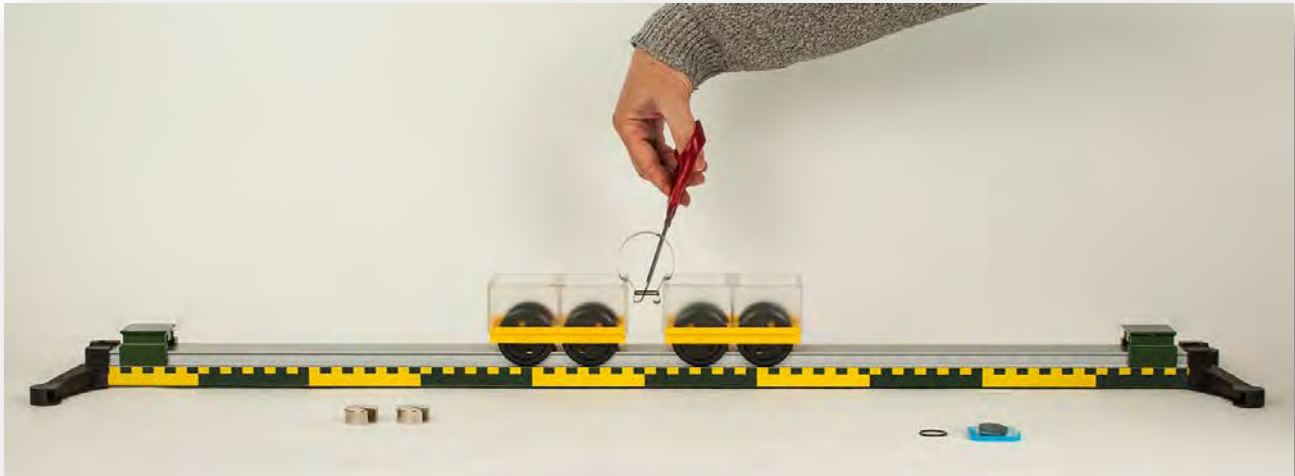


INTERACTION AND MASS – QUANTITATIVE

MED 07.05



Material

Item-no.	Qty.	Description
DS101-3B	1	Stand rail with scale, L=1000 mm
DS112-1E	2	Rail claw, simple
DM300-2A	2	Dynamics trolley, demo, 50 g
P1312-2A	2	Car body for trolley SE
P1120-2F	2	Slotted weight 50 g, SE
DS102-2G	2	Clamp saddle
P1311-2E	1	Flat spring for collision experiments with trolleys
P7502-1A	1	Pair of scissors, SE
P1312-2E	1	Rubber rings for momentum, 20 pcs.

INTERACTION AND MASS – QUANTITATIVE

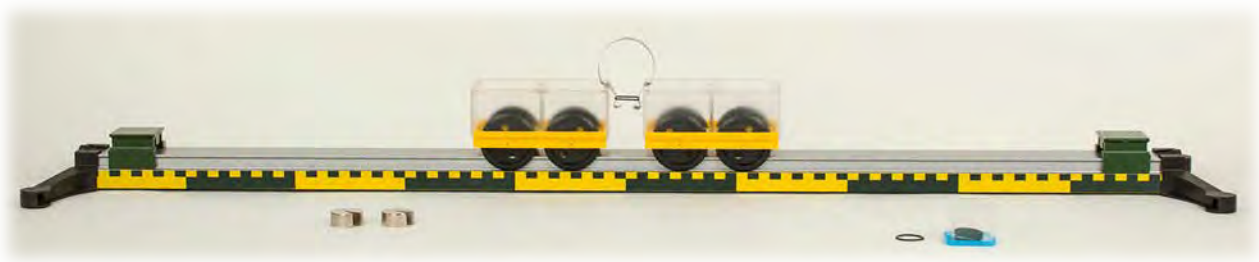
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Purpose

If two masses are at rest and put each other in repulsive motion by mutual force, then the impulse theorem gives the statement that the amounts of the velocities behave inversely like the masses. This results in the possibility of dynamic mass determination.

Preparation

Attach the two rail claws to the stand rail; afterwards fix the two clamp saddles to the left and right end of the stand rails. Next put the car bodies on the trolleys.



Experiment

The trolleys have a mass of 100 g each, place them in the centre of the stand rail.

Taut the metal spring with a small rubber ring (O-ring) and place it between the two trolleys as shown on the image

Cut the rubber ring with a pair of scissors now, what is happening?

Observe the speed of the two trolleys.



Result

The trolleys are moving away from each other at the same time..

Explanation

The speed is measured by pre-setting the expected speed ratio (according to the principle of linear momentum) as the ratio of the distances travelled in the same times.

Always indicate the position of the outer ends of the two trolleys (start position) and place a sliding saddle at the end of the pre-set paths (end position).

The two trolleys should hit the sliding saddles at the same time

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Mass		Relation of mass	Start position of the trolley (cm)		End position of the trolley (cm)		Relation of the distance
left	right		left	right	left	right	
100 g	100 g		35	62	20	77	
200 g	100 g		25	52	10	82	
150 g	100 g		30	57	20	72	

Place the slotted weights on the trolleys and repeat the experiment according to the values given in the chart.

Conclusion

If two bodies interact, one can infer the mass of the other body from the ratio of the speed after the interaction and from the knowledge of the mass of one body.

Note

Due to the friction of the trolleys it is not recommended to extend the track further.