

Ahmed Mohamed Hany | Elshaheed Abdelmonaem Read official school For languages | Ras sudr | Egypt

Handmade devices to identify the components of soil and its types.

Set of low cost devices can be made inside the school by recycling available wastes and the children toys through teachers or the students themselves to identify the types and components of soil for primary stages. They are designed by the Participant to serve the inquiry-Based Science Education method. The student can get the information and develop the observation and conclusion skills, register data, enjoy learning and be ready for innovation and creativity.



Salts discovery



Soil components mixer

Mixes soil with water to observe the different components of soil.

To identify salts in soil by simple electric circuit depending on that the salty solution conduct Electricity so by doing soil solution then test its conductivity, student can conclude that soil contains salts and we can compare this solution with distilled water conductivity that is bad conductor of electricity.

Soil refinery

It helps student to compare between sizes of deferent types of soil. It consists of three layers of refineries with different sizes of holes



Conclusion: The student can get the information and develop the observation and conclusion skills, register data, enjoy learning and be ready for innovation and creativity Easley.



THE EUROPEAN NETWORK FOR SCIENCE TEACHERS

Abdulmüttalip AKKAYA | Kamil Tolon Science and Art Center | Bursa | Turkey

The Best Way for Counting Snail Cheap and simple model for biology students

Most of the scientist uses the "markrecapture" method for determining animal population. But like other methods, it takes a long time to determine wildlife populations. It works by that formula:

 $\frac{M(\text{marked initially})}{N(\text{total pop. size})} = \frac{R \text{ (marked recaptures)}}{T(\text{total in 2nd sample})}$

 $N = \frac{M * T}{D}$





I have developed a model for this method. I used cardboard as study area and beads as animal species. I put some pit traps on cardboard.

Thus I could be adapted a hard ecological study to secondary school classroom. Now we can determine animal populations in 40 minutes and we use only a shoe box and some beads also with a small computation.



- Very easy to use
- Cheap enough for all schools
- Full compatibility to scientific method



THE EUROPEAN NETWORK FOR SCIENCE TEACHERS

Ákos Vecsei | Experience Workshop | Pécs | Hungary

Don't Throw it out, create a robot!

"Don't throw it out, create a robot!" This is the catchphrase of the REBOT building kit, which seeks to introduce children to programming and robotics through a playful and environmentally friendly approach. With the help of this kit, it is possible to build robots out of empty boxes and bottles which can be controlled wirelessly by means of a program running on a computer or mobile phone, and the robots may even be capable of autonomous operation.





The created robots are able to move with the help of four servo motors, they can communicate with two LED lights, can recognize obstacles in front of them with two infrared sensors, and they can even be controlled in the hallways of a school, solely by moving our mobile phone. With the help of the modified scratch program running on the computer we can link several robots, and we can control robots built by others as well over the internet.

facebook.com/rebotkit



Conclusion: We can really develop the knowledge and the behavior of the environment of the children at the same time for the sustainable development.



THE EUROPEAN NETWORK FOR SCIENCE TEACHERS

Johannes Almer, Ernst Hollweck | Ludwig-Thoma-Gymnasium Prien a. Chiemsee | Germany

Who murdered Sir Ernest? Physics, Chemistry, Music, English

At a grand ball last night, the host, Sir Ernest, was murdered. The search for the murderer starts with a video. Sir Ernest greets his guests (Mr Darcy, Mr Bennet, and Mr Bingley) and they clink glasses. During the murder scene talks Sir Ernest to one of the three guests without mentioning his name. They clink glasses before the murderer pulls out a knife. Now the young detectives can begin solving the mystery using acoustic spectral fingerprints.





What's more?

+ Science

basics of the science of sound and its spectra

+ Activity

experimental acitivity to learn science of spectra

+ Motivation

students share their conclusions and learn how to work cooperatively

+ Education 2.0

individual help using videos and interactive web based applets







Joseph Fraunhofer entwicklte die sogenannte Spektroskopie. Dieses Verfahren wird heute z.B. bei der Altersbestimmung von antiken Möbeln verwendet. Wie nennt man dieses Verfahren?

Infrarotspektroskopie	
Spektralmikroskopie	
Farbendoskopie	
Ultravioletspektroskopie	
and the second s	



NETWORK FOR SCIENCE TEACHERS

Ambrož Demšar | Zavod sv. Stanislava, OŠ Alojzija Šuštarja **@**| Ljubljana | Slovenia

Water – Drop Projector with Laser

and syringe and some adhesive tape





Optics scheme by courtesy of author Gorazd Planinšič, first time published in The Physics Teacher, Vol 39, 2001. Http://www.fmf.uni-lj.si/~planinsic/articles/planin2.pdf



Dr Aneta Mika | College of Education and Therapy/ Teacher Training Centre | Szczecin | Poland

Biophysical inspirations

Biophysics ...

