



CRESCENT VALLEY ROBOTICS TEAM 955

CORVALLIS, OREGON

DaVinci Days Gumdrop Bridge-Building

Notes from July 2012

WHAT: In 2012, First Force decided that we should be more “engineering-relevant” and do more than just hold a robotics exhibition. The decision was made to put on a set of engineering-themed hands-on activities in the field next to the exhibition. We (955) chose to do gumdrop bridge-building.

Setup: We started setting up at 12:30 Saturday morning of DaVinci Days weekend. Our setup consisted of (or should have consisted of):

- Two rented tables, placed next to each other in parallel with a space in between
- A canopy tent overhead to protect the participants from the sun. (On the east side of 11th Street, the trees don't produce any meaningful shade until very late in the afternoon.)

Supplies:

- Gumdrops. We ordered 20 pounds worth (about 2,400) through candywarehouse.com – we could also have gone to Winco and done a lot of shoveling. This turned out to be way too many gumdrops.
- Toothpicks. We picked up 3,750 (15 Boxes) from Winco..This was also way too many. But, we didn't have any way to know that.
- If I had to do it all again, I would cut the number of gumdrops and toothpicks down by at least 25%.
- Template sheets. We printed 200 template sheets, thinking that kids would take them with them after building their bridge. Hardly anyone did. We could have done just fine with 25 sheets, perhaps laminated.
- We ordered a self-inking rubber stamp to stamp the kids' passports. We decided against ordering a bridge-specific-looking one. Instead we ordered a general “Good Job” teacher-stamp so that we can re-use it for future 955 activities.
- Four 4' long 2x4 blocks of wood. These were the banks of our “river”, one river per table. (We bought these out of the Home Depot scrap box. They are cheaper that way.)
- Twelve 16” long 2x4 blocks of wood. These were our “bridge load”. (This is two 8' long 2x4s, which Home Depot cut into 16” sections for us.)
- A bottle of hand cleaner to clean excessively-sticky hands. Nobody seemed to care.

At the Event:

- This attraction was very popular. (Engineering and sugary food – what's there not to like?)
- We (955ers) stood in the middle, between the two tables and ran identical operations at each table. This let more kids participate at a time.
- It seemed like we needed about **four** people running it there at a time.
- Some of the 955ers made sample bridges and other structures at the start to use as examples. This was a good idea.
- We emphasized that nobody *had* to build a *bridge* – they could do anything they wanted. This appealed to the very young ones and the older ones. We got sculptures, artwork, office buildings, geodesic domes, and an airplane. The thought and creativity are what is most important.

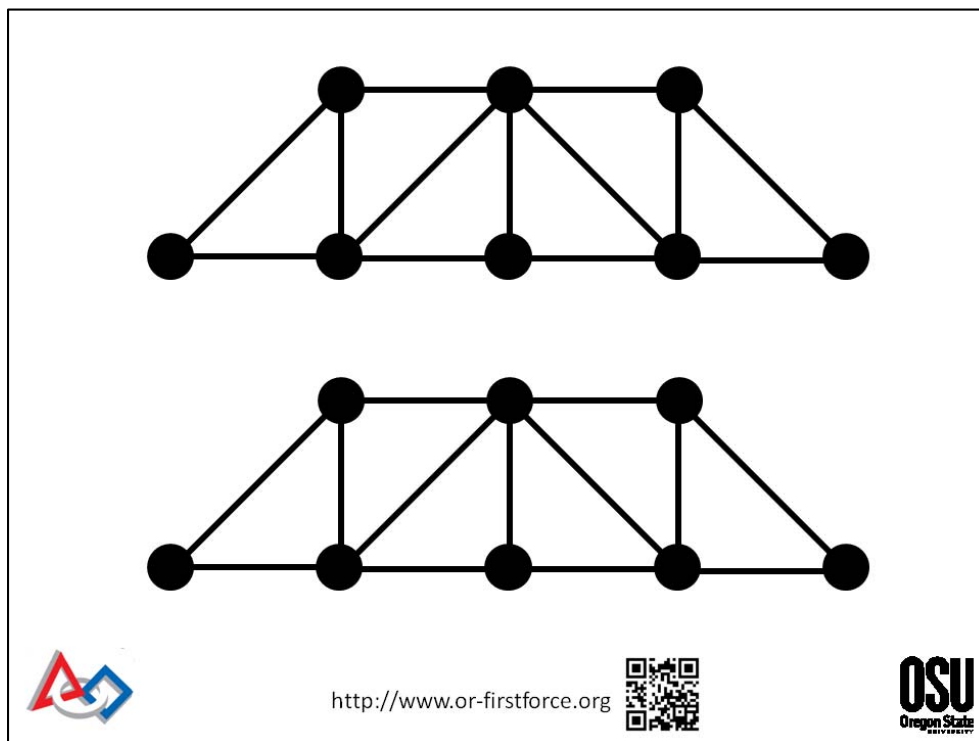
- Most kids started with one of our template sheets. Some followed it *exactly*. Others used it as a “I get the general idea” starting point and did something of their own.
- The biggest engineering topic we emphasized was the use of **triangles** for strength. Beyond that, we just guided them and encouraged them.
- When the kids were done building, they placed their bridge over the “river”. We placed a couple of the load blocks on top of their bridge to show them how strong it was.
- We didn’t attempt to pile enough load on the bridges to make them fail (unless the bridge-owner wanted to). Since it was a discovery activity, not a competition, it seemed better to let them leave with their product intact.
- Most kids took their bridge with them, but not all.
- Adults enjoyed munching gumdrops while their kids built the bridge. We had plenty.
- It might have been fun to have some (laminated) bridge photos there so that the kids could see how much their designs resembled real bridges.
- Even under a canopy, we all got hot on this sunny day. Water bottles and cold sodas were *really* appreciated.

Conclusions:

- I think this was a really good thing to do. It was legitimate engineering, without being overly oppressive. It kept the fun. But, the next time these kids drive over the Van Buren Bridge, they are going to notice the triangles and understand why they are there.
- There were at least as many girls as boys who participated. Cool!

Template Sheet:

This is what it looked like. This is smaller than scale. The actual template that we used was part of a PowerPoint file.



<http://www.or-firstforce.org>



In Action:

Sorry, it's all the photos I had time to stop and take. Also, after a while my hands were too sticky to hold a camera...

