



Date: 3/31/25

Your Name: Lucy Koup

Your School: Bow High School

Grade Level(s): 10-12

Course(s) Taught: Integrated Life Science, Environmental Science

Number of Students Involved (Total): 70

Name of your scientist partner and their institution, and any other partners (other partners can include, but are not limited to, collaborations within the school, community groups, non-profit organizations such as the YMCA, or stand out family or friend mentors that helped your project succeed):

Priyanka Roy; Keene State College, Cindy Klevens of NH Dept. Environmental Services and the Bow Committee on Drinking Water Quality

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? How long have you been participating in SEPA and how were you recruited to participate?

I have been teaching high school science since 2021. Prior to that I coordinated and taught science to middle and high school students in an adventure-based environmental education program with the Appalachian Mountain Club. I hold a B.S. in Environmental Science from Villanova University and an M.S. in Environmental Studies from Antioch University New England.

I am passionate about helping others foster their relationship with the natural world, and about connecting students to real world experiences doing science field work in their communities - this made the All About Arsenic project a natural fit!

Abstract: Provide a 500-word summary of your project. Describe the curriculum. How was drinking water sampling, data analysis, and science communication integrated into that curriculum? Provide specifics (number of samples collected, what the samples were analyzed for, how Tuva was used, what opportunities students had to talk about their data through some public outreach, etc...). Did students use the Science Communication Toolkit and/or Solutionaries Framework to prepare for this outreach event or guide their participation in SEPA this school year? Did students participate in an Intergenerational Learning activity (pH exercise etc.)? Please include anecdotes or stories in this section!

During the 24-25 school year, about 70 students were involved in the water collection. Collection began in December of 2024. The project is set up to integrate with topics in the Chemistry and Environmental Science curriculum throughout the school year. Data literacy curriculum begins in September and is a continuous strand that students come back to over the year. Incorporating data literacy skills in a scaffolded and meaningful way into science curriculum at BHS has been an area of focus for the last few years. The Chemistry curriculum is based around water and water contaminants and the removal of such is integral to the course. The Environmental Science curriculum covers a broad range of topics including water quality and watersheds. This year, Environmental Science engaged in multiple experiences designed to help build their knowledge of well-water contaminants and their effect on humans, as well as engage in a meaningful science communication project in their community. Scientist partner, Priya Chowdhury, visited Bow High School in March to share a presentation related to her research on Daphnia. Students engaged in a hands-on activity exploring how environmental stressors impact Daphnia. Students worked alongside Cindy Klevens of NH DES and the Bow Drinking Water Committee to engage in Science Communication efforts to bring awareness to drinking water issues in Bow. Students completed a lab experience testing the efficacy of table-top pitcher filters (in partnership with Dartmouth and NH DES), and used the Science Communication Toolkit to create a community outreach video aimed at educating the public that there are low-cost, effective, easy to install filtration options. A community email will be sent to all those who participated in the project this year letting them know that a select number of ZeroWater pitcher filters are available to those who need access to filtration options, as well as alerting them to the work of Environmental Science students on their community outreach video.

Details

Did you...

