

These are the projects selected by the Italian National Steering Committee. The selection process was difficult, since the quality of all projects submitted by the Italian teachers was very high

### A Compact Cosmic Rays Telescope for Outreach Activities

A. Di Giovanni, A. Candela, M. D'Incecco, F. Arneodo



The Compact Cosmic Ray Telescope is a portable tracking system to detect charged particles produced by the interactions of cosmic rays with the atmosphere. The apparatus has been developed as a didactic tool. Students are introduced to the invisible world of subnuclear particles, opening a new window to the modern physics.

### Science Games

G. Salerno



The game in the teaching of Science is a cognitive model for the study of complex phenomena. The combination of high school play and learning is generally neglected, but can be a valuable tool in science education. This work includes games of Earth Science, Genetics and Chemistry.

### ACCOMPAGNA – ACceleration + COMPAss Geo Navigator

M. Casoni, M. Nicolini



We realized a CPU with on board 3-axis acceleration sensor and 3-axis magnetic field sensor. It gets the final trip position through acceleration integration and trajectory-magnetic field vector angle estimate. Event-triggered "Adaptive Frequency Acceleration Sampling" software strategy. Students involved: G. Busi, T. Calzolari, S. Campana, G. Colombari, L. Dallari, I. Mazzi, E. Rebecchi.

### Solar Tower

D. Barca



The solar tower technology is a modern methodology of renewable energy production. The physical principle which is at ground of solar tower working is the energy conversion from solar radiation into kinetic energy of air molecules, placed under a bell-glass, and the afterwards utilisation for feeding one or more eolic turbines.

### From Soil to Photosynthesis

A. Cane



The project is based on the method of cooperative learning which enhances the centrality of the teaching-learning relationship: the students of the primary school and the superior schools (tutors) learn to observe, describe and record natural phenomena reproduced in controlled laboratory conditions. They are the protagonists of the process and the teacher is the director.

### Space ...effects - Weightlessness Experiments

G. Pezzi



Experiments regarding weightlessness conditions have been recorded by a wireless video camera fitted for a launch module. So we can observe what is happening inside the box, during the free fall of a pendulum, a candle, a bottle of water, a spring, magnets, scales.... and other equipments.

### Genetic Transmission of Inheritable Characters and Biotechnology

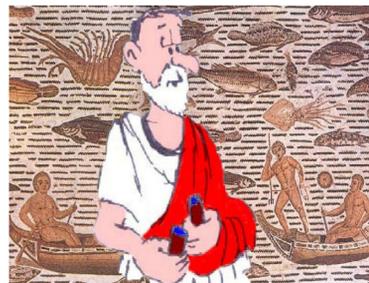
F. Cutrona, M.L. Vittorelli



A 20 hour lab course for secondary school students (age 16-18 years), targeted to the close examination of genetic topics and of some biotechnological applications in the field of medicine and forensic analyses, is presented.

### Studying Chemistry with Pliny the Elder

G. Farusi



The project moves through some doubts and statements of Pliny the Elder. A selected passage of the "Naturalis Historia" the context from which the learning process starts is talked over in the classroom and then one moves on, readapting in the lab, either the same natural event the author refers to, or something similar.

### Robot@mico

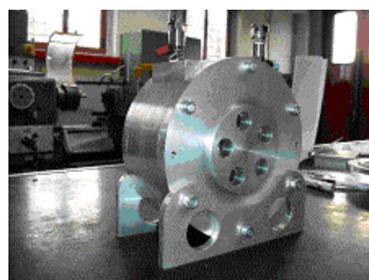
M.G. Gallo



The project Robot@mico has been developed in school since 2004-2005. It has evolved over time both in physical devices used and classes involved. In 2009-2010 the students have built and programmed robots that could play football, using Lego Minstorm teaching kit and C programming language. Four robots were built, two with the role of forwards and two with the role of goalkeepers, with different softwares.

### The Tesla Turbine - carrying out projects of the past for an innovative use in the present

R. Stocco



The Tesla Turbine is a bladeless turbine that exploits the properties of the boundary-layer of a fluid. Two models, tried in 1909, did not give the hoped results. If they had been constructed with materials and technologies currently available, perhaps the story would be different. Our project has involved students and teachers from four Schools. The turbine has been designed by the CAD-CAM. A small prototype and three turbines were assembled.

### Science Box: Force-Movement-Energy

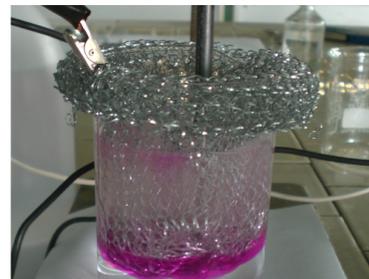
S. Hasler, M. Zanella



Explore the world of science and phenomena of physics through fascinating experiments, stories, picture books, non-fiction books and hand puppets. Target group are especially children in kindergarten, parents and skilled personnel in education.

### Why Does this Occur? Teaching Electrochemistry in a High School

C. Duranti



The project is focused on the experimental study of the electrolysis of aqueous salt solution also with electrode overvoltage. In the classroom activities the English teacher has been involved too according to the CLIL method.