

The Didactics of Science
Through Polymorphic Self-
Made Experimental Apparatus
of Quantitative Determinations

An alternative proposal for the
teaching of Natural Sciences

A model for teachers training in Natural Science has:

- a) to evoke their interest and the spontaneous attendance,
- b) to control the acquisition of knowledge, by themselves,
- c) to acquire training and psychomotor skills,
- d) to help them to collaborate.

Why it has to be self made

- a) It is authentic creative activity.
- b) It is an inquiring approach of natural phenomena.
- c) Develops cognitive and psycho motive skills.
- d) Facilitates the logical process of induction.
- e) Makes a clear discrimination between observations' data and their interpretation.
- f) Covers the sentimental sector through the “pleasure of creation”.

Why it has to be quantitative

- a) The manipulation of the errors and their treatment, helps for a depth understanding of phenomena.
- b) It combines Science with Mathematics (Statistics).
- c) Admits personal control of knowledge and personal evaluation.
- d) Gives the sense of the monad and the use of monad through the calibration step.

Why it has to be polymorphic

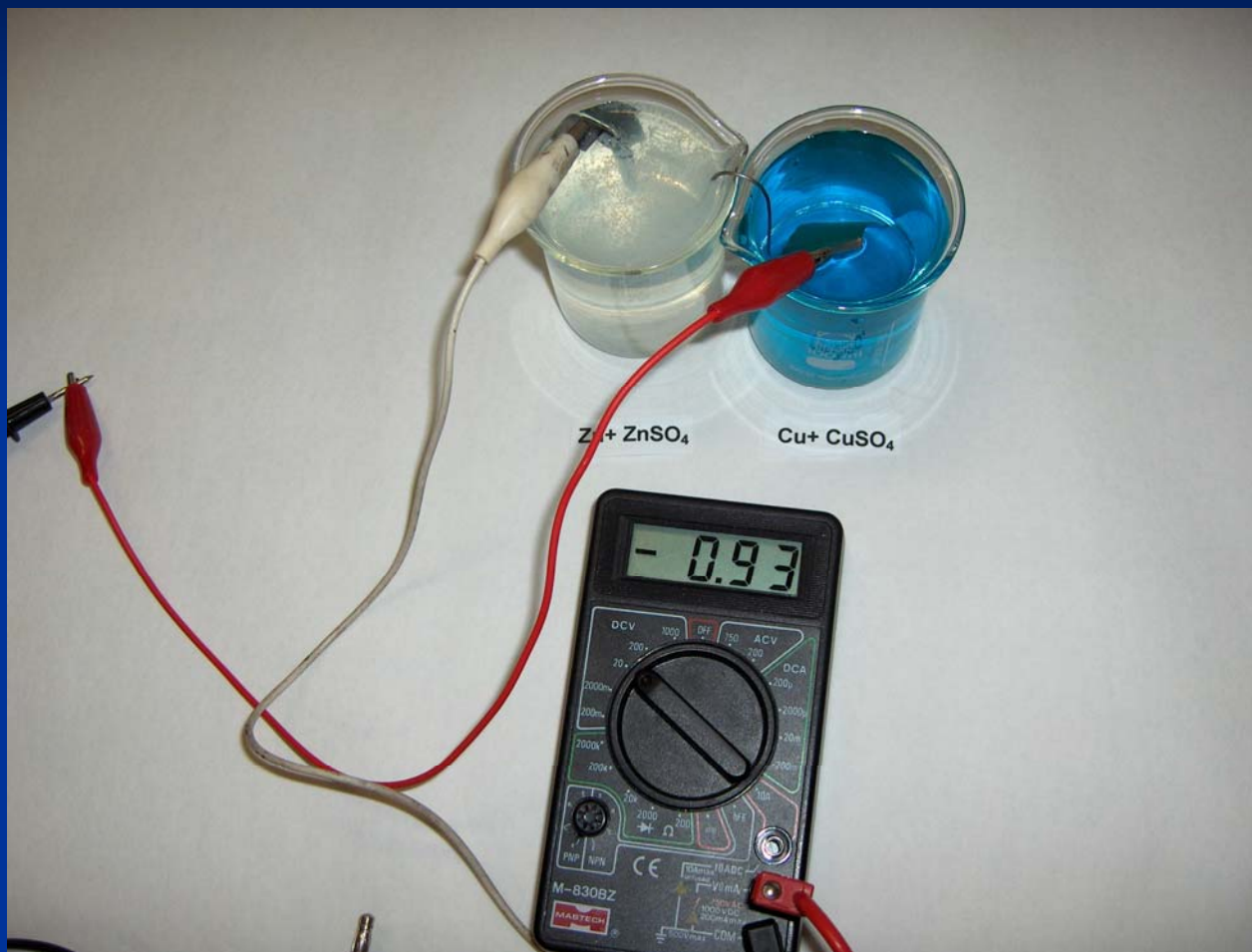
- Teacher knows the phenomenon at a higher level for himself.
- He plans the experiment at lower level simultaneously.
- He has the experience on the way of how he will teach it in the classroom.

