



**CALIFORNIA STATE SCIENCE FAIR
2007 PROJECT SUMMARY**

Name(s) Benjamin Francis	Project Number J1015
Project Title The Good, Bad, and the Ugly of CO(2)	
<p style="text-align: center;">Abstract</p> <p>Objectives/Goals I started this project because I was curious about the greenhouse effect and global warming. My objective was to research and educate myself. I found it all starts in the atmosphere with its gases and carbon dioxide. I choose an experiment that uses carbon dioxide as the main element and interest. How much carbon dioxide is produced by different gas sources?</p> <p>Methods/Materials The experiment uses four different gas sources to produce carbon dioxide: ambient air, human exhalation, nearly pure CO(2), and car exhaust. Each source of air was inflated into different balloons, then through a straw, the gas was leaked into its own test tube of bromothymol blue indicator solution. The goal of the experiment is to neutralize the carbonic acid by adding diluted ammonia to each test tube, documenting the drops used. Materials listed in brief: 5 test tubes, 20 funnel straws, 5 modeling clay washers, 20 balloons-5 sets of 4 different colors, bromothymol blue solution, ammonia, vinegar, baking soda, a tire pump, and a car.</p> <p>Results My hypothesis is: Car exhaust releases more carbon dioxide than the other gas sources. The result did not support my hypothesis. The nearly pure CO(2) released more carbon dioxide than any other gas source. After the experiment trials, I realized that it was now obvious that the nearly pure CO(2) used to represent the natural carbon dioxide would release more gas because it is a created part of the atmosphere.</p> <p>Conclusions/Discussion Carbon Dioxide is important for life on Earth. Natural sources produce carbon dioxide and man made sources produce carbon dioxide too, keeping the balance seems to be the issue. I don't believe that global warming is an accurate description of why our climate is having changes, but there is evidence that pollutants produce harmful effects and too much carbon dioxide has potential to be a problem for our atmosphere. Changing some activities big or small can make a difference. I would have liked to have interviewed a climate scientist and discuss all the techniques used to record weather and predict climates. It would be interesting to discuss global warming with scientists who are for and against the topic. In conclusion, we all need to be good stewards of Earth which sustains us all.</p>	
Summary Statement The interaction of carbon dioxide in the atmosphere and our environment.	
Help Received My mom helped organize my research and journal. She typed the papers and assisted me on putting my board together. My dad assisted me on the experiment. The bar graph was done by our family friend, Steve Kemmer and the interview was given by John Cook, from Central Valley Motorsports.	