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**STEAME ACADEMY**  
**TEACHING FACILITATION LEARNING & CREATIVITY PLAN (L&C PLAN)**  
**L.1 STUDENT TEACHERS**  
**Sustainable Tourism in Rodos**

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**1. Overview**

Title	Sustainable Tourism in Rodos		
Driving Question or Topic	Rodos island relies heavily on tourism for its development and growth. The crisis in tourism in 2020 and 2021 demonstrated the importance of sustainability in tourism, as the island was hit severely by the crisis. What is the current situation in Rodos regarding the sustainability of tourism? Are there any initial actions that can be taken to that direction? Which are the actions that tourism related businesses take? Does the island do well in terms of sustainability related to another touristic island?		
Ages, Grades, ...	11-13	6 <sup>th</sup> grade (Primary school) – 7 <sup>th</sup> grade (Gymnasium)	
Duration, Timeline, Activities	26 hours	26 X 45-50 minutes lessons	>=10 activities
Curriculum Alignment	<b>Sciences:</b> -ecology -climate change - sustainability <b>Technology:</b> -Informatics <b>Engineering:</b> - <b>Mathematics:</b> - algebra (calculations) - statistics (basic data analysis) <b>Entrepreneurship</b> - Tourism development - Economic development		

Contributors, Partners	<ul style="list-style-type: none"> <li>- Municipality of Rodos</li> <li>- Association of hotel owners of Rodos</li> <li>- Dodecanesian Association for Development and Progress</li> <li>- Chamber of Commerce and Industry of Dodecanese</li> <li>- Greek National Tourism Organization</li> <li>- UNWTO (United Nations World Tourism Organization)</li> </ul>
Abstract - Synopsis	In the present project the students, working in small groups, while developing their understanding and knowledge about sustainable tourism, compare the level of sustainability of tourism in Rodos with that of another island and then form their proposals for improving sustainability and check their hypotheses.
References, Acknowledgements	<a href="https://www.gstcouncil.org/gstc-criteria/glossary/">https://www.gstcouncil.org/gstc-criteria/glossary/</a> <a href="https://www.unwto.org/sustainable-development">https://www.unwto.org/sustainable-development</a> <a href="https://single-market-economy.ec.europa.eu/sectors/tourism/eu-funding-and-businesses/funded-projects/sustainable_en">https://single-market-economy.ec.europa.eu/sectors/tourism/eu-funding-and-businesses/funded-projects/sustainable_en</a> <a href="https://www.youtube.com/watch?v=kgAHZHkMTQU">https://www.youtube.com/watch?v=kgAHZHkMTQU</a> <a href="https://www.youtube.com/watch?v=aYcll372Wb8">https://www.youtube.com/watch?v=aYcll372Wb8</a>

## 2. STEAME ACADEMY Framework\*

Teachers' Cooperation	<p><b>Science teacher (T1)</b></p> <ul style="list-style-type: none"> <li>• The Science teacher is the coordinator of the project</li> <li>• Coordination of meetings</li> <li>• Presentation of tourism sustainability concepts</li> <li>• Investigation with students and other teachers the sustainability parameters of sustainability parameters</li> </ul> <p><b>Informatics teacher (T2)</b></p> <ul style="list-style-type: none"> <li>• Assistance and guidance of students in locating and extracting information</li> <li>• Presentation of tourism sustainability concepts</li> <li>• Collaboration with the other teachers on technical matters during the project process</li> <li>• Supporting the students and teachers in the use of the applications used for calculations and presentations</li> </ul> <p><b>Mathematics Teacher (T3)</b></p> <ul style="list-style-type: none"> <li>• Supporting students on the calculations and results</li> <li>• Providing assistance and guidance to the students related to calculation methods</li> <li>• Presentation of tourism sustainability concepts</li> <li>• Collaboration with the other teachers and students on the results of the proposed solutions</li> </ul> <p>T1 cooperates with T2, T3 on the presentation of the sustainability framework and on the measurements that will have to take place, the parameters to be investigated and the analysis of sustainability data</p> <p>T1 cooperates with T2, T3 on the presentation of concepts and content and the format of the data and results</p> <p>T1 cooperates with T2 and T3 on the final details of the presentation of the students work</p>
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- Meeting with a representative from the Greek National Tourism Organization regarding the touristic profiling of Rodos and the governmental views on sustainable tourism
- Meeting with a representative from the Dodecanesian Association for Development and Progress to get more detailed information about tourism in Rodos and to get data on tourism
- Meeting with representatives from the Municipality of Rodos (Department of Recycling and Waste Management, Department of Environment and Department of Tourism) to get information on the municipality's policies and to get data
- Meeting with representative from the Chamber of Commerce and Industry to get information on the tourism related commercial activities and to get data
- Meeting with the chairman of the Association of hotel owners of Rodos to discuss on sustainability activities undertaken by the association members
- Meeting with a representative of UNWTO to get more information about tourism sustainability worldwide and get data for another region.

