



**CALIFORNIA STATE SCIENCE FAIR
2007 PROJECT SUMMARY**

Name(s) Emerson W. Glassey	Project Number J1712
Project Title Photosynthesis	
Abstract Objectives/Goals My objective was to find out whether or not the rate of photosynthesis changed as light intensity was increased or decreased. Methods/Materials I used a jar, for the airtight container; a carbon dioxide sensor; an oxygen sensor; a light sensor; a blanket; a temperature sensor; LabPro; Logger Pro; a computer; two 40 watt incandescent bulbs, with holders; a variable resistor; and two Chamaedorea Elegans or Chamaedorea Neanthe bellas. I used the carbon dioxide and oxygen sensors to measure the rate of photosynthesis. If oxygen goes up and carbon dioxide goes down then the rate of photosynthesis must be rising. The temperature and light sensors were also collecting data at the same time. All of this plugged into the LabPro, which went to the computer and was recorded by Logger Pro. The plants were inside the jar with the sensors in the jar lid, except the light sensor which was next to the jar. Samples were taken every half-minute for 11 hours. Results At no light, carbon dioxide levels rose and oxygen levels decreased. At 33 lumens, carbon dioxide levels rose slower and oxygen levels decreased at a lower rate. At 66 lumens, carbon dioxide ranged from rising to staying level. At 100 lumens, the carbon dioxide levels went down or stayed level and oxygen levels either went up or stayed level. Conclusions/Discussion Although the oxygen never significantly went up, nor the carbon dioxide down, it was obvious to me that the rate of photosynthesis went up as the light intensity was increased. Basically this is what happened: As the heat rose in the jar due to the lights, the rate of respiration went up, in order to cool off the plant. This caused the amount of carbon dioxide to rise. Respiration consumes oxygen and gives off carbon dioxide; but, at the same time the rate of photosynthesis rose because of the increased light intensity. So at 100 lumens, they canceled each other out, but at 0, 33, and 66 lumens the rate of respiration was faster than photosynthesis. So, yes, the rate of photosynthesis increased as light intensity was increased.	
Summary Statement I tested to see how the rate of photosynthesis for a Chamaedorea Elegans changed under 0, 33, 66, and 100 Lumens.	
Help Received A friend's father lent me most of the sensors, software, and interfaces from Willits High School (he's the chemistry teacher).	