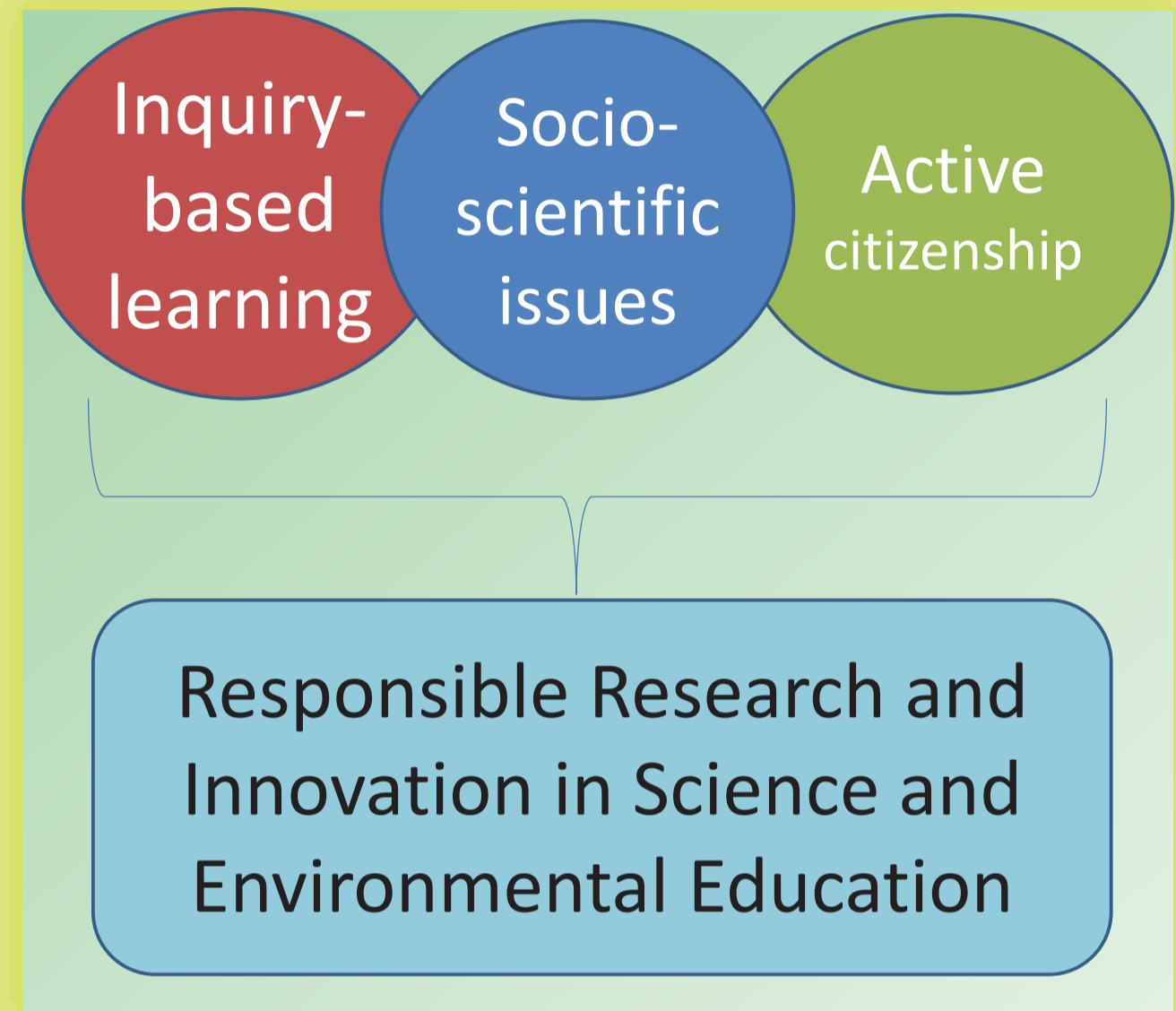


Alexia Alexandrou | Agios Ioannis Primary School | Nicosia | Cyprus



Which fertilizer would you use to grow onions?

The learning module was chosen based on the debate about **chemical** and **organic fertilizers**. It is suitable for students aged 11-12 years old, and was developed using the PARRISE project's **SSIBL (socio-scientific inquiry based learning) framework**. The activities developed aim to familiarize students with the procedure of growing vegetables and study the concepts of eutrophication and soil pollution. In addition, in line with the European-wide emphasis on Responsible Research and Innovation, an important goal of the curriculum is to engage students in the discussion of a **socio-scientific debate** and cultivate their **active citizenship** for matters that affect us and our environment.



