



# A GLASS HALF-FULL

Help an empty glass steal water from a full glass and explore capillary action!

## YOU WILL NEED

- Two identical glasses
- Water
- Kitchen paper towels



## WHAT YOU DO

### Step 1

Place the two glasses next to each other and fill one up with water. You can add some food colouring to the water if you like to make it a bit more fun!

### Step 2

Take two kitchen paper towels and place one on top of the other. Now fold them in half once, and then again so you have a thin rectangular 'wick'.

### Step 3

Fold this wick in half and place one half in the glass of water and the other half in the empty glass.



### Step 4

Keep checking your experiment every 15 minutes to see what happens!

### THE SCIENCE BEHIND IT

Everything is made from atoms. Atoms are like tiny little building blocks that are so small you cannot even see them with a microscope! Atoms join together to make molecules, and the water molecules that make up your glass of water are quite unique. A water molecule is made from two hydrogen atoms and an oxygen atom, which is why water is called 'H<sub>2</sub>O' ('H<sub>2</sub>' means two hydrogen atoms and 'O' means oxygen). The special thing about this molecule is that it is bent into a V shape with the oxygen in the middle having a slight negative charge, and the two hydrogens having a slight positive charge. This means that water is a polar molecule, allowing it to do some special things.

When you hold two magnets together the positive and negative ends attract each other. Because water molecules are polar, having a slight positive charge on one side of the molecule and a slight negative charge on the other, they act like little magnets and attract each other. This is why water droplets form; if a drop of water was in space it would be a perfect sphere because all the molecules are attracting each other equally, but on Earth gravity pulls the perfect sphere into the drop shape we see. Water molecules bonding with each other like this is known as cohesion, but water molecules can also bond to other things. For example, when you dip your finger in a glass of water your finger gets wet, and if you hold your finger very still, eventually there will be a drop of water hanging off the end of your finger. The water molecules bonding to your finger is called adhesion, and because the water molecules also bond to each other by cohesion, the water droplet can hang from your finger.



## KITCHEN SCIENCE - A GLASS HALF-FULL

In your experiment you will have noticed that after a few hours the two glasses will have an equal volume of water. This is because adhesive forces between the water molecules and the molecules of the paper towel, along with cohesion within the liquid, allowed the water to move up the paper towel against gravity and down into the other glass. This process is called capillary action, and you can also see this when you light a candle; liquid wax is absorbed by the wick where it then moves up to the top and acts as fuel for the flame.

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