



University
of Basel

Swiss Nanoscience Institute



Egg in a bottle

Have you ever tried to get a hard-boiled egg into a milk bottle? Granted, it's not something you need every day, but it's a very nice little experiment that is lots of fun, especially at the end.

What you'll need

- a hard-boiled egg
- a milk bottle
- hot – but not boiling – water

Instructions

- Peel the hard-boiled egg.
- Pour some hot – but not boiling – water into the milk bottle.
- Place the egg on top of the bottle, sealing the bottle mouth.
- Now sit back and wait, keeping an eye on what's happening.
- If the water was too hot and produced too much steam, the experiment won't work right away, as the egg will be pushed out of the bottle mouth by the rising steam. If this happens, just put the egg back on top of the bottle.
- Once the egg is inside the bottle and you want to get it out again, first of all pour out the water. Then shake the bottle so that the pointy end of the egg is facing the bottle mouth. Finally, blow hard into the bottle.

What happens and how does it work?

- The hot water warms the air in the bottle. As the water gradually cools, so does the air.
- Cold air takes up less space than hot air, so it contracts.
- As the bottle is sealed by the egg, the contracting air creates a partial vacuum, which slowly pulls the egg into the bottle.
- We can get the egg back out again much faster than it went in by blowing vigorously into the bottle. For this to work, the pointy end of the egg must be facing the bottle mouth.

