

# The GOSTEAM project and its Community

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Dr. Angelos Lazoudis

Ellinogermaniki Agogi



# Partners



Ystad  
Gymnasium

Bundesgymnasium  
und  
Bundesrealgymnasium  
Schwechat

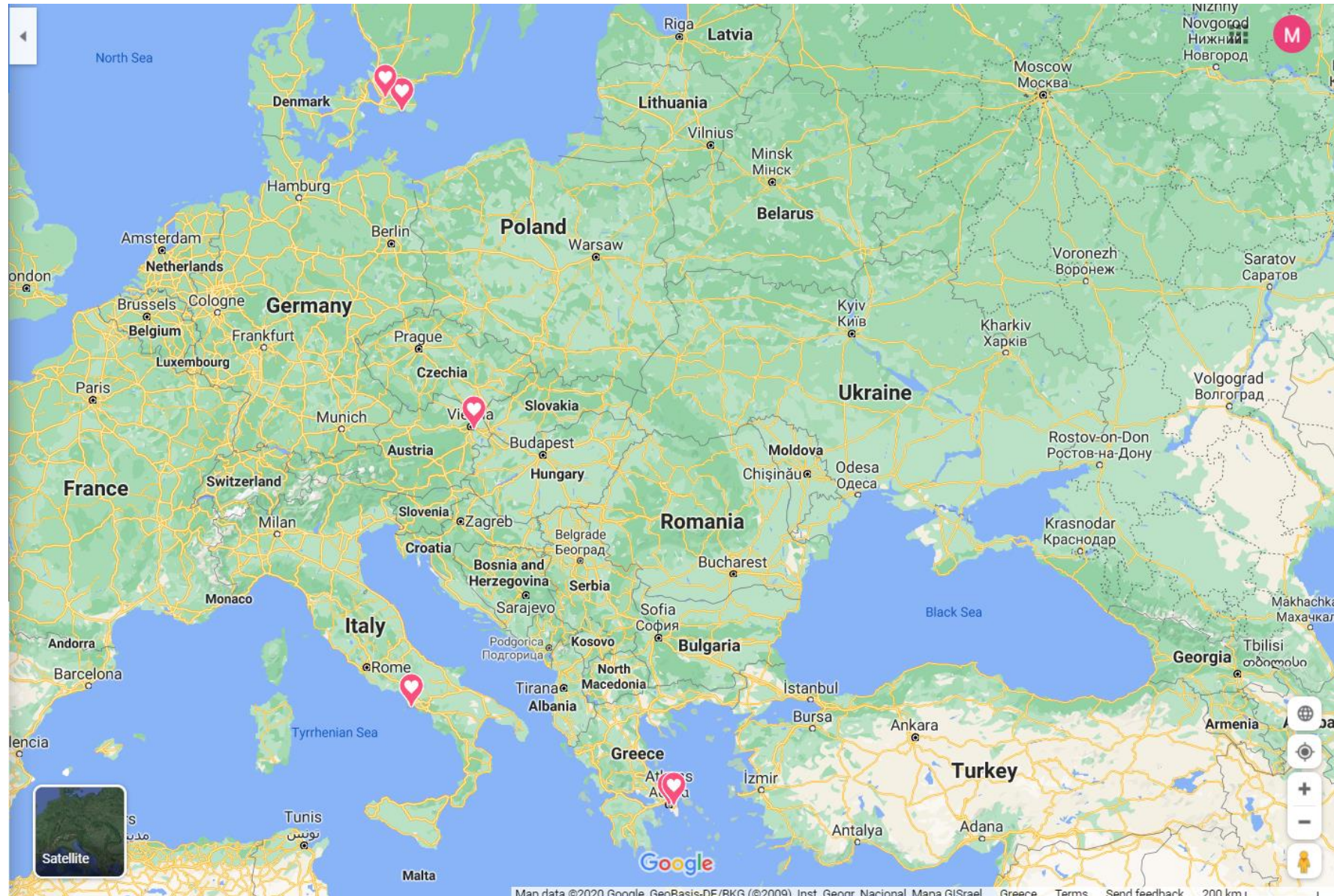
Lund University

National  
Technical  
University of  
Athens

Fondazione IDIS -  
Città della  
