



CALIFORNIA SCIENCE & ENGINEERING FAIR 2018 PROJECT SUMMARY

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Project Title Effects of Artificial Light on <i>Solanum lycopersicum</i> var. <i>cerasiforme</i>	
Abstract Objectives/Goals The objectives were to test the negative effects of artificial light on cherry tomato plants, by the means of the artificial light being turned on during the night compared to the plants having no artificial light at night in order to simulate how light pollution affects plants in densely populated urban areas. A resulting goal was to figure out if inadequate plant growth led to a worsening of air pollution. Methods/Materials Three small, open greenhouses were built for the purpose of sheltering plants from heavy rain and wind, and to protect them from potential frosts, but they did not block natural sunlight in the daytime. Two tomato plants were housed in each greenhouse, for a total of six potted plants, along with bright lights in the first greenhouse, dim lights in the second greenhouse, and no additional lights in the third greenhouse. These solar powered outdoor lights easily turned on at the onset of darkness, simulating a city lighting up at night. Results <i>Solanum lycopersicum</i> var. <i>cerasiforme</i> thrived when grown in optimal conditions (natural sunlight during daytime and darkness at night) in comparison to less favorable conditions, which included the presence of artificial halogen lights on the plants at night. The control group grew an average of 19.25 cm, the group with dim artificial light grew an average of 6.25 cm, and the group with bright artificial light grew to an average of 11.25 cm. Conclusions/Discussion The results prove how plants in bustling cities never get to "sleep," because they are always exposed to bright light, interfering with the circadian rhythms of plants. This may show correlation to an increase in air pollution, since plants that are never removed from bright environments cannot photosynthesize as well as plants grown in optimal conditions, and will produce less oxygen. This discovery may aid environmentalists in reducing air pollution and light pollution by developing better, more "sleep-friendly" lights for cities.	
Summary Statement We discovered that the presence of unwanted artificial light affects the growth and oxygen production of <i>Solanum lycopersicum</i> var. <i>cerasiforme</i> (cherry tomato) plants, contributing to the problem of air pollution in dense urban areas.	
Help Received Pauline Riendeau, Gisele's grandmother, for allowing us to grow the plants in her backyard, our parents for purchasing the materials to construct the greenhouses, and our Chemistry Honors teacher, Mrs. Valle.	