

SCHOOL NAME

Trenton Elementary

Project Title:

Why Arsenic?

School:

Trenton

Grade Level:

7th and 8th

Teacher:

Michelle Bailey Brzezowski

Project Partners: Who did you work with for this project? Name your mentor and their institution and any other partners.

Liz Marnik- MDIBL

Teacher Profile: A brief biography of yourself. How long have you been teaching? What did you study in school? What are you passionate about inside and outside the classroom? Why are you interested in the All About Arsenic project?

I just finished my 3rd year teaching middle school science, and my 2nd year teaching middle math. I studied marine Biology in college. I had been working in that field, and in bio medical sciences at MDI Bio Lab before my teaching adventure started. I am passionate about marine science and environmental education as well as math education. The All about Arsenic project gave me a chance to be involved with the Bio Lab again and use real world project with my students.

Summary: Provide a 500-word summary of your project. Describe the curriculum. How were arsenic monitoring and data literacy integrated into that curriculum? Provide specifics (# samples collected, what the samples were analyzed for, etc).

I introduced the unit by doing some review lessons on ground water and the properties of water introducing vocab words such as solute and solvent. Most of these activities came from the SEPUP Physical Sciences curriculum unit C, Activity 30, 34, 36, and 37. I had planned more but did not have time for them. For my project I wanted the students to create a variety of products that could be shared during our forum. I set up 4 different projects for one of my classes, and the other class all focused on data analysis. We first collected about 33 samples from our students and teachers. While we waited for the samples to be processed we practiced using Tuva by completing some of the activities designed by their staff on the site. We also started on the following projects. I allowed for the students to have some choice on their project by allowing them to submit their preference with a Google form.

Class 1 had 4 separate projects: **1.** Create a PSA on What is arsenic, how it gets in our water and why we care. **2.** Create a PSA on the next steps for how it is removed and resources that are available. **3.** A pitcher filter study to rate commercially available home water pitcher filters. This group tested 4 pitchers, we used an Arsenic test kit from the Bio Lab, and sent samples to a professional lab for verification. **4.** Create a display to summarize the state wide current data and provide answers to FAQ's around this current Arsenic data.

Class 2 had the task of starting data analysis using Tuva of the current data in a CER (claim, evidence, reasoning) format. They created 3 slides each, a claim that answers a reasonable question of the data, the evidence as a Tuva graph that supports the claim, and a written explanation of the reasoning that supports their claim.

The CER's were shared at the forum along with the 4 projects from class 1. We used trifold display boards as visuals, science fair style. Class 1 also creating the same CER slides, but they were not shared during the forum.

While all this was going on I had enlisted the collaboration of our ELA and Social Studies teacher. I collected a list of journal articles and scientific text for the students to read and analyze. The plan was to have each student write a science journal article of their own based on what they learned throughout the project and through these readings. The ELA teacher used this as informational text curriculum and finished the journal article writing after the forum was over.

Project Details:

- Detail specific curricular items such as questions, articles, books, YouTube videos, and labs. It's helpful if you provide links.
 1. Compiled [articles](#) as listed above
 2. Review of ground water video through [youtube and follow up questions](#).
 3. [This study and article](#) gave us awesome graphics for use on giving a summary of statewide arsenic data.
 4. [This document](#) was how we began data analysis using Tuva students could then decide on a question of the data that they could investigate. We discussed what a correlation was and how to recognize it.
 5. [Webquest](#), I found this webquest and thought it would be good sub plan activity or 'early finisher' activity. Some kids worked on it some didn't get to it.

- Did you:

- Collaborate with any other teachers in your school?

I collaborated with my ELA teacher as described above.

Cindy Lambert, our technology integrator and past teacher under this project assisted with the 2 groups creating PSA's. During class, she took those two groups while I worked with the other 2.

- Go on any field trips? Why and where?
- Conduct any experiments? What kinds of questions did students ask?

A group of 3 students conducted tests on 3 commercially available pitcher filters. With my assistance they unpacked, setup and collected water samples from the filters. They bought a faucet filter too but were unable to find a way to attach to the high arsenic (~100ppb) stock water we got from Dr. Disney. We tested the raw and filtered water using a test kit from the lab, and we sent in samples to Northeast Labs in Maine for professional comparison. I contacted them ahead of time for specially pricing. They collected and analyzed the results for percent removal of arsenic and changes in TDS. Just as I expected Zero water came out the highest removal rate.

- Use your stipend to purchase anything for your classroom? If so, what, and how did you use it?

For the pitcher filter test I bought the filters and I got special pricing for the professional testing of 4 samples. I also bought trifold display boards. Of course there was the collection supplies and shipping costs.

- Invite any guests to visit your classroom?

I hosted a filtration company, Air and Water Quality, in the classroom. They sent a representative to talk about how their filtration works and to introduce the students to a different science career. This was meant to be a chance to students to also ask questions about working in plumbing or water filtration. Dr. Disney and Anna also visited my classroom.

- How did you use Tuva, both for the arsenic data and for other datasets?

I really felt it was important for students to be familiar with the program before we looked at the arsenic set. The arsenic dataset was SO big it would have overwhelmed my students. So use the intro activities within Tuva, "Man's Best friend" part I and Part II. I also used some others for other units. I do love Tuva! ☐

- How did you plan your community meeting?

- Where was it?—Trenton school
- What did the students do?

The only group that gave a presentation was the group that conducted the filter pitcher study. The CER slides were printed and put on tri fold boards. The PSA's were shared, one as a opener and one as a closer. The 4th group project created a trifold board with a summary of the current data and project details. It was simply an FAQ of what the project was, who was involved, and the basics of the current data such as average levels of arsenic for the schools involved.

- How many people attended? Most of our students and parents. I think around 15 or 20 students out of 25 came.

- Include any data analyses your students did.

[Class 2 CER Google Slide](#) compilation of all students work, plus my exemplar (first 3 slides).

I will try to get a photo of the trifold display from the pitcher group.

Discussion:

- What did students learn? It's great to include quotes if you have them.

Students expressed that once they understood how to use Tuva they liked it but at first it was overwhelming and not interesting. A few were really interested in what the word correlation meant.

- What did you learn?

Collaboration with ELA for article reading and a final written piece from each student was invaluable but also could have been stronger. The students really could see that healthy safe water was a world wide problem

- What would you do differently?

I had short class periods and planned too much into each day. Students need more work with data analysis of smaller data sets before they can look at the large arsenic data set. I should have spent even more time earlier in the year on data analysis. I really liked taking the CER approach to this data, and should have used that approach for other datasets before. It would have been best to send samples a few weeks sooner. While we worked on analysis of previous data with the CER concept a student said "why do I care it's not our data". I realized it was less authentic before we got our own results. I would not do the Summary of current data group again. They were the only group working in Tuva at the time and I thought they could become experts in it, but I think it made them feel a bit left out since the others were making PSA videos and running tests on filters.

Conclusion: A few sentences to bring everything together.

The CER approach worked very well on data analysis, I will use that again. Our forum was successful and some of student groups felt great success. Still some students were not engaged. Creating a forum for public education on why arsenic is a concern that also focused on data analysis by the students was challenging.

I also created [this video](#) to help my parents and community find their results once they were in.

References: