

# Bonus Hustle effect 1

## The Glass Challenge

The distance round the rim (the circumference)  $C$ , is related to the glass's diameter  $d$  by the formula  $C = \pi \times d$  (remember,  $\pi$  is the number 3.14159). So that means that the distance round the rim is a bit over three times the diameter. Most glasses expand towards the top, so the circumference is actually quite large. But not a lot of people know that. It's basic maths, but often forgotten.

You have a head start here then. People don't realise that you have a factor of three times the glass diameter to play with. That's where the optical illusion comes in. If you show people a letter T, where the top horizontal line and the vertical line are in reality the same length, people perceive that the upright vertical line is longer. It's another of those brain errors!

If you think of your glass now seen from the side, the diameter at the top will be seen as being shorter than the distance from the table to the rim. That will happen even if they are the same distance. Combine this optical illusion with the maths mistake about  $C = \pi \times d$ , and you will find that with most glasses you can stack them on a range of easy to hand objects, and the distance round the rim, the circumference, will still be longer.

Do check your glass before you perform though, and make sure you know what you can stack it on to still win the challenge. Having a bit of string to prove the point makes the finale easier and punchier. Most important of all, play the spectators! Stick a couple of packs of cards down on the stack. Then even if there is still someone not 100% sure, 'grudgingly' add another pack, making it look like you have lost the challenge. Then it's out with your string for proof that you are the winner. Who said geometry wasn't useful!?

