



national science week

9-17 August 2025



Holey Bottle

Control water with just a turn of the lid.

Safety

Adult help and supervision when using the thumb tack. Make sure to clean up any spills.

What you need

- PET bottle
- 1 thumb tack/ drawing pin
- Water

What to do

1. Fill your PET bottle with water and screw the lid on.
2. Poke a hole in the bottle, below the waterline, using the thumb tack. Be careful to not squeeze the bottle unless you want to get wet.
3. Turn the bottle so the hole faces away from you and unscrew the cap.
4. Observe and record how far the water shoots out.
5. Screw the lid on to stop the water flowing.

What's happening?

When you poke a hole into the water filled bottle, you might expect water to flow out, but it doesn't. There is an interaction between the surface tension of the water and the air pushing on the side of the bottle. The surface tension of water prevents air from entering the bottle through the hole, while the force of the air, called air pressure, pushes on the bottle preventing water from coming out of the hole.

When you unscrew the lid, air can enter the bottle and push down on the water (along with the force of gravity), squirting water out through the hole.

When the lid is screwed back on, no more air enters the bottle, resetting the interaction between surface tension and air pressure.

Extension activity

Try poking additional holes at different heights along the bottle and observe how far the water shoots out from each hole. Does every hole continue draining water or does it stop?