



Hacky Sack - Trebuchet / Catapult Design Challenge

Background: This competition is based on the medieval catapult: a device that was used to hurl large “rocks” into an opposing force’s castle. The objective of the competition is to design and construct a catapult that shoots a Hacky Sack using inexpensive and readily available materials.

Rules: Regarding Materials to be used:

1. Any standard, commercially available mousetrap / rat-trap / coil spring(s) / bands or weight will be used as a catapult energy source to throw an ordinary Hacky Sacks into a target.
2. The competitors are allowed to use any inexpensive and readily available materials to build the catapult. Commonly used items such as plastic pipe, string, glue, Popsicle sticks, wooden dowels, rubber bands, wooden strips, metal tubing etc. are common materials that may be used. In other words, no rocket launchers, no explosives, etc. are to be used. *If competitors have a question about the use of a particular material, they are asked to contact the competition's sponsor to obtain a ruling.*

Rules Regarding Design:

1. The swinging arm of the Catapult may not be assisted in the direction of throw (acceleration) by anything attached to the main body of the launch base.
2. The catapult may be attached to a wood or cardboard launching base plate or platform, no more than 1" thick. The base plate/platform can have any width or length, as long as it fits within the launching site (24" x 36" rectangle). The plate must sit firmly on the launch surface. It cannot be used to adjust the height of the toss although it may be pivoted (rotated) for aiming in the proper direction.
3. There are no restriction on the orientation of the catapult. The catapult can throw the Hacky Sack overhanded, side arm, or underhand; however, the Hacky Sack must, at some point from the initial firing position to the time it is released, pass or start within 3 inches of the base plate/platform or launch site. Legs can't be used to artificially raise the height of the catapult.

The Competition:

1. Each team will bring their catapult to the competition site fully assembled and ready to compete.
2. The competitor's device will be placed within the launching site on the floor. No part of the device may extend outside the launching site before a shot.
3. The Bullseye is a sandbucket with inside dimensions of 12" diameter X 8" deep. The distance from the center of the launching site and the center of the Bullseye pit will measure 24'.
4. The catapult may be manually held in place on the floor to steady it; however, the participants must be completely clear of the launching arm.
5. The launching arm must be set in motion by pressing a release lever using a rod or dowel stick or pulling a cord attached to a pin to insure the safety of the participants.
6. Each team will be given 7.5 minutes to setup the catapult in the launch site and complete 8 shots at the target. 1 practice shots will be allowed and, adjustments may be made to the device between shots. (Teams are encouraged to develop and use some method to determine the best launch parameters to use during the event.

(Room ceiling height may be a factor.)

Scoring guidelines:

1. Each hit within the Bulls eye target area will score 10 pts. However, the shot must land inside of the pit in order to count as a bull eye hit. Any shot that strikes outside the pit area but within 18" of the target will score 7 pts. Any shot that strikes outside the pit area but within 32" of the target will score 5 pts. Any shot that strikes outside the pit area but within 48" of the target will score 3 pts. **The team with the most points after the six shots will be declared the winner.**
2. Ties will be broken by a one shot "shoot-off" for distance. The team that can make the necessary adjustments to their catapult and get the most distance will be declared the winner.

Scoring guide is in development but will be based on the scoring guidelines.