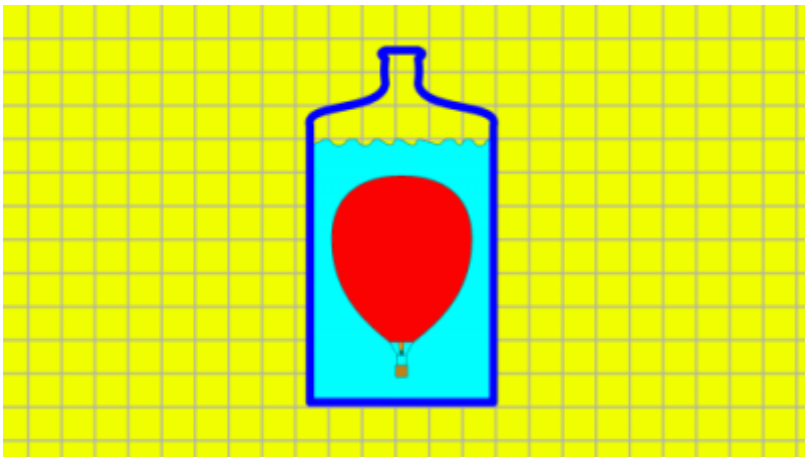
Balloon in a bottle



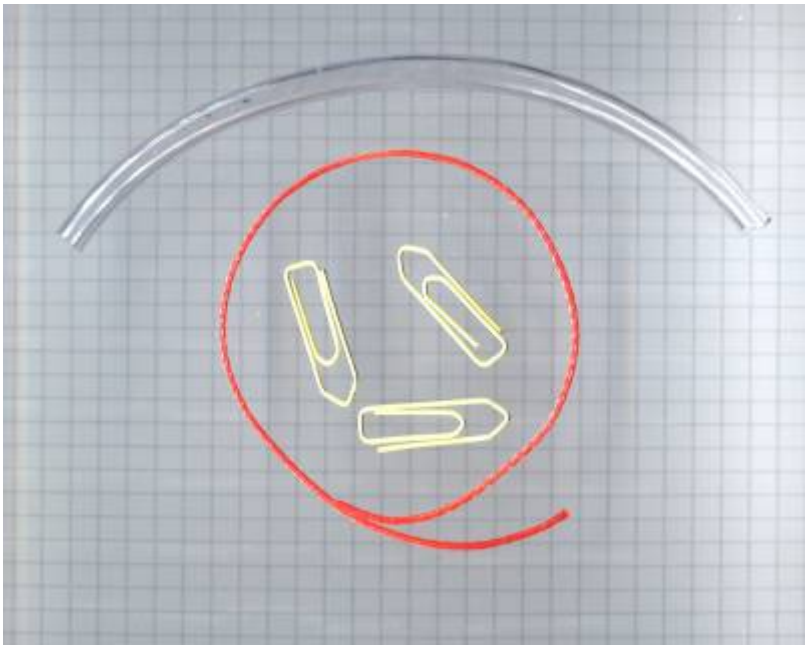
The experiment is also kwown under the name Cartesian diver

The balloon in the bottle is a simple experiment to demonstrate the effect of static buoyancy. Although this is hydrostatic buoyancy, whereas a balloon in the air experiences aerostatic buoyancy, the effect is the same.

Warning

Only carry out this experiment if you know what you are doing. This experiment uses parts that can be swallowed. Therefore, special care should be taken when children take part in the experiment. These instructions should supplement, not replace, your own assessment of the risks and measures to prevent them.

Parts list

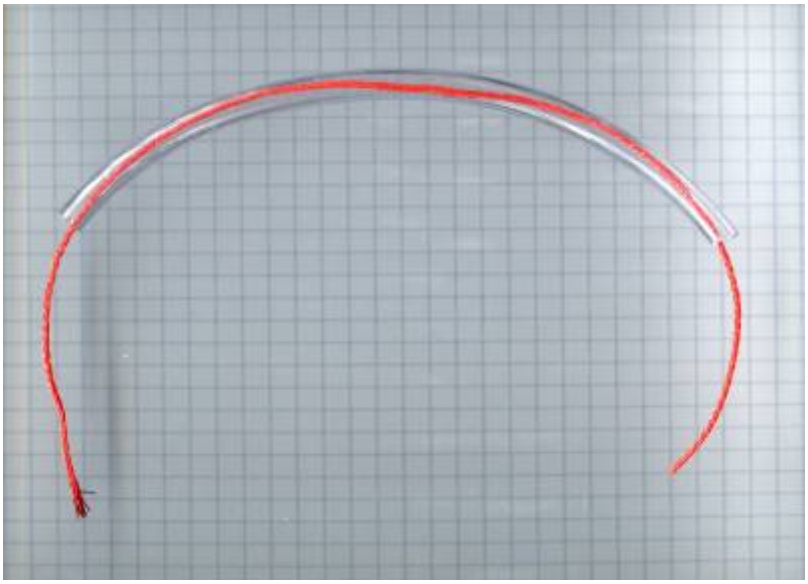


For the balloon:

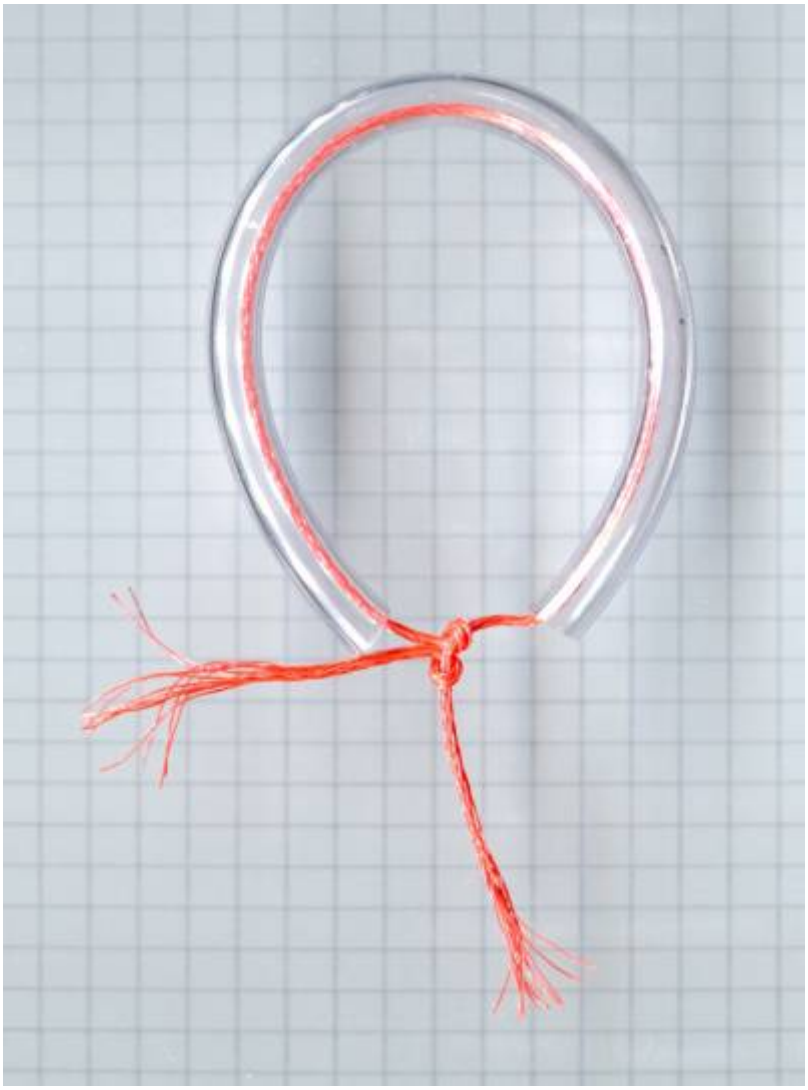
- A clear plastic tube (hardware store, pet store, aquarium supply).
- A thread.
- Several paper clips

And a flexible plastic bottle, with a wide enough neck for the balloon to fit through.

