

scIenCe & eTwinning

A selection of scientific projects
carried out by Italian schools
and their European partners





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Introduction

“In nature nothing is created, nothing is destroyed: everything is transformed”. This principle brings to the concept of “evolution”: the *in fieri* characteristic of our world.

This aspect has always fascinated human beings, whose history is marked by discoveries and inventions, which paved the way towards human progress. In ancient times discoveries laid mainly upon intuition, very few tools were available to scientists. Through centuries, this pattern has gradually changed, till nowadays, when human thought and “machines” interact as a *continuum*.

A concrete example of this trend is the relationship existing between Science and Technology, which is at the very heart of Seventh Framework Programme (FP7). Namely in June 2004, the European Commission published a communication on the future of EU research policy called “Science and Technology, the key to Europe’s future”.

In particular, in the paper “The Lisbon Strategy and the new dynamics for science technology and innovation” it is stated that “the EU produces a large amount of highly qualified people, especially in science and technology field...”. Therefore, European schools should take advantage of this virtuous circle by boosting the process of teaching and learning of scientific subjects, within their curricula.

In this publication is provided a selection of eTwinning projects in which Italian schools, together with their EU partners, focused upon scientific issues (Maths, physics, chemistry etc), using ICT to investigate and discuss these topics.

On 7th March 2007 in his speech to honour Europe’s scientific excellence, Janez Potočnik, EU Commissioner for Science and Research, affirmed: “It is not enough to have a good mind. The important thing is to use it well.”

ICT applied to science could be a starting point to put into practice this thought.

To know more about eTwinning:
www.etwinning.net
<http://etwinning.indire.it>

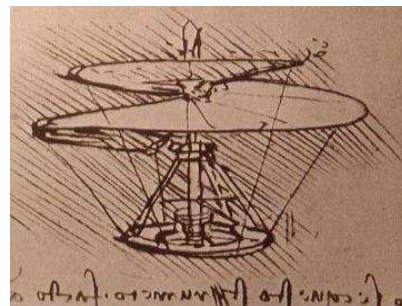
Fables of Leonardo da Vinci

Science Through Leonardo's Tales

Italian School: Scuola Media "G. Antona Traversi" (Meda - MI)

Teacher: Antonino Sergi

e-mail: antonino_sergi@yahoo.it



School partner: Ciobiskio pagrindine mokykla (Lithuania)

Teacher: Rasa Gurcyte

Project Description

Everybody knows Leonardo da Vinci, the Italian genius of Renaissance.

He was a painter, a sculptor, an engineer, an astronomer, a geologist, a mathematician, an inventor, a scientist, an anatomy scholar, an architect, a musician... But who knows Leonardo da Vinci as a writer? While investigating this aspect of Leonardo's genius, students have discovered and discussed, together with their European partners, which are his discoveries and inventions, and why they were so important for human progress.

On the website, created specifically for the project by Italian and Lithuanian partners, you are likely to see a selection of the most remarkable among his intuitions: the Anemometer, tools to test flopping wings, jointed wings crossbow motor for flying machine, parachute, "the car", flying shuttle. Focusing on Leonardo's genius, students had the chance to study literature and science at the same time, while enhancing their language and ICT skills.

ICT: ppt

To know more: <http://resources.eun.org/etwinning/ipertestuale%2031.ppt>

Age of students: 11-14
Theme(s): Language and Literature, Maths, Science, History and Tradition
Language: English
Type of School: Secondary Lower School

SciencEm@il

Communicate about scientific and non-scientific subjects

Italian School: Liceo Scientifico Statale "G. Ferraris", Varese

Teacher: Patrizia Iotti

e-mail: qualita@liceoferraris.it



School partner: Lycée Technologique et Scientifique "Nicéphore Niepce" (France)

Teacher: Denis Martin

Project Description

Science can be an amusing and original way to meet new friends and learning about their environment. This project applied this concept by making Italian and French students aware of possible steps to investigate the world surrounding us, focusing on scientific research field (namely chemistry and physics). Communication took place in English, thus improving the students' knowledge of scientific terms in English. Through a monthly exchange of messages the aim is to create a "Science Club", made up of students and their teachers. This working process stimulated the dynamic and interactive dimension in students' learning process in the two partner schools, while widening their linguistic and ICT skills. Namely, project goals are: exchange knowledge about physics and chemistry, with particular focus on laboratory activities, e-mails to communicate on scientific topics, comparison the "practice of science" in two countries on the basis of the students' school life.

