

STEAM Project 2018-2019

Launchers (Part 1)

Objective: To build a machine capable of launching a “Nerf” 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”
2. An assortment of building materials will be provided (must stay within allotted budget)
 - a. Groups may use additional materials with approval and “cost” determination by Mr. Flinn.
3. Launching device cannot exceed 18” in any given dimension
4. Launching device must have a trigger mechanism capable of being activated from a “safe” distance of 5’ away
 - a. The launching device can be attached to a platform for stability during launching
 - i. Platform provided, attachments (i.e. screws, etc.) are group’s responsibility
5. Application of content standards to project
 - a. Research “content standards” for Math, Science, and at least one additional content area of your choice
 - b. Copy an applicable standard into a word document
 - 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, one additional content standard)

Trial(s):

1. Groups will be allowed three “final” trials for maximum distance measurement
2. Groups will be allowed three attempts at each distance of a designated target to determine “accuracy” of the launching device.

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:

- January 3rd (All Day)
- January 4th (All Day)

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)
 - Most Aesthetically Pleasing Launcher
 - Best Design Portfolio