



# CALIFORNIA STATE SCIENCE FAIR

## 2007 PROJECT SUMMARY

Name(s) <b>Jessica Y. Kwan</b>	Project Number <b>S1517</b>
<b>Project Title</b> <b>Determination of the Ideal Concentration of Hydrogen Peroxide Solution for the Growth of Flowering Plants</b>	
<b>Objectives/Goals</b> The objective of this research was to determine which concentration of hydrogen peroxide ( $H_2O_2$ ) solution would be optimal for the maximum growth of a plant.	<b>Abstract</b> Five flowering viola plants and five flowering impatiens plants were purchased and repotted into separate flower pots containing a general potting soil which had no added fertilizers. The violas and impatiens were separated into two different groups, and each pot was labeled according to the percentage of $H_2O_2$ solution that the plant would receive. Every other day, for two weeks, each plant was watered with 40 mL with its respected concentration of $H_2O_2$ , and the height and length of each plant was recorded. The four different percentages of $H_2O_2$ solutions (1.5%, 3%, 4.5%, 6%) were diluted, using tap water, from a 30% hydrogen peroxide solution before watering the plants. Seven recordings of each plant were taken by the end of this experiment.
<b>Results</b> Overall, the flowering plants which were watered with the 1.5% concentration of $H_2O_2$ grew the tallest and longest. The growth of the flowering plants watered with 3% $H_2O_2$ did not support the hypothesis because the plants did not reach optimal height or length growth. The growth of plants watered with 4.5% and 6% $H_2O_2$ solutions declined until the plants had wilted. The control group, which was not watered with any concentration of $H_2O_2$ , grew at a steady rate, but did not grow as tall or long as the plants in 1.5% $H_2O_2$ solution.	<b>Conclusions/Discussion</b> Through the experimentation, it was determined that the usage of hydrogen peroxide generally led to an increase in plant growth depending on the concentration of the solution. At a low concentration of 1.5%, the growth of the plant was enhanced, while at a high concentration of 4.5% and 6%, the growth of the plant was stunted. The 3% concentration of $H_2O_2$ , which is marketed by the horticultural industry, initially helped the plant to grow, and then caused the plant to wilt. This data suggests that the decomposition of $H_2O_2$ solution within the soil of the plant directly affects the growth of plants, and depending on how dilute or concentrated the solution of $H_2O_2$ , the solution can be beneficial for plants.
<b>Summary Statement</b> The purpose of this project was to determine whether or not the varying concentrations of hydrogen peroxide solution would aid the growth of a plant.	
<b>Help Received</b> Mr. Starodub helped with science fair preparation, Father helped educate on the properties of $H_2O_2$ , Mother helped with education of botany, Twin sister helped with dilutions of $H_2O_2$ solution	