



**CALIFORNIA STATE SCIENCE FAIR
2002 PROJECT SUMMARY**

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Project Title Indicators or Not?	
Abstract Objectives/Goals The purpose of this project is to test the petals of different types of flowers for indicators. An indicator is present if a smearing of a single petal changes color with the addition of acids and bases. Methods/Materials The first step for testing is to choose one container and add ½ cup of vinegar. With the second container add ¼ cup of baking soda and two tablespoons of water. Add one Q-Tip to each of the containers and stir. With one petal, rub harshly on the computer paper until color is visible on the paper. Using the Q-Tip from the vinegar container, smear vinegar on the top half of the petal smears. Using a pen, label the vinegar side of the petal smears. With the Q-Tip rub baking soda onto the other half, but remember to leave some room between the two for reference to the original color. Again using the pen label the side with baking soda. Repeat these steps with all varieties of flowers. Results After our tests were completed, the flowers with white or yellow petal colors did not have indicators because of their light color. However, the flowers that had darker colored petals clearly showed indicators. Indicators were visible by the color change using vinegar and baking soda. For example a reddish colored rose had changed to a light blue (using baking soda) and a florescent pink (using vinegar). This change was caused by an imbalance in the pH level. Thus, the color would change dramatically from the base color. Conclusions/Discussion The results showed that flowers with dark colored petals clearly exemplify indicators. Dark colored flowers have indicators because they change their color in the presence of acids and bases. The petal smears changed colors dramatically because of the pH imbalance. The hydrogen ions in acid solutions are what causes the petal smears to become lighter than the original petal color. The hydroxide in base solutions is what causes the color to become darker. Flowers that had light color petals (including yellow and white) did not show any signs of indicators. Flowers with bright petals showed various changes depending on their species.	
Summary Statement Flowers were tested to determine whether or not they had an indicator.	
Help Received Dana's Flower Basket donated bouquets of flowers for testing.	