



**CALIFORNIA STATE SCIENCE FAIR  
2013 PROJECT SUMMARY**

<b>Name(s)</b> <b>Zana M. Youssef</b>	<b>Project Number</b> <b>J0332</b>
<b>Project Title</b> <b>Strongest Truss Bridge</b>	
<p style="text-align: center;"><b>Abstract</b></p> <p><b>Objectives/Goals</b> The purpose of this project is to investigate the load carrying capacity of different type of truss bridges. I knew I wanted to attempt this investigation one year ago. The idea came to me at the County Science Fair Competition last year where I saw 3 types of bridges displayed for judging; Suspended, Truss, and Beam. After that I focused on trying to figure out which type of truss bridge will be the strongest, Equilateral, square, and 30-60-90 deg. I chose to focus more on truss bridges because it is more practical and economical to build. Since then I started obridges. Why not only use one type? This would be easier and probably cheaper.</p> <p><b>Methods/Materials</b> 1) Equilateral 2) Square 3) 30-60-90 deg The bridges were built using Balsa wood, Popsicle sticks, and tacky glue. Once the bridges were built and were dry enough to be tested, the Equilateral truss bridges were loaded first. The bridges were supported on each side by metal stools, and I hung a bucket from the center of the bridge and filled it up with water. I added water gradually to the bucket until the bridge broke. Once the results were recorded, the same test was performed on the Right Isosceles truss bridge as well as the 30-60-90 deg truss bridge. The same tests were performed two more times on each type of bridge, and the results averaged and recorded. The following materials were used in making the bridges:</p> <p><b>Method</b> In order to do a scientific and accurate investigation, the three truss bridges were built for comparison purposes to study which one carries more weight. In order to perform a logical and equal comparison, the following conditions were chosen; 1) Length of all three bridges were kept the same 2) Materials used to build all three bridges were the same 3) The loading method to break the three bridges was the same</p> <p><b>Results</b> The average weight held by the square bridge was 7.56 kg with maximum deflection of 0.56 inches. The equilateral truss bridge held an average weight of 17.56 kg, and the 30-60-90 deg. bridge held the maximum load of 20.56 kg.</p>	
<b>Summary Statement</b> My project is about 3 types of Bridges that were all tested in order to see which is the strongest and could hold the most weight.	
<b>Help Received</b> My dad and Brother helped me carry the bucket and attach to the bridge in order to break them.	