

THE EUROPEAN NETWORK FOR SCIENCE TEACHERS

Meltem YONTAR | Kanyon College | Usak | Turkey

## **Good Mathematics In My Country**

No matter which age group , human beings are generally prejudice against mathematics . However , math is everywhere in our lives but most students can't recognize it and they can't associate it with real life. This is aim of my project . Our students often wonder what these rules will work and if they don't find out the math in our lives, they would come up to math is a lesson which enclose a lot of nonsense formula.

This project's goal is to overcome the prejudice and to teach the students how important the mathematics in our life. My Project is in partnership with 6 countries. Every country forms mathematical problem of anything which is famous in our country and the students in other countries solve these problems together. Not only we get information about the country but



#### also we learn how universal mathematic is.

While we are implementing this Project we also take advantages of technology. We use many software such as : chat,twinspace,web2.0 tools ,video maker, GeoGebra, e-mail, PowerPoint, video conferences, to prepare our pictures, drawings, banners, logos and such products. The think they know the best is technology but our biggest problem is children using technology wrong way. In this Project students learn technology by using to math, do Project activities and design etc. Of course, we can't exclude children from technology. They even have to be more involved with technology in this Project. They are using technology quite a lot to learn. They are learning the thing they know the most to use it the right way.



Conclusion: we learn lingua of math is a universal language, it has fun way to learn it and how much the science of the math in our lives.



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Miklós Jendrék | György Boronkay Technical Secondary School Vác | Hungary

# **Musical Physics**

The project deals with the problem of detecting and converting audio-frequency vibrations of electromagnetic and light signals. Transformations of electromagnetic energy make it possible to show a vast amount of physical effects in an unconventional and spectacular way.

During the signal converting process we have the opportunity to view and examine optical, acoustical and electromagnetic phenomena.





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Secondary School Physics

An iron core coil is connected

to the input of the PC speaker The changing magnetic field nduces electromotive force in the coil. If the frequency of the oltage is in the audible range, after amplifying we can hear arious, and often surprising ound effects

near a stretched string and If we move the coil towards the pluck the string, we can hear speaker, a barking-like sound the amplified sound in the an be heard. The reason for loudspeaker. that is the positive feedback The device is suitable for making With our device, the sound microphones and loudspeaker coming from a mobile phone's For this we also need an dspeaker can become loude acoustic resonator (a plasti without losing quality. It is glass, a tin or a tea kettle) and a nough to move the coil close to he mobile phone's loudspeaker. strong magnet





**Conclusion:** Many physical electromagnetic and photometric experiments can be made more interesting and colorful by utilizing and transforming tone signals.



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Miriam Romberg | Helmholtz-Gymnasium | Dortmund | Germany

### **3-Dimensional vision and its illusion in cinemas** Physics

How do **3D** glasses in cinemas work? To explain this, linear and circular polarisation of light are studied. In preparation, students independently explore the technique of anaglyphs. They develop its foundations by implementing concepts from biology and computer science.

#### **Structure of the sequence**



#### **Advantages of the sequence**

- **interdisciplinary** (biology and computer science)
- high **motivation** by using the context of cinemas from the students' **daily life**
- interesting for **girls** as well

- **internal differentiation** by two difficulty levels
- **transparency** by implementing an advance organizer
- **independent development** of the topics



László Orosz | DOC High School Educational Centre of Demecser | Hungary

## **Objects in our surroundings in balance Everyday objects are used in the physical experiments**

Collect different household devises in your home. Try to find the **equilibrium position** of these objects. Then alter them (remove or add parts).

they act the Do same way? No, they don't. Let's find out why!

Take a simple **broom** for instance. By taking off the brush the equilibrium position will not be at the expected place.





Is it possible to fill a **glass** on the end of a **wooden ruler** that is not attached to the table? Of course the ruler is not nailed to the table. Yes, It can! You can even fill the glass with some wine. But guess how!



Why are these experiments good? They can help students understand the events. Playfulness and rules lead to proof. The equipment does not cost much.



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Mr. Panov Oleksandr and Ms. Miachkina Alina | Kharkiv | Ukraine

## Using I-Phone For Demonstration Different Physics Phenomena And Cognitive Skills Development

The aim of our project is to show the children that physics can be interesting and easy to learn





#### The radio wave passes from the Earth to the Sun in 8 minutes



For demonstration we propose to use a mobile phone which is a source of radio waves. Thus placing the phone in various media our students are able to do various experiments themselves. They can determine the degree of penetration of the radio waves.