Scienza

Ellinogermaniki  
Agogi

# Partner Countries





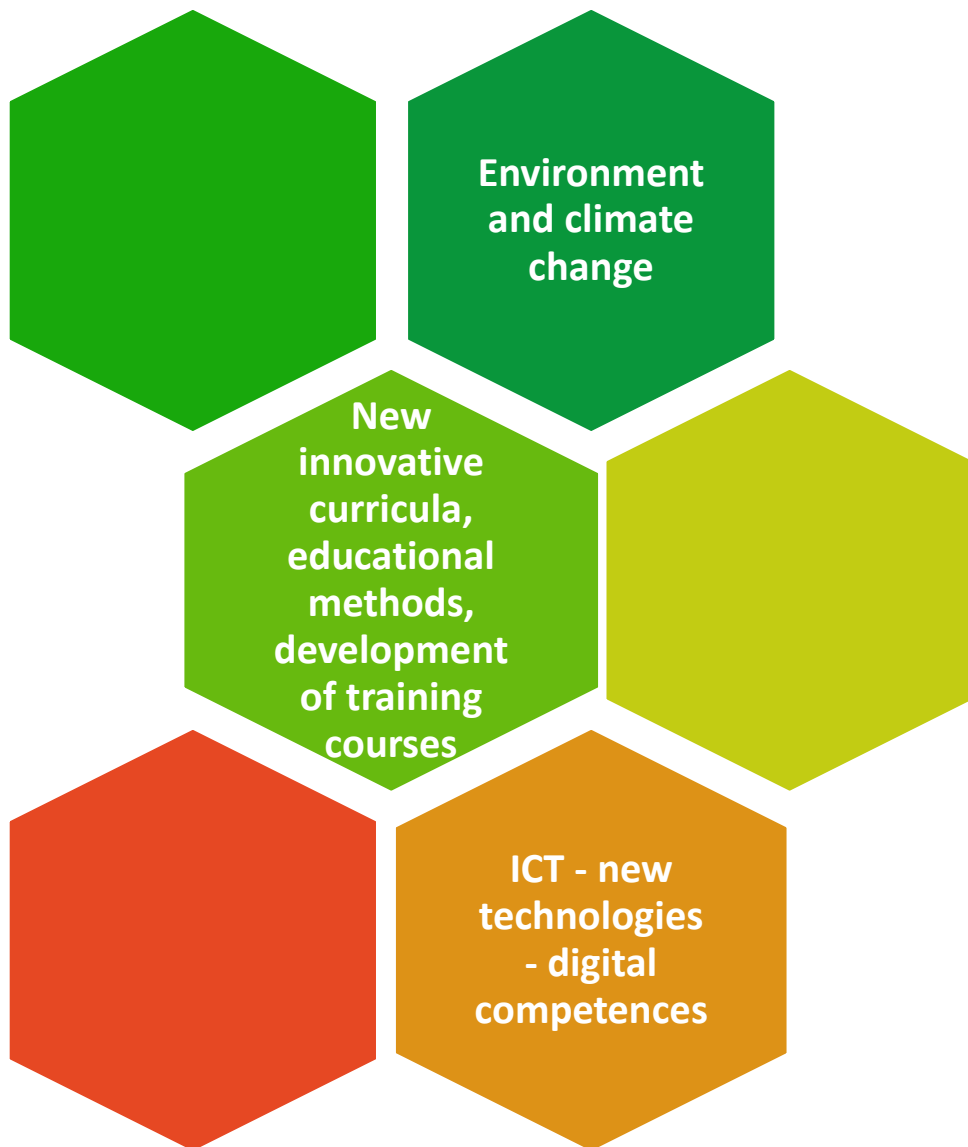
# Priorities based on the Erasmus+ call

**HORIZONTAL:** Supporting individuals in acquiring and developing basic skills and key competences

**SCHOOL EDUCATION:**  
Increasing the levels of achievement and interest in science, technology, engineering, and mathematics

