Università degli Studi di Perugia

Corsi di Laurea in Geologia @ unipg

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Piano Nazionale Lauree Scientifiche

Promoting innovation in Geoscience education: the experience of Geology Courses @UNIPG

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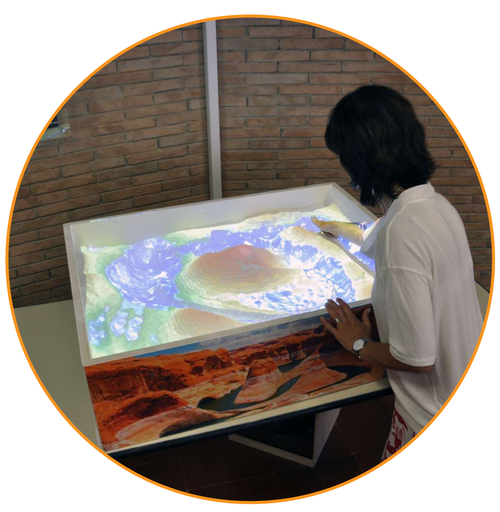
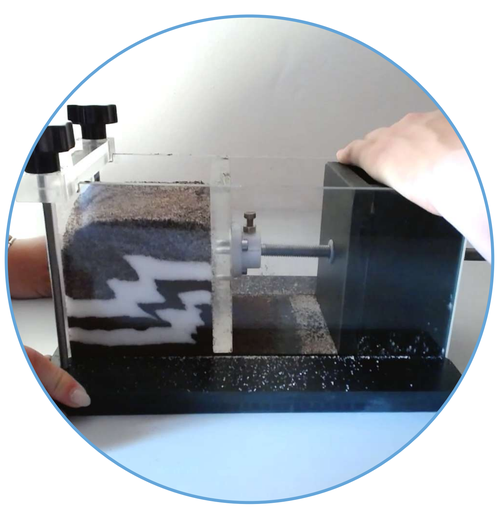
The new activities developed by the Geology Courses at the University of Perugia were organized on two different fronts: 1) the organization of a unique interdisciplinary laboratory for geosciences: the **TerraLab Explorer** and 2) the development of a new and innovative **web site** populated by a large number of **Augmented Reality contents**.

http://geo.unipg.it

The **TerraLab Explorer** is intended to host students and educators from the high school (and university students) for developing laboratory experiments following the "learn-by-doing" approach. Among the proposed experiments are the Augmented Reality Sandbox for simulating Earth's surface processes, the study of tectonics, the simulation of lava flows on natural terrains printed in 3D, the study of transport of Earth's material using a rock tumbler, macro- and microscopic observations of rocks, fossils and minerals, and 3D scanning and printing of geological objects. In the TerraLab Explorer students and educators can perform a number of experiments, extract data, validate hypotheses, and test their knowledge.

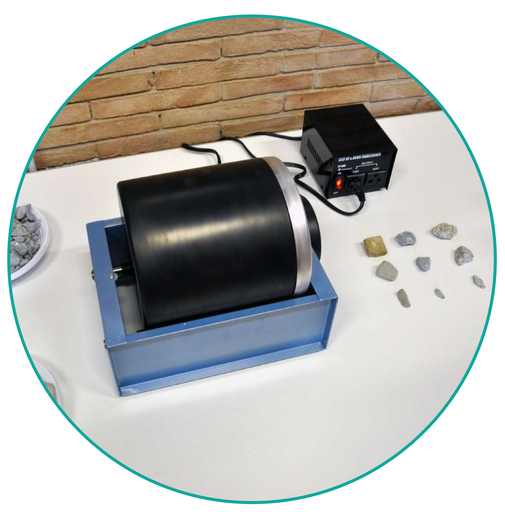


01 AUGMENTED REALITY SANDBOX
Use your hands to sculpture real time terrain morphologies, add water or lava, and observe how the ladscape changes instantly in space and time.



02 EXPERIMENTAL TECTONICS
Build, observe and analyse the geological and structural evolution of orogenic belts and the development of geological structures in time.

03 VOLCANO LAB
Measure viscosity and reproduce lava flows on landscapes generated by high-quality 3D printing to understand how lavas with different viscosity behave while flowing.



04 ROCK TUMBLER
Perform abrasion experiments of different rock fragments to simulate transport processes and measure their change in shape and size.

05 GEO.FAB.LAB
Scan in 3D samples of rocks, minerals and fossils and print them using a high-quality 3D printer to understand the geological processes that acted to generate them.

The **web site** has been designed in order to be easily accessible through mobile devices and contains many interactive contents to inform students about geological processes and the fascinating life of geologists. The site also hosts many outstanding contents of augmented reality that students can experience using their own mobile devices: the "**Augmented Reality Newsletters**". These are about the major topics in geosciences including plate tectonics, earthquakes, volcanoes, fossils, minerals, etc., and can be downloaded and used by students and educators in the classroom or at home.