Balsa Wood Bridge Design Competition

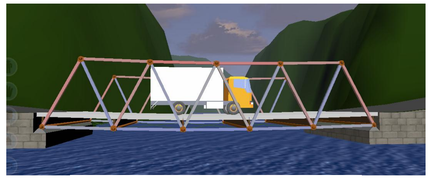
Design it!

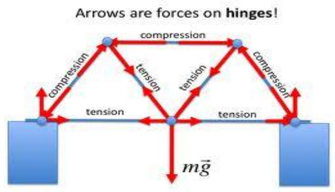
The first step in bridge building is to come up with a design! Your design should be original. Don't be afraid to get creative! Aside from being within the weight and size restrictions, your bridge must also be strong, to support as much weight as possible….

Your design drawing will be an essential part of the judgment criteria

Design Drawing - Score will depend on:
1. Resemblance - The accuracy of the drawing in relationship to the bridge. The drawings may be full size or to scale.
2. Dimensioning - Proper indication of the height, width and length of various parts of the bridge.
3. Completeness of title block - Must indicate: Name of project, school name, teacher name, team name, Team members, grade levels and date of completion.
4. Appearance and neatness - Quality and cleanliness of the presentation.

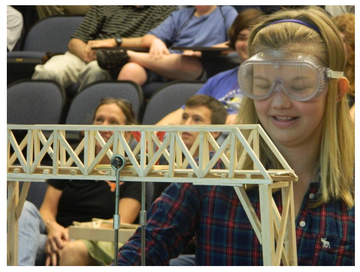
Use a program such as West Point Bridge Designer (a free software download that can be found at http://bridgecontest.usma.edu/download.htm) to design and test your bridge virtually!





Learn how the forces of tension and compression work to hold up a bridge…or bring it down!

How will your bridge stand up to the test?

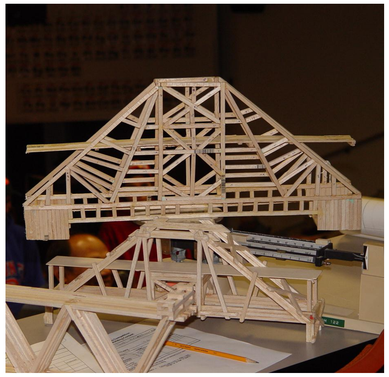


Build it!

The bridge shall be designed and constructed by a team of three students. The bridge must meet certain weight and dimension requirements which are described in detail in the instructions. One of the most important things about this project is to learn the engineering team approach to solving problems. Working, as engineers do, in a team, will result in generating ideas and improving on your first thoughts and ideas in producing the finest bridge you can.

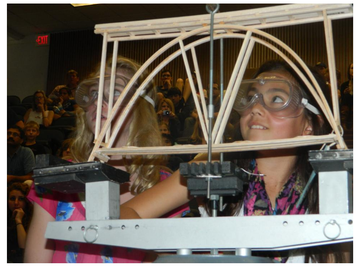
CAN YOU BUILD ONE OF THESE?

Balsa wood and fast-drying glue are the only materials to be used.
The bridge must be "free standing"
Total mass of the bridge, including glue, may not exceed 110 grams.
No fastening method other than mechanical interlock of the balsa pieces or commercial glue is allowed.
All bridges, when presented for judging at the competition shall have, affixed to the bridge by tag or other means, identification which shall indicate the school name, teacher name, team name and team members and grade levels.
For a full list of contest rules and guidelines, refer to the handouts received by your teachers, or see contact information on this poster.



Break it!

Put your bridge to the test! How much weight can it take before it breaks?



The purpose in loading the bridge until it fails is to simulate the real life functioning of a highway bridge. Since any highway bridge which deflected (bent downward) seriously would immediately be taken out of service as being unsafe, any bridge in this competition which deflects more than 3.5 cm will be considered to have failed under load.

The Competition Details

The overall winner will be the team with most points. Each team will be judged upon the following criteria:

- Craftsmanship: 0 to 10 points
- Originality: 0 to 10 points
- Design Drawing: 0 to 10 points
- Load Capacity: 30 to 70 points

In case two teams reach the same load capacity, the efficiency of the bridge is calculated by dividing the maximum load that the bridge supported by the original weight of the bridge. The team with the highest efficiency will be declared the winner.

$$\%\ \boldsymbol{Efficiency} = \frac{\boldsymbol{Failure\ Load}}{\boldsymbol{Weight\ of\ Bridge}} \times \mathbf{100}$$

*Be sure you convert the units!

Contact information:
The competition will take place at USF's annual Engineering EXPO. Contact ecfernan@usf.edu for details.

Date of Competition: Spring, 2014

Sponsors:

UNIVERSITY OF SOUTH FLORIDA