CALIFORNIA STATE SCIENCE FAIR
2011 PROJECT SUMMARY

Name(s)
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Project Number
J0615

Project Title
Dye Intensity

Abstract

Objectives/Goals
I was interested in finding out if fabric left in natural dyes for longer periods of time would show higher intensity of color.

Methods/Materials
I chose to use 4 vegetables to make natural dyes on cotton and wool fabric swatches. I chopped one cup of each vegetable and wrapped it in cheese cloth. I then boiled 4 cups of water and placed one vegetable in the pot. After 15 minutes I placed 5 cotton and 5 wool swatches into the boiling dye. At fifteen minute intervals I removed one swatch of cotton and wool until all pieces were removed. The final fabrics were in the dye for 75 minutes each. After the fabrics were all completly dried, I then used a light meter to measure the intensity of the colors. I used a piece of PVC pipe formed at a 90 degree angle that had the corner cut open. When I placed the open corner of the pipe on the fabric and held a flashlight at one end, the light would go down and bounce up off the fabric to the other side where I held the light meter. Lighter colors would read higher numbers and darker colors would read lower numbers as more light was absorbed into the fabric and less bounced up to the meter.

Results
Spinach showed the lowest increase in intensity as the dye was a very pale yellow-green color from start to finish, although it did become slightly darker. The Beets, Onion Skins and Blueberries all showed higer levels of increased intensity, with Blueberries showing the darkest results. As my research suggested, the wool did accept the dye more and had even higher levels of intensity than the cotton. After some swatches blew into the grass while drying, I noticed brighter green spots and decided to repeat the entire process on both cotton and wool with fresh cut grass. Unfortunately, I still could not get a true green dye, although it too showed increased intensity on the last swatches.

Conclusions/Discussion
Overall, the results that I achieved did support my theory that the longer the fabric stayed in the dye, the more intense the color would become. All my life I have had interests in fashion, art and cooking, so by doing this project I was able to incorporate all three together. After completing the project I used the leftover Beets and Blueberry dyes to tye dye a t-shirt.

Summary Statement
I wanted to find out if fabric left in natural dyes for longer periods of time would show higher intensity of color.

Help Received
Mother took and printed pictures.