

## GOOD PRACTICES

Description for the site:

### Title: Aerosol... hooked on! How do you control a 'missing crown'?

There is growing evidence that carbon dioxide levels in buildings are closely linked to the airborne spread of infections. Carbon dioxide is produced by the exhaled air of people living inside a room. The aim of the scenario is for the students to reflect on how diseases are transmitted in closed spaces, the role of CO<sub>2</sub> and other parameters in the transport of airborne particles into them, while the ultimate goal of the scenario is for the students to develop a sensitive sensor to measure airborne particles using elements that already exist in science laboratories or that can be obtained by simple means such as Arduino microprocessors.

This good practice presents an open school education initiative, developed by GEL MACRY GIALOU and the educator Anna Karaiskou from 10/10/2021 to 1 / 5 /2022. Science scientists participated in the activities. This practice was repeated in the year 2021-2022 in another context and another structure, by the same teacher as well as the teacher Antonis Fountoulakis who are also the authors of this open scenario. This practice was previously presented in:

<https://connect-eu.exus.co.uk/el/2021/11/05/%ce%b1%ce%b5%cf%81%ce%bf%ce%bb%cf%8d%ce%bc%ce%b1%cf%84%ce%b1/>

- **Care:** In this phase, students' curiosity and need to upgrade their knowledge level are stimulated, pre-existing ideas are explored and prior knowledge is activated. Interest and participation is fostered through real work based on a community problem, in this case the control of COVID-19 and ways to build a sensitive sensor device. The concerns and needs related to the problem are identified and the challenges to be investigated and the affected social actors to be involved are prioritized. To engage students by inviting them to participate in a participatory research project to develop strategies for the prevention and control of Covid-19 (and other similar infectious diseases) and also to consider how it is possible to build the study device themselves. They begin by first exploring their concerns and needs with their families and then prioritizing the challenges that need to be explored. The scenario is formed based on the need for more direct communication in the classrooms without losing the sense of security. The students who took part in the activities were 15-17 year olds who were studying at the Lyceum. A total of 35 students participated in the whole process.
- **Know:** This phase facilitates the acquisition of knowledge and the development of the scientific skills and attitudes required to address the issues under consideration. Students used knowledge of physics, chemistry and programming. The skills the students practiced were:
  - To understand how to deal with a topic-challenge that they find interesting.
  - To acquire research skills
  - To understand that often in a given target problem there is a conflict of interests and to realize the existence of different approaches.



- Formulate proposals-recommendations to the citizens and agencies involved
- Well-informed discussion, communication, writing, interpretation, drawing and presenting conclusions based on knowledge
- Collaboration
- **Do:** In this phase, students applied the knowledge and skills acquired to develop the final product assigned to them. In this case, the final product was titled "Development of a sensitive CO2 sensor for the control and protection against viruses such as SARS-CoV-2 in closed spaces". Studies and means of achievement were summarized and shared in an open letter. A school scientific conference was organized, where groups of students presented their work and proposals to the educational community. Representatives of policy makers and other relevant bodies were invited to the conference. The project was also presented at the 4th Panhellenic Scientific Conference P.D.E. Crete in May 2022.

**Conclusions on Open Schooling:** Community participation in the Connect-Horizon 2022 program discussed the vital role that education plays in preparing students to collaboratively address global challenges and local issues facing humanity today, such as global warming, climate change, environmental destruction, disease, inequality and violence. Students' contact not only with teachers but also with scientists and policy makers makes them think together and learn science to address global and local problems.

**The change/innovation was supported by:**  School management  school association/network  Local government  Other: \_\_\_\_\_

**Student results:** The purpose of this Project was to create the right conditions for the students to develop a scientific way of thinking in their daily life. Low cultural familiarity with science, lack of role models, insufficient exposure to experimental methods of inquiry, as well as limited opportunities to participate in science outside of formal education lead to a lack of "scientific capital". The solution is to add more opportunities to the curriculum for these students to learn what scientists do, talk to their families about science, and appreciate the impact of science on the world. The satisfaction level of the children after the end of the project was great as they saw their efforts rewarded, they completed the construction successfully, they met many scientists with whom they solved several problems and they communicated their results with great joy at the CONNECT conference.

**This practice contributed to the increase of:**  
 engaging families with sciences  involving girls in science  raising awareness among students about careers in the natural sciences

Please specify: Parents participated in the collection of questionnaires for the student survey. The girls actively participated in the mapping and literature review and in general all students showed a special interest in digital maps and the contribution of geomorphological terrain to road construction.

