

Elementary Engineering Activity Bag 1

Catapult - Student Activity Guide

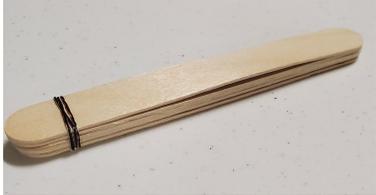
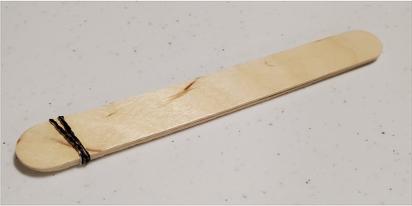
It's your lucky day! You have been hired by your favorite toy company to design a cool new machine for a game. The machine is called a catapult. It will launch pom-poms at targets. To make the best game, you will have to design, test, and redesign your catapult. This is the engineering design process.

Materials From the Bag

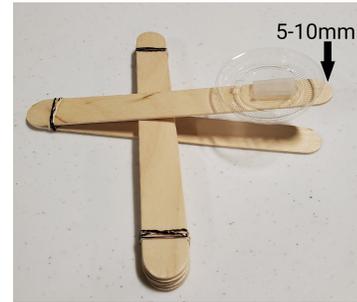
- 12 Craft Sticks
- Tape
- Rubber Bands
- Plastic Lid
- Pom-pom
- Measuring Tape
- Paper Food Tray

Part 1: Prototype

A prototype is a basic design that you can improve.

<p>1. Take 5 of the craft sticks and tie a rubber band tightly around one end. You can use tape in place of rubber bands.</p>	
<p>2. Tie another rubber band tightly around the opposite end so all 5 sticks are bound together.</p>	
<p>3. Take 2 more craft sticks and tie a rubber band on one of the ends.</p>	
<p>4. Insert the 5 sticks banded together through the 2 stick bundle.</p>	

- Attach the plastic lid near the end of the top craft stick with a piece of tape. Leave 5-10mm between the edge of the plastic lid and the end of the craft stick to help launch the catapult. Practice launching your pom-pom.



Part 2: How High Can You Launch a Pom-pom?

Your first challenge is to launch your pom-pom as high as you can from your catapult.

1. Use the prototype and test it to see how high you can launch the pom-pom.
2. Using the measuring tape, measure how high your pom-pom goes.
3. It is ok if the pom-pom doesn't go higher at first. Keep changing your design and try again. *How high did your pom-pom go?*
4. Draw your final design. *What is different from your first design? What did you change in your design that made the catapult launch the pom-pom higher?*

Part 3: How Far Can You Launch a Pom-pom?

Your next challenge is to launch your pom-pom to land as far as possible from your catapult.

1. Use the prototype and test it to see how far you can launch the pom-pom.
2. Using the measuring tape, measure how far your pom-pom goes.
3. It is ok if the pom-pom doesn't go very far at first. Keep changing your design and try again. *How far did your pom-pom go?*
4. Draw your final design. *What is different from your first design? What did you change in your design that made the catapult launch the pom-pom further?*

Part 4: Hit Your Mark

Your final challenge is to hit a paper tray with the pom-pom launched from the catapult. Using the tape measure, place the paper tray 50mm in front of the catapult.

1. Draw your catapult.
2. Build and test your catapult. The pom-pom must hit the tray without bouncing.
3. It is ok if you miss it at first. Keep changing your design and try again. Continue until your pom-pom hits the paper tray.
4. Draw your final design. *What is different from your first design? What was difficult for this challenge?*

Place the tape back into the bag for future activities.