CALIFORNIA STATE SCIENCE FAIR
2013 PROJECT SUMMARY

Name(s)

Jesse T. Casey

Project Number

33548

Project Title

Siege Weapon

Abstract

Objectives/Goals

If I test which arm length will go the farthest, then I believe that the longest arm shall fire the farthest and the shortest arm will fire the shortest. If I test which sling length will go the farthest, then I believe that the longest sling will fire the farthest. The scientific basis for this hypothesis is that the longer the throwing arm and the sling, the greater the speed at which the projectile will be launched.

Methods/Materials

Make sq.base/Add 2 vertical planks to oblique cut plywd plks/Make cement cylinder/Add cyl. to 61cm.arm & then to crossbar/connect to catapult frame./Add 4 diff.arms/Make 4 diff.sized slings /Identify space of launch/ Launch 10 tests length of arms & sling with the 2mtr arm/adjust pin so launch angle is a cons45 degrees/Record data.Materials:27.2kilo cement cyl. 2.5cm round metal pipe arms & wire slings 61cm/122cm/183cm/244cm/4#104 9*9 cm oblique cut plks/5.06cm nails/2#61.5 9*9 planks/2#153 9*9 cm plks/4- 2.5cm wheels/2#87 9*9 plks/18 & 2Tbraces/1-152.5*51cm plywd/189cm crossbar2.5cm.rnd/2#5cm knobs/1field/Softball

Results

My results were that initially the longer the arm gets the farther it throws, but after a certain point the distance curve began to plateau and increases were small. In the case of the sling the distance fired was also initially greater as the sling length increased, but the sling eventually got longer than the arm and distance fired dropped dramatically.

Conclusions/Discussion

My investigative question was how the length of the arm and sling affects the throwing distance of a catapult. I thought that the longest throwing arm would go the farthest and the longest sling would also go the farthest. My data showed that the distance the arms fired was always higher than the arm before as the arm length got longer, but it slowly began to flatten out into a plateau. This data & research done shows that this would eventually hit a peak of the farthest distance possible to throw and drop in distance from there, because the longer the arm gets the more it weighs which means it will eventually weigh more than the counter weight. For the sling as it gets longer my data shows that there is a peak, much like the arms peak, of the farthest distance that can be thrown. The difference is that the sling#s peak has a much more dramatic rise and fall than the arm#s peak. This decrease in throwing distance with longer arm and sling shows that my hypothesis is incorrect.

Summary Statement

this project is about the effect that throwing arm length and sling length will have on the distance that a catapult throws a projectile.

Help Received

dad edited papers, mum took photos

Preliminary