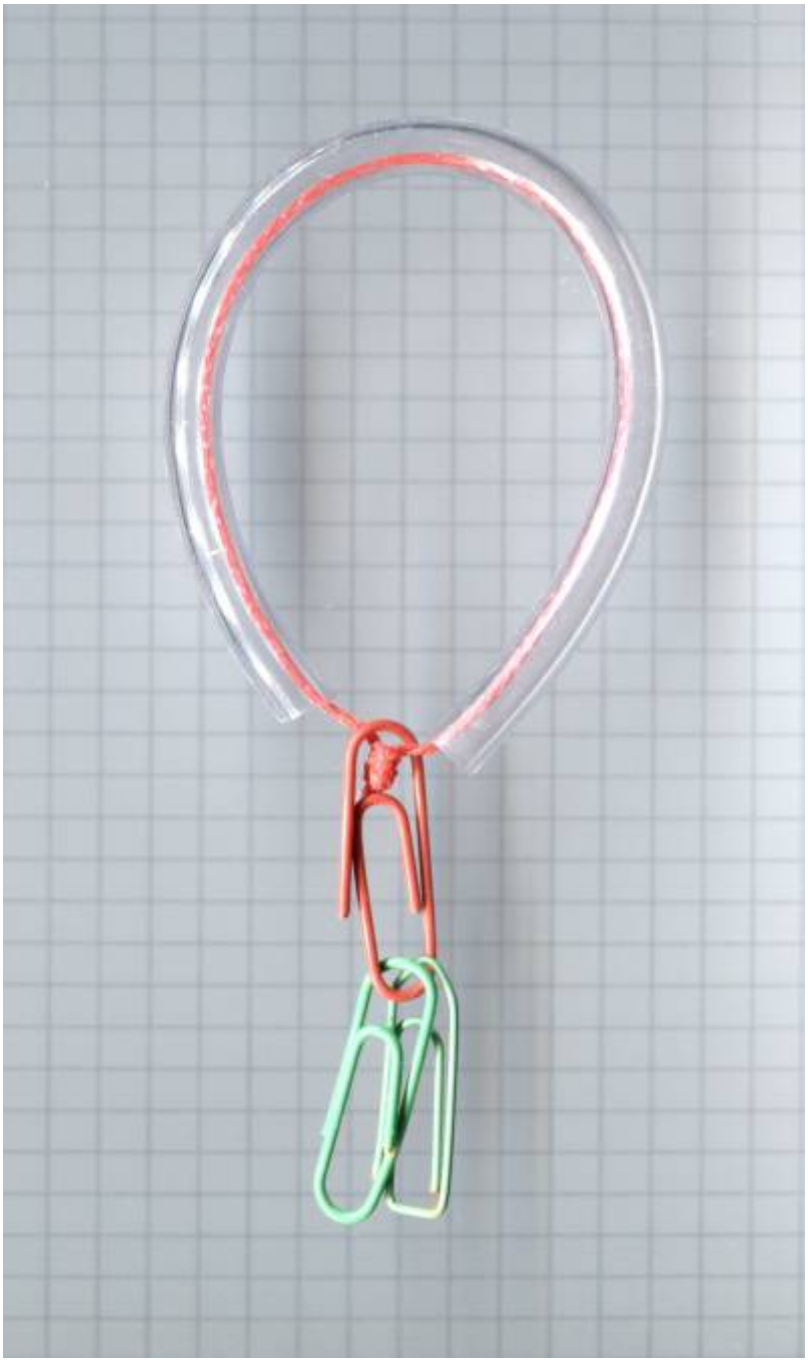
Building the balloon



First, cut the tube to the desired length. Then the thread is pulled through the tube.