Amandine FORNY | Ecole Lémania | Lausanne | Switzerland

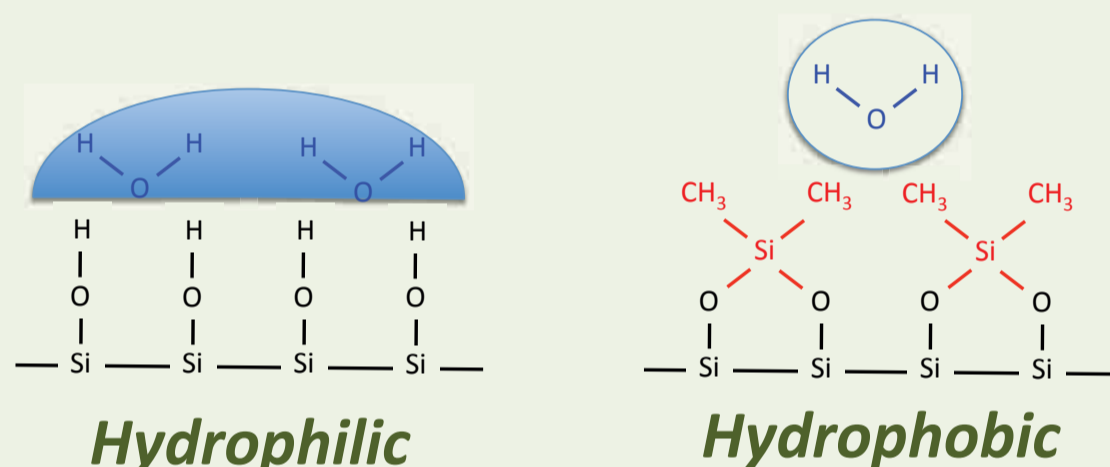
Dry water

A surprising experiment for primary to high school students

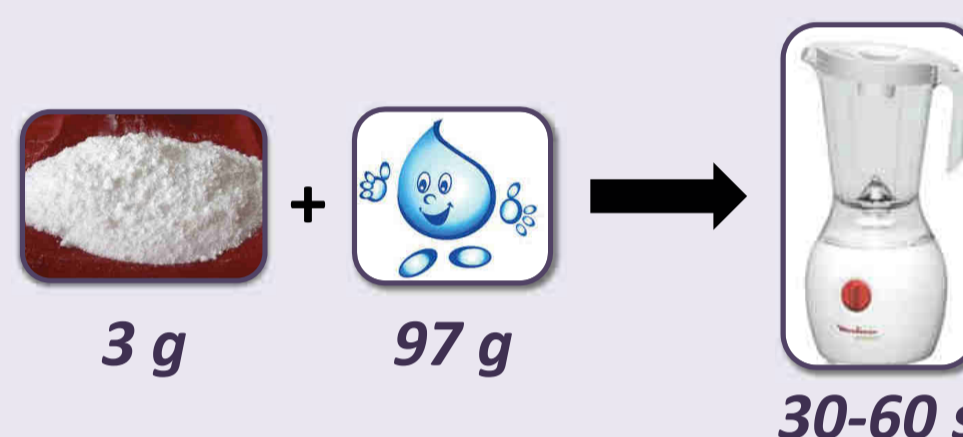
This demonstration deals with the concept of chemical affinity between water and surfaces. It may be related to various objects of students daily life such as umbrella, waterproof clothes...

Hydrophilic or Hydrophobic?

Hydrogen bonds make silica powder hydrophilic by nature. Specific chemical treatment makes it hydrophobic.



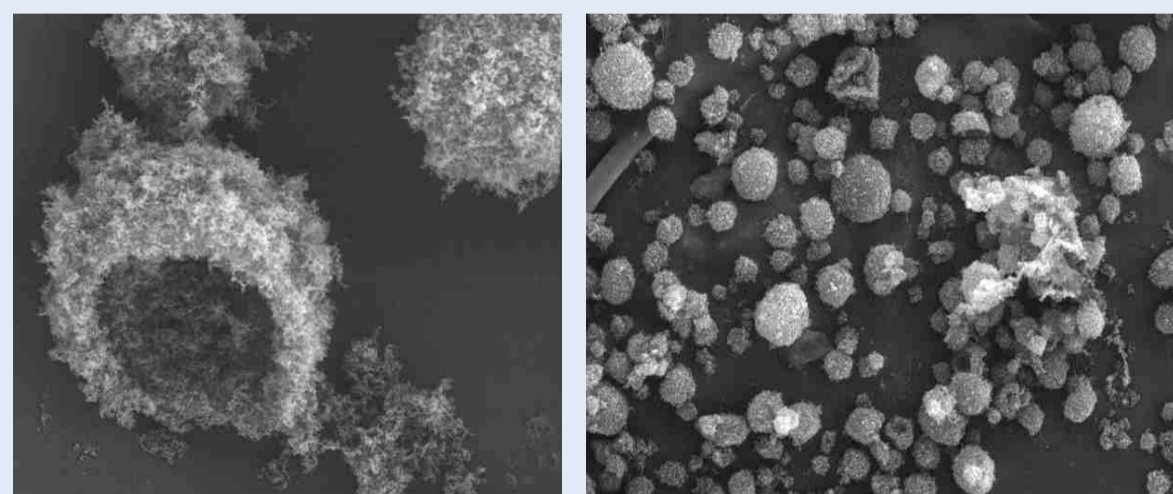
How to prepare Dry water?



Simply mix 3 grams of hydrophobic silica powder with 97 grams of water in a kitchen blender for 30 to 60 seconds: it is that easy!

How does Dry water work?

