

## Catapult Challenge

Materials (not all are necessary – get creative with what you have!)

Craft sticks

Elastic bands

Legos

Caps

Plastic spoon

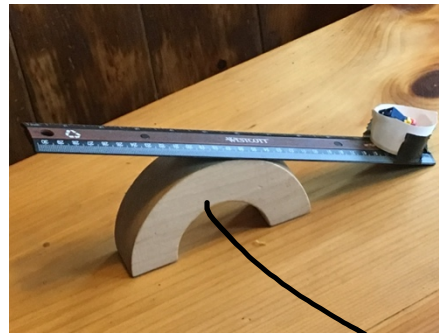
Ruler

Blocks

Anything around the house you get permission to use!

### 1) Do some initial testing with a simple system.

Use a ruler or a long board and place it over an object that can act as a FULCRUM. Tape a cup or lid to help hold the object you intend to launch. You are making a simple LEVER system to launch objects on a TRAJECTORY (a path through space).



Fulcrum

Use the force of your hand, or drop an object on the side without the payload – are you able to launch your object?

Things to test:

Test it several times with one object and the fulcrum in the middle. Is the trajectory consistent? Why or why not?

Move the fulcrum a little to one side or the other. Test several more times, how is the trajectory affected?

Use a different size fulcrum or a different size lever, how does this affect the trajectory?

This system requires your force on one side to propel the payload on the other side, do differences in your speed and strength affect the trajectory?

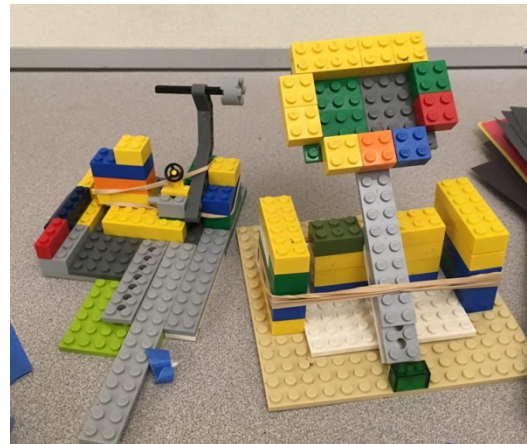
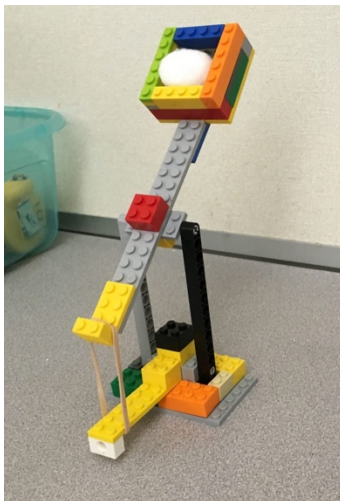
Try launching objects of different sizes and weights.

- 2) **Make a simple catapult** with 2 craft sticks and a rubber band and plastic spoon if you have these items. Instead of a spoon you could use an old lid and hot glue it to the end. Use more craft sticks for fulcrum held together with more rubber bands as shown or try other small items around the house like a cork or a thick marker.



Now instead of using your force on the opposite side of the payload, you will use your force to pull back on the payload side to launch releasing potential energy now stored in the system thanks to the rubber band.. Continue to play around the size and placement of the fulcrum and the length of the lever to create different results.

- 3) **Design your own catapult** using materials you have readily available to you – here are some examples students have created out of Legos, but if you do an Internet image search for Lego catapult, or craft stick catapult, you will find some more ideas. Some catapults are designed to launch their payloads FURTHER, and some HIGHER – which will you try?



Are you interested in learning more about catapults. [This website](#) offers a great explanation of the workings of the 5 different kinds with great pictures and diagrams.

# SHARE YOUR WORK

Share your finished catapult!

Share your picture to our Google Classroom

[Science Meets Art: S•M•Art Activities you can do at Home](#)

Code: i2nqbc7

OR

email a picture to [ksparhawk@flyingcloudinstitute.org](mailto:ksparhawk@flyingcloudinstitute.org),

OR

have your parent post a picture to our page on Facebook.

AND/OR

If you can, use this link to join Flying Cloud staff at Zoom hangout at 10 am Friday, March 27 (Code: 684-095-5161) and you can share with us your catapult in action!