POPSICLE STICK BRIDGE CONTEST

PRESENTED BY

Engineers and Geoscientists BC – Burnaby/New Westminster Branch

Burnaby Public Library

Burnaby Parks and Recreation

EVENT SCHEDULE

- Tool Kit Pick-up: March 5th to April 1st 2018
- Contest (event day): April 7th 2018
  10:30 AM - 11:00 AM: Check-in
  11:00 AM - 2:00 PM: Announcements, testing of bridges, and prize distribution

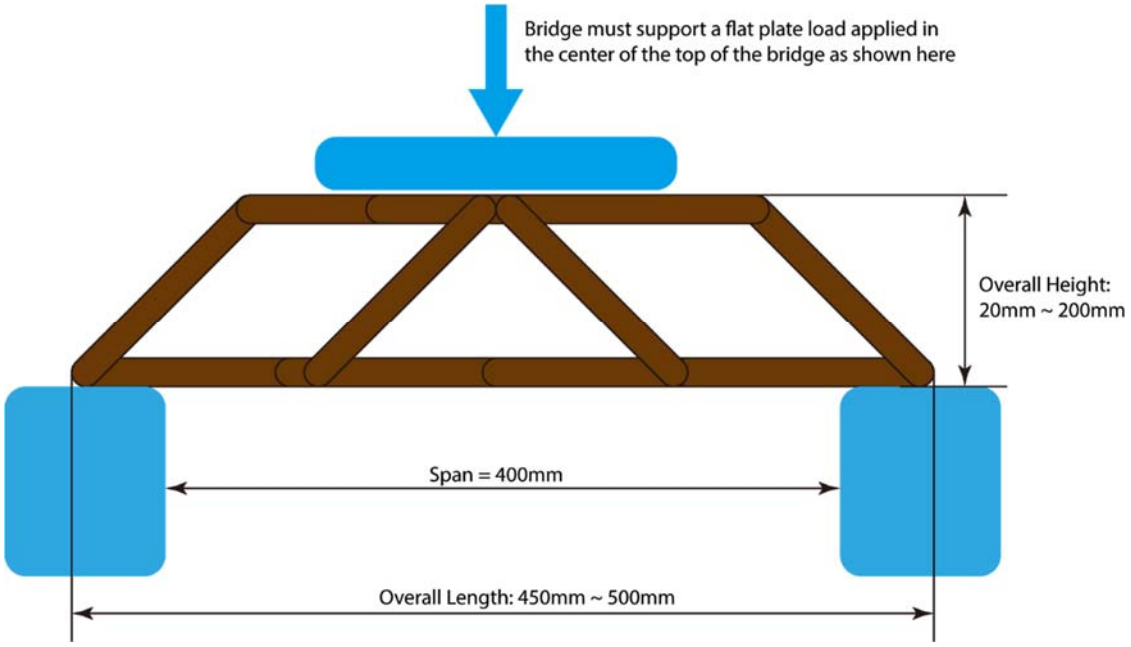
PRIZES

- All participants will receive gifts for participating.
- Winners of each group will receive a Chapters gift card.
- Winners must be present to claim prizes.

HOW TO JOIN THE CONTEST

- Please pick up the official kit of bridge-building supplies between **March 5th** and **April 1st 2018** at the Children's Desk at **Burnaby Public Library, Bob Prittie Metrotown Branch, 6100 Willingdon Avenue, Burnaby**.
- Contestants are allowed to participate as individuals or as teams with 5 members **maximum**. Each bridge built by a team is considered as **one (1) entry** in the contest. All participants must be currently enrolled in elementary or secondary schools

RULES OF BRIDGE CONSTRUCTION



- Contestants are allowed to participate as individuals or as teams with **5 members maximum**. Each bridge built by a team is considered as **one (1) entry** in the contest.
- Participants are encouraged to build the bridge using the official bridge-building kit which contains 100 popsicle sticks (**113 mm long and 10 mm wide**), and a bottle of glue. The same standard wooden popsicle sticks purchased by participants are allowed. Popsicle sticks MUST be used as a whole without alteration. **Cutting, grinding or sanding of popsicle sticks is NOT permitted**. No other type of glues are accepted EXCEPT **Aleene's Tacky Glue**, **Titan School Glue** or **Elmer's School Glue**.
- It is recommended to build the bridge using no more than **100** popsicle sticks. The overall weight of the bridge MUST be under **150 grams**. The winning bridge would be the strongest one which uses the least materials (**highest load-to-weight ratio**):

  Load-to-Weight Ratio = Load / Bridge Weight

- The dimension of the bridge MUST be compliant with the numbers below:
  - Overall Length: **450 mm** to **500 mm**
  - Minimum Span: **400 mm**
  - Overall Height: **20 mm** to **200 mm**
  - Overall Width: **50 mm** to **120 mm**
- A deck made from construction paper MUST be included, which is wide enough to allow a matchbox car (**35 mm wide and 15 mm high**) to roll across the bridge.
- The bridge MUST be able to stand on a flat surface on its own without any support from other surfaces.

- The highest center portion of the bridge MUST be designed to support a level loading plate of the test machine. (The dimension of the loading plate is **100 mm by 120 mm**.)

BRIDGE TEST PROCEDURE

- Bridges will be inspected at registration. Any violations of the rules outlined above will result disqualification from the official results. The judging panel decision is final.
- The bridge test machine will apply a load to the center of the top side of the bridge. The load capacity of the bridge will be the maximum load accepted by the bridge before it is destroyed.
- All bridges will be destroyed during the test unless the contestants decide not to continue with incremental loads before the failure occurs.

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 paper 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 such as the Second Narrows Bridge and the Queensborough Bridge. The Port Mann Bridge, the Lions Gate Bridge and Alex Fraser Bridge are not good examples to follow because they rely on cables.
- Research the Internet and your local library for excellent bridge reference information to help your design. Watch the following YouTube video to get inspired:

  https://youtu.be/wMP1iUv6FtQ or go to YouTube and type in "APEGBC Popsicle Bridge Building Contest"

- 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.
- A bridge that is symmetrical is less likely to twist when loaded and hence will probably carry more loads.
- If you are not sure whether your bridge will be stable, test it yourself - span it across two tables set about 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!
- For further information, email **bn@egbc.ca**.