

Can you get an egg in and out of a bottle?

Learn about air pressure



Equipment

- ◇ An empty milk bottle (or other glass bottle)
- ◇ A hard boiled egg with the shell removed, or a small balloon
- ◇ Scrap paper
- ◇ Matches



Method

Getting the egg into the bottle

1 Get an adult to help with this step. Twist up the piece of scrap paper light it with the matches and quickly put it in the bottle.

2 Immediately put the egg on the top of the bottle. As the paper burns the air inside the bottle heats up, it expands and becomes less dense than the air outside the bottle. The paper goes out as the oxygen inside the bottle is used up.

The air cools and the egg is forced into the bottle due to the pressure difference between the inside and outside of the bottle.

Getting the egg out of the bottle

1 Hold the bottle upside down.

2 Blow into the bottle sealing over the end with your mouth. This forces extra air into the bottle past the egg. The pressure inside the bottle increases and the egg will be pushed out of the bottle due to the pressure difference.

So how does this relate to atmosphere?

The large scale circulation of the atmosphere and oceans, and smaller scale weather systems, are all driven by pressure differences. Air, and water, will always tend to move from areas of high pressure to areas of lower pressure.

The pressure of the air above us at the surface of the Earth is usually about 1000mbar - thats 100,000Pa. That is the equivalent of 3 adult elephants on each square metre! At any one time the pressure at sea level may vary around the world from as little as 870mb (inside a hurricane) to 1083.8mb (recorded in Siberia, 31st December 1968).

The air pressure varies between about 970-1040mbar as weather systems pass over. Pressure also falls with height. This is why airplanes must have pressurised cabins. At the top of Mount Everest the pressure is only 330mbar.



Where can I find more information?

For a video of how to carry out the experiment please see here:
<http://www.videojug.com/film/how-to-suck-an-egg-into-a-bottle>

For more information about atmospheric pressure please see here:
<http://www.ace.mmu.ac.uk/eae/english.html>