Projectile Motion - Build a Mini Catapult

Sections

Joey Scouts | Cub Scouts | Scouts | Venturer Scouts | Rover Scouts

Scouts VICTORIA

Challenge Areas

COMMUNITY | PERSONAL GROWTH | OUTDOOR | CREATIVE

Scout Method Elements

COMMUNITY INVOLVEMENT | LEARNING BY DOING | NATURE AND THE OUTDOORS | PATROL SYSTEM | PERSONAL PROGRESSION | PROMISE AND LAW

SYMBOLIC FRAMEWORK | YOUTH LEADING, ADULTS SUPPORTING

SPICES Growth Areas

SOCIAL | PHYSICAL | INTELLECTUAL | CHARACTER | EMOTIONAL | SPIRITUAL

The Adventure

In this activity we will be making our own paddle pop catapults. This is a great activity for Joeys and Cubs but can equally be enjoyed by older sections. Catapults are a great way of learning about energy, gravity and Newton's Laws of Motion.

Plan

1. Investigate projectile motion and Newton's Laws of Motion. There are a range of resources available online for different age groups such as this: https://easyscienceforkids.com/vectors-and-projectiles/ and http://www.physics4kids.com/files/motion_laws.html
2. Investigate gravity and how it impacts different objects. Do objects of different weights drop at the same time?
3. Investigate different types of energy such as potential energy and kenetic energy and the laws of conservation of energy. This YouTube video can be a good starting point: https://www.youtube.com/watch?v=6KUP__MR4u8
4. Read the safety information and discuss with your leaders or another appropriate adult what safety equipment, precautions, and supervision may be required. Ensure that you have these safety measures in place before starting the 'Do' section.
5. Gather all the equipment that you need to make your catapult. You will require the following equipement per catapult: around 6-7 paddlepop sticks, 5 rubber bands, 1 plastic or wooden spoon, a selection of pom poms, marshmellows, or other suitable projectiles, a bowl or other target for the projectiles (optional), and a tape measure (optional to measure how far your projectile goes).

Do

1. Make a stack of paddlepop sticks (we suggest a stack of 4 or 5) and join them together at each using rubber bands.
2. Take two additional sticks and stack them together. Rubberband them together on just one end.
3. Pull the two paddle pop sticks slightly apart and place the larger stack of paddlepop sticks in between them.
4. Place a rubber band around the stack of sticks to just the upper paddle pop stick.
5. Secure the two stacks together with another rubber band.
6. Wrap a rubber band or maybe 2 around the spoon to connect it to the upper paddle pop stick.
7. Place a pom pom or marshmallow onto the spoon.
8. Hold the catapult with one hand, and use the other hand to pull the spoon down. Release the spoon and watch your pom pom or marshmallow fly!
9. Play around with your catapult. How far can you make your projectile go? Can you catch your projectile? How well can you aim your catapult?

Review

1. Were you able to make your projectile fly? Why or why not?
2. What did you enjoy most about this activity? What did you learn?
3. What kind of theories and predictions can you make when using the catapults?
4. Does using different types of surfaces make a difference?
5. How could you modify your catapult to improve it?

Safety

• Be careful with rubber bands as if looped too tight onto limbs, etc, they can impair circulation. Rubber bands can also be used as projectiles that, if not careful, may pose a danger to eyes. Never shoot a rubber band in the direction of someone else.
• This challenge card includes projectiles which, if misused, can injure individuals. Make sure to use soft projectiles such as pom poms or marshmallows. Do not aim projectiles at the eyes of individuals.
• You will be using paddlepop sticks which can sometimes cause spliters. Take care when handling these.
• Allergen warning: Some individuals may react to ingredients or equipment used in this challenge card. Common allergens that may be present include latex (in the rubber bands) or various ingredients in marshmallows.

Variations

• Create a challenge within or between patrols to see who can create the best catapult, considering different aspects such as accuracy and distance.
• Older sections may wish to supersize this activity and build a larger catapult, keeping in mind that this will likely require more safety considerations than the smaller catapults.