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**Select the most relevant photo related to your initiative (which will be public and published under an open license) to represent the practice.**






padlet

Science is Wonderful! + 86 • 4 μήνες

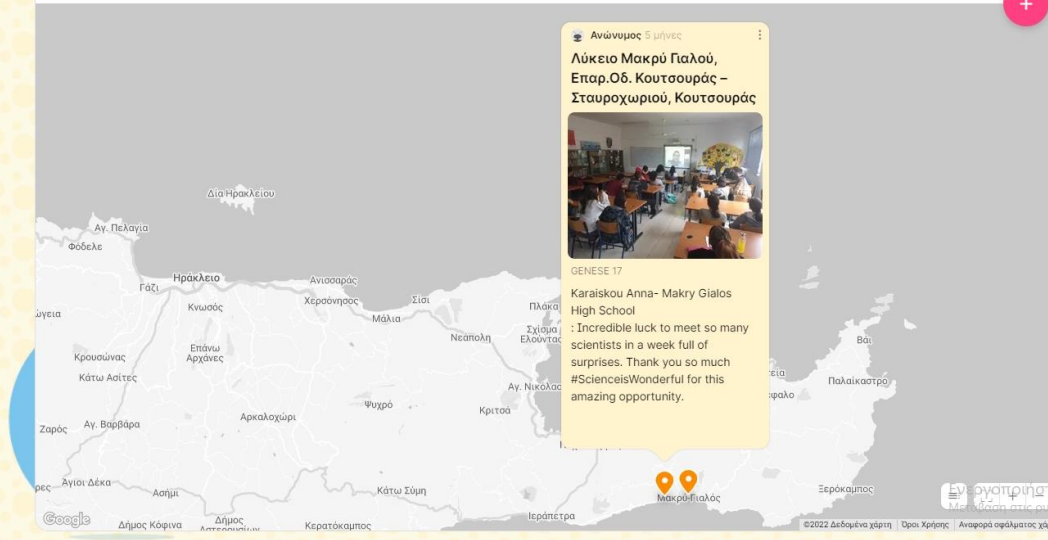

**Share your experience here !**  
Feel free to share any content you would like to in this area ! You are encouraged to mention the name of your school if you can.

