



# The “Crunchy Crafty” Catapult

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## Question

Will the hardness of the material being shot in the catapult affects how hard the catapult will shoot it?

# Abstract

- The motivation for my project is that I wanted to do something with a catapult. I'm in love with the roman history and that for a history project, the romans used this device to attack other armies and won many battles because of technological advancements. This is important scientifically because it proves that what type of ammo will fly the best.

# Hypothesis

- Out of the three materials being used (whale eraser, ball of tissue, and normal sized marshmallows) the eraser will go the farthest because the whale eraser is the hardest.

# Materials

- You need a catapult.
- Things that you are shooting include:

Tissues, marshmallows, and an eraser. These objects were decided by us because of the quality of hardness between them.

These items will be used as the ammo for the test.

- A tape measure to record how far the objects go.
- And a notebook to record the whole test.

# Procedure

- First, make a mark on the ground so you know where to keep the catapult for the whole experiment
- Second, place the catapult on the mark
- Make sure for the second step that you have lots of space for the catapult being shot
- Then place the object that you want to fire first on the catapult. The objects I used were tissue paper, marshmallows, and a whale eraser.
- Fire the object 20 times
- Switch the object for another object from above or from your own
- Record your results for the first one and remember to measure each shot in SI units
- Fire the second object you chose 20 times
- measure how far it goes and record in a book
- Fire third object you chose 20 times
- Measure how far it goes and record in a book

# Variables

- Independent Variables- What is being shot out of the catapult (Balls of tissue, marshmallows, and a whale eraser)
- Dependent Variables-How far the catapult fire (distance) with the ammo.
- Controlled Variable-They all start on the same point, how hard the catapult is pulled.

# Experimental Pictures

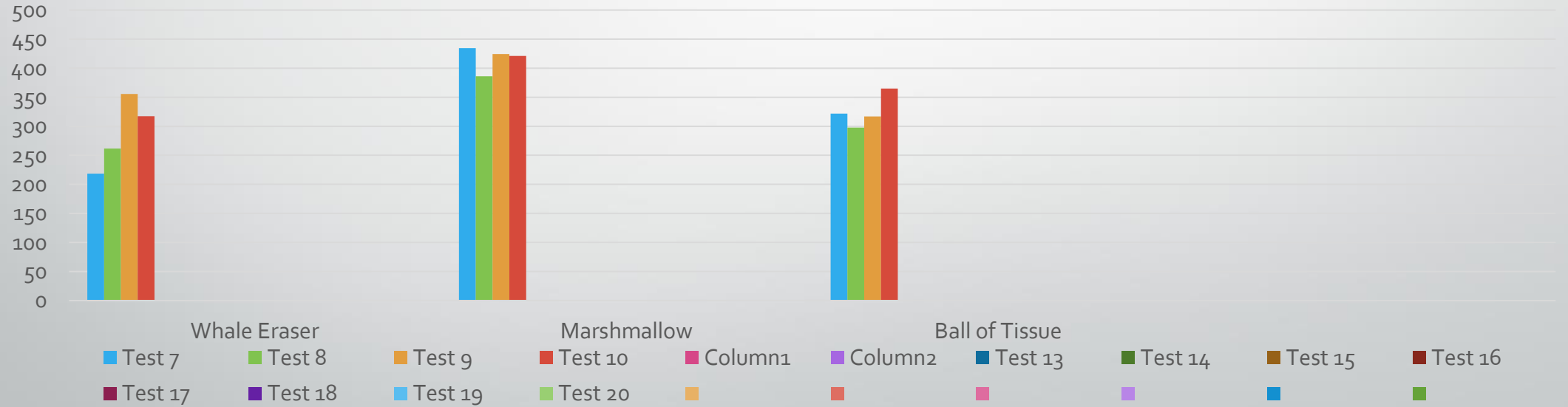




# Results

- Whale eraser  
276.86, 226.06, 193.04, 238.76, 248.92, 416.56, 218.44, 261.62, 355.6, 317.5
- Marshmallow  
492.76, 429.26, 421.64, 449.58, 381, 467.36, 434.34, 386.08, 424.18
- Ball of tissue  
298.76 254.9 293.6 313.59 287.31 291.61 321.67 297.73 316.89 364.93

# Graphs



# Conclusion

- We concluded that the whale eraser did not go the farthest. The reason is that it was the heaviest object. The Catapult was in the same position each test making it a fair experiment. The marshmallow was the farthest, ball of tissue was second, and whale eraser was third. The hardness did affect the results as the marshmallow was the softest.