

STEAM Project 2018-2019

Launchers (Part 2)

Objective: To build a machine capable of launching a soccer ball as far as possible and as accurately as possible.

Requirements:

1. Design process must be detailed in “Design Portfolio”
 - a. Must create an initial “Design Proposal” detailing build plans in writing (approved by Mrs. Zerr)
 - b. Must include a hand-drawn multi-view design rendering (front, top, side) with dimensions (approved by Mr. Heier)
 - c. Initial proposal must include anticipated material list & projected cost analysis (approval from Mrs. Backman)
 - d. Should contain pictures and notes of design process
 - e. Must include a final itemized “budget journal” when project is complete
2. We will travel to Home Depot to purchase building materials. Each group is allowed up to \$40 to spend on materials of their own choosing.
3. Launching device cannot exceed 8’ in any given dimension during the entirety of the launching process
4. Launching device must have a trigger mechanism capable of being activated from a 15’ “safe” distance.
5. Application of content standards to project
 - a. Research “content standards” for ALL curriculums offered at Wheatland High School.
 - i. Mathematics, Science, Industrial Arts, Fine Arts (Art or Music), English, Social Studies, Business, FACs, Physical Education (or Health),
 - b. Copy an applicable standard into a word document – must be different than standard used for “Part 1”
 - c. Construct a minimum one-paragraph explanation of how the project ties to the standard
 - d. Complete this task for one standard/content area (i.e. must do one Math, one Science, etc.)
6. Must construct and conduct a final presentation per Mrs. Zerr’s requirements

Trial(s):

1. Groups will be allowed three “final” trials for maximum distance measurement
2. Groups will be allowed nine attempts at a target distance of their choosing to determine “accuracy” of the launching device.
 - a. Target must be placed at 10 yard increments, and will score one point for successful hit at each increment out (i.e. 10 yard success = 1 point, 100 yard success = 10 points)

Data to Gather:

1. Total mass of machine
2. Mass of item launched
3. Distance launched
4. Arc apex (highest point of arc)
5. Total time in air

Use the data to calculate the following:

1. To be determined by Mr. Reed & Miss Wetter

Event Days Scheduled:

- March 8th (8th Hour)
- March 19th (All Day) – Heading to Hays @ approximately 10:30
- March 22nd (All Day)
- March 25th (All Day)
- April 29th (Evening) Community Presentation Day in conjunction with Awards/Open House Night

All-Around Competition

- All groups will be awarded points (1-12) in the following categories, with the top overall point earners receiving a prize!
 - Maximum Distance Launched
 - Most Accurate Launcher
 - Budgetary Efficiency (Cost to build/distance launched)
 - Best Presentation
 - Most Aesthetically Pleasing Launcher
 - Best Design Portfolio

Grading

- This project will count for 10% of your Q4 grade in every class you are currently enrolled
 - o Attendance, participation, contributions, teamwork, and professionalism factor heavily into this grade
 - o Group members will also have the opportunity to evaluate each member's contributions. This will also factor significantly into the grading.