

Executive Summary

Project Purpose

The purpose of this project is to design and build a water balloon launcher with groups of 3-5 people. The budget is \$100. The accuracy, team participation, presentation, and written report will determine the final grade for this project.

Design Selected

The design chosen for this project was a trebuchet. Some constraints for this project are budget, size, competition, manpower, and materials. A few criteria for this project are safety, visual appeal, cost, and quality. After brainstorming amongst the group, the design was agreed upon. It was determined that this was the most reliable, cost-efficient, and consistent design. The chosen design utilizes a throwing arm with an attached pouch that is being projected by a counterweight.

Implementation

The initial design had to be modified a few times before the final design was reached. Once the final design was reached, construction began on the trebuchet. The first component built was the base, as shown in Figure 1. Next, two center supports were added with holes drilled for the dowel, as shown in Figure 2 and 3. After that, two supports for the fulcrum were added to each side of the trebuchet, as shown in Figure 4. Next, a throwing arm was built. The dowel was put through the throwing arm and inserted into the fulcrum, as shown in Figure 5. A runway for the pouch to slide on was then made, as shown in Figure 6. To ensure safety, a trigger, as shown in Figure 7., was added to allow the operator to be 10 feet away when launched. The final project, including all of the necessary components for operation, is shown in Figure 8.

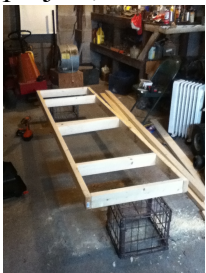


Figure 1.



Figure 2.



Figure 3.



Figure 4.



Figure 5.



Figure 6.



Figure 7.



Figure 8.

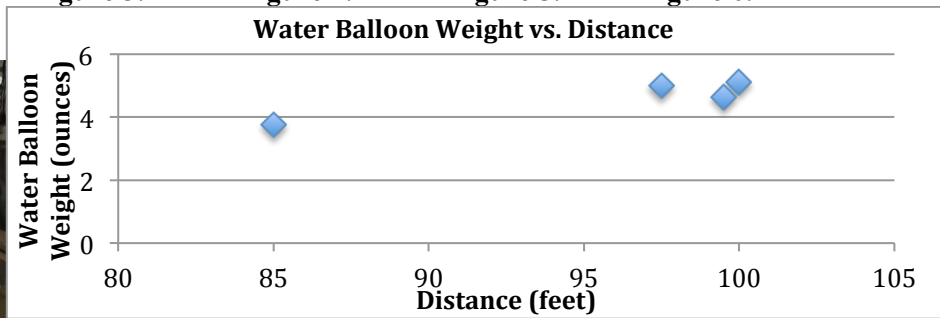


Figure 9.

Results

The total cost for the supplies used was \$78.05. This cost of this trebuchet fell well within the range of the budget for this project. After a few test runs, multiple distances were recorded, as shown in Figure 9.