



**CALIFORNIA STATE SCIENCE FAIR
2009 PROJECT SUMMARY**

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Project Title In the Spotlight: The Effects of Light Intensity on Photosynthesis	
Abstract Objectives/Goals In this project, the goal is to find out what effect light intensity (luminous intensity), of an artificial light source, has on the rate of photosynthesis in an aquatic plant, Bacopa Australis. In order to test the effects of light intensity in terms of luminosity on the rate of photosynthesis, the Bacopa Australis will be tested under four light sources, each with a different measurement of lumens. Since oxygen gas is a byproduct of the photosynthetic process, the rate of oxygen being emitted by a plant can be used to measure the rate of the entire process. Methods/Materials The tip of a single stock of Bacopa Australis is placed inside the 70mL test tube, which is filled completely with a .25% sodium bicarbonate and water solution. The opening of the test tube is then covered with Parafilm to prevent extra amounts of Carbon Dioxide from entering. The test tube is then placed under a small desk lamp in a closet. The 455 lumen bulb is placed into the small desk lamp. After five minutes of being exposed to the 455 lumen intensity, the plant is checked. The bubbles released by the plant are counted and recorded. This is repeated five times. The same procedure is used with the 770, 1060, and 1610 Lumen bulbs. Results Though the data was not entirely conclusive, it did help support the hypothesis in the sense that when the plant was exposed to the highest light (luminous) intensity, the average rate of photosynthesis was the highest. When the overall average number of bubbles for each trial was taken, the average increased as the light (luminous) intensity increased. Through the data it can be concluded that light intensity does have an impact on the rate of photosynthesis. Conclusions/Discussion From the data obtained, it can be concluded that light intensity may have a significant impact on the rate of photosynthesis. A general trend in the averages suggests that a higher intensity may in fact increase the rate of photosynthesis. However, the results of this experiment were not as accurate as possible. Bubbles vary in size and therefore vary in the amount of gases they contain. In addition, oxygen may not have been the only gas that was being emitted, as the plant also releases some carbon dioxide in cell respiration. For these reasons, the results obtained by counting bubbles were not entirely conclusive.	
Summary Statement The experiment tested the effects of light on the rate of photosynthesis.	
Help Received Parents contributed knowledge of aquatic plants; Sister helped put board together	