

Siphon

On SCOPE's Trade Science episode, Julia made a siphon.
Here's how you can do it at home:



What you need:

2 large containers

Water

Food colouring

2-3m plastic tubing (available from hardware stores)

What to do:

1. Fill one container about $\frac{3}{4}$ full of water.
2. To make it easier to see the water, add some food colouring.
3. Leave the second container empty.
4. Position the two containers so the one full of water is in a *higher position* than the empty one (e.g. put the container full of water on a table and the empty container on the ground).
5. Place one end of the tubing into the container full of water.

For the siphon to work, the tubing needs to be full of water. So...

6. Suck on the other end of the tubing, like a straw. Make sure you take the tubing out of your mouth before the water reaches the other end!
7. Quickly place the other end of the tubing into the empty contain.

Watch as the water continues to flow through the tube until the container full of water is empty, and the empty container is full of water!



What's happening?

Toilets are pretty amazing contraptions. They not only flush away your number 1s and numbers 2s in one foul swoop, they do it using really simple mechanisms – one of which is a siphon.

A siphon is simply a long tube which drains liquid. What makes them so amazing though, is that the shape of the tube allows water to move from one area, up a tube- *against gravity AND without a pump*- to another area at a lower level.



So how does it all work? Well it is to do with gravity and the difference in pressure between the containers and the tubing. Basically, the water flowing into the empty container lowers the pressure in the tubing. So, as liquid always flows from an area of high pressure to an area of low pressure, the water in the container flows into the tube. Then, thanks to gravity, the water continues to flow down the other side of the tubing.

So when you flush the toilet, all that extra water moves up the siphon, it then tips over the edge and flows down the other side. This causes the rest of the water to follow until the toilet bowl is empty, ready to be filled again.