

Case Study 2021-2022

Summer of 2021- collected water daphnia using a phytoplankton net into a mason jar filled with pond water

August 26-

Collected 4 gallons of pond water with students- bought 2-gallon plastic buckets from Lowes in the paint department for collection. Students collected duckweed, and elodea as well. One-gallon plastic tubs used for storage were purchased from Target and the pond water divided into two storage containers., and elodea place in only one of the containers with pond water.

August 31- divided approximately 30 daphnia into the containers with the duckweed and elodea

September 18- Many organisms are living within the pond water and the water daphnia are being eaten, students decided to restart the bioassays under a more controlled environment.

- Decision to remove as many living organisms as possible from pond water that through multiple straining of the water through phytoplankton nets

- Decision to purchase daphnia in media that will not have been contaminated with other species eggs and larva

- Decision to purchase single-celled algae cultures to determine best food source for the daphnia

- Decision to have pond water tanks with natural habitat for duckweed production

- Decision to study long-term effects of water daphnia to arsenic and uranium and duckweed

September 27- discussed attempts of bioassays with Dr. Disney and others during Office Hours

September 28- water has been filtered and in clean containers

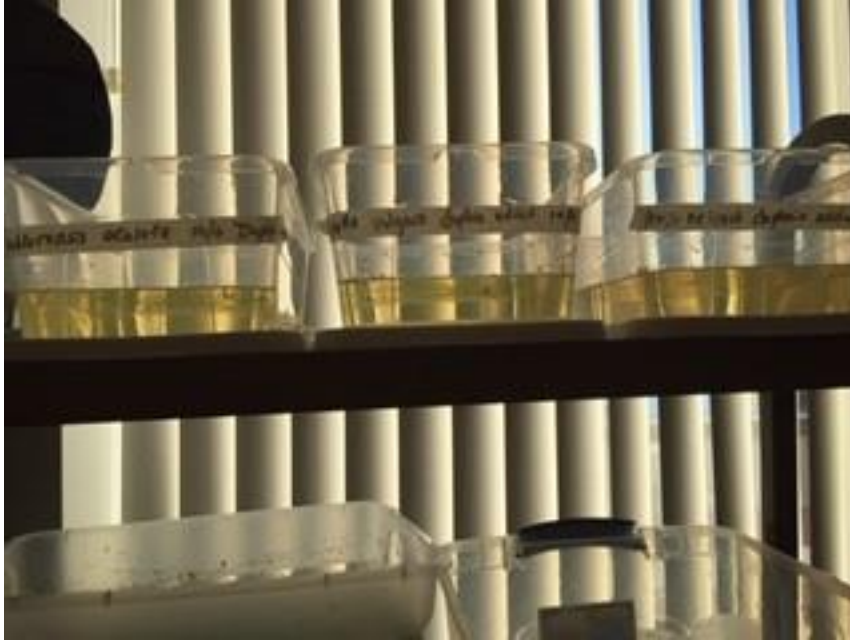
Purchased algae from Algae Research Supply- *Chlorella vulgaris*, and *Nannochloropsis oculata* both single-celled, student researched food sources for daphnia including single-celled algae that did not form filaments and yeast

Purchased 100 daphnia from FLINN Scientific

Received household water from a faculty member with arsenic levels of 14 micrograms per liter

October 7- received algae and daphnia, students divided the daphnia into the three shoebox sized plastic bins and marked them by their food source, students will feed them one pipette filled with their food every Wednesday. Research on the daphnia indicated that care must be taken when adding food or water to their tank so not to kill them. 600 mL of pond water was put into 9 medium sized mason jars and ten duckweed plants placed in each utilizing dissecting probes.

October 18- counted the number of daphnia in their containers, the population doubled in the algae and tripled in the yeast.



October 28- added conditioned pond water into the daphnia and duckweed habitats.

November 3- counted the daphnia and duckweed populations. The daphnia continue to thrive in all three environments and the decision was made by students that the populations were strong enough to divide them leaving one/half of each population in the original container as a control and the remainder in a container with pond water. Once these are stabilized arsenic will be added.

The duckweed root lengths and frond numbers were counted in each jar. The jars were divided and labeled – 3 jars of duckweed “control” 2 jars with duckweed received 100 mL of 10% arsenic water, 2 jars received 20% arsenic solution and 2 30% arsenic solution.





January 5- Participated in the “All About Arsenic Mapping Session”

January 6- New Hampshire Department of Environmental Services meeting in Pelham through ZOOM and testing completed in the summer of 2021 because of an EPA inquiry of a home on Dunton road

January 12- Zoom meeting with Amy Hudnor from the Department of Environmental Services, Dr. Disney, and Dr. Lust from the SEPA grant and MDI, on working together as ambassadors.

March 7- received second set of results of well water

March 9, 2022- Zoom call with Abby Roche about Pelham’s work with the SEPA grant

March 11, 2022- Pelham Science Team looked at water filtration graphs created from TUVA and developed by Dr. Lust

March 13, 2022- contacted Flor (science partner) about setting up a second semester guest lecture on the geology that causes the uranium and arsenic issues in southern N.H.

