Playdough to PLATO

Candy Pumpkin Catapults

STEM activities (Science Technology Engineering and Math) are always a hit with my kiddos, but this engineering activity had the whole family wanting to get in on the action. After explaining to my 3 and 5 year-old what a catapult was, I simply challenged them to build one that would launch candy pumpkins.

They couldn't believe their ears. Launching candy across the house? What's not to love?! After your little engineers build theirs, hop on over for more science fun with our Epic STEM Challenges!

In the most basic terms, a catapult is a simple machine used to launch an object or projectile without the use of explosives.

Before building our catapult, I showed my kiddos an example of a simple catapult using a spoon. Balancing the candy pumpkin on the end of the handle, I simply hit the spoon end with my hand to send the pumpkin flying through the air.

Making Candy Pumpkin Catapults

To make the pumpkin catapult, I quickly gathered a few supplies:

- 7 craft sticks (wide craft sticks are easier for little hands to hold.)
- 4 rubber bands
- 1 small cup (We used the top to a juice container.)
- A hot glue gun

First, I had each kiddo stack 5 craft sticks on top of each other and then I helped them bind them on each end with a rubber band. This would act as the base and fulcrum – the point at which the lever will pivot.

They stacked the remaining 2 sticks and bound them with a single rubber band on the very edge of one end.

Next, we pried open the 2 sticks to make a “V” shape. We placed the bundle of 5 sticks at the very bottom of the “V” shape and secured it with the final rubber band.

The last step on the pumpkin catapult was to glue the small cup that would hold the pumpkins onto the end of the top arm of the catapult. In the photo below, the arm is the stick with the Halloween tape on it. If you are doing this with little ones, it helps to glue the cup in from the end of the stick. This gives little fingers an area to push down on to create the tension to make projectiles fly.

Making Pumpkins Fly

It only took a few minutes to construct our ultra simple pumpkin catapults and my kids couldn’t wait to launch pumpkins.

At first, they just played around with the catapults to see the best way to get the pumpkins to fly the furthest. {These aren't the most powerful catapults and only launched the pumpkins a few feet.}

I handed them a couple candy corns to see if the difference in weight had an affect on the distance the projectile would fly.

Then we moved on to experiment with how we aimed the catapults. I set up 9 small glasses in a pyramid shape. The kids had to get 3 out of 5 pumpkins into the glasses in order to eat one. Of course, once the sugar kicked in, things got a little crazy and the game turned into shooting candy pumpkins into each others' mouths. Whoever said science wasn't fun?!

As far as first attempts go, this catapult was perfect. Simple, quick, and easy for all ages to use. My 3 year -old is officially obsessed! He used his catapult the next day to launch acorns to our neighborhood squirrels.

Pumpkin Catapult Extensions

Both kids are already thinking about what they could launch next and how to make things fly further. Here are a few extensions we've thought up:

Secure the catapult to prevent movement and test how accurate it is using the same projectile.

Change the number of craft sticks in the bundle and see what effect it has.

Test different rubber bands. How does this affect the launch?

Test different sizes and weights of objects.

Test holding the arm down at different angles.

Build a few different models and test which launches the furthest and most accurate.

Build a bigger catapult and test different materials (bungee cord, exercise band) to see what happens.

The Science Behind It

A simple machine is a mechanical device used to change the direction or magnitude of a force. The catapult is an example of a lever type simple machine in which a beam or arm pivots at a fixed point called the fulcrum.

In the catapult we built, as we pressed down on the arm, tension was building and energy was being stored.

Energy that is stored when a material is compressed (think of a spring) or stretched (a slingshot) is called elastic energy. When you release the arm of the catapult, the elastic energy is converted into kinetic energy – the energy of motion. When you place an object like the pumpkin candy in the bucket, the pumpkin will move at the same speed as the arm and the bucket.

When the arm stops, the pumpkin projectile continues to move forward due to Newton's first law, which states that an object in motion stays in motion. The pumpkin becomes airborne.

Gravity pulls the pumpkin back toward the ground, giving the pumpkin its trajectory, or path.

