

POPSICLE STICK BRIDGE CONTEST 2023

PRESENTED BY



Engineers and Geoscientists BC – Burnaby/New Westminster Branch
Burnaby Neighbourhood House

EVENT SCHEDULE

- Tool Kit Pick-up: April 3rd to 15th 2023 at Burnaby Neighbourhood House (South House)
Time: Monday to Friday, 9am – 5pm; and April 15th Saturday, 10am – 1pm
Address: 4460 Beresford St. #100, Burnaby (behind Metrotown Skytrain Station)
- Contest (event day): **April 22th 2023 at Bonsor Recreation Complex**
Address: 6550 Bonsor Ave, Burnaby – 2nd Floor Banquet Room
(Direct room access available through exterior walkway/ramp from South Parking Lot, or a set of stairs between the two parking lots that lead up to the patio)
- Contest Schedule:
10:30 AM - 11:00 AM: Check-in
11:00 AM - 2:00 PM: Announcements, testing of bridges, and prize distribution

PRIZES

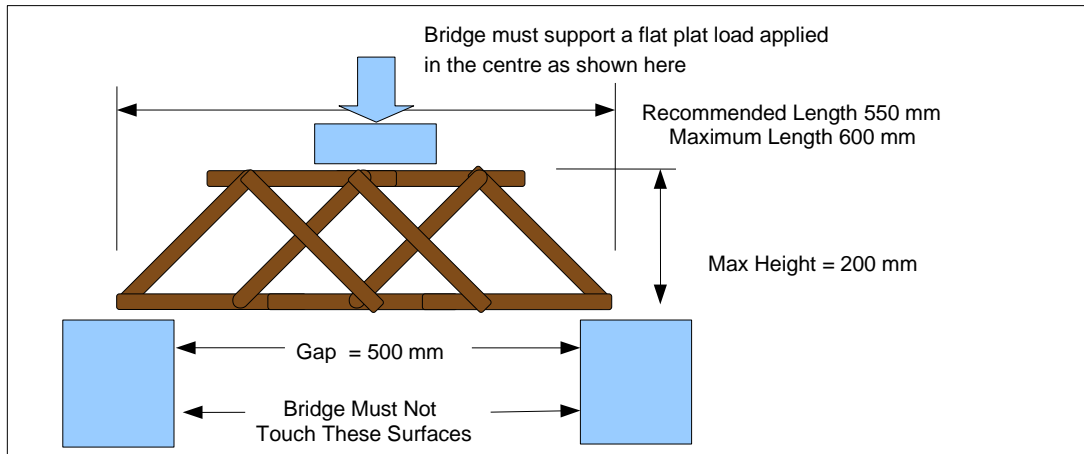
- Winners of each group will receive a Chapters gift card.
- Winners must be present to claim prizes. Awards will be presented at 2pm or after testing of bridges (whichever is earlier).

HOW TO JOIN THE CONTEST

- Open to Everyone currently enrolled in elementary or secondary schools.
- Fill out the Registration Form and email to outreach.bn@volunteer.egbc.ca before April 16th for registration, with email subject line **Popsicle Bridge Contest 2023 Registration**.
- Please pick up the official kit of bridge-building supplies between **April 3rd** and **April 15th 2023** from the Reception Desk at **Burnaby Neighbourhood House (South House), 4460 Beresford Street – Suite #100, Burnaby**. Show a printed or digital copy (ie. show on smart phone) of the registration form to the reception to pick-up your kit.

- Contestants are allowed to participate as individuals or as teams with 4 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.
- *Children under 13 must be accompanied by an adult.

