

April 9, 2014

Dear Mr. Vassiliades,

I would like to express my immense gratitude to you and the Professional Engineers in California Government for choosing me as the James E. Roberts Award recipient at the 2014 Los Angeles County Science Fair. My name is Sebastian Cordero and I am a 6th grader at Our Mother of Good Counsel School in Los Angeles. Mathematics and Science are my favorite subjects and I was very excited that as a 6th grader I was finally eligible to go to the Los Angeles County Science Fair this year. My grandfather is an engineer and I was excited to choose a project where I could express my interest in the area of engineering.

I chose my project *Keeping You in Suspens(ion): The Effect of Suspension Mechanisms on Bridges* because I have always been fascinated with bridges. I think bridges are not just incredible works of engineering, but they are very beautiful as well. However, I have always been nervous when we have driven over a bridge. I've wondered how it is that the bridge can be so long and still hold so much weight without breaking in the middle. I also notice that not all bridges were built the same, and I wondered why that was and if it made a difference in their strength. Therefore, I started to research bridges and realized that there are many different kinds of bridges but the two most common are beam bridges and suspension bridges. Then I realized that suspension bridges are used more often if the length of the bridge is longer because they can hold a lot more weight than beam bridges. I decided to test to see if it is true that suspension bridges are stronger and also to see if the length of the bridge makes a difference for both beam bridges and suspension bridges.

I discovered that my hypothesis was correct. If a suspension bridge is compared to a beam bridge with respect to how much weight they can hold, then a suspension bridge holds more weight, especially if the lengths of the bridges are increased because the suspension mechanism allows for the better handling of compressional and tensional stress. I built two bridges, one beam and one suspension. I tested both bridges at three lengths: 15cm, 20cm and 25cm. I tested the amount of weight each bridge could hold and discovered that a suspension bridge can hold almost twice as much weight as a beam bridge when the length is short at 15cm. However, when the lengths of the bridges were increased, the beam bridge weakened a lot whereas the suspension bridge stayed more constant. As a result, at 25cm, the suspension bridge could hold almost three times the amount of weight that the beam bridge could hold. I found these results fascinating. It showed how much better the suspension bridge was at handling compressional and tensional stress. This is because, unlike a beam bridge, a suspension bridge can transfer those stresses to the cables and the anchored towers.

When I won second place at my school science fair, I was extremely excited that I would get to participate at the Los Angeles County Science Fair. I had an amazing time at the Fair and I learned so much, not just about science but also about how to interview and explain my ideas. However, nothing was better than the great honor I was given by the PECG. I could not believe I actually won the James E. Roberts Award! I was so thrilled that my hard work had been recognized and that you saw a future scientist in me. I plan to use the \$500 cash award to pay for a science camp this summer so that I can continue to learn more about science. I think more kids my age should take an interest in science and engineering because we are the future. We are the ones who will build the great structures of the future and who will find ways of making life easier and better to live. I hope one day that I can make a contribution as important as Mr. Roberts' Caltrans Highway Bridge Seismic Retrofit Program which made bridges safer for all us.

Thank you again for recognizing my project and believing in my future as a scientist. You made the Los Angeles County Fair an incredible experience for me and you have motivated me to continue studying science and engineering.

Sincerely,

Sebastian Cordero