



# Global Junior Challenge

Projects to share the future

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## Project Location

**Country:** Italy

**City:** Rome

## Organization

**Organization Name:** Marymount International School of Rome

**Organization Type:** School

## Privacy Law

Consenso al trattamento dei dati personali

**Do you authorize the FMD to the treatment of your personal data?:** I do authorize the FMD to the

## Project Type

Education up to 15 years

## Project Description

### Description Frase (max. 500 characters):

Students, using 3D printers and laser cutters, created a model of an area of Italy (it can be done with any other area of the world, of course). The most important part students had to work on is not the surface but the layers of rocks below ground level: they reproduced the faults where two layers of rocks meet. Then, using a little motor (12 Volts, DC) connected to one of the layers, they simulated the pressure of one layer on the other one: the pressure increases, slowly yet relentlessly, as it is controlled by a knob (a potentiometer). When the pressure is enough and reaches the trigger point, these two layers of rocks slide and the pressure is released, altogether, which makes the soil shake. Students also added sensors that measure the pressure and the amount of shaking. This interesting and educational project involves art (3D design, coloring), science (geology), math (measuring pressure and scaling it), technology (using motors, wires, Arduino), and engineering (putting the project

together): a full STEAM project!

### **Project Summary (max. 2000 characters):**

Full description of the project: students design on TinkerCad and build (with 3D printers and/or laser cutters) landscapes divided into two faults. They attach one fault to a servo motor or DC motor. The motor is powered by a power supply or battery and its power is controlled by a potentiometer. By adjusting the power sent to the motors, students recreate earthquakes (from which Italy has been affected this year!) and understand how the tectonic plates and faults work. Moreover, students measure the amount of shaking by using an Arduino and a tilt sensor. They also use LEDs to visually show how much shaking has been generated (the equivalent, in small scale, of the real earthquake scales). This is very educational and helps the students to better understand what has happened to the homes affected by earthquake and why. It educates the kids on a part of the Middle School science curriculum and helps them to deal with the amount of destruction they experienced. Students also have time to look at how different structures behave during earthquakes (buildings, bridges, etc. made with 3D printers): a core part of the Maker and FabLab movements is thinking and designing to help humanity, and make the world a better place. Students try to come up with an idea to build safer structures!

### **How long has your project been running?**

2016-10-01 00:00:00

### **Objectives and Innovative Aspects**

This interesting and educational project involves art (3D design, coloring), science (geology), math (measuring pressure and scaling it), technology (using motors, wires, Arduino), and engineering (putting the project together): a full STEAM project! It teaches students how earthquakes work and it helps them to process with what happened to them and their homes, by better understanding what cause these terrible events.

### **Results**

**Describe the results achieved by your project How do you measure (parameters) these.** Students cutting, A (max. 2000 characters):

**How many users interact with your project monthly and what are the preferred forms of interaction? (max. 500 characters):** Students

(about 200),

## Sustainability

**What is the full duration of your project (from beginning to end)?:** Less than 1 year

**What is the approximate total budget for your project (in Euro)?:** Less than 10.000 Euro

**What is the source of funding for your project?:** Grants

**Is your project economically self sufficient now?:** No

**Since when?:** 2017-07-01 00:00:00

## Transferability

**Has your project been replicated/adapted elsewhere?:** Yes

**What lessons can others learn from your project? (max. 1500 characters):**

This is a good example  
curriculums (science, m

**Are you available to help others to start or work on similar projects?:** Yes

## Background Information

**Attachments:**  [Earthquake Project](#) [1]

[Arduino robot sensor stampa 3D printing laser cutter cutting technology math science geogreaphy earthquakes](#) [2]

Fondazione Mondo Digitale

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**Source URL:** <https://gjc.it/en/progetti/earthquake-simulator>

### Links

[1] <https://gjc.it/sites/default/files/earthquakes.jpg>

[2] <https://gjc.it/en/keywords-separate-commas/arduino-robot-sensor-stampa-3d-printing-laser-cutter-cutting-technology>