat trip on the San Francisco Bay to trawl and collect plankton and document physical characteristics of the water
  + Rocky intertidal monitoring in Marin County
* More student-designed experiments
  + Student designed research on planarians
  + Student-designed research on sand crabs at Ocean Beach
* Students meet more actual scientists (specifically of color and/or female)
  + Students presented endangered species research to graduate students
  + Graduate students/professors present talks to students about their research
* Bringing ocean technology into the classroom
  + Students will designing remotely-operated vehicles to explore tidal areas
  + Students will send styrofoam cups with a researcher down in a CTD to explore the concepts of pressure and depth

*Evaluation*

**Biology/Environmental Science (2 year cycle)**

* Introduction to Polar Regions
  + Students will write thank you notes to Dr. Julia Smith explaining one thing they learned from the experience
* Current LARISSA cruise
  + Students will ask creative questions to the LARISSA team and create a lab report detailing their findings from their marine sediment core exploration
* Park Exploration
  + Students will follow a .5 meter quadrat area of space to investigate what changes occur over the course of a year
  + Students will identify stakeholders in the park and possible changes they would want if they were in charge of the park
* Climate Change Exploration
  + Using computer simulations, students will explore the nature of retreating glaciers and potentially watch the movie *Chasing Ice*
  + Using temperature data, students will look at the current scientific understanding of global warming
  + Using computer simulations, students will look at rising sea levels in their community and see which communities will be most effected
  + Students will look at their own carbon footprint but also think about larger interventions that need to occur to stop climate change

**Marine Biology**

* Several applied research field trips
  + Students will participate in field trips and pre- and post- surveys of what they learned from the experience
* More student-designed experiments
  + Student will submit lab reports for their experiments
* Students meet more actual scientists (specifically of color and/or female)
  + Students will write thank you notes to guest speakers highlighting something they learned or appreciated
* Bringing ocean technology into the classroom
  + Students will keep scientific journals throughout the design-build-test series
  + Students will be tested on understandings of pressure, depth and buoyancy