VCP-Mechanics
Session 5 Assignment
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This was the group project we used for Statics class last year.

Group project -truss design

***Objective**:* To design and build a truss of 12 inches long and 3 inches high (no width restrictions) which will have maximum load efficiency. Load efficiency is defined as the ratio of the strength of the truss to the weight of the truss.

Apparatus: Each student will use 25 craft sticks (Popsicle sticks) as shown in figure 1. Any type of glue may be used to hold the sticks together. The sticks may be cut and or fabricated in any way. No other material or additional wood may be used other than the original 25 sticks supplied.

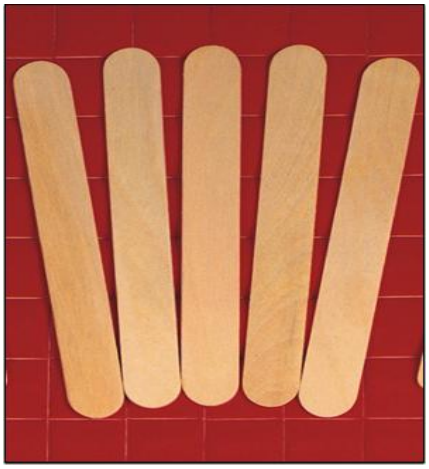

Figure 1 the pop-stick for the class project

Method: Any design may be used but the following points should be considered.

1. The truss will be tested by applying a distributed load to the top. Make sure your truss is symmetrical or all of the load may be applied to just the highest point.
2. The truss will be supported by rods located 11 inches apart. The truss should be at least one inch longer or it will fall between the supports.
3. If a truss is too thin the members will twist or buckle rather than failing in tension or compression. Analysis of which members are under tension and compression should show which member should be strengthened the most. A "T" or "H" shaped beam is less likely to buckle than a flat beam. You may fabricate any shape members you wish to construct your truss.

You might find a lot of possible solution through the internet. Figure 2 is one of such example.

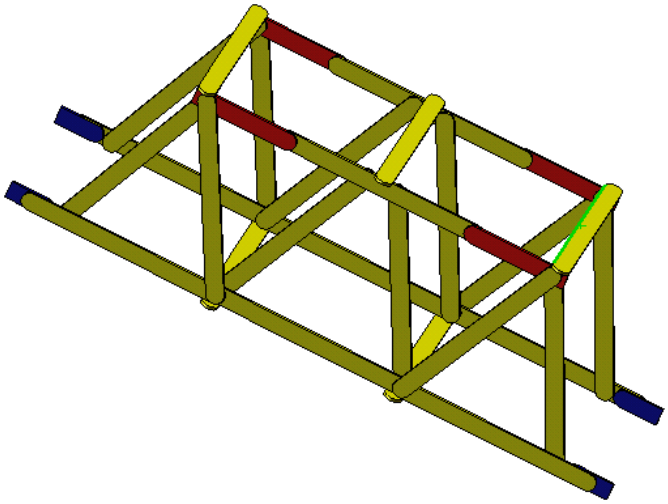

Figure 2 one example of possible truss

Test Procedure: Each truss will be measured to be sure it meets minimum specifications in length and height. Each truss will then be weighed. The truss will then be tested to destruction, using a compression test. The mode of failure and maximum load supported by the truss will then be recorded.

During the first test, you might take some photos to record the actual fracture locations of your design, which might help you to improve your design for the second test.

Evaluation: A written report will be required containing the following:

- A scale drawing of the truss showing where the failure occurred.
- An analysis of the failure, including recommendations to strengthen the structure.
- Based on your method of failure, a sketch showing any changes in design to improve the truss in order to support a greater load.
- Discuss the benefits derived from the experiment.

Some important timelines

- On November 14, 2012, which is the second lecture hours (Wednesday) in the week#11, the truss structures will be tested. The maximum loading will be recorded.
- One November 30, 2012, which is the third lecture hours (Friday) in the week #13, the truss structures will be test again. The maximum loading will be recorded.
- The report is due at December 3, 2012, which is the first lecture hour (Monday) in the week #14.