



**CALIFORNIA STATE SCIENCE FAIR
2009 PROJECT SUMMARY**

Name(s) Dana M. Thibodeau	Project Number J2034
Project Title Algae: Made in the Shade	
Objectives/Goals The objective of this experiment was to discover how sunlight direction affects the growth of algae	
Abstract Methods/Materials The materials that were used were 10 small plastic containers, black spray paint, tap water, green algae, and medium grid sand paper. After completely setting up the containers; each day recordings and observations were taken, including final algae growth.	
Results A 30-day and shorter 20-day trials were conducted. The first trial proved that algae grew best with shades blocking sunlight from the west and east. The trial proved that no shading was not optimal for growth. Complete shading ranked last in total growth. Algae growth was found to be similar in opposite directions. As an example east and west had a difference of only 11%. Second trial results were similar, although there was a slight change in the direction that the optimized growth occurred. The optimum direction was southwest, with the northeast being a close second. Just as the first trial these were opposite directions. Total growth in the two trials was similar but the direction shifted counter-clockwise 45 degrees. It was found that average water temperatures stayed between the high/low daytime temperatures over 90% of the time. Warm temperatures lead to water level drops due to evaporation. Temperatures were cooler in the second trial as a result of the winter season and more rain.	
Conclusions/Discussion It was found that shading in specific directions resulted in optimal algae growth. In the fall season it was determined that east and west shading resulted in optimal growth. In the winter season the optical growth occurred with shading provided in the southwest and northeast directions. To grow algae well, it does not necessarily mean that algae needs complete sunlight. This was proven when multiple partial shaded containers grew better. Therefore, algae will grow more efficiently when receiving some shading. Results proved that this experiment was extremely accurate. This can be validated by facts. When each container and the opposing container (ex: north and south) received similar results, it proved that it was not a coincidence. The shift was most likely due to the change in the position of the sun; however, further research is required to prove that hypothesis.	
Summary Statement This project determined how sun light direction and shading can be used to optimize alga growth.	
Help Received Father showed how to spray paint containers used to grow algae.	