



**CALIFORNIA STATE SCIENCE FAIR
2011 PROJECT SUMMARY**

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Project Title Individual Water Purification System	
<p style="text-align: center;">Abstract</p> <p>Objectives/Goals If we can create a water purification system for individual houses so that it recycles "used" water, then lots of water and money would be conserved. This purification system, the IWPS (Individual Water Purification System), would incorporate five types of water purification methods so that the resulting, "recycled" water would cost less and be more pure than other existing brands.</p> <p>Methods/Materials The IWPS is a five-stage purification system. Stage A consists of an almost vertical PVC pipe with one opening in the middle and one at the bottom. The middle opening should have a slanted piece of mesh placed in it to filter out solid waste. Stage B consists of one large container for sedimentation, as only the lighter particles can flow on to Stage C, which contains the Luster Hydrosponge, a sponge used to grow aerobic bacteria for eating remaining unwanted particles and for aerating the water. After this, Stage D uses chemicals to neutralize the pH levels and bond with remaining dirt particles so that they can be easily filtered out mechanically. The last stage, Stage E, uses ultra-violet light to kill any remaining bacteria.</p> <p>Results The IWPS-produced water is far more pure than EPA standard for water purity and compares favorably with other sources of water. In many areas (copper and nitrites contamination, alkalinity, hardness), the IWPS water has the lowest level of contamination. The IWPS is also very water-efficient, as only six ounces of water weren't recycled out of 10 gallons of water we tested. Finally, the IWPS water costs considerably less than existing water sources, like tap water, bottled water, and reverse-osmosis system (projections based on the average consumption of 4 gallons per day).</p> <p>Conclusions/Discussion The main goal of the Individual Water Purification System was to conserve water, which we succeeded in doing; for the ten gallons we tested in our system, only six ounces flowed out into the "sewer", which means 99.53% of the water will continue being reused in the system. The quality of this water not only exceeds the EPA standards, but also compares favorably to other popular water sources in almost all categories tested, as the only contaminant that it has higher levels of is chlorine. Also, our calculations project the cost of the IWPS is lower than that of current water sources, making the IWPS the best water system in terms of water efficiency, water purity, and cost.</p>	
Summary Statement To conserve water, the IWPS was designed as a five-stage water purification system intended to purify all water-- whether this is toilet water, sink water, or water from the shower-- coming from the house so that it can be reused.	
Help Received All work was completed only by the three members of the IWPS Project. We were supervised by Maisam's dad while building the system.	