CALIFORNIA STATE SCIENCE FAIR
2011 PROJECT SUMMARY

Name(s)
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Project Number
J0619

Project Title
Dyeing for M&M's

Abstract

Objectives/Goals
The objective of this experiment is to identify the FD&C dyes in red, orange, yellow, green, blue, and brown M&M candies using paper chromatography, vinegar solvent, and McCormick and Durkee food coloring controls.

Methods/Materials
Chromatography papers spotted with extracted candy sample or contol food coloring dyes were placed in a chamber containing vinegar solvent. Capillary action created columns containing one or more different colored peaks. The Rf (retention factor) was calculated by dividing the distance traveled by the dye by the distance traveled by the vinegar. The procedure was carried out six times for each control dye and sample candy, and an average Rf was calculated.

Results
Using the data, logic, and some guess work, the dyes were identified as: red--red #40; yellow--yellow #6 and likely #5, blue--blue #1 and #2, orange--yellow #6 and possibly #5, green--blue #1 and #2; and brown--blue #1 and #2, yellow #6 and possibly #5, and red #40.

Conclusions/Discussion
Differences in solubility enabled the FD&C dyes in the M&M candies to be identified by chromatography, which was found to be a fun, easy, and economical process useful in product quality and purity testing.

Summary Statement
Using paper chromatography, I will identify the FD&C dyes in six different M&M candies using vinegar solvent and food color controls.

Help Received
Mrs. Becky Wilson gave advice, and my parents helped with technical explainations, formatting my bar graphs, and critiques of my written and oral presentations.