

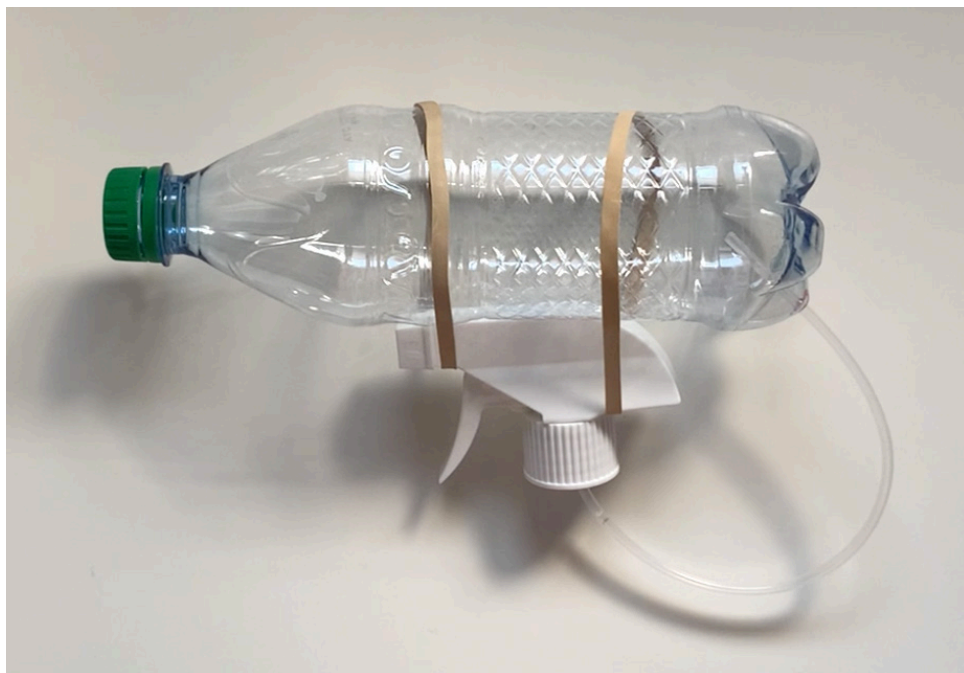
# TAKE & MAKE KIT

## Water Toy

TIME: 20 min

CONTAINS SMALL PIECES

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## What's in this kit?

In this kit you can also experiment with items around your home and create a water toy to enjoy during the hot summer months.

### You will learn:

- Engineering
- Water pressure

## Let's Get Started!

### Materials

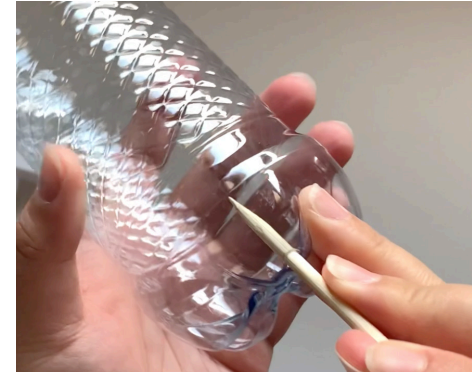
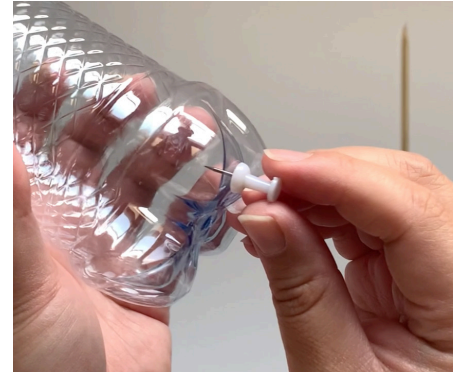
Plastic bottle  
Spray nozzle  
Rubber bands  
Poster putty  
Tape

### Tools

Push pin  
Pencil  
Scissors

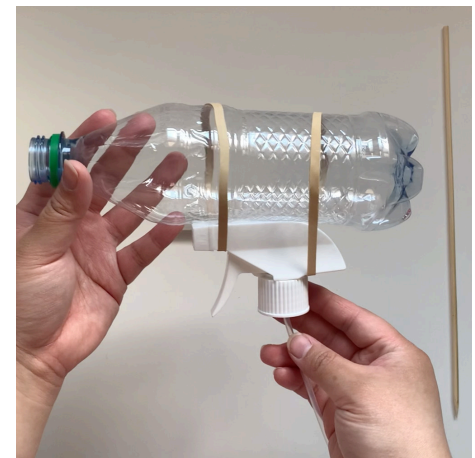
### Step 1 - Prepare bottle

Recycle and reuse a clean plastic bottle for this project. Take the push pin and create a pilot hole at the bottom of the bottle. Insert a pencil or a bamboo skewer to make the hole wide enough for the tubing of the spray nozzle.



### Step 2 - Attach spray nozzle

Take two rubber bands and place them on either side of the bottle. Stretch the rubber bands around the bottle and then use them to secure the spray nozzle. Make sure the top is flush with the bottle and that the hole created is facing down. Use the tape to keep the spray nozzle in place.



### Step 3 - Plug water source

Insert the tubing of the nozzle into the hole you created. To avoid any leaks take some of the poster putty, stretch it out, and use it to plug the area round the tubing where it enters the bottle.



### Step 4 - Fill with water

Open the top of your bottle and fill the chamber with fresh water. Give the trigger a few squeezes and test out your new water toy! Make sure you turn the knob of the nozzle to adjust the settings.

You did it!



## Did You Know?

Did you know that the top selling water toy of all time is the Super Soaker invented by Lonnie Johnson? It was by chance in 1982 that the African American inventor and now former Air Force and NASA engineer invented the toy water gun in his own home. Johnson then patented and sold it as the Power Drencher in 1990. From a young age, he was a curious maker and inventor that experimented with scraps and gadgets in his parents' home.





## Challenge!

How strong is your water toy? Line up some found objects like small toys, empty bottles, or small cups to test how strong your water toy is. Stand from a distance and aim your water toy at the objects.



### Predictions!

Which one do you think will move the farthest? Why?

Take aim and record your observations. Which one moves when you shoot at it? What material is it made from? How far did it move?

## Going Beyond - Water Pressure

Water pressure is the force created by the weight of water trying to flow to a lower height. In the water toy the water is pushed down the tubing and into the spray nozzle mechanism. Multiple instances of force being applied (like squeezing the trigger) allows the water to forcefully exit through the tip of the nozzle.

### Let's explore water pressure.

Remember to work over a sink or outside where things can get wet.

**1 - Water is squishy.** Take two clear cups and fill one up just past halfway with water. Take the second cup and place it inside the first cup. Without pressure, the top cup will bob on top of the water. Now try pushing down the cup. Your weight on the cup will cause the water to spill out over the edge because it has nowhere else to go. Water will fill the space it occupies but when it has nowhere else to go it will force it's way out.

**2 - Water is heavy.** Take an empty plastic bottle and create a row of holes a few inches apart from the bottom. Fill the bottle with water and watch what happens when the water streams out. The water at the bottom will gush out farther than the holes at the top. This is because the water pressure is different at each hole and is heavier and stronger at the bottom.

HANG OUT,  
MESS  
AROUND,  
GEEK OUT.



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