



**CALIFORNIA STATE SCIENCE FAIR  
2009 PROJECT SUMMARY**

<b>Name(s)</b> <b>Julia A. Pokorny</b>	<b>Project Number</b> <b>J0523</b>
<b>Project Title</b> <b>A Summer Fashion Statement or a Chemical Reaction? What Turns Hair Green in Pool Water?</b>	
<p style="text-align: center;"><b>Abstract</b></p> <p><b>Objectives/Goals</b> The purpose of the experiment was to find out whether copper or chlorine causes blonde hair to turn green in pool water.</p> <p><b>Methods/Materials</b> I made nine solutions with three different concentrations of copper-based algaecide and three different concentrations of chlorine bleach. I made a solution with dilutions appropriate for swimming pool water and solutions with lower and higher concentrations of algaecide and chlorine. I poured the solutions into clear containers, put lids on the containers and waited two days, placed hair in the containers, replaced the lids, and waited six days before taking the hair out.</p> <p><b>Results</b> I found that only solutions with high concentrations of copper-based algaecide had hair that changed color. The solutions with high amounts of chlorine dissolved the hair. The exception was the container with high algaecide and high chlorine. In this solution the hair did not dissolve but did change color. A precipitate also appeared on the bottom of the container which suggests a chemical reaction between the copper and chlorine.</p> <p><b>Conclusions/Discussion</b> I can conclude that copper does affect the hair color. I cannot make a conclusion about chlorine, because there was either no change or the hair was dissolved.</p> <p>I also did a secondary experiment. It suggested that copper pipes may be a source of copper in pool water and that chlorine be a factor in releasing the copper into the water.</p>	
<b>Summary Statement</b> I tested copper and chlorine to see what turns blonde hair green in pool water.	
<b>Help Received</b> Dad helped me learn about dilution, supervised while making the solutions, and helped me choose the dilution factors for the solutions.	