

# POP FLY



## YOUR CHALLENGE

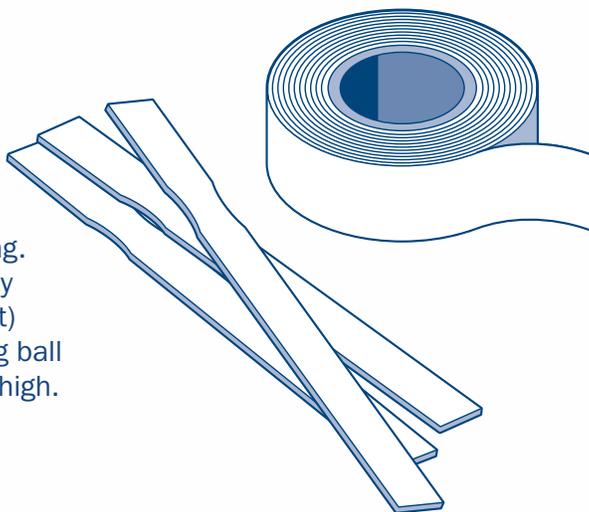
It's football with a twist. Invent a way to send a Ping-Pong ball flying high enough to catch it. Take some paint stirrers, a wooden spool, and tape. Now, add your foot. Ready, set, launch!

## MATERIALS

- Duct tape
- 3–5 paint stirrers
- 1 wooden block or spool
- 3-oz paper cups (for your redesign)
- 1 Ping-Pong ball

## BRAINSTORM AND DESIGN

Using the materials (and your foot), make something that launches a ball high enough so you can catch it. When we made ours, we came up with lots of ways to send our ball flying. Most of our designs (but not all) used levers. Levers are handy because they can convert a small motion (the flick of your foot) into a large motion (the end of the lever flinging your Ping-Pong ball into the air). Now, let your imagination (and Ping-Pong ball) fly high.



## BUILD

Think of different ways to put it all together and get that ball flying!

## TEST

How high did it go? Did it fly high and straight enough for you to catch? Could your tallest friend catch it?



## REDESIGN

Even the best inventions can be improved. Now that your ball can fly through the air with the greatest of ease, challenge yourself to:

- send the ball twice as high
- pop up a tennis ball
- pop up two balls at once
- launch a ball for a partner to catch



# POP FLY Continued

## INSIDE THE ENGINEERING

Levers, levers, everywhere. Yup, they're all around you. You see, levers make work easier by converting a little effort into a lot of force (like a hammer) or by converting a little movement into a large movement (like a broom or golf club). And who doesn't want to get more done with less effort? Baseball players use a lever every time they are up at bat. When you swing a bat, you move the part you're holding just a little bit. But the other end of the bat moves a lot! The same with the flippers on pinball machines—a little flick sends the ball flying. A see-saw is a big lever, though you'd need a lot of force to send someone flying! And hundreds of years ago, soldiers hurled heavy stones using catapults, which use a lever system to send the rocks flying. We think Ping-Pong balls are much more civilized!

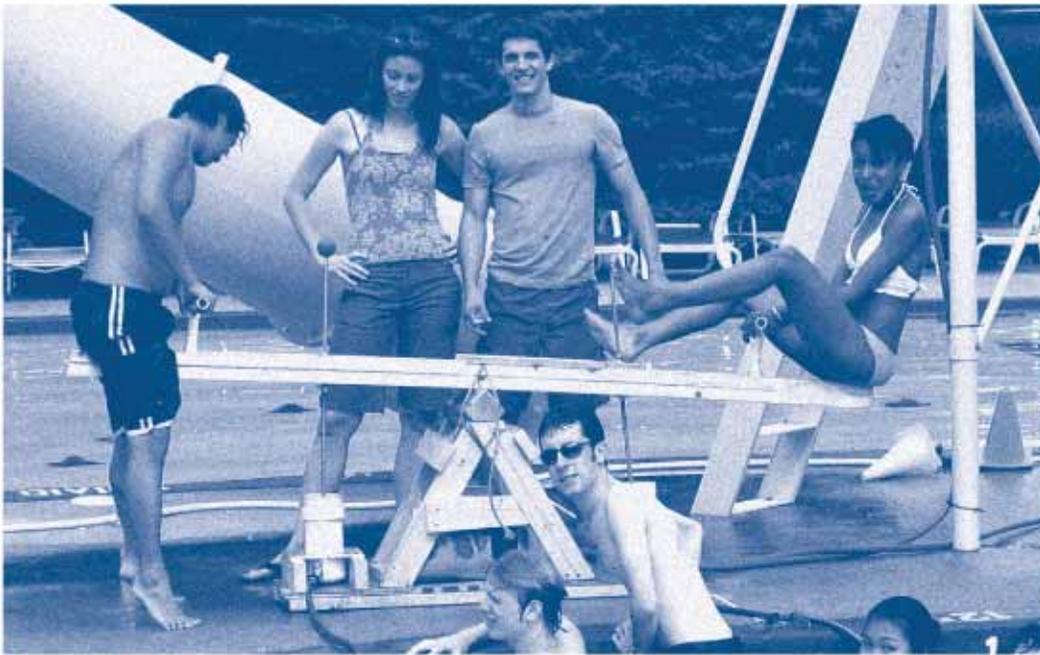


Photo: Mika Tomczak

For their water slide challenge, the *Design Squad* cast needed to pump water to the top of a slide to make it slippery. One team used a seesaw to help push and pull pistons to pump the water.



If you liked this challenge, go to [pbskidsgo.org/designsquad](http://pbskidsgo.org/designsquad) to download more challenges to try at home.



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