

Ball in an Air Jet

Apparatus

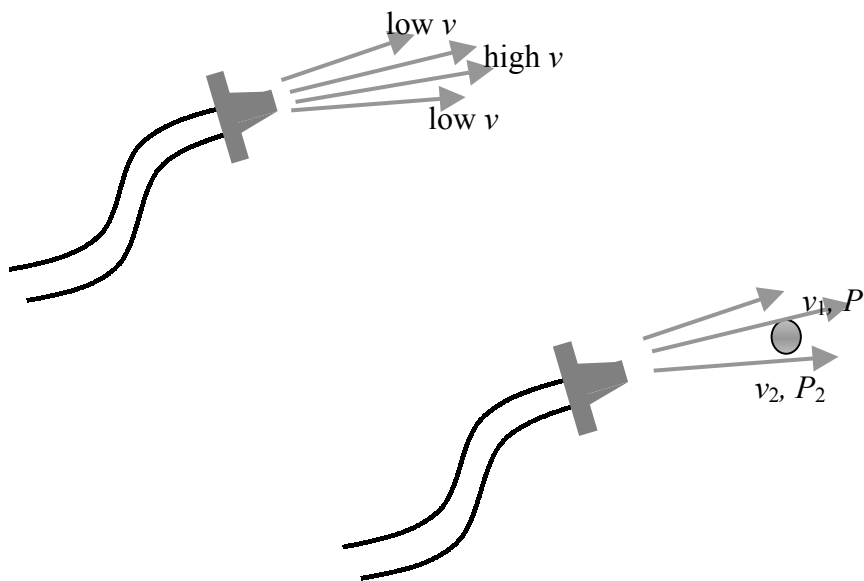
light ball, such as a ping-pong ball, or beach ball for large air jets.
air pump, to supply air jet

Action

the students position the ball in the air jet so that it stays there, and explain why this is possible.

The Physics

The air jet has a velocity profile with the air in the middle having greater velocities than the air near the edges. So if the ball is balanced in the air jet as shown, $v_1 > v_2$ and $P_1 < P_2$. This pressure difference results in a 'lift' force up which is equal and opposite to the weight of the ball.



Accompanying sheet

Ball in an Air Jet

Balance the ball so it stays in the jet.

It should balance with the air jet pointing straight up or at an angle.

Why does it stay there instead of falling down or being blown away?