

A NEW TILT ON BOTTLE ROCKETS

This is a traditional bottle rocket creation with a twist. Instead of trying to get your rocket to go as high as possible, you are to design it to go as straight as possible, horizontally. So your goal is to design some type of aerodynamic package (wings, nosecone, etc) that will keep the rocket flying in a straight line until it reaches its target without losing altitude or veering off course.

DESIGN

the design is pretty open with the following specifications that all rockets must yield to.

- The basis of your rocket must be an unaltered 1 LITER plastic bottle with a standard opening. It can be any shape, but must be unaltered and at one liter size.
- The bottle cannot be modified itself (stretched, melted, cut open, etc) but modifications can be added to it (nosecone, wings, flaps, etc).
- The overall length (axial length perpendicular to the nozzle opening of the bottle) of your rocket including tip and bottle must not exceed 2 ft.
- The overall width (maximum length perpendicular to the axial direction) must not exceed 1.5 ft.
- All rockets must have a nosecone. The nosecone must be made of a "soft material" to protect the wall it will hit. The tip cannot be made of hard wood, metal, ceramic, stone, etc, or any material that will damage a wall. Soft woods like balsa wood, or cardboard are fine.
- There must be no added material within 3 inches of the opening of the bottle when the rocket is finished. This is so that it can be easily attached to the launch apparatus.
- The total rocket must not have a mass greater than 0.4 kg.

COMPETITION

- Rockets will be massed, measured and impounded upon arrival.
- When a team is called, their rocket will be dipped into blue chalk and then attached to the launching apparatus. The bottle will be pressurized to between 20-40 psi with air. No liquid is allowed inside the bottle.
- The apparatus will be aimed at a bulls-eye (at an angle of approximately 15°) 18 ft away from the launch platform.
- The rocket will be released and allowed to contact the target making a mark with the blue chalk. The distance will then be measured from the center of the bulls-eye to the center of the chalk mark to determine how far from the center the shot was.
- Team will then be ranked on how close they are to the bulls-eye, closest first and so on and then normalized. Closest gets 50, 2nd closest 49 and so on. Ties will split the points.
- The shot must reach the wall in the air, if it hits the ground or ceiling the first spot it touched anywhere will count as the measuring point and the straight line distance from the bulls-eye to that point will be used.