



CALIFORNIA STATE SCIENCE FAIR 2007 PROJECT SUMMARY

Name(s) Shaleena Jeeawoody	Project Number J0908
Project Title Water Purification: The Green Way	
Objectives/Goals Many contaminants can enter the water system through various ways, greatly endangering human health. Excess iron can cause chronic fatigue, cancer, and heart disease, while excess copper can damage the liver and kidneys, and can cause severe stomach distress. The purpose of my project is to find out whether natural products, such as Dungeness crab shells and Nopal cactus gel, can filter out the metals, iron and copper, dissolved in water.	
Abstract Methods/Materials I used four plastic columns and filled the first one with sand, the second one with charcoal, the third column with crushed boiled Dungeness crab shells, and the last one with raw Nopal cactus gel. I prepared three solutions of iron (II) sulfate and copper (II) sulfate each of different concentrations: 5 ppm, 50 ppm, and 500 ppm. I ran 100 mL of distilled water through each tube as my control, followed by 100 mL of each solution. I measured the concentration of metals in the filtrates using Lamotte iron and copper test strips. As the water could not penetrate the thick gel, I put the cactus gel in jars with 100 mL of each solution, gave them a good shake, and let them stand. In one set of jars, I used raw, untreated cactus gel and in the other set I used boiled cactus gel. Over several days, I measured the concentration of metals in the jars using the Lamotte test strips.	
Results Sand proved to be 0% effective as it did not filter out any of the metals. For all concentrations of iron and copper tested, the crab shells removed all the metals instantaneously, showing 100% effectiveness, just like the charcoal. The boiled cactus gel shows 100% effectiveness in iron removal after 2 days instead of 30 days when raw, and 100% effectiveness in copper removal after 3 days instead of 30 days when raw.	
Conclusions/Discussion Since the Dungeness crab shells and Nopal cactus gel trapped the dissolved metals, iron and copper, present in the water, the filtered water contained no metal, thus making it safe to consume. Therefore, crab shells and cactus gel can be used as filters to purify water, hence, an environmentally friendly way to cleanse our water by recycling the crab shells that would otherwise end up in landfills and by using cactus that grows in abundance in South West United States and Mexico.	
Summary Statement The purpose of my project is to find out whether natural products, such as Dungeness crab shells and Nopal cactus gel, can filter out the metals, iron and copper, dissolved in water.	
Help Received My mother helped me gather the materials I needed and guided me during my experiments. My father and my sister helped me with my display board.	