The Bridge Building Challenge
The Ottawa 72nd Cubs 2003 Engineering Challenge

In the past, the Cubs have been given engineering challenges. Last year, given a limited parts list, they had to build a machine to launch a tennis ball as far as possible. At winter camp this year we tried building a tower out of mini-marshmallows and dry spaghetti.

The challenge this year is to **build a bridge** using glue and popsicle sticks! The winner will be the one whose bridge can support the most bricks. The bricks will be hung from the bottom while the bridge is placed between two supports. Once again you can work in groups of one, two, three, or four. You must do a plan first, and show it to a leader. There will not be a chance to work on your bridge in Cubs - this is an at home project.

Parents, don't help the Cubs, help the Cubs learn.

MATERIEL
- no more than 50 standard Popsicle-type sticks (wooden, solid, nominally 11.3 cm x 1.0 cm)
- wood glue (water soluble) and/or hot glue (water soluble). No epoxy glues allowed!

CONSTRUCTION
- a plan must be submitted to a leader
- Cubs to work individually, or in teams of two, three, or four
- sticks can not be formed into a laminate (layers glued together)
- sticks may be broken or cut and the pieces used individually, but not otherwise altered in shape
- the material properties of the wood sticks may not be altered in any fashion, including soaking and bending. The glue will be used for joining not coating.

SPECIFICATIONS
- the bridge height shall not be less than 25mm (1")
- the bridge length shall be greater than 254 mm (10") and less than 400 mm (15 3/4")
- the ends of the bridge shall lie flat on the testing supports, which are 200 mm (7.8") apart
- the bridge must allow a tennis ball to roll end to end without falling off. You will need a guard rail. Guardrails are safety requirements on most bridges.

TESTING PROCEDURES
- the bridge will be placed in the test apparatus with both ends of the bridge resting on a horizontal support
- judges will score the bridges based on quality of work, originality, aesthetics, and design
- a tennis ball will be rolled across the bridge from end to end
- the load (standard bricks) will be hanging from the centre of the deck of the bridge, using a harness and plate, and bricks will be applied to each bridge, one after the other, starting with a randomly chosen bridge in each round
- the load will be applied slowly so as to prevent an impact failure

SCORING
- the maximum number of bricks applied before breaking will be the score for the bridge
- in the event of a tie, the judges design score shall determine the winner.