



Trip to Lago Nero (Tusco-Emilian Apennine, Italy): How has our Apennine been changing?

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The sharp division of disciplines in Italian Secondary school is a problem which hinders the natural learning of pupils. At the end of the 1st education cycle, candidates must stand six written tests and an oral exam during which they present a topic that includes a lot of disciplines and that they develop unifying what they have been taught fragmentarily. Climate changes that are taking place and the use of Earth resources are a significant topic suitable for a multidisciplinary as well as interdisciplinary approach.

Thanks to the Region of Tuscany, which has financed the Educational Contract “ An agreement for water” (2012-2015), we could develop this module which involves 14 years old students and is focused on the climate change evidence in a lake, Lago Nero, originated in the Tusco-Emilian Apennine during the development of an ancient Wurmian glacier.

The didactical path includes:

- lessons in the classroom on weather, climate and climate changes caused both by nature and by man.
- A focus on Lago Nero
- A trip to Lago Nero, observation of the landscape geomorphology: differences between fluvial valleys and glacial valleys, signs of remote events such as roche mountonnée or recent ones such as landslides and floods caused by intense rainfalls. Collection of samples.
- Participation at a conference organized by the Region at San Giorgio Library in Pistoia (<http://rinnoviamoci2011.blogspot.it/>) during which students met some administrators and talked with them. A video made by the pupils was presented on this occasion. <http://www.icsfrankcarradori.it/studenti/>

Further activities include:

- Open day for families of the younger pupils, during which older pupils explained some of the activities carried out, included the module on Lago Nero.
- identification of minerals (connection with Chemistry)
- identification of rocks outcropping in the area of the lake: what do they tell about geologic history of our mountains? How can they reveal the age of a geologic formation? (connection with Geology).
- information from vegetation about climate changes which are taking place. For example, the limit of the arboreal vegetation (climax of the area is Abieti-Fagetum) has risen of about 30 m in the last 40 years , as it can be seen from old pictures (connection with Ecology).
- Climate changes (connection with Physics)
- Education on the necessity to preserve some micro environments peculiar of Apennine chain (glacial relics) which have remained until now thanks to a microclimate which is rich in precipitation and quite cold at northern exposures.

Other disciplines which are involved are Geography, Technology and History.

The whole class was involved and strongly motivated. It became clear how important the problem is and how significant our personal commitment is to face climate changes. Results in learning turned out to be different but none of them was below standard.