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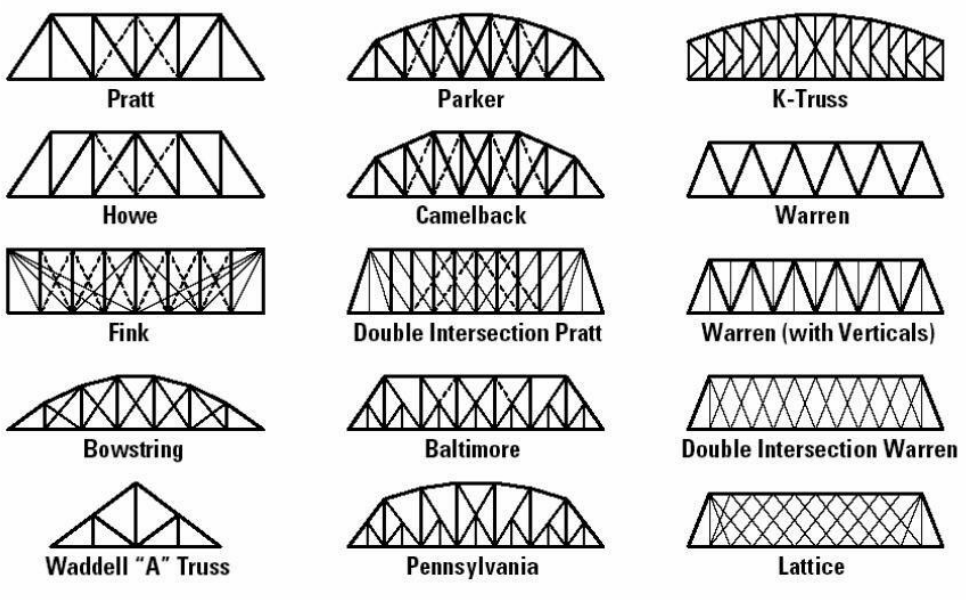
POPSICLE STICK BRIDGE CONTEST



Richmond Public Library - Brighouse Branch

March 7, 2020

Category/Event	Event Start
Check in (for all)	11:00 AM
Grade 10 and under	1:00 PM
Grade 11 and 12	1:30 PM
Open (18 years or older)	2:00 PM
Prizes and Awards	2:30 PM

* Children under 13 must be accompanied by an adult.
* Winners will receive official certificates

Awards:

- **Winners must be present to claim prizes.**
- Awards will be presented at 2:30 PM or after testing of all bridges (whichever is earlier). The **top 5 Teams** will be given awards in ascending order of their scores. The score is calculated by dividing the maximum load exerted on the bridge by the actual weight of the bridge.

Design Brief
The goal of the contest is to construct the strongest bridge possible with only **100 Popsicle sticks and Aleene's Tacky Glue or Titan School Glue or Elmer's School Glue**. The bridge must span a 400 mm gap with a maximum height of 200 mm, and a matchbox car must be able to traverse the bridge on a construction paper deck. The design and construction of the bridge is left up to the competitor. Specifications are included below.

Everyone is welcome to participate.

Participants are encouraged to send in their registration form by email to **egbc.richmond@gmail.com** and pick up their kits from the Richmond Public Library (Brighouse) early.
Contestants may participate as individuals or as teams, however teams are encouraged.

OFFICIAL CONTEST RULES

Registration:

1. Each bridge built by a team is considered as one (1) entry. All entries must be registered in advance. A completed registration form should be emailed back to **egbc.richmond@gmail.com** by **February 23rd, 2019**. Type your name(s) (**no handwriting please**) using the spelling that you want to appear on certificate for entries.
2. A limited number of construction kits will be available for pick-up from Richmond Public Library (Brighouse) during February. Email instructions are on the registration form.
3. You will receive a confirmation email.
4. The kit materials consist of 100 Popsicle sticks, and a bottle of Glue. Participants can also buy their own material from craft stores or dollar stores. **Standard wooden Popsicle sticks 113 mm long and 10 mm wide** must be used. No other type of glues is accepted except **Aleene's Tacky Glue** or **Titan School Glue** or **Elmer's School Glue**.