**SCHOOL EDUCATION:**  
Reinforcing the development of key competences

# Topics addressed by GOSTEAM



|  |   |
|--|---|
| Key Action 2:<br>Cooperation for Innovation and the Exchange of Good Practices | Strategic Partnership in school education |
| Project Start Date   | 01-09-2020                                |
| Project End Date   | 31-08-2023                                |
| Project Total Duration   | 36 months                                 |
| National Agency of the Applicant Organisation                                  | SE01 Swedish Council for Higher Education |
| Main objective of the project  | Innovation                                |



# GOSTEAM aim and objectives



- **Aim:** to design, implement, and evaluate educational hands-on STEAM activities in the fields of *Geographic Information Science and Technology, Cartography, and Environmental Science* for shaping the next generation of geospatially and environmentally aware citizens
- **Objectives:**
  - transfer academic knowledge and research practices to secondary education
  - apply, in and outside the classroom, research methodologies and new technologies that tackle complex geospatial problems

# The GOSTEAM online community



# Joining the OSOS community



TEACHERS SCHOOLLEADERS STUDENTS PARENTS BUSINESSES POLICY MAKERS [Select Language](#) ▾



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Home



## LATEST NEWS

### 1169: The Start Of A Movement!

The Open Schools for Open Societies project partner are very proud to announce that today, 1169 schools are participating in the project. The project partners will continue to support the schools after the formal end of the project, March 31st, 2020.

[read more](#)

1 2 3 4 ... 7 >

<https://www.openschools.eu/>



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|  |   |   |  |   |   |   |
|--|---|---|--|---|---|---|
|  |  <b>69</b><br>Accelerators |  <b>129</b><br>Communities |  <b>1249</b><br>Schools |  <b>2400</b><br>Teachers |  <b>1290</b><br>Projects |  Academies |
|--|---|---|--|---|---|---|

Enter the keyword and choose the category you want

# Welcome to the Open Schools for Open Societies Portal

OSOS provides innovative ways to explore the world: not simply to automate processes but to inspire, to engage and to connect. It supports the development of innovative and creative projects and other educational activities. It transforms schools to innovative ecosystems that act as shared sites of science learning in which leaders, teachers, students and the local community cooperate.



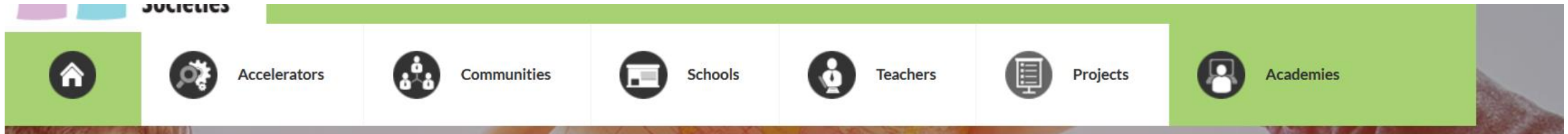
OpenSchoolsEU @OpenSchoolsEU  
European recognition of @OpenSchoolsEU through the @minedugr and our National Coordinator @IEPedugr. National recognition for quality in global education from @GENE\_GlobalEd



## HOW TO USE

Our schools should be incubators of exploration and invention and accelerators of innovation by promoting Open Schooling. OSOS supports a holistic approach that transforms schools to innovative

