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Small Scale Water Filtration Project

Elaine Yang  
*Lincoln High School*

Lang Ming  
*Lincoln High School*

Alex Tees  
*Lincoln High School*

Lauren Galle  
*Lincoln High School*

Tristan Coffey  
*Lincoln High School*

*See next page for additional authors*

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Presenter Information
Elaine Yang, Lang Ming, Alex Tees, Lauren Galle, Tristan Coffey, Andria Tattersfield, and Colin Brock

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Access to clean drinking water is a large problem that our world is facing today. Consuming contaminated water can lead to the spread of water-borne illnesses. Populations without the security of water struggle to develop, as seen predominately in Africa. As Oregonians prepare for life after a major earthquake which could devastate the infrastructure that delivers clean water to our homes, a water filtration system should be part of a family’s emergency preparedness plan.

There are a large variety of processes for achieving fresh water. Combining all of the necessary components to lead to clean water is a complex process, as we have discovered during our field research. We saw an opportunity to create an inexpensive and user friendly device that encompasses all of the required aspects of purifying water for drinking.

Our design allows users to filter particulates from water and also senses for chemical contamination to prepare it for boiling. First, the water flows through a funnel to a pipe and goes through two layers of wire mesh and carbon foam. That removes sediments from the water, as well as some organic compounds. The carbon film can also reduce certain heavy metals, such as fluorine and lead.

Next, the water flows through a sensor. The sensor can detect the presence (or high concentration) of heavy metals and rapidly respond to them. If the sensor picks up these harmful contaminants, the light will be red. In that case, the water would have to be discarded. If the water simply needs to be put through the filter again, the light will blink yellow. If the water is safe to drink, the light will be green.

Finally, the water will exit the pipe into a pot that the user provides that will collect the water. The water can then be boiled to remove all biological contaminants.