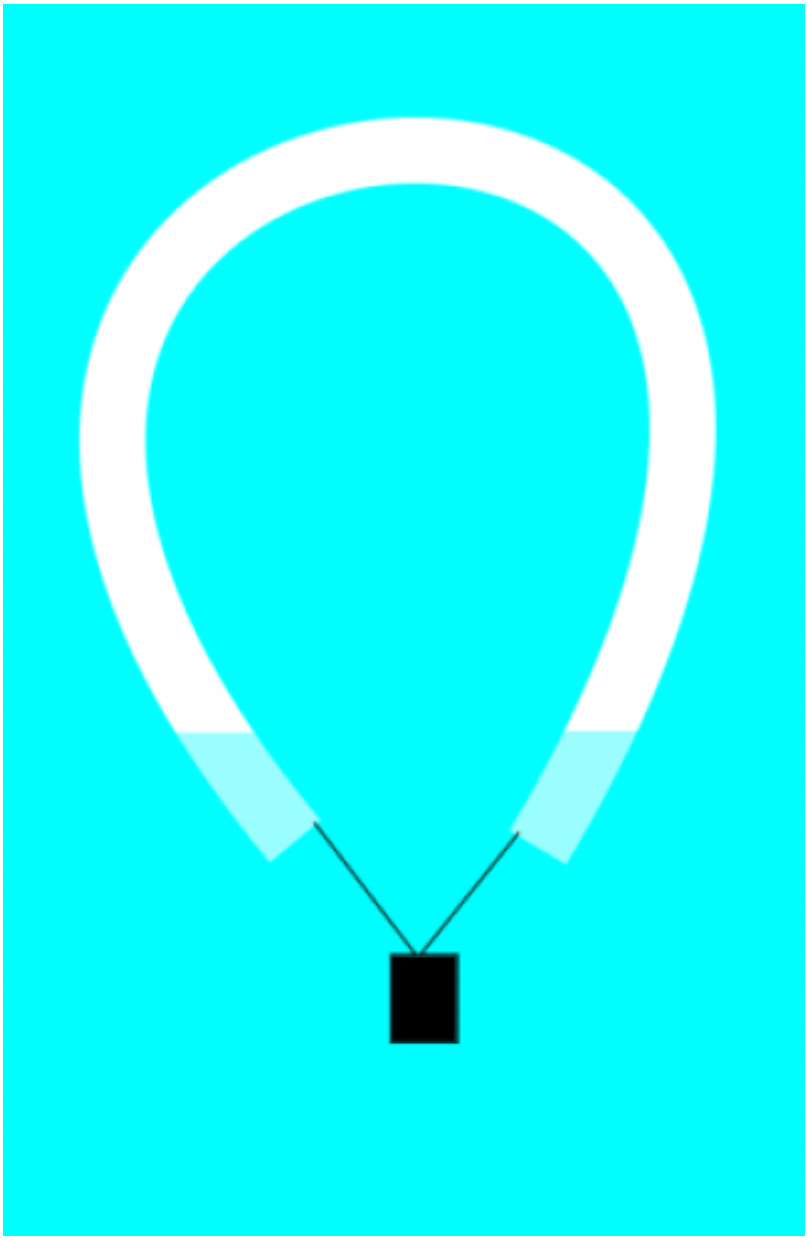


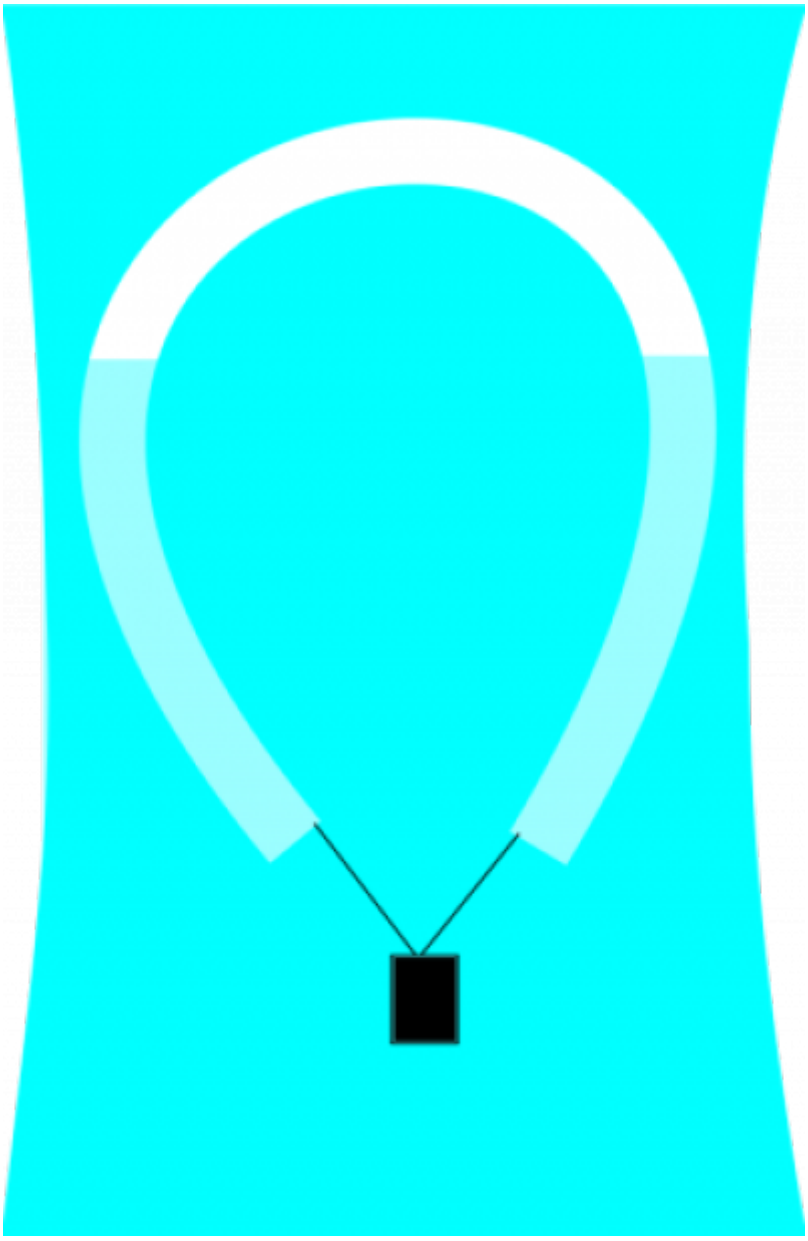
Then the tube is pulled together with the thread to form a balloon shape, and then the thread is knotted.



Then the paper clips are attached to the thread at the bottom. The paper clips have two functions. Firstly, they ensure that the tube openings stay down. Secondly, they are used to balance the balloon. The balloon should only have enough rising force to float in the water. It is easier to balance the balloon in an open container.

Function





When the balloon is in the closed bottle, the pressure increases when the bottle is squeezed. The increase in pressure compresses the air bubble in the tube and the volume generating the buoyancy decreases - the balloon sinks. If, on the other hand, you reduce the pressure on the bottle, the pressure in the bottle decreases and the air bubble in the tube can expand - the buoyancy increases and the balloon rises.

Video

Balloon descends and ascends in the bottle.

Bottle balloon - animation

Experiments ←