

Filtration Station 3.0

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Project ID#

Q1: Research Question/Engineering Goal

Does the type of organic matter in a homemade water filter impact the effectiveness of its filtration?

Why it Matters?- If a cost effective water filter can be developed it will bring clean water to areas in need or in times of crisis.

Hypothesis

If organic material filtration systems are compared to activated charcoal filtration systems, then the activated charcoal filtration systems will be most effective because they are known filtering agents and used in commercial filters.

Q2: Methodology/Project Design

In order to test the hypothesis I made 6 identical filters with recyclable and household items. The only change in each filter was the type of organic material found in each for a total of 5 trials per filter. I then tested the filters with local river water. During each trial I tested the pH, chlorine, turbidity, and alkaline of each sample and documented the results.

Q3: Data Analysis & Results

	Unfiltered Water	Filter With no Organic Material	Filter with Banana	Filter with Coffee Grounds	Filter with Rice	Filter with Activated Charcoal
pH Mean	6.8	6.8	6.8	6.2	6.8	6.8
Alkaline Mean	180 ppm	180 ppm	180 ppm	96 ppm	120 ppm	80 ppm
Chlorine Mean	0 ppm	0 ppm	0 ppm	0 ppm	0 ppm	0 ppm
Turbidity Mean	100 jtu	40 jtu	40 jtu	100 jtu	40 jtu	0 jtu

Q4: Interpretation & Conclusions

From the results I was able to identify that all filters had some impact on the water. In regards to chlorine the control did not have any and all the filters had the same result. As for pH levels, I found that the only filter that changed the pH level was that of Coffee. The pH changed to 6.2 which is considered drinkable but not healthy long term. The rest of the filters keep the levels the same which is a safe drinking level. The ideal number is 7. For the alkaline test the ideal range for drinking water is under 100 ppm, some of the filters caused no change but the coffee, rice, and activated charcoal brought down the alkaline levels to a safer drinking range. Lastly, in the turbidity test the ideal range for drinking should be under 12.5. JTU. From the results we can see that a variety of filters reduced the numbers excluding the coffee filter which actually made it worse. The activated charcoal did the best however and filter the largest amount of particles in the water. In conclusion I found that all filters were able to filter some parts of the water. However, the filter activated charcoal was the most effective since it not only maintained the pH level but it improved alkaline and turbidity. As a result my hypothesis was correct.

