

Medieval Egg Toss

Objective: Modify a catapult that will hurl an egg a maximum distance and hit a target.

Materials: Each group will receive the following materials:

One catapult with three rubber bands. (If they break during testing, you will get replacements)

A card with the mass of your in grams.

One golf ball marked with its mass in grams.

One piece of clay that has a mass equal to the difference between the egg and the golf ball.

One meterstick (Can only be used in preparation, not as part of the catapult)

A piece of masking tape that can be used to make spots on the floor and the catapult.

Experimenting: You will have 35 minutes to experiment with your catapult. During experimenting keep your catapult clamped to the table. You can connect the three rubberbands anyway you want to as long as they are connected only to the catapult. You can modify the catapult arm by moving the pivot point. You cannot modify the catapult in any other way. For example, you cannot more the hooks. You cannot fire the egg until the final trials.

Your first goal while experimenting is to try to come up with a design and launch method that will give you a maximum distance for the egg. Once you have a design your next goal is to practice being consistent with launch and to determine the distance of the target to the nearest cm.

Firing: Once the score cards are filled in with launch distances, teams will take turns launching their eggs. The launches will happen from shortest to longest predicted distance. Your catapult will be moved to the launch table and a target will be placed at your predicted target distance. Each team will be responsible for launching their egg. You will be given one minute to launch once your catapult and target are in place.

Team Number _____

Team Members _____

School _____

Team Members _____

Circle one: (Middle School) (High School)

Distance of predicted hurl: _____(cm) Distance of actual hurl _____cm
(if it hits any part of the pan target, the predicted distance will be used)

Did egg hit the center target ? (Yes!) (No ☹)

Scoring: The score will be calculated as follows:

$$\text{Score} = \text{Distance of actual hurl} * \text{target multiplier}$$

Target multiplier = 1.5 if the egg hits the center target and survives

Target multiplier = 1.3 if the egg hits the big target. (The egg can hit the pan anywhere and doesn't need to survive)

Scoring: The highest raw score will receive 100 points, and the remaining scores will be proportional.