



## STEM Kit:

### Catapults

**Program Level: Daisy, Brownie, Junior and Cadette**

This kit will have cotton balls flying through the air in no time! Use craft sticks and rubber bands to design your best catapult.

#### Supplies Provided:

- 2 sizes of popsicle sticks
- Adhesive
- Rubber bands
- Bottle caps
- Cotton balls
- Tape measure

#### What to Bring:

- NONE
- If you decide to expand this activity to use other materials, you may want to bring plastic spoons, rulers, paint stirrers, spatulas, etc.

#### Instructions:

1. This activity can be done individually or in pairs – if you try to make larger groups, there may be a chance that some girls don't get a chance to participate.
2. Show the girls how to build a basic catapult. (see photo at the end of this guide for help)
  - a. Stack 5 craft sticks together and rubber band the ends
  - b. Stack 2 craft sticks together and wrap a rubber band around one end (if you want to use 1 stick that already has a bottle cap attached, this will allow you to skip step E)
  - c. Separate the other end of the 2 craft sticks, and slide the stack of 5 craft sticks between the 2 sticks
  - d. Wrap a rubber band around all of the craft sticks to hold the catapult together
  - e. Attach a bottle cap to the end of one craft stick to serve as the launching platform
  - f. Place a cotton ball on the launch platform and gently press down on the tip of the stick and then release to launch the cotton ball
3. Give girls a chance to start with the basic design, and set some parameters for what you want the catapult to do. Maybe it's launching the object in a straight line, it might be to see how far the object can fly, maybe you are trying to get the object to hit a target or land in a cup or bowl.
4. Once they have a good idea of the basic design, and what they are trying to achieve, let them change their design to see if a new catapult can deliver different results. Depending on the time you have for this activity, you may wish to measure your results and record data to analyze after everyone takes a turn launching their object. If girls make one adjustment and retest their catapult, they should be able to see which design they think works "better". You can also have them test their design 5-10 times to see if their results are consistent.

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5. When it's time to wrap up, have the girls take all of the rubber bands off of their designs to put the materials away. If there are broken craft sticks or rubber bands, please discard those before putting materials away.

### Why?

Engineering is all about problem solving. A couple things to ask while facilitating this activity are:

- What didn't go right the first time you tried it? Could you find a solution?
- How did working on your own or with a couple friends help you? What made that tough?
- If you were to plan to do this activity again, would you want to do differently?
- Was there a method that resulted in a very stable structure?
- How could this activity relate to an engineer's work?



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