**Spaghetti Bridge Project**

**Your Challenge** is to construct a bridge to certain specifications. The goal is to design and create the most efficient and aesthetic bridge possible using **only spaghetti noodles and school glue**.

**The Criteria**:

 **Weigh Held –** You want your bridge to hold more weight than your classmates’ bridges.

**Structural Effectiveness** is equal to the weight supported divided by the weight of the bridge.

**Aesthetics** Subject to Coach Huff’s opinion and will be determined through visual appeal, uniqueness, symmetry, & neatness.

Data calculations must be accurate.

**The Specifics:**

**Span:** The bridge must be a **minimum** of 12 inches in length. *Note*: the gap that you will span is 10in, if your bridge is short, you will lose credit, or possibly be disqualified. There is **no** maximum length.

**Deck:** Must be at least 1.5 inches wide. This will be measured using a block of wood that should be able to travel the whole length of the bridge. The width cannot exceed 2.5 inches.

**Bridge Height:** The height of the tallest point of the bridge can be no more than 7inches above the level of the higher table.

**Load Connection:** The bridge must be able to accommodate my loading block at the midpoint of the deck. The loading block is 2in long, by 1.5in wide, by .75in tall. A whole in the center of the bridge must accommodate a ¼in rod that must pass through the vehicle deck.

**Pedestal:** One table is exactly 3.5cm lower than the other. Your bridge should have a pedestal on one end to account for this issue. The pedestal is part of the bridge; must be constructed from spaghetti & glue and must be attached.

**Material Specifications:**

Spaghetti Noodles: Kroger Brand Spaghetti available in 16oz packages is about the cheapest it gets.

*Any other type/style noodles (besides round spaghetti) will result in deduction, possible disqualification.*

Elmer’s (or similar) school glue. *Epoxy, wood glues, hot glue, and super glues will result in deduction, possible disqualification.*

Do not coat bridge with any material (paint, stain, or glue)

Total Weight of bridge cannot exceed 10 ounces.

**Bridges not meeting these specifics will be penalized and possibly disqualified**

**Testing Procedures:**

1. Bridge will be weighed and measured for compliance with specifications.
2. Loading block will be put in place in the center of the bridge.
3. Bridge will be placed between 2 tables spaced 10 inches apart.
4. Load will be applied by Coach Huff slowly until I have achieved bridge collapse.

**Data Sheet**

**(Must be completed on the day of bridge test)**

 **Grams Ounces (*Round to nearest 10th*)**

Weight of Bridge \_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_

Weight Held!! \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_(Including weight of loading apparatus)

Calculate Structural Effectiveness Ratio. Include units in your answers.

Structural Effectiveness = $\frac{Weight Held (lbs)}{Weight of Bridge (oz.)}$ Divide and round to nearest 10th to find weight carried per ounce.

Structural Effectiveness = \_\_\_\_\_\_\_\_\_\_\_\_\_

**Spaghetti Bridge Rubric**

**Honors Geometry**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  |  |  |  |  |
| **Aesthetics (10)** | Bridge is messy, not clean. Extra glue. Noodles out of place. (3) | Bridge has some appealing qualities but is mostly messy. (5) | Bridge is mostly appealing, but has one or two messy areas (7) | Bridge is neat, clean. No noodles out of place. (10) |
| **Bridge Criteria (18)** |  |  |  |  |
| Length ≥ 12in  | Does not Meet (0)\* |  |  | Meets (3) |
| 1.5 ≤ Width ≤ 2.5 in | Too wide or block not accommodated (0) |  |  | Meets (3) |
| Height ≤ 7in | Does not Meet (0) |  |  | Meets (3) |
| Pedistal Attached | Does not Meet (0) |  |  | Meets (3) |
| Hole for Loading | Does not Meet (0) |  |  | Meets (3) |
| Materials | Anything other than school glue & noodles (0)\*\* | Bridge over 10oz (0)\* |  | Meets (3) |
| **Effectiveness (40)** |  |  |  |  |
| Weight Held (20) |  | Based on how well your bridge  |  | = |
| Structural Effectiveness (20) |  | compares to the bridges of your classmates |  | = |
|  |  |  |  |  |
|  |  |  |  |  |

\*If bridge is too short or over weight, it will moved to last place in the structural effectiveness category.

\*\*If illegal materials are present, it will move to last place in the weight held category.

\*\*\*Bridges with no structure (i.e. just a pile of noodles) will be moved to last place in the weight held category.

 Name \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_