

April 14, 2014

Dear Mr. John Vassiliades and Professional Engineers in California Government,

Thank you so much for choosing my project to win this year the 2014 Marilyn Jorgensen Reece Award. It is an honor for me to be chosen for such an important award. I am so grateful for the \$500 cash prize, the trophy, and the medal. I am going to use the cash price for educational purposes.

My name is Camila Fernandez, I am in 7th grade at Magnolia Science Academy 6. My favorite subjects are math, science, art, and physical education. I am in an advanced math class and I love to run. Some of my hobbies are play piano, paint, hike, and have fun with my little sister. My family and I love to travel and explore new places to learn new things.

At my school's science fair, my friend, Melany Arriola, and I won second place as a team and got to go to the 64th Los Angeles County Annual Science Fair for the second time. Our project was called *Earthquake Resistant Structures*. Earthquakes are common in California and often cause a lot of destruction. One way engineers prevent destruction caused by earthquakes is by strengthening structures. Our experiment tested different techniques to strengthen structures, such as bracing, counter weight, and isolated base. We built several structures, one without bracing and the others with different types of bracing. We also built two structures, one with a counter weight and the other one with an isolated base. We built a pair of each so we can test the structure with a base and with no base. Then we placed the building on a home-made earthquake simulator, shook the structure, and recorded the time till they failed. At the end we compared the time and determined which of the techniques was the most effective.

We hypothesized that the structure with X-bracing was going to resist the most because it has an x-shape that creates a triangular structure, which gives more support to the structure. We also hypothesized that the isolated base was going to help the structure resist the earthquake the most because it will absorb most of the ground shaking, instead of a more flexible structure that would swing with the ground. In conclusion our hypothesis was partially proved. Structures with K-bracing survived longer than structures with X-bracing. The experiment showed that K-bracing and the isolated base were the two most effective techniques. Overall this experiment helped us investigate which modern day technique has the best effect when strengthening structures. If I could, I would do further research on other ways to make buildings resistant to other natural disasters or to try out other building shapes such as domes and pyramids.

The LA County Science Fair has been again another wonderful experience and to win such an honorable award makes this year very special.

THANK YOU!

Sincerely,

Camila Jose Fernandez

Magnolia Science Academy 6

Grade 7