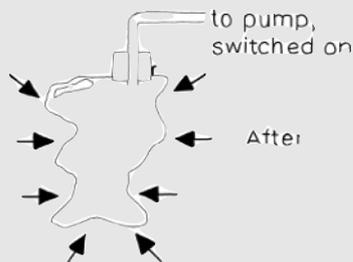
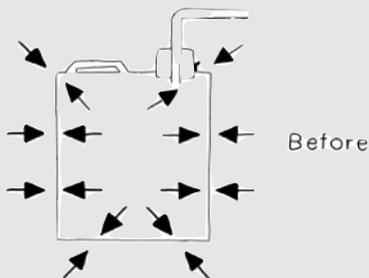


# COOL PHYSICS



## TASK:

A) Watch the video.

**What do you wonder?**

**What do you notice?**

Think about what you have just seen. Take some notes.

B) Use the given text (page 2) and the drawing about atmospheric pressure to

- **Simplify the explanation. “Make it as easy as. ABC, so a child could understand“.**
- **Use additional drawings and shorter texts to explain what is going on.**
- **Be ready to explain your simplified concept to a partner.**

**C) Try the experiment yourself.**

**SAFETY FIRST! DON'T TAKE ANY RISKS!**

**You can film the experiment. We'll find out, which video is the best.**

## Tools / Ideas you could use:

- a piece of paper and a pencil,
- or a suitable App on a device of your choice,
- Chat or Meetings in Teams.
- Supporting materials in the „Dateien“-Channel (Cool PhysicsScaffolding). You'll find ideas for making good clips, such as creating a storyline and thoughts on some technical issues.



## How to explain what you've just seen?

### An example:

### The Can Crusher - Atmospheric Pressure

We are living at the bottom of a “sea” of air called the atmosphere, which exerts a pressure on us.

*Before the pump is switched on, molecules are hitting the outside and the inside of the can with equal pressure.*

*After the pump is switched on, there are almost no molecules inside the can and the pressure of the molecules outside the can crushes it!*

Molecules of air are hitting us all the time to cause this pressure this pressure. Fortunately the pressure inside our body is equal to this, so we are not crushed.

The pressure exerted on us by the atmosphere is about 100 000 N per square metre ( $1\text{m}^2$ ).

**What caused the can to collapse?** When you heated the can you caused the water in it to boil. The vapor from the boiling water pushed air out of the can. When the can was filled with water vapor, you cooled it suddenly by inverting it in water. Cooling the can caused the water vapor in the can to condense, creating a partial vacuum. The extremely low pressure of the partial vacuum inside the can made it possible for the pressure of the air outside the can to crush it.

A can is crushed when the pressure outside is greater than the pressure inside, and the pressure difference is greater than the can is able to withstand. You can crush an open aluminum can with your hand. When you squeeze on the can, the pressure outside becomes greater than the pressure inside. If you squeeze hard enough the can collapses. Usually, the air pressure inside an open can is the same as the pressure outside. However, in this experiment, the air was driven out of the can and replaced by water vapor. When the water vapor condensed, the pressure inside the can became much less than the air pressure outside. Then the air outside crushed the can.

When the water vapor inside the can condensed, the can was empty. You may have expected the water in the pan to fill the can through the hole in the can. Some water from the pan may do this. However, the water cannot flow into the can fast enough to fill the can before the air outside crushes it.