

# MAKE WATER WEIGHTLESS

If you watch a video of an astronaut in space, you will see them floating gently around. You might think that they have escaped the pull of Earth's gravity, but astronauts float because they are in a state known as free-fall.

Objects in orbit are constantly in free-fall because they are being pulled down by the gravity of whatever they are orbiting. At the same time, the object being orbited is curving away from them at the same speed (see pages 22–23). They seem weightless, because everything else around them is falling at the exact same speed. You can explore weightlessness with a cup of water, but do it outside because you might get wet!

## YOU WILL NEED:

- a paper or plastic cup
- scissors
- a jug of water

**1** Ask an adult to help you cut a small hole in the side of the cup. The hole should be close to the bottom of the cup.



**2** Take the jug of water outside, place a finger over the hole and fill the cup two thirds full. Take your finger away and watch what happens. A steady stream of water will pour out of the hole because gravity is pulling it down. The cup is not pulled down by gravity because your hand is holding it up.



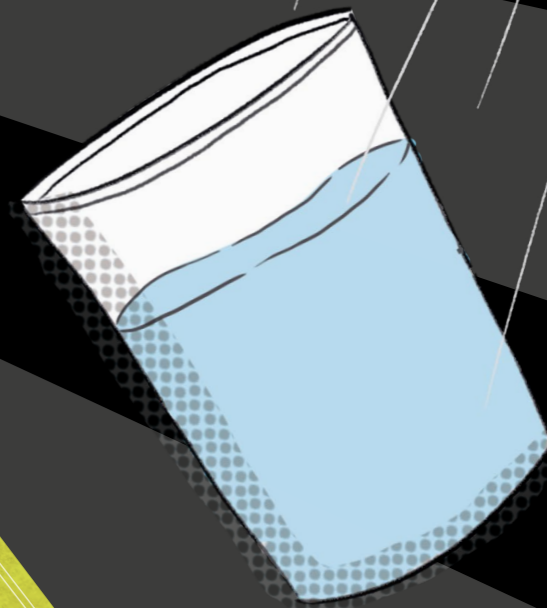
**3** Now place your finger over the hole and again fill the cup two thirds full of water.



**4** This time, gently let go of the cup as you pull your finger away from the hole. Watch carefully. Look out for the splash as the cup hits the ground!



**5** You should notice that as the cup falls with the water, none of the water pours out of the hole. Like the astronaut in space, the water is free-falling inside the cup, making it seem weightless.



## SPACE FACT

Water in space is a very tricky thing to deal with. It is free-falling, so it is impossible to make it stay inside a cup. Instead it floats around and forms balls of water. Astronauts can have lots of fun floating around in the ISS trying to catch floating balls of water!

