



You go up and I go down

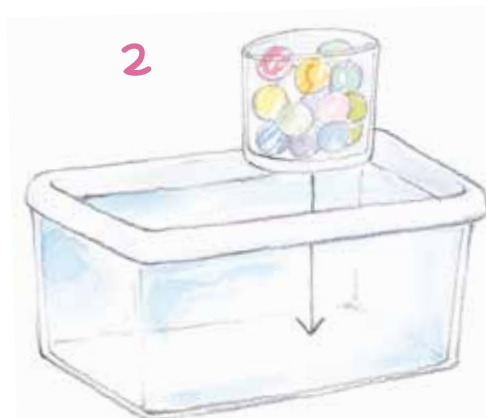
You will need:

- ◆ A large transparent container
- Two small containers with lids
- A glass
- Some marbles
- A teaspoon
- Blue and red food coloring



1 Fill the large clear container with water, but NOT completely! Leave about 3 fingers without water.

2 Now fill a glass with marbles or similar objects that weight a bit. Place the glass inside the container of water and they will serve as a "pedestal" to support another container on top.

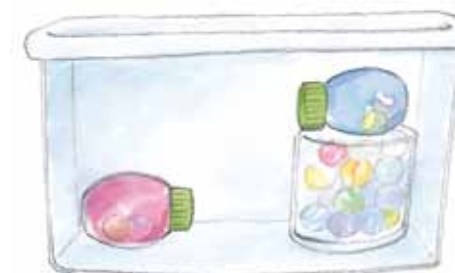


3 In one of the small containers, prepare a mixture of hot water and red colorant, half a teaspoon and the rest water. Place a few marbles inside the container and close it.



4 Then mix the cold water with the blue colorant. It's important to maintain the temperature difference between the water in the two containers and to have two contrasting colors. Also place a few marbles inside and close it.

5 Place the closed containers inside the large container in the following way: The one with the red colorant at the bottom and the one with the blue colorant supported on the glass of marbles. They should both be horizontal and facing one another, like in the picture. Now you understand why you put the marbles in the containers, don't you? To stop them from floating! Then finish filling the large container with water at room temperature.



Why does it happen?

You have hot red water and cold blue water in a container filled with water at room temperature. **The hot water is less dense than the room temperature water and thus weighs less and tends to rise, whereas the cold water is denser, weighs less and sinks.** The same thing happens in the atmosphere with air masses and at the bottom of the ocean! Thanks to this, there are clouds and ocean currents and that's why we place air conditioning high up on the wall!

6 Try it out!

Concentrate and quickly unscrew the lids of both containers at the same time... 1, 2, 3... NOW! Remove the lids and observe how the colored liquids flow freely. Where does the blue liquid go? And the red?





Bigheaded bottle

1 Choose a balloon in a color you like and draw a funny face on it. We've drawn a smiley face, as he will have a lot of fun in this experiment!



You will need:

- ◆ A half liter bottle of soda
- A small container
- A permanent marker
- Scissors
- A balloon

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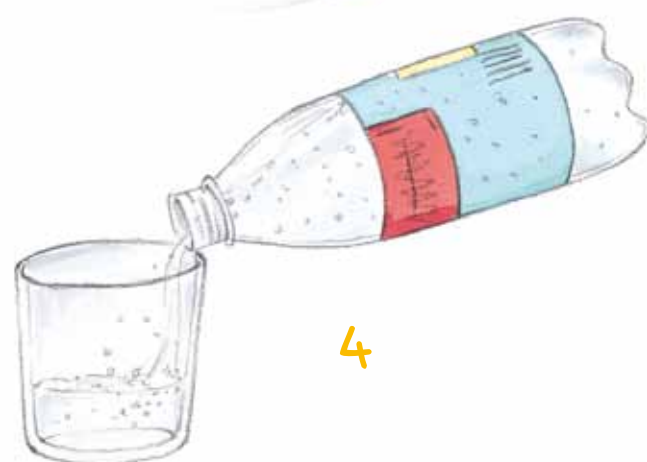
2 Open the soda very carefully, without losing the gas! Don't shake it before you open it or open it upside down... as all of the gas and bubbles will come out and you'll get wet!

3 Remove the ring around the bottle opening, as you won't need it for the experiment. You can remove it with your fingers or with the help of the scissors. Snip!

4 Remove a little soda from the bottle, pouring it into the small container: About 4 fingers. Don't worry; it doesn't need to be exact...



