



**CALIFORNIA STATE SCIENCE FAIR  
2006 PROJECT SUMMARY**

<p><b>Name(s)</b> <b>Nikki M. Tachiki</b></p>	<p><b>Project Number</b> <b>J0623</b></p>
<p><b>Project Title</b> <b>Ground Substances at Different Locations Affect the Flow Rate of Water</b></p>	
<p align="center"><b>Abstract</b></p> <p><b>Objectives/Goals</b> To determine how different locations substrates affect the flow rate of water and their permeability to water. To prove drier climates increase the porosity of soil and sand substrates; therefore substrates closer to the center of the desert would have the highest flow rates.</p> <p><b>Methods/Materials</b> The procedures are as follows: 1. I constructed a tube stand using wood. I collected eighteen samples of soil. I put a tube filled with soil through the stand and poured water in using a coffee filter to keep the soil in place. After three minutes, I removed the measuring cup to record the amount of water flowed through. 2. I altered the location of the ground sample to test my hypothesis. 3. Two trials were conducted for each soil sample. The first trial was through dry soil and the second was through wet soil. 4. I measured the amount of water that flowed through the tube in milliliters. I used this amount to calculate the velocity by dividing the amount of water flowed throuh, over the time water passed through the tube, all over the area of the tube. I materials I used were wood, Titebond II Premium Wood Glue, screws, plastic flex tailpieces, copper tube straps, waterproof tape, coffee filters, rubber bands, one inch tubes, measuring cups, a stopwatch, water, and ground substances to perform my experiment.</p> <p><b>Results</b> The results from my experiment were: (1) The amount of water that flow through the tube after three minutes ranged from 1 to 91 milliliters. (2) The velocity of the flow rate of water ranged from .31cm per minute to 5.71cm per minute.</p> <p><b>Conclusions/Discussion</b> The location of the samples did affect the flow rate. Each sample location varied in velocity. The average flow rate from the Red Rock Canyon was the fastest. This location was closest to the center of the desert therefore proving my hypothesis and prediction correct. There was no pattern observed based on the soil substrate#s location.</p>	
<p><b>Summary Statement</b> By finding the flow rate of water through ground substances, I proved drier climates increase the porosity of soil and sand substrates; therefore substrates closer to the center of the desert would have higher flow rates.</p>	
<p><b>Help Received</b> Father helped buy supplies; Mother helped glue papers to the board; Mr. Hobbs helped me stay oraganized and on track.</p>	