



**CALIFORNIA SCIENCE & ENGINEERING FAIR
2018 PROJECT SUMMARY**

Name(s) Richard Li	Project Number 38840
Project Title The Concentration Levels of Carbon Dioxide in Pasadena over Certain Periods of Time	
<p style="text-align: center;">Abstract</p> <p>Objectives/Goals The objective is, first, to measure carbon dioxide levels in the atmosphere, and compare it to carbon dioxide levels taken at Mauna Loa. Second, the objective was to find correlations between the time and concentration of carbon dioxide.</p> <p>Methods/Materials First, the data was taken from a Picarro CO2 Isotopic Analyzer. The data was all plotted on a scatter plot. The linear trend was calculated and subtracted. The new data was then split into four groups. The groups were sorted and averaged to come up with four seasonal variations. The points were then plotted on a scatter plot. The same was done with the Palos Verdes data.</p> <p>Results First, the carbon dioxide concentrations and Mauna Loa concentrations both increased in ppm over 13 years. Next, there were correlations between the time of day and the concentrations. The night time and winter had the largest concentrations of carbon dioxide. The drought period had a winter period that had much higher carbon dioxide concentrations than during other winter periods.</p> <p>Conclusions/Discussion First, there was an increase in both background and Pasadena CO2 levels. Second, there were correlations. Night time had the highest concentrations because there was no sunlight, meaning plants can't perform photosynthesis. Winter has the highest concentrations because of the temperature inversions. The drought period had the highest concentration during winter, possibly because of wind speeds. Overall, there was an increase in CO2 levels, and there were correlations.</p>	
Summary Statement I analyzed thirteen years of carbon dioxide concentrations to find correlations between times of day and concentrations of CO2.	
Help Received I analyzed the data myself. I was supplied the data from Professor Yuk Yung from Caltech University, and Dr. Sally Newman.	