



**CALIFORNIA STATE SCIENCE FAIR
2011 PROJECT SUMMARY**

Name(s) Kile Young	Project Number 31653
Project Title The Unique Properties of Coccolithophorid Algae and Its Effects on the Biofixation of Carbon Dioxide	
Objectives/Goals The purpose of this experiment is to show a way in which CO ₂ may be reduced by using Coccolithophorid Algae. These algae have the unique property of being able to lock up CO ₂ within their coccolith shells thereby producing carbon sinks. Because of this, CO ₂ does not get released back into the atmosphere where it would have the potential of contributing to global warming. Abstract Methods/Materials Prepare algae culture for the aeration process by combining algae with a solution of boiled salt water and soil nutrient water. Bottle the culture solution and hook up to aeration and light apparatus for 10 days. Remove and separately bottle into 12 (591ml capacity) bottles with 250ml of algae solution in each. Add ferric nitrate in specified quantities into each bottle leaving 2 control bottles with no added ferric nitrate. Measure CO ₂ in bottle and record. Cover opening tightly with plastic wrap and then twist lid on securely. Place on continuous rotisserie motion apparatus. Remove 1 set of bottles after 4 days and carefully measure the CO ₂ level and repeat procedure with 2nd set of bottles after 7 days. Repeat all above for 2nd trial. Record and compare results. Results The results turned out to be consistent with my hypothesis. The algae had the greatest growth with the highest concentration of ferric nitrate at 16ml. Correspondingly, the increased amount of algae consumed the most CO ₂ at this level by decreasing the CO ₂ by 11.6%. Trial 1 and 3 were on the continuous rotisserie motion apparatus for 4 days and trial 2 and 4 were on the motion apparatus for 7 days. The additional 3 days of continuous light and motion proved to increase the amount of CO ₂ removed from the air by 1.5%. I surmised that over the 3 additional days, more algae grew therefore used up more of the CO ₂ within the bottle. Conclusions/Discussion The Unique Properties of Coccolithophorid Algae and Its Effects on the Biofixation of Carbon Dioxide confirms the usefulness of algae and its viability as a method to remove carbon dioxide from the air. Although it is not a final answer to our problem of global warming, it can help, while new technology is being developed and researched for more permanent solutions.	
Summary Statement My project shows the unique ability of Coccolithophorid Algae to reduce CO ₂ in our environment.	
Help Received Mr. Briner (my science teacher) was a great support answering my questions and directing me with his advice, my cousins helped me with their knowledge in the field of environmental studies, and my mom helped me with the board design.	