“Cowtapult” Project and Analysis

PICTURE HERE…a picture

## ME 488

## Design of Experiments

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# Objective

# Executive Summary

# Project Design

### Description

Our “Cow-ta-pult” is modeled after a cross-bow design, using plywood, a drawer guide, a couple of springs, a jack, and a cup. No materials were purchased for this project, all materials were reused from previous assemblies or old projects. The “Cow-ta-pult” has a wooden base with adjustment arms attached that hold up the ramp portion of the design. The adjustment arms have several different cutouts which allow for a change in angle relative to the ground. The ramp is also attached to the base by using two hinges.

The drawer rail guide is attached to the ramp using screws, and is used to propel the ‘pig’ through the air. Attached to the guide is a wood block that is fixed to the cup holding the pig, as well as two springs that are used to move the rail guide. The opposite ends of the springs are attached to the corners of the ramp, creating a situation similar to a rubber band slingshot when the apparatus is pulled back into its launching position.

A strong wooden block is attached at the front end of the rail guide to act as a stop for the slingshot. The ……..

### Factors and Levels

Four factors were selected for this apparatus including change in angle of trajectory, change in payload weight, change in base height, and change in spring position. The initial high/low settings for the change in angle were 45 and 60 degrees. The change in payload weight was determined by adding no additional weight, and then adding all the sand that would fit in Mr. Super Piggy’s belt (Figure #)

### Concerns (measurable but not controllable)

* Shape of the pig
  + Drag force based on surface area of the pig

### Concerns (not measurable and not controllable)

* The pig moving around in the cup
  + Also, the way the pig is sitting in the cup initially
* Experimental Design and Procedure
* Wearing out of the assembly

# Analysis

# Conclusion

# Challenges

# Things to do differently next time

# Appendices