



**CALIFORNIA STATE SCIENCE FAIR  
2013 PROJECT SUMMARY**

<b>Name(s)</b> Nicole M. Bialick	<b>Project Number</b> <b>J2107</b>
<b>Project Title</b> <b>The Effects of Environmental Gases on the Stability of Inkjet Prints</b>	
<p style="text-align: center;"><b>Abstract</b></p> <p><b>Objectives/Goals</b> It is known that humidity, temperature, and exposure to bright lights can cause damage to photos and inkjet prints. The object of the study was to investigate whether common environmental gases affect the stability of inkjet prints. The goal is to determine the conditions for long-term preservation of homemade inkjet prints.</p> <p><b>Methods/Materials</b> It is known that humidity, temperature, and exposure to bright lights can cause damage to photos and inkjet prints. The object of the study was to investigate whether common environmental gases affect the stability of inkjet prints. The goal is to determine the conditions for long-term preservation of homemade inkjet prints.</p> <p><b>Results</b> The environmental gases had little to no effect on the color stability of the prints during the first two months. However, dramatic changes were seen after four months of incubation. Very minor changes were observed by the evaluators at each week. At week 16, carbon dioxide caused an obvious break-down of the inkjet ink. The inkjet color most effected by the environmental gases were the skin-tones. Carbon dioxide caused the greatest number of color changes, followed by nitrogen. Oxygen and room air caused the least number of changes in inkjet color stability.</p> <p><b>Conclusions/Discussion</b> An experimental system was devised so that treated inkjet prints could be closely compared to the control prints from which they came from. By placing treated cutout disks directly back into the control color pallet, the observer is able to make an accurate determination if color changes have occurred the most significant color changes were caused by carbon dioxide and nitrogen. At each time point the skin-tone prints were altered by at least one of the gases. The other colors tested (Red, blue, green, yellow and black) were pure color, or a very simple mixture. Skin-tones are a mixture of many colors, and if the gases effected just one of the combination's colors, a change in the overall skin-tone may be seen. At week 16 changes to the skin-tone and pure red color were observed.</p>	
<b>Summary Statement</b> High concentrations of common environmental gases can effect the stability of inkjet prints.	
<b>Help Received</b> My father helped me to fill up the Mylar bags, and my whole family helped me to evaluate the prints.	