ROQED PHYSICS LAB

Study of elastic deformations.

Purpose of the work: To
investigate the dependence of the elastic force on the elongation of the spring, to make sure that the force of gravity is proportional to the mass of the body.

Devices and materials:
000 - staffin
001 - Foot for a tripod on the coupling
002 - Spring with a ruler
003 - hanging weight 100 g (3-4 pcs.)

Theoretical part:
Stretching the spring, you can see that the greater the deformation of the spring, the more elastic force, that is, by the amount of deformation, one can judge the elastic force. It can be assumed that the modulus of the elastic force is directly proportional to the elongation of the spring, that is, F_{elast}~ k. When hanging new weights from the spring, you must make sure that experience confirms this assumption.
Spring elongation is the difference between the length of the stretched spring and the length of the undeformed spring.

Work progress:
1. Assemble the installation shown on the board.

2. Run the simulation and measure the extension of the spring (l) caused by the mass (m).

3. Enter the result in the Table.

4. Repeat the experiment 2 times hanging, the second and third weights

5. Make a formula to calculate the value of the spring stiffness (*k*).

$$k = \frac{mg}{l}$$

6. Table:

Experiment no.	*m* (kg)	*l* (m)	k (N / m)	$k_{avg.}$, N / m
1	...	...		
2	...	...		
3	...	...		

6. **Make aconclusion:**

A. The greater the deformation of the spring, the greater the elastic force. The spring force depends on the spring rate and its elongation.

B. The greater the deformation of the spring, the lower the elastic force. The spring force depends on the spring rate and its elongation.

C. The force of elasticity does not depend on the deformation of the spring.