



**CALIFORNIA STATE SCIENCE FAIR  
2004 PROJECT SUMMARY**

<b>Name(s)</b> <b>Todd K. Sakamoto</b>	<b>Project Number</b> <b>J0615</b>
<b>Project Title</b> <b>Determining the Effects of Soil Additives on Soil Stability: Three-Year Study</b>	
<b>Abstract</b> <b>Objectives/Goals</b> My project's goal was to determine if soil additives better stabilizes a building when it is shaken. My hypothesis stated that sand (base soil) combined with stones would work best. <b>Methods/Materials</b> I used two different apparatuses for my experiment. The first dropped the iron rod into the bucket tht contained the soil. It was made out of 2 2x2 plywood boards and spaced by 4 4-foot wood dowels. The iron rod was inserted into a PVC pipe thatdropped it into the bucket. The next apparatus was a shaker table. I used 2 2x2 plywood boards that had 8 springs in between the boards. I used a protractor to measure the amount of force. I started the test at 3 degrees, then went ot 5 degrees if it didn't tip over, and then increased by 5 degrees until it tips over. The test variables that I am using are sand combined with fertilizer, stones, mulch, pumice, potting soil, and sand by itself. First I tested each with the soil additive on the top, then on the bottom, and finally I mixed the two together. I tested each variable 7 times. <b>Results</b> The sand combined with the fertilizer worked the best for all of different layerings. It averaged 17.14 degrees of force with it on top, 15.72 degrees of force with it on the bottom, and 12.86 degrees of force with the two combined. <b>Conclusions/Discussion</b> The results didn't support my hypothesis and if you were to add a soil additive to a foundation, fertilizer would work best.	
<b>Summary Statement</b> My project is about how soil additives affect a building's soil stability.	
<b>Help Received</b> Uncle let me borrow supplies	