ICT: e-mail

| | |
|------------------|--------------------------------------|
| Age of students: | 15-16 |
| Theme(s): | Foreign Languages, Maths and Science |
| Language: | English |
| Type of School: | Secondary High School |

The teaching and learning of scientific subjects in our school

Exchange of information on scientific Subjects



Italian School: Liceo Scientifico "A. Einstein" Milano
Teacher: Edoarda Paolini
e-mail: edoarda.paolini@istruzione.it

School partner: Sackville School (United Kingdom)
Teacher: Nicholas Falk
Other members: Albert Einstein Gymnasium (Germany)

Project Description

This project consists in an exchange of information concerning scientific subjects (science, Maths, physics) taught in school. Students prepared questionnaires to submit to their correspondents asking their opinions about the different subjects and the way they are presented in their schools, in laboratories, comparing syllabi and programmes. Laboratory experiments, or visits to scientific Institutions were reported and explained in detail. From these exchanges of experience and problems encountered in learning different aspects and levels of the subjects, students were stimulated by each other's ideas and results. Italian, British and German students used digital videos and a web-site, video-conferencing and live webcasts. The latter was used as the basis for lessons. The project gave the chance to exploit the full potential of what ICT can offer within the scientific field. Also the head of the schools were involved. Outcomes were the creation of a school working groups dedicated to their international dimension.

The aim of the project is to make the students aware of different approaches to scientific subjects, boosting students' comprehension on what "Unity in Diversity" means, by showing them a concrete application of this principle.

ICT: magazine factory

To know more: http://www2.edu.fi/magazinefactory/magazines/12389_7156/

Age of students: 15-18
Theme(s): Cross-Curricular Subjects, Europe, ICT, Foreign Languages, Maths and Science
Languages: English, German, Italian
Type of School: Secondary High School

Nature: the perfect Constructor

What laws does Nature use to create?

Italian School: Liceo Scientifico Statale "G. Ferraris"
Varese

Teacher: Patrizia Iotti

e-mail: qualita@liceoferraris.it



School partner: Zespół Szkół Zawodowych im. St. Staszica (Poland)
Teacher: Izabela Kolodziejczyk

Project Description:

Nature is the constructor with a creative limited imagination. Italian and Polish students taking part in this project took as a starting point of their research this question: "Does the Nature-constructor know the laws of physics and can it use them to build its creatures?"

A rich web-site in terms of contents and inputs for discussion, have been set up. During the duration of the project articles, dealing with the following topics, have been uploaded on regular basis: the force gravity; weight and friction; the sense of balance stability; the centre of gravity; the blood pressure; the production of the speech, the sight; the influence of radiation on living organisms.

ICT: web-site

To know more: <http://www.wodip.opole.pl/~iolchawa/eTw/etfiz/index.htm>

Age of students: 16-18
Theme(s): Foreign Languages, Maths and Science
Language: English
Type of School: Secondary High School

Maths to Play

Discover the creative side of Maths

Italian School: Liceo Classico "E.Duni" Matera
Teacher: Maria Teresa Asprella
e-mail: mariateresa.asprella@email.it

School partner: Lycée classique de Diekirch (Luxembourg)
Teacher: Geneviève Harles



Project Description:

This project wants to propose a non traditional approach to Maths though which, on the one hand, students can learn by playing, on the other, they think over the deepest meaning of this subject. Students are often scared by the most technical aspects of this subject, especially by its strictly accurate language. Aim of this project is to arouse curiosity and interest for Maths in young people, pointing out the fact that it has always been an essential part of human beings' culture and mind. The contacts between the two schools started with a Mathematical games exchange. Students are competing by proposing and solving problems with intriguing enunciations, whose resolution did not require the knowledge of complicated formulas and theorems, but only logics, intuition, imagination and...desire to play. Students in Italy and Luxemburg have proposed new points of view, approaching also history of Maths, finding out that it can express values and that Mathematicians have given and are still giving their personal contribution to the progress of society. Moreover some students became photographers and with digital cameras they have investigated Maths hidden in the reality of their everyday life. Many works were written in Italian, French and English, a dictionary of these three languages was provided.

ICT: magazine factory

To know more: <http://www2.edu.fi/magazinefactory/magazines/mathstoplay/?artCat=1>

Age of students: 15-18
Theme(s): Maths & science
Language: English
Type of School: Secondary Upper School

Young Astronomers II: The space conquest, from ancient scientists to today's discoveries



How did Astronomy change in time?

