Bridge Building Contest

Object :

To design and construct a bridge that conforms to certain size specifications and is both strong and light.

Materials :

Grades K-5 You may use an unlimited number of craft (Popsicle) sticks, an unlimited amount of white glue (such as Elmer's glue), and a maximum of one sheet of typing, duplication or copying paper no heavier than 20#. The craft sticks must be wood and start out as standard craft sticks not longer than 12 cm long and approximately 1.5 cm wide and .2 cm deep.

Grades 6-12: You may use an unlimited number of round toothpicks, an unlimited amount of white glue (such as Elmer's glue), and a maximum of one sheet of typing, duplication or copying paper no heavier than 20#. The toothpicks must be wood and start out as standard toothpicks not longer than 6.7 cm long and approximately 2.3 mm in diameter.

NOTE : Please follow the site-specific construction rules on the WSTA web site: http://www.wsta.net and click on the Science and Engineering Contest link.

Construction Rules for East Side Contest

Construction Rules for West Side Contest

Label your bridge with your name and grade level.

The bridge must span a gap of 30 cm. and be no more than 20 cm. high.

The bridge may not weigh more than 300 grams.

There must be a bridge deck that a truck could use to cross the bridge. The truck is 4 cm wide and 5 cm tall. The deck may be at any level of the bridge.

The force will be applied to the surface of the bridge deck midway between the abutments. The test bar will be placed with the long dimension parallel to the road bed. If a superstructure is used, an opening 3 cm in diameter must be left for the insertion of the piston that applies force to the test bar.

Scoring :

The bridge will be weighed before testing. Testing is complete when the pressure dial drops significantly, the deflection from the original position is 3 cm, or when the structure breaks. A "strength coefficient" is calculated by dividing the highest pressure reading by the weight of the bridge. The bridge with the highest "strength coefficient" wins.

Comments :

As you design your bridge, you must keep in mind how the applied weight (force) will be distributed along the structure. Your bridge should provide maximum support to the area where the weight will be applied.

Glues such as epoxy, super glue, polyurethane, etc. can not be used.

Toothpicks or craft sticks may be cut, bent, carved, or broken in construction.

Selected Reading :

Dupre', Judith. *A History of the Worlds Most Famous and Important Spans* . Blackdog & Leventhal Publishers, N. Y. ISBN 1-884822-75-4

Design Technology: Children's Engineering, ISBN 1-85000-590-7.