

**Project Title:** [Communicating Data, All about Arsenic](#)

**Your Name:** Mary M Wright

**Your School:** Kearsarge Regional High School

**Grade Level(s):** 10 - 12

**Course(s) Taught:** CP Chemistry ,CP Anatomy and Physiology (running start class – college class taught in high school setting ), Anatomy and Physiology ( non CP), Adult education/ night school

**Number of Students Involved (Total):** Aprox. 95

**Project Partners:** Who did you work with for this project? Name your partner and their institution and any others. Nick Bears at Colby Sawyer College in New London, NH

**Teacher/Scientist Partner 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 “Communicating Data” project?

I’ve been teaching for almost 30 years. I’ve taught various life science courses including Anatomy and physiology, Biology, Ecology, Zoology, Marine Science and Oceanography as well as Chemistry and AP Chemistry. I also teach in an evening ,adult education program.

Inside the classroom, I’m passionate in encouraging students to pursue post-secondary science education with a focus on getting involved in undergraduate research. I also encourage

**Summary:** Provide a 500-word summary of your project. Describe the curriculum or how you were involved. How were drinking water sampling and science communication integrated into that curriculum? Did you use any resources from the Student Reporting Lab at PBS? Provide specifics about sample collection (# samples collected, what trends in the data did your students find?) What outreach events happened?

During the 2023-20234school year approximately 95 students were involved in the All about Arsenic Project and associated curriculum. 50 students were enrolled in CP Chemistry, 20 were in CP Anatomy and Physiology, 10 were involved in non-CP Anatomy and physiology. My night school population varied depending on the term (10 – 14) .

The involvement of the students varied depending on the class. The CP chemistry students were the most involved. See project Details below.

**Project Details:**

- **CP Chemistry activities**
  - a. Collected and submitted water samples in the Fall.
  - b. Learned to use Tuva using activities such as “Meet the elements”
  - c. Used Tuva to look at the large “All about Arsenic” data set covering multiple years. Learned to create graphs, filter data, etc.
  - d. Selected a water contaminate to research using academic data bases. Wrote an annotated bibliography for a minimum of three articles from peer reviewed journals (this became the basis for the community outreach project)
  - e. Were the audience for presentations from Colby Sawyer students (Nick Bears)
  - f. Performed the Tuva Activity about the water issues on the College of Atlantic campus.
  - g. Designed, performed and wrote up/ presented toxicity studies on a water contaminate ( this may or may not have been the contaminate on which they wrote the annotated bibliography). In general, these used either an aquatic annelid, duck weed, or germination of lettuce seeds. These

were either presented or were part of a poster presentation. This was a “new activity”; every student did this when in the past this was optional.

- h. Community outreach project: Student had to create a poster presentation, pamphlet, slide show or other, that was designed to educate the general public about a particular water issue (that they had researched. Most students used the issue from “d” over which they wrote their annotated bibliography. (this has been a constant for the last few years)
- Non- CP Anatomy and Physiology.
    - a. These students used TUVA – written human biology activities
    - b. Student performed the College of the Atlantic activity.
    - c. Water toxins were discussed in our unit on the nervous system. They looked at the senior project of a student from the 2022-23 school year where the student noticed that worms raised in arsenic water had slow reaction time to touch. They refined the original procedure and then designed a blind study where my CP Anatomy class collected the data not knowing the treatment given to each individual worm
    - d. They may a group presentation and created a video with narration of their results ( see below). While this is a bit rough, I was impressed at how engaged this group (often unengaged) was in this activity.
    - e. <https://docs.google.com/presentation/d/1IHg6xSLcOFaAe4YrwCiFCQFu0CBolx3BhG5FrNXq7Wc/edit#slide=id.p>
  - CP Anatomy and physiology :
    - a. These students used TUVA – written human biology activities
    - b. Student performed the College of the Atlantic activity.
    - c. Performed the nero toxicity experiment as described above
  - Night School
    - a. Used Tuva to explore data and various data stories.
    - b. Were offered water testing (only one returned the sample in time)

Student projects were displayed during a school function in the Spring.

#### **Discussion:**

The big change this year was the inclusion of toxicity testing for every CP Chemistry student. While this was logistically challenging given my physical classroom space, this was a great activity and was well received by the chemistry students. I will be including this again during the 2024-25 school year.

I’m still concerned that a number of students will create graphs from data sets and misinterpret their meaning. I’m going to make this a focus during the 2014-35 school year.

Parents are very interested in the project and were as excited as the students to get results. We did have a number of problematic wells. I’d say about half of these homeowners started looking into mitigation.

**Conclusion:** There were many positives this year: The toxic risk studies were a great addition to my chemistry classes and is something I will continue. I will also continue to increase my use of TUVA, but is very clear to me that our district needs to start coordinating data literacy in science programs from elementary through

secondary levels. I'd also like to encourage my colleagues to implement the use of peer reviewed articles in science classes from grade 10 and above.

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