	No	Yes	If yes, how many?
<p>Collaborate with your Scientist Partner?</p> <p>- If so, how?</p> <p>Priya Chowdhury visited Bow High School in March to share a presentation related to her research on Daphnia. Students engaged in a hands-on activity exploring how environmental stressors impact Daphnia.</p>	<input type="radio"/>	<input checked="" type="radio"/>	_____
<p>Use the Science Communication Toolkit?</p> <p>- If so, how?</p> <p>Students used the Science Communication Toolkit to create a community outreach video aimed at educating the public that there are low-cost, effective, easy to install filtration options.</p>	<input type="radio"/>	<input checked="" type="radio"/>	_____
<p>Use the Solutionaries Framework?</p> <p>- If so, how?</p>	<input checked="" type="radio"/>	<input type="radio"/>	_____
<p>Use any Intergenerational Activities?</p> <p>- If so, how?</p>	<input checked="" type="radio"/>	<input type="radio"/>	_____
<p>Collaborate with any other teachers in your school?</p> <p>- If so, who and what do they teach?</p> <p>Bethany McKilen, Chemistry Amanda Guilbert, Chemistry</p>	<input type="radio"/>	<input checked="" type="radio"/>	_____
<p>Conduct any experiments?</p> <p>- If so, what kinds of questions did students ask?</p> <p>Students asked questions about how effective table-top pitcher filters are when samples of varying known arsenic concentrations are used.</p>	<input type="radio"/>	<input checked="" type="radio"/>	_____
<p>Go on any field trips?</p> <p>- If so, where and why?</p>	<input checked="" type="radio"/>	<input type="radio"/>	_____
<p>Have any guests visit your classroom?</p> <p>- If so, who and why? What did the guest do?</p> <p>Priya Chowdhury visited Bow High School in March to share a presentation related to her research on Daphnia. Students</p>	<input type="radio"/>	<input checked="" type="radio"/>	_____

engaged in a hands-on activity exploring how environmental stressors impact Daphnia. Cindy Klevens visited Bow High School twice to help students conduct a lab testing the effectiveness of table-top pitcher filters at removing arsenic from drinking water.			
Have a Community Meeting? - If so, where was it, what did the students do, how many people attended, etc...?	<input checked="" type="radio"/>	<input type="radio"/>	_____
Have other Outreach Events? - If so, where were they, what did the students do, how many people attended, etc...?	<input checked="" type="radio"/>	<input type="radio"/>	_____
Use your stipend to purchase anything for your classroom? - If so, what, and how did you use it?	<input type="radio"/>	<input checked="" type="radio"/>	\$150
5 ZeroWater pitcher filters			

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? Please include anecdotes and stories here.

Environmental Science students this year engaged in an in depth look into filtration options available that remove arsenic and other contaminants. Students were looking particularly at low-cost, effective, and easy to install options. Students were excited to be conducting hands-on experiments, and to be creating something that would be shared with their community.

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? Please include anecdotes and stories here.

As in previous years, students were able to personalize their Chemistry and Environmental Science learning by applying the information to their wells at their homes and their own health. The value of this cannot be overstated. Through engaging with the project and the associated curriculum, students gain valuable data literacy skills such as formulating scientific questions and analyzing data for trends. Learning how to fix the problem is also such valuable learning. Environmental Science students engaged in work to develop science communication skills - in particular how to choose an audience and frame their message. Students were asked to represent both well water data from testing this year, as well as from their lab experience with table-top pitcher filters as part of their summative assessment (video project).

If you are a teacher who has participated in both SEPA grants, how have you shifted your teaching to include the additional goals of science communication and intergenerational learning?

I have only participated in the current SEPA grant.

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? Please include stories that illustrate students understanding the link between data visualization and literacy and science communication. If you are a teacher who has participated in both SEPA grants, how have you shifted your data literacy focus to include this grant's science communication goal?

In Chemistry classes, Tuva was introduced early as a tool for data analysis, and was used regularly in the practicing of these skills. In addition to data analysis, TUVA was used in some cases for the delivery of content.

In Environmental Science, TUVA was used after data was received from our water samples. Students completed two TUVA data activities - "Well Should We Question the Water" and "Can Arsenic be Filtered Out." Students practiced skills of formulating experimental questions and evaluating/analyzing data.

Students also used TUVA to generate graphs to be included in their community outreach videos.

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

Overall, the process was very smooth, especially considering the volume of water samples collected. In previous years, issues have arisen when entering student data into Anecdota - particularly regarding students gathering data about their particular water filtration system at home, and entering data accurately and completely. We worked hard to combat that problem this year, and I believe had more success.

If you did not use Tuva this year, how did you analyze drinking water data? Please explain why you did not use Tuva. What challenges and successes did students experience with your chosen data analysis/visualization tool?

We used Tuva this year.

