HydroPuris

Water Purification and Testing System

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Meet the Team

Shrey Agarwal

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Our Project

Water Purification and Testing System

The Hydropuris are trying to solve the problem of the lack of clean water while being on the run. To do this, we made a filter to purify water that can originate from any water source.

WPTS is a water purifier using minerals, fruit peels, and an LED. The device is a two-bottle filter that utilizes gravel, seaweed, rice husks, coconut, fiber, and sand.

Problem Statement

In many places of our world, dangers such as droughts, floods, earthquakes, and so many more take place. While these natural disasters occur, the residents of the area need to evacuate, and during that process, they do not have many necessities such as food, shelter, and water. The main lack of necessity we will be looking into is water.

Design

- Two bottle design
- Materials in filter
  - Gravel
  - Seaweed,
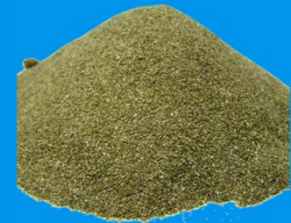 - Rice Husk
  - Coconut Fiber
  - Sand
- Engineering Aspects
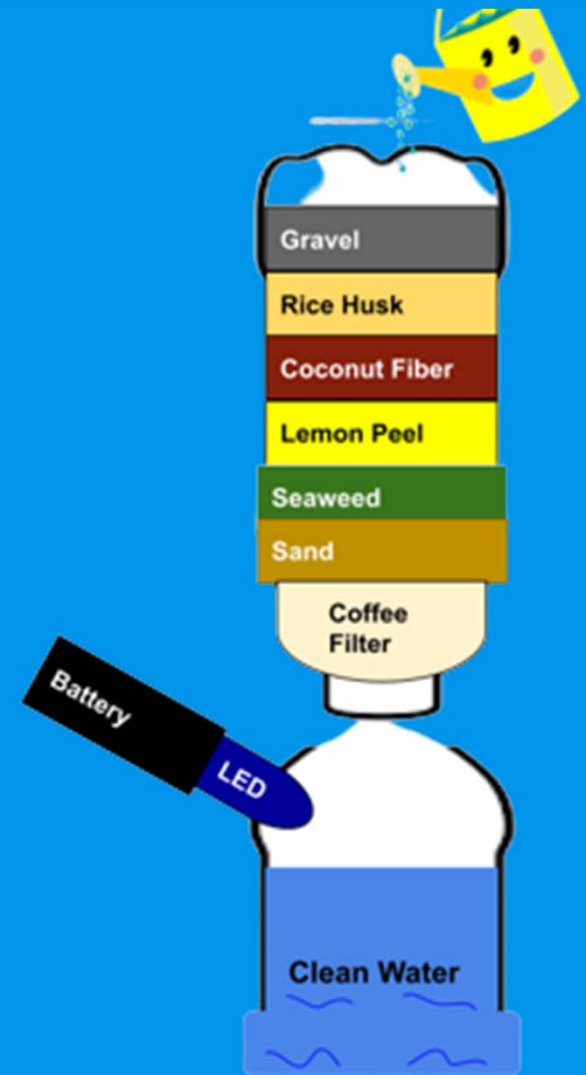
Final Prototype

Materials

- Gravel
  - Takes out large contaminants from bacterial water

- Seaweed
  - Soaks up carbon and nitrogen, removes unwanted toxins and inorganic nutrients

- Lemon Peels
  - Removes 96 percent of lead ions

Materials

- **Rice Husk**
  - Takes out color, odor, and dissolved organic substances
- **Coconut Fibers**
  - Removes a variety of particles such as chlorine and chloramines
- **Sand**
 - Removes smaller, leftover sediments and bacteria in water

LED

We also used LED as our last component of filtering our water out. The LED took out all the remaining bacteria as our final step to purify the water. For our project, we used LED UV-C which can be used effectively as a disinfectant to kill microorganisms. They can be designed so that a wavelength can be inputted and emit photons in the UV-C range. The LED was necessary to complete the final step of filtering out the contaminated water.