Contacted Dr. Lust over questions with TUVA and water filtration graphs that she sent based off Pelham well water data

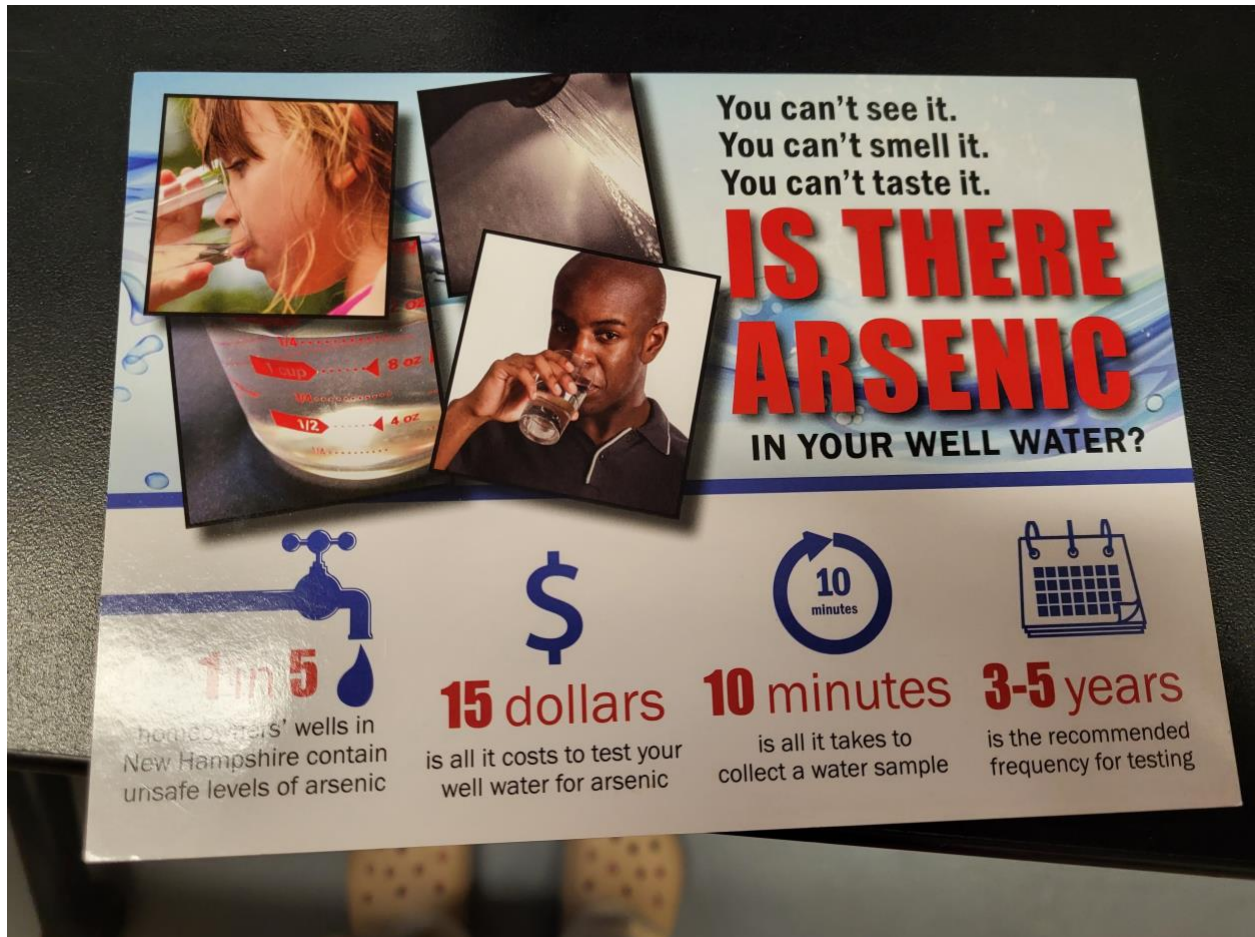
March 16, 2022- scientist partner emailed over potential dates for another virtual presentation

March 14, 2022- Flor responded with a tentative date of After April 18 for meeting with students to go over data and geologic formation

