



CALIFORNIA STATE SCIENCE FAIR 2010 PROJECT SUMMARY

Name(s) Caroline E. Lamoureux	Project Number J0215
Project Title The Effect of Weight Distribution on Bridges	
<p style="text-align: center;">Abstract</p> <p>Objectives/Goals The objective of this experiment is to determine whether weight distribution (the number of pressure points) affects the amount of weight a truss bridge can hold. The scientist hypothesized that if weight is distributed throughout multiple pressure points on a truss bridge, then the bridge is less likely to collapse.</p> <p>Methods/Materials Nine identical truss bridges were constructed out of basswood and aliphatic wood glue. U-bolts were used to suspend a bucket from the underside of the bridges. Each bridge was tested by filling the bucket with sand until the bridge collapsed. Three of the bridges were tested using a single U-bolt, placed in the center of the bridge to suspend the bucket of sand, three bridges were tested using three evenly placed U-bolts to suspend the bucket of sand, and three bridges were tested using five evenly placed U-bolts to suspend the bucket of sand. After the bridge collapsed, the bucket of sand and U-bolts were weighed and results recorded.</p> <p>Results The results showed that as the number of pressure points (U-bolts) increased the bridges were able to hold more weight. The average weight held by one pressure point was 12.2 kg, by three pressure points was 14.6kg, and by five pressure points was 31.7 kg. The weight held using five pressure points was substantially larger than when one and three pressure points were used.</p> <p>Conclusions/Discussion The scientist proved that the way weight is distributed on truss bridges affects the amount of weight that the bridge is able to hold. As more pressure points (U-bolts) were added to suspend the weight, the amount of weight that the bridges were able to hold increased as weight was more evenly distributed throughout the bridge. Bridges have been used for thousands of years for passage over natural boundaries and man-made obstacles. Since weight distribution over bridges affects how much the truss bridge is able to hold, engineers should consider ways in which to keep weight distributed when building bridges.</p>	
Summary Statement My project shows the relationship between weight distribution (pressure points) and the ability of bridges to hold weight.	
Help Received Father helped collect materials.	