# What is there to see or share?



Home | My Area



Angelos Lazoudis

Ellinogermaniki Agogi | Senior Researcher in Science Education

Account Settings

Competence Profile

Member Since: 2014.03.12

Last Login: 2021.07.04

|                           |                   |                |                 |
|---------------------------|-------------------|----------------|-----------------|
| Status shared (microblog) | Notifications: 54 | Connections: 0 | Communities: 18 |
| Groups: 2                 | Discussions: 2    | Blogs: 0       | Bookmarks: 0    |
| Activities: 0             | Events: 0         | Polls: 0       | Resources: 7    |
| Projects: 0               | Tools: 1          | Interactions   | Recommendations |
| Scenario in ISE tool      | Social Relations  |                |                 |

# What is in each community?





Open Schools for Open Societies

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- Accelerators
- Communities
- Schools
- Teachers
- Projects
- Academies










Home | GOSTEAM



## GOSTEAM

This is a schools community of Ellinogermaniki Agogi

This is the educational community of the project GOSTEAM.

|  |   |   |
|--|---|---|
|  Members: 10    |  Groups: 0     |  Events: 0   |
|  Discussions: 0 |  Activities: 0 |  Blogs: 0    |
|  Polls: 0       |  Resources: 44 |  Projects: 0 |

 Leave

 New sub-community

Managed By:

Eugenia Kyriotis



Marinos Kavouras



Margarita Kokla

# GOSTEAM educational resources



[Home](#) | [GOSTEAM](#) | [Community Resources](#)

Search educational resources of the Community

Create new educational resources in the Community

Search by title:



Type:

- Any -

Search

[Clear](#)

Hide Filters

Sort by: Most Popular

1 - 10 out of 44 resources

**Marble**

Tue, 12/29/2020 - 13:31

Repository: ODS Contributor: [Arvid Pilesjö](#)

A virtual globe of the Earth, the Moon, Venus, Mars and other planets.

**PHET - Greenhouse Effect Simulator**

Wed, 12/30/2020 - 13:48

Repository: ODS Contributor: [Arvid Pilesjö](#)

Via this free tool, students can simulate the greenhouse effect.

# GOSTEAM educational resources



- **44 Educational resources have been uploaded in the GOSTEAM community.** These are mainly educational tools for performing learning activities in formal and informal educational environments.
- **All educational scenarios that will be created by the consortium will be uploaded on the community in the form of lesson plans following specific GOSTEAM templates**
- **Feel free to upload and share your own or existing scenarios that have been modified to fit your classroom's needs**
- **All the digital tools that will be presented in the GOSTEAM summer school will be uploaded as educational resources**

# What info is provided for each resource?



Open Schools for Open Societies

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Accelerators | Communities | Schools | Teachers | Projects | Academies

Home | GOSTEAM | Resources | Satellite and Information Service from NOAA

## Satellite and Information Service from NOAA

Original hosted in "ODS", contributed by Arvid Pilesjö on 04/01/2021

Rating: -/5  
Views: 8

Languages: English

Environmental satellite data and derived products covering Earth's atmosphere, oceans, and near-space conditions.

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# Future scenarios under development



|   | EA   | BSG   | Ystad   | Idis  |
|---|--|---|---|---|
| 1 | The ancient tunnel of Eupalinos in Samos (Geometry, topographic maps)                    | Acceleration and velocity of objects as three-dimensional vectors (smartphones, cameras, ...) | How to use Google Earth   | Topographic profiles  |
| 2 | Eratosthenes experiment (calculate Earth's circumference)                                | Functions in two variables (GeoGebra)   | Map-projections (What would be the best projection of Finland?)   | Epicentral location   |
| 3 | Earth observation and satellite images comparison (+ temporal scale, land cover changes) | Distances with vector algebra (3D coordinate system)  | How can you use digital tools to train concepts linked to earth's map network: latitude, longitude, projection, turning circuit, equator, arctic circle, coordinates? (design tourist-trip) | Shadows and heights   |
| 4 | Sea level rise impact on coastal areas (scenarios, communication)                        | 3D cartography and spatial visualisation  | Climate change. What are the effects?   | Celestial coordinates   |
| 5 | Earthquakes' epicenter identification (trilateration, coordinate systems)                | Geodesic dome (create shadow caves for the school yard)                                       | What are (some of) the consequences of human impact on nature (flood mapping, erosion, water storage, ...)  | Glacial seas from space   |
| 6 | Trilateration and the GPS (2D and 3D intersection points, coordinates, uncertainty)      | Experiments with PET missiles   | Introduction to GIS. (What are the benefits of using GIS)   | The measurement of the earth's radius with the method of Eratosthenes |
| 7 | Scale of the Solar System in a nutshell  | Google Maps Orientation Basics  | Learning QGIS   | Let's program the robot ladybug                                       |

