CALIFORNIA STATE SCIENCE FAIR
2007 PROJECT SUMMARY

Name(s)
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Project Number
J0704

Project Title
Earthquake Intensity

Abstract

Objectives/Goals
The goal of my experiment was to measure the damage that a simulated earthquake causes on different land types and varying forces using a scale loosley based on the Mercalli Intensity Scale.

Methods/Materials
The foremost material used in the experiment was the earthquake simulator. This, I designed and built myself.

Results
As the intensity of the earthquakes increased, the amount of damage increased as well. Therefore, the overall data shows a positive correlation. Also, each of the trials for both land types had very similar damage ratings. Landfill had a significantly higher overall damage rating than bedrock at every level of earthquake intensity. The amount of damage to the sugar cube structure increased more rapidly with increases in earthquake intensity on landfill than on bedrock. The largest differences of the damage rating were on the second trial with a force (inches the ram was pulled back) of four, and the second trial with a force of five. Both of these had a difference of 4.5. The larger earthquakes that took place on landfill caused the sugar cube structures to suffer severe to complete damage, while the smaller earthquakes that took place on bedrock had barely any effect on the structure. Once the ram had made contact with the platform, there was an initial hit, but the platform did not continue to move after the initial impact. After the ram made contact with landfill, the platform continued to shake, causing more damage to the sugar cube structure each time

Conclusions/Discussion
This experiment proved that increasingly larger earthquakes create more damage to a structure on certain land types. This prediction was based on thoughts that land with no support would shake more than land with more support, and the excess movement would create more chances for the sugar cube structure to raze. In this case, landfill was the land with no support, and bedrock was the land with it. The movements of the landfill proved to be most damaging. This experiment was well controlled and the data was very consistent. If some of the cubes were chipped at the bottom, that could make the structure unstable before it even became subject to an earthquake. This may have occurred several times during the testing, because if the brittle sugar cubes were hit with a strong force, they could have become weaker for the next earthquake.

Summary Statement
This project is a unique way of demonstrating the contributing effects or the bi-products of earthquakes and what harm they encompass.

Help Received
My father supervised the construction of the earthquake simulator and helped me a few times when I was having trouble with negligible tasks involved, liked putting in a nail or screw, attactching eyelets, etc. He also drove me to the store to buy the materials and edited my final report,