Action Plan Formulation

**Step 1: Theoretical background knowledge (4 hours – 2 + 2)**

- The science teacher presents to the students the basic concepts of sustainability and sustainability in tourism.
- The science teacher makes an introduction to the environmental dimension of sustainable tourism (based on ETIS approach)
- The mathematics teacher makes an introduction to the economic and managerial aspects of sustainable tourism (based on ETIS approach)
- The informatics teacher makes an introduction to the social and cultural dimension of sustainable tourism (based on ETIS approach)
- During the second part all the teachers provide more information on the related dimensions of sustainable tourism focusing each one on the dimension that they have briefly presented
- Teachers coordinate the meeting with the representatives from the external organizations involved in the project and the information that can be provided by them for the realization of the project.

**Step 2: Extension of theoretical knowledge and connection with the real world (7 hours - 2 + 2 + 2 + 1)**

- All teachers present the ETIS toolkit to the students and work together on the analysis of the indexes used, the ways of measurements and the sources of information.
- All the teachers together coordinate the meeting with the representative of the Greek National Tourism Organization, in order to form the profile of tourism in Rodos and get information about the views of the national agency on sustainable tourism
- All the teachers together coordinate the meeting with the representatives from the municipality (Department of Recycling and Waste Management, Department of Environment and Department of Tourism) to discuss on the issues of waste management on the island, the problems faced, the environmental impact of tourism and the data to be provided for the project.
- All the teachers together coordinate the meeting with the representative from the Chamber of Commerce and Industry to get information on the tourism related commercial activities of the

businesses of the island and to get data on the volume of activities and the activities that they undertake regarding sustainability

- All the teachers together coordinate the meeting with the representative from the Dodecanesian Association for Development and Progress to get more information on the research on tourism that is carried out by the organization, their views and findings on sustainable tourism and to get the data needed for the project
- All the teachers together coordinate the meeting with the representative the chairman of the Association of hotel owners of Rodos to discuss on sustainability activities undertaken by the association members, the initiatives undertaken by the Association and to gather information on the actual activities hotel units have taken (eco-labels, specific actions/measures taken)
- All the teachers together coordinate the meeting with the representative from UNWTO to get information about the global status, perspectives and initiatives on sustainable tourism and destination data.

### **Step 3: Formulation and definition of the project (3 hours)**

- Students work with the support of all their teachers, on formulating a brief report on the views of the external actors, the problems identified by them and the actions towards sustainable tourism mentioned
- Students work in small teams with the support of the teachers to decide on the parameters to be investigated and calculated during the project
- Students and teachers agree on the parameters, the plan of data analysis and the general concept of the outcomes.
- The work teams are formed

