

**ENGINEER'S WEEK TOOTHPICK BRIDGE
COMPETITION RULES
MONTSHIRE MUSEUM OF SCIENCE
FEBRUARY 20, 2010**

DESCRIPTION:

The objective of this event is to design and build a structure with the highest load-to-weight capacity ratio (Failure Load/Weight), over a predetermined span using toothpicks and glue.

The competition will be divided into two divisions; a student division and open division. All participants will receive free admission to the Museum of Science for the day of competition. Limit one admission per bridge per person entry.

This is an engineering event; therefore, failure to adhere to the rules and regulations herein may result in disqualification from the competition.

Materials:

1. Round, uncoated toothpicks
2. Elmer's white glue.

Construction:

1. Any type of bridge may be constructed as long as it meets the following specifications.
2. Do not coat the bridge with any material (i.e., paint, stain or glue).
3. The bridge must be constructed to meet the following specifications:
 - *See Figure 1 for more detail*
 - a. The bridge will span an opening of twelve (12) inches on the loading table. Note that the bridge will need to be longer than twelve inches to allow for bearing on the table.
 - b. Bridge will only be allowed to rest on the provided loading table. No glue or physical attachments may be made to the top or sides of the loading table.
 - c. Bridge width: Minimum = 1.5 inches
Maximum = 2.5 inches
 - d. Bridge height: Minimum = None
Maximum = 8 inches
4. The bridge must be able to accommodate the loading block (2"x2") at application point (see Note 5 under Testing). The loading block application point is at the midway point in the bridge. The loading block will be placed on top of the bridge or on the road bed depending on the design of the bridge.

Testing:

1. All bridges will first go to the Check Station where they will be weighed and measured for compliance with the construction specifications. Bridges that are completed but do not meet the construction guidelines will be given a chance to make any necessary alterations.
2. No alterations will be allowed unless deemed necessary by the Judges. If such alterations are required, the team will be allowed fifteen (15) minutes to complete them.
3. The loading block and testing apparatus will be provided and may not be altered.
4. During the test phase, the bridge will be placed in the center of the testing apparatus containing a span of twelve (12) inches.
5. The load will be applied to a 2"L x 2"W x 1"H loading block resting at the midpoint of the span. A standard five-gallon plastic bucket will be attached to the loading block. The roadbed must be constructed to accommodate the 2"-wide loading block and the one-fourth (0.25) inch eyebolt at the midpoint of the span.
6. The participant(s) will add sand to the five-gallon bucket until the structure fails. For this contest, structural failure is defined as obvious structural collapse.
7. The total load incorporates the total mass of the loading apparatus, bucket and sand.

Scoring:

1. Overall ranking will be based on the structural stability score.
2. The structural stability score will be determined by the equation:
[maximum load supported (grams) / mass of bridge (grams)]

Prizes:

All participants will be entered into drawings for random door prizes throughout the competition.

