



**CALIFORNIA STATE SCIENCE FAIR
2009 PROJECT SUMMARY**

Name(s) Adam D. Walker	Project Number J2036
Project Title The Curious Death of Stomata by Carbon Dioxide	
Objectives/Goals To determine if high concentrations of carbon dioxide influence stomata numbers and function.	
Abstract Methods/Materials Drill one hole in experimental 1 gallon plant container for surgical tubing insertion. Assemble dry ice container (put Vaseline around the holes, duct tape the plugs in place and put glass tubing through one of the plugs). Fill 2 wide mouth containers with Vermiculite(1lb) 2½ inches deep. Plant 2 plants(one philodendron and one aluminum pilea)in each container. Cut 5lb. dry ice with screwdriver and hammer and place(wearing gloves)inside dry ice container. Put dry ice container inside of Styrofoam ice chest and surround with newspaper. Connect the tubing. Start experiment by releasing carbon dioxide into one container while the other container remains open to ambient air. Water control container every other day and experimental only on the first day because water evaporates and condenses at the top of the container and falls.Keep the plant containers exposed to sun keeping a 70-80 degree environment. Replenish dry ice every 2 days and select one leaf from each plant in both containers for stomata counting. Paint clear nail polish on the undersurface of the leaves. After nail polish dries, remove the nail polish film impression with forceps.Place impressions on microscope slides with a drop of water.Count stomates under microscope.Mark slides with date as back-up to written data. Continue experiment for 8 more days (experiment is a total of nine days).Collect data as measurements are made.	
Results By exposing experimental plants to high levels of carbon dioxide, stomata numbers decreased and the plants died. After two days, the experimental plants were starting to wilt while the control plants were fine. After a week of exposure to only carbon dioxide and water, the experimental plants were completely brown and lifeless. In the end, the experimental plants had zero stomata while the control plants had eighty-one stomata (philodendron) and one hundred sixty-six stomata (aluminum pilea).	
Conclusions/Discussion I found that if a plant is in an environment saturated with Carbon Dioxide for too long, its photosynthetic process shuts down, and the plant virtually starves itself to death.I have learned that if the carbon dioxide levels on earth rise too high, it will not only cause global warming, but also might kill all of the plants and animals.	
Summary Statement How do high levels of carbon dioxide effect stomata numbers and function.	
Help Received Parents helped get materials; Received some advice from teacher.	