Technology

- **Our team programmed Arduino based turbidity sensor using C++ which showed us the cloudiness of the water.**
- **Our team also used a PH sensor to measure our different water samples.**
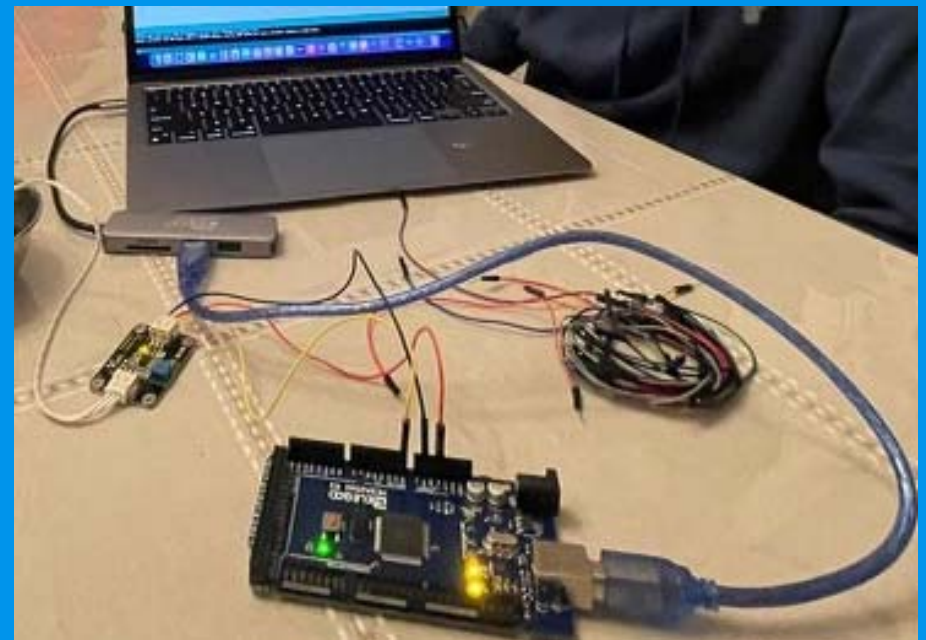
Data Analysis

Our data supported our hypothesis because as seen from our pH and Turbidity sensors our filtered water was cleaner than our three other water samples; creek water, tap water, and dirt water.
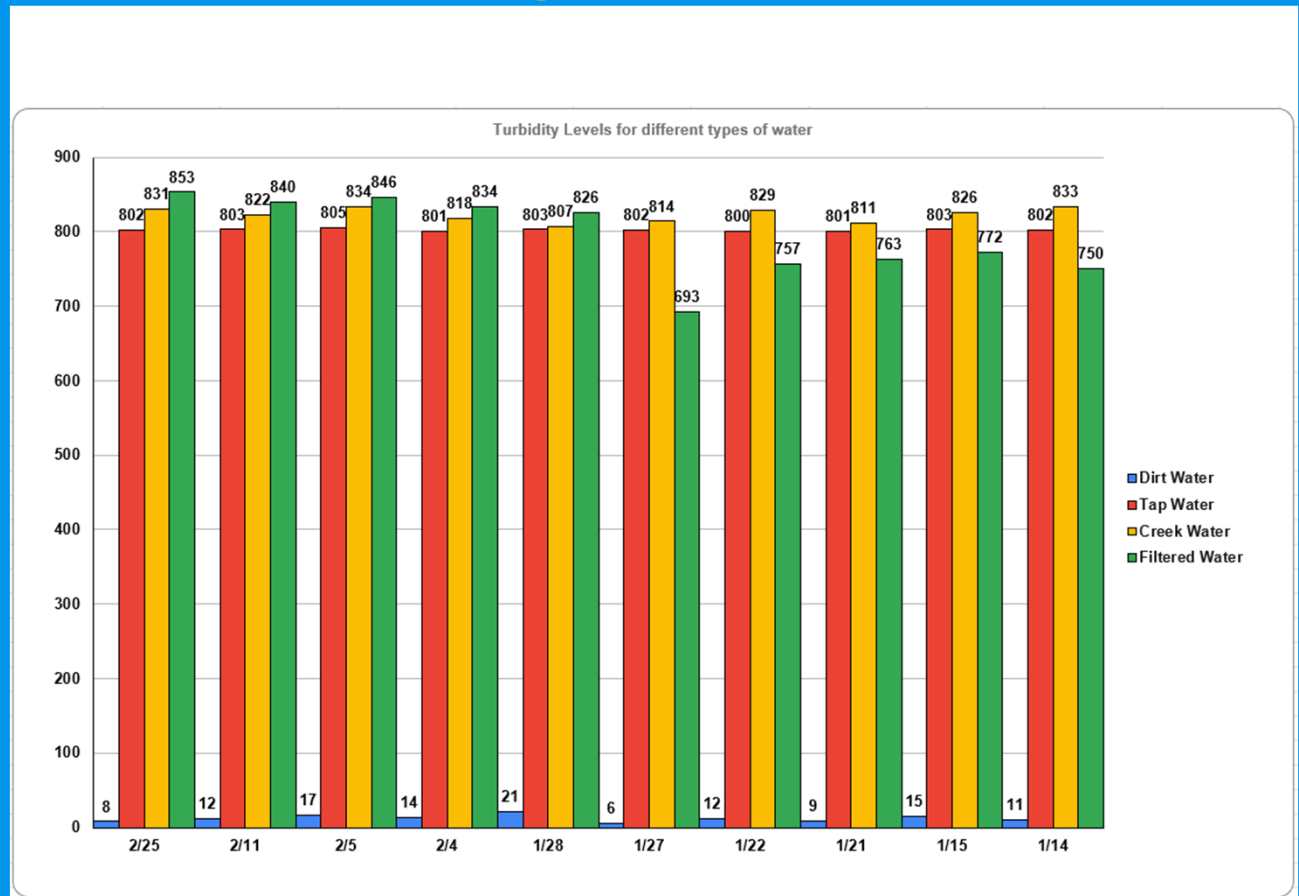
pH

- pH latest measurement:
- Creek Water: 8
- Dirt Water: 8
- Tap Water: 7.5
- Filtered Water: 7
- The creek, dirt, and tap water samples were more alkaline compared to our neutral and pure water.