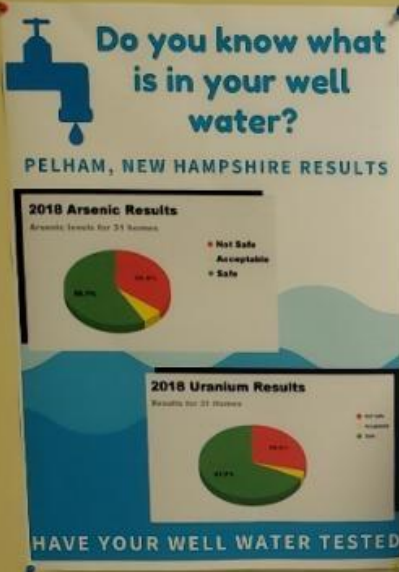
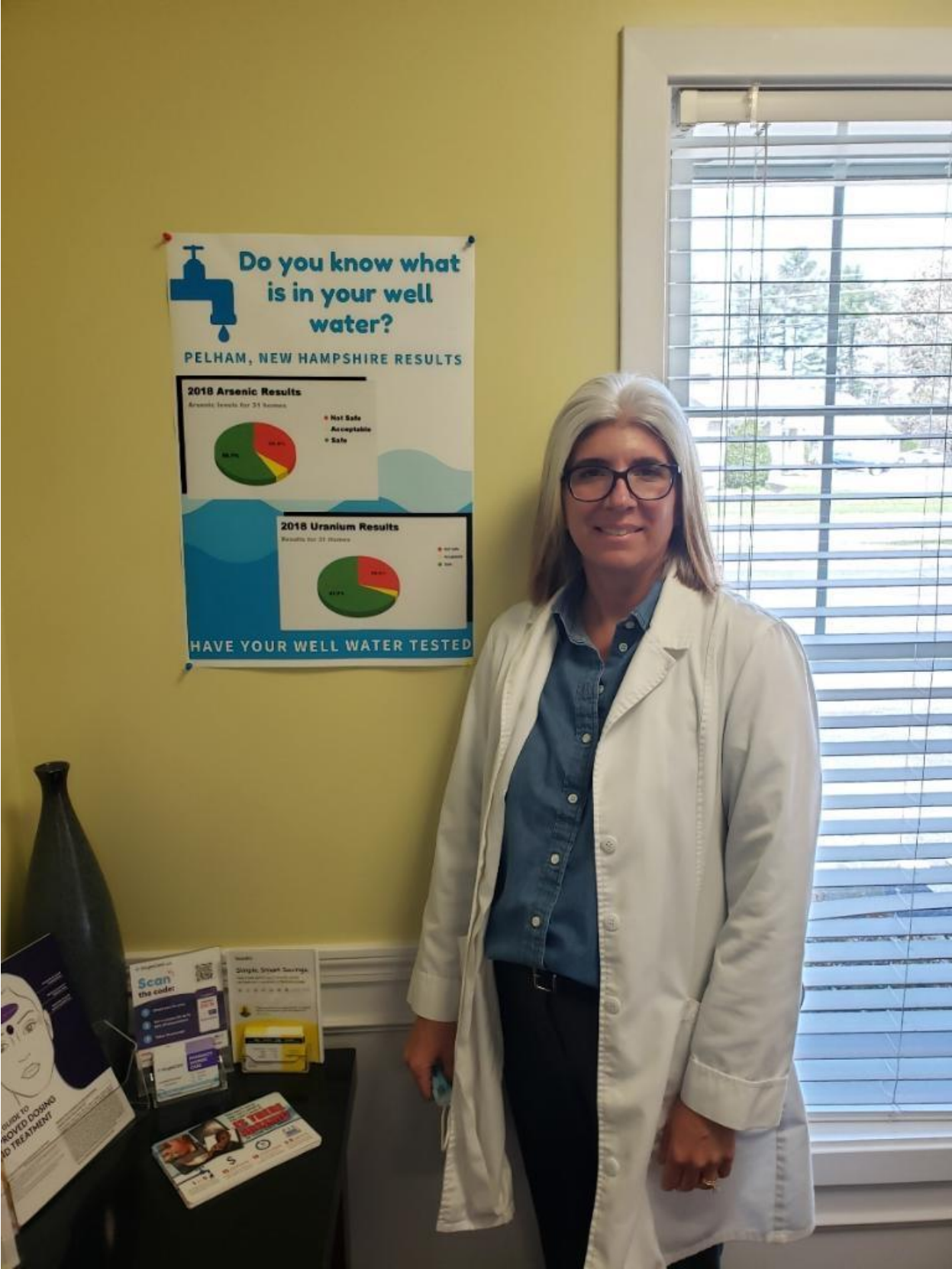
Board of Selectman set date for student presentation as Tuesday May 10 at 6:30 on well water

March 28, Contacted Amy Hundor from Department of Environmental Services in New Hampshire to attend the May 10th Board of Selectmen meeting to answer any questions that are not appropriated for students to answer.

March 31, 2022- postcards on arsenic in well water distributed to Pelham Healthcare Associates walk in clinic in Pelham. The postcards were from Dartmouth on arsenic dangers in well water.



April 21, 2022 poster created by students on well water dangers presented to the Pelham Healthcare Associates office.



Informational brochures on a table, including one titled "GUIDE TO IMPROVED DOSING AND TREATMENT" and another titled "Scan the code!".

May 10, 2022- Board of Selectman Meeting with Pelham students and Amy Hudnor from N. H. Department of Environmental Services. The student's presentation can be found at the following link between 05:18 and 23:14. They presented data and Amy Hudnor helped with answering questions. 387 samples were looked at to date.

<https://ptv.viebit.com/player.php?hash=MJA6nz8FOw89>



May 13- Zoom meeting with scientist partner Flor Fahnestock on the geological link to toxic metals in well water