

Volcanologists for a day: an experience with Canarian students

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Abstract

Geology is one of the key areas in both primary and secondary education. However, when teaching the areas related to geology, many doubts arise both, for teachers and students. In the case of students from the Canary Islands, who live literally on volcanic islands, geological concepts and processes form part of their environment, their heritage and is relevant for them.

During the 2021-2022 academic year, and within the educational project "Ciencia a lo grande" (Science in a big way), a number of practical workshops on volcanoes have been designed and developed in 9 primary schools in Tenerife, with the target audience being either, students or teachers, who also received specific training to be able to continue the activities on their own in the following years. The workshops have been focused on the activation of perception and awareness of our environment.

Materials and Methods

Training for teachers Working on concepts and processes

Energy
Gases
Explosiveness
Viscosity
Eruption
Volcanic structure

Practical workshops with students Hands-on activities

1. Slime race
2. Analysis of Canary Islands volcanic surface
3. The role of gases on a volcanic eruption

Results

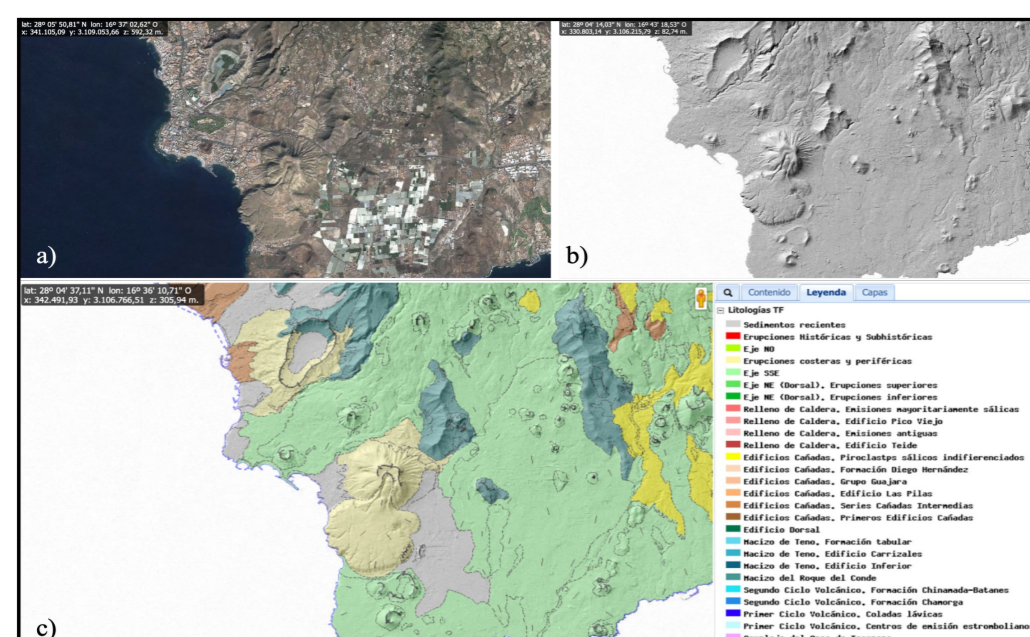
Slime Race

We use slime (viscous polymeric fluid) to simulate volcanic lava. If the lava is more liquid, the eruption produces a larger volume of material that generally moves faster than more viscous lava. To see this property visually, we place three samples of fluid of different viscosity on an sloping surface at the same height in a race to see which one moves faster. The students formulate hypotheses, observe and draw conclusions.



Analysis of Canary Islands volcanic surface

The aim of the activity is to distinguish on the maps the materials that make up each of the areas of the terrain where we can find different morphologies and volcanic structures depending on the type of volcano. The analysis of satellite images gives us an idea of the eruptive history of a volcano, and so, its danger. For the analysis of images, space photographs and orthophotos of the Canary Islands, where the pupils live, were used.



The role of gases on a volcanic eruption

The eruptive process was simplified by using the phenomenon of effervescence, which allows a rapid accumulation of gases inside a container. The container was a syringe (magmatic chamber) filled with slime and water, to which an effervescent vitamin tablet was added. The more liquid mixtures emerged from the syringe in a fluid form, while the more viscous mixtures clogged the hole until they reached a pressure that caused them to come out explosively.



Evaluation by scientists Science educators who carried out the activity

- Very good reception of the training for teachers.
- Very high reception and participation of the students.
- Most of the students already knew some terms related to volcanoes

- Preconceptions about viscosity were quite accurate.
- Great interest in observing the experiment.
- Slime made the activity more attractive and intuitive.

