

## The Water Filter

### Define:

This is the water filter challenge. In this assignment we were asked to create a functioning water filter out of a 2 L bottle. We were given materials and were given unfiltered water to filter with the filter we were creating. The challenge of this assignment was to filter the water that our teacher (Ms. Yorke) gave us. It looked really unsanitary, had chunked of stuff in it and it reeked of a scent no one enjoyed. Some questions we came up with during the procedure of the construction of our water filter were...

- 1) What are the common materials used when making a DIY water filter?
- 2) What is the shape of the water filter?
- 3) What are the most suitable materials to use in the water filter?
- 4) Should the PH level of the filtered water match the PH level of the water source we are releasing it into?
- 5) What order should we put the materials in when it is in the water filter?

### Discover:

Some problems that came up with drinking unfiltered water as that people that drunk unfiltered water from dirty sources became sick and could possibly die from drinking water. Some waterborne viruses I found on

<https://www.lenntech.com/processes/disinfection/deseases/waterborne-diseases-contagion.htm> was Hepatitis E, Hepatitis A, Typhoid fever and Cholera are sicknesses that are commonly transmitted through drinking unsanitary water. Things that humans have done in the past to prevent drinking unfiltered, unsanitary water is boil the water to make it drinkable.

On <https://www.bryceviewlodge.com/make-water-safe-drinking-simple-water-purification-techniques/> I found a few good techniques for purifying/ filtering water.

- 1) Boiling your water. Boiling water is an easy solution if you need clean water. By boiling your water, you are able to take out bacteria you are unable to take out if you filtered it using a DIY filter.
- 2) Using Iodine Chrystals, pills, and or tablets can purify your water very efficiently. They can kill of bacteria and viruses in unfiltered water in less than an hour. Since they also come in pill forms, you are able to carry them around whenever you go camping or tracking in the woods.
- 3) Ultraviolet light is also used to sanitize dirty water. It's shape is similar to a small flashlight and you turn it on and shine it on the water for a while. When you do that, the ultraviolet light kills bacteria. Some downsides to this strategy is it required batteries to operate and it wont remove solid materials in the water (ei. Sticks, rocks, sand ect.) the good thing about using ultraviolet light is that it is easy to carry wherever you go.

### Dream:

I've always thought of how to filter water and the common one that everyone thinks of is simply boiling it. When you're out in the wilderness and you're looking for pure and drinkable water, you don't want to carry pots around wherever you go. There are other solutions that I have listed previously and I have never learned about some of the ones I've read, though, I was familiar with the iodine pills. Using ultraviolet light is also a good one I was unfamiliar with and I didn't know that carbon was used to purify water. But while I was sitting in on my bed one night, I just thought that maybe, we humans could invent a water bottle that purifies our water from the inside and out. I would call it the G-water. It would be a water purifier insulated water bottle that you would put dirty water in and shake it for a few minutes, then you can drink the water from the bottle after shaking it. It sounds crazy but it's a cool idea to have one of those things. And to stop solid materials in the water from getting into your mouth, you would have a very fine tuned metal filter where you would drink from the bottle. Someone will have the idea and create it. When they do, I'll probably have one with me.

### Deliver:

The filter we created was a really cool one and a little different from the ones that everyone else in our class had. This filter had 2 funnels full of materials we used to filter the water. The materials are 2 2L bottles, carbon, sand, cheese cloth, cotton and a sponge.



### Debrief:

#### Steps:

- 1) We first started brainstorming in our groups, and discussing what we would use in our filter. We started doing research about DIY water filters and found what was commonly used in the filter. We found out that coffee filters, rocks and sand are commonly used when making a DIY filter.
- 2) After our brainstorming stage, we started deciding on what to use in our filter. We decided we would use cheese cloth, sponge, sand and cotton balls because they seemed like they would filter the dirty water well when all the other components of our filter were added in with it.
- 3) After deciding that we would use those materials, we decided that we would test each of the materials before adding them



into our filters. We tested each of the materials we decided on and we saw carbon rocks on the table, so we decided that it wouldn't hurt to test that out as well. We later found out what it does and watched other groups use the rocks. We found out (through testing what it would do) that it is really good at filtering water and it does not stain the water when it is crunched and used in the filter.

- 4) We started planning out how we were going to put the materials in and what order they will be in when they were in the filter. We worked on the sheet of paper that we were handed to work on. We drew a diagram of what we wanted the filter to look like and labeled all the materials in it.



When we finished all the steps it took to make our filter, we decided we were ready to test the filter out with the dirty water on the table. We put it through and it took a while to filter and once it was done, we put it in an Erlenmeyer flask and examined the water. We took a look and we saw that the water was still quite foggy. We decided to add cotton to the top funnel of our filter and tested the water again. We saw better results, although it was still a little foggy. We could have improved the filter by doing more research for

the level each material should be on the filter and what order they should be in when they are in the filter. If we did that instead of wasting out time testing out every single one of our materials, we would have gotten more successful. Since we did not add any filter paper to our filter, it was not clearer than it would have been if it did have filter paper. We also thought that carbon was the best solution and put it in a funnel of its own. I feel like we either did not have enough layers or we didn't place them in the best order possible. Either or, we still did really well on this assignment and I think we deserve an A+ on it.