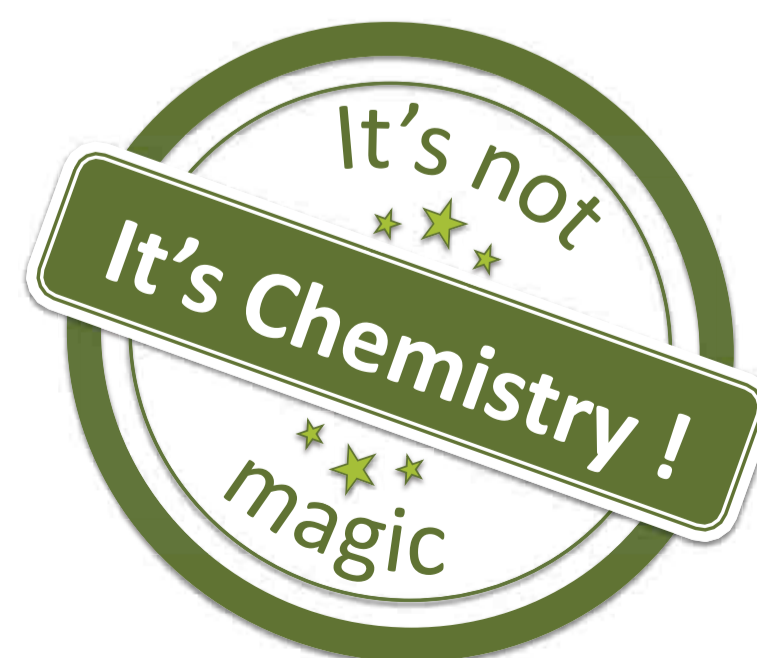
Water droplets created by high-shear blending are coated by hydrophobic silica powder which forms capsules.



What are the applications of dry water?

- **Cosmetics:** Delivery of active compounds (skin hydration, make-up...)
- **Fire-fighting:** painting rich in water able to delay progress of fire
- **Agricultural spraying:** precise and controlled delivery of water
- **Any other idea?**

Dry water is an easy demonstration to explain scientific concepts and to attract curiosity and interest of students for physics and chemistry.



Ana Paula Liberato Rodrigues | Escola Sec. Quinta das Palmeiras | Covilhã | Portugal

Effect of Acid Rain

What if suddenly giant volcanoes erupted on earth?

It is believed that most of the climate changes were caused by gigantic volcanoes that have thrown into the atmosphere many gases as it currently happens with factories and cars.

What happens to gases released into the atmosphere?

They form Acid Rain. Acid rain occurs due to the dissolution of acidic oxides in the atmosphere. An important effect of acid rain is the acidification of the oceans.

What are the consequences of ocean acidification?

Ocean acidification is the result of the pH decrease in Earth's oceans which is caused by the uptake of carbon dioxide (CO₂) from the atmosphere. This acidification significantly affects food chains.

We can simulate the acid rain formation by collecting gases during a volcanic eruption and make them react with water.

The acidified water affect living beings?

Let's test the daphnia 's behavior !



Our project aims to show the effect of acid rain on ecosystems through a playful and experimental way. Easy to perform in a science class, adaptable to various school levels and program content.

Ana Villaescusa. Maria Auxiliadora School | Algeciras | Spain

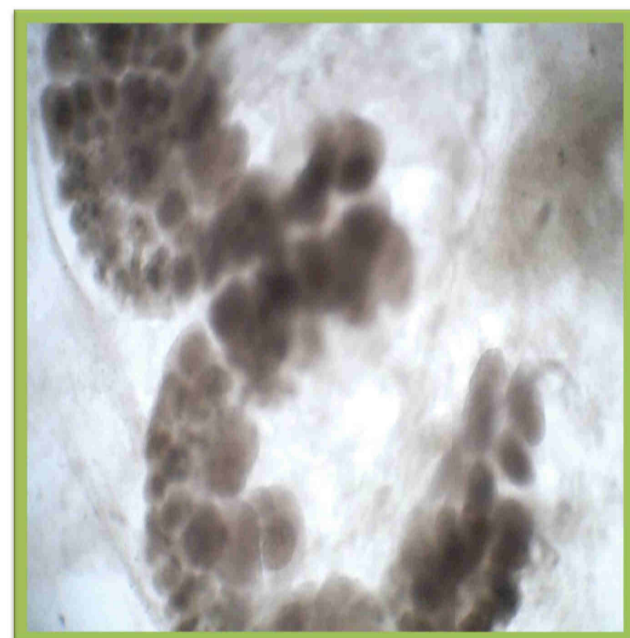
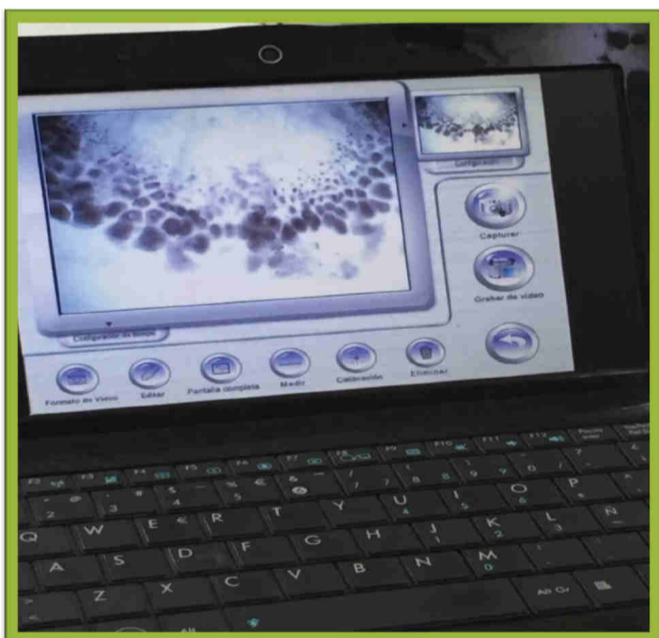
Rebellion in the sea

The new biological role of jellyfishes

Massive jellyfish blooming on Spanish coasts is a phenomenon with relevant social-economic implications. The aim of this study is to combine the changes in the abundance of these organisms along three beaches of the Straits of Gibraltar with the environmental variability, and to analyze their influence. Monitoring the observed populations and studying the biological cycles of these cnidarians completed a school project carried out from October 2014 to March 2016. This research was coordinated by scientists at the Institute of Marine Sciences of Andalusia (ICMAN-CSIC) and it is a clear example of the so-called citizen science.



