



**CALIFORNIA SCIENCE & ENGINEERING FAIR
2018 PROJECT SUMMARY**

Name(s) Benjamin E. Bailey	Project Number 38104
Project Title Comparing the Load Bearing Capacity of Howe Truss and Pratt Truss Bridge Designs	
<p style="text-align: center;">Abstract</p> <p>Objectives/Goals The objective is to measure the different load bearing capacities of the Howe Truss and Pratt Truss bridge designs using models. Comparing the strength of both bridges with the load on top but only in the center vs. load distributed all the way across the top from end to end.</p> <p>Methods/Materials Standard size popsicle sticks, glue, level, ruler, bucket, cardboard box, scale, books to make bridge level when building. Built Howe Truss and Pratt Truss bridge models using diagrams from research. Placed two cinder blocks on level surface then put Howe bridge on top. Placed bucket in center of bridge, added sand one cupful at a time until bridge failed by support popping off. Weighed sand subtracting weight of bucket and noted weight. Repaired bridge and repeated. Repeated process with Pratt Truss for two trials. Then repeated trials using cardboard box the exact length of Howe until bridge failed by cracking. Repeated with Pratt. Could not do multiple trials with box because both bridges cracked.</p> <p>Results The Howe Truss was stronger in both bucket trials, with the load in the center both times. The Pratt was significantly stronger in the box trial with the weight distributed across the top of the bridge.</p> <p>Conclusions/Discussion The Pratt Truss is a better choice overall because most bridges need to support weight all the way across a bridge most of the time. But for a bridge or other truss supported structure where the load might be only in the middle, the Howe Truss design might be the better choice.</p> <p>I think this can be very useful to know when designing a bridge or truss structure - use the design that will be stronger depending on what the bridge is used for.</p>	
Summary Statement I showed that the Pratt Truss is stronger with the load all the way across the top, but the Howe Truss is stronger with the load on the top center.	
Help Received I built the bridges myself from information from the internet. My science teacher gave me notes on making the board more detailed.	