



**CALIFORNIA STATE SCIENCE FAIR
2006 PROJECT SUMMARY**

Name(s) Lindsay H. McHugh	Project Number J1527
Project Title It's Getting Hot in Here! A Study on the Greenhouse Effect	
<p style="text-align: center;">Abstract</p> <p>Objectives/Goals The purpose of this experiment is to determine if different amounts of carbon dioxide in the air affect the amount of heat retained in the air. I infer that the can containing the most carbon dioxide, 8g, will retain the most heat and cool down the slowest.</p> <p>Methods/Materials The greenhouse effect will be recreated inside of a coffee can. Carbon dioxide will be made by mixing 140ml of vinegar with various amounts of baking soda. The experiment will include five different coffee cans: one with 140ml. vinegar with no baking soda, one with 140ml. vinegar and 2g baking soda, one with 140ml. vinegar and 4g baking soda, one with 140ml. vinegar and 6g baking soda, and one with 140ml. vinegar and 8g baking soda. Carbon dioxide will be poured into the coffee can and the can will be sealed closed. There will be a special sun lamp positioned above each coffee can to simulate the heat and light of the sun. A thermometer will be taped at the top, middle and bottom of the can to read the temperatures at different heights of the can. The temperature on the thermometers will be recorded every 10 minutes with the light on until the temperatures stopped rising. Then the lights will be turned off and the temperatures at each height of the can will be taken every 10 minutes until they reach room temperature. The readings of the temperatures inside the cans will be compared with those of another thermometer that measures the room temperature at the same time intervals.</p> <p>Results I feel my hypothesis is partially correct because the air within the cans that have the highest amounts of carbon dioxide cooled down more slowly and retained a higher temperature at the end of the test period while the can with air and vinegar cooled to the original starting temperature the quickest and had the lowest temperature in each section of the cans at the end of the test period. However, the can with 6g of baking soda, the second highest amount of baking soda, retained the most heat in all levels of the can and cooled at the slowest rate, not the can with 8g of baking soda as I hypothesized.</p> <p>Conclusions/Discussion My conclusion is that more carbon dioxide in the air caused the air to retain more heat and take longer to cool down. This experiment may show that as the amount of carbon dioxide in Earth's atmosphere increases, the atmosphere will hold more heat, causing the temperature to rise in the future.</p>	
Summary Statement The purpose of this experiment is to determine if different amounts of carbon dioxide in the air affect the amount of heat retained in the air.	
Help Received My father helped by purchasing the supplies that I needed. He also helped with some typing when my hands got tired. My mother helped by giving advice for the design of the board. Both of my siblings informed me when the timer was buzzing so that I could take temperatures and recordings.	