Biological cycle of *Cotylorhiza tuberculata*. Digital microscope. School Laboratory 50x



Pelagia noctiluca. Female gonads. Digital microscope. School Laboratory (50x)

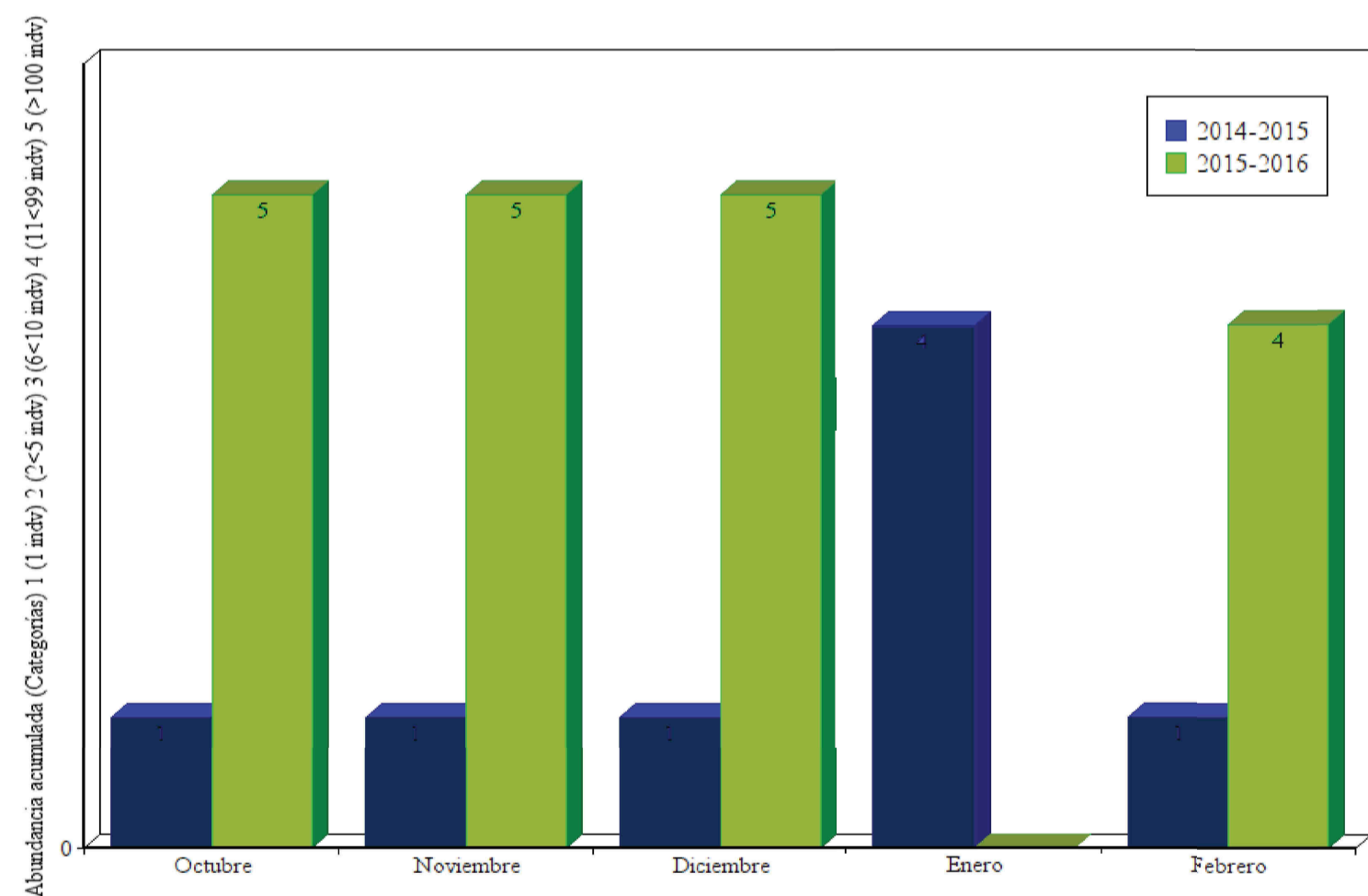
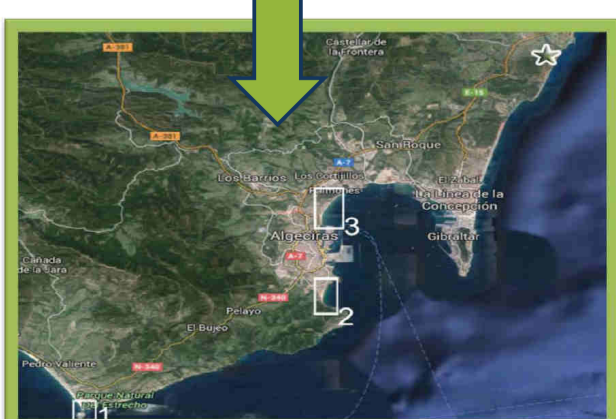


Table of beaching recording of *Pelagia noctiluca* 2014-2016



Sampling locations

This research project aims to raise awareness about the impact of human intervention on marine ecosystems, especially because gelatinous plankton is a very opportunistic group able to survive when other groups can not. **Don't forget this key message: The future of the seas lies in our own hands!**



Anna Dove | Dowdales School | Dalton in Furness | Cumbria | UK

MY SCHOOL IS AN ISLAND

A Local Growing Algae Experiment

Six 13-14 year old students from Dowdales School took part in a 10 week investigation.

