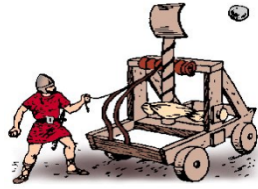


Engineering & CAD Catapult/Trebuchet Activity



Objective

Design a mechanical system to propel a projectile (tennis ball) for maximum horizontal distance.

Criteria

1. The projectile will be a "tennis ball".
2. All system components, except fasteners, must be fabricated from stock materials.
3. The system mechanism (excluding the arm) may not extend beyond an imaginary cubic boundary of 24" x 24" x 24".
4. The total system may not be elevated beyond the ground itself.
5. The potential energy of the total system must be zero before and after operation.
6. Propellants, chemical explosives and compressed gas are all prohibited. Only a mechanical means may used to propel the ball. The device must be safe and will not be allowed to compete or qualify for grade credit. The teacher will determine if the device meets safety needs.
7. The ramp angle is arbitrary and can be adjusted during the contest.
8. The ball must remain motionless at the loaded position for ten seconds before launch.
9. The device must be released or set in motion from a distance not less than 10 feet.
10. All entries must have accommodations to restrain the system from motion during operations. This can be in the form of a weighted base.

Judging Criteria

1. Each entry will have 3 attempts to obtain a maximum distance.
2. Horizontal distance will be measured from the front edge of the device.
3. The flight of the ball must accurately follow the provided measurement line, or equal distance footage will be deducted from the total footage.
4. The maximum distance will be declared winner.

Drawings

Each student is required to produce the following scaled CAD drawings of this device.

1. Multiple View Drawing
2. Isometric Drawing
3. 3D Rendered Rhino Drawing

Grading Criteria

Specific Criteria Items	Pts. Possible
Finished Working Catapult or Trebuet	100
Minimum Distance (10 ft.)	50
Winner of Max. Distance (ea. Category) ExCredit	50
Second Place (ea. Category) ExCredit	25
3 View Scaled CAD Drawing (Fully Dimensioned)	100
Isometric Scaled CAD Drawing	50
3D Rendered Rhino Drawing	100
Total Points	475