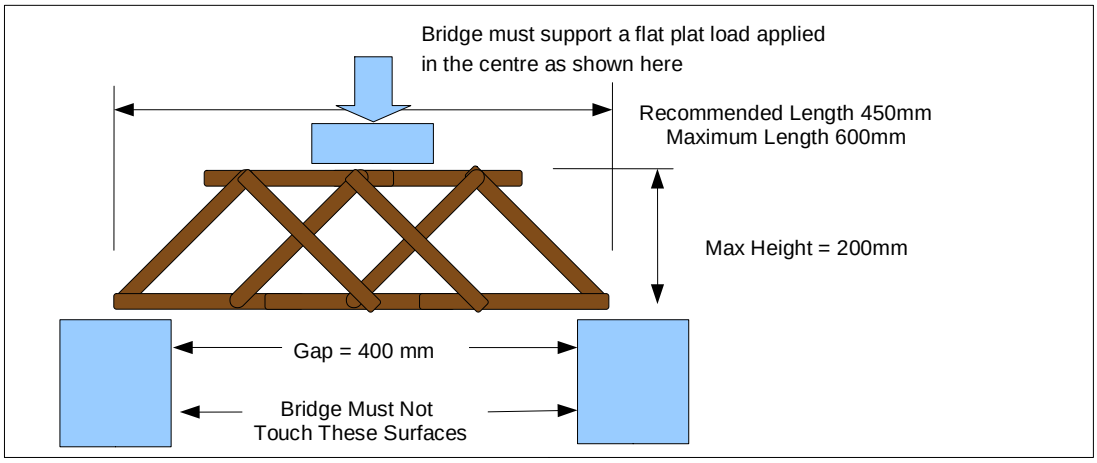
Construction:

1. The bridge must be built with a maximum of **100 Popsicle sticks** and **Aleene's Tacky Glue or Titan School Glue or Elmer's School Glue.** No other glues are acceptable. Popsicle sticks with non-standard dimensions are not allowed. Popsicle sticks must be used whole and without alteration. **No cutting, grinding or sanding is permitted.**
2. A deck made from construction paper must be included, wide enough to permit a matchbox car, 35 mm wide by 15 mm high to roll across the bridge.
3. It is critical that the bridge **must span a minimum 400 mm gap**. It is recommended that the bridge to be **at least 450 mm long** (25mm excess on each end) to ensure that bridge does not fall through the 400mm opening when the load is applied (please see the diagram below). **The bridge must not exceed 125 mm in width**. Note that the bridge may not load the sides of the 400 mm gap at any time during the testing. If it does, the test will be terminated.
4. The test machine will apply a load to the center of the top side of the bridge as shown. The highest

centre portion of the bridge should be designed to support a flat loading plate. The dimension of the loading plate is 100 mm by 120 mm. The **bridge must not exceed 200 mm in height and 550 mm in length.**

Test Procedure:

1. Bridges will be inspected at registration. Any violations of the rules outlined above will result in disqualification from the official results. The judging panel decisions are final.
2. Bridges will be weighed pretest at registration. In event of a tie, lightest bridge wins.
3. Testing can be performed by the contestants if they desire with the bridge tester. The winning bridge is the bridge that holds the highest load at failure. All bridges will be destroyed during testing unless the contestants decide not to continue with incremental loads before the failure occurs (to save their bridge)!



BRIDGE BUILDING ADVICE

- Give yourself plenty of time; don't wait until the last minute to build your bridge. The glue will need at least 24 hours to dry and will get stronger if allowed to dry for 2 days or more. Also, wood joints are always stronger if you clamp them tight while the glue dries - try using big binder clips to clamp the sticks together (clamps will be removed before testing).
- For bridge ideas look around at real bridges. A Popsicle stick bridge is of course much smaller, but the same principles apply (the important part is not the deck, but the steel or concrete structure that supports it). Look particularly at railway truss bridges, but also at bridges like the Port Mann Bridge, the Second Narrows Bridge, and the Queensborough Bridge. The Lions Gate Bridge and Alex Fraser Bridge are not good examples to follow because they are suspension bridges and rely on cables.
- Research the internet and your local library for excellent bridge reference information to help your design.
- Your bridge needs to have a solid, stiff shape. Notice how a popsicle stick is much stiffer and stronger when on its edge. A bunch of sticks glued together flat, like a raft, has very little strength and will sag during testing. Also, the strongest structural shape is a triangle.
- A bridge that is symmetrical is less likely to twist when loaded and hence will probably carry more load.
- If you aren't sure if your bridge will be stable, test it yourself - span it across two tables at 400 mm apart, and press down on the top of the bridge in the middle of the span. Just be careful not to break your untested creation!
- In past years, winning bridges have held over 300 kg (660 pounds). The highest record for a bridge with only 75 sticks was 322 kg (710 pounds) and with 100 sticks was 547 kg (1206 pounds)!