All scenarios will be created in English and available on the online GOSTEAM community portal.

There will be 40 scenarios overall, out of which at least 20 will be implemented in real formal and informal educational settings.

# Future scenarios under development



|    | EA  | BSG  | Ystad   | Idis                                       |
|----|---|--|---|--|
| 8  | Offshore Wind Farms site-prospecting (multi-criteria problems, spatial analysis, overlay)   | The Graticule of the Earth                             | Visualisation (making maps to show statistics)              | Light paintings                            |
| 9  | Solar Panels placement and orientation on the Earth, Mars and the Lunar surface (elevation, slope, aspect, shading, ...)                                      | point of view: Tape Art (creating a perspective mural) | Visualise patterns of population and migration              | Model of the island                        |
| 10 | Spatial Compactness and Contiguity – Mars and Moon Landing  | polyvalent image space: mirror anamorphosis            | What country in Europe lives in the best environmental way? | The greenhouse effect and its consequences |
| 11 | Optimal route finding and Least Cost Path concepts (networks and navigation)  | 3D Design  |   |  |
| 12 | Ecological Risk Assessment and Satellite observations (pattern recognition, spatial clustering or dispersion and spatial dependency and autocorrelation, ...) | Optical illusions                                      |   |  |
| 13 | Early Warning Systems and Seismic Wave Processing with Python (can we predict earthquakes? ...)   | Create spatial figures with CAD Software               |   |  |



# The GOSTEAM Summer School



# GOSTEAM Summer School Team



## **Dr. Marinos Kavouras**

*Professor, School of Rural and Surveying Engineering  
National Technical University of Athens*

## **Dr. Maragarita Kokla**

*Assistant Professor, School of Rural and Surveying Engineering,  
National Technical University of Athens*

## **Dr. Eleni Tomai**

*Research Assistant at Cartography Laboratory,  
National Technical University of Athens*

## **Dr. Angelos Lazoudis**

*Senior Researcher in Science Education  
Ellinogermaniki Agogi, Greece*

## **Dr. Loukas Katikas**

*Researcher in Education -Environmentalist, GIS Analyst  
Ellinogermaniki Agogi, Greece*

# The Summer School Program



|                   | Monday 5 <sup>th</sup> of July   | Tuesday 6 <sup>th</sup> of July   | Wednesday 7 <sup>th</sup> of July   | Thursday 8 <sup>th</sup> of July   | Friday 9 <sup>th</sup> of July  |
|-------------------|--|---|---|--|---|
| 10:00-11:00 (CET) | Introducing spatial thinking notions– Connecting spatial thinking to STEAM fields  | Spatial thinking development  | Learning to teach spatial - How to develop spatial thinking educational scenarios | <b>Workshop III</b><br>Potential landing sites on the Moon and Mars for my rover | Presentation of developed scenarios   |
| 11:00-11.15 (CET) | Short Break  | Short Break   | Short Break   | Short Break  | Short Break   |
| 11:15-12:30 (CET) | Introducing GOSTEAM Project and Community  | <b>Workshop I</b><br>Earth Observation & Satellite images in your classroom   | <b>Workshop II</b><br>Ride like the wind: selecting an offshore Wind Farm site    | <b>Workshop IV</b><br>Solar panel placement on Earth, the Moon and Mars!         | Presentation of developed scenarios   |
| 12:30-13:00 (CET) | Designing an educational activity for your class: the GOSTEAM templates & approach | Resources and tools for enhancing spatial thinking                            | Resources and tools for enhancing spatial thinking                                | Resources and tools for enhancing spatial thinking                               | Presentation of developed scenarios - Online group photo                      |
| 13:00-14.00 (CET) | Lunch Break  | Lunch Break   | Lunch Break   | Lunch Break  | Lunch Break   |
| 14:00-15:00 (CET) | Participants work on their educational scenarios- GOSTEAM team online support      | Participants work on their educational scenarios- GOSTEAM team online support | Participants work on their educational scenarios- GOSTEAM team online support     | Participants work on their educational scenarios- GOSTEAM team online support    | Final discussion and thoughts, future planning and events, Email Certificates |

