



**CALIFORNIA STATE SCIENCE FAIR
2016 PROJECT SUMMARY**

Name(s) Katherine L. Tolles	Project Number J1515
Project Title Can We Terraform Mars?	
Abstract Objectives/Goals The objective of this study was to try and grow Anabaena (blue-green algae) in the atmospheric aspect of a simulated Martian environment, to help determine whether this microbe could survive on Mars and begin terraforming the planet. Methods/Materials Scientific Vacuum, with meter to gauge pressure (measurable in Kpa). Tank of CO ₂ . Samples of Blue-Green algae. Sterilized Petri dishes, transfer pipets, beakers and graduated cylinders. Results A sample of Blue-Green algae was placed in a scientific vacuum for a week, and a photograph of its progress was taken every day at approximately the same time. At the end of the week, a color picker tool of a software application was utilized to identify the hue. The hue degree showed a steady increase throughout the week, indicating a steady increase of cultivation. Although, when I determined the percentage difference of the hue between each day, the data suggested a slight decrease in speed of the algae's daily cultivation towards the end of the week. Conclusions/Discussion I concluded that the Blue-green Algae was capable of surviving in an aspect similar to that of Mars, therefore beginning that process of converting the atmosphere. However, my data shows that it is possible this microorganism may not thrive for a long period of time, perhaps due to the minuscule amount of nitrogen available within the simulated atmosphere. My results can contribute to the research on possibly using microbes as the first step in terraforming Mars.	
Summary Statement I showed that Blue-Green Algae is capable of cultivation in a simulated aspect of a Martian Environment.	
Help Received I talked to many scientists about which direction I should take my project, including Josh Schimel of UCSB, and Frank Kinnaman. I also received guidance from my science teachers at school to help me with learning how to properly use the scientific vacuum and to check my calculations of some formulas.	