

## TRIBUTES - Helpful information, links to websites and videos for all 6 events

\*\*\*/\*\* Number of Asterisks indicate level of importance that you look at and study contents of link. \*\*\* = Very important link, must look at to be a contender for gold; \*\* = Good information link that will help you prepare; No asterisks indicates optional link to get additional information.

### A1- Hot Air Balloon Weight Lifting Competition

[Scorecard Link](#)

The goal for this event is to build a balloon that can lift the heaviest weight.

Event	Video			
Link I.D.	Duration	Video/Website Title	Links	Notes
*** HAB #1	9:36	How to Make a Hot Air Balloon Part 6 Using Small Bags	<a href="http://www.youtube.com/watch?v=5MuZ0QPuyt8">http://www.youtube.com/watch?v=5MuZ0QPuyt8</a>	Watch only first 4:15 minutes of video. Pay attention to Surface area / Volume ratio. Also, note comment between 4:00 and 4:15 minutes about how greater volume holds heat better. You will want to consider both of these things when building your balloon to lift more weight than your competitors.
** HAB #2	1:12	Homemade hot air balloon	<a href="http://www.youtube.com/watch?v=76ChR0rUZ8w">http://www.youtube.com/watch?v=76ChR0rUZ8w</a>	Using simple dry cleaner bags and hair blow dryer you can make a hot air balloon. For the contest you will most likely use bags similar to what is shown. You will probably have 3 to 5 bags to work with, so think how to best use the bags (see video notes above for HAB #1 for importance of surface area to volume ratio)

### A2- Trebuchet Precision Strike Contest

[Scorecard Link](#)

The goal for this event is to try and hit 4 designated targets (3 balloons and one wall of boxes) with tennis balls launched from a Trebuchet (an ancient war machine similar to a catapult used to knock down castle & ancient city walls). You will want to achieve the highest number of strikes to attempts ratio to win.

Event	Video			
Link I.D.	Duration	Video/Website Title	Links	Notes
*** TPS #1	2:37	Floating Arm Trebuchet, the most efficient catapult!	<a href="http://www.youtube.com/watch?v=-qDvMwa71Fg&amp;feature=related">http://www.youtube.com/watch?v=-qDvMwa71Fg&amp;feature=related</a>	This video shows the construction and launching of a projectile with a trebuchet similar to what you will use except yours will be smaller. There is not much in the way of preparation just be ready to hit all targets with as high of strikes/attempts ratio as possible to achieve the most points.

### A3- Highest & Lightest Egg Drop

[Scorecard Link](#)

The goal for this event is to build the lightest packaging that will prevent an egg from breaking when dropped from up to 21 feet in the MPR (no parachutes or wings allowed).

Event Link I.D.	Video Duration	Video/Website Title	Links	Notes
*** HLED #1	1:38	Amazing Egg Drop with paper and tape	<a href="http://www.youtube.com/watch?v=BnfbKqXt9WY">http://www.youtube.com/watch?v=BnfbKqXt9WY</a>	This is probably one of the best starts at making a great egg drop container. The key features are: (1) The paper cone structure, and (2) The straws. Both of these help to gradually dissipate the force applied to the egg. More straws could be used to absorb the initial impact before the cone impacts. Straws are also punched through paper cone to hold egg in place.
HLED #2		How to Drop an Egg 100 Feet without Breaking it.	<a href="http://slimjim270.hubpages.com/hub/How-To-Drop-An-Egg-Without-Breaking-It">http://slimjim270.hubpages.com/hub/How-To-Drop-An-Egg-Without-Breaking-It</a>	The design on this page might overdue it a bit, but you can get some ideas on "nesting packaging inside packaging to cushion the egg as it comes in contact with the floor. Remember you want it to protect the egg, but the lightest packaging that prevents the egg from breaking WINS.
HLED #3		Egg Engineering - Save the Egg	<a href="http://www.wangmichelle.com/images/experience/related_teaching_experience/science_engineering_explorations/curriculum/science_camp/egg_drop.pdf">http://www.wangmichelle.com/images/experience/related_teaching_experience/science_engineering_explorations/curriculum/science_camp/egg_drop.pdf</a>	You want to mainly check out the last page of this pdf for ideas on an egg drop container.

