

TOOTHPICK BRIDGE BUILDING

The bridge must be constructed from FLAT, ROUND, or SQUARE toothpicks (standard length of about 7 cm) and Elmer's YELLOW, INTERIOR, ALL, or WOOD glue. Each bridge must satisfy the following requirements.

1. The total mass of the bridge must not exceed 35 grams.
2. The bridge must have space for a 5 cm x 30 cm board to slide between the bridge and the table and between the legs at the ends.
3. The roadway of the bridge needs to be at least 4 cm wide for the whole length of the bridge (at least 30 cm span).
4. The roadway of the bridge must not be more than 10 cm above the tabletop.
5. The roadway shall consist of at least a continuous rail along each side the maximum length of the bridge.
6. The bridge must allow a 3.5 cm wide x 50 cm long x 2 cm high board to be laid on the roadway to see that the road is level. There must not be more than a 1 cm gap between the road and the board.
7. There must be room for a 2 cm x 4 cm x 15 cm test rod to be placed across the roadway in the middle of the bridge. (This is where the weight will be applied to break the bridge).
8. The maximum bridge height is 22 cm.
9. The bridge must be free standing.

Grading:

1. Initial sketch (10 pts) – Must include a side view and show the position of the test rod, the 5 cm x 30 cm opening, and the roadway – also, an end view with the roadway labeled and the width shown.
2. Bridge Design (50 pts+) – Based on completion on time and within rules (30 pts) [No bonus points possible unless all 30 pts earned], and strength (20 pts) based on the following scale: 4 lbs or less = 4 pts, 5 to 10 lbs = 8 pts, 11 to 15 lbs = 12 pts, 16 to 20 lbs = 16 pts, 21 to 30 lbs = 20 pts, 31 to 45 lbs = 24 pts, 46 to 60 lbs = 28 pts, over 60 lbs = 32 pts.
3. Final sketch/analysis (10 pts) – Must include an updated sketch of the bridge with the labels described above, and an explanation of where the bridge failed and what could have been done to prevent that failure while keeping the bridge legal.