



Material:

Item-no.	Qty.	Description
DS101-1G	1	Support base, large, L=500 mm
DS090-3K	1	Claw base "Sepp", 260 x 220 mm
DS093-04	1	Sliding saddle "Sepp", H=40 mm
DS300-50	1	Support rod, squared, L=500 mm, 12x12 mm
DS300-75	1	Support rod, squared, L=750 mm, 12x12 mm
DS400-3K	2	Bosshad cross-pattern, Demo, green
DS204-2L	1	Bearing pin with clamp insert
DM221-1H	1	Lever rod, metal, L=1000 mm
DM725-ND	1	Newtonmeter "inno" 20 N / 2000 g
P3120-5B	1	S-shaped assembly platform

Weights on hooks

Purpose

Equilibrium condition on one-sided lever
 Torque
 Leverage law

Preparation

Place the sliding saddle in the centre of the large support base and insert the 500 mm support rod into the sliding saddle; the 750 mm support rod is inserted into the sliding saddle of the claw base. Afterwards mount a bosshead on each of the support rods as shown on the image on the left.

Remove the bearing pin from the clamp insert and put the bearing pin through the laterally displaced central hole of the lever rod. Now put the bearing pin back into the clamp insert and mount the clamp insert at the bosshead.

Mount the weighing bar of the Newtonmeter on the right bosshead.
 Move the claw base until the hook of the weighing bar is above the right end of the lever rod.

Hang the lever rod at its right end into the hook of the weighing bar.
 If necessary the lever rod can be balanced with the screws on the side.

Experiment 1

Set the measuring range of the Newtonmeter to „N“ (Newton); afterwards turn it on and tare if required (set to 0.)

By attaching weights on hooks different equilibrium positions are set and the associated normal distances "n" and the forces "F" are measured.

Weight on hook (kg)	corresponds (N)	Normal distance (n) in meter	Product		Newtonmeter (N)	Normal distance (n) in meter	Product

$2 \times 9.81\text{N} \times 0.15\text{m} = 9.81\text{N} \times 0.30\text{m}$

Result

The law of the lever applies:
 The product of force and normal distance is constant.
 Opposing torques keep each other in balance.

Experiment 2

The wheelbarrow is a practical application of the one-sided lever.

Additional required material:

DM223-1S 1 Wheelbarrow - model

Experiment 3

Masses can also be attached at different points (points of attack) at the same time.



Additional experiments

In order to use the full length of the lever rod it can be hung on the left side with a hook on support

For experiments on statics the lever rod can also be attached to Newton meters at both ends.

