



**CALIFORNIA STATE SCIENCE FAIR
2012 PROJECT SUMMARY**

Name(s) Alexander del Palacio	Project Number J0908
Project Title Zap: Making a Van de Graaff Generator and Testing Two Different Triboelectric Material Combinations	
<p style="text-align: center;">Abstract</p> <p>Objectives/Goals To test and see which of two triboelectric material roller combinations in a Van de Graaff Generator(VDG) that I built generates a larger static field around the sphere of VDG. The two roller combinations used were Aluminum and Silicon for the first set and Aluminum and Poly Vinyl Chloride (PVC) for the second. To test the distance of the field of static electricity around the sphere of the VDG, I used a simple instrument that I built called an Electroscope which reacts to static charges. My hypothesis, based on the triboelectric series chart, is that the combination of silicon rubber and Aluminum, being farther apart from each other on the chart than the combination of Aluminum and PVC, would generate a larger static electric field around the VDG.</p> <p>Methods/Materials Methods:A VDG is constructed from 2 steel bowls joined together and attached to a standard 1.5" ABS pipe. Inside the tube 1 aluminum roller and 1 PVC or silicone rubber roller are connected by a rubber belt and driven by a Dremel motor.At the base and at the top 2 copper wire brushes and one ground wire to transfer the electrons to the sphere. A second apparatus consists of a 12 oz glass jar with 2 aluminum foil vanes suspended inside the jar by a paper clip wire which extend outside the jar.</p> <p>Materials:2 steel bowls(1 with hole at bottom), 1 rubber belt,1Aluminum roller,1 Silicone rubber roller,1 PVC roller,copper wire,ABS Pipe 3.81 cm diameter x 33 cm long, 7mm X 58mm bolt and nut,3.81 cm x 7.6 cm ABS hub,1 Threaded ABS connector and nut,1 2.5 mm x 5.0 cm drill rod,1 glass jar,1paper clip,1 3"x5"cardboard,stranded copper wire,1 Dremel 4000 power tool.</p> <p>Results After testing both combinations of rollers a total of 10 times each the result was that the combination of the silicon rubber and aluminum rollers generated a larger static field, ranging between 27.5 to 29 centimeters, while the PVC and Aluminum roller combo field range was 22.86 to 23.62 centimeters.</p> <p>Conclusions/Discussion At the end of my tests, the data I collected supported my hypothesis that the combination of the silicon rubber roller and the Aluminum roller would generate a larger static field than would the PVC roller and Aluminum roller set.This result is consistent with the ranking of the materials on the triboelectric series chart, whereby silicone rubber is farther away from the aluminum roller than is PVC.</p>	
Summary Statement I comapred the static fields generated by 2 different triboelectric material combinations in a Van de Graaff.	
Help Received I recieved help from my father for the use of powertools. I also recieved help from my teacher Ms. Buck with editing.	