CALIFORNIA STATE SCIENCE FAIR
2006 PROJECT SUMMARY

Name(s)
Conor P. Beck

Project Number
J1804

Project Title
The Effect of Bridge Design on Bridge Weight Bearing Capacity

Abstract

Objectives/Goals
This project tested to see whether a Pratt truss or a Warren truss would hold more weight. The researcher's hypothesis was that the Pratt truss would hold more weight.

Methods/Materials
In this experiment, the researcher built both types of trusses out of popsicle sticks. Each one was placed, one at a time, in a testing device made of plexiglass and wood. Iron weights were then placed into a bucket that was attached to the bottom of the truss. Sand was slowly poured into the bucket until the truss failed. The project contained 50 total trials, 25 trials for each truss.

Results
The results of these trials showed that the Warren truss held an average weight of 35.16 kilograms, while the Pratt truss only held an average weight of 32.03 kilograms. The range of weight held by the Warren truss was 35.35 kilograms. High and low outliers were detected in these results, however, with a maximum weight of 50.85 kilograms and a minimum weight of 15.5 kilograms. For the 25 Pratt truss trials, the range of weights held was 14.63 kilograms with no outliers detected.

Conclusions/Discussion
The findings did not support the researcher's prediction. Where the Warren truss held more weight on average, the Pratt truss was more consistent. In the real world, engineers could use these findings to determine which truss design to use when building a bridge.

Summary Statement
This project tested to see whether the design of a bridge had an effect on the amount of weight the bridge could hold.

Help Received
Dad hepled with troubleshooting and testing; Mom helped type and proofread report; Teacher let me borrow the triple beam balance for testing; Neighbor provided Caltrans information on trusses and bridges.