

Suction by blowing

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Słowa kluczowe:

pressure, powietrze, prawo Bernoulliego, rozpylacz

DZIEDZINA:

Physics

Cel doświadczenia:

The problem to solve is to suck up a table tennis ball by means of a plastic tube and a stream of air from a blower.

Spis materiałów:

1. a table tennis ball
2. 2 plastic tubes, preferably of a transparent material, with a dimension slightly larger than the ball diameter and a length of approx. 20 cm
3. a hair dryer (the higher power, the better) or another air blower
4. plasticine

Etapy realizacji:

1. Put the ball on a table or on the floor.
2. Apply a plastic tube to the ball from above.
3. Turn on the dryer (blower).
4. Move the dryer closer to the upper end of the tube.
5. Observe the ball behaviour.
6. What happens when you gently lift the tube?
7. In the other tube, at approx. $\frac{1}{4}$ of its length, cut a hole with a diameter corresponding to the diameter of the first tube.
8. Place the first tube in the second one (so that they are perpendicular to each other) and seal the connection with plasticine.
9. Apply the plastic tube to the ball from above.
10. Turn on the dryer (blower).
11. Move the dryer closer to the horizontally positioned tube.
12. Observe the ball behaviour.
13. Try to hit any target with the ball.

Pytania do doświadczenia:

1. Does the positioning of the blower at different angles affect the result of the experiment?
2. What will be the course of the experiment if we place an airflow concentrators on the hair dryer, i.e. make the air outlet narrower?
3. Does the use of a second tube facilitate or hamper the sucking of the balls, and why?

Opis zjawiska:**Ciekawostki:**

1. Bernoulli's principle resulting from the pressure difference between the moving gas and gas 'at rest' was used in perfume atomisers. Currently, it is utilised in spray painting.
2. In high-speed railways it was necessary to increase the distance between the tracks; otherwise, due to Bernoulli's effect, the moving trains might 'stick together' causing a disaster.
3. In football, the track along which the rotating ball moves, so-called 'banana shot', is also associated with Bernoulli's effect. The additional force acting on the ball is the so-called Magnus effect.
4. The behaviour of liquids or gases described by Bernoulli's effect is also referred to as a hydrodynamic paradox.