Dec 30th

After extensive searching, I've finally found a store that sells tamarind with seeds. Bombay Spices and T&T .However they sell it in a paste, which will make it difficult to extract the tamarind. An Indian auntie gave me very helpful information on removing the seeds. She said to boil them for 10 to 15min so that the pulp will evaporate and leave behind the seeds. I did buy fresh Okra as a backup. T&T sells packaged fresh tamarind, so I bought a box of that too.

Dec 31st

Tested possible microplastics. Magic eraser is a great alternative seems to absorb water which makes it heavy sinking to the bottom which could interfere with the tamarind flocculation. Even when separated, they are attracted to each other, however smaller pieces do exhibit the same behavior . It could possibly work if the smaller pieces are not attracted in the long term.

Jan 3rd:

Shelling the tamarind seeds is proving to be an extensive project, and after boiling i carefully removed the sticky seeds to rinse in a strainer. Next I used a mortar and pestle to crack open the outer casing of the seed and jewelry pliers to meticulously remove extra shells. I won't be able to finish today so I will continue tomorrow.

Additionally, proving any material is pure plastic is difficult as Canada has banned single-use plastics and micro-beads. However, I'm going to use textile microplastics, a shirt made from 90% polyester and 10% elastane. Insulation foam, especially the expanding kind, is a dangerous microplastic if it breaks down into very small pieces. It creates a sort of dust that is easily inhaled and can cause damage to the human respiratory system. For this reason I'm using it as an insoluble microplastic in my experiment. I'm also

investigating whether certain types of teabags release microplastics into the water. I left a bag soaking in colored water overnight to see if it would cause the water to become cloudy as the magic eraser did.

Jan 4th:

Woke up and began shelling the tamarind again, I can tell that this is going to take up a rather large amount of my time. I began to think about how to measure the percentage of microplastics removed from the water. Either by putting in a set amount of microplastics or by weight. Since microplastics are tiny, my Dad offered the micro scale from work. (He works in a restaurant. Hopefully this way I will have an exact amount for each repetition of the experiment.)

Jan 7th:

After being sick, today I finished shelling all of my tamarind seeds. Using a coffee grinder (with no plastic parts for contamination), I grinded the seeds because they were too hard to grind on a mortar and pestle. The seeds required multiple grindings and I sifted them to ensure it resulted in a very fine powder. In addition to grinding the seeds, I also grinded the shells that I had leftover, if in any case of an extension project, i could see if the same theory applies to the seed casings.

Jan 11:

TODAY I DID MY EXPERIMENT!!! To begin 6 jars, each filled with 1 litre of water. I added one drop of blue food coloring to each for better visibility. I then measured out exactly ⅛ of a tsp of each microplastic and weighed them for added information. I did the same for the tamarind powder, 1 tbsp which was equivalent to 8.57 grams. The reason I did 6 jars was so that I could have control. In which it was just the microplastic (same amount) to see how it would behave on its own. I had 5, 10, 15 and an hour timer to see how the flocculation would progress over longer periods of time.

Jan 13:

I realized that I had no concrete numbers for exactly how many microplastics were removed, so I decided to redo my experiment. Still exactly the same as before, but I would decant the top and dry the bottom, separating the tamarind and microplastic. Then I'd weigh the microplastics and compare from the original amount to determine the percentage.

Jan 17:

As per my process, I redid my experiment, and I now have 3 different percentages for each variation of microplastic to see how much was removed by the tamarind.

EXPERIMENT(2):

1. Fill 6 jars with 4 cups of water each and 1 drop of food coloring
2. Measure exactly 1 tbsp of tamarind powder and make sure it weighs 8.57 grams, (Repeat 3 times)
3. For each microplastic measure ⅛ of a tsp and weigh on a microscale for accuracy(repeat twice for each microplastic.
4. Simultaneously, sprinkle each microplastic in 2 jars and cover in the tamarind powder
5. Set timers for 5, 10, 15 and 45 minutes
6. Make observation at each of the above intervals

EXPERIMENT : SEPARATION OF MICROPLASTICS FOR PERCENTAGE

1. After 45 min, remove what is left on the top with a net of pure cotton, and pipe cleaners twisted
2. Pour the rest of the water through a filter with a cotton cloth
3. Squeeze to remove the excess water and leave the tamarind and microplastic mix to dry overnight
4. Remove the dried tamarind and microplastic from the cloths
5. Separate the microplastic and then weigh with a microscale

Jan 22:

Time is running out. I have made graphs in Excel today comparing the amount that was initially added to the water, and the amount removed by the tamarind. By tomorrow I aim to submit a finished project to Mrs Davis for review and critical feedback. Feedback over the weekend, trifold pick-up on Monday and finish the trifold before Thursday.

Jan 29th FRIDAY

Today is the Science Fair at my school, and over the course of 3 hours, I receive 2 pairs of judges and helpful feedback. Mostly they are asking for extension of the project through trying different amounts of tamarind powder and more research on the possibility of tamarind in the application of a large scale water treatment. I have to wait until next wednesday to see if I made it to the city-wide fair.

Feb 3rd Wednesday

I made it to CYSF! It's great, but I only have a month to extend my project. I want to extend my project and I'll try to make contact with some experts.

Feb 5th

I emailed 5 different experts.

Feb 6th

Manager of water distribution for the City of Calgary, Chris Huston replied to my email and he is going to direct me toward the Team Lead and Engineer, Tushar Sawant.

Feb 11th

Tushar Sawant is gathering the Senior Engineer to answer my question more adequately. We have scheduled a meeting for tomorrow at 3:30pm.

Feb 12th.

I had a meeting with Tushar Sawant and Kelsley from the City of Calgary. They don't think that tamarind can replace polyacrylamide because of supply, consistency and the other possible effects that tamarind can have on the water. Furthermore they emphasized the need for experimentation with different amounts of tamarind seed powder, Tushar also recommended trying to gel the TSP.

Feb 19th

I ran my experiments today. See procedure for details.

March 1st and March 2nd

Worked a total of 9 hours uploading everything to the CYSF website. Also discovered many typos and fixed my graphs. I am now adding to this logbook everything that has happened in the past month because I forgot about adding to it every time I did something important.

Signing off, Sofia Flores Rojas