



**CALIFORNIA STATE SCIENCE FAIR  
2006 PROJECT SUMMARY**

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<b>Project Title</b> Color Crime	
<b>Abstract</b> <b>Objectives/Goals</b> Plants are found all around us, and often arouse a healthy interest. So, I designed a project intended to increase my knowledge of the world I live in. Five experiments were conducted comparing the pigment composition of various parts of different plants, thus determining what happens to it in different scenarios. <b>Methods/Materials</b> For each experiment, pigment was extracted from the specified plants. Then, for each sample, a chromatography strip was prepared and run for one and a half hours. The remaining pigment extracts from each sample were analyzed with a UV/VIS spectrophotometer at particular wavelengths. Finally, as an addition to the original experiment, some well-separated strips of the chromatograms were cut out to elute the individual pigments. In turn, each individual #clean# pigment was analyzed with the same spectrophotometer at the matching wavelengths. <b>Results</b> Ex.1: [What happens to pigment as leaves change color with seasons?] It was shown that in a series of green, yellow, red, and brown leaves the quantities of different pigments diminish or increase accordingly to replace the previous color of a leaf. Ex. 2: [Why are two leaves of the same tree different in color intensity # one is lighter while the other is darker green?] The lighter leaf contained more of the lighter chlorophyll a, while the darker leaf contained more of the darker chlorophyll b. Ex. 3: [Does the temperature of a refrigerator have an effect on a plants pigment composition?] The refrigerated plant showed no difference* in composition when compared to a fresh plant. Ex. 4 and 5: [Compared different, yet similarly colored parts of the plant to determine whether or not the coloring pigment was the same] The root-crops, leaves, and petals showed no difference* in composition when compared to each other. *it is meant that the graphs constructed from the spectrophotometer#s data had corresponding peaks. <b>Conclusions/Discussion</b> Ex. 1: The pigment in a leaf deteriorates with time, giving way to another pigment, causing a change in color. Ex. 2: The color intensity difference is caused by varying forms of chlorophyll as well as the amounts of pigment found in each leaf. Ex. 3: The temperature of a refrigerator has no effect on the pigment composition of a plant. Ex. 4 and 5: The pigment which gives a certain color to various parts of the plant is the same in all those	
<b>Summary Statement</b> "Color Crime" is designed to create a better understanding of our surrounding flora through analyzing and comparing their pigment composition.	
<b>Help Received</b> Assistance with handling equipment was received from Inna Afassijeva Ph. D.; Lab space provided at University of California in Irvine by Asistant Professor Ruslan Aphasizhev	