



**CALIFORNIA STATE SCIENCE FAIR
2004 PROJECT SUMMARY**

Name(s) Susie S. Nazlikian	Project Number J1618
Project Title Find the Hidden Colors	
Abstract Objectives/Goals The objective of this project is to find hidden colors in plant leaf tissue. Methods/Materials The pigment spot was not immersed into the developer. The top end of the reaction chamber was tapered so that it will hold the chromatography paper strip at the desired distance. The paper strip level was ensured so that it does not touch the walls of the reaction chamber. The screw cap was placed over the chamber and the developer was allowed to advance up the paper without agitating the reaction chamber. Within 8-10 minutes you will notice bands of color have separated. The chromatogram was removed from the chamber when the developer front reaches near the top of the paper and allowed the air to dry. The chromatogram was saved for comparison to the ones produced with developers II, and III. Steps 3 through 6 were repeated, using developer II, and III. Within 15 minutes you will notice certain bands of colors that have separated in each of the chromatograms. The chromatograms were removed from the chromatography chambers to air dry. Results The results for the projects show the R(f) values for every band. The chromatogram shows 4 individual faint plant pigments of carotenes, xanthophylls, chlorophyll a and chlorophyll b by using developer IV. Conclusions/Discussion This project has demonstrated that the presence of chlorophyll, being the predominant pigment of green plants, masks the color of carotenes and xanthophylls in leaves. However, during autumn chlorophyll starts to break down, allowing these pigments to show their colors of red, orange, and yellow. For example, red pigments are usually masked by the green pigment chlorophyll during spring and summer, in the fall, the leaves lose their chlorophyll and the red pigments become visible. This project has demonstrated that the hidden colors don't really disappear. They are only masked by the leave pigments according to seasonal changes which determine the amount of sunlight received by the plant. Thus, paper chromatography continues to have an impact in the advancement of knowledge and understanding of every field of biology and chemistry. This project can be used in areas such as medicine, forensic chemistry, and differentiate individual plant pigment bonds. It can also be used in the separation of organic and biological compounds for forensic purposes that can be used as fingerprints.	
Summary Statement This project states how to find the hidden colors using paper chromatography.	
Help Received The help that I received was from a science advisor, mother, and sister.	