



THE 2018 SOUTH CAROLINA  
**4-H ENGINEERING  
CHALLENGE**

## Bridge Building Challenge

### Challenge Description:

Each team will design, construct and test their bridge to determine which bridge can hold the most weight. The design of the bridge is determined by the team and the perimeters of the event.

### Team Requirements:

- 2-4 students per team.
- Age Range: Junior (age 9-13) and Senior (age 14-19)

### Materials Needed:

None. All materials will be provided the day of the challenge.

### Challenge Instructions:

On the day of the challenge, the teams will be informed of the width of the gap their bridge must span. Each team will receive 60 small craft sticks, 1 HOT glue gun and 3 5" glue sticks. Teams will be given 40 minutes to construct their bridge.

The bridges will be tested in the following manner: Each team will weigh their bridge before testing. Then, the team will bring their bridge to the testing space and put on safety goggles. The members of the team will attach a hanging weight container to their bridge using 2 zip ties. Weights will be added by team members one at a time until the bridge breaks or the container touches the floor. After the bridge breaks or the container reaches the floor, the weight container and its contents will be weighed to determine how much weight it took to break the bridge.

The challenge will be held in an area large enough to house all teams. The challenge will be run by one challenge facilitator and adult volunteers. Participants' chaperones will not be allowed in the challenge room during the build time but will be allowed in the room to silently watch during testing.

### Preparation Instructions:

Research bridge design. The facilitator suggests these resources:

- The Elements of Bridge Design [www.britannica.com/technology/bridge-engineering](http://www.britannica.com/technology/bridge-engineering)
- BATS- The basic of Bridge Design (Beams, arches, trusses and suspensions) [www.pghbridges.com](http://www.pghbridges.com)

Practice building and testing different bridge designs. Decide which design your team wants to use before coming to compete.

### Judging:

The bridges will be judged based on how much weight it takes to break each bridge. The bridge that holds the most weight will earn 1<sup>st</sup> place, the bridge that holds the next largest amount of weight will earn 2<sup>nd</sup> place, and the bridge that holds the next largest amount of weight will earn 3<sup>rd</sup> place. In the event of a tie the bridge weighing the least will place before bridges weighing more.