<https://esia.ea.gr/gosteam-summer-school/>

# Requirements & Preparation section



and foster both success and participation in STEAM disciplines.

Learn how to assist students in using open access educational resources, how to teach them spatial, environmental, and other STEAM concepts, and how to engage them in playful learning in order to boost their interest in STEAM disciplines and careers.

[Register now](#)

|             |            |             |                    |                                       |           |
|-------------|------------|-------------|--------------------|---------------------------------------|-----------|
| Description | Objectives | Methodology | <b>Preparation</b> | Follow-up, Recognition and Evaluation | Programme |
|-------------|------------|-------------|--------------------|---------------------------------------|-----------|

This website will act as a main hub of communication and for sharing and distributing preparatory material with the participants. Participants will have a common workspace for uploading and downloading educational materials.

Before coming to the summer school, participants will be asked to review some materials relative to the topic of the summer school and the methodologies that will be discussed.

Messages will be posted in this section with guidelines/resources that you will use in the workshops.

# The GOSTEAM Templates (& **your** summer school task)



# Educational Scenario Templates (Page 1 - Metadata)



## GOSTEAM Hands-on Activity Template *(Classroom-Formal)*

**Title:**

**Short Description (Max 500 words):**

**Keywords (Up to 5):**

## Information about the Implementation

Age and language of the students:      9-12      12-15      15-18      18+

Language:      Age:                     

Number of Lessons – Duration (per lesson):

Number of Lessons:       Duration per Lesson:

**Subjects:**

For which subject(s) the activity is usable, is it an interdisciplinary activity?

- Science 
  - Physics
  - Chemistry
  - Biology
  - Geosciences
  - Environmental
  - Other
- Technology
- Engineering
- Arts
- Mathematics

# Educational Scenario Templates (Page 2 - Metadata)



## Information about the Scenario

Curriculum and country:

Link of the current activity to the curriculum:

Country:  Class:  Grade:

Topic:

Objectives (Max 100 words):

Description of the learning objectives

Materials (Max 100 words):

Which resources and materials (software, hardware) are needed?

Spatial concepts, skills and abilities:

Which spatial concepts and skills are covered by the activity?

**Spatial concepts:**

**Primitives:** Identity/Name  Location  Space/Time

**Simple:** Distance  Direction  Connectivity  Movement

Boundary  Shape/Area  Adjacency

**Difficult:** Overlay  Buffer  Topology  Coordinate

Map  Scale  Shortest Path  Navigation

Surface  Slope/Gradient  Aspect  Contour

**Complex:** Interpolation  Map Projection  Spatial Dependency

**Other:**

# Educational Scenario Templates (Page 3 - Metadata)



## Spatial skills:

- Map literacy
- Navigation/orientation
- Estimating distances and directions
- Recognizing and understanding patterns/Understand and identify models of spatial organization
- Select an ideal location based on the given spatial features
- Visualization
- Understand and identify spatial correlations/ dependencies
- Categorize spatial entities/ geographic features and identify hierarchies
- Compare spatial entities and draw analogies among them
- Identify/determine connections/relations
- Understanding scale in space and time
- Delineation of spatial regions/ zones based on given features/ properties

