



**CALIFORNIA STATE SCIENCE FAIR  
2008 PROJECT SUMMARY**

<b>Name(s)</b> <b>Alexandra A. Lamoureux</b>	<b>Project Number</b> <b>J0216</b>
<b>Project Title</b> <b>Bridges: Which Design Is Best?</b>	
<b>Abstract</b> <b>Objectives/Goals</b> This project was an engineering experiment on the strength of different bridge structures. The bridge structures tested include: simple frame (control group), railroad, rigid frame, and Warren truss bridge structures. The researcher hypothesized, if the triangular design of the truss bridge structure more effectively spreads the weight throughout the bridge (tension and compression forces), then the truss bridge structure will be able to hold the most weight of the structures tested. <b>Methods/Materials</b> Twelve bridges (three of each type) were built with pieces of basswood glued with wood glue and set out to dry for 24 hours. After drying, each bridge was laid across two chairs and a bucket was attached to the center of the bridge. Cups of sand were poured slowly into the bucket until the bridge collapsed. <b>Results</b> After each bridge collapsed, results were taken and analyzed. The researcher found the simple frame bridges (control group) held the lowest average weight (4.1 kg), rigid frame bridges held the second lowest average weight (4.467 kg), rail road bridges held the second highest average weight (4.567 kg), and the Warren truss bridges held the highest average weight (11.050 kg). <b>Conclusions/Discussion</b> In conclusion, the researcher's hypothesis proved true. The Warren truss structure withstood the greatest tension and compression forces allowing it to hold more than twice the weight of the other bridge frame designs. The researcher found that the spreading out of weight of the truss design helps the bridge hold more weight and should be considered when determining bridge safety.	
<b>Summary Statement</b> This project was an engineering experiment on the strength of different bridge structures.	
<b>Help Received</b> Father helped gather specified supplies and materials; Mother helped gather specified research books.	