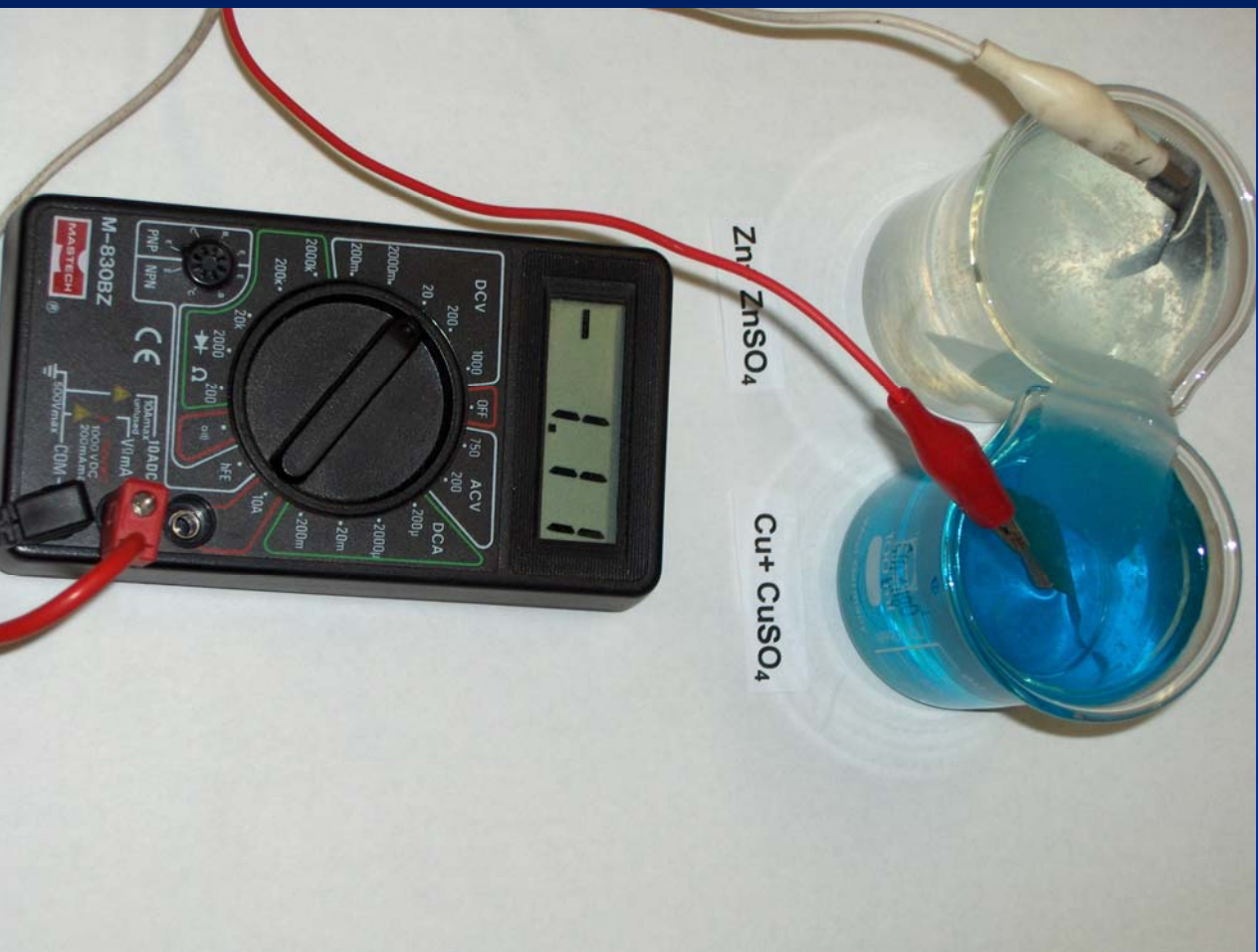
Battery

- **Area:** Chemistry.

- **Educational Goals:**
 1. Connection of the electromagnetism with chemistry.
 2. Classical prototype of the atom, through an application.
 3. The red ox reactions, as a process of electrons transmission.
 4. The conductivity of an electrolytic conductor and the factors affecting it.
 5. The internal resistance of a battery and the factors affecting it.
 6. The transformation of the chemical energy to electric.

