PCS edventures!™

Experts in Hands-On STEM Education

Soar Like Superman with STEM

Everyone loves a good superhero! Throughout our lives, we have watched superheroes in movies and read about them in comic books. As a child, you probably even wished to have superpowers of your own—maybe super strength, laser vision, invisibility, teleportation, mind-reading or flight. In this STEM activity, inspired by *The Science of Superpowers* Enrichment Program for Grades 1-3, learners will pretend to soar through the air like Superman to help people in need. After building a simple catapult design, they will test their flying skills as they launch a variety of objects towards different target locations.

STEAM ENRICHMENT

HANDS-ON STEM EDUCATION

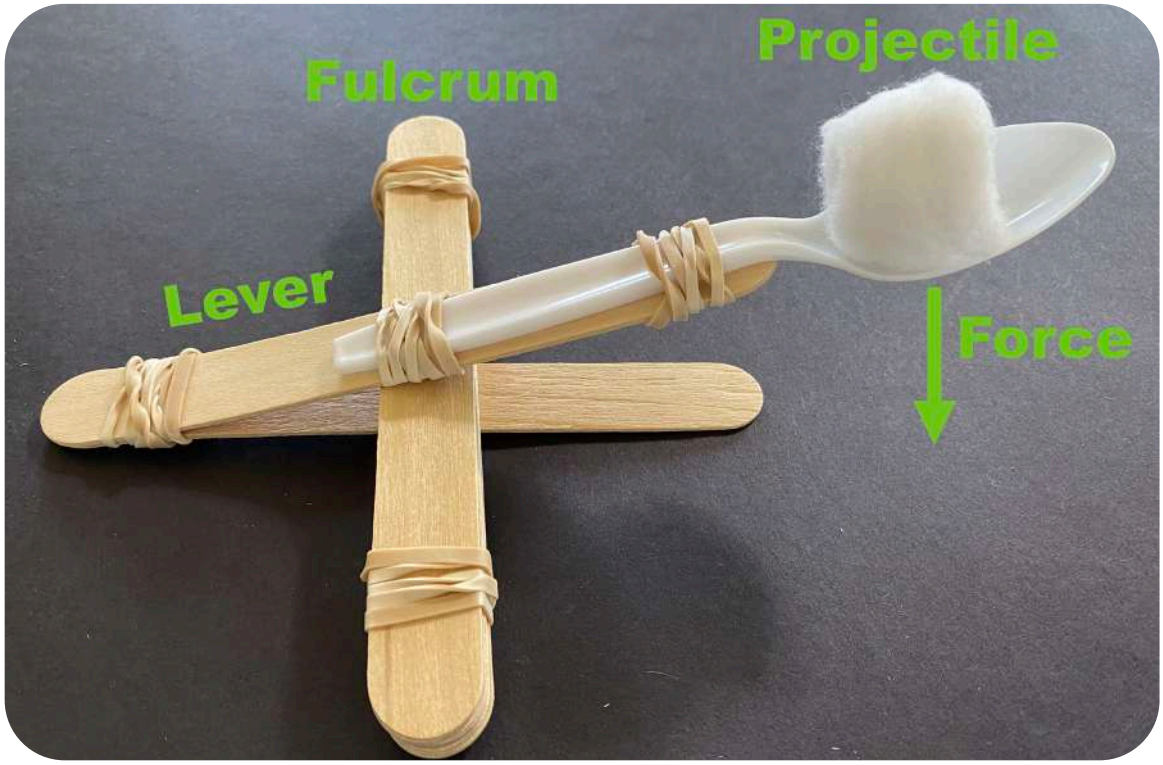
For over 30 years, PCS Edventures has inspired students to develop a passion for Science, Technology, Engineering and Mathematics (STEM), focusing our efforts on making learning and discovery a fun and interactive process for grades K-12.

- Classroom
- After-School
- Home Learning

Background Information

Did you know that Superman was the world's first comic book superhero? This man of steel leaped tall buildings in a single bound, lifted heavy cars with ease and used his incredible superpowers to help people all around the world. You may have heard this famous saying about him, "It's a bird, it's a plane, it's Superman!" That's because he also had the ability to fly. Have you ever imagined what it would be like to soar through the air like Superman? If so, today is your lucky day! In this activity, you will pretend that you are a superhero who needs to fly to different locations around the community, such as a school, grocery store, post office or fire station, to help people in need. In actuality, you will build a simple catapult and launch a variety of objects towards different targets.

What is a catapult? A catapult is a device used to launch objects called projectiles. The main component of the catapult is the lever, which is considered a simple machine. Simple machines help make work easier. Other lever examples include shovels, scissors, see-saws and most anything with a handle. By placing a lever over a pivot point, called a fulcrum, projectiles require much less force to move. The amount of force needed to move an object can be modified by moving the lever over the fulcrum or adjusting the weight of the projectile being launched.



