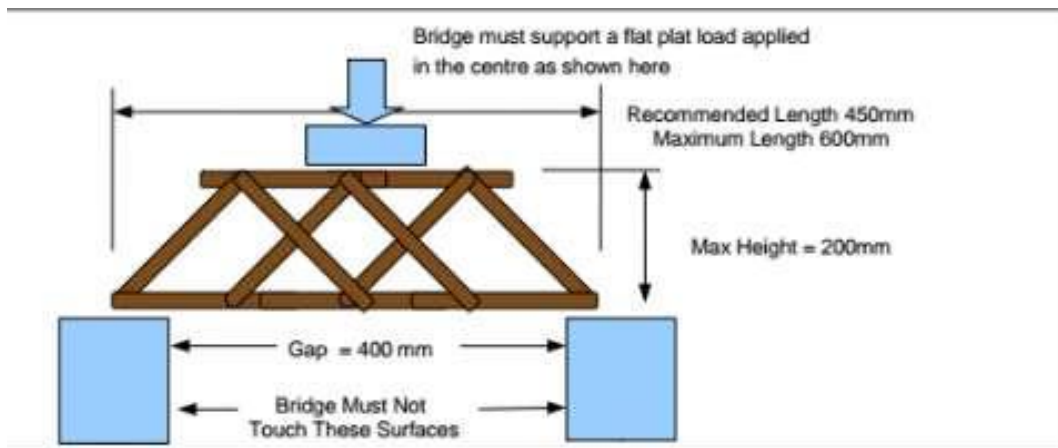


## BRIDGE BUILDING COMPETITION RULES 2023

### HOSTED BY THE FRASER VALLEY BRANCH

#### BRIDGE CONSTRUCTION AND TESTING

1. Each participant, or team, will work with approximately 150 popsicle sticks and a sheet of construction paper.
2. The finished bridge shall be built from a maximum of 100 wooden popsicle sticks using white all-purpose glue (e.g., Titan School Glue, Elmers School Glue or LePages Bondfast).
3. Popsicle sticks must be left whole.
4. A sheet of construction paper is to be used for the deck of the bridge, cut to fit the bridge design.
5. The bridge deck should be designed to have a matchbox car rolled across it. The car is approximately 35mm wide and 15mm high.
6. A load is applied at the top of the bridge, near the center, using a loading plate.
7. A testing machine measures the load as the bridge fails.
8. It is critical that the bridge must span a minimum 400mm gap. We recommend that the bridge be at least 450mm long to ensure that the bridge does not fall through the 400mm opening of the test apparatus when the load is applied (See the diagram below).
9. The bridge must not exceed 125mm in width. Note, that the bridge may not load the sides of the 400mm gap at any time during the testing. If it does, this will be considered the failure load.
10. The test machine will apply a load to the center of the top side of the bridge as shown. The highest center portion of the bridge should be designed to support a level loading plate. The loading plate is 100mm by 120mm. The bridge must not exceed 200mm in height and 600mm in length.



## **BRIDGE BUILDING TIPS**

1. Give yourself plenty of time; do not wait till the last minute to build your bridge. The glue will need at least 24/48 hours to dry.
2. Wood joints are always tighter if you clamp them tight while the glue dries – try using big paper clips to clamp the sticks together. Please remember to remove the clamps before the competition day.
3. For bridge ideas, look around you, at real bridges. The popsicle bridge is of course much smaller, but the same principles apply. The important part of the bridge is the steel and concrete structure that supports it and not the deck itself! Look particularly at the railway truss bridges, but also the bridges like the Second Narrows Bridge and the Queensborough Bridge. The Port Mann Bridge, the Lions Gate Bridge & the Alex Fraser are not good examples to follow, since they rely on Cables!
4. Research the internet and your local library for excellent bridge reference information to help your design.
5. 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. The strongest structural shape is a triangle!
6. A bridge that is symmetrical is less likely to twist when loaded and hence will probably carry more load.
7. If you are not sure, your bridge will be stable, test it yourself – span it across two tables set about 400mm apart, and press down on the top of the bridge in the middle of the span. Just be careful not to break your bridge!

## **COMPETITION DETAILS**

1. Entrants may be either teams or individuals.
2. The winning bridge is that which holds the largest load before breaking.
3. The bridges will be weighed before testing. In the event of a tie, the lightest bridge will be declared the winner.
4. Prizes will be awarded to the bridge with the highest load at failure.
5. Bridges are to be ready for testing on the day of the contest. Bridges will be broken as part of testing.
6. To register, please go online to <https://www.egbc.ca/About/OurTeam/Branches/Fraser-Valley-Branch>, entry fee is \$20 per individual or \$30 per team.
7. Official kits will be mailed to the registrants.
8. All be best!