Recursive Water Balloon Drop
A Project on Creativity, Teamwork, and Design

Engineering design requires use of science, creativity, and project management. In this project you will be challenged in these areas, and use iterations to improve your design.

Challenge and Rules
Your objective is to drop a water balloon from the highest height without the balloon breaking. Drops will be done in increments of 2 ft., and the balloon must survive a test to move to the next height. You may protect the balloon with the following parts:

- 500 drinking straws.
- 300" of transparent tape (1 roll)
- 5 rubber bands size 84.
- 10 rubber bands size 18
- 4 additional balloons can be used in each drop event. These additional balloons can be filled with air, water, cut into pieces, etc.
- Nuts and bolts from the left-over bin

The tape and rubber bands may not touch the primary balloon at the beginning of the drop, but it is ok if during the fall or impact they do come into contact with the balloon. Tape and rubber bands can touch the 4 additional balloons at anytime, and the 4 additional balloons may touch the primary balloon. Parts can be cut up, and replacement parts are generally available in a limited amount.

Your protection device including the water balloon may not exceed a starting size of a 10"x10"x10" cube, but it is ok if the during the drop the device expands. The device must be simply released (no tossing), and cannot hit any structure on the way down. The starting height is defined by the lowest part of the device.

For better video capture the protection device must have unobstructed viewing windows of 1.3"diameter to allow a direct view of the water balloon (not through the tape or straws). As shown below both the North and South hemispheres of the structure must have allow for access of a 1.3" diameter rod, as well as the East and West hemispheres. There will be GoPros capturing impact at 240 frames per second(fps).

Either option is acceptable for North & South	Either option is acceptable for East & West
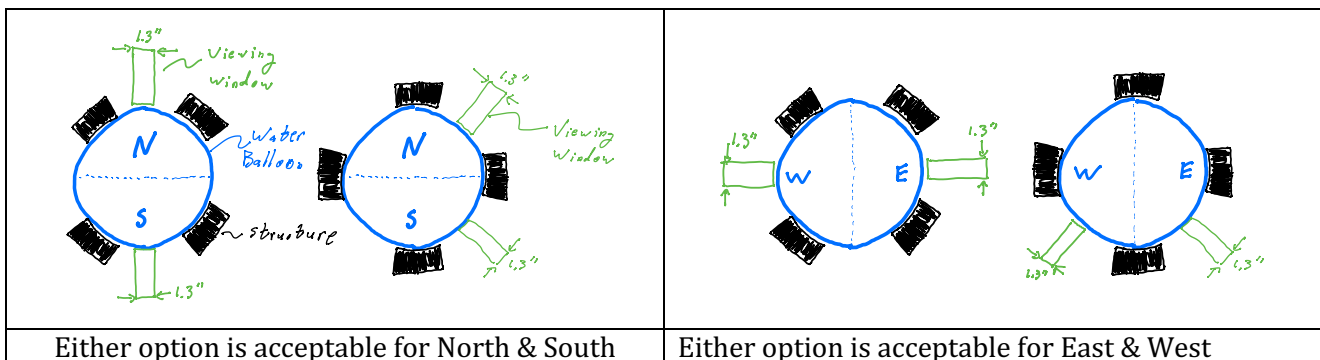
Individual Homework Assignment Over the Weekend
Each student is to develop 3 concepts for the challenge. Give each concept a name and draw it on a separate page with annotations and comments. For each concept list the list the pros and cons, and indicate what you think will happen during the drop. Perform this assignment individually.

Schedule
- Monday 9:30am-3pm (lunch break) => In Teams: Build, Test, Document, Redesign, Repeat.
- Monday Evening => Prepare Oral Presentation.
- Tuesday Morning => Give Oral Presentation to rest of cluster.