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Elliot on at 6:45 am

I loved the catapult it was so much fun for everyone in my class and me.

Thanks so much!

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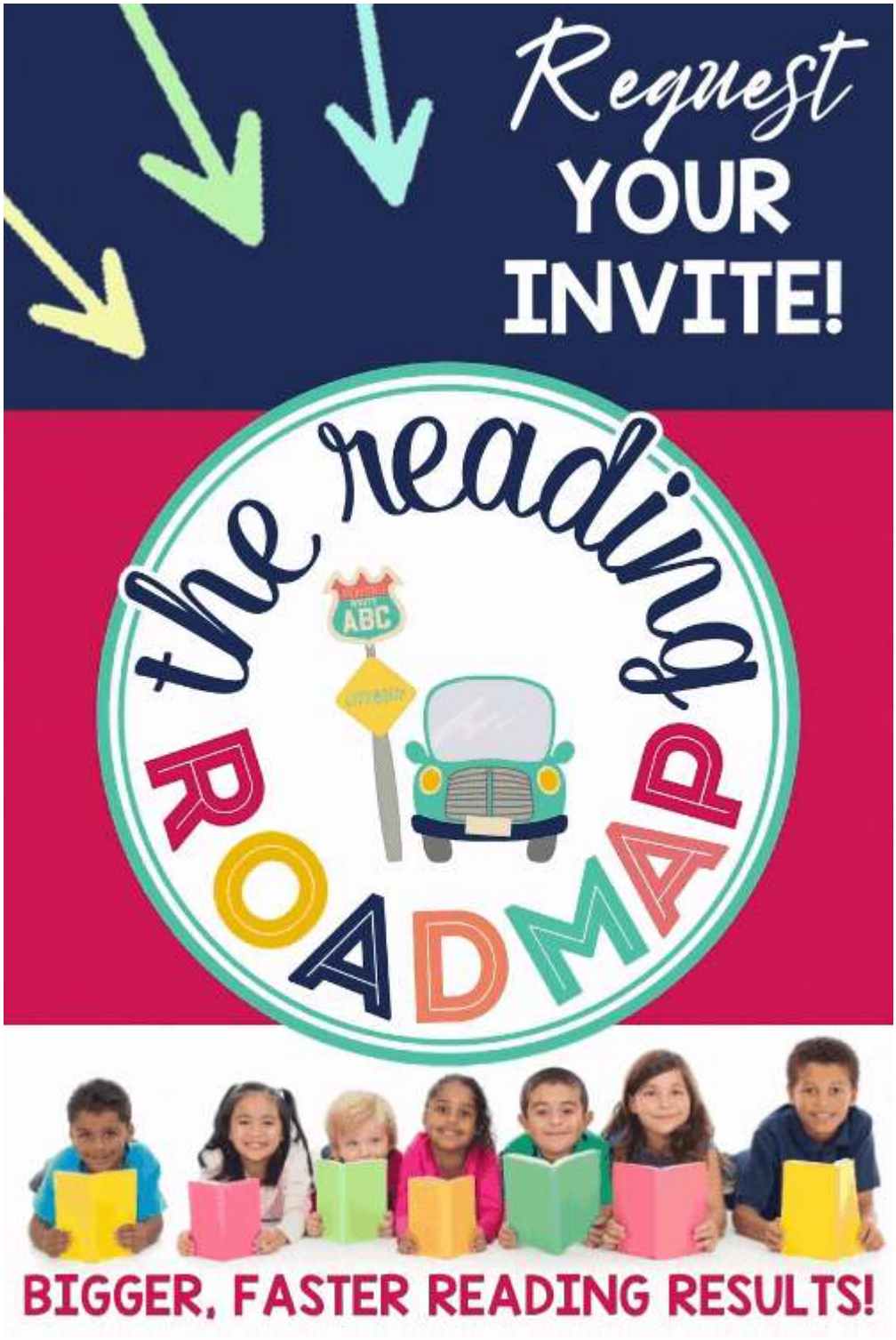
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