How did you enhance *your own* Data Visualization and Science Communication skills As an educator or scientist partner?

Participation in the SEPA DataCom, as well as work with the project over the course of the last school year contributed greatly to my own data visualization and science communication skills. As a newer teacher partner, gaining familiarity with TUVA through DataCom training was incredibly helpful. Additionally, the sessions related to Science Communication in the workshop contributed to my skills set, especially the introduction of the Science Communication Toolkit. I can design lessons targeted to helping students gain these skills, and that will become very helpful as we increase our community outreach regarding the project.

Science Communication Outreach

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

Environmental Science students produced science communication outreach products in the form of a video educating our local community about low-cost, effective and easy to install filtration options.

Did your students work with the Science Communication Toolkit this year? Yes ☒ No ☐

If yes, please describe how it went. What worked best? What improvements could be made?

Overall, I think it worked well in getting students in the mindset of how messages (particularly science messages) are communicated. Students were engaged in the Audience lesson. In the Frame your Message lesson, I would recommend not including so many examples for how the different questions/issues related to

drinking water can be framed. I found that once students saw the example given for each, that really limited their thinking, and many were unable to think about the topic from a different angle. Perhaps utilizing a few different examples that aren't then used in the worksheet would be helpful.

Please include anecdotes or stories here. If you did not use the Science Communication Toolkit, why not? What other resources and activities did you use to teach or facilitate science communication? Did the science communication skill building inspire outreach or build capacity in your students in ways not directly associated with the SEPA project?

Students were excited by the Science Communication Toolkit, overall. One student who is also enrolled in the Concord Regional Technical Center's Education & Behavior program shared that the exercise students complete in the Audience lesson was something she had been asked to do in one of her classes there. She was excited to use this skill in a different context, and this definitely boosted her confidence.

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 are stories and anecdotes you can include about student participation in intergenerational learning activities?

N/A - did not complete.

If no, please describe why. What other resources or activities did you use to teach about or facilitate intergenerational learning?

I think in an effort to not overwhelm myself, and to not disproportionately give time to this project over other curriculum objectives, I decided to focus my energy on the Science Communication Toolkit for now.

What worked best? What improvements could be made?

N/A - did not complete.

Did the intergenerational activity go home at the same time as the drinking water samples? Yes ☐

No ☒ Please explain.

I did not use the intergenerational activity this year.

What feedback did you hear about the activity?

N/A - did not complete.

Solutionaries Framework

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

If yes, please describe.

N/A - did not use.

What worked best? What improvements could be made?

N/A - did not use.

If no, why not? Please include other activities or resources you used to teach about or facilitate systems thinking, place-based discovery, or project-based learning.

I think in an effort to not overwhelm myself, and to not disproportionately give time to this project over other curriculum objectives, I decided to focus my energy on the Science Communication Toolkit for now.

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?

I would love to repeat the aspects that I incorporated this year - well water sampling data collection/analysis, science communication community outreach project, visits from scientist partner and NH DES.

Which aspects of this project will you change next year?

As this is the first year of taking on a larger curricular tie-in to the project, I anticipate that I will have a significant amount of tweaking/revision to the curriculum to improve upon it.

I may undertake sending out the Intergenerational Learning Activity with well water sample kits.

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

Science Communication Toolkit

TUVA

Partnership with outside experts/resources

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

[Lab: Testing Arsenic Pitcher Filter Efficacy](#)

*Can share more artifacts (videos) and instructions/rubrics once projects are complete.

Add addendums such as stories and anecdotes, photos, student assessments, testimonials from parents/students, etc.

Can update later once these materials are complete and available.

What were gaps or barriers you experienced this year?

The biggest barrier to success that I find is time. I found the curriculum tie-ins to be worth the time invested with students, but in a class where there are many curriculum objectives, I am certainly still figuring out how to include this meaningfully, without losing too much of the other stuff that has been a part of the class in the past.

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

No anticipated needs outside of the regular classroom award money to re-order supplies for well water testing.

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