They imagined their school as an island, and developed ideas to transform it into a fully functioning, self sufficient habitat for humans.

They took into account energy use, impact on the environment and sustainability in their planning, and used theoretical and practical activities to investigate their ideas.



The group conducted an algae experiment investigating the most efficient way to grow algae.



Concentrating on the growth of algae allowed the group to explore an exciting area of chemistry broadening their knowledge and deepening their understanding of algae and its benefits.

PROJECT INVESTIGATION

- Dowdales School re-location to Sweden
- Use of Algae as a sustainable, sufficient and economical source of energy
- Transportation Links
- School site alterations
- School operations
- Students Health and Well-being

This project developed students skills within science and also their communication and presentation skills using teamwork and problem solving while promoting independent learning. The students involved in this project felt it really helped them to improve their confidence and leadership.

This project can be adapted to work in any school setting or by collaborating with schools in your local community or in other countries. This is because the project is simple, versatile and flexible in cost to suit the environment your school is situated in.

It enabled the students to be more independent and creative in their ideas but fundamentally rooting them in science and allowing them to develop their inquiry skills.



Annamária Komáromi | Balassi Bálint Eight Grade Secondary School | Budapest | Hungary

Thermal protector „sunshade”

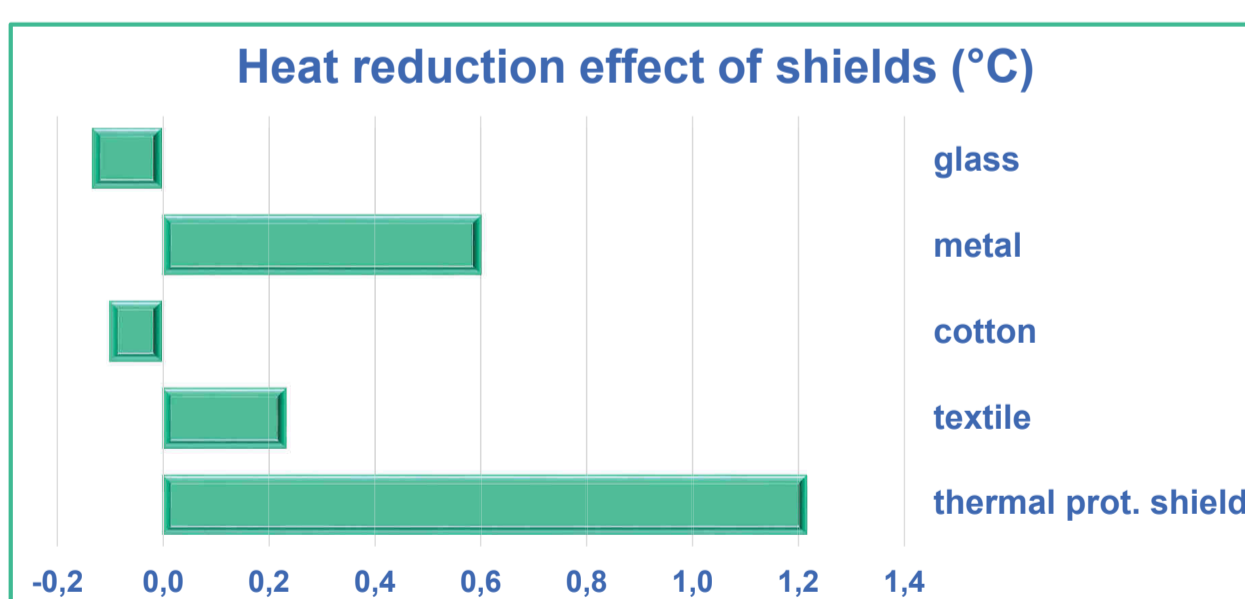
Space walk in classroom – an experiment

Skylab, the first American space station, lost its thermal protection shield during the launch in 1973. Engineers and scientists developed an emergency repair procedure.



We use this event to conduct experiments in physics workshops where students develop materials for heat shield.

After space walk in the classroom we study thermal radiation, absorption and reflection



Our student-groups do independent measurements to test different materials for heat shield.

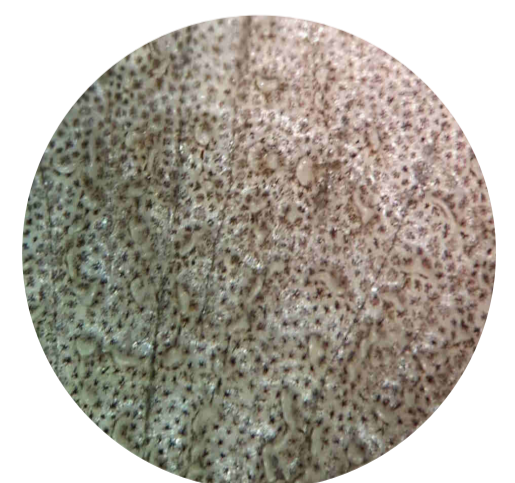
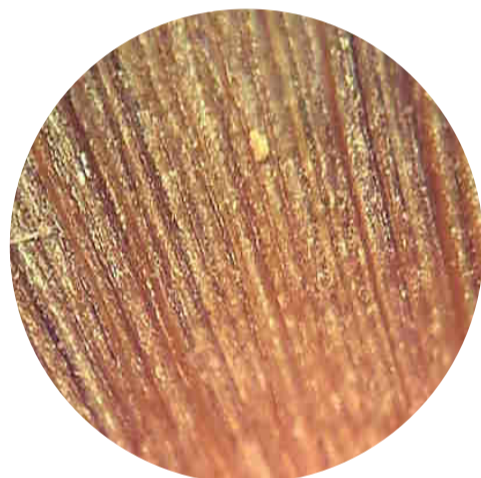
Students discover through their own exploration what radiations space objects are exposed to while on near-Earth orbits. They also learn about heat radiation incident to and emitted by Earth.