## Short Description



# Educational Scenario Templates (Page 4 - Activities)



## Description of the activity in detail

### Classroom activities

Description of activities for face-to-face teaching in the classroom

### Online activities

Description of activities for distance learning in home-schooling

### Sustainable contact:

Name & email

### References (if any):

### Assessment (if any):

**Template A.  
Formal – Classroom  
activities template**

# Educational Scenario Templates (Page 4 - Activities)



## Description of the activity in detail

### Educational Purpose:

*This item is focused on the specific topic addressed in the activity*

### Cross-cutting objectives:

*This item describes cross-cutting information and skills the beneficiaries could acquire attending the activity*

### Previous knowledge of the participants:

*This item summarizes the knowledge that participants should have to make the most of the activity and which are usually communicated in advance to the reference teacher*

### Tools and materials:

*This item summarizes the tools and materials needed to implement the activity allowing each participant to operate. These tools and materials could be: laboratory tools, every day, materials, networked computers, open-source software.*

**Template B.  
Informal – Outside  
classroom activities  
template (1)**

# Educational Scenario Templates (Page 4 - Activities)



## Abstract, description:

*Usually, this item describes in more detail the topics addressed during the activity and its educational purposes*

## Proceedings, description:

*This item describes how to carry out the activity and it could be divided into several steps*

## Sustainable contact

Name & email

## References (if any):

## Assessment (if any):

**Template B. (cont'd)  
Informal – Outside  
classroom activities  
template (2)**

# Educational Scenario Templates (Page 4 - Activities)

## Template C. Inquiry-based science education template - (Summer School template)

### GOSTEAM Summer School – Workshop II

Title:

Date

---

Name, Organisation



Cross-cutting geospatial & environmental  
STEAM instruments for the new generation

Project Number - 2020-1-SE01-KA201-077972



# Metadata



Age and language of the students:

Number of Lessons – Duration (per lesson):

Subjects:

Curriculum and country:

Country:

Class:

Grade:

Topic:

Objectives (Max 100 words):

Materials and Tools (Max 100 words):

# Metadata



Spatial concepts, skills and abilities:

Spatial skills:

Geospatial concepts and spatial abilities documentation (see Section 3.2):

[http://www.gosteam.eu/wp-content/uploads/2021/05/GOSTEAM\\_IO1\\_A1\\_final.pdf](http://www.gosteam.eu/wp-content/uploads/2021/05/GOSTEAM_IO1_A1_final.pdf)

# Description of the activity in detail



Short Description (Max 500 words):

Keywords (Up to 5):

# 1. Questions eliciting activities

## Provoke curiosity

*Usually, the most effective way to provoke students' curiosity is by presenting an exciting video or a series of photos*

## Propose preliminary explanations or hypotheses

*Formulate the scientifically oriented questions that teachers will present to the students to trigger their engagement in thinking about the topic investigated based on their existing knowledge. Make these questions digitally available and easily usable, e.g., by integrating them in the materials described in the previous step.*







## 2. Active investigation

### Plan and conduct simple investigation

*This is the phase in which students are being prepared for the subsequent phase of evidence gathering during observation.*



## 3. Creation

### Gather evidence from observation

*It is recommended to introduce group work at this stage. Guide the teachers to divide students in groups, each of which will be facilitated by the teacher to formulate and to evaluate explanations to the scientific questions based on the collected evidence.*

### Activity planning



# 4. Discussion



## Explanation based on evidence

*Describe ways and they can use to this end and give them directions how to discover them.*



## Consider other explanations



## 5. Reflection

### Communicate explanation

*Provide content which the teacher can use to help the students to get familiarized and to become efficient in scientific writing.*





Thank you for your attention!



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