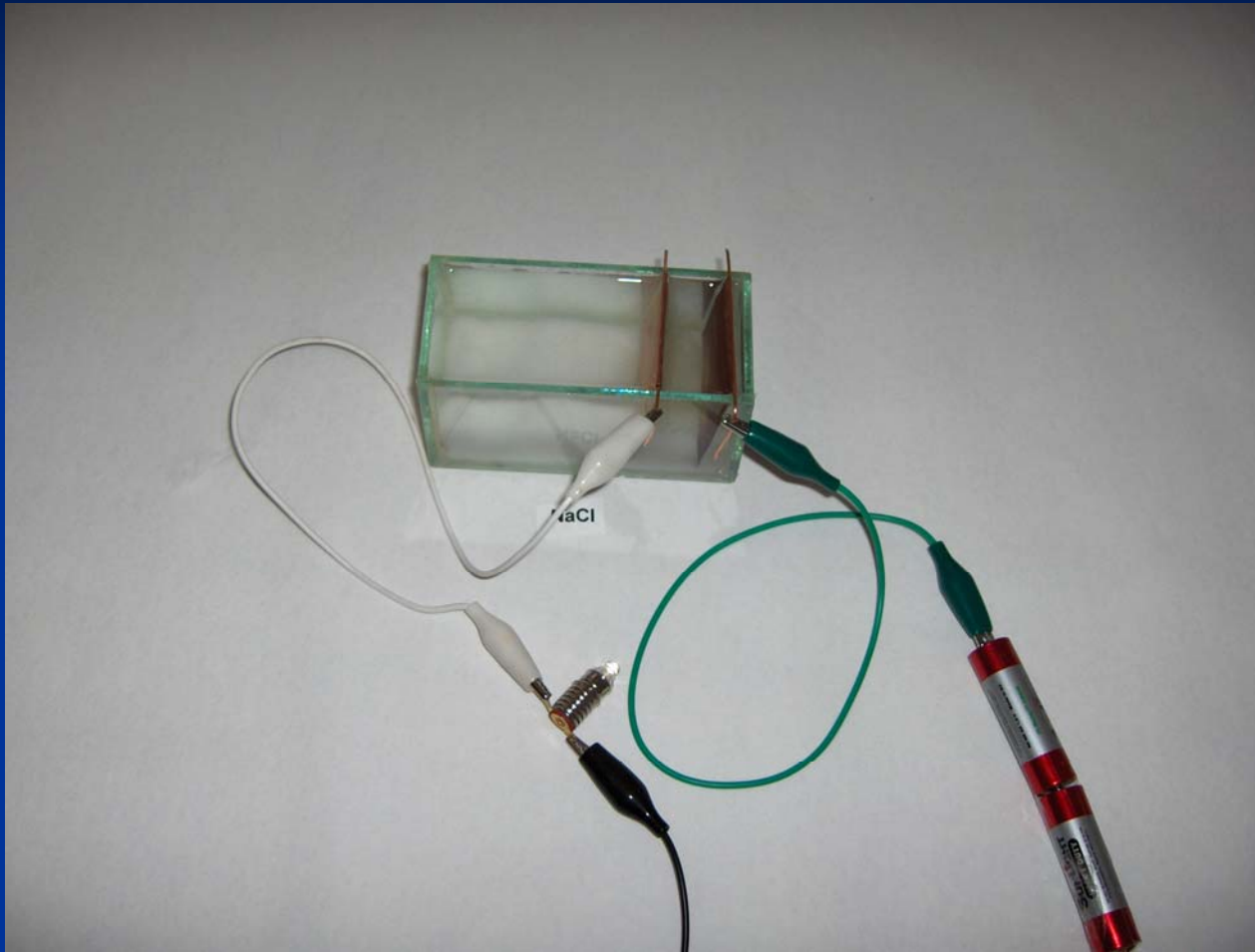






Zn + ZnSO₄

Cu + CuSO₄







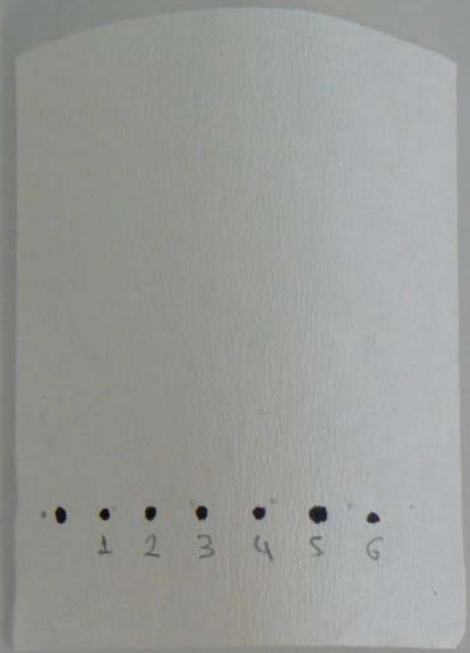
