



Material

Item-no.	Qty.	Description
DS101-3B	1	Stand rail with scale, L=1000 mm
DM344-1S	1	Projectile launcher 02
C7235-2B	1	Lab-jack small
DM300-2A	1	Dynamics trolley, demo, 50 g
P1312-2A	1	Car body for trolley SE
P1120-2F	3	Slotted weight 50 g, SE

Purpose

To demonstrate the potential energy of a body (trolley) in dependence of its position.

Preparation

Mount the projectile apparatus at the right end of the stand rail, do not pull up the piston yet.



The lab-jack is fixed at a height of approximately 20 cm.
Place the stand rail on the lab-jack as shown on the image above



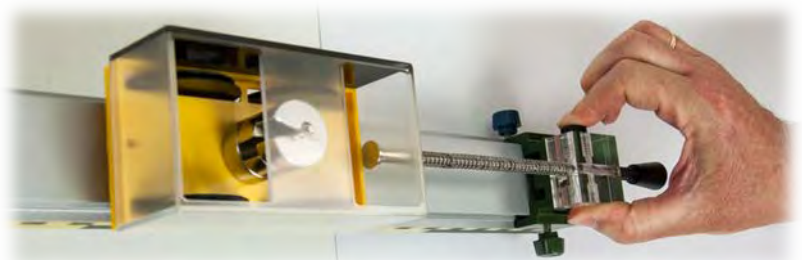
Place three 50g weights
on the tower of the
dynamics trolley.



Afterwards place the car
body on the dynamics
trolley; make sure that
the small rod of the
trolley points through the
hole of the car body.

Experiment 1

Position the dynamics trolley
right before the piston, thus
the trolley will push against the
piston.



Now push the launch button
so that the piston is freely
movable.

Is the energy of the trolley sufficient to press the piston (and the spring) in?

Result

The energy of the trolley (slope downforce) is not sufficient to press the piston in.

Experiment 2

Place the dynamics trolley on the raised end of the stand rail and hold it at this position. Again push the launch button so that the piston is freely movable.

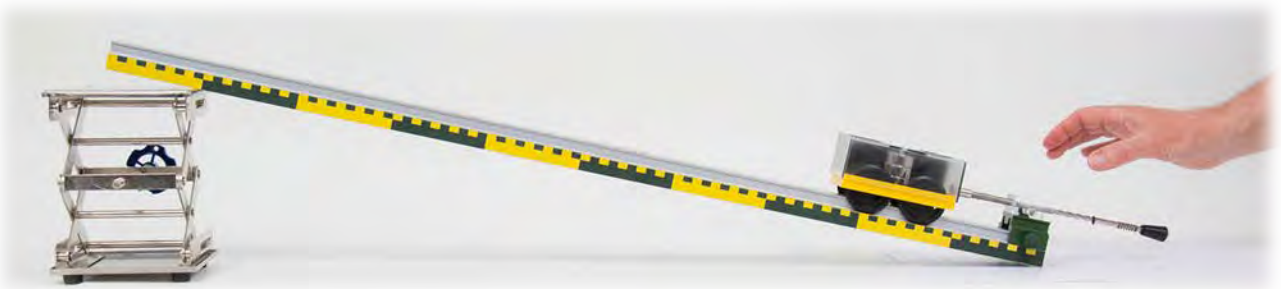
Let the dynamics trolley loose; as soon as the trolley hits the piston and the piston has been pushed in wait for a moment and let go of the button on the projectile apparatus.

Is the energy of the dynamics trolley sufficient in this experiment so that the piston (and the spring) gets pushed in?



Result

As soon as the trolley hits the piston the piston is pushed in by the energy of the trolley and the spring gets tensioned.



If the button is released at the right moment (when the spring is fully tensioned) it can be determined how much work the trolley has performed.

Note

The energy conversions should now be pointed out:
Position energy - kinetic energy (translation) - deformation and friction work.

A corresponding application is a ram or a hammer.