



**CALIFORNIA STATE SCIENCE FAIR  
2008 PROJECT SUMMARY**

<b>Name(s)</b> <b>Charlie Paulsen; Anthony Rinaldi</b>	<b>Project Number</b> <b>J1624</b>
<b>Project Title</b> <b>The Effect of CO(2) on Ambient Air Temperature</b>	
<p style="text-align: center;"><b>Abstract</b></p> <p><b>Objectives/Goals</b> The objective of this experiment determine whether a container filled with CO(2) would cool at a slower rate than a container filled with ambient air when both containers were heated to the same temperature. Due to the nature of CO(2) molecules, their density, their ability to absorb many wave lengths of radiation, and the long period of time they stay in the atmosphere, the hypothesis developed was that heated CO(2) would cool more slowly than heated ambient air because CO(2) retains heat.</p> <p><b>Methods/Materials</b> Two identical glass aquariums were used for this experiment. Both were fitted with identical Plexiglas lids and thermometers. One tank was filled with CO(2). A wooden framework suspended two identical heat lamps in exactly the same position above each of the aquariums. Glass trays filled with water were placed in identical positions on top of each aquarium to absorb the thermal energy that was generated by the heat lamps so that only visible light radiation was reaching the gases. A black surface was placed under each aquarium so that light radiation from the heat lamps would be absorbed by the black surface and then converted to thermal energy which would heat the gases. This was intended to simulate what happens on the surface of the earth. The heat lamps were turned on, and the temperature of each aquarium was monitored until the temperature inside both aquariums reached 86° Fahrenheit (30° Celsius). Both aquariums reached this temperature at approximately the same time. The heat lamps were turned off and the temperature of each aquarium was recorded every five minutes for 30 minutes. The experiment was repeated twice to confirm the accuracy of the results.</p> <p><b>Results</b> In both trials, the aquarium filled with CO(2) averaged 3°F (1.6°C) higher temperature than the aquarium filled with ambient air. Therefore the hypothesis was supported.</p> <p><b>Conclusions/Discussion</b> Further experiments might involve heating the aquariums for a longer period of time to reach a higher temperature and recording the cooling in five minute intervals for an extended period of time. This would help to further confirm the accuracy of the results. Although the pure CO(2) used in the experiment does not reflect the actual composition of earth's atmosphere, the results of this experiment indicate that CO(2) may have an effect on global warming.</p>	
<b>Summary Statement</b> This project is about determining the effect of CO(2) on ambient air temperature.	
<b>Help Received</b> Father helped construct experiment apparatus.	