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The Effect of Trebuchet Design Modifications on Projectile Launch Distance

A trebuchet is a type of medieval siege device that was designed to hurl objects at backbreaking speeds to attack and destroy castle walls. But, could the design be modified and improved for maximum launching efficiency? That is what this experiment set out to discover. In it, a fully-working model trebuchet is being altered so that it can be discovered which design modifications work best for launching projectiles. We altered four factors – projectile mass, counterweight mass, arm length, and sling length – in order to discover what effect they had on projectile launch distance. To test variables, we would set one variable to a particular level, launch it, and mark where it landed. Then, after 4 trials with 2-4 levels in each variable, we would find the average of the four trials in each level, compare them, and then determine which one gave the greatest launch distance. The level that did produce the greatest launch distance became an automatic factor in the launches afterward. It was then revealed that the lightest payload, the medium counterweight, the shortest arm length, and the middle sling length (100% arm length) proved to produce the greatest projectile launch distances.