Italian School: Liceo Classico "Ugo Foscolo" (Albano Laziale-Roma)
Teacher: Antonio Cupellini
e-mail: cupellini.antonio@tiscalinet.it

School partner: 2nd Technical School of N. Smirni (Greece)
Teacher: Vassiliki Niarrou

Project Description

A *fil rouge* runs through centuries: the human beings' interest towards Nature and Sky. Through centuries, inventions and discoveries have accompanied men and women on their way towards progress. In particular stars, planets, the Sun and the Moon have been the target of human studies and speculations. Before the first man walked on the Moon, many ancient scientists, from Plato, Pythagoras, Archimedes and Plutarch to Galileo and many others helped to open the way for today's and tomorrow's generations. In this project students got familiar with scientific thought of our ancestors, while learning more about modern inventions and discoveries on the conquest of space. Cross-curricular approach play a cornerstone role in this project. The Italian teacher of Latin and Greek works worked with Maths teacher, integrating ancient theories with geometric theorems, which help to comprehend the basic laws of astronomy.

Through an *ad hoc* web-site students may communicate, learn how to work together, exchange experiences and ideas, and above all, train their ICT and foreign languages.

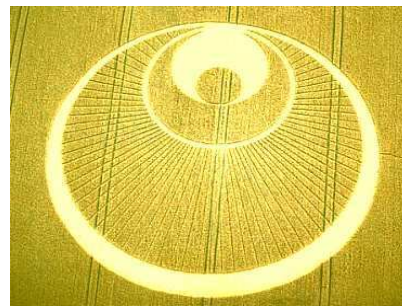
ICT: website

To know more: http://2tee-n-smyrn.att.sch.gr/astro_site/top.htm

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|------------------|---------------------------------------------------------------------------------------|
| Age of students: | 15-17 |
| Theme(s): | Cross-curricular Subjects, Maths, Science, Language and Literature, Foreign languages |
| Languages: | English, Greek, Italian |
| Type of School: | Secondary High School |

'Crop Circles' Challenge – Collaborative Maths on the Net

Create a Maths Network



Italian School: ITCS "Cesare Vivante", Bari
Teacher: Palmira Ronchi
e-mail: palmira.ronchi@istruzione.it

School partner: Sint-Donatus Instutuut (Belgium)
Teacher: Ivan Merchtem De Vinne
Other members: Intercultural Gymnasium of Thessaloniki (Greece)

Project Description

A challenge among European students to reconstruct some "Crop Circles" formation using Geogebra (a free Maths software). Through this partnership Italian, Belgian and Greek schools developed and created cross-curricular materials, in so doing colleagues teaching different subjects such as science, chemistry and physics had the chance to team work.

Geometry, algebra and calculus are matched in GeoGebra (www.geogebra.at) in an innovative way, in order to give pupils and students a more active role in learning Mathematics. Today Geogebra is available in 13 languages. Teachers from all over Europe use and contribute to the multi-lingual user forum (www.geogebra.at/forum) and the multilingual pool of education materials (www.geogebra.at/en/wiki) around Geogebra. By using this tool the partners have established a partnership through which the schools involved investigated in a Mathematical way "crop circles" formations.

The approach and final results are both cross-curricular; they are respectively the working process and the outcome of this project, which can represent a model to follow for other European teachers, who wish to teach Mathematic in an innovative and original way.

ICT: blog

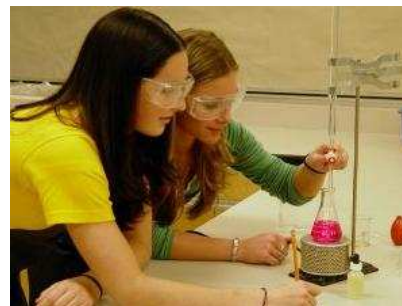
To know more: <http://partnersinpatterns.blogspot.com>

Age of students: 13-18
Theme(s): Environment, ICT, Maths and Science
Language: English
Type of School: Secondary High School

eFestival of Science

Show and Tell Scientific Experiences

Italian School: Istituto Tecnico Nautico "San Giorgio"
Genova
Teacher: Teresa Procopio
e-mail: teresaprocopio@itnautico.it



School partner: Dolnośląski Zespół Doskonalenia
Zawodowego (Poland)
Teacher: Halina Bednarz
Other members: 4th Lykeion of Corfu, Greece

Project Description

Science could be also a focus for a Festival, which could be transformed in an "e"Festival, if ICT are the pillars on which project is build upon.

Italian and Polish students produced multimedia resources -on science, physics, astronomy, chemistry – like photos, movies, presentations.

Different aspects of science are investigated and the results of the team work were published on an *ad hoc* website. Namely a video explaining resonance is provided, together with multi-medial presentations on several Maths experiments, photo reportages on different computer tuning and a video on a paper balloon filled with a lot of air floating in the air.

ICT: website

To know more: <http://efestival.profusehost.net/vip/index.php>

Age of students: 14-17
Theme(s): Informatics/ICT, Cross-curricular Subjects, Maths, Science, Media,
Pedagogical S.
Language: English
Type of School: Secondary High School