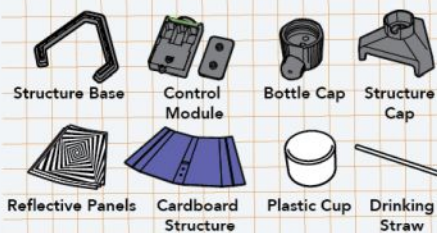


# ANTI GRAVITY FOUNTAIN

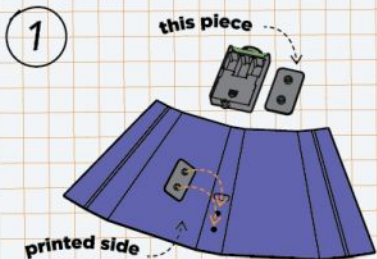
## Included Materials



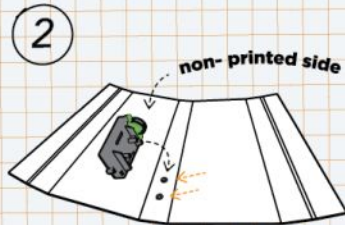
## You will need to prepare:



## START BUILDING!



Align the holes and push the plastic plate of the control module through the cardboard



Assemble the control module to the plastic plate from the non-printed side of the cardboard

### Advice for Supervising Adults

This experiment kit is only intended for use by children over the age of 8 years. The instructions should enable adults to assess the experiment's suitability for the child concerned. Before starting the experiments, read through the instruction manual together with your child and discuss the safety information. Check to make sure the kit has been assembled correctly, and assist your children with the experiments.

### Notes on Using Batteries in Experiment

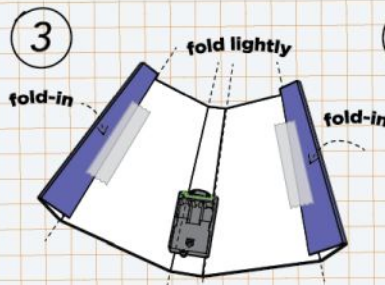
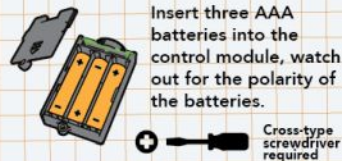
**Warning!** Only for use by children aged 8 years and older. Instructions for parents or other supervising adults are included and have to be observed. Keep the packaging and instructions as they contain important information.

The wires are not to be inserted into socket-outlets. Only adults should install and replace batteries. Alkaline batteries are recommended. If the toy has not been used for a long time, remove the batteries. Non-rechargeable batteries are not to be recharged. Rechargeable batteries are to be removed from the toy before being charged. Rechargeable batteries are only to be charged under adult supervision. Do not mix old and new batteries. Do not mix alkaline, standard (carbon zinc) or rechargeable (nickel cadmium) batteries. Exhausted batteries are to be removed from the toy. The supply terminals are not to be short-circuited. Only batteries of the same or equivalent type as recommended are to be used. Batteries are to be inserted with the correct polarity.

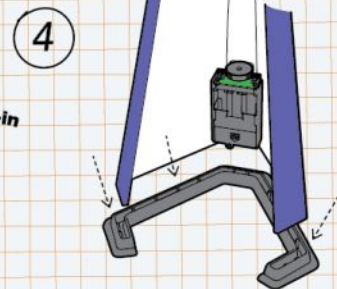


If any time in the future you should need to dispose of this product please note that Waste Electrical products should not be disposed of with household waste. Please recycle where facilities exist. Check with your Local Authority or retailer for recycling advice. (Waste Electrical and Electronic Equipment Directive)

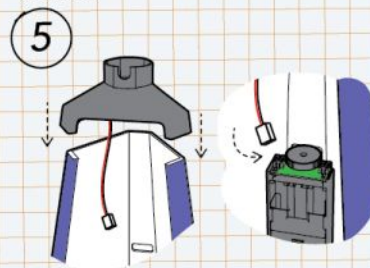
## ! Install batteries first:



Fold-in the left and right ends of the cardboard. You may further secure it with tape