### **Step 4: Application of knowledge and implementation (10 hours)**

- Students, with the support of the teachers formulate the spreadsheets that they will use for data analysis in the dimension of sustainable tourism they have undertaken.
- Students, with the support of the teachers gather the data from the online sources and from the external organizations that are involved in the project.
- Students, with the support of the teachers analyze data and evaluate sustainability of tourism of the island.
- Students with the support of the teachers find and critically analyze the data for another destination (e.g. Mytilene, Sardinia, an island from the Canaries)
- Students with the support of the teachers, make a comparison between the two touristic destinations and draw their conclusions
- Students, with the support of the teachers, formulate proposals for improvement and form scenarios while calculating their impact.
- Different scenarios formulated by each team are presented and discussed in the classroom and the final proposals for actions are decided
- Students calculate the total impact of the proposed scenario and work in plenary for the results and reporting.
- Students supported by their teachers work on the final presentation of the project

### **Step 5: Results presentation and evaluation (2 hours)**

- Students present their results to the teachers or other peers and evaluation of the implementation and of the results of the project is carried out.

*\* under development the final elements of the framework*

### 3. Objectives and Methodologies

#### Learning Goals and Objectives

Learning goals of the project:

**LG#1:** Introduce students to the concept of sustainable tourism

**LG#2:** Present and familiarize the students with methods and approaches for measuring and assessing sustainability in tourism

**LG#3:** Analyze the connection between sustainability and regional development

**LG#4:** Familiarize students with the use and evaluation of data

**LG#5:** Elaborate further the interconnection between the actors in a regional economy involved in the tourism sector

**LG#6:** Elaborate on the impact that regional policies can have on the sustainability of tourism.

Learning objectives

**LO#1:** Students will understand the concept of sustainable tourism and sustainability of tourism

**LO#2:** Students will know about the approaches for assessing and evaluating information on sustainability of tourism

**LO#3:** Students will know how to use tools to measure tourism sustainability

**LO#4:** Students will understand how to compare tourism sustainability between two regions

**LO#5:** Students will conceptualize ways to improve tourism sustainability in a regional level

#### Learning Outcomes and expected Results

After completing the project students should:

##### **Knowledge**

- Know the main dimensions of tourism sustainability
- Understand the main ways tourism in a region can be sustainable
- Mention criteria for evaluating the sustainability of tourism
- Understand the interrelation between the tourism related economic activities and sustainability

##### **Skills**

- Locate information sources and extract data
- Perform mathematical calculations using spreadsheet software
- Make assessments by comparing data
- Use tools and criteria to assess sustainability
- Use presentation software to create presentations

##### **Attitudes**

- Develop interest on sustainable tourism
- Raise awareness on sustainable development of a region
- Develop a more respectful towards the environment attitude
- Develop interest on actual economy and sustainable economy

#### Prior Knowledge and Prerequisites

##### **Prior knowledge-skills:**

- Basic use of spreadsheet software for calculations
- Basic mathematical calculations
- Basic use of office applications suite

Motivation,  
Methodology,  
Strategies, Scaffolds

- Communication and cooperation skills
- Basic use of the internet for information search
- Teamwork skills

**Prerequisites:**

- Laboratory with access to the internet
- Teleconference platforms
- Access to office suite applications
- Presentation equipment

**Motivation**

- Preservation of the environment
- Regional development and progress
- Connection of the project with the real world of the students
- Entrepreneurship

**Methodology**

Project based approach that involves the collaboration between teachers of Science, Mathematics and Informatics and the collaboration of groups of students working in small teams of 4-5 students

