

# Boat ride without an engine?

## Materials and equipment:

- paperclip
- drinking glass
- cardboard
- pencil
- scissors
- detergent
- a large clean bowl filled with drinking water

### „Preliminary test“

Fill a glass brim full with water and very carefully place the paperclip on the water surface.

What does the paperclip do?

It floats on the surface.

It sinks.



### Why?

The paperclip can remain on the surface, because the **surface tension** of the water is strong enough to hold up small objects.

### Preparation:

1. Draw a boat on the cardboard and cut it out.
2. Now take the bowl filled with water and set the boat onto the surface and let it float.
3. Dip your finger into the water just behind the boat.
4. What happens?



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Put a drop of detergent onto your fingertip and dip that finger into the water, just behind the boat.

### Observation:

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Do you have any idea what could be the cause?

➡ It has got to do with the surface tension!

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### What is surface tension?

Water consists of miniscule particles. These are called water molecules. These molecules tightly hold together, so that they create a sort of “skin” on the surface.



This „skin“ is the reason why some insects can walk on water. The water molecules, that is the miniscule particles, have got positively and negatively charged regions. Positive and negative attract each other. That is what creates a stable pattern, which in turn forms the „skin“.

A very good way to visualize the surface tension of water is an experiment that makes use of a 1€ coin.



The following link will take you to the video:

<https://www.youtube.com/watch?v=Eo6imkTJaXA>