



**CALIFORNIA STATE SCIENCE FAIR  
2012 PROJECT SUMMARY**

<b>Name(s)</b> <b>Yousef Joseph; Nick Mah</b>	<b>Project Number</b> <b>S1111</b>
<b>Project Title</b> <b>The Effect of Air Pollution on the Rate of Photosynthesis</b>	
<b>Abstract</b> <b>Objectives/Goals</b> The objective is to study the effects of common airborne pollution on the wavelengths and luminosity of sunlight and its effect in photosynthesis on plants. <b>Methods/Materials</b> The experiment was performed with cuvettes containing DPIP, a chloroplast suspension, and a phosphate buffer. The cuvettes were then placed under the exposure of flood lights to stimulate photosynthesis. Then, we would measure the change in color of DPIP, which was being reduced through photosynthesis with a spectrophotometer. With the data, we would then check the overall rate of change with the other gas pollutants. The gas pollutants (nitrogen dioxide and sulfur dioxide) were prepared under a hood (except carbon dioxide) and collected through water displacement in square plastic bottles. <b>Results</b> Sulfur dioxide and carbon dioxide showed a detrimental effect on the rate of photosynthesis. However, nitrogen dioxide had an interesting effect on the rate of photosynthesis. It seemed to improve the rate of photosynthesis. Based on our results, we were able to infer that sulfur dioxide has a more deleterious effect on the rate of photosynthesis than carbon dioxide. <b>Conclusions/Discussion</b> In the data collected, we can conclude that sulfur dioxide and carbon dioxide had a harmful effect on the rate of photosynthesis. Nitrogen dioxide seemed to have a positive effect on the photosynthesis. We believe that these results are incorrect because nitrogen dioxide is a reddish-brown gas that alters the wavelengths of light. However, the gas we collected was clear leading us to believe that the gas collected was not nitrogen dioxide, but another gas that we have yet to identify.	
<b>Summary Statement</b> The purpose of our experiment was to test whether air pollution affected photosynthesis and if it did, to see how harmful the effects were.	
<b>Help Received</b> Mr. Garabedian allowed us the use of his equipment; Mrs. Mah helped with the layout of the board	