Here we are presenting an easy-for use way of explanation one of the most difficult physics programme division "Electromagnetic waves propagation". This teaching method has been developed by authors and has been successfully used in our teaching practice.





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Parisopoulou Evangelia | Fryganiotis Private School | Thessaloniki | Greece

## Study of gas evolving reactions using a closed volumetric apparatus in a school laboratory

In the school laboratory, reactions that evolve gases can be used in order to study the stoichiometry of a reaction.

Direct measurement of gas volume produced by a simple reaction may be done by using the gas to displace a liquid into a container such as a graduated cylinder.

Parisgianna is a simple, cheap and very accurate setup for preparing and measuring the gaseous product.





It can be used as instructional equipment in both secondary education and university chemistry laboratories.



#### "Parisgianna" costs no more than 10 euros.

Over **30 different** chemistry and biology experiments can be conducted with its use.



#### Paulo Gil | Escola Básica e Secundária de Pinheiro | Termas de S. Vicente | Portugal

## **Mathematical Tourism**

Combining Mathematics to tourism is a new form of learning, both at the cultural level as of Mathematics itself.

Look at what surrounds us and understand what concepts/mathematical procedures are being used, in a more or less visible way, is the big challenge.

The outlined tours show the purpose to diversify everyday situations in which Mathematics appears associated with different areas of knowledge.









The present work gave us the possibility of looking at and contextualizing Mathematics in a way that you recognize it in everyday life, giving meaning to the concepts and procedures learned in the classroom. It also allows to humanize mathematics in history and culture, that removes some of the mystique often associated with the study of this discipline.

Pernille Rovsing | Østerskov Efterskole | Hobro | Denmark

## "Close Air Patrol" A space game with physics

"A perfect hit from an enemy spacecraft instantly destroyed the solar panel at the spaceship SS Ludwig and it was now drifting with reduced motor power towards the cold nothingness.

At the same time the emergency alarm bellowed inside the spaceship, the noise was extreme and red light was spread from the bridge. In a split second the computers calculated that the only chance for the spaceship was to lose 420 kg within 7 minutes and 23 seconds. The sweat ran from the Captain's forehead as he tried to figure out, what he could continue without. There was no time for panic – he activated the intercom, and with a cold voice, he ordered the rest of the crew into their spacesuits...."









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"Close Air Patrol" is a board game where the pupils interact with the laws of Newton while playing. They control the spaceships and fight the enemys by using physics.



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Poul Hedegaard, Odense Katedralskole, Odense, Denmark

## **Colours, light and shadow** Presenting scientific methods in a new way

In this project, students plan and carry out experiments in which they investigate the rules for additive colour mixing and the position of colours on the colour circle, to find explanations for coloured shadows and complementary colours.

One of the goals in the Danish curriculum is to present and use scientific methods. This project is part of the basic science course, and therefore hypotheses must be easy to verify or falsify, using simple and cheap experimental equipment.

The results from the experiments with colours



are used to motivate the learning of more difficult subjects in physics and biology, e.g. colour vision, colour blindness, the Bohr model of the atom, and photosynthesis.

Instead of a traditional final written report the students use their gained knowledge to help younger students (14-16 years old), visiting our school in the Science Festival Week, to help them make hypotheses and experimental verification or falsification.

Price: One box with one white and three coloured LED-spots: 30€. Boxes needed: 8-10, to make the students work in groups of 3 or 4.



#### Two conclusions (from the students evaluation of the project)

- Experimental work makes it easier to understand physics!
- Physics is much easier to understand, when you have explained the phenomena several times for others!



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#### Riccardo Bonomi | Istituto Comprensivo di Siziano | Siziano (PV) | Italy

## **Chemistry with Lego**<sup>®</sup> An innovative method for teaching chemistry

Bricks of different shapes and colours give the pupils the opportunity to "touch" the studied rules and therefore create a virtual chemical laboratory.

With an enhanced Periodic Table of the Elements at hand, the students learn how to build chemical molecules that are stable because the model itself leads them to see if the procedure was carried out correctly by giving immediate feedback on their work.









The same activity can be done digitally with free software (es. BlockCAD), which allows you to create constructions. You can choose all the elements you need by dragging them to a workspace.



For understanding the complexity of chemistry but also its logic and simplicity