

## Water

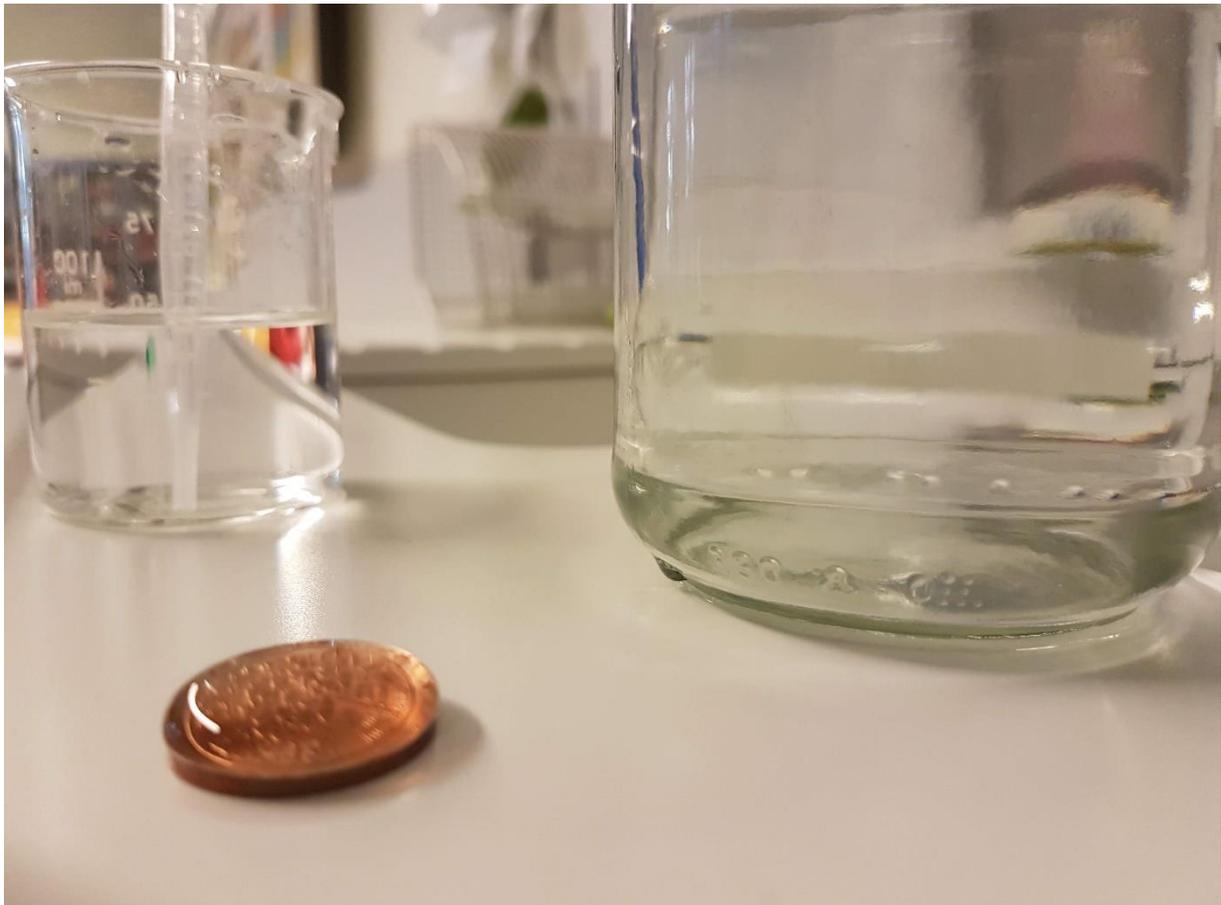
Three experiments about surface tension of the water:

### **Experiment I – Showing the surface tension of the water on coins**

You need:

- different kind of coins
- pipette
- water

We had a little competition. We tried to put as many drops of water as possible on a 1 Euro-Cent-coin, 2 Euro-Cent-coin 5 Euro-Cent-coin and 10 Euro-Cent-coin coin. Because of the surface tension of the water it was possible to put 36 drops on a 1 Euro-Cent-coin, 55 on a 2 Euro-Cent-coin, 61 on a 5 Euro-Cent-coin and 46 on a 10 Euro-Cent-coin in our competition. As you can see at the picture the water builds a dome on every coin because of the surface tension of the water.



## Experiment II – Swimming paperclip

You need:

- a glass of water
- a paperclip
- a piece of paper (tissue or blotting-paper)
- some detergent or soap

What do you have to do?

The piece of paper has to be as big as the paperclip.

First put the paperclip on the blotting-paper and place both on the water surface. The blotting-paper absorbs the water and will sink. The paperclip still swims on the water surface because of the surface tension of the water.

To destroy the surface tension of the water you can add one drop of detergent and the paperclip will sink as well.



## Experiment III – Lava-Lamp

### You need:

- a high, transparent container made of glass or plastic (maybe a beaker glass)
- Water
- vegetable oil
- effervescent powder or dishwasher tablets
- Ink or food colouring (if desired)

### What do you have to do?

1. Fill half of the beaker glass with vegetable oil and then with water. You can already observe the effect that oil does not mix with water. The water pushes under the oil.
2. Next, a few drops of ink or food coloring are added. They also slowly sink down through the oil and mix with the water.
3. Now the effervescent powder or half a dishwasher tablet is added.
4. As soon as the effervescent powder or the dishwasher tablet arrives at the bottom of the coloured water it starts to bubble. Now the lava lamp starts shooting colorful bubbles upwards. Once at the top, they slowly go under again.

### How does the lava lamp work?

Grease or oil and water cannot be mixed into a homogeneous liquid. Therefore, two different layers form in the glass. The coloured water sinks downwards and the oil floats upwards. This is due to the density of the two liquids. Oil has a low density and is therefore much "lighter" than water. That's why the oil keeps fighting its way up past the water, no matter how much you mix both liquids. In the case of water, it is exactly the opposite: it has a high density and is therefore "heavy". Like a stone, it sinks through the oil layer to the glass bottom.

Dishwasher tabs consist, among other things, of sodium carbonate, also known as soda, and begin to bubble together with water. On the way up, the carbon dioxide bubbles enclose the coloured water and take it to the surface. At the water surface of the lava lamp, the bubble bursts and the gas escapes. The water sags through the oil layer back down to the glass floor of the lava lamp, where the next gas bubble is already waiting.

