



Flying Objects

The Big Idea

We'll show you how to make a catapult out of a plastic spoon, pencils and rubber bands. Then we'll see how the size of the fulcrum can make your flying object the winner!

You Will Need:

To play the game:

- ★ Masking tape or another way to mark a starting line
- ★ Measuring tape
- ★ Objects to fling: Anything that's safe to fly, like dry pasta, marshmallows, craft pompom balls, a few cotton balls taped together or crumpled-up paper
- ★ Scrap paper and sharpened pencil, pen or marker to record your flying distances

To make the catapult:

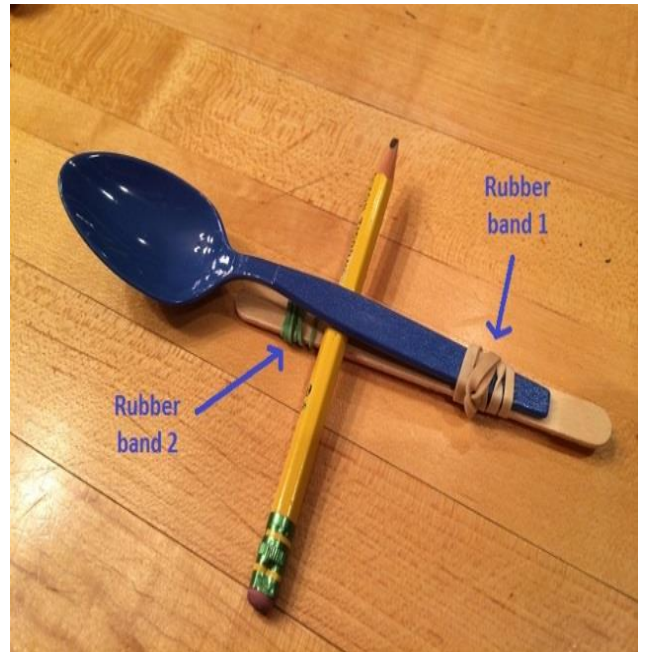
- ★ Pencil: 1
- ★ Plastic spoon: 1
- ★ Popsicle stick: 1 (You can use another pencil, preferably unsharpened, if you don't have a popsicle stick)
- ★ Rubber bands: 2, small or medium size
- ★ Thick marker (optional): 1

The Math Behind the Scenes:

Catapults are a great way to practice measuring distance while exploring a bit of physics. So, if you're ever looking to become an engineer and build your own roller coaster or rocket, you'll have the right skills to take off!

Make the Catapult:

1. Hold a spoon and a popsicle stick or one of your pencils back to back with the scoop pointing up. The scoop should extend past the stick, as shown.
2. Wrap a rubber band around the spoon and stick near the lower tip.
3. Wrap a 2nd band around only the popsicle stick at the top.
4. Create a fulcrum by sliding a pencil between the center of the spoon and stick. The 2nd rubber band keeps the fulcrum in place!



How to Play:

1. Assemble your catapult and gather the objects to fling.
2. Find a space long enough to safely fling your objects. Mark one end of your space with masking tape or other item to create a starting line.
3. Fling your first object from the starting line and measure the distance! Record that distance on your paper.
4. Keep flinging and measuring. Try different objects and compare the distances to see which object flies farther!
5. You can change the fulcrum of your catapult by sliding out the pencil or inserting a thick marker. If you don't have a thick marker, just take out the pencil to see how that changes the flying distance of your objects.

Riddles and Questions

Kindergarteners: One of our balls flew 20 feet! What numbers do you say to count up to 20?

1st-graders: If a pompom flew 5 feet and a marshmallow flew 2 feet further than that, how far did the marshmallow fly?

2nd-graders: If a piece of dry pasta flew 15 feet and a ball of paper flew only 5 feet, how much farther did the pasta fly?

3rd-graders: A cotton ball flew 7 feet and a piece of cereal flew twice as far. How far did the cereal fly?

4th-graders: If a cotton ball flew 7 feet and a piece of cereal flew twice as far. What is the total distance the items flew in all?

5th-graders: Dry pasta flew 195 inches! How many feet did the pasta fly?

Answers:
K: 1, 2, 3, 4, 5, and so on.
1st: The marshmallow flew 7 feet!
2nd: The piece of dry pasta flew 10 feet further than the ball of paper.
3rd: The piece of cereal flew 14 feet.
4th: $7 + 14 = 21$ feet in all!
5th: There are 12 inches in every foot and 12 goes into 195 16 times with 3 inches left over. So the pasta flew 16 feet and 3 inches!