Experience with inquiry activities and their assessment at a lower secondary school in Slovakia

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Dublin 2014

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Introduction

- School reform in Slovakia have started since 2008
- The state education programme and school education programme
- Spiral way of building knowledge and skills was replaced by teaching blocks of topics
- The main part of education in physics is **active pupils´ learning** based on **experimentation with elements of inquiry (textbooks)**

How we implement IBSE

- Our school tries to carry out **activities that support ideas of IBSE**
- Types of activities
  - regular textbook activities, home assignments
  - special science events, e.g. **science open day** for parents, **science lessons** for elementary school pupils, **science conference** at school or at science institution
  - **activities in cooperation with science institutions**

How we assess IBSE in school

The assessment of pupils work in the **regular school activities** based on the following ideas:

- Designing an experiment
- formulating of hypotheses about a problem
- conducting an experiment,
- searching for information from internet or books
- the pupils´ ability to cooperate and work in a group

How to melt chocolate

- **home assignment**
- **the aim was** to find the best way **how to melt** chocolate and **find out the melting point**
- Written report (Tools, steps of procedure, explanation, conclusion)
- **Peer assessment** by pupils from the same class who did not know the names of assessed friends,
- they used **5 scaled rubrics**

Which objects conduct electric current

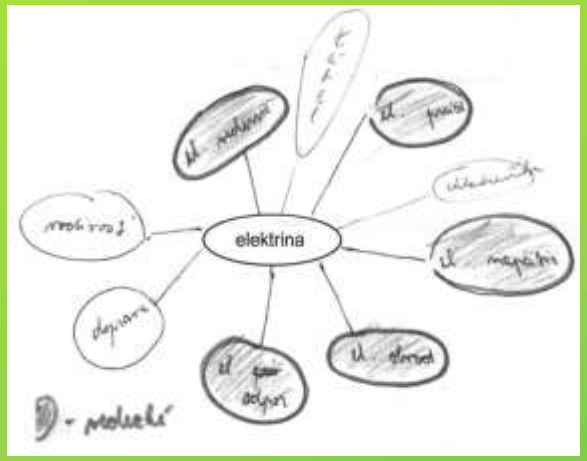
SAILS activity

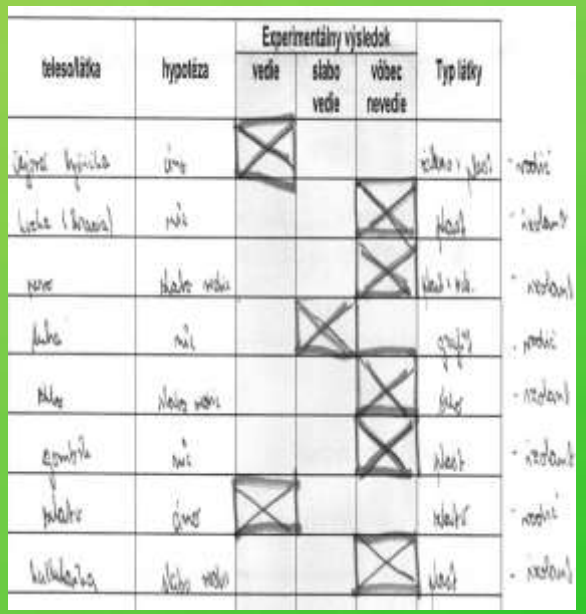
Each pupil wrote a written report

- the concept map, **design of** experiment,
- Choosing tools
- **Tablet with different objects and of different materials** (tea spoon of metal, plastics, piece of wood, scissors, etc.)
- **hypothesis on conductivity**

(conducts well, poorly, not at all)

- The **experiment** and **comparing** the results of experiment with **hypothesis**
- **Essay with topic** Why is electric current important for our life





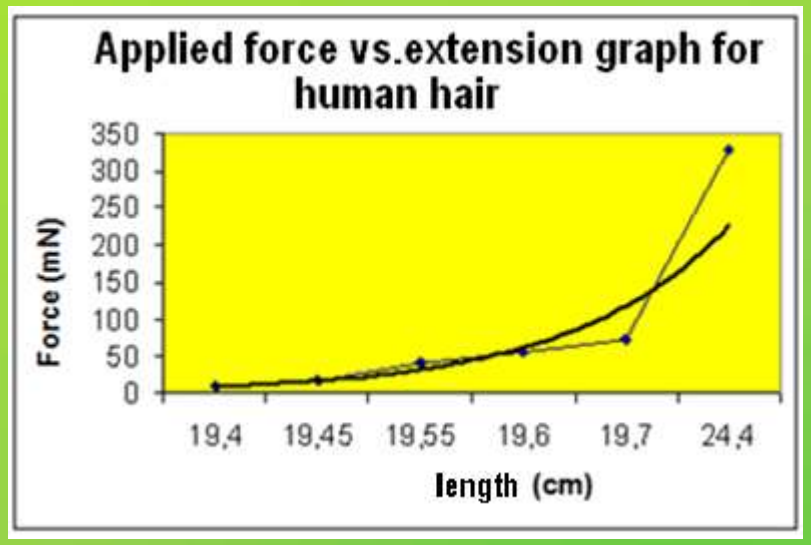
Assessing IBSE in cooperation with science institutions

