



Date: 4/7/25

Your Name: Matt Davis

Your School: Windham High School

Grade Level(s): 11-12th

Course(s) Taught: Chemistry & Chemistry/Physics

Number of Students Involved (Total): 45

Name of your scientist partner and their institution, and any other partners: Jane Disney MDIBL

Teacher Profile:

I am a non-traditional teacher who has recently come into the profession after a career change. I am currently in my second year of teaching and this is my first year at my current high school in Windham Maine. My first bachelors degree was in history, and because of a Noyce Scholarship grant, I was able to obtain my second in Biology with a minor in secondary education. I come into the profession with a passion for learning, I am always interested in the newest findings or ideas from different fields of science, and how they fit into the the human story and our understanding of the universe around us. I couldn't think of a better career for a generalist such as myself. As a teacher, I try to bring some of that interest and curiosity into the classroom with my students. All about arsenic provides a great point of interest for the students where they can see the process of science being done, and engage with it in their local communities. This program offers the opportunity for high school students, particularly those who are not already on a future college STEM track, to see why these disciplines are so important, and have a hands on experience with data and doing science.

Abstract:

The project here at Windham has had a late start for its first year. As I transferred into the district, I did not get access to curriculum, room, or policies until close to the start of the year. This presented a challenge, as I was in the process of learning about the school and classes I taught in the first semester. I received approval to offer testing in December and once we were through vacation and finals, the best place to stand up the program as a unit has come in the middle of April. As there was no established curriculum for my Chemistry/Physics classes, I started the process of redoing the yearlong curriculum for fall 2025. In that process I developed an outline for an early fall unit designed around data collection and understanding. This was put onto a work in progress website the students will have access to when we run the unit in the fall. Towards the end of this year though, we have the opportunity to trial some lessons and the unit as a whole. We sent our letters to my Chemistry/Physics students as an opt in opportunity, and five households took us up on the opportunity. All the samples were from private wells, except for one from the classroom chemistry bench sink. They were tested for 20 elements, including alkali, alkaline earth metals, transition metals, post-transition metals, metalloids, and Uranium. As we move into the unit, we will be developing an understanding for data and its importance to scientific study. Tuva will be used as a data visualization tool for the students to build their skills by manipulating practice data, before moving into the Tuva data set for Arsenic in Well Water. This

will be utilized this school year. The design and timing for the unit in the fall will include several bio-assays as well as potential filtration tests (time dependent), which should be a good bridge for the students early in the Junior year, coming from Biology courses previously as Sophomores. As the cohort of students is much less self-directed, the structure of the unit will offer several types of community engagement and communication. In my experience, school boards enjoy hearing about accomplishments and student engagement, so structured meetings with the school board, PTA, and other interfaces with the school and community will be offered. I will also be including methods for reaching out to elected officials to consider bills to help Maine communities deal with the challenges of our geography. In the second year, I also envision an opportunity to reach out to local neighbors to offer testing as well as intergenerational learning.

Thank you for this program and what it does, I think it does a good service towards general science education that connects students to what science actually is.

Details

Did you...

	No	Yes	If yes, how many?
Collaborate with any other teachers in your school? - If so, who and what do they teach?	X	☐	_____
Conduct any experiments? - If so, what kinds of questions did students ask?	X	☐	_____
Go on any field trips? - If so, where and why?	X	☐	_____
Have any guests visit your classroom? - If so, who and why? What did the guest do?	X	☐	_____
Have a Community Meeting? - If so, where was it, what did the students do, how many people attended, etc...?	X	☐	_____
Have other Outreach Events? - If so, where were they, what did the students do, how many people attended, etc...?	X	☐	_____

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

X

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\$_____

Describe the student, or group of students, whose work most exemplified the All About Arsenic+ project this school year. What were they excited about? How did that facilitate their learning?

Reflect on your students' primary learning outcomes/gains with reference to data literacy, science communication, and using data visualizations in communication. What are they getting out of their involvement in this project?

How did you use our Tuva drinking water dataset? Did you use the software for teaching, was it a tool students used to create data visualizations? What about other Tuva data activities? Did you use them in your teaching? Did students build skills using those activities?

What challenges did your students have with Tuva, the website, the datasheet, Anecdata, anything related to the project process.

If you did not use Tuva this year, how did you analyze drinking water data?

How did you enhance *your own* Data Visualization and Science Communication skills?

Science Communication Outreach

What kinds of science communication outreach products did your students produce?

Did your students work with the Science Communication Workbook this year? Yes ☐ No ☐
If yes, please describe how it went. What worked best? What improvements could be made?

Don't forget to add all final student products to your teacher folder on the shared google folder! (Feel free to add additional products that led to the final products. Simply create a separate folder under your teacher folder.)

Intergenerational Learning

Did you send an intergenerational activity home to parents? Yes ☐ No ☐

If yes, please describe the activity.

What worked best? What improvements could be made?

Did the intergenerational activity go home at the same time as the drinking water samples? Yes ☐ No ☐
Please explain.

What feedback did you hear about the activity?

Solutionaries Framework

Did you use the Solutionaries Framework in your class? Yes ☐ No ☐

If yes, please describe.

What worked best? What improvements could be made?

Did you attend the Institute for Humane Education series on the solutionaries framework in your class?

Yes ☐ No ☐

Which aspects of this Communicating Data project will you repeat next year?

Which aspects of this project will you change next year?

List and describe the resources that helped your students the most this year.

Provide a list, and links, if applicable, to specific curricular items such as online worksheets, articles, books, YouTube videos, and labs.

Add addendums such as curriculum, photos, student assessments, testimonials from parents/students, etc.

What are the anticipated needs for the 2025-2026 school year?

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