



Guidelines for internal school Bridge Building Competition

Due to restrictions on the number of teams per school that are permitted to take part in our bridge building competition, we recommend that an internal competition be held prior to our competition. All year 8 and 9 students (or year 9 and 10 in New Zealand) could take part with the winning team(s) going through to our competition. It's a great way to get a wider group of students involved!

There are a few ways to hold your own internal competition. Students can either design their bridge digitally, or physically using some or all of the suggested materials below.

Digital competition

We encourage students to design their bridge digitally prior to construction to better plan and design their physical bridges. This helps them build a stronger bridge and ensures they don't run out of materials.

Each year we encourage students to submit a digital design of their bridge prior to Judging Day to take part in the Digital Award. Aurecon engineers select the best wireframes per location and virtually test them using bridge analysis programs.

Although your school may not have the ability to load test the digital bridges using bridge analysis programs, a great way to get students involved in the Bridge Building Competition is to get them to start with a digital design.

How to run an internal Digital Competition:

1. Get students to design their bridge digitally using AutoCAD, SketchUp Make or SketchUp Free (as an educator these are free to use). There are download links and tutorials on [our website](#)
2. Students can print out or email their designs to submit into the internal school competition
3. The teacher can then review the entries to decide on a winner. We suggest using the judging criteria in the Aurecon Bridge Building Competition guidelines to award each bridge based on its workmanship, innovation, aesthetics and functionality
4. The students with the winning bridge(s) will be able to go on to construct their bridge that they've designed using the materials supplied by Aurecon, as well as submit their digital design to the Digital Award!

Physical construction competition

The following guidelines are only suggestions and you can use whatever materials you like. Before beginning the competition, it may be a good idea for the teacher to build a bridge him/herself before the students do to ensure that the hanger will fit onto the bridge. This will also give the teacher an idea of what sort of weight the bridge can support and how long it takes to construct a bridge. You could even compare the strength of the students bridges to the teachers!



Please note that for our competition, we will be providing you with materials and bridge specifications different to those listed below. Please refer to the Aurecon Bridge Building Competition guidelines for more information.

Suggested Specifications

- Your bridge must be able to span 300mm, i.e. there should be a clear distance of 300mm between two supports
- Your bridge must be able to support the loading apparatus with the hanger positioned at the centre of the bridge. Your science laboratory may have a hanger with weights. If not, consider using a bucket with water. 1 litre is equivalent to 1 kilogram. You may want to do the testing outside
- Incrementally increase the load on the bridge until it fails. The bridge that can support the most load wins

Recommended materials and equipment

- Bamboo skewers: these can be found at your local supermarket, are 250mm long and cost about \$2.00 per packet of a hundred. Allow 25 skewers per team. The skewers have sharp ends, so it may be a good idea to trim the ends off before commencing
- PVA wood glue: this can also be found at your local supermarket and costs about \$4.50 for 100ml. It is nontoxic and easy to use. Do allow enough time for the glue to dry before testing it
- Scissors or a small hacksaw for cutting the skewers
- A tape measure or a ruler
- Pencils and paper for drawing the bridge before it is constructed
- Clothes pegs for temporarily holding the skewers together whilst the glue dries
- Safety glasses to be used when testing the bridges

Good luck, and happy building