

The Arena for 2013 C-STEM RoboPlay Challenge Competition

A possible competition arena for the RoboPlay Challenge Competition is described below. Each team should build their own competition arena for practice in school and bring it with you for use in the morning from 8:30am-12:30pm on the day of the competition. Note: The competition board shown below will not be the one on which the actual competition will occur. Keep in mind, this example board is given to allow students to get a feel for the surface the competition will take place on. The real competition board will have an entirely different layout and obstacles for each challenge task.

Bill of Materials (can all be bought at Home Depot or equivalent home improvement store)

- The estimated cost for building this competition arena is \$60.
- 1 4 x 8 foot mdf board
- 26 feet of 3/4 inch PVC (should buy an extra couple of feet just in case) – all connectors with respect to 3/4 in.
- 4 90° elbows with side outlet (tri-connectors) & 1 90° elbow PVC connectors
- 3 PVC T snap connectors with threaded hole
- 1 PVC end cap
- 1 PVC male adapter
- 4 1/2 in. diameter pegs (ours are cut from a 1/2 inch Douglas fir dowel) for fixing PVC to the corners
- 2 packets of epoxy glue to secure the pegs to the board (can also use velcro)
- 3 soda cans
- 1 hacky-sack
- 6 slalom gates
- 1 bell



Below is a schematic diagram of the above board with dimensions: Note: The red dots are sample starting positions

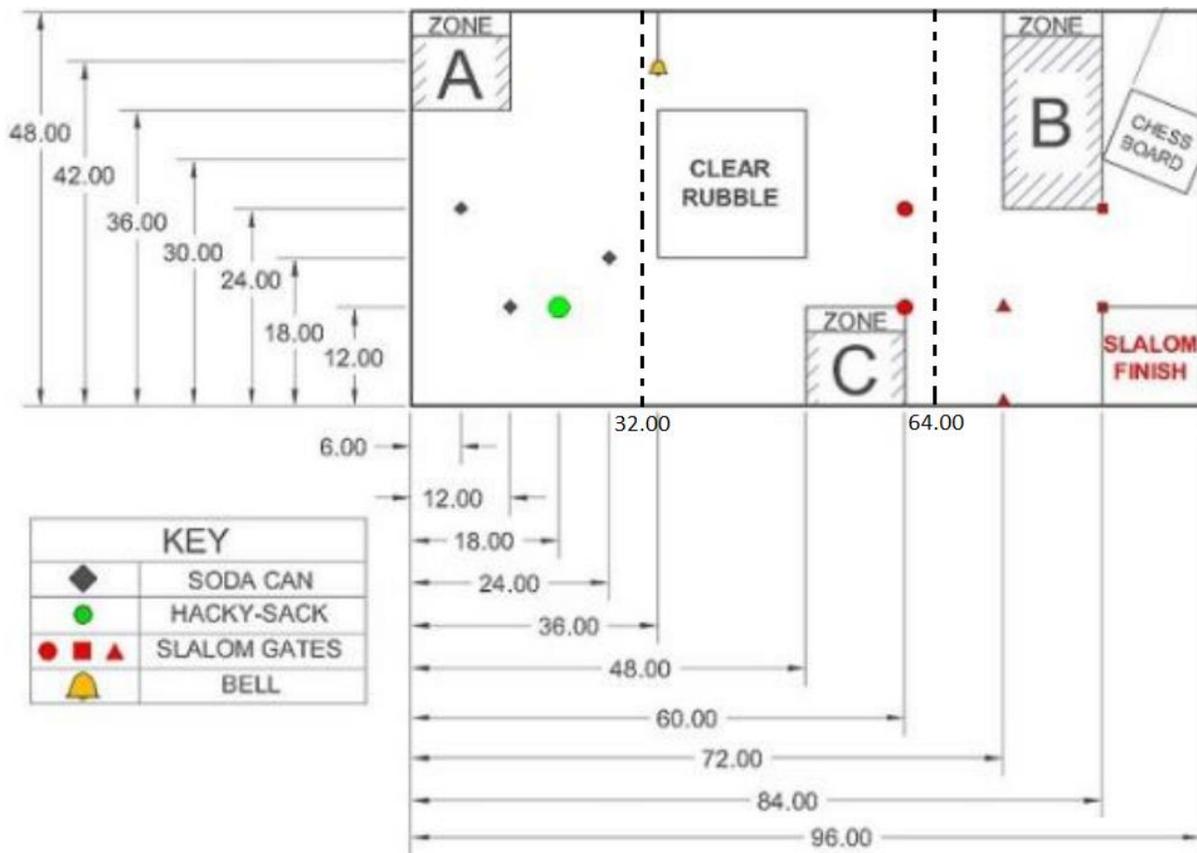


Figure 1: All dimensions are in inches

Instructions for Challenge Board Construction

As with the large PVC segments, it would not hurt to have a few extra pieces of the connectors. As for construction the easiest way we found was to start with the outer walls first. The basic construction is as follows: Piping will be placed around the entire perimeter of the board. Along the 8 ft. edges, the PVC pipe must be cut to 94.25 ± 0.125 in. Each end connects to a tri-connector with the bottom facing hole fitting over the wooden peg. At approximately 4 ft. along the 8 ft. pipes, attach T snap connectors to keep the center sections of the pipe from sagging. Cut 2 sections of pipe 46.25 ± 0.125 in. long to fit along the shorter sides and fit into the last holes of the tri-connectors. Glue each peg into the corners at 0.25 in. from each wall. (When cutting the PVC pipe, keep pieces on the longer side and shorten if necessary for tri-connectors to fit properly over the pegs.)

At 36 in. from the Zone A side (dimensioned above), attach another T snap-connector, but face the threaded hole upwards. Use the male adapter to thread into the hole and the slip side to fit a 10 in. length of pipe. The other pipe end fits into the 90° elbow. The other end of the elbow has a 5.5 in. pipe piece with fitted with an end cap on the other side. At 3.5 in. along the 5.5 in. pipe, drill a small hole to run a length of string through. On the end of the string attach the bell such that when suspended, the lowest point of the bell is no greater than 7.75 in. from the base of the pipe from which it's suspended. Tie the string around an object at the appropriate location to ensure the proper suspended length and that it won't fall further through the hole.

Dimension and label the board zones and place the obstacle objects as shown above.

For Traveling

Cut the board into 3 separate pieces along the dotted dimensions shown above. These locations are equally spaced and do not interfere with any obstacles or critical sections. When practicing, simply lay the board pieces side by side on a flat surface, no need to secure the pieces together. Competition boards will be whole, uncut 4' x 8' sections.