STEM Challenge – Catapult

## Scenario

There is a new type of satellite that must be launched into orbit. The satellite resembles a ping pong ball, but on a much larger scale. Your task is to design, build, test, then modify a catapult that will launch the satellite into orbit. Using the materials provided, create a design, submit your design, and then create the product. Once the catapult is assembled, you will be given a test period and more time to modify it. Official testing will take place, and the group with the furthest launch will be awarded the contract for the large, full scale mission.   
Clarifications: The launch mechanism can take any form. It can be trebuchet style, slingshot, counter tension, traditional catapult, etc…

## Day 1

Explore – You will be given some, but not all of the products you are allowed to use to build the catapult as test objects. That means cut, glue, attach, expand, modify, etc… those products to test their strength, durability, force, etc… to aid you in the design process.

## Day 2/3

Design/Build – Design your catapult on paper. You must submit your design for approval. It must include detailed drawings and explanations of the concept of how it will work. You must also project your expected results.  
Once the design is submitted and approved, you will receive your building materials and may begin building.

## Day 4

Test day – Test your catapult. You will have one period to test your catapult. Be sure to explore ways in which you can improve the distance achieved. For the test launch, there are no launch restrictions.

## Day 5

Launch day – Official, measured launches will take place. You will have to launch the test satellite three times. The group who has the furthest overall launch will be granted the contract to build the new satellite launcher at full scale. One member of each group will need to record the results of ALL groups and ALL launches for later analyzing.

**Day 6**  
Analyze results – Study the results of all groups. In your individual groups, draw general conclusions as to why certain catapults performed how they did. What could you have done to apply other groups concepts to your catapult?

General Rules

All members of the group must participate – you will evaluate each other on your participation.

You can modify *any* and/or *all* of the items given to you any way you like, using **only** the materials provided and tools available to you in this room.

The catapult may only be ‘primed’ and launched using one finger. It cannot be braced to the table by hand (you *may* use materials to brace it to the table). Once launched, the catapult can move, but it cannot fall off the surface. You can put the satellite (ping-pong ball) on the launch mechanism using another hand once primed.

If you want or need more materials, they can be purchased. Materials that are purchased have a value that subtracts inches from your final launch height or length.

Have fun – and learn something!