

Forces and work
Friction

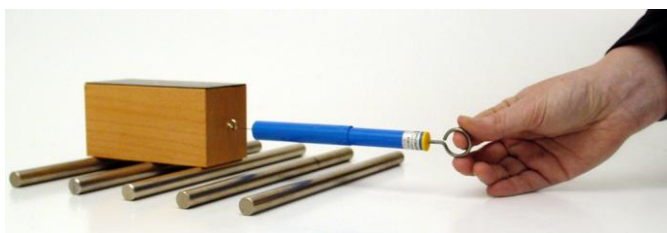
Kinds of friction

Objects of the experiment

1. Demonstration of different kinds of friction and comparison of the occurring frictional forces

Setup

Picture 1



Picture 2

Apparatus

1 Wooden blocks for friction experiments, pair	342 10
1 Precision dynamometer, 1 N.....	314 141
1 Precision dynamometer, 0.1 N.....	314 111
5 Stand rods, 25 cm, 10 mm diam.	301 26

Carrying out the experiment

Static friction:

- Put the big wooden block on the table and append the dynamometer 1 N.
- Make a force act on the wooden block by pulling the dynamometer horizontally.
- Measure the maximum pulling force at which the wooden block just remains at rest.

Sliding friction:

- Repeat the previous measurement.
- Measure the pulling force at which the body moves uniformly.

Rolling friction:

- Put the big wooden block on the stand rods as shown in picture 2. The distance between the stand rods should be around 4 cm. Append the dynamometer 0.1 N.
- Measure the pulling force at which the wooden block on the stand rods rolls over the table.

Measuring example

- The amount of the measured pulling force corresponds to the frictional force in the different cases.

Kind of friction	Frictional force F_R in N
Static friction	0.7
Sliding friction	0.5
Rolling friction	0.02

Evaluation

The static frictional force is the maximum frictional force of a body at rest.

If the pulling force exceeds the static frictional force, the body begins to move. When the body slides over the surface, sliding friction occurs.

If the sliding friction is to be reduced, the body has to be born on rolls or wheels.