



**CALIFORNIA STATE SCIENCE FAIR  
2005 PROJECT SUMMARY**

<b>Name(s)</b> Nathan Malefyt; Griffin Whitehead	<b>Project Number</b> <b>J0521</b>
<b>Project Title</b> <b>How Does the Amount of CO(2) Gas Compare to the Amount of CO(2) Solid after the Sample Has Completely Sublimed?</b>	
<p style="text-align: center;"><b>Abstract</b></p> <p><b>Objectives/Goals</b> From a known mass of solid CO<sub>2</sub> (dry ice), what is the volume of CO<sub>2</sub> gas produced when the sample has completely sublimed? How does the measured volume compare to the volume predicted by the ideal gas law?</p> <p><b>Methods/Materials</b> We took ten different samples of solid CO<sub>2</sub> (dry ice) of different known masses. After weighing each sample we placed them in our reaction vessel one at a time and waited for them to completely sublime. Once they had completely sublimed we measured the amount of gas by seeing how much water was displaced by the CO<sub>2</sub>. We recorded and graphed the results and compared the gas amounts from our given solid to the predictions of the ideal gas law.</p> <p><b>Results</b> Our results were plotted on two graphs, one comparing the amount of grams of dry ice to the liters of gas produced, and the other comparing the grams of dry ice to the moles of CO<sub>2</sub> gas. Using the method known as the least squares fit for linear functions we plotted a straight line on our grams of CO<sub>2</sub> to moles graph.</p> <p><b>Conclusions/Discussion</b> From our limited results we have found that the amount of CO<sub>2</sub> gas produced by the dry ice is proportionately the same with all masses. We had many minor adjustments we made to get accurate results. The ideal gas law gives a very accurate prediction of our results in our experiment with the ideal gas CO<sub>2</sub>.</p>	
<b>Summary Statement</b> We measured the volume of CO <sub>2</sub> gas given off by various weights of dry ice, and evaluated those data points using the ideal gas law equation ( $PV=nRT$ ) to calculate the molecular weight of CO <sub>2</sub> .	
<b>Help Received</b> Nathan's father helped us in using the equipment and helped us better understand the science behind our experiment.	