Zn+ ZnSO₄ Saturated in Na₂SO₄

Cu+ CuSO₄ Saturated in Na₂SO₄

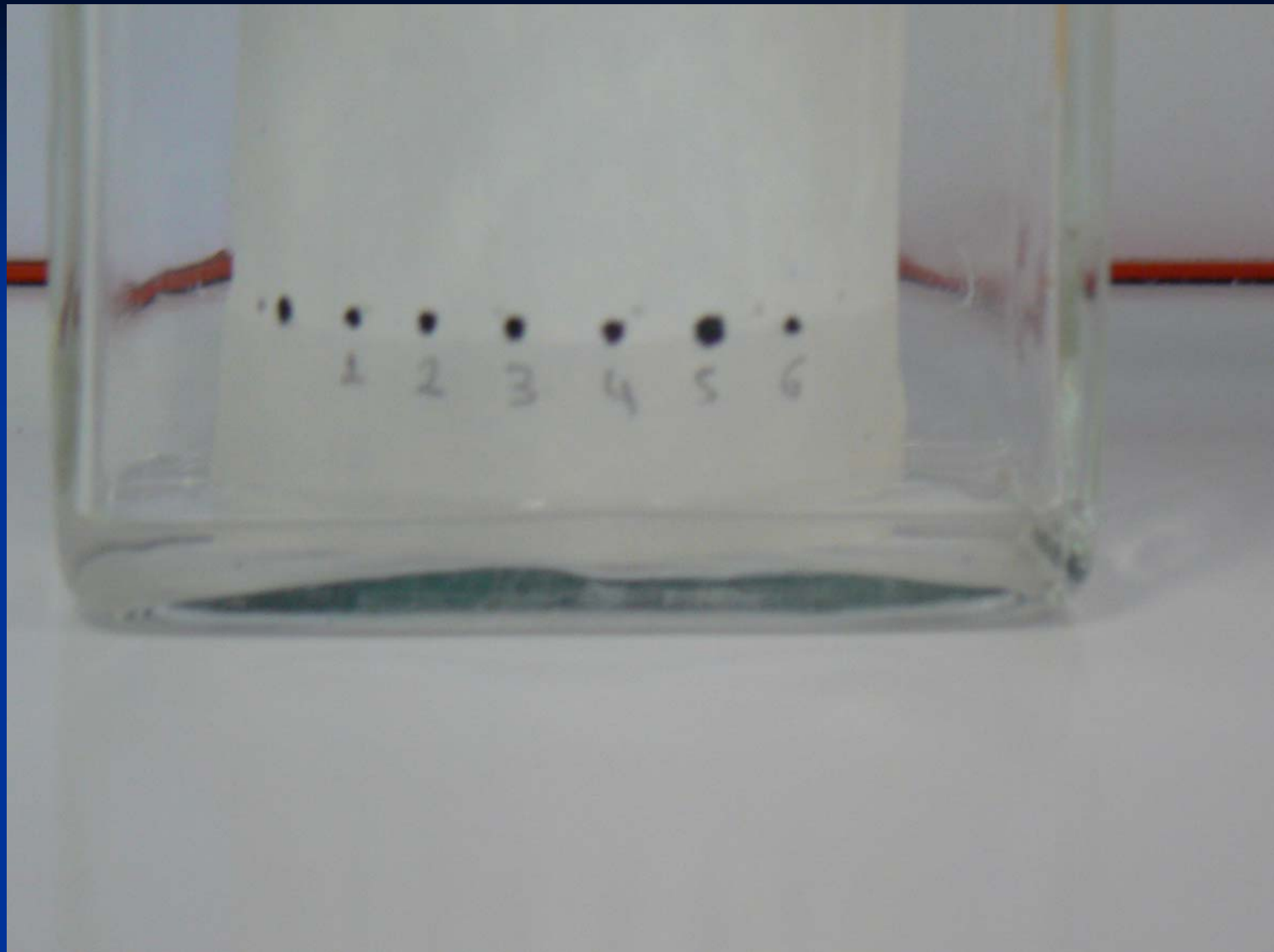