3

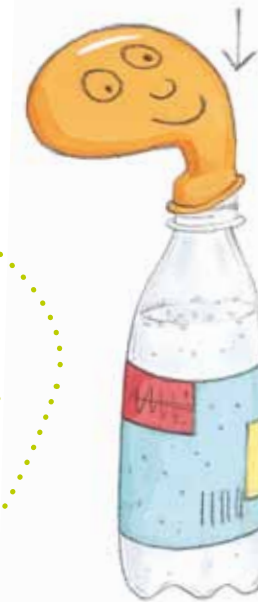


4



Why does it happen?

Soda is a drink that contains carbonated water. And what's that? Well, it's water that contains a gas, carbon dioxide dissolved in it; that is, there is a lot of carbon dioxide mixed with the water. When you shake the bottle with the balloon in place, the balloon inflates even more. It didn't just get fat suddenly! This happens because **the gas that is dissolved in the water has separated and has been released!** The gas tries to leave the bottle and the only way out is into the balloon. And because the balloon is elastic, it inflates on its own!



5

5 Place the balloon opening over the neck of the bottle, so that it is well secured and the balloon doesn't shoot off, hey!

6 Try it out!

Hold the neck of the bottle with the balloon with one hand, just in case... and shake the bottle strongly so that the gas enters the balloon. If you leave the bottle on the table, you will see the balloon blow up, as if by magic! You have a bigheaded!

6





Mysterious column

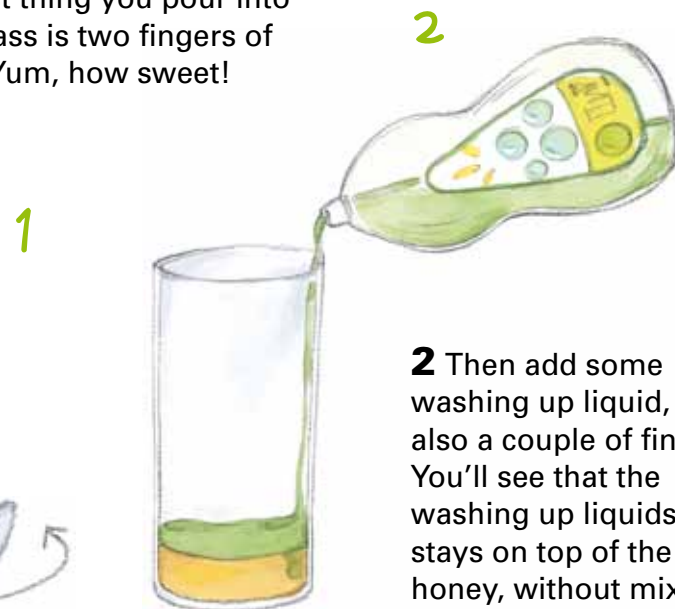
You will need:

- ◆ Alcohol
- ◆ Honey
- ◆ Washing up liquid
- ◆ Oil
- ◆ Water
- ◆ Colorant
- ◆ A teaspoon
- ◆ A normal glass
- ◆ A tall glass
- ◆ Different kinds of balls

3 The third liquid is the water, but with red coloring! Then you'll be able to distinguish the colors well. Add a little coloring and two fingers of water. Then pour it on top of your strange column.



1 The first thing you pour into the tall glass is two fingers of honey... Yum, how sweet!



2 Then add some washing up liquid, also a couple of fingers. You'll see that the washing up liquids stays on top of the honey, without mixing with it! And the color contrast is fun!



4 Now pour in the forth liquid. It's the oil's turn! Pour it carefully, down the side of the glass and you'll see that everything stays without mixing!

Why does it happen?

By combining liquids of different **densities** that are also **immiscible**, that is, that they do not mix together, you obtain a very pretty column of liquids that are positioned layer by layer in order of density. The lightest, the less dense goes at the top; lower down, the layer is denser and weighs more. When you drop objects into the column (rubber balls, plastic foam, drawing pins and marbles...), the following occurs: According to their density and their shape, they stay in one place or another!



5 And finally, the last liquid: The alcohol! Leave it transparent, because the other liquids are colored. You'll see that despite the fact that you leave it for a while, the 5 liquids remain intact, each occupying its space without bothering the others.

6 Try it out!

Drop the different balls you have prepared: More and less heavy, large and small, etc. You can also drop other things to see in which liquid they are trapped! Or guess with friends: Will it stay in the honey? In the oil? In the water? This column is a mystery...

