



**CALIFORNIA STATE SCIENCE FAIR
2003 PROJECT SUMMARY**

Name(s) Lindsey A. Ellison	Project Number J1806
Project Title What Types of Pipe Are the Most Earthquake Resistant?	
<p style="text-align: center;">Abstract</p> <p>Objectives/Goals My hypothesis is that PEX pipe will be the strongest and copper pipe will break. I think that this is because PEX pipe is really flexible and you can bend it with your own two hands. So, I think that an earthquake would not have much of an effect on it. I think that copper will break during an earthquake because it is not very flexible, and it is made of metal. There are more fittings required and the tension builds upon itself which could cause a break.</p> <p>Methods/Materials Install Cast Iron, ABS, PVC, Steel, Copper, and PEX pipes into a woodframed wall. Attach eye screws, turn buckles and cable to opposing corners of the wall. Alternate tightening and loosening the turn buckles on either side of the wall causing it to sway from side to side simulating an earthquake. Repeat the process until a pipe breaks. Before the test, pressure gauges were installed in each pipe and were filled with air pressure to see when a pipe broke.</p> <p>Results My results came out to be a lot like I thought they would be except the copper did not break. PEX pipe was the most flexible and steel was the one to break. Most of the different pipes just bent or tilted and I thought that they would just stay the same. No pipes broke at 3, 4, 5, 6, or 7 inches (or 7.62, 10.16, 12.7, 15.24, or 17.78 cm,) but they got pretty bent out of shape! Finally, I had to get my dad to help me secure and shake it, and that's when steel broke.</p> <p>Conclusions/Discussion I found that in the case of an earthquake, all the pipes do fairly well. However, the first one to break would be steel. I think that this is because it is not very flexible, and the fittings don't allow much movement. So, we should make our pipes PEX, and ABS!</p>	
Summary Statement A simulation of an earthquake, testing pipes to see if they are earthquake resistant.	
Help Received Father used skill saw and torch.	