**Strategies**

Project based learning

Autonomous work

Teamwork

Guided discovery

Brainstorming

Scenario building

Simulations – basic mathematical model building and testing

**Scaffolds**

Guidance and consultancy from teachers

Additional information from experts

Support during lab work from teachers

#### 4. Preparation and Means

Preparation, Space Setting, <i>Troubleshooting Tips</i>	<p><b>Preparation</b></p> <p>The teacher in charge of the project is the science teacher, assisted by all the other teachers. Initially he/she discusses with the other teachers the goals of the project and the actions to be taken for its implementation. All the teachers together initially review the basic sources of information and the resources and tools to be used during the project and discuss about the information and the calculations that will be required. All the teachers formulate an initial document for the presentation of the concept of the project to the students. All the teachers take care to identify what will be needed for their part of the intervention in terms of materials, resources and infrastructures. The science teacher makes a preliminary contact with the external actors involved in the project to identify their availability and schedule the meetings. The informatics teacher checks on the availability of the computer laboratory and all the needed applications and platforms.</p> <p><b>Space setting</b></p> <p>The implementation of the project requires the following settings: Computer laboratory with internet access where students can work at least in pairs on data analysis, presentation software and spreadsheet software. Classroom, where students can work collaboratively in small teams of 4-5 students. The classroom must be equipped also with presentation equipment (computer, projector and office applications) and have a connection to the internet for the online meetings with the external actors.</p> <p><b>Troubleshooting/tips</b></p> <p>Teachers have to primarily check if external actors use or have access to data based on the ETIS toolkit for international touristic destinations</p>
Resources, Tools, Material, Attachments, Equipment	<p><b>Educational resources and materials</b></p> <p>Teachers can use the resources mentioned in the references section supplemented by additional custom developed materials focusing on sustainability and tourism.</p> <p><b>Tools and equipment</b></p> <p>The implementation of the project requires basic equipment and software namely</p> <ul style="list-style-type: none"> <li>• Computer laboratory with access to the internet</li> <li>• Office suite applications (word, excel, PowerPoint)</li> <li>• Presentation equipment in classroom</li> <li>• Teleconference platform</li> <li>• Classroom where teleconferences can be held</li> </ul>
Health and Safety	<p>The project takes place in the school unit. Teachers have to assert that the infrastructures and laboratory will be used properly.</p>

## 5. Implementation

Instructional Activities, Procedures, Reflections	<p>The project is implemented extending to 25 study. Classes are held once a week in the context of additional activities in primary or secondary education. The leading teacher (Teacher 1 – T1 - Science Teacher) participates in all the activities and the other teachers (Teacher 2 – T2 - Informatics teacher), (Teacher 3 – T3 – Mathematics teacher), have also extensive participation in the project while they are also involved widely in specific parts of the project where their participation is needed (data analysis, online information extraction, software use)</p> <p><b>Lesson block 1 (2 x 50 minutes)</b></p> <p>T1</p>
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25 minutes, presentation of the project to students

- motivation of students
- presentation of goals and concept of the project

T1, T2, T3

25 minutes, presentation of participation to the project

- motivation of students
- brief presentation of the activities that can take place during the project

T1, T2, T3

20 minutes, evaluation process agreement

- Discussion with students and agreement on the project evaluation methods and discussion on the final outcomes

30 minutes, introduction to sustainability

- Introduction of the students to the general concepts of sustainability

**Lesson block 2 (2 x 50 minutes)**

T1, T2, T3

25 minutes, presentation of the concepts related to sustainability and sustainable development

T1, T2, T3

25 minutes, introduction to sustainable tourism

- definitions
- importance

T1, T2, T3

50 minutes, presentation of the main dimensions of sustainable tourism and discussion with students

**Lesson block 3 (2 x 50 minutes)**

T1, T2, T3

50 minutes, analysis of the ETIS approach to sustainable tourism and the ETIS toolkit

- development of the instrument
- dimensions of sustainability
- criteria

T1, T2, T3

50 minutes, toolkit analysis

- discussion with the students and brainstorming on the sources and ways to get and analyze data
- primary decision on the handling of the information during the project
- student's teams formation

**Lesson block 4 (2 x 50 minutes)**

T1, T2, T3

50 minutes, meeting with representative of the Greek National Tourism Organization

- touristic profile of the island
- governmental views and actions towards sustainable tourism
- actions for sustainability taken that include Rodos
- data that can be provided for the project

50 minutes, meeting with the representative from the Chamber of Commerce and Industry

