



**CALIFORNIA STATE SCIENCE FAIR  
2009 PROJECT SUMMARY**

<b>Name(s)</b> <b>Alexis G. Baldwin</b>	<b>Project Number</b> <b>J0503</b>
<b>Project Title</b> <b>Color Me Blue!</b>	
<p style="text-align: center;"><b>Abstract</b></p> <p><b>Objectives/Goals</b> In this science fair project, I made an electronic device which functions as a colorimeter, that converts the concentration of dye in a solution into electrical resistance, which you can read off a multimeter. Then I made a set of standard solutions to convert between the data I have (resistance) and the data I want (Concentration). Then I determined the amount of dye in the samples with unknown concentrations (sport drinks, juices, and soda) and tracked the rate of color loss in a bleach-treated solution.</p> <p><b>Methods/Materials</b> I used the Beer Lambert law and chemical kinetics for my science fair project. I did one test on my colorimeter to find out how much blue dye was in each cuvette from the diluted series, then to find out how much blue dye was in the various sports drinks, I measured the different sports drinks on the colorimeter. I then did a different test and took the cuvette with half water and half blue dye and placed different amounts of bleach inside each one and tracked the rate at which bleach affected the blue dye.</p> <p><b>Results</b> In my test for the unknown amounts of blue dye, I found that Shasta soda had the most amount of blue dye #1. The following: Tropicana Twister Blue raspberry juice, All Star Berry Gatorade, Fierce Grape Gatorade, were all very close in the amounts of blue dye. They were separated by less than a 100th of an ohm. The G2 Gatorade had the least amount of blue dye. The last test I performed was with the bleach. The results were that the solution with the most drops of bleach (four) stopped at 0.611 ohms at 17 minutes when it became clear and colorless. The test with 2 drops of bleach went to 0.600 ohms at 15 minutes to become colorless. The third test involved one drop of bleach and took 19 minutes, stopping at 0.599 to become colorless.</p> <p><b>Conclusions/Discussion</b> The interesting thing is that my hypothesis was based on my belief that the bluer the product, the more blue dye was in it, but actually only by a fraction of an ohm were the drinks apart. This was amazing because the color on these products ranged from a light purple to blue. The other testing with the bleach also produced an unexpected result because the 2 drops of bleach actually took 15 minutes to make the cuvette become colorless and yet the 4 drops took 17 minutes in the same amount of water with blue dye.</p>	
<b>Summary Statement</b> Measuring the amount of blue dye is in various liquids and tracking the rate at which bleach affects it.	
<b>Help Received</b> Dad supervised the building of the circuit; Mom with proofreading my report.	