



# CALIFORNIA SCIENCE & ENGINEERING FAIR 2019 PROJECT SUMMARY

<b>Name(s)</b> <b>Landon Pretre</b>	<b>Project Number</b> <b>J1127</b>
<b>Project Title</b> <b>The Green Zone: Plants Filtering Our Air</b>	
<p style="text-align: center;"><b>Abstract</b></p> <p><b>Objectives</b> The purpose of this project is to understand whether plants, such as Peace Lily, Snake Plant, and Spider Plant, can help clean our air especially when smoke or other bad chemicals are released.</p> <p><b>Methods</b> The project measured the ability to plants to filter surrounding air over a 24 hour period within a greenhouse tent when toxins, including smoke from a burned sticky note, formaldehyde from car air fresheners, and benzene from wood stain paint were in the air. The toxins were released into the sealed tents with first one and then three plants. The plants tested were the Peace Lily, Snake Plant, and Spider Plant, which are known to be good air filterers. A control tent without a plant was used for comparison purposes in all tests. An identical air quality meter was put in each tent to monitor the air quality, measured by levels of Formaldehyde (HCHO), Particulate Matter (PM2.5), and Benzene gas and other toxic organic compounds (TVOCs).</p> <p><b>Results</b> The results were mixed but especially interesting for the Smoke Test which showed the tents with one plant dropping pollution levels slightly more quickly than no plant. When there were three plants, there was a major difference between the time when the plant tents' pollution started dropping and the control tent pollution started dropping. The Spider plant won the Smoke Tests for both one and three plants, with the Peace Lily and Snake Plants not far behind, also doing significantly better than the control tent with no plant.</p> <p>The data for the Air Freshener and Wood Stain Tests was inconclusive because it was hard to control the release conditions. However, from those tests, it was evident that these home products (air freshener and wood stain) did cause pollution in the air, especially releasing gases like benzene (and other volatile organic compound gases) and formaldehyde that are both harmful to humans.</p> <p><b>Conclusions</b> Overall, this project proved the hypothesis that if toxins are released near plants, such as smoke, then the air will be cleaner than the air without plants, especially during the day time. Additionally, the more plants the better for cleaning the air. Perhaps plants can be used in cities near polluting factories to help reduce their negative impact on the environment?</p>	
<b>Summary Statement</b> My project proved that certain plants can filter toxins like smoke and chemicals from the air during daylight time periods.	
<b>Help Received</b> I received help recording toxin levels when I was at school or at sports. Also, I had help from my dad in sealing the tents. I got the idea from my grandmother who showed me a plant air filtering sheet from her gardening club. My mom helped me order the air quality measuring equipment and tents.	