RULES OF BRIDGE CONSTRUCTION



- Contestants are allowed to participate as individuals or as teams with **4 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**):

$$\text{Load-to-Weight Ratio} = \text{Load} / \text{Bridge Weight}$$

- The dimension of the bridge **MUST** be compliant with the numbers below:
 - Overall Length: **550 mm to 575 mm**
 - Minimum Span (Gap) Length: **500 mm**
 - Overall Height: **20 mm to 200 mm maximum**
 - Overall Width: **50 mm to 125 mm maximum**
- 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 in 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!
- In past years, winning bridges have held over 300 kg (660 pounds). The all time record for a bridge with only 75 sticks was 322 kg (710 pounds) and with 100 sticks was 415 kg (915 pounds)!
- If there are further questions, email outreach.bn@volunteer.egbc.ca.



THANK YOU TO OUR SPONSORS



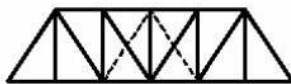
ENGINEERS &
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BRITISH COLUMBIA

BURNABY / NEW WESTMINSTER BRANCH POPSICLE STICK BRIDGE COMPETITION

REGISTRATION AND CONSENT FORM

Judging/Competition Date: Saturday April 22, 2023 – 10:30 AM TO 2:00 PM

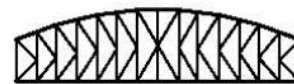
1. Participate as individuals or a Maximum of four members in a team. Each bridge built by a team is considered as **one (1) entry** in the contest.
2. All participants must be currently enrolled in elementary or secondary schools.
3. Fill out the Registration Form and email to outreach.bn@volunteer.egbc.ca before April 16th, 2023 11:59pm for registration, with email subject line **Popsicle Bridge Contest 2023 Registration**.
4. Please pick up the official kit of bridge-building supplies between April 3rd and April 15th 2023 from the Reception Desk at **Burnaby Neighbourhood House (South House), 4460 Beresford Street – Suite #100, Burnaby**. Time: Monday to Friday, 9am – 5pm; and April 15th Saturday, 10am – 1pm. Show a printed or digital copy (ie. show on smart phone) of the registration form to the reception to pick-up your kit.
5. Frequently Asked Questions, full competition rules and construction hints are available at egbc.ca/bn.
6. For further information, please contact us by email outreach.bn@volunteer.egbc.ca
7. Each individual contestant, whether solo or team, must complete this form and have it signed by a parent or guardian before picking up the bridge kit.



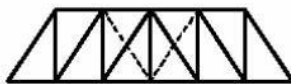
Pratt



Parker



K-Truss



Howe



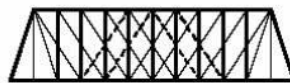
Camelback



Warren



Fink



Double Intersection Pratt



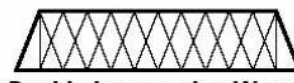
Warren (with Verticals)



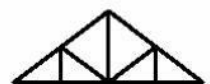
Bowstring



Baltimore



Double Intersection Warren



Waddell "A" Truss



Pennsylvania



Lattice



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REGISTRATION FORM

Engineers and Geoscientists BC Burnaby / New Westminster Branch 2023 Popsicle Stick Bridge Building Competition (April 22, 2023)

Student Name (First, LAST)			
School			
Grade			
Entry Type (Please tick selection)	<input type="checkbox"/> Individual <input type="checkbox"/> Team Team Name (if applicable): _____ If Team, please include names of other team members: 1. 2. 3. 4.		
Parent/Guardian Emergency Contact Information			
Parent Name (First, LAST)			
Email			
Phone Number			
Medical Alerts, Allergies (if any). Disabilities or special concerns we should be aware of.			
How did you hear about our competition?	<input type="checkbox"/> School	<input type="checkbox"/> Library	<input type="checkbox"/> Word of Mouth
	<input type="checkbox"/> Previous Entry	<input type="checkbox"/> Other explain:	

INSTRUCTION

Please fill out the information in the required fields of this form. **No handwriting please.**
Save, scan, or take a photo of this form.

Email subject line: **Popsicle Bridge Contest 2023 Registration**
Send your email to outreach.bn@volunteer.egbc.ca
Attach the completed form and send!

Please register before April 16, 2023; and pick-up the popsicle tool kits between April 3rd – 15th.