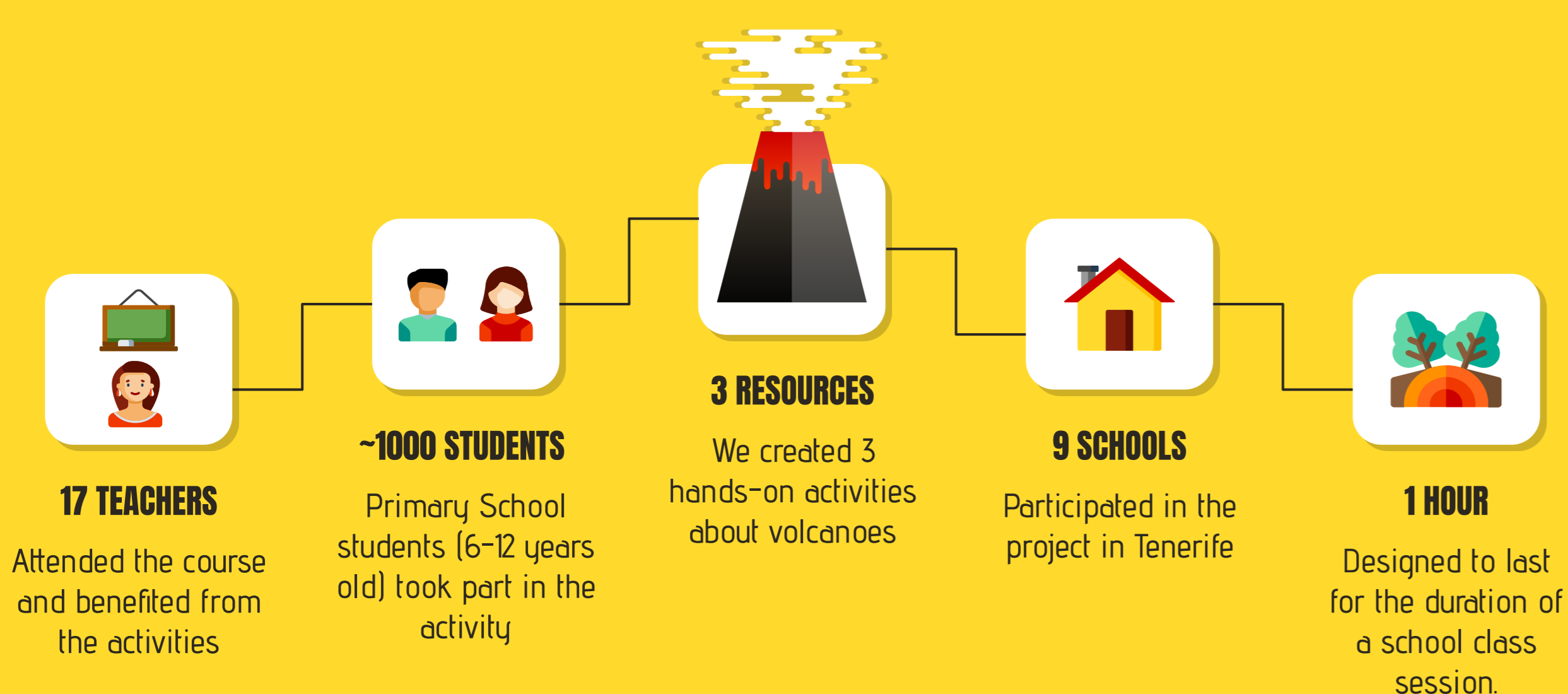
- The learning curve was suitable for a one-hour session.
- Students can point out and even identify most of the volcanic buildings present without the need for prior training.
- The resources can easily be adapted to different levels.

- The experiment amazed both pupils or teachers.
- The students understood the influence of viscosity on the explosiveness of a volcano.

Evaluation by teachers Through satisfaction questionnaires

- Even the youngest students were able to use the deductive reasoning needed.
- 80% agree that the activity was well understood.
- 20% said that the students had some difficulty at the beginning (prior to the experiments).
- Some teachers said that they had learned too...
- The activities were enjoyable, captured the students' attention, and were very easy and fun to carry out in the classroom.

Impact



Conclusions

The qualitative results obtained in the 9 schools where it has been implemented have been very positive. The three educational workshops carried out within the framework of the project have used accessible resources and didactic materials of their own elaboration, which work both with elementary school pupils (6 to 12 years old) and with the teaching staff. Theoretical and practical training has been given to these teachers, reaching 17 teachers from these 9 schools.

References

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