Project Title:

School: Dover High School, Dover, New Hampshire

Grade Level: 9

Your Name: Don Wason

Project Scientist Partner: Florencia Fahnestock, University of New Hampshire

Teacher Profile: I have taught Earth Science at Dover High School for 37 years. I have a B.S. in Geology from Bates College and an M.S. in Geochemistry from Stony Brook University. I worked on a project several years ago with the University of New Hampshire and the United States Geological Survey analyzing well water samples, that had range of arsenic contents, for iron and manganese to see if there were any geochemical connections. I became interested in the All About Arsenic project because of this previous work and the fact that my own well contains elevated arsenic and I have had to install a filter to mitigate this problem.

Summary: Prior to sampling my students created an arsenic cycle diagram with descriptions of specific processes that move arsenic through the Earth Systems (Atmosphere, Anthrosphere, Biosphere, Cryosphere, Geosphere and Hydrosphere) and a discussion of the health risks of arsenic in the biosphere. Since the majority of Dover residents get their drinking water from the municipal water system, only a few students live in homes with private wells. Most of these houses had filtration systems, so these students collected two water samples, one with filtration and one without filtration. Once the data was received, my classes examined the data and evaluated the effectiveness of the individual filtration systems. Most filtration systems were shown to be effective. We discussed the variety of filtration systems in use and the maintenance each requires to remain effective. The importance of water testing and appropriate mitigation and maintenance was highlighted in the class discussion of the data.

Project Details:
- 128 students were involved in this arsenic project and completed the Arsenic Cycle Project.
- 7 students and 4 faculty provided water samples
- Detail specific curricular items such as questions, articles, books, YouTube videos, and labs. It's helpful if you provide links.
- Students used Tuva to look at arsenic concentrations of specific water samples. These data formed the basis of several class discussions on arsenic filtration methods, effectiveness, and maintenance.

Discussion:
- Students learned about the importance of clean drinking water, the danger of arsenic in drinking water, particularly in New England, and the ways that high levels of arsenic in private well water can be mitigated
- I learned that even though my well water contains moderately high levels of arsenic (9 ppm), my reverse osmosis filtration system is very effective at removing this arsenic.
- One of the water samples provided by a faculty colleague contained high amount of Uranium. He is getting this checked out and is looking for ways to mitigate this.

Conclusion: This was a valuable experience for my students. As is true for most people, my students take safe drinking water for granted. It was eye-opening for them to see the health effects that arsenic in drinking water can cause and how slow regulatory measures are developed and put in place to address this problem. They

were encouraged by the effectiveness (and relative low cost) of filtration mechanisms available. My students and I have only scratched the surface of the possible investigations that could be carried out using the data that is available on our samples and the data base as a whole.