



**CALIFORNIA STATE SCIENCE FAIR
2008 PROJECT SUMMARY**

Name(s) Cameron Fuller; Adam Goldman	Project Number J0211
Project Title How the Materials of Bushings Affect a Skateboard's Turning Performance	
<p style="text-align: center;">Abstract</p> <p>Objectives/Goals The goal of this project is to determine how much the material of a skateboard's bushings effect its turning performance.</p> <p>Methods/Materials Eight bushing pairs made from different plastic materials, manufactured for consumers, machined from industrial products and home cast from molds, were tested to compare turning performance. All were tested in a skateboard, weighted to turn on a 30 foot by 40 foot gradually sloping grid. Securing straps and registration marks ensured identical testing conditions. A secured rolling chalk device trailed and marked the skateboard's path. Paths were photographed and plotted on a grid. The compression of the bushings, indicated by the path's curve, was compared with manufacturers Durometer rating specifications.</p> <p>Materials: Urethane casting rubber, Urethane casting systems, high strength silicone rubber, silicone casting rubber, Hapol sanding resin, Epoxy, Urethane, Doh-Doh bushings, UHMW Polyethylene rod, popsicle sticks, plastic measuring cups, gas masks, goggles, latex gloves, camera, skate board, plastic box, bungee cords, 50lb sand bag, wood plank, rolling chalk marker, ladder, string, fan, putty, muffin tin, data sheets, graph paper, pencil, tape measure, Chalk line, sticks and powder, Duct tape.</p> <p>Results All of the bushings manufactured by the same company performed consistently with their ratings, but only in relation to one another. Polyurethanes tested varied the most in hardness, one being among the hardest, another the softest.</p> <p>Conclusions/Discussion The results suggest that plastics, polyurethane in particular, range in hardness, depending on their formula, and, contrary to expectation, a (poly)urethane with a lower hardness value performed as if it were much harder than one with a higher value. With all the data about plastics: specific gravity, density, and tensile strength, the hardness value or Durometer rating was the only specification consistently available for each material tested. Turning performance is greatly effected by the bushing material, but the Durometer rating is, apparently, not the only determining factor.</p>	
Summary Statement This project tests how the materials of skateboard bushings affect a skateboard's turning performance by using a chalk marker to trace the path of a weighted skateboard that is rolled down a hill several times each with a different set of b	
Help Received Mother provided transportation, supervised resin casting of volatile substances	