



# CALIFORNIA SCIENCE & ENGINEERING FAIR 2019 PROJECT SUMMARY

<b>Name(s)</b> <b>Javeria Ahmed; Ynna Buriel; Rosie Chen</b>	<b>Project Number</b> <b>J1101</b>
<b>Project Title</b> <b>Greenhouse of the Future: A Low Maintenance, Low Cost, and Space Efficient Greenhouse Alternative</b>	
<p style="text-align: center;"><b>Abstract</b></p> <p><b>Objectives</b> The purpose of this project is to build a new greenhouse to replace modern greenhouses by making it more space efficient, cost-efficient, and low maintenance.</p> <p><b>Methods</b> The main materials group used to build our prototype were wood, polycarbonate, PVC pipes, and irrigation tubing. To test our device, our group grew 20 arugula plants in 2 chambers on the same conditions. Each chamber received 12 hours of LED light per day and was watered for 20 minutes on our water system every other day for 31 days. Each chamber also received the same amount of soil, until the topsoil reached the edge of our trapezoid. Our group measured how tall the plants were (taking the tallest plant for measurement) in cm from the soil level to the top of the leaves.</p> <p><b>Results</b> The arugula grew 2.5 inches, which was just short of our criteria, 3 inches. However, our greenhouse fulfilled every other criteria and constraint. Our greenhouse was built under \$100, was only about 4 feet by 0.5 feet by 3 feet, and had a working water system and LED light system.</p> <p><b>Conclusions</b> From what we can conclude from our test, the arugula did not grow as well as we hoped, meaning that our prototype was environmentally friendly but cannot produce as many crops as the average greenhouse.</p>	
<b>Summary Statement</b> We created a greenhouse that was more space efficient, cost efficient, and low maintenance than a regular greenhouse.	
<b>Help Received</b> We designed and built the greenhouse ourselves. We used our school's tools to build the greenhouse and we got some of our data from agrilyst.com.	