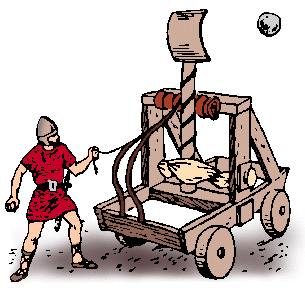
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|  | WSMS Gateway |  |  |

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| **Ping Pong Launcher** |

Introduction

A catapult is a device designed to launch a projectile long distances. Catapults and trebuchets were popular medieval weapons of mass destruction. The equivalent of today’s missiles, they allowed warriors to launch projectiles and burning materials into castles, across rivers, etc.

Since Lovejoy didn’t want to volunteer any schools for target practice, you and your team will design a device to launch ping pong balls.

Constraints

* Other than basic supplies, all materials will be your responsibility to bring
* Your design must be smaller than 12”x12”x12”
* Final prototype will be tested for distance and accuracy
* The launcher must be free standing
* No electronic parts
* Must have a method to test launch angles/distances

Testing Your Design

* Accuracy Test
  + Teams will square off in a tournament
  + On opposite sides, teams will launch balls trying to land them in their opponent’s cups.
  + Winner will be the team to first score in each cup
* Distance Test
  + Teams will chose an optimum launch angle to send their ball as far as possible
  + Distance will be measure from the landing spot, NOT where the ball stops rolling
  + Farthest distance wins

Procedure

* Fill out your Design Brief
* Use a decision matrix to decide which solution is the best
* Sketch and dimension the different views of each part in your engineering notebook
* Convert these sketches into individual part files
* Assemble all parts into a final model
* Build your prototype in the workshop
* Test your design

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| **Ping Pong Launcher Design Brief** |

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| --- | --- |
| Client: |  |
| Designer: |  |
| Problem Statement: |  |
| Design Statement:  (What you will be doing) |  |
| Constraints:  (Guidelines and limitations) |  |
| Deliverables:  (What to turn in) | * Fully assembled Inventor model * Sketches in engineering notebook * Physical prototype * Conclusion questions |

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| **Ping Pong Launcher Decision Matrix** |

1. In the criteria boxes list the criteria from the design brief, as well as criteria you come up with.
2. Under the ideas boxes put your 3 ideas for possible launchers.
3. Evaluate the design idea for all criteria. For a yes or no response to the criteria, use 1 if the answer is no, 2 if the answer is yes. When assessing a criteria, use the scale between 1 and 4, 1 -2 means it almost or definitely does not meet this criteria, 3 - 4 means it almost or definitely is the best possible solution to the problem for this specific need.
4. When you finish evaluating your sketches, add the numbers across and put your answer in the Total column.
5. The design with the highest total is your Best Solution.

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| --- | --- | --- | --- | --- | --- | --- | --- |
|  | Criteria | | | | | |  |
| Ideas |  |  |  |  |  |  | Totals |
| A: |  |  |  |  |  |  |  |
| B: |  |  |  |  |  |  |  |
| C: |  |  |  |  |  |  |  |
| D: |  |  |  |  |  |  |  |

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| **Ping Pong Launcher Test Data/Conclusion** |

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| --- | --- | --- | --- | --- | --- |
| **Angle/Draw** | **Trial 1** | **Trial 2** | **Trial 3** | **Trial 4** | **Average** |
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Conclusion

1. What was your launch angle for maximum distance?
2. Which angle provided the most consistent results?
3. Why was your final design chosen over other options?
4. What was the biggest problem you ran into? How did you solve it?
5. What would you do differently if you started over?
6. What advice would you give to someone trying to complete this project?