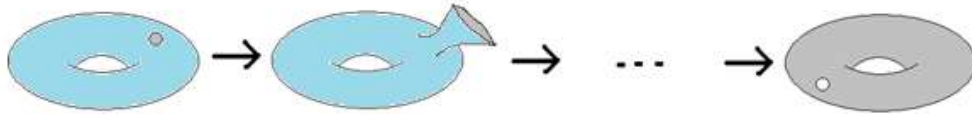


MORE WITHOUT WORDS

Mathematical Puzzles to Confound and Delight

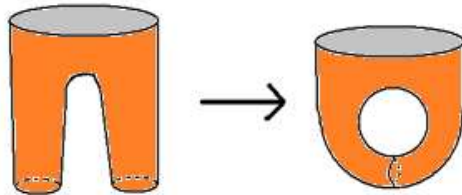


MWW 23: SOLUTION



At first it seems impossible to turn a hollow donut inside out – surely the hole gets in the way? – but the feat can be accomplished. Moreover, the final result is another donut! See my attempts at explaining all this in my video: www.jamestanton.com/?p=799 .

If you are not convinced of this, try taking an old pair of trousers and sewing together the two leg openings. This makes a large floppy donut with a hole in its side. (The opening at the waist is the hole.)



Now turn the sewn trousers inside out. You will see that it is indeed possible to do so. And if you examine what you have, you'll also see that the result is another donut – but it is a very long and skinny donut with a very long “tube like” central hole. (The trouble with material is that it doesn't stretch and the lack of stretching makes it a bit tricky to see what the result actually is. You'll have to look closely and think clearly about what you see!)

What do you get if you turn a double-donut inside out? Astonishingly, another double donut!



See *SOLVE THIS: Math Activities for Students and Clubs* for more on turning surfaces (and mutilated laundry!) inside out. (<http://www.maa.org/publications/ebooks/solve-this>)