



**CALIFORNIA STATE SCIENCE FAIR  
2008 PROJECT SUMMARY**

<b>Name(s)</b> <b>Mary R. Data</b>	<b>Project Number</b> <b>J0906</b>
<b>Project Title</b> <b>Break It Down to Save Our Planet: The Breakdown of CO(2) Emissions</b>	
<b>Abstract</b>	
<b>Objectives/Goals</b> The objective of my experiment was to determine whether CO(2) emissions could be reduce by exposing CO(2) gas to microwaves	
<b>Methods/Materials</b> Fifty (50) empty water bottles with identical size and shape were used in the experiments. I filled each bottle by exhaling into the bottles to simulate carbon dioxide gas emissions. I then used a CO(2) sensor and software program to measure and analyze the CO(2) concentration in parts per million (ppm) for each bottle to establish a base line. The next step was to expose ten (10) bottles to microwaves at a give length of exposure time. Each group of ten (10) bottles was exposed for a different amount of time from 1 to 5 minutes. After each bottle was exposed to the microwaves for their assigned time, I then re-measured the CO(2) concentration of the bottle. I repeated my experiment ten (10) times for each exposure time to insure accurate results. I documented each experiment and analyzed my results.	
<b>Results</b> I found that the microwave exposure time applied to the CO(2) gas has a significant effect on the breakdown of the CO(2) molecules. In experiments #41 through #50 (five minutes exposure time) there was consistently a 54% reduction in CO(2) concentration (ppm) as compared to experiments #1 through #10 (one minute exposure time) which consistently resulted in a 13% CO(2) concentration reduction.	
<b>Conclusions/Discussion</b> Carbon dioxide CO(2) emissions are responsible for 86% percent of the global warming pollution in the United States. The Majority of the CO(2) gas is generated by burning of fossil fuels. Microwaves can break the chemical bonds of the CO(2) molecule reducing the concentration (ppm) in a controlled environment. The length of time CO(2) gas is exposed to microwaves has a significant effect on the reduction of CO(2) concentration.  Just imagine a microwave machine with higher wattage reducing the CO(2) emissions content of a car. I can envision having a magnetron in the trunk of a car and the engine exhaust gas passes through this machine to break the CO(2) molecule into carbon and oxygen. We would really live in a healthy world.	
<b>Summary Statement</b> My project is about the effects of microwaves on the breakdown of the chemical bonds of carbon dioxide gas molecules, which are responsible for global warming.	
<b>Help Received</b> My brother helped me with one of my spreadsheets. My dad helped in the safety of my experiment to make sure I was not injured. He also helped me with the electrical and cutting the wood for my display. I enjoyed nailing, painting and learning how to read electrical diagram and soldering the wires to the LED.	