PH Levels for different types of water
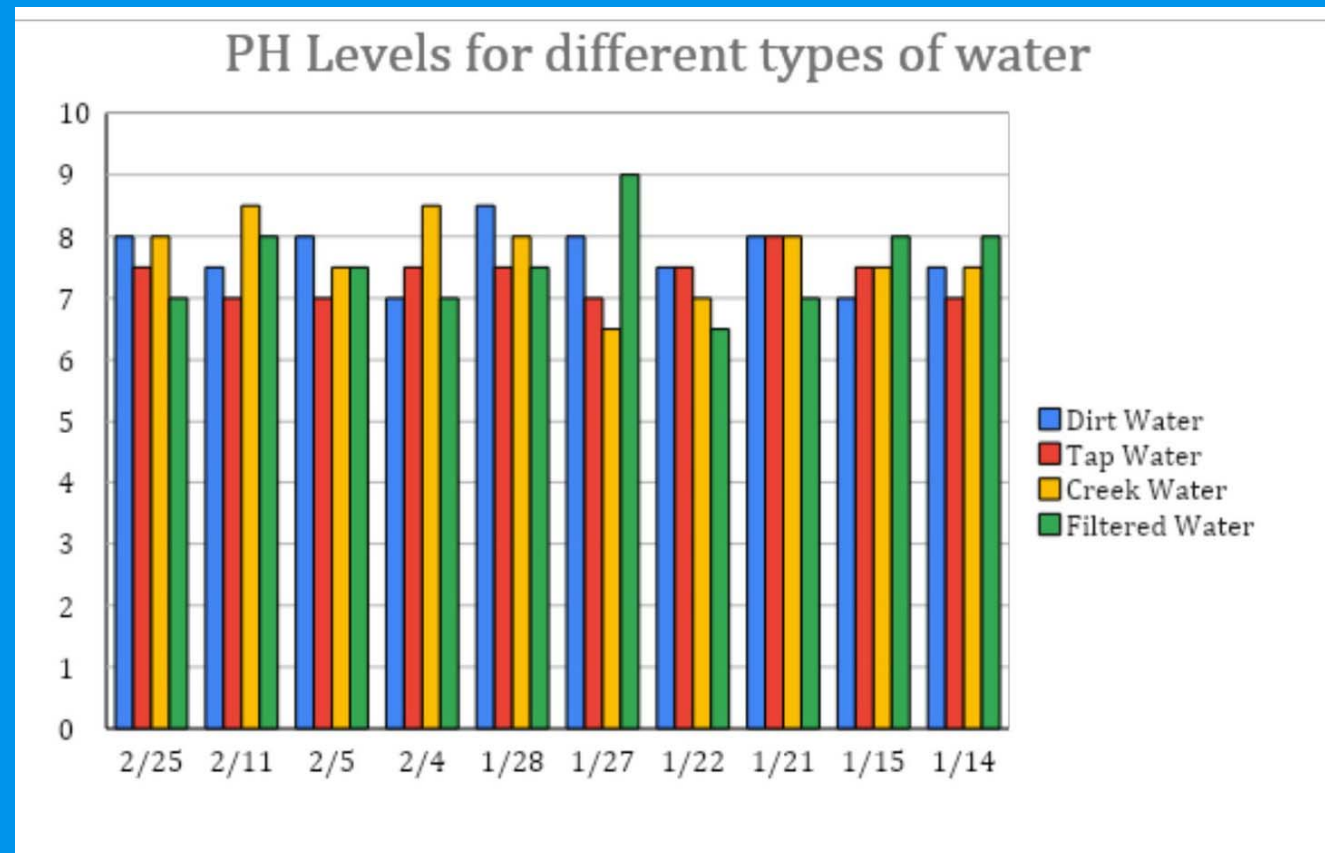
Turbidity

- **Turbidity Values (0-900)**
  - **The closer to 900 the more pure or less turbid the water is**
    - **Dirt Water: 8**
    - **Tap Water: 802**
  - **Filtered Water: 853**

Process

- Brainstorming
  - **We narrowed our ideas from 30 ideas to 3 potential ideas, to 1 final idea**
- **Background Research**
  - Our team researched many potential materials and designs to make sure our project would be possible and feasible
- **Materials**
  - **We looked at many different materials for the project, and narrowed them down so the device would be successful**
- **Design**
  - **After research, we came up with many different designs and came down to one to make the cleanest water**
- **Preparing for testing**
  - **We bought our materials and tested our device**

Thank you!