Dr. Budayné dr. Kálóczy Ildikó – Gőz József – SYM-BIO Group
Tóth Árpád Gimnázium | Debrecen | Hungary

A Stereoscopic World

Micro world is waiting to be discovered

Interactive microscopy research provides students with a spectacular view of Nature's beauty.



Protecting the values and wonders of the living world by recognition and improved way of thinking.



TÁG TermészettUDományos lab**OR**
Öveges labor és szellemi műhely

Nature, Science and Life represented as a unity in the spirit of sustainability

Science and our Environment

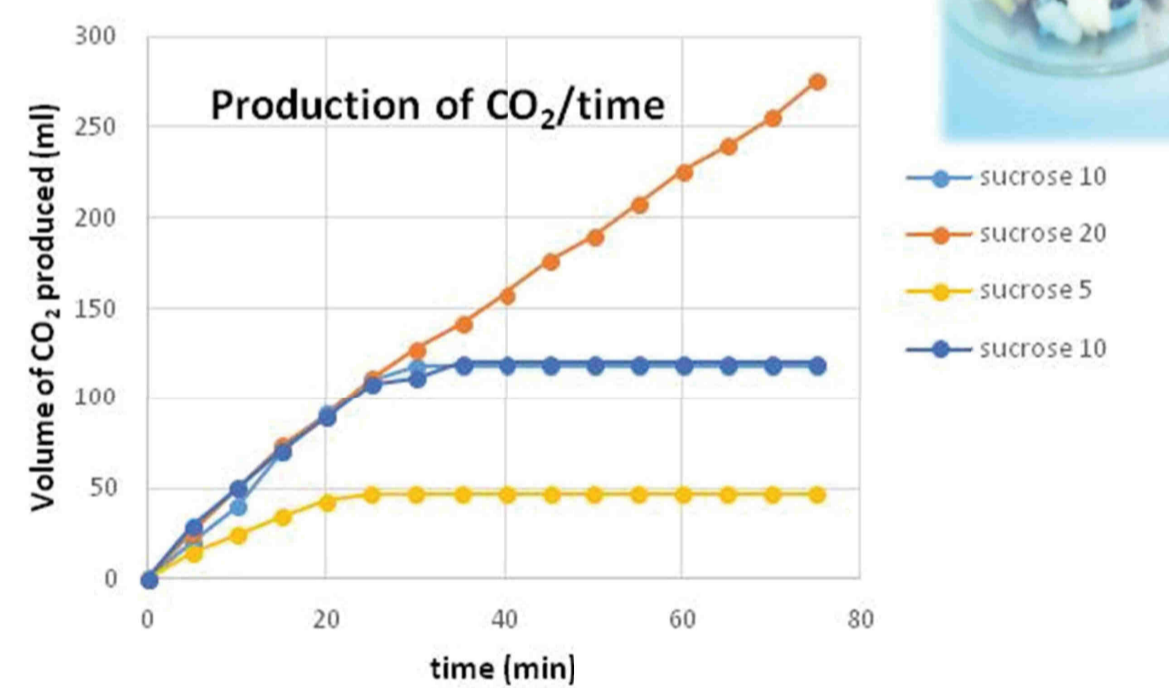
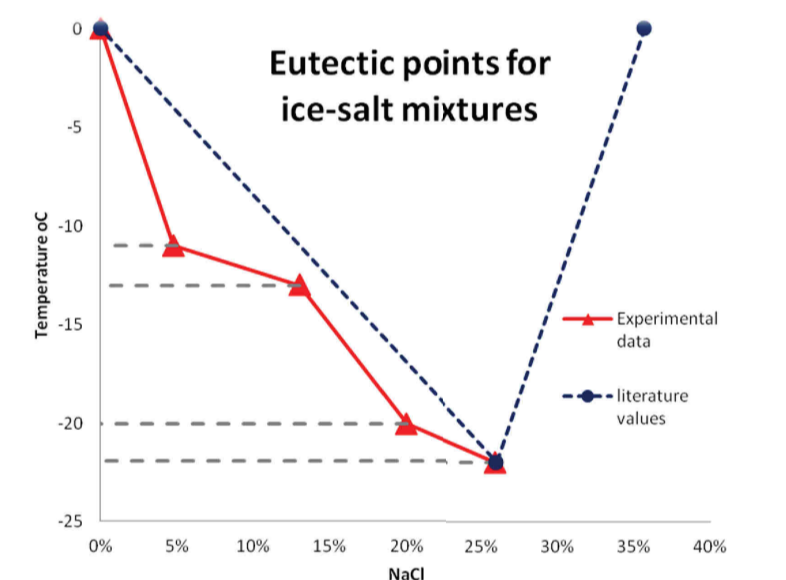
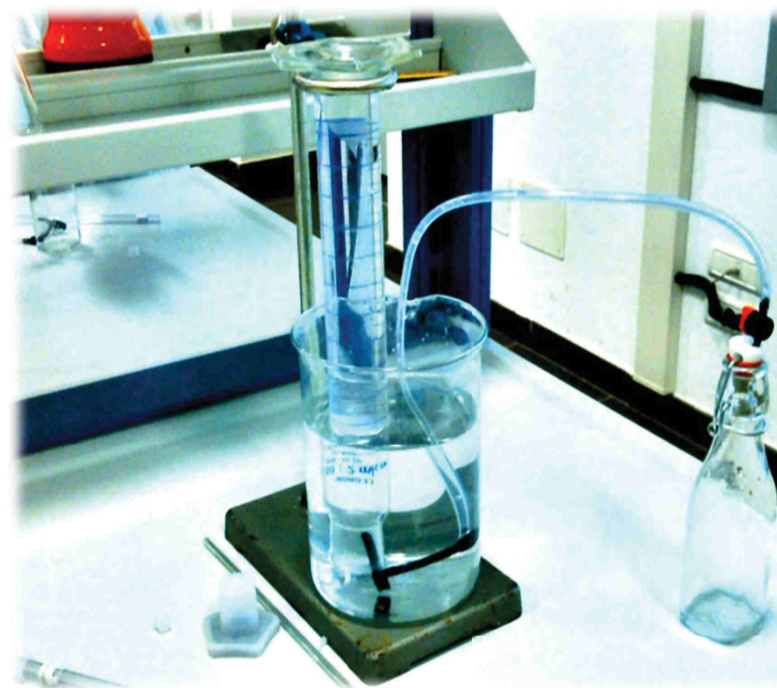
Francesca Butturini, Gordon Kennedy | Liceo Educandato agli Angeli | Verona | Italy

