

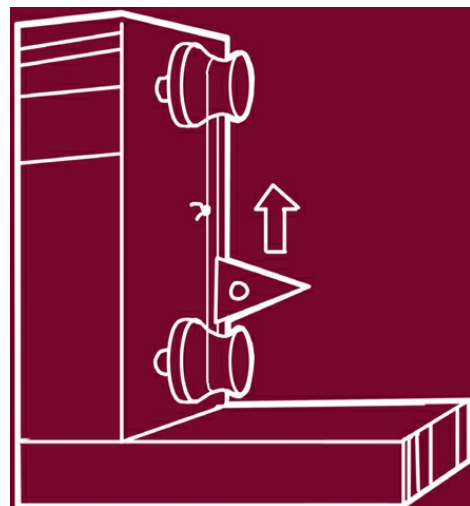
RAISE THE FLAG

Since the pulley system on a flagpole is one we see in everyday life, let's start there. This challenge will use only one, fixed pulley. But don't worry, the challenges will get more complicated!

The Challenged Identified: Create a contraption of at least three steps that raises a miniature flag on a miniature flagpole using either real or makeshift pulleys.

Contraption Hint: You don't need actual pulleys to make a contraption using pulleys. Many objects can serve as a grooved wheel that a string can pass over to create a fixed pulley. Don't forget that ancient peoples most likely used a makeshift pulley by throwing a rope or vine over a branch. How can you copy that in your contraption?

Brainstorm ideas and supplies: You'll need something for a base, something for the pole, rope or string, and something to act as a pulley. Then, decide what chain reaction you will use to raise your flag. And don't forget the flag, which can be made out of fabric or paper or many other materials!



<i>Other things that could be used like a wheel</i>	<i>Other things that could be used like a rope</i>

Draw a plan: Start by sketching out how you will make a flagpole and pulley system.

Build: Put the contraption together so your flag can be raised using the pulley system that you've designed.

Test: Once you've built your flagpole, attached a flag, try it out.

Evaluate:

Did the flag rise like you wanted it to? Why or why not?

Was the flagpole sturdy enough? Maybe there wasn't enough force to raise the flag. Or maybe there was too much!

Redesign: What design changes can you make to your pulley system to make it more effective? Do you need to make your flagpole stronger? Or perhaps think of other materials you could use to make a flagpole or contraption to start the flag raising. Lessening the tension on the string might also make the flag easier to raise. Sketch any design changes you would make.