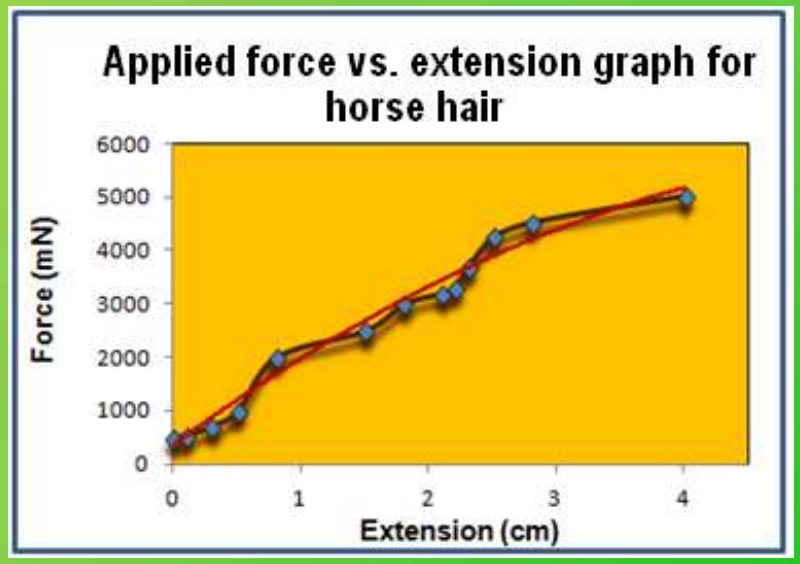
The assessment of pupils work in the **project activities in cooperation with Slovak academy of Science and University** based on the following ideas:

- attitude towards the inquiry activity, enthusiasm, drive,
- ability to work in a group
- level of knowledge, skills,
- planning investigation and collecting data
- search for information and presenting them
- explaining knowledge in front of different audience

Human and horse hair

- In cooperation with the Institute of Physics, Slovak Academy of Science, 15 pupils of 7th and 8th grade.
- Pupils compared the shapes of the human and the horse hair, its thickness, load capacity and **extention under different applied forces**.





The pupils work on the project **was assessed by teacher and by scientist who cooperated** on this project .

This assesment was based on

- work with the **apparatus**
- the level of presentation and argumentation within the discussion at the **science conference**

How crystals grow

- in cooperation with the Technical University and with Slovak academy of science

  The project involves :
- **the visit of the University** mineralogical collection.
- **Creating own different colour crystals** made by evaporating saturated water of salt solutions
- **investigated the properties of crystals** (shape, crystalline structure, colour, etc.)
- **present the results** at pupils' science conference.

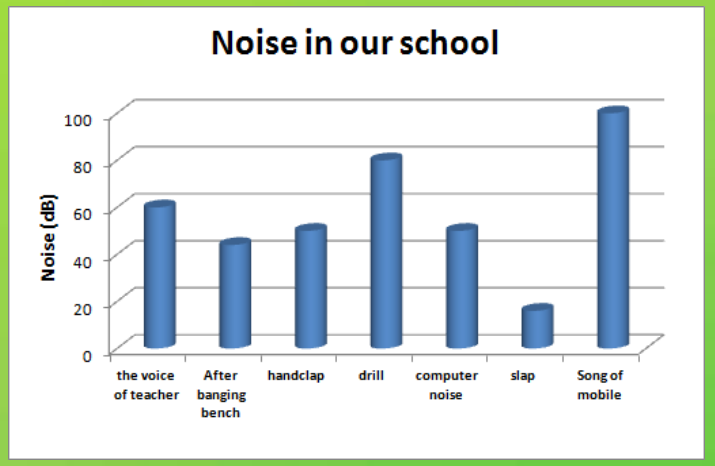
This project was assessed by teacher and also by scientist, who cooperated on this project . The evaluation was based mainly on activity of pupils, their level of knowledge, of the level of presentation on conference

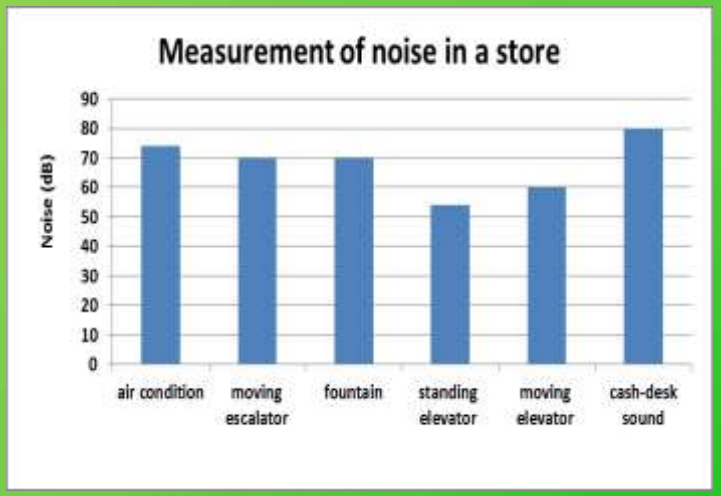
How noisy is our school and its neighbourhood

- in cooperation with University
- the sound level meter..

The project consisted of inquiring :

- **the noise at school** -voice of teacher, noise of PC, school corridor, etc
- **noise at home** - washing machine, refrigerator, etc
- **the noise in the supermarket** - air condition, fountain, elevator, etc.
- **the noise on a street and means of transport** - quiet and noisy street, tram, bus and bus station, etc.





The assessment of the project was based also on

- the pupils´ creativity,
- originality in exploring different noise
- tabular and graphical evaluation of the noise level
- suggestions on protection against noise

CONCLUSION

- The physics became more interesting for pupils but also for teachers.
- Pupils look forward to these lessons.
- Physics became more fascinating not only for pupils who like physics, but also for the others who were inspired by science presentations of their peers.

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Thanks for your attention