



CALIFORNIA STATE SCIENCE FAIR  
2006 PROJECT SUMMARY

<b>Name(s)</b> Christine K. Renschler	<b>Project Number</b> <b>J0818</b>
<b>Project Title</b> <b>The Aftermath of Hurricane Katrina: Removing Lead from Floodwater Contaminated Wood</b>	
<p style="text-align: center;"><b>Abstract</b></p> <p><b>Objectives/Goals</b> The samples of floodwater taken in New Orleans after Hurricane Katrina by the Environmental Protection Agency showed large amounts of lead and other toxic chemicals in the floodwater. After the flood water receded from New Orleans, remains of the chemicals are still present on the buildings.</p> <p>The purpose of my project was to determine what would best remove lead from contaminated wood.</p> <p><b>Methods/Materials</b> I soaked 50 popsicle sticks for 6 days in lead contaminated water (100mg/L Pb equivalent), to simulate the wood in the houses being soaked. Then, I let the popsicle sticks dry. After 9 days, I cleaned each popsicle stick with either water, soapy water, 5% sodium hydroxide, 5 % hydrochloric acid, or one of two solutions of EDTA, a lead chelator (9.64 <math>\mu\text{M}</math> and 964 <math>\mu\text{M}</math>). I measured the amount of lead removed from the popsicle sticks using a thioacetamide color reaction method and compared them to standard lead solutions to determine their concentration. Popsicle sticks soaked in water without lead served as negative controls.</p> <p><b>Results</b> 5% NaOH caused the wood to break down, so it could not be used. The average lead concentrations from 5 samples per cleaning solution were: water: 1.6 mg/L; soap: 1.3 mg/L; 5% HCl: 16 mg/L; EDTA (9.64 <math>\mu\text{M}</math>): 1.4 mg/L; EDTA (964 <math>\mu\text{M}</math>): 1.4 mg/L. HCl removed the greatest amount of lead.</p> <p><b>Conclusions/Discussion</b> My experiment proves that among the solutions tested, 5% HCl would be the best cleaning solution to remove lead from wood. One similar acid is vinegar, containing 5% acetic acid. It is cheap and would be widely available for decontaminating homes. It disproves my original hypothesis that EDTA would remove the most amount of lead.</p>	
<b>Summary Statement</b> My project was about the environmental cleanup of lead contamination following the flooding caused by Hurricane Katrina using different cleaning solutions.	
<b>Help Received</b> Dad provided lab and supervised experiments; Aunt helped choose lead as the contaminant to study; Dr. Hemmi ordered chemicals and provided methods.	