

# Greater San Diego Science and Engineering Fair

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**Project Title:** The Durability of Nail Polish

## Abstract

**Objectives/Goals:** The goal of this project is to find the most durable nail polish overall when utilized in various lifestyles and uses and when considering polish recipe.

**Hypothesis:** The most expensive brand of nail polish with the least ingredients is the most durable and the least expensive brand of nail polish with one of the longest list of ingredients has least durability. OPI, the most expensive, will last longest. Wet and Wild, the least expensive, will have the most chipping in the least time.

**Methods/Materials:** Six nail polishes, Essie, OPI, Cover Girl, Wet N' Wild, Sally Hansen, and Maybelline were used on two individuals with different lifestyles. These same polishes were also used on ping pong balls in order to perform a stress or rub test. Each person had both hands painted with two standard coats of nail polish. Polish was worn for one full week. Pictures were taken on days one, three, five and seven in order to compare results. Finally, a marked section of each ping pong ball was also polished with two coats. The ping pong ball was rubbed on twenty pound paper until it showed visible signs of wear. The results both ping pong ball test and nail tests were then compared to see if durability results were similar.

**Results:** The ping pong ball test showed Wet N Wild took seven rubs to show a visible difference on the painted surface. Maybelline was second lowest with seventeen rubs. Essie was third lowest at nineteen rubs. The next polish had more than a 200% increase in rubs. Sally Hansen took forty rubs to see a visual difference, Cover Girl took forty-one and OPI took sixty-one rubs on paper until there was a visible difference on the painted surface. Throughout the finger nail tests, Wet N Wild showed noticeable chipping and damage on at least 50% of the nails by day three and significant chipping by day seven. Maybelline and Essie also showed noticeable chipping after three days of wear on at least 50% of the nails. Sally Hansen showed minor chipping on less than 30% of the nails at day three and didn't have comparable damage to Essie, Maybelline or Wet N' Wild until day five. Cover Girl showed minor chipping at day three and lasted five days until there was noticeable chipping on greater than 50% of the nails. Finally, OPI showed less than 10% chipping by day three and lasted five days until there was chipping on 50% of the nails.

**Conclusions/Discussion:** The results of both sets of tests, ping pong balls and nails, both supported the hypothesis that OPI was the most durable polish and that Wet N' Wild was the least durable polish. The ping pong ball test showed OPI outlasted Wet N' Wild by fifty-six (54) rubs on white paper. Similarly, the third day of wearing Wet N' Wild polish showed visible signs of wear and cracking on at least fifty-percent of all painted nails while OPI only showed wear on 10% of the painted nails. Therefore, all tests conducted support the original hypothesis.

**Summary Statement** This project's focus is to inform users of the most durable polish given an array of lifestyles.

**Help Received** Testing help, data recording, proofreading and support from my mom. Proofreading and support from Mrs. Gillum. Other information as it related directly to nail polish and chemical bonds by Paul Bryson, PhD