Ανώνυμος 5 μήνες

**Λύκειο Μακρύ Γιαλού, Επαρ.Οδ. Κουτσουράς – Σταυροχωριού, Κουτσουράς**

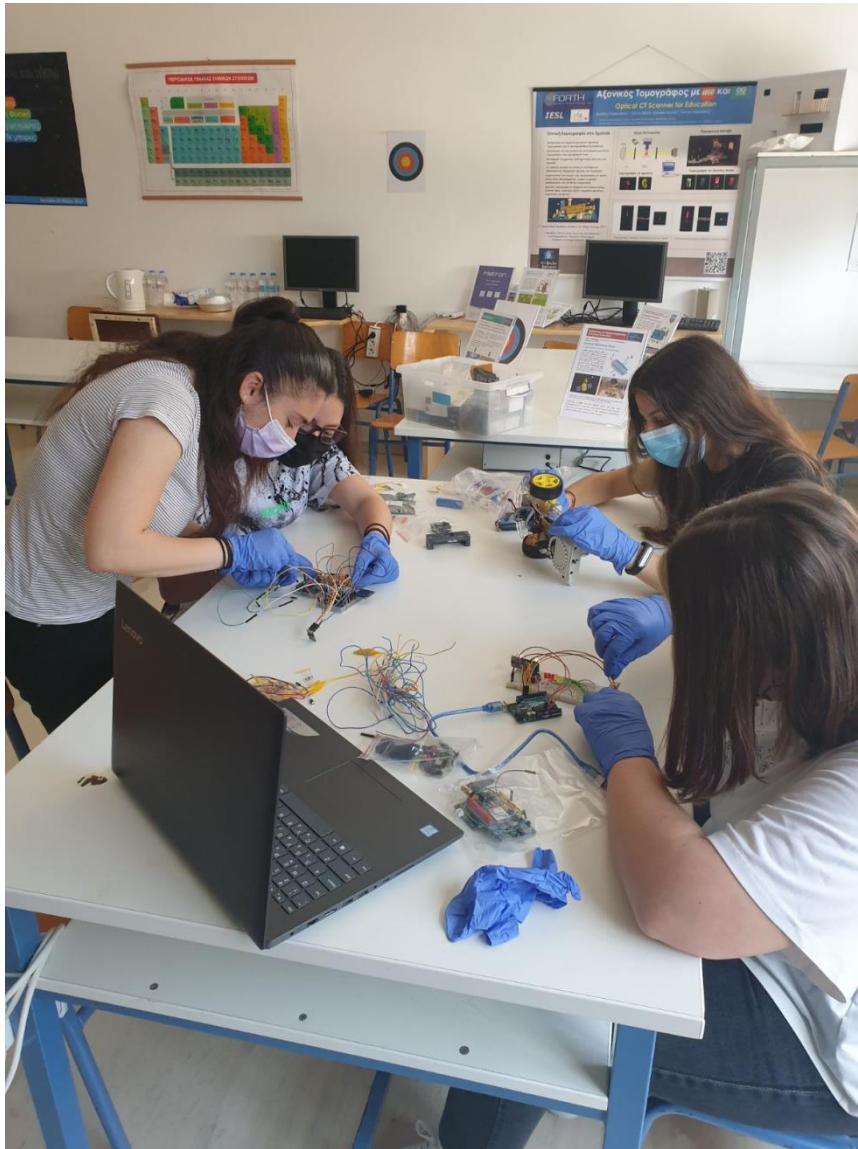


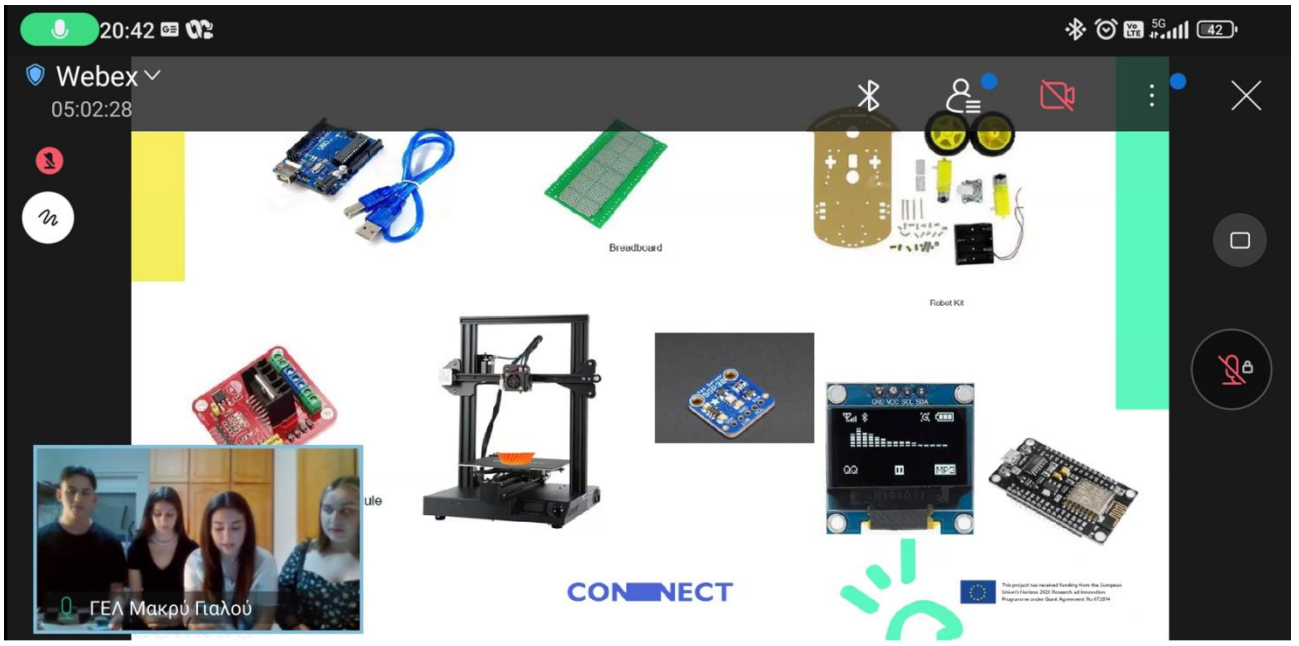
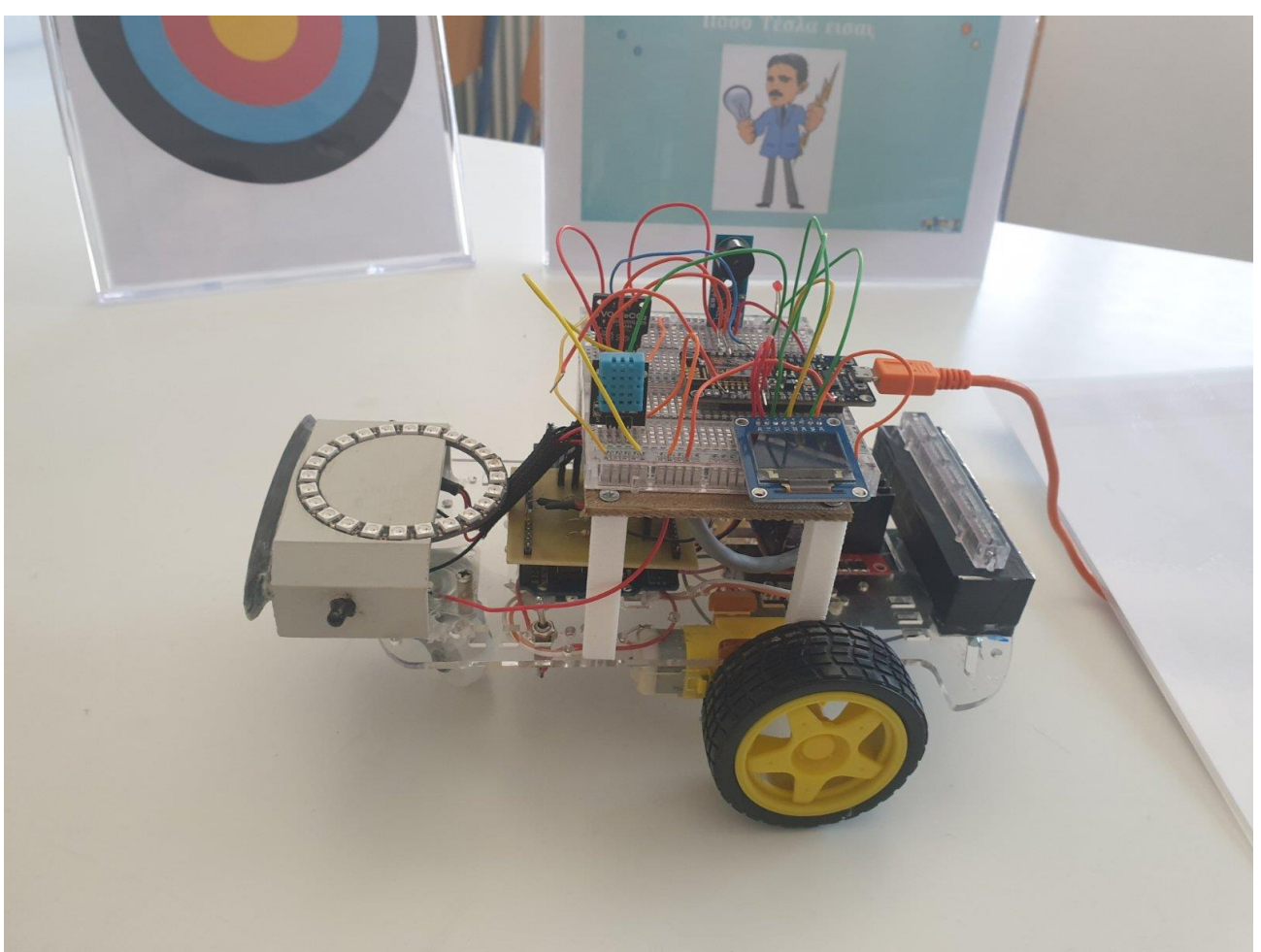
GENESE 17  
Karaiskou Anna- Makry Gialos High School  
: Incredible luck to meet so many scientists in a week full of surprises. Thank you so much #ScienceisWonderful for this amazing opportunity.

