



# CALIFORNIA SCIENCE & ENGINEERING FAIR 2019 PROJECT SUMMARY

<b>Name(s)</b> <b>Farah Aswad</b>	<b>Project Number</b> <b>J0902</b>
<b>Project Title</b> <b>Growing Algae in Different Conditions</b>	
<p style="text-align: center;"><b>Abstract</b></p> <p><b>Objectives</b> The objective of this project is to test whether or not a supply of different concentrations of carbon dioxide, fertilizer and increased light exposure will increase algae growth, which can be useful in many ways such as producing oxygen for breathing. Based on the conducted research, it is hypothesized that the fertilizer will have the biggest effect on the algae growth. To conduct the experiment, 50 ml of cultured algae was tested for growth under different conditions for 1 month: three different concentrations of CO<sub>2</sub>, (5%, 10%, 20%), three different concentrations of fertilizer (5%, 10%, 20%), and continuous exposure to light. Sugar and brewer s yeast were used to produce CO<sub>2</sub> in reactor bottles to be released to the bottles labeled CO<sub>2</sub>, through a tubing apparatus connecting both bottles. A total of 40 bottles of algae were cultured (5 for the control, 5 for each of the CO<sub>2</sub> concentrations, 5 for each of the fertilizer concentrations, and 5 for continuous exposure to light). Algae growth was analyzed using spectrophotometer.</p> <p>The results showed that the 20% carbon dioxide concentration was the best for the algae to grow. Additionally, the algae grew with the higher concentration of fertilizer at a slower rate. Exposure to continuous direct light significantly decreased the amount of algae. Therefore, my hypothesis was proven incorrect in that fertilizer did not have the best effect on algae growth. The least effective was the control as it had no source of CO<sub>2</sub> or fertilizer.</p> <p>To further expand this project, I would like to test if different temperatures, level of pH of the water, and/or if vitamins, such as VIT B, VIT C, and VIT E are provided, would affect algae growth.</p> <p><b>Methods</b> 50 ml of cultured algae was tested for growth under different conditions for 1 month: three different concentrations of CO<sub>2</sub>, (5%, 10%, 20%), three different concentrations of fertilizer (5%, 10%, 20%), and continuous exposure to light. Sugar and brewer s yeast were used to produce CO<sub>2</sub> in reactor bottles to be released to the bottles labeled CO<sub>2</sub>, through a tubing apparatus connecting both bottles. A total of 40 bottles of algae were cultured (5 for the control, 5 for each of the CO<sub>2</sub> concentrations, 5 for each of the fertilizer concentrations, and 5 for continuous exposure to light). Algae growth was analyzed using spectrophotometer.</p> <p><b>Results</b></p>	
<b>Summary Statement</b> The objective of this project is to test whether or not a supply of different concentrations of carbon dioxide, fertilizer and increased light exposure will increase algae growth.	
<b>Help Received</b> I have conducted the experiment myself.	