



SUPER POWER: Gravity!

ANTI-GRAVITY GLASS & SPINNING WATER

LAB NOTES...

OVERCOMING GRAVITY

Today, you've created two forces which when strong enough can overcome gravity. You then used them to keep water in a glass even when it was upside-down! In the anti-gravity cup experiment, you used the higher air pressure outside the glass to push the card upwards so that it kept a tight seal on the rim of the glass and the water didn't spill out.

In the spinning water experiment, you created a centripetal force, which pushes the water outwards away from the centre which was your hand. In your experiment, the centripetal force pushed the water against the bottom of the cup to keep it there, even when the cup was upside down!

Remember that everything which has mass has gravity.

"Mass" means how much stuff something is made of and bigger planets tend have more mass, so have stronger gravity! Our Moon is smaller than Earth, so the gravity is weaker there. Jupiter is much bigger than Earth, so if we could stand on the surface, the gravity would be about 2.4 times stronger.



TO MAKE YOUR ANTI-GRAVITY GLASS...

1. Watch the video of Nanogirl investigating gravity
2. Cut a square of card large enough to fit over the top of your drinking glass
3. Fill your glass up with water right to the top.
4. Place the square of card over the top of the glass and press down.
5. Over a sink or bowl, keep the pressure on the card and turn the glass upside down.
6. Let go of the card and see if it stays under the glass on its own!

BUILD TIME
15
MINS

TO MAKE SPINNING WATER...

1. Cut the bottom end off a plastic bottle to make a small cup.
2. Using sharp scissors, make a small hole in opposite sides of the cup, about 1 cm below the edge.
3. Measure and cut a length of string twice as long as your arm, thread one end through each hole, and the string to secure it to the cup.
4. Practice swinging the cup with no water in it first - this will tell you how strong your knots are! Spin it fast enough that the string is always tight.
5. Pour a small amount of water into the bottom of your cup, find somewhere with a lot of space, and swing it again - see if the water stays in even if the cup is upside down!

YOU WILL NEED

- An empty recycled plastic bottle ☐
e.g. soda bottle or milk bottle
- Drinking glass..... ☐
- String..... ☐
- Scissors..... ☐
- Thin card..... ☐
- Water..... ☐
- Towels (for spills!)..... ☐

Investigate...

If you jump up as high as you can, how many seconds can you stay in the air for? How do you think this would change if you were on the moon, or on Jupiter?

How do you think this science is used by engineers who design theme parks?

Do you think the length of your string will make a difference?

Do you think the anti-gravity experiment would work with paper instead of card?