PAPER
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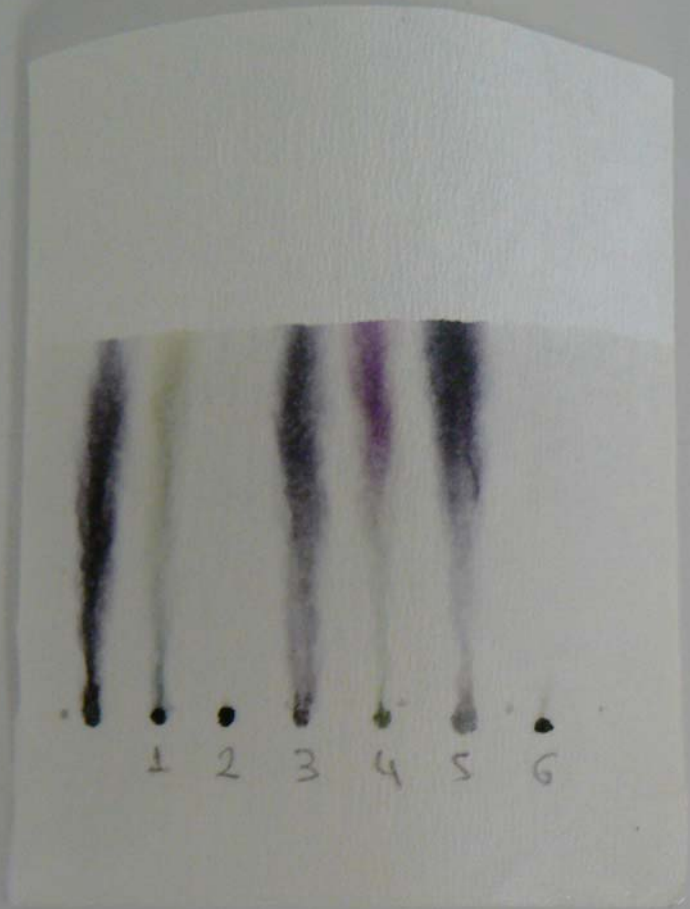


