

Pressure cups

How to make a pressure cup

All you'll need is A) a large, firm cup, B) a sheet of thickish plastic or a small, firm plastic bag, and c) loads of sticky tape!



Tips 1/ To make sure your plastic is large enough, line three cups up along the centre line, marking off the edges. Repeat in several directions until you have a very large circle.

2/ The plastic needs to be nearly air tight. Use loads of sticky tape and make sure you go above and below where your rim ends several times. Of course, if your cup is completely air tight you'll have to rip the plastic to pull it out (or back in) so some small holes are acceptable.

How to work it:

1/ Push the plastic into the cup, yet it resists... why?

2/ Now pull the plastic out of the cup, again it resists ... why?
(Remember – air never sucks! It only ever pushes!)

How it works

Air has pressure: every single particle of air is moving around, and when a little particle hits something, it gives it a little push. Now even though those little pushes are soooo teeeeny tiny that you cannot see, hear or feel them individually, there are actually soooo many particles of air that all together they can give even a very small thing a very large push!



1/ When you are trying to push the plastic into the cup, the air inside the cup now has more pressure than the air outside the cup – that is, because you're squeezing down on them the particles inside the cup tend to press against the plastic just a little more often than the air outside the cup. You experience this as a push. So the air inside the cup is pushing out, making it hard to get the plastic in. that's not so hard, eh?

Air Bottle

Push in the plastic – why is it so difficult?

Perhaps because the air pressure in the bottle is pushing the plastic back out?

Pull out the plastic – why is it so difficult?

There's air in the bottle, and air in the room. Both have pressure because the air particles are bouncing around. Perhaps it is difficult to pull the plastic out because the air pressure in the room is now pushing the plastic back in!

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2/ Where people get stuck is why it's hard to pull the plastic back out again, especially since air never sucks. The visual explanation is that as you try to pull the plastic out, the air *in the room* is now pushing against the plastic harder than the air in the cup. This means you're trying to pull not only the tiny, insignificant weight of the plastic, but the enormous, significant pressure of the air touching the plastic as well. And as we well know, air is always pushing in all directions all the time ... very powerfully!