



# CALIFORNIA SCIENCE & ENGINEERING FAIR 2018 PROJECT SUMMARY

<b>Name(s)</b> <b>Vivian B. Tien</b>	<b>Project Number</b>  38650
<b>Project Title</b> <b>The Effect of Solar Energy on Water Filtration</b>	
<b>Objectives/Goals</b> The purpose of this experiment is to create a low-cost device that effectively filters contaminated water to produce purified drinking water using solar energy. <b>Abstract</b> <b>Methods/Materials</b> Filtered contaminated water using a magnifying lens suspended above a copper heating chamber into which unclean water was slowly dispensed, creating a focal point hotter than the original sunlight. A pulley system allowed the device to track the path of the sun through counterweights on either side that rotated the magnifying lens. Used a Purtest Bacteria Test Kit and MHT Drinking Water Test Strips to test the samples of water. <b>Results</b> The drinkability levels of the water from my device were much better than the levels found in tap water, my control variable. Compared to water treated by the traditional NaDCC tablet, my device produced water with less total alkalinity, pH, total hardness, and free chlorine/bromine. The water produced by my device had zero contaminants and an ideal 6.0 pH level. Tap water, water treated by the tablets, and water treated by my device all tested negative for the presence of E. coli and Coliform bacteria in the original pond water. The results of all three trials were very consistent. <b>Conclusions/Discussion</b> Drinkability test showed that my device successfully filtered biologically contaminated water to a healthy 6.0 pH level with no contaminants. The bacteria test proved that my device could also filter out E. coli and Coliform bacteria. All of my trials proved that my hypothesis was correct. I was able to create a low-cost device that can effectively filter biologically contaminated water using solar energy.	
<b>Summary Statement</b> I created a low-cost device that can use sunlight to effectively filter biologically contaminated water.	
<b>Help Received</b> My father taught me how to solder and supervised the construction of the device. My science teacher reviewed my papers.	