### B1- Mousetrap / Balloon Car Speed and Distance Contest

[Scorecard Link](#)

The goal for this event is to build the fastest and longest running car.

Event Link I.D.	Video Duration	Video/Website Title	Links	Notes
*** MBS&D #1	1:53	Balloon Powered Car - Sick Science! #092	<a href="http://www.youtube.com/watch?v=zcHLdCI3Ygw">http://www.youtube.com/watch?v=zcHLdCI3Ygw</a>	This is the simplest car to make for the contest, and it appears to be quite fast. The one problem with balloons in cold weather tend not to let air out as fast as on a warm day, so keep that in mind

***	<b>MBS&amp;D #2</b>	3:34	Mousetraps in Motion - Sick Science: #090 <a href="http://www.youtube.com/watch?v=mVNFxIEMWvw">http://www.youtube.com/watch?v=mVNFxIEMWvw</a>	This takes a little more effort but if you use a hook mechanism on the axel that will allow the string to pull completely off of the axel then it's quite possible this car will go the furthest.
	<b>MBS&amp;D #3</b>		How to Build a Mouse Trap Powered Racer or Boat <a href="http://www.mousetrap-cars.com/how-to-build-tips.htm">http://www.mousetrap-cars.com/how-to-build-tips.htm</a>	This link gives details on designing the axel hook, so string will come loose and car will go a greater distance.
	<b>MBS&amp;D #4</b>		Mousetrap Cars and Mouse Trap Powered Vehicles <a href="http://www.mousetrap-cars.com/dawr.htm">http://www.mousetrap-cars.com/dawr.htm</a>	Ideas for increasing distance and speed

## B2- Zip Line Carriage Race and Speed Calculation

[Scorecard Link](#)

The goal for this event is to build a carriage from the supplied recycled bottles, PVC sprinkler pipe, card board, paper and tape that will be the fastest and beat all other competitors. You will be given the distance traveled and clock times for each run, and then you will have to accurately calculate your carriage speed for points. You will have some test runs as well as actual side-by-side races against your opponent. Points are based on race placements, times down the zip course, and skills at calculating speed. So brush up on the speed equation, and start thinking about a winning zip line carriage design.

Event	Video			
Link I.D.	Duration	Video/Website Title	Links	Notes
***	<b>ZLCR #1</b>	1:04	Biggest Zip-Line in the World <a href="http://www.youtube.com/watch?v=j6g1j5589MA">http://www.youtube.com/watch?v=j6g1j5589MA</a>	Not much to do to prepare except study how to calculate speed. The judges will give you your times following each run, and they will give you the cable distance. Just remember to take good notes during the test runs as to what carriage modifications gave the best time, so you can increase your chance of winning.
**	<b>ZLCR #2</b>	2:05	World's most extreme zipline - ZipFlyer Nepal <a href="http://www.youtube.com/watch?v=MsOzAbUt8n8">http://www.youtube.com/watch?v=MsOzAbUt8n8</a>	Compare the position of riders in this video with those in the video above. Which do you think has less air resistance?

### B3- Cable Rocket Precision Contest

[Scorecard Link](#)

The goal for this event is to build a rocket that will attach & shoot up along an inclined cable and then stop as close as possible at 2 predetermined marks.

Event	Video			
Link I.D.	Duration	Video/Website Title	Links	Notes
*** CRP #1	7:35	How to build a simple air rocket part I	<a href="http://www.youtube.com/watch?v=9rWg0L_a2FQ">http://www.youtube.com/watch?v=9rWg0L_a2FQ</a>	Simple air rocket design
CRP #2	5:59	Weekend Project: Compressed Air Rocket	<a href="http://www.youtube.com/watch?v=eNFfk5uo6DQ">http://www.youtube.com/watch?v=eNFfk5uo6DQ</a>	This video shows you how to make the launcher and launch an air rocket.

Start practicing building and testing these items listed above, so you can edge out your competitors.