

Paper Cup Stool

Recommended Ages: All


What do you think would happen if you tried to stand on some paper cups? You would crush them, right? What if you used the power of STEM (Science Technology Engineering and Math) to stand on the cups *without* crushing them?

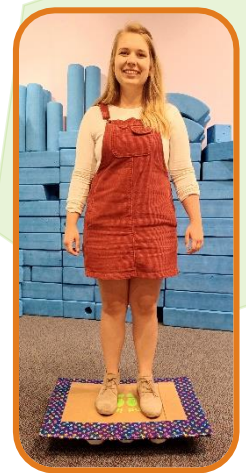
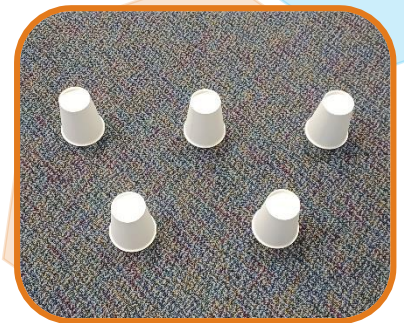
In this engineering challenge, you will create your own paper cup stool!

Materials:

- 5 – 10 Medium to Large Paper Cups
- 1 Piece of Cardboard (Big enough for your feet to fit on)

Procedure:

1. Try standing on 1 or 2 paper cups. Do they crush under your weight? If not, see what you have to do to get them to crush. We will use this same method later on.
2. Spread out at least 5 paper cups in a way they are evenly distributed. **Example** 
3. Place your sheet of cardboard on top of the paper cups.
4. Now try standing on top of the cardboard. Do the cups support your weight now? Is it sturdy? If you had to use a stronger method earlier to crush your single cup, try that same method now. Did it work this time?
5. If you have the supplies, try adding another layer of cups and cardboard to make a two-tier stool!




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How does this work? It has to do with weight distribution. Check out the math below!


$60 \text{ pounds} \div 1 \text{ cup} = 60 \text{ pounds per cup}$



When all of your weight is on one cup, you are too heavy and the cup is crushed.

When you have multiple cups and the piece of cardboard, your weight becomes distributed across all of them.

$60 \text{ pounds} \div 5 \text{ cups} = 12 \text{ pounds per cup}$



DID YOU KNOW?
An **engineer** is someone who studies how and why things work. They can study buildings, machines, and even electronics! If you liked exploring how weight distribution works, maybe engineering is for you!

