



# CALIFORNIA STATE SCIENCE FAIR 2016 PROJECT SUMMARY

<b>Name(s)</b> <b>Enzo A. Pardo</b>	<b>Project Number</b>  36226
<b>Project Title</b> <b>A Bridge to Nowhere</b>	
<b>Objectives/Goals</b> The principal objective of this project is to find out which design in bridges will sustain the most force. <b>Methods/Materials</b> The project was performed by building 6 original truss bridge designs. Each bridge was made of 1/4" X 1/4" balsa wood. The bridges were tested by using a DI2000, a machine which applied a concentrating force over the bridge to determine its breaking point. <b>Results</b> After testing different bridge designs, it became clear that the DI2000 initially found weakness within the road bed and substructures for the first two original bridge concepts.  A third bridge was constructed doubling the strength of the road bed in which case it was the bridges side wall that failed to uphold the load.  Although these tests led to the construction of stronger bridge components, it became clear that consistent controlled components would need to be developed to accurately test the structural stability of the bridge body.  Therefore, bridges D, E and F were constructed utilizing the same road bridge and substructure designs changing only the bridge body.  Initial testing of bridges D, E and F resulted in the consistent failure of the roadbed.  Further series of tests were then conducted by reinforcing the road bed resulting in dramatic bridge failure recorded as bridges G,H, and I. <b>Conclusions/Discussion</b> In the end, bridge G, the bridge with the greatest amount of triangles in the bridge wall, supported the highest level of pressure while sustaining the least amount of damage confirming that the number of triangles in the structure directly affects the overall strength, proving the initial hypothesis to be correct.	
<b>Summary Statement</b> I built multiple truss bridges out of balsa wood using my original designs and tested each ones structural integrity.	
<b>Help Received</b> I designed and built my bridge models on my own. I looked at bridges being built today and built in the past to try to come up with ideas.	