

SUMMARY OF ACTIVITY

Young students from disadvantaged socio-economic areas in Naples (Italy), were among those who suffered most from the prolonged school closure due to the pandemic. These areas are characterized by higher-than-average school dispersion. The STEM project *Next Land* (<https://www.next-level.it/progetti/next-land/>), is intended for students living in such areas and it has the goal of instilling interest towards scientific topics into young students and to promote the role of scientific education for sustainable development.

Our working group has developed teaching activities with particular attention to concept application and hands-on experiment and has reached 21 seventh-grade classes from four different schools (~250 students) of age 11-14. We here present our main findings.

METHODOLOGY AND TEACHING APPROACH

The students were asked to fill in an entrance test of 10 questions to evaluate their feelings towards the social importance of geosciences and their initial knowledge of basic geosciences concepts (with no grades).

During the lectures, we used a **Predict-Observe-Explain strategy** to engage the students in conversation and raise their interest. We show an example of this methodology using Google Earth images that we used for activity 1.

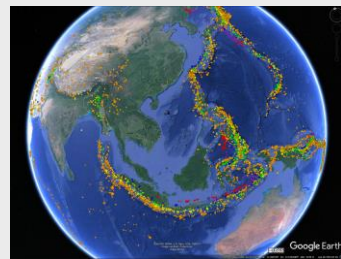
Prediction:

Looking at this image, are there places where earthquakes happen more frequently?



Observe:

The locations of earthquakes were shown and the students were prompted to make observations. Here we report some of their answers. *"Earthquakes occur more frequently in poor countries."*



"There are safer places."
"Earthquakes occur more frequently along the edges of something."

A short 15 minutes lecture on the theory of tectonic plates was given, followed by Practical Activity 1.

Zoom in and explain: Following practical activities, where the students were asked the same question (*Do earthquakes happen more often in some areas?*),

PRACTICAL ACTIVITIES

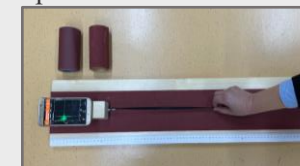
We developed four activities supplementing and supporting four geoscience subjects:

1. Assemble a jigsaw puzzle reproducing the major tectonic plates.
2. Build a 3D model of a fault.
3. Reproduce an earthquake and measure it with the aid of a smartphone app.
4. Observe the behavior and effects of a tsunami on a model town.

1. Tectonic plates puzzle



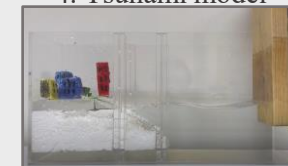
3. Reproduction of an earthquake



2. Fault 3D model



4. Tsunami model



RESULTS AND EVALUATION

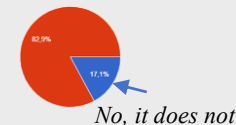
In order to evaluate the impact that our lectures had on the students, we asked them to fill in a final questionnaire on Google Modules. Unfortunately, despite the interest that the students showed in class, only ~ 45% of them filled in the exit form. Here we show the outcomes of two questions. In the entry questions, the students were asked whether "We know why earthquakes occur". The answers were almost split at 50% between YES and NO. From the exit questionnaire, the 83.3% of the students answered that earthquakes happen because plates move, 10.3% stayed of the opinion that we cannot know for sure, while ~9% answered that underwater landslide can lead to earthquakes (rather than causing tsunamis). We explain this confusion with the observation that the tsunami activity was always the last presented, therefore suffered from students' tiredness and distraction.

The achievement that made us proud and happy, is reported in the following pie charts.

Do you think studying Earth Sciences can be useful for the development of society?

Entrance test

82.9%: Yes, what happens in society depends on what we study



Exit test

91.6%: Yes, because we can learn how our planet works and take action to save and protect human lives and the environment