- views on sustainable tourism of the organization
- economic activities related to tourism
- volume and interrelation of activities
- implications on employment and regional development
- actions for sustainability undertaken by other commercial businesses
- data to be provided for the project

**Lesson block 5 (2 x 50 minutes)**

T1, T2, T3

50 minutes, meeting with the representative from the Dodecanesian Association for Development and Progress

- views on sustainable tourism of the organization



- Tourism data from the survey on tourism that is carried out by the organization
- activities for sustainable tourism undertaken

50 minutes, Meeting with representatives from the Municipality of Rodos (Department of Recycling and Waste Management, Department of Environment and Department of Tourism)

- views on sustainable tourism of the municipality
- environmental impact of tourism
- problems related to their work
- data on waste and waste management for the project
- actions undertaken by the municipality
- environmental data needed for the project

#### **Lesson block 6 (2 x 50 minutes)**

T1, T2, T3

50 minutes, meeting with chairman of the Association of hotel owners of Rodos

- views of the Association on sustainable tourism
- actions undertaken by members
- problems faced by hotel units
- data needed for the project

T1, T2, T3

50 minutes, meeting with representative of UNWTO

- views on sustainable tourism on a global perspective
- Policies of UNWTO
- actions undertaken
- interconnection between organizations for sustainable tourism
- data from ETIS toolkit

#### **Lesson block 7 (2 x 50 minutes)**

T1, T2, T3

30 minutes, sum up of the information from the meetings

20 minutes, preparation for the report from the meetings (views, actions, expected data)

T1, T2, T3

50 minutes, teachers support students working in small teams to summarize and report on the meetings with the external actors

- Report on views, policies and actions regarding the economic dimension of sustainable tourism
- Report on views, policies and actions regarding the social dimension of sustainable tourism
- Report on views, policies and actions regarding the environmental dimension of sustainable tourism

#### **Lesson block 8 (2 x 50 minutes)**

T1, T2, T3

30 minutes, discussion of reports

- Each team presents their report to the teachers and the other teams and discuss the findings

20 minutes, compilation of joint report

- Students work with the support of the teachers to formulate the format of the final joint report for the project

T1, T2, T3

50 minutes, preparation for data analysis

- Students with the support of the teachers work in teams to decide on the model of sustainability and the criteria they will use for tourism sustainability assessment based on the ETIS toolkit and the data that can be found online and the data discussed with the external actors
- The spreadsheet is tested, validated and explained to the students that may still encounter difficulties

#### **Lesson block 9 (2 x 50 minutes)**

T1, T2, T3

50 minutes, data collection and handling from online sources

- students together with the support of their teachers work on the collection of data from the online databases

- when needed indices are calculated and then registered to the spreadsheet

T1, T2, T3

50 minutes, data collection and handling of data sent from organizations

- students work in teams with the support of their teachers on identifying the needed data from the datasets sent and on calculating the indices needed.

**Lesson block 10 (2 x 50 minutes)**

T1,T2,T3,T4

50 minutes, sustainability assessment

- Students work with the support of their teachers on the evaluation of sustainability of Rodos in terms of each dimension individually and as a whole and assess the results

50 minutes, sustainability assessment

- Students work with the support of their teachers on calculating and analyzing sustainability data for another touristic destination or island

**Lesson block 11 (2 x 50 minutes)**

T1, T2, T3

50 minutes, comparison of the sustainability of tourism

- students discuss their findings about the two destinations, identify the dimensions that present differences (positive – negative points) and explore the findings in comparison also to the views of the local actors that they met

50 minutes, proposal formulation

- Students discuss between them and with the teachers the results of their evaluation and brainstorm on different proposals that could improve the sustainability of tourism

**Lesson block 12 (2 x 50 minutes)**

T1, T2, T3

25 minutes, proposal formulation

- Students propose different actions for improving sustainability of tourism in Rodos

25 minutes, proposal discussion

- students and teachers discuss on the proposed by the students' solutions

T1, T2, T3

50 minutes, project presentation preparation

- students with the support of their teachers develop the format of the presentation and reports of the project including the results of their sustainability assessment, the comparative report, the proposed solutions and the expected impact

**Lesson block 13 (1 x 50 minutes)**

T1, T2, T3

50 minutes, finalization of presentation and of the other evaluation materials

- all the teachers work together with the students on the final presentation.

