



# CALIFORNIA STATE SCIENCE FAIR 2012 PROJECT SUMMARY

<b>Name(s)</b> <b>Enrique Lorenzo; Vanessa Mendoza; Francine Rubio</b>	<b>Project Number</b> <b>S0516</b>
<b>Project Title</b> <b>Leaf Chromatography</b>	
<p style="text-align: center;"><b>Abstract</b></p> <p><b>Objectives/Goals</b> With this experiment, we wanted to find the effects of temperature on pigmentation. To obtain adequate results and ultimately conduct the most conclusive chromatography test, we first tested each element of the experiment itself to find the best materials to utilize when conducting our final experiment. Once we conducted five experiments to give us the best type of paper, chemical, method, time, and color leaf to use, we finally took two leaves (one at 6.67 degrees Celsius and the other heated for 20 s) and conducted our experiment.</p> <p><b>Methods/Materials</b> For each experiment, we took the leaves and crushed them into a chemical in a beaker and left them alone for two hours so that the solvent could extract the pigment. We then hung a strip of paper from a pencil sitting atop the beaker so that only the tip of the paper was in the chemical at the bottom of the beaker to allow the mobile phase (the pigments running up the paper) to begin. Afterward, we measured the distance between each pigment and observed their vivid vibrancy to record our results.</p> <p><b>Results</b> We found that computer paper was the best to use because of the cellulose fibers being more tight-knit, the pure acetone was most effective because it yielded more distinct lines of different pigments, the green colored leaves yielded more differentiation as well, the coin method was not as effective as using the solvent during the stationary phase, recently-picked leaves held better results during the mobile phase, and finally colder temperatures yielded a wider variance and increased pigmentation in leaves than warmer temperatures did.</p> <p><b>Conclusions/Discussion</b> This, we discovered, was very applicable to real life concepts because in the East Coast, farther from the equator, color change in leaves is more vibrant because of colder temperatures. Chromatography can also be used in crime scene investigations to match pigmentation in lipstick or other substances. We were limited in our materials and our time in the lab, but we still conducted six successful experiments. We would like to expand our experiment to find if pollution has an effect on pigmentation or even find why artificial pigments fade in the sun and if that is related to temperature.</p>	
<b>Summary Statement</b> It is about the effects of temperature on the vibrancy and differentiation of pigmentation of leaves when a chromatography test is conducted.	
<b>Help Received</b> Enrique's dad helped to paint the board and put magnets on the back to ensure that they can stand atop each other and Ms. Pearce helped us get ahold of the chemicals we needed.	