

Forces and work
Forces and their effects

Setting up a dynamometer - Stand setup

Object of the experiment

1. Calibrating a helical spring as a dynamometer

Setup**Measuring example**

F in N
0
0.5
1
1.5
2
2.5
3
3.5
4

Apparatus

1 Helical spring, 10N/m, set of 2	352 07ET2
1 Weights, 50 g, set of 12	342 61
1 Metal rule, 1 m	311 02
1 Stand base, V-shape, small	300 02
1 Saddle base	300 11
1 Stand rod, 100 cm, 12 mm diam.	300 44
1 Clamp with hook	301 08
1 Universal marker pens, set of 10.....	309 45ET10

Evaluation

At a helical spring the acting force and the spring elongation are proportional to each other.

If the elongations of the helical spring are marked on a scale and if the corresponding forces are written near the marks, the calibrated helical spring can be used as a dynamometer.

This dynamometer enables the gravitational force of arbitrary bodies to be measured.

Carrying out the experiment

- Stick some paper onto the back of the metal scale, or use the metal surface itself as a ground for the scale.
- Use the pen to draw the zero on the metal scale at the height of the lower edge of the spring.
- Suspend a weight from the spring, and mark the lower edge of the spring again with the felt-tip pen.
- Calculate the force acting on the spring from the mass of the suspended weight ($F = m \cdot g$). Round the value.
- Write this value near the mark on the scale.
- One after another suspend additional weights and repeat the procedure.