Rise and Shine!

Chemistry at breakfast time: Italian versus English style

Breakfast offers an excellent example of the meeting of culture, health and chemistry.

Using techniques from analytical, physical and organic chemistry, together with simple and easily found materials, we have been able to bring some of the abstract concepts of chemistry to the breakfast table.



Experiments with brewer's yeast, extraction of caffeine from coffee and studying ice-salt mixtures all provide students with an opportunity to connect chemistry to their daily lives.

Daily
science
at the
table!

Breakfast time: a moment for *real* chemistry!

José Luis Olmo Rísquez | I.E.S. Azuer | Manzanares (Ciudad Real) | Spain

Cryptic biodiversity in your school

At school and high school there are many and different ecosystems that can be found. The main aim of our project is to investigate, identify and recognize the cryptic biodiversity, i.e. hidden, not visible. For this reason, samples have been taken from different ecosystems such as soil or moss. The samples were brought to the laboratory where water was added to activate the microorganisms. After that, They were filmed in vivo with a camera attached to the microscope and a laptop computer. We have identified a total of 52 species and we have recorded more than 200 videos which have allowed us to describe and characterize the communities present in each ecosystem.

BIODIVERSIDAD CRÍPTICA EN EL IES "AZUER"

En este blog se va a ir mostrando la biodiversidad oculta que es posible encontrar en un Instituto de Educación Secundaria... información relacionada con los microorganismos investigados. Este proyecto (y el blog) es único en toda España y en Europa y en el Mundo, ya que no tenemos referencia de ningún trabajo u artículo que hayan estudiado la biodiversidad en un Centro de Educación Secundaria.

Inicio

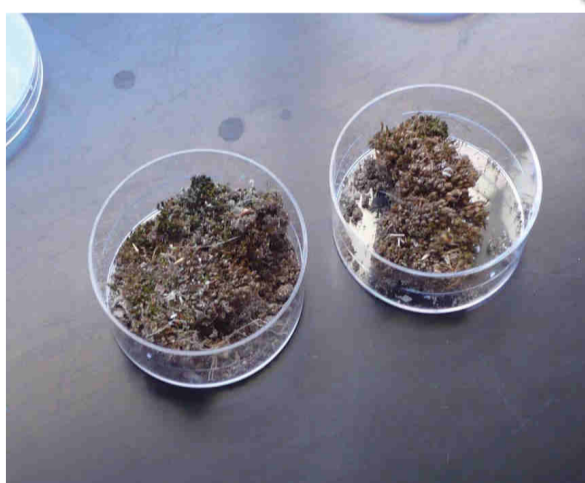
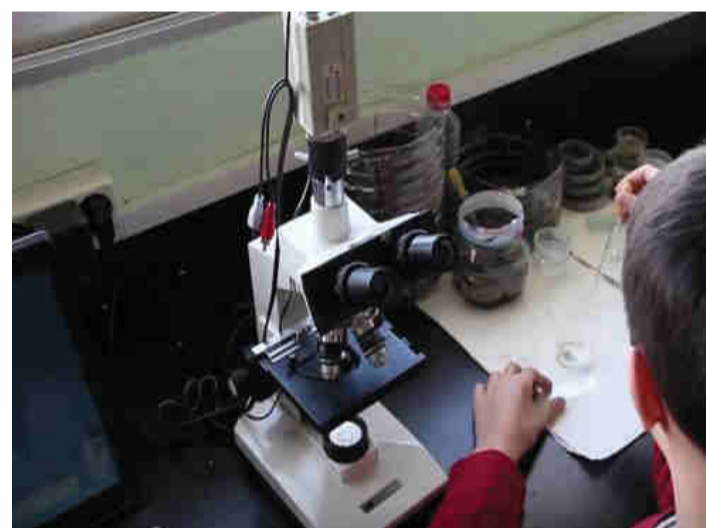
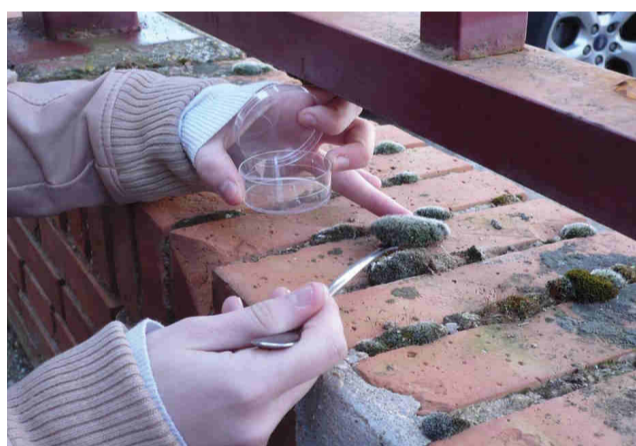
- AMEBAS DESNUDAS (2)
- AMEBAS TERCIAS (6)
- Amonia sp. (1)
- Aroloia sp. (1)
- ASPECTOS PEDAGÓGICOS (1)
- Bacterias (1)
- HELIOGRAFIA (1)
- Elaphocysta hyalina (1)
- Chlamydomonas sp. (1)
- Chlamydomonas sp. (1)
- Chlamydomonas sp. (1)
- CILICADOS (20)
- Ciliados ciliados (1)