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#### ABOUT THE CONNECT PARTNER that supported the school

ORGANISATION	Regional Directorate of Primary and Secondary Education of Crete (RDE)
COUNTRY	Greece
Όνομα συνεργάτη	Georgios Panselinas
Implementation period	Starting date: 10/10/2021 Ending date: 01/05/2022

#### ABOUT THE TEACHERS PARTICIPATED

SCHOOLS	GEL MAKRI GIALOU
TEACHERS names (for Good Practices' Certificates)	KARAISKOU ANNA
Gender	
SUBJECT (Natural Sciences, Physics, Chemistry, Biology...)	Physics, Chemistry, Biology, Programming
How many subjects were used in open schooling?	All!
Title of open school education resource used	AERSOSOLS
Type of learning scenario of science activities (structured or open scenario)	Open Scenario
Curriculum modules	<ul style="list-style-type: none"> <li>• Health and people. Factors affecting human health. Microorganisms – transmission and treatment of pathogenic microorganisms. Problems</li> <li>• Through molecular forces</li> <li>• Carbon cycle</li> <li>• Aerosols</li> <li>• The mathematics of the pandemic - non-linear phenomena</li> <li>• Air pollution</li> </ul>

#### ABOUT THE STUDENTS PARTICIPATED

Class	1 <sup>st</sup> -2 <sup>nd</sup> High School
Age (average)	15 - 17 years old
Number of students participated that concluded the educational scenario	35
Number of students who completed the educational scenario of scientific activities	35

#### SCIENTISTS PARTICIPATED:

Name	Pavlidis Ioannis
Field	Bioogist, Professor at the University of Crete

## QUESTIONNAIRE





### 01. How have you (teachers) used open educational resources? Could you describe what you did in your lessons?

#### Student activities with scientists:

The educational material was modified and developed based on new rhythms and conditions of life. It makes it quite easy to have a program for Arduino.

#### Student activities with their families:

Reflection and creation of a questionnaire for the final purpose of the subject.

### 02. How have your students used the CONNECT resources? Do you have (or could describe) samples of better scientific actions (for our site/rewards)?

#### Any examples of what the students prepared?

Organization and study of the schedule of experimental processes.

Selection of scientists who would talk about issues of interest and problem solving in the specific project.

They created study-organization and material selection groups and communication groups.

#### Slide? Poster? Video?

(Add an image if possible)

...

### 03. How well did the science action learning scenario resources meet your needs?

#### Example related to the school curriculum:

The corresponding open scenario had been created for high school children and the method as well as the brochures were used in full.

#### Students involvement:

From the beginning the involvement was great, due to the topic of reflection and the need of students to create something new.

#### Student interest and confidence in science:

The interest was essential from the beginning, because the topic was crucial and the final goal necessary for the most human outcome of the educational process ("we finally take off the masks with ... safety"). Achieving the final task gave the students confidence, and they understood that everyday questions and concerns can be solved by "science".





#### 04. How easy or difficult it was to use the science action learning scenario resources?

##### Issues related to materials, procedures, pressure from the interaction with the curriculum:

The laboratory was fully equipped and the faculty showed flexibility in changing the program for every innovative idea.

#### 05. What were the benefits of implementing the science action learning scenario for your students?

##### Describe the results of the students in their scientific actions related to:

KNOWLEDGE	Students gained knowledge about the issue they chose to work on through the panel of experts, which included local bodies, scientists and other relevant bodies with knowledge of the chosen topic.
SKILLS	<ul style="list-style-type: none"> <li>To understand how to deal with a topic-challenge that they find interesting.</li> <li>To acquire research skills</li> <li>To understand that often in a given target problem there is a conflict of interests and to realize the existence of different approaches.</li> <li>Formulate proposals-recommendations to the citizens and agencies involved</li> <li>Well-informed discussion, communication, writing, interpretation, drawing and presenting conclusions based on knowledge</li> <li>Cooperation</li> </ul>
ATTITUDES	<ul style="list-style-type: none"> <li>Interest in science</li> <li>Tendency to communicate and interact with classmates</li> <li>Confidence in implementing innovative ideas</li> <li>Adaptation to modern technology developments</li> <li>Willingness for critical and constructive dialogue</li> <li>Flexibility and receptiveness to alternative views if they are substantiated</li> </ul>

#### 06. What have been the challenges of using educational science activity scenarios for your students?

##### Main challenges faced by students (Please select all that apply):

- Difficult...
- Long duration...
- Boring...
- Other (Please specify): **lack of time**







### 07. What activities worked well with the curriculum?

What helped the children achieve the learning objectives:

That they thought it was "incredibly cool" to create something out of nothing! (student expression).

### 08. What activities did not work well with the curriculum;

Anything that could be done differently or avoided:

We encountered no problems in the process.

### Submission:

1. Please save the file in the following format: **YEAR MONTH DATE COUNTRY SCHOOL** (e.g. 20220326GR1stPrimarySchoolHeraklion. docx )
2. Please send this form to CONNECT Panel: <https://tinyurl.com/Connectbestpractices2022>

