



**CALIFORNIA STATE SCIENCE FAIR  
2004 PROJECT SUMMARY**

<b>Name(s)</b> <b>Anthony J. Khougaz</b>	<b>Project Number</b> <b>S0210</b>
<b>Project Title</b> <b>Shake, Rattle, and Roll 2: Possible Earthquake Stress on Building Structure</b>	
<b>Objectives/Goals</b> To see which building structure might hold up best in an earthquake.	
<b>Abstract</b> <b>Methods/Materials</b> Four basic materials were used to simulate building structures: K'nex, Legos, sugar cubes and Lincoln logs. K'nex were used to simulate steel girder construction, Legos were used to simulate reinforced block wall construction. Sugar cubes were used with frosting mortar to simulate unreinforced block wall/brick construction and Lincoln logs were used to construct a log cabin. Structures were built with approximately the same base. Structures were shaken with an "earthquake maker" designed and built last year for a soil liquifaction experiment. The structures were tested at least twice, time to failure was recorded and photos before and after were taken.	
<b>Results</b> The Lincoln log construction was the most unstable, followed by the sugar cube construction (after foundation adjustment). The Lego construction followed and the best structure was the K'nex structure.	
<b>Conclusions/Discussion</b> Prior to research, I believed the heavier construction (block wall/brick) would hold up best. My initial research indicated that the steel girder buildings would hold up best. The test results appear to bear this out. I did not attempt to test structures on different soils where liquifaction could be a factor, nor did I attempt to simulate a specific magnitude earthquake, but merely subjected all models to the same degree of stress.	
<b>Summary Statement</b> My project was to test simulated building structures reaction to earthquake stress.	
<b>Help Received</b> My science teacher reviewed my completed project/report and offered suggestions. My father helped reassemble my "earthquake maker" and and helped operate it while I observed and logged results.	