



**CALIFORNIA STATE SCIENCE FAIR
2015 PROJECT SUMMARY**

Name(s) Quentin A. Gonzalez	Project Number 35927
Project Title Can Algae Be Used as an Ink Substitute?	
Abstract Objectives/Goals The purpose of this experiment is to determine if algae, specifically a species of green algae called Spirulina, can be used as an ink substitute and to find what abiotic factors and environmental conditions such as water temperature are best for cultivating algae. Methods/Materials Algae, plant fertilizer, 5 gallon container, printer, ink cartridge, fish tank heater, air pump, air pump tubes. Results During this experiment, I collected some very interesting and conclusive results. From the data I have gathered, I found that it is best to cultivate algae in water that is approximately 80 degrees Fahrenheit, as it had the best growth rate and highest overall weight of the other two temperatures. At the end of the experiment, the Spirulina algae in the 80 degree water had gained and grown an additional 4.33 pounds of algae, greatly overtaking the 50 and 110 degree water. The algae in 50 degree water only added 1.67 pounds and the algae in 110 degree water only added .18 pounds, making it the worst performing of the three temperatures. I also observed that the algae in 80 degree water had the best growth rate compared to the other two containers. Surprisingly, the 50 degree water performed better in all aspects than the 110 degree water. Conclusions/Discussion In conclusion, I feel that my science project was successful. Through valid data and testing, I was able to justify and prove that my hypothesis was correct. Algae growth is, in fact, directly affected by the temperature of water that the culture is growing. My hypothesis was also correct in that it is best to cultivate algae in water with a temperature of approximately 80°F, as it provides the greatest potential for algae compared to the 50°F and 110°F water. In summary, optimal algae growth is seen when grown in waters of 80°F, followed by 50°F being the next most efficient, and then 110°F being the most ineffective of the three temperatures. Most importantly, however, I found that, from my experiment, it is possible to use algae as a substitute for common printer ink. Though it did not product the desired result that I had envisioned, I was still able to print the pigments of the algae onto a piece of paper, which in my opinion is a success, considering no one has ever experimented with this technology. The process of experimenting with printing with algae can be improved, and I believe once it has, the potential for this technology is limitless.	
Summary Statement Use algae to print documents and replace ink sources.	
Help Received Marine biologist educated me and helped me grow algae.	