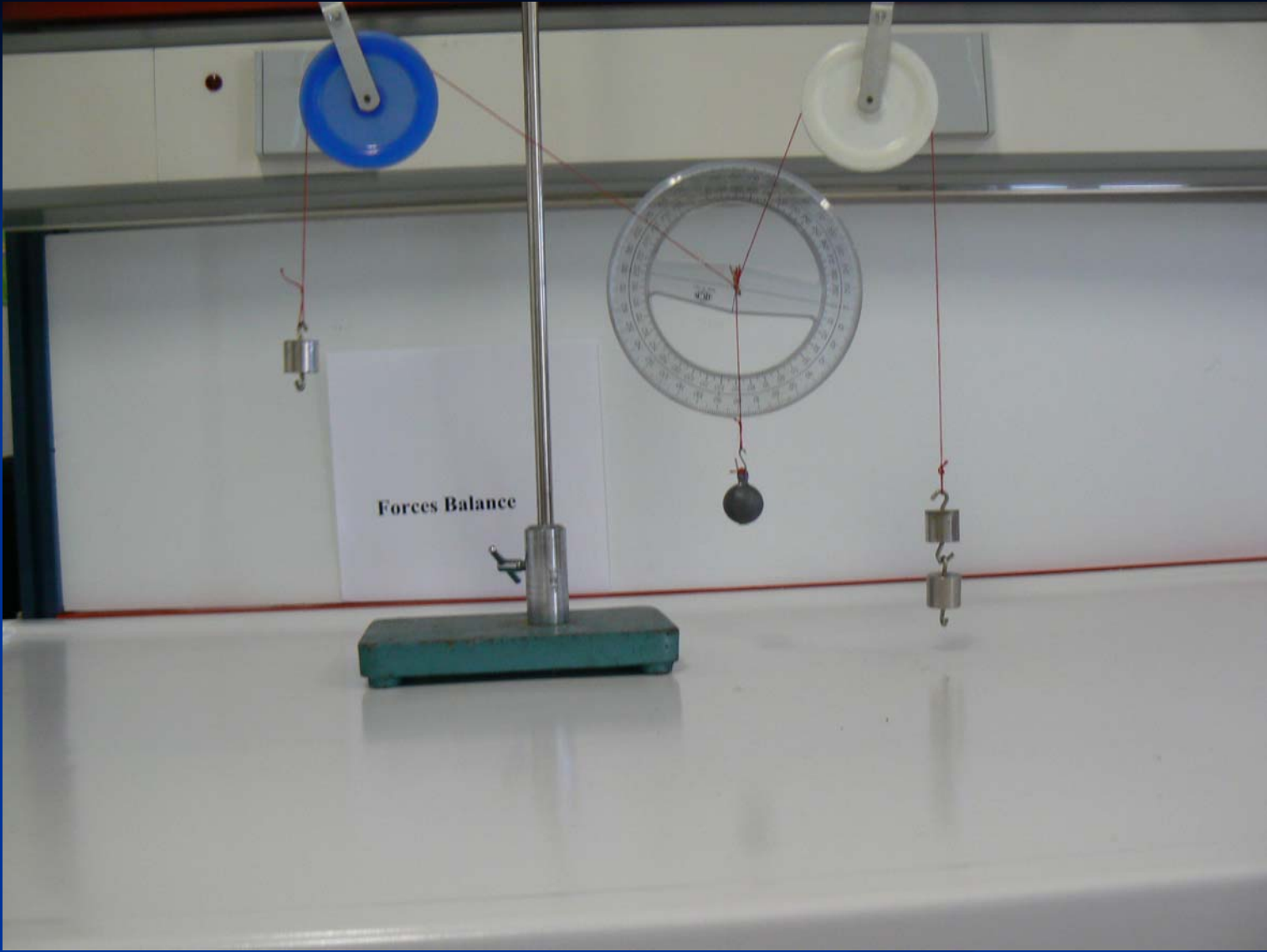


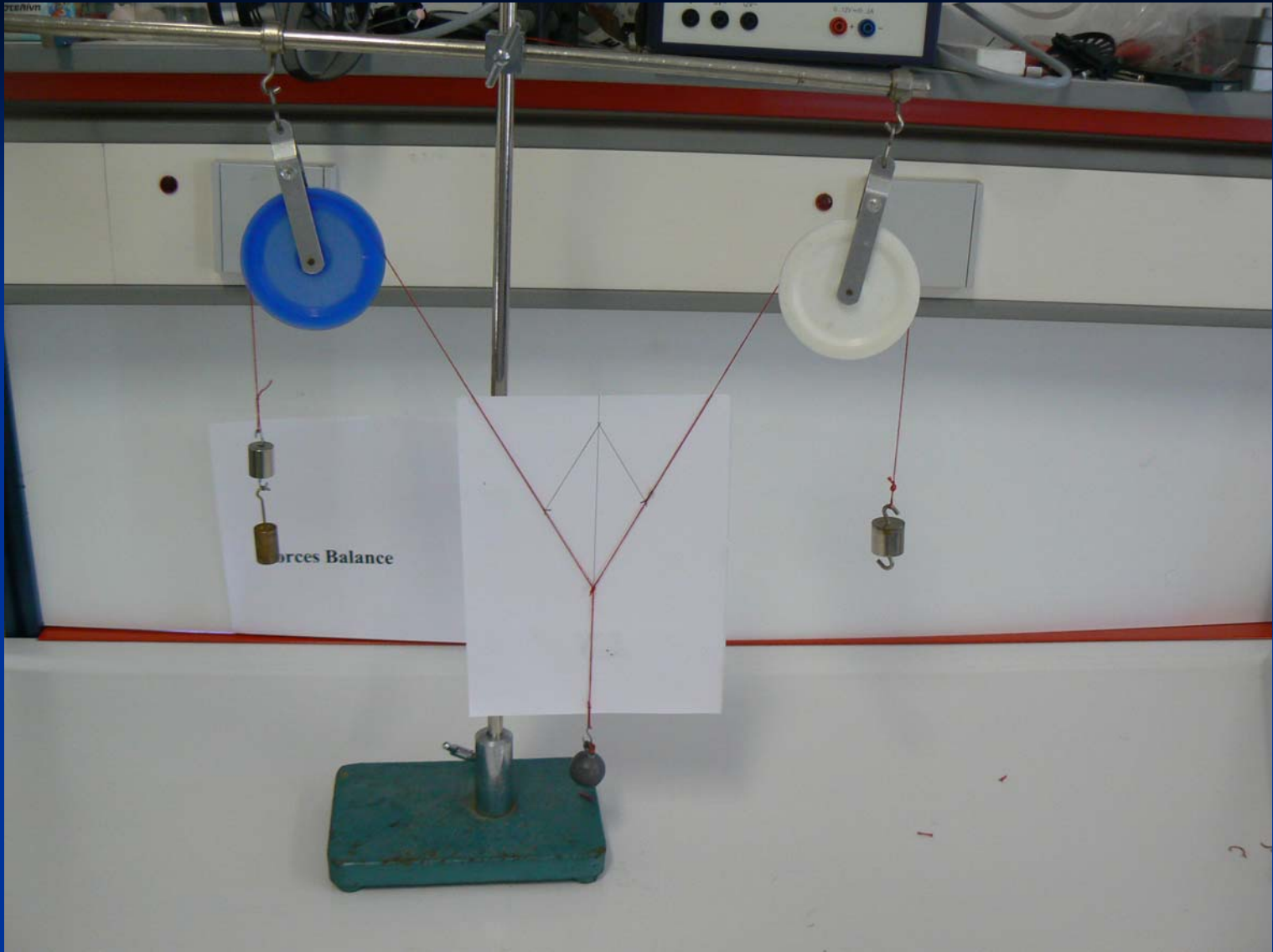


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Forces Balance

