



**CALIFORNIA STATE SCIENCE FAIR  
2005 PROJECT SUMMARY**

<b>Name(s)</b> <b>Stephen A. Richardson</b>	<b>Project Number</b> <b>J1818</b>
<b>Project Title</b> <b>Soils and Earthquakes</b>	
<p style="text-align: center;"><b>Abstract</b></p> <p><b>Objectives/Goals</b> The experiment will explore seismic resistive effects of different soils applied beneath a building's foundation. The procedure will apply simulated earthquake test waves to various soils and materials and record the results and building movement during the shaking. This project will attempt to answer the question: Which soils isolate a building from an earthquake the best?</p> <p><b>Methods/Materials</b> I plan to record measurable results from an experiment that I will design and build. I will test different types of soils in a wooden box with each soil shaken by a speaker so I can record resulting shaking in the model building. I will record the results using an oscilloscope connected to an instrumented model building.</p> <p><b>Results</b> The data shows rock pebbles isolates simulated earthquake test waves the best. I also discovered that the farther away the model building and sensor was from the wave source the less the movement. Deeper and denser soils isolated the waves the best. Sand was actually one of the soils that did not dampen the waves as effectively I originally thought. The readings were taken on eight different soils and over 400 data points were collected during this experiment procedure.</p> <p><b>Conclusions/Discussion</b> Before I started the experiment I thought sand would isolate the earthquake waves the best. But I found out that a better earthquake isolation soil is rock pebbles! I liked doing this science fair project and it was harder than I thought it would be. I would like to thank True Value Store for providing the soils and my dad for the tools to help me with this science fair project. With my experiment I wanted to show a unique way to demonstrate which soil isolated earthquake test waves most effectively and I proved it.</p>	
<b>Summary Statement</b> My project tests seismic resistive effects of different soils when exposed to earthquake test waves.	
<b>Help Received</b> Dad helped with test equipment setup	