



**CALIFORNIA SCIENCE & ENGINEERING FAIR
2019 PROJECT SUMMARY**

Name(s) Sholeh Mozaffari	Project Number J2020
Project Title Same Chemical Process, Different Types of Hair	
<p style="text-align: center;">Abstract</p> <p>Objectives The objective of this study was to show how dyeing hair permanently alters the texture and color of hair.</p> <p>Methods Bleach, 6rr red-colored dye, and two different levels of developer, 20 and 40, were all tested on three different types of hair swatches, Caucasian, Asian, and African American. A total of 24 tests were run, 8 on each swatch of hair. Both the dye and bleach were mixed with either 20 or 40 volume developer. Once applied to the different types of hair, the swatches were wrapped in foil and processed for 40 minutes, but were checked on at the 20, 30, and 40 minute mark.</p> <p>Results When looking at the texture of the hair swatches, I based my observations on a scale of 1-5, 1 being no change in texture (silky smooth) and 5 being an extremely noticeable change (extremely dry). In all of these tests the African American hair swatches had the most change (Color- 20 volume- level 3 & 40 volume- level 4, Bleach- 20 volume- level 4 & 40 volume level 5), the Caucasian samples had a moderate change (Color- 20 volume- level 2 & 40 volume- level 3, Bleach- 20 volume- level 3 & 40 volume- level 4), and the Asian swatches had the least amount of change (Color- 20 volume- level 1 & 40 volume- level 2, Bleach- 20 volume- level 2 & 40 volume- level 3).</p> <p>The changes in color when looking at dye were based on a 1-5 scale, 1 being no change (the original color) and 5 being an extremely noticeable change (the desired shade of red). When testing with 20 volume developer and dye the Caucasian hair samples had the most change in color (20 volume- level 2) while the Asian and African American samples both had the same level of change (20 volume- level 1). The 40 volume developer and dye results showed that the Caucasian hair had the most change (40 volume- level 4), the Asian sample had a moderate change (40 volume- level 3), and the African American swatch had the least amount of change (40 volume- level 2). The outcome of bleach tests and the change in color was also not what I expected. The changes in color when looking at bleach were examined on a 1-5 scale, 1 being a barely noticeable change from the natural haircolor and 5 being an extreme change from the natural haircolor. The results were the Asian sample had the most amount of change (20 volume- level 4 & 40 volume- level 5), the African American hair had a moderate change (20 volume- level 3 & 40 volume- level 4), and the Caucasian swatch had the least amount of change (20 volume- level 2 & 40 volume- level 3). I observed the color change becoming more extreme the further down the hair swatch towards the ends 1of</p>	
Summary Statement My experiment is testing what happens when the same chemical process is used on different types of hair.	
Help Received I came up with the idea for my experiment and my mom helped me understand how to make it into a science fair project. My teachers, Mrs. Humkey, Ms. Ringstad, and Mrs. Meza were my mentors throughout the process and helped me compile all of the parts and pieces of a science fair project.	