

# Target Practice

Build a catapult using a lever, and power it with a rubber band. Then, use what you've learned to build your own design, and send a marshmallow flying through the air!



## 1 Get what You need.

- plastic spoons • rubber bands • duct tape
- craft sticks • brass fasteners • scissors
- mini marshmallows • pen • toilet paper or paper towel tubes • cardboard base (chipboard, shoebox, tissue box, cereal box, milk carton, etc.) • target (trash bin, for example) • meter stick (optional—for Dig Deeper activity on back of sheet)

## 2 Construct a catapult.

- Attach a toilet paper tube to a cardboard base. This is your *fulcrum*.
- Tape the handle of a plastic spoon to the end of a craft stick. This is your *lever*.
- Use a pen to make a hole in the top of the tube and insert the lever. Secure with tape.
- Punch a hole in the base in front of the tube (using the pen), and attach a brass fastener.
- Wrap a rubber band around the brass fastener, then around the middle of the lever (so that there is tension as you pull it back). Tape in place.

## 3 Launch it!

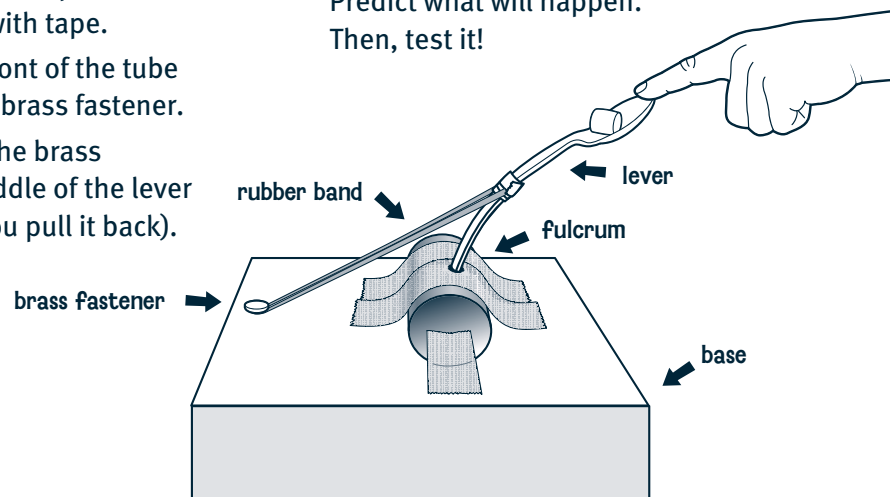
Pull back on the lever and put a marshmallow on the spoon. Then, let go! What happened?

## 4 Design Your Own.

Now that you know how to build one kind of catapult, brainstorm your own design. Try a different base or fulcrum, build a different type of lever, or use the rubber band in a different way.

## 5 Test it!

Can your marshmallow hit a target? How can you make it go farther? Or higher? Change one thing (a *variable*), like the length of the rubber band or the position of the lever. Predict what will happen. Then, test it!



### Chew on This!

A catapult is a device used to hurl an object. It uses a simple machine called a *lever* (the spoon and craft stick), which is attached to a stationary point called a *fulcrum* (the cardboard tube), to help move a *load* (the marshmallow).

Your catapult is powered by the rubber band. When you pull back on the lever, *potential energy* is stored in the rubber band. When you let go, the potential energy is transferred to the lever and turned into the energy of motion (or *kinetic energy*), and the marshmallow is flung forward.

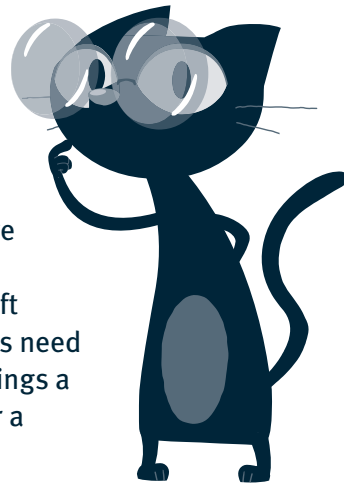
# Dig Deeper

**catapult contest!** See whose catapult can send the marshmallow the farthest. Use a meter stick to measure the distance, and then record the results.

**POP FLY.** Make a lever and send a ping-pong ball flying high! Check it out at *Design Squad*: [pbskids.org/designsquad/projects/pop\\_fly.html](http://pbskids.org/designsquad/projects/pop_fly.html).

## Did You Know?

The catapult was used in ancient and medieval warfare to hurl stones and other projectiles at the enemy. Today, catapults are used for other purposes: like launching airplanes into the air! Ships that carry aircraft don't have space for long runways, so planes need help getting airborne. An aircraft catapult slings a plane forward, helping create enough lift for a safe takeoff.



Watch **FETCH!** on PBS KIDS GO! (check local listings) and visit the **FETCH!** Web site at [pbskidsgo.org/fetch](http://pbskidsgo.org/fetch).



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Fold

# Fetch!

Education  
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# Target Practice

My sweet Charlene has banned me from her back yard—she refuses to see me! I wrote her a love note and need a way to deliver it. I know: Build a catapult for me! I'll fling the love note over the . . . WAIT! Are you thinking what I'm thinking? CAT-a-pult?! I'll fling BLOSSOM over the fence, WITH the love note! I say, there never was a smarter dog . . .

## GOOO FETCH!