Jueves, 7 de mayo de 2016

Video resumen del proyecto

Video resumen del proyecto.

K@leidos AZUER Versión Extendida



100%
Original!

Conclusion: Never before has cryptic biodiversity been investigated, at this level, at any school. This project has allowed students to learn about microbial ecology and to become interested in the wonderful and amazing microscopic world.

KODRIČ Filip, KRIVIC Gašper; mentor SILAN Darja Msc | Gimnazija Jožeta Plečnika Ljubljana | Slovenija

Spectral signature of plants grown under LED lights

Light is the most important environmental factor for plant photosynthesis. Its effect can be expressed in plant growth and development. The simplified action spectrum for photosynthesis has two peaks in red and blue wavelength.

Does the illumination with a special LED light will influence on plants too?

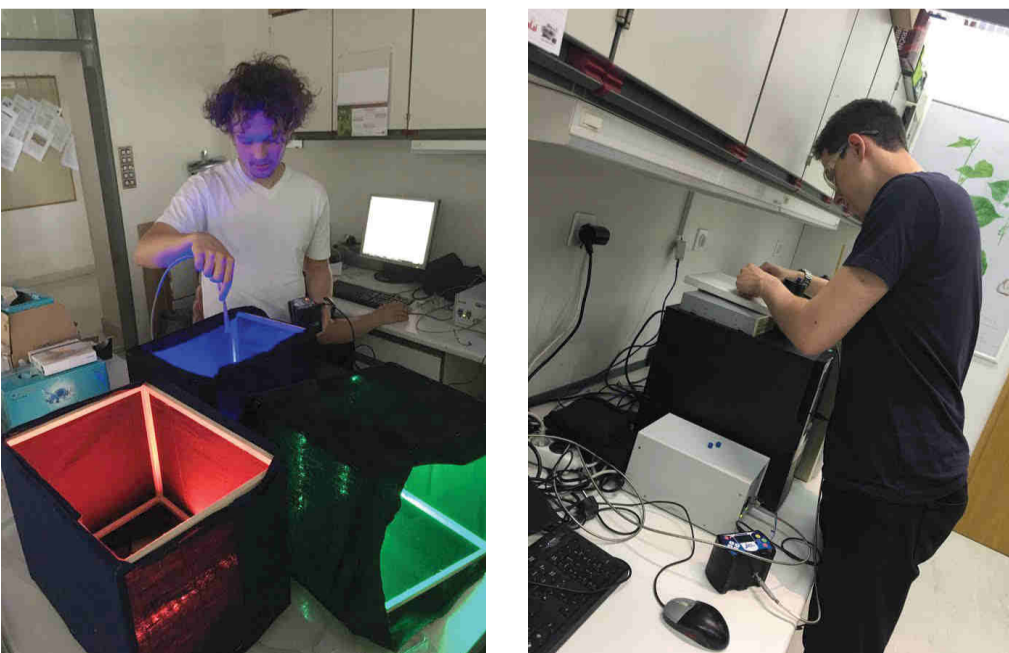
The test of three main light wavelength on plants - red, blue and green was done.



METHODS:

In each grow box we used 2x25 cm LED strip light 14,4 W/m, 60 LED lights/m of different wavelength: 470nm (blue), 530nm (green) and 630nm (red).

Wheat seeds (*Triticum aestivum*) were planted in each grow box and one additional for the control purposes on sunlight. Experimental place was under controlled conditions. (relative humidity of 40 - 60 % and temperature of 21°C ($\pm 2^\circ\text{C}$), 12 h photo-period.



Monitoring of plants growth was done. The transparency of leaves and their reflection parametra was measured with spectrometer JAZ and DH-2000 (Ocean optics) all along visible light spectrum (400 nm -700 nm).

RESULTS AND CONCLUSIONS:

- optical properties under the different LED light conditions shows the differences in the leaf spectral signatures of blue, red and green light;
- relative reflectance spectrum confirms that the blue light is the most important for plants growth;
- red light was more efficient only in early stages, but growth in later stages fell behind; it was more reflected than blue;
- green light grown plants were underdeveloped and shortest; reflection of leaves was the highest.

