Project Title: Arsenic in the Environment

School: Mount Desert Island High School

Grade Level: 10-12

Teacher: Hannah Mondrach

Project Partners: Sarah Hall (College of the Atlantic), Anna Farrell (MDIBL), Jane Disney (MDIBL)

Teacher Profile:
This was my fifth year at MDI High school, and I taught for two years prior to coming to Maine. In school, I studied Spanish, Italian, and Geosciences, and then went on to get my Master's in Curriculum and Instruction (for science education). I currently teach Chemistry, Science of the Outdoors, and Environmental Science. I am passionate about really engaging with the world around us through hands-on, place-based education! The All About Arsenic project fits well with this, as I believe it brings a greater awareness to students and others about a very real issue in a very tangible way.

Summary:
I started by first introducing the All About Arsenic project to all of my classes - my Chemistry classes both semesters, my Science of the Outdoors class in the fall, and my Environmental Science class in the spring. In the slideshow, I showed them maps of arsenic levels in soil in the United States and where there is higher probability of having arsenic. We watched the video "In Small Doses: Arsenic" in order to get some background on the topic. I also discussed the problem with high arsenic levels in food and water, and gave an explanation of how this topic fit into the context of our courses - for Chemistry, arsenic is one of those strange elements on the Periodic Table, and for Science of the Outdoors and Environmental Science, we talked about how arsenic can be another man-made contaminant of the environment. We went over how to do the water sampling, and students were sent home to test their water. I was impressed with one student who decided to test the water in Southwest Harbor at its source in Long Pond and at the end of the road at the last fire hydrant near Bass Harbor. We did not get our results back by the end of the semester for either semester, but hopefully students will be able to use the information in their results and our class discussions to be more aware of what is in their water! Overall, we submitted 63 samples!

Project Details:

- There were 63 students involved in this project in all of my classes.
- Links that were helpful to us:
    - https://www.dartmouth.edu/~arsenicandyou/index.html
    - https://www.youtube.com/watch?time_continue=1&v=6HVNpoFvRdk&feature=emb_logo
    - http://www.allaboutarsenic.org/
- We:
    - Discussed arsenic as an element that occurs naturally in the environment (based on particular geology) and by human means (such as the old use of arsenic-containing chemicals used on apple trees).
    - Discussed arsenic within the bigger context of pollutants in the environment.
    - Tested our water and tested out a few curiosities (such as the school water and Southwest Harbor's water at the beginning and end of the public water supply system).

Discussion:

- In the future, I might try to use more of a Question, Claim, Evidence model for student data analysis. I would create a Google Slideshow with a number of research questions, and after assigning questions to students (or having them make their own), I wold have them come up with their own Claim for each question, and then provide Evidence for their claim (the student would paste a graph that shows the data that supports their claim). This would make sure they are getting practice with graphing the data, and allow us all to see the data in one place in a way that tangibly answers our questions.
- In the future, I would also try to fit the project into the curriculum at an earlier date each semester to make sure that we get our data back in time to use Tuva and do more data literacy things.

Conclusion:

I am so glad that we got to participate in this project and am excited to try out some new things the next time around! Thank you to all of the people who partnered with us and provided so much support along the way!

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