Pickup Game

When you apply a force to something, that object moves in the same direction as the force. Push a toy car, and the car rolls in the direction of the push. Hit a ball with a bat, and the ball flies off in the direction of the hit. It’s basic logic. It’s also one of the laws of motion.

In this next experiment, you may observe something that goes against this law... or does it? Can you figure out what forces account for the odd behavior of this table tennis ball?

Materials
A table tennis ball       A small funnel

To Do
Make sure that the funnel has been cleaned with soap and rinsed thoroughly. Hold the funnel with the wide opening facing down.
Place a table tennis ball into the wide end. Gently hold the ball upward against the spout opening. While holding it in place, blow along, steady stream of air through the narrow end.
As you continue to blow, release the ball. What happens? What forces are at work? How long can the ball stay up?

The Science
As you blew into the funnel, it created a rush of fast-moving air. This air produced a region of low pressure. Since the ball was "bathed" in this low-pressure current, forces other than its weight needed to be considered.
If the pressure difference is great enough between the air stream and the surrounding air, the force overcomes gravity and can lift the ball. Although there is still a downward force from the air blowing onto the ball, the inward push due to the difference in air pressure is the winner in this competition of forces.