



# CALIFORNIA SCIENCE & ENGINEERING FAIR 2018 PROJECT SUMMARY

<b>Name(s)</b> Chloe Brandon	<b>Project Number</b>  38435
<b>Project Title</b> Carbon Dioxide Uptake in California Native vs. Non-Native Plants	
<b>Abstract</b> <b>Objectives/Goals</b> This project was designed to observe the differences in carbon dioxide consumption between varieties of California native drought-resistant ( <i>Salvia</i> species, commonly known as sage) and the non-native landscaping plant <i>Ligustrum recurvifolium</i> . The two secondary objectives were a) measuring oxygen production rates and b) investigating leaf anatomy images in these plants. <b>Methods/Materials</b> Carbon dioxide and oxygen sensors were used to measure uptake and production levels. In addition, a plastic chamber, digital data logging system, <i>Salvia mellifera</i> plant, <i>Salvia leucophylla</i> plant, <i>Ligustrum recurvifolium</i> plant, spinach clippings, and a glass thermometer were used. <b>Results</b> The carbon dioxide data collected were compared to microscopic images of each plant's leaf structures and stomata, as well as data on the rates of oxygen generation in each species. The observed differences between <i>Salvia mellifera</i> and <i>Salvia leucophylla</i> were statistically significant. The <i>Salvia mellifera</i> was more efficient at removing carbon dioxide levels than <i>Salvia leucophylla</i> , although they were both more efficient than the <i>Ligustrum</i> . Anatomical differences in stomata and drought-resistant features were observed. <b>Conclusions/Discussion</b> Although the carbon dioxide uptake data were statistically very similar, the approximately 16-fold difference in water use makes the drought-resistant California natives a good option for water conservation without reducing carbon dioxide uptake.	
<b>Summary Statement</b> I devised a project which found that California native and non-native plants have similar carbon dioxide uptake rates.	
<b>Help Received</b> Dr. Karen Jain for her guidance in microscopic viewing and statistical analysis and Ms. Mary Hines for coordinating use of the sensors and equipment.	