



**CALIFORNIA STATE SCIENCE FAIR
2006 PROJECT SUMMARY**

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Project Title
London Bridge Is Falling Down

Abstract

Objectives/Goals
 To design a truss structure based on equilateral, scalene, and isosceles triangles to determine the strength and the architectural benefits of the different triangles.

Methods/Materials
 To test my hypothesis, I first had to build the nine trusses that consisted of three trusses based on equilateral triangles, another three based on isosceles triangles, and another three on scalene triangles. To build these trusses I had to build the truss sides and then connect it to another truss side with three base popsicle sticks and two popsicle sticks on top. I also made the control group from two overlapping popsicle sticks glued together. When the trusses were finished I then conducted the experiment. To do this I had to take two level supports set the trusses on it one at a time and tie two pieces of nylon line on the middle joint of both truss sides. Then I began gradually adding 250 ml to 1,000 ml of H₂O until the truss hit its fullest weight capacity and broke. I did the above for each of the nine trusses and then analyzed the results.

Results
 The trials below consist of 2 trusses so that the structure could stand upright. Altogether I constructed and tested 27 trusses. Below are the results of each set of 2 trusses. ex:scalene trusses trial # 1 held 9,000 ml of water.

Control Group	Scalene Trusses	Equilateral Trusses	Isosceles Trusses	ml H ₂ O	ml H ₂ O	ml H ₂ O	ml H ₂ O
Trial 1 1,000	Trial 1 9,000	Trial 1 16,000	Trial 1 14,000				
Trial 2 3,797	Trial 2 11,336	Trial 2 15,625	Trial 2 9,647				
Trial 3 5,000	Trial 3 6,000	Trial 3 12,000	Trial 3 13,253				
Avg 3265.67	Avg 8778.67	Avg 14541.67	Avg 12300.00				

Conclusions/Discussion
 From the results I concluded that the truss based on equilateral triangles can support the least amount of weight (not including the control group). I can also conclude that the isosceles truss can support the most amount of weight. I could list the reasons but I don't have enough room.

Summary Statement
 Which type of triangle supports the truss with the most beneficial results.

Help Received
 mom helped me tie the trusses;Dad helped me type