



**CALIFORNIA STATE SCIENCE FAIR  
2005 PROJECT SUMMARY**

<b>Name(s)</b> <b>Brian M. Smith</b>	<b>Project Number</b> <b>S0216</b>
<b>Project Title</b> <b>Shake, Rattle, and Roll: Wood vs. Brick During Earthquakes</b>	
<b>Abstract</b> <b>Objectives/Goals</b> My objective is to test wood and unreinforced masonry for the amount of energy that passes through to determine which is a better building material for earthquake resistance. <b>Methods/Materials</b> Materials: 1 swinging apparatus; 1800mL water; 1 fishing weight; 1 medium sized pan  Methods: I will swing a fishing weight attached to the swinging apparatus against a brick or piece of wood. This will generate a wave in the pan of water. The amplitude and frequency of the wave will be calculated for results <b>Results</b> Wood is a better bulding material because it had a smaller wave and larger frequency. This indicates that the wood allowed more energy to pass through the material and thus subject less damage on itself. <b>Conclusions/Discussion</b> The larger the wave size determined if the material allowed more energy to pass through it. The energy from the falling weight along with the centrifugal force caused a large amount of energy to be applied to the material. This energy passes through the material and is transferred to the water, crating a wave that rolled throughout the pan. The variable that had an affect on the amount of energy passing through the brick was a combination of the density, the rigid characteristics, and the hardness. The wood proved to be less dense and softer because of the molecular composition of the molecules of wood. These characteristics determined the amount of energy to pass through the material. The brick had an average wave height of 2.04mm while the wood had an average wave height of 6.99mm. This is a difference of 4.95mm. In conclusion, wood makes a better building material because it allows more energy to pass through.	
<b>Summary Statement</b> My project tests what building material is more resistant to earthquake damage, wood or unreinforced brick masonry construction.	
<b>Help Received</b> Aunt was interviewed; Father helped print digital photos	