

MAKE A "CARTESIAN DEVIL"



SUPPLIES

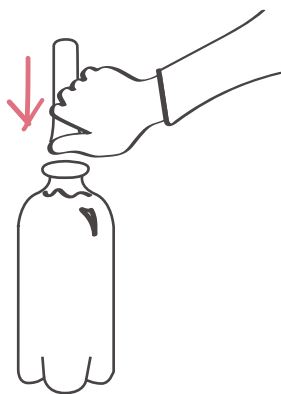
- 1 LITER PLASTIC BOTTLE LIKE SHOWN
- AN EMPTY SMALL VIAL LIKE FROM A PERFUME SAMPLE

1

FILL THE PLASTIC BOTTLE COMPLETELY UP WITH WATER AND THE VIAL ABOUT HALF WAY UP

2

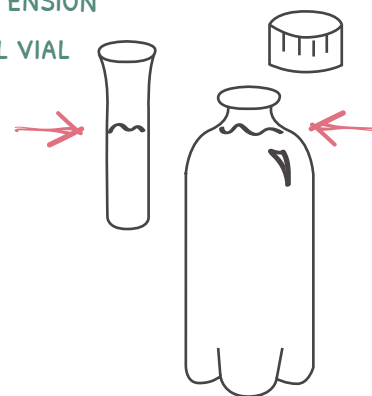
PUT YOUR FINGER OVER THE OPENING OF THE VIAL, TURN IT UPSIDE DOWN AND THEN INSERT IT INTO THE BOTTLE. THE HIGH SURFACE TENSION WILL KEEP THE WATER INSIDE OF THE SMALL VIAL



DO A QUICK TEST...

SEE IF THE VIAL ONCE INSERTED UPSIDE DOWN AND CLOSED INSIDE OF THE BOTTLE SINKS TO THE BOTTOM.

IF SO, REMOVE IT AND FILL IT WITH LESS WATER.



3

TIGHTLY CLOSE THE TAP OF THE PLASTIC BOTTLE

4

SQUEEZE THE SIDES OF THE PLASTIC BOTTLE AND OBSERVE WHAT HAPPENS...

SQUEEZING THE SIDES OF THE BOTTLE, THE VIAL SINKS. RELEASING YOUR GRIP ON THE BOTTLE AND WATCH THE VIAL RISES BACK UP.



THE PRESSURE FROM YOUR GRIP ON THE SIDES OF THE BOTTLE FORCES WATER TO ENTER INTO THE VIAL MAKING IT HEAVIER SO THAT IT SINKS. ONCE YOU RELEASE YOUR GRIP ON THE BOTTLE, THE COMPRESSED AIR INSIDE OF THE VIAL PUSHES THE EXCESS WATER BACK OUT. THEN THE VIAL IS ONCE AGAIN LIGHT ENOUGH TO FLOAT INSIDE

THE FIRST PERSON TO PERFORM THIS EXPERIMENT WAS RAFFAELLO MAGIOTTI, GALILEO'S STUDENT IN 1648. ANOTHER NAME FOR THIS INSTRUMENT IS LUDIONE. THIS WORD IS DERIVED FROM THE FRENCH WORD LUDION WHICH MEANS JOKER BECAUSE OFTEN TIMES A SMALL JOKER WOULD BE PAINTED ON THE GLASS OF THE TINY VIAL THAT WOULD THEN MOVE UP AND DOWN CREATING A MORE ENTERTAINING EFFECT