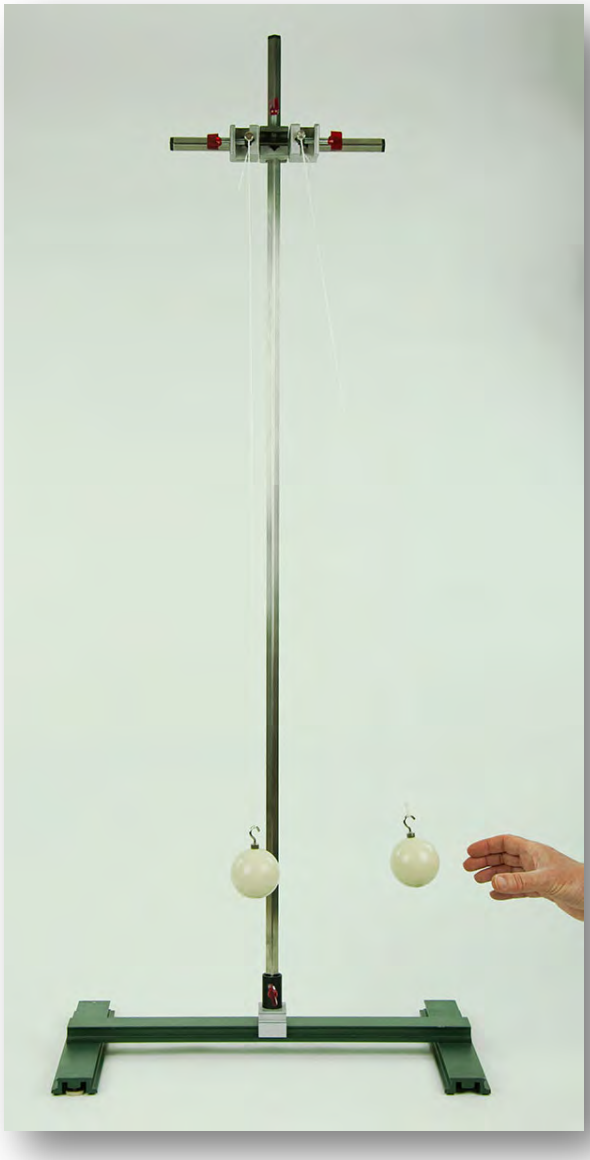
MOMENTUM

MED 08.02



Material

Item-no.	Qty.	Description
DS101-1G	1	Support base, large, L=500 mm
DS093-04	1	Sliding saddle "Sepp", H=40 mm
DS300-00	1	Support rod, squared, L=1000 mm, 12x12 mm
DS300-25	1	Support rod, squared, L=250 mm, 12x12 mm
DS095-3K	3	Bosshead cross-pattern, demo 03
DS204-2L	2	Bearing pin with clamp insert
DM380-6K	2	Ball, D=60 mm, plastics, white, tapped
DS102-3S	2	C-hook, threaded
DG200-1S	1	Cord, white, D=1.7 mm, L=5 m

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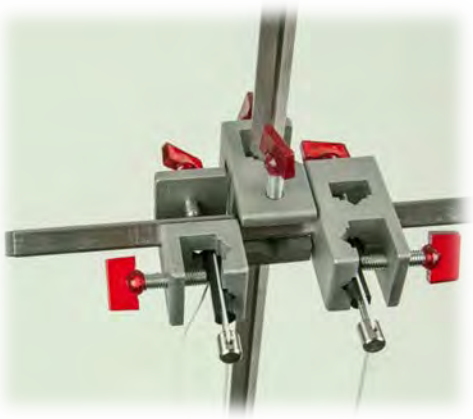
Purpose
To demonstrate that the momentum $p = m \times v$ is a second important variable for moving bodies besides the (potential and kinetic) energy; for a complete system the sum of the single momentum are relevant.

Preparation
Fix the sliding saddle in the centre of the support base;
the 1000 mm support rod is inserted in this sliding saddle

Mount the bosshead 10 cm below the top end of the support rod, the 250 mm is horizontally mounted in this bosshead afterwards as shown on the image on the left page.



Now mount the other two bossheads as shown on the image to the left.

Screw the two C-hooks into the pendulum balls.

Cut of two pieces of 100 cm from the driving cord and make a loop at one end of the cords.

The cords are placed through the hole of the bearing pin and the hole of the clamp insert as shown on the image; the cords have to be of equal length.

Fix the bearing pins to the outer bossheads.

The two pendulum balls should hang at the same height - readjust the cords on the bearing pin if required.

Make sure that the pendulum balls hang close but are not touching each other.

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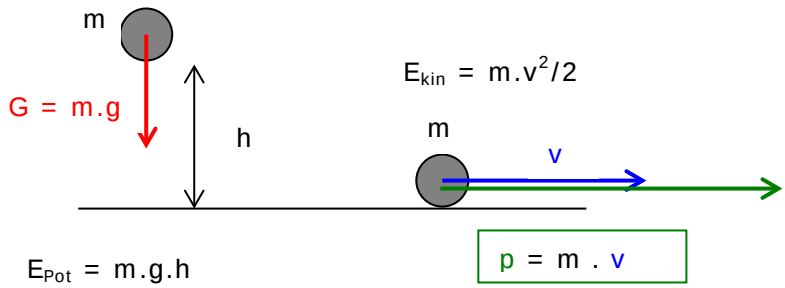
Experiment
One of the two balls is deflected about 30 cm.
Check whether both cords are parallel, then let go of the ball.



The terms potential energy (Weight x Lifting height), kinetic energy $m \times \frac{v^2}{2}$ and the momentum $m \times v$ (Vektor) can be explained now.



Note
It can be pointed out that energy has no direction (scalar size) but the momentum has the direction of speed (vector size), which is particularly important for non-central impacts.

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