Activity Materials:

Catapult:

- 10 craft sticks (popsicle stick or tongue depressor size)
- 5 rubber bands
- 1 plastic spoon

Suggested Projectiles (You as a superhero)

- Mini marshmallows
- Large marshmallows
- Pom pom balls
- Cotton balls
- Styrofoam balls
- Ping pong balls
- Balled up paper
- Balled up aluminum foil

Suggested Targets (Locations around the community)

- Sheets of paper
- Plates
- Bowls

Step-By-Step Instructions for a Catapult:

1. Use two rubber bands to connect the handle of a spoon to one craft stick. The bowl part of the spoon should hang off the end.

2. Place this stick on top of another craft stick and use a rubber band to wrap around the bottom end of both sticks. Set this aside.

3. Stack 8 craft sticks together and wrap one rubber band around each end of the stack.

4. Pull apart the open end of the 2 craft sticks and slide the stack of 8 craft sticks in between.

5. Place your catapult on the floor.

6. Label your targets and place them in front of the catapult at different distances.

7. Choose a projectile and place it in the spoon.

8. Hold down the catapult with one hand and use your other hand to push down the spoon.

9. Let go of the spoon and watch your projectile soar like Superman!

10. Test each type of projectile 3 times and record which targets they land on.

Sample Recording Sheet:

TYPE OF PROJECTILE	TEST #1	TEST #2	TEST #3
Mini marshmallow			
Large marshmallow			
Pom pom ball			
Cotton ball			
Balled up paper			

Discussion Questions:

- Which projectiles landed on the closest targets? Why?
- Which projectiles landed on the farthest targets? Why?
- Did any projectiles land on both the close and far targets?

Extensions:

- Use a ruler to measure the distance each projectile travels.
- Use a stopwatch to measure the amount of time each projectile travels.
- Calculate the speed of each projectile using the equation: speed = distance/time.
- Change other variables, such as the location of the fulcrum or the amount of force used on the spoon, to see how that affects the results.
- Design and build a new, improved catapult using other materials.

Student Recording Worksheet:

TYPE OF PROJECTILE	TEST #1	TEST #2	TEST #3

TYPE OF PROJECTILE	TEST #1	TEST #2	TEST #3

TYPE OF PROJECTILE	TEST #1	TEST #2	TEST #3

Want More Superhero Activities?

This STEM challenge was inspired by the activities found in *The Science of Superpowers* Enrichment Program (Grades 1-3).

The world of comic books is full of heroes, villains, challenges and triumphs — and the heroes need help! In this unit, students answer the call for aid by dissecting superhero skill sets to uncover the science behind superpowers. Through 12 days of hands-on exercises in biology, engineering and technology, students fly alongside Superman, sling webs with Spider-Man and recognize the real-life heroes of our world.

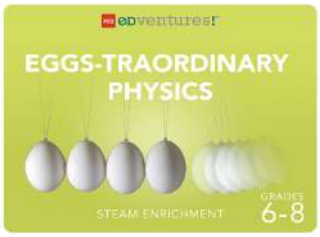
Want More Catapult Activities?

Pirate Camp Enrichment Program (Grades 1-3)

Cast-off into the seven seas as students work together to navigate its treacherous depths, engaging in STEM-focused experiments, hands-on design trials and challenging tasks like forging catapults, tying knots and fashioning maps to hidden treasure! In *Pirate Camp*, action, adventure and discovery await you at every turn! (On Day 8, students build catapults and test how the fulcrum, force, and load change the catapult's effectiveness).

Summer Camp Classics Enrichment Program (Grades 6-8)

In *Summer Camp Classics*, students gather around the campfire and relive the joys of summer camp with this 12-part take on the classics. From friendship bracelets and leaf prints to team-building challenges and new ways to make s'mores, students get creative and discover their strengths with this STEAM-filled arts and crafts camp. (On Day 10, students break out the hard hats to build a collaborative, mega-sized, pom-pom-projecting catapult).



Eggs-traordinary Physics Enrichment Program (Grades 6-8)

Which came first, the chicken or egg-citing physics challenges? In *Eggs-traordinary Physics*, students turn the study of motion and mass into hands-on projects and team building challenges! They'll spin, toss, race and design while studying the ideas of motion, such as velocity, speed and the major role gravity plays. It's a whole lot of egg-streme fun! (On Day 9, students use the engineering design process to build catapults for accuracy, distance or height).

For more information, visit: https://edventures.com/collections
or contact a STEM Program Specialist at (800) 429-3110

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