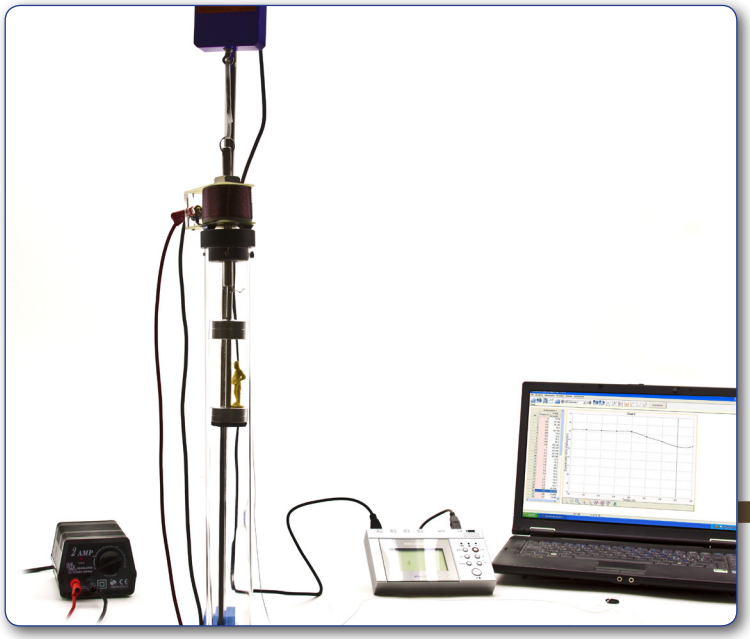
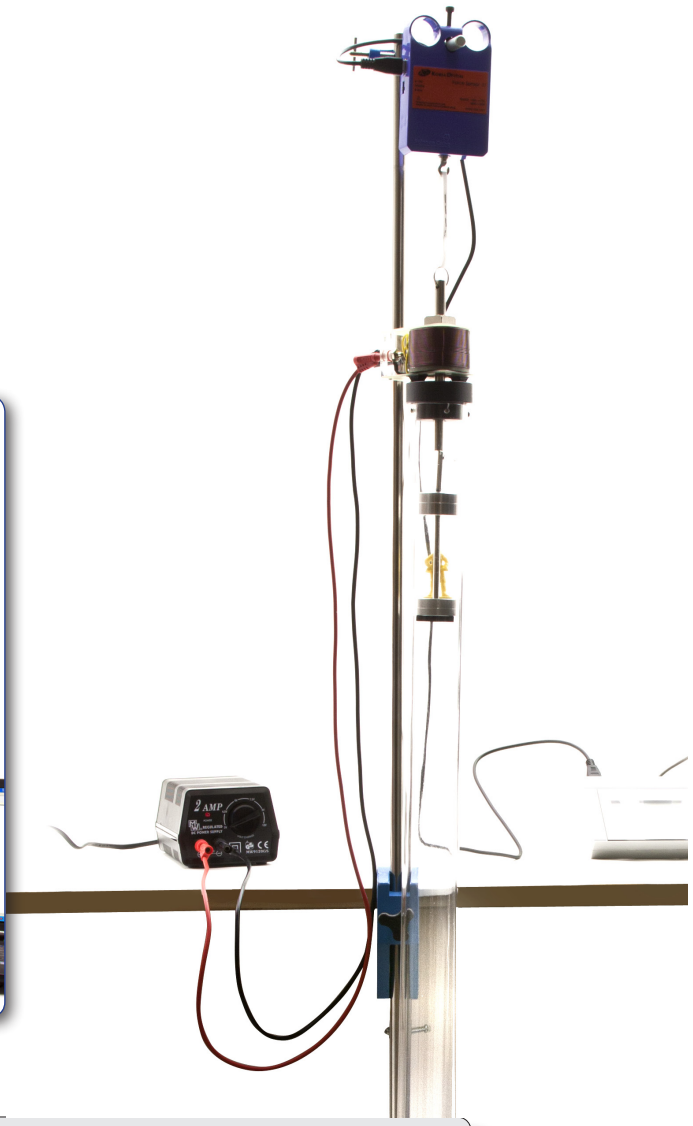




#1428 EINSTEIN'S ELEVATOR

This new OPTIKA SCIENCE apparatus carries out the famous conceptual experiment known as Einstein's elevator, formulated by A. Einstein in 1911 to illustrate the equivalence principle, which is one of the mainstays of the General Theory of Relativity.

The apparatus requires using a data acquisition system, whose processing is not complex.

Our "elevator" consists in a pair of aluminium discs fastened on the same pin, which can slide freely inside the plexiglass tube. The elevator can be initially anchored to the upper end of the tube by using an electromagnet. By de-energizing the electromagnet, the elevator free-falls along the tube down to the bottom end.
A wire retrieves the elevator to bring it high again.

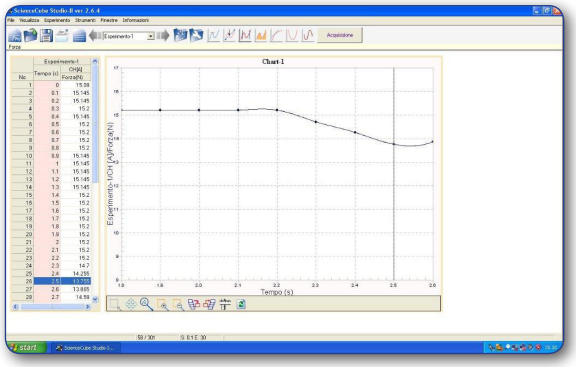
A hole system applied on the closing caps, at the bottom and top, prevents the inner air compression to slow down the elevator fall.

#1428 EINSTEIN'S ELEVATOR

According to Einstein's equivalence principle, during the free-fall, the elevator loses its weight as it was in a space far from the presence of gravitational forces.
The free-fall of the elevator along the tube is about 1 metre; therefore, the free-fall time is estimated of 0.45 sec.

In order to notice quantitatively the loss of weight of the elevator in a relatively short time, the entire system, consisting in the plexiglass tube, electromagnet and elevator, is connected to a force sensor.
Our data acquisition system can acquire data at 100 data/sec. This is largely sufficient to follow the weight time evolution of the free-falling elevator.

The weight of the elevator is provided by the difference of the data processed before and after the free-falling; therefore, the intuitions of Einstein are proven to be correct.



Contents

Verification of Einstein's equivalence principle

Supplied equipment

1 110 cm long plexiglass cylinder, equipped with PVC caps	1 elevator consisting in two aluminium discs fastened to the same pin
1 electromagnet (coil + core)	1 12 mm diam. rod, L 120 cm
1 table clamp	1 PVC ring with rod
1 electromagnet power supply	1 wire
1 supporting rod for the force sensor	2 double clamps
1 Suitcase	

Optional items required but not included:

force sensor (cod. 9032)	interface (cod.9001) or USB force sensor cod. 9068

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