



**CALIFORNIA SCIENCE & ENGINEERING FAIR
2019 PROJECT SUMMARY**

Name(s) Brett Swertfager	Project Number J1519
Project Title Phytoplankton Growth: Are Terrestrial Fertilizers the Answer?	
<p style="text-align: center;">Abstract</p> <p>Objectives The objective is to determine which nutrient or terrestrial fertilizer will have the most phytoplankton growth.</p> <p>Methods Phytoplankton (Nannochloropsis oculata), iron sulfate, used coffee grounds, Kelp meal, Miracle Gro, Viridis Mix, Petri Dishes, Microscope 400x, digital camera, PH strips. Two samples of every nutrient/fertilizer (control, used coffee grounds, iron sulfate + used coffee grounds, Viridis Mix, Kelp Meal, Miracle Gro), which I counted for growth of phytoplankton daily for 8 days.</p> <p>Results All nutrients/fertilizers increased phytoplankton growth more than my control, with iron sulfate+used coffee grounds resulting the highest growth.</p> <p>Conclusions The iron sulfate + used coffee grounds mixture resulted in the highest phytoplankton growth. With iron sulfate and used coffee grounds being inexpensive and plentiful resources, this combination could be a viable option in increasing diminishing phytoplankton populations as ocean water temperatures rise due to climate change.</p>	
Summary Statement My project is about determining the best nutrient or fertilizer to increase phytoplankton growth to counter the impact of rising ocean temperatures.	
Help Received I planned and executed the samples and testing. I conducted the daily microscopic sample review, counting, and averaging.	