Regional/Provincial Scope Document

Spaghetti Bridge Challenge 2024

Grades 6 - 9 – Teams of 2 to 4

Purpose of the Challenge:

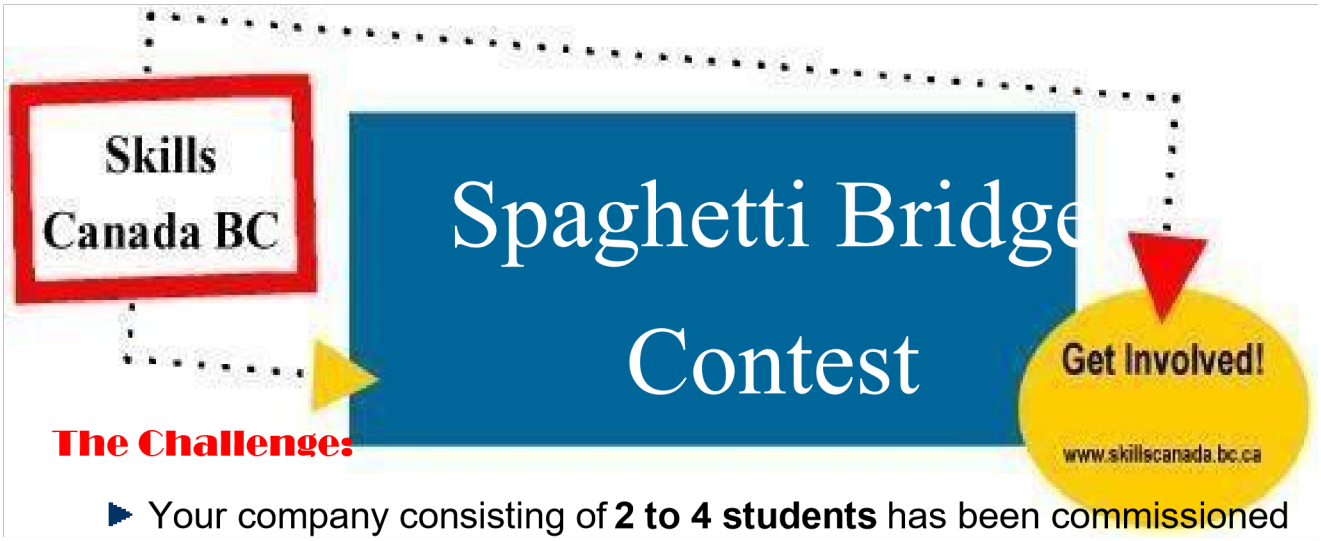
The Junior Skills Challenge is designed to allow grades 6 – 9 students the opportunity to explore trades and technology careers in a research fashion as well as to experience hands on practical application of skills. The Challenge is open to all regions in the province where teams of students will be tasked with a design/build situation or problem. The team project will be constructed at the Regional Skills Competition, judged by a panel comprised of educators, industry and community partners. The 1st place team will advance to the annual BC Skills Provincial event where the students will reconstruct a new bridge to be judged by provincial judges.

Delivering this career information at the lower grades will empower students with a more complete picture of the opportunities afforded by industry careers.

Developed By:

Okanagan College
&
Skills Canada BC

Provincial Technical Chair: Michael Grainger mgrainger@tru.ca



The Challenge:

- Your company consisting of **2 to 4 students** has been commissioned to design, engineer and build a working model of a bridge.
- The Spaghetti Bridge is to be constructed at the contest using **only Catelli spaghetti** and hot **glue**.
- The Spaghetti Bridge is to be as **light** as possible and be able to hold up the official **1 Kg loading mass** for **60 seconds**.
- The Spaghetti Bridge is to be a minimum width of 50 mm, a minimum height of 100 mm and is to span a length of 500 mm.
- The loading mass will be hung from a supplied official **loading platform** that the contestants will incorporate in the design.
- The platform must be located at the **mid-point**, on the **bottom** (road or deck) of the bridge.
- The bridge road or deck does **not** need to be a **solid** surface.
- The team whose bridge supports the official loading mass for a period of 60 seconds and has the **smallest mass** wins the competition.
- The teams will be allowed to test their bridge during the building time with a ½ **Kg** loading mass.
- Bridges will be judged as: Score = $\frac{1kg}{\text{Mass of bridge (g)}}$
- The contestants will be given 3 hours to build their freestanding Bridge.

- Each team of students is to work on their own without outside assistance from either their sponsor or other persons.

- Each team will be supplied with 200 grams of Catelli spaghetti, a glue gun and glue sticks. The bridges are to be constructed using only the materials supplied.

- A **loading platform** made of 1/4" fiberboard 50 mm X 50 mm with a metal hook attached weighing approximately 18 g will be supplied which **must** be used to accommodate the official loading mass during the testing period. The supplied platform must be incorporated in the design and will be located at the **mid-point** on the **bottom** (road or deck) of the bridge.

    - An **alternate loading platform** that is 3D printed with holes for a loop of string is allowed. The STL file will be uploaded to the Skills BC Spaghetti Bridge Competition Document page. A Youtube video detailing the use of this platform is located here; https://youtu.be/vFqNJVZ8oCA This loading platform is lighter than the wooden one and plans should be made to ensure a fair competition.

- The bridge deck does **not** need to be a solid surface for the length of the bridge.

- **No support(s)** from the bridge to the vertical sides of the testing platform will be permitted.

Evaluation

1) The bridges will be weighed to determine the bridge mass. The loading platform will be included in the total bridge mass.

2) Bridges will be loaded starting with the heaviest Bridge.

3) One of the team's members will load the bridge with the official loading mass, attaching it to the loading platform (supplied)

4) The bridge must support the mass with no assistance for a period of 60 seconds.

5) The bridge will be deemed to have failed if the loading platform separates from the bridge; or, if the loading platform moves in 5mm, or more, in any direction during the 60 seconds.

6) The winner will be the bridge that is the lightest and survives the loading time of 60 seconds.

7) Additional prizes will be awarded to surviving bridges in the order of increasing mass.

8) Ties will be broken by the bridge that can hold the most additional load before breakage.

9) The table on which the testing occurs shall be free from any outside vibration for the time period that a bridge is being tested by the contestants.

Appendix I

Websites that may be helpful:

Skills Canada BC http://www.skillscanada.bc.ca

Bridge Building sites:

PBS, Nova: Super Bridge
http://www.pbs.org/wgbh/nova/bridge/build.html

Bridge Builder Magazine
http://www.bridgebuildermagazine.com

Career Information Sites:

http://www.achievebc.ca http://www.learnandearn.bc.ca