

Material

Item-no.	Qty.	Description
DS101-4B	1	Universal rail with scale and holes, L=1000 mm
DS101-2A	1	Flexible track, acrylic, L=1000 mm
DS101-3A	1	Supports for fastening flexible track
P1321-3K	2	Block for light gate
DM360-5R	5	Ball, D=60 mm, plastics, red

Purpose

Demonstration of the preservation of momentum and energy in a closed system.

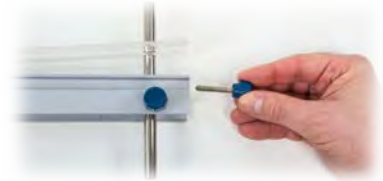
Preparation

Place the flexible track on the universal rail with scale and holes and put the two central rods through the holes.



Both plastic screws are fixed on the upper thread thus the flexible track lays on the aluminum profile.

The two support rods are inserted through the outer holes and fixed as shown on the image on the right.



Since the support rods protrude beyond the bottom side of the universal rail the aluminum rail is placed on the two blocks.



The 5 plastic balls are placed on the flexible track - they gather in the middle.

Experiment

A ball is placed next to the outer support rod at the end of the universal rail and then released. How many balls are rejected on the other side after the momentum has been transferred.



Repeat the experiment with two and three balls.



Result

The number of "bumping" balls is equal to the balls that are repelled on the other side.

Preservation of momentum and energy (as long as there is no "intervention" = closed system) is clearly recognizable because the entire momentum and the entire energy are always transferred to the same number of balls.

Note

The transmission of the momentum always goes from one ball to the next. This becomes easily visible when the balls on the rail are slightly apart of each other. It is also noticeable that the impacting balls "roll a little further" and no longer roll back. The rolling balls also have rotational energy due to the rolling motion. This form of energy is not completely transmitted by the impact and causes the other balls to shift.