Year 12 Physics

2010 Semester 2

Extended Experimental Investigation

Trebuchets

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The following EEI was conducted to find the optimal launching conditions for a trebuchet. Considering the hypothesis:

It was hypothesized that if the mass of the counterweight is increased, then a maximum range for a trebuchet will be found when the arm length, release angle and structure of the trebuchet remain constant after which the efficiency of the trebuchet will suffer and thus the range decrease. Furthermore it was hypothesized that when the angle of release is changed then a maximum range for a trebuchet will be found when the arm length, counterweight mass and structure of the trebuchet remain constant. Also it was hypothesised that the combination of the two of these variables would result in an optimum set of variable to attain a maximum range.

It was found that the hypothesis was correct in that optimal values would be found for each of the variables. A release angle of 45° was seen to be the optimum and a maximum counterweight mass of 5kg was found. Beyond this weight the trebuchet could not physically handle and thus the efficiency suffered. Conclusions were drawn and recommendations for further investigation were made.