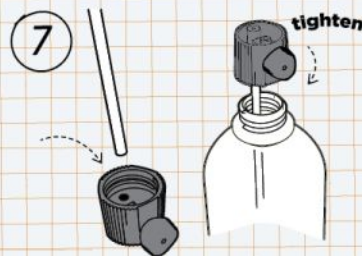
Insert the assembled cardboard unit to the structure base



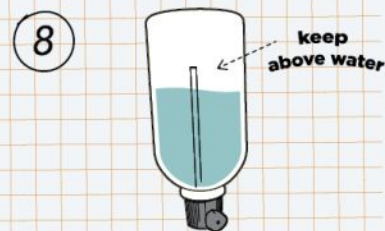
Insert the structure cap to the cardboard unit and connect the wire of the LED to the circuit board



Place the printed backdrop to the cardboard unit, you have now completed the cardboard unit



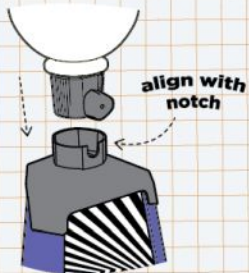
Insert the plastic straw to the bottle cap. Fill the water bottle with water, close the bottle cap and tighten the knob.



Flip the bottle upside down. Water level shall not exceed the tip of the straw



9



Insert the bottle to the top plate

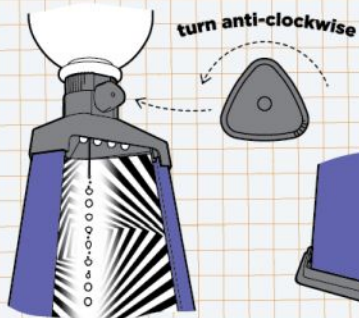
10



Place the cup directly underneath the bottle

## EXPERIMENT TIME!

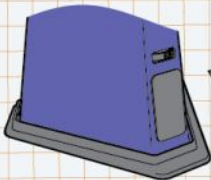
Can you create anti-gravity water?



Turn the knob slowly in an anti-clockwise direction until water is dripping out



For best results, perform the experiment in a dark environment



Turn the light switch to the left. The more you turn the switch, the faster the light flashes

turn to the left

## Tips

The goal is to make the dripping water to “freeze motion”. It might take some time to get there, here are some tips: It won't work if the water is dripping too slow or is flowing continuously, try to aim for spot where the water is dripping quickly.

You are now half way there. Start adjusting the light switch and observe the dripping water at the same time carefully. At some point you will see the water freeze motion.

## THE SCIENCE BEHIND THE MAGIC

So why is the water freezing in mid-air or even flowing backwards? Bad news is, scientists don't have the skills to create anti-gravity water yet. But the good news is, it is actually an **optical illusion**, and that means there's **SCIENCE** involved!

First, let's take a step back and understand the basics of “video”. You might already know; video or animation are just still images playing **in sequence** (or showing one by one). If the images are played quickly enough, it tricks your brain and you start seeing the images in smooth motion, and it becomes a video!

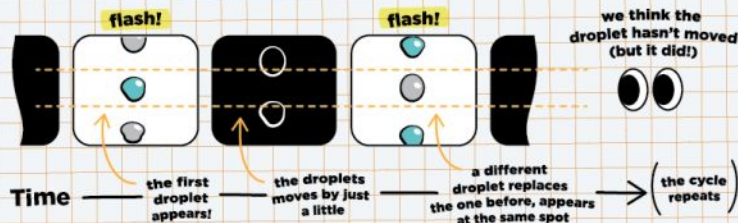


**DO YOU KNOW:**

To look smooth enough for viewing, each second of a video contains at least 24 images!

What you are seeing is called a **Stroboscopic Effect**.

The magic in this experiment is the **flashing light** (or **strobe light**, hence the name of the effect). Under bright conditions, you only see the stream of water as a blur. But under a strobe light, each flash creates a clear snapshot. If the next droplet happens to be at the same position at the next flash, we will see as if the droplet hasn't moved at all!



So why sometimes the water flows “backwards”?

If the next flash appear slightly earlier, then we will see the next droplet at an “earlier” position. Remember how movie works? Because the next droplet will always appear earlier than the previous (over and over again), the sequence tricks our brain into thinking they are moving upwards!