



## Solid and fluid mechanics set, with straight ramp

EQ005N

### Function

Intended for experimental study, physics laboratory and carrying out physics experiments on: Kinematics. The range, uncertainty and speed of a horizontal launch. Dynamics. Knowing the fixed pulley, a simple machine. Knowing the movable pulley, a simple machine. Mechanical advantage of the movable pulley. The golden law of mechanics. The exponential hoist, a simple machine. The parallel notebook, a simple machine. The movable pulley. Building the parallel notebook. The characteristic stretching curve of a helical spring and a rubber belt, elastic hysteresis. Hookes law in a helical spring. Elastic deformation and plastic deformation. The restoring force of the spring and Newtons third law. The elasticity constant resulting from the association of springs in series. The elasticity constant resulting from the association of springs in parallel. Static. The conditions of stable, unstable and indifferent static equilibrium for a supported spherical rigid body. Homogeneous body. What is meant by a rigid body. Stable balance. Energy Conservation. Mechanical work and mechanical energy in a mass and helical spring system. The work done by the force along the central axis of the spring. Elastic potential energy and kinetic energy (energy of movement). The principle of conservation of mechanical energy in a mass and helical spring system. Determining the values  $\mathcal{E}$  of potential energy, kinetic energy and velocity at a position on the trajectory. Horizontal launch, range, uncertainty and amount of horizontal movement. Decomposition of the two-dimensional movement into two rectilinear movements. Measurement inaccuracy, measurement deviation, range measurement uncertainty. Measuring the height of fall and determining the amount of time the projectile spends in the air, flight time.

The horizontal component of velocity. The amount of horizontal movement. The conservation of the amount of horizontal movement. Hydrostatic. Thrust, a quantity with direction, direction and module. Difference thrust meter. Measuring forces with the dynamometer. The mass of a body does not change. Weight is a force, a vector quantity that has direction, direction and module. The weight of a body can change, it depends on where the body is. The relationship between the apparent decrease in weight of a body immersed in a liquid and the buoyancy. Determining, by difference, the value of thrust. Archimedes principle. Fluid. The principle of the impenetrability of matter. The Buoyancy value depends on the weight of the fluid displaced. Wave. the simple pendulum and its laws. The ideal simple pendulum. Elongation and amplitude in the movement of a simple pendulum. The period and frequency as a function of the amplitude of the simple pendulum maintaining the same length. Building the simple pendulum. The law of pendulum isochronism. Determining the average period and frequency for different amplitudes. Table and graphs period versus amplitude and frequency versus amplitude. The law of masses and pendular substances. Determining the average period and frequency for different pendular masses. The law of lengths of the simple pendulum. Observing the oscillating movement of mass in a mass and helical spring system. Mass-spring system and simple harmonic motion, MHS. The dynamic determination of the elastic constant in a mass and oscillating helical spring system, the MHS. Measuring the weight and calculating the mass value, disregarding the mass of the spring. The MHS performed by the mass and oscillating spring system. Care to reduce the damping effect. Dynamic determination of the elastic constant disregarding the mass of the spring. Measuring the MHS period. The value of the springs elasticity constant. Dynamic determination of the elastic constant considering the mass of the spring, etc.

## **Knowledge areas**

Physics

## **Key Experiments**

The mechanical advantage of the fixed pulley

The mechanical advantage of the movable pulley

The experimental determination of the mechanical advantage of the parallel block and tackle system

The calibration of a rubber belt, the calibration of a coil spring, the elastic hysteresis

The simple pendulum

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