... is a science which applies research methodology characteristic of physics to perform the analysis of the structures of organ systems, biological phenomena and processes. Biophysics, then, aims at interpreting life processes by means of methodology adopted from physical sciences. Since a living organism and processes taking place inside it are very complex, **biophysical modeling - a simplified method** of solving a particular research problem - is applied.





Models can be constructed in project teams or individually. Project preparation comprises a few stages.
First, students need to thoroughly acquire the theoretical knowledge required and plan their research

Project enjoy great popularity and arouse interest among students.

work.

• Then, they prepare and make the project.

Finally, they present the project to an audience.





This could be put down to the fact that they create an opportunity for them to understand **how their bodies work**. They also enable to conduct cross curricular approach in teaching **biology**, **physics** and **chemistry**, and allow students to see relations and mutual correlations between these subjects.



Introduction to biophysical modeling a simplified method of solving a particular research problems, as an interesting method of student motivation during lessons.





Ann Blanking MBE | St Mary's College | Londonderry | Northern Ireland, United Kingdom

Creating Projects in Science Clubs Stimulating, Salient, Science

Our Extra-curricular Chemistry Club has a present student membership ranging from ages 11 to 17 years. Students work together on challenges with the older students helping the younger students with their more advanced science knowledge.

A range of projects have been undertaken concerning everyday salient topics involving; health, environment etc., All projects follow the scientific method and all are subsequently entered for various Science Competitions in the UK and Ireland. This allows students to gain skills in social interaction, presentation, communication and ICT.



Pic 1: members of the Chemistry Club celebrating success at The BTYSTE Competition

The projects are undertaken entirely in school and make use of the existing school resources. They are undertaken by the girls and are chosen from, and involve, recent topics in the news.



Pic 2: light box made from cuvette box

Equipment for projects can often be made from scratch by reusing and recycling materials:

- A polystyrene cuvette box was used to construct a light box for measuring UV/visible light transmittance and was used for a range of projects.
- A spectrophotometer was made using an LED, 9V battery, resistor, light sensor and multi-meter. It was used to measure concentrations of dyes in various drinks.



"Problems are only Opportunities for Solutions". Inventive use of available resources can facilitate most projects, foster an interest in STEM and promote problem solving skills.



THE EUROPEAN NETWORK FOR SCIENCE TEACHERS

Antxon Anta Unanue Elizabeth Goiri Little

Physics for Everyone

The Energy of Light and a Photoelectric Effect "Simulation"





2

The energy of light of different colors is shown through the effect of different colored LEDs on a $E_1 = h \cdot f_1$ phosphorescent sheet. Phosphoresence only sets in with light above a certain energy threshold (color). This experiment can be thought of as a simulation of the photoelectric effect.







Building a Loudspeaker: Electromagnetism & Sound

The principle of a loudspeaker is illustrated using a discman, a magnet, a coiled wire and a plastic cup.

audio jack connects to coil, transmitting an audio-modulated current I(t)

plastic cup placed on vibrating coil





This causes the coil to vibrate according to the modulated signal. This vibration is transmitted to the air we are able to perceive it as sound. A plastic cup placed on the coil serves as an amplifier.

3 Birefringence and Interference Colors Using Tape and Crossed Polarizers

fixed magnet

When white light passes through (birefringent) tape sandwiched between two crossed polarizers, the emerging light is colored. The color is dependent on the thickness of the birefringent material and by layering the tape one can produce a spectacular display of colors!





Schematic after S. J. Edwards and A. J. Langley, Leonardo, Vol. 14, No. 3, pp. 187-190, 1981



THE EUROPEAN NETWORK FUR SLIENCE TEACHERS

Kvennaskólinn í Reykjavík, Fríkirkjuvegi 9 | ICELAND

Kitchen Chemistry - A Way to Enhance Students Interest

How do you teach 16 year old students basic chemistry with a low cost text-book and simple exercises and laborations?

- 1. Elements and substances in the classroom/kitchen.
- 2. Solubility, why does it matter in every day life and for the environment?
- 3. On the block, storytelling about the Periodic Table.



restui tilfeilum tedur daudo

Students' work

*Vivid teaching methods * *Active students* Back to basics * *Enhances positive attitude * *Self-evaluation * Responsibility * * Better outcome * More joy*





perfect for low-cost lab



THE EUROPEAN NETWORK FOR SCIENCE TEACHERS

Kvennaskólinn í Reykjavík, Fríkirkjuvegi 9 | ICELAND

Iceland – Facts and Figures



Iceland is 103 000 km² Settlers from Norway 874 AD Total Population=338 349 Population Reykjavík area=213 619 Unempl. 1,7% Inflation 1,9%

(www.hagstofa.is March 2017)

Waterfalls







The Main Building

My School:

Kvennaskólinn í Reykjavík *Junior College * Established 1874 *

- * Stepping stone for Women's right
- * Girls-school until 1976 * Public *
- * Now 650 students * 16–19 years old *
- * 3 lines of studies = Nat.+ Soc.+ Hum. *
- * University Entrance Exam *

Ásdís Ingólfsdóttir