- students finalize also all their other reports that will be submitted

- teachers schedule for the presentation of the results in the class/whole school

**Lesson block 14 (1 x 50 minutes)**

T1,T2, T3

30 minutes, presentation of the project and its results

20 minutes, final evaluation of the project and discussion with the students on the outcomes and the process

Assessment - Evaluation	<p>Evaluation of the project and its results is performed mainly in two different contexts.</p> <p>a) the level of participation, involvement and contribution of each student is evaluated. This evaluation is based in direct observation by the teachers where a rubric can be used or a journal of observations</p> <p>b) the final result is evaluated judging by the presentation and the reports of results.</p>
Presentation - Reporting - Sharing	<p>The final expected results of the project are</p> <ol style="list-style-type: none"> <li>1. a report of the views of external actors</li> <li>2. a report of the comparative results of the two destinations on sustainability</li> <li>3. a report of the results on sustainability of Rodos after the proposed interventions</li> <li>4. a presentation of the project's results as a whole</li> </ol>
<i>Extensions - Other Information</i>	<p>The project can be extended and generalized to address regional sustainable tourism in different regions.</p> <p>The results and methodology followed can be exploited in different economic activities in the context of another project.</p>

# Resources for the development of the STEAME ACADEMY Learning and Creativity Plan Template

## In the case of learning through project-based activity

### STEAME ACADEMY Prototype/Guide for Learning & Creativity Approach Action Plan Formulation

*Major steps in the STEAME learning approach:*

#### **STAGE I: Preparation by one or more teachers**

1. Formulating initial thoughts on the thematic sectors/areas to be covered
2. Engaging the world of the wider environment / work / business / parents / society / environment/ ethics
3. Target Age Group of Students - Associating with the Official Curriculum - Setting Goals and Objectives
4. Organization of the tasks of the parties involved - Designation of Coordinator - Workplaces etc.

#### **STAGE II: Action Plan Formulation (Steps 1-18)**

##### Preparation (by teachers)

1. Relation to the Real World – Reflection
2. Incentive – Motivation
3. Formulation of a problem (possibly in stages or phases) resulting from the above

##### Development (by students) – Guidance & Evaluation (in 9-11, by teachers)

4. Background Creation - Search / Gather Information
5. Simplify the issue - Configure the problem with a limited number of requirements
6. Case Making - Designing - identifying materials for building / development / creation
7. Construction - Workflow - Implementation of projects
8. Observation-Experimentation - Initial Conclusions
9. Documentation - Searching Thematic Areas (AI fields) related to the subject under study – Explanation based on Existing Theories and / or Empirical Results
10. Gathering of results / information based on points 7, 8, 9
11. First group presentation by students

##### Configuration & Results (by students) – Guidance & Evaluation (by teachers)

12. Configure STEAME models to describe / represent / illustrate the results
13. Studying the results in 9 and drawing conclusions, using 12
14. Applications in Everyday Life - Suggestions for Developing 9 (Entrepreneurship - SIL Days)

##### Review (by teachers)

15. Review the problem and review it under more demanding conditions

##### Project Completion (by students) – Guidance & Evaluation (by teachers)

16. Repeat steps 5 through 11 with additional or new requirements as formulated in 15
17. Investigation - Case Studies - Expansion - New Theories - Testing New Conclusions

## STAGE III: STEAME ACADEMY Actions and Cooperation in Creative Projects for school students

**Title of Project: Eco-Innovation: Designing a Sustainable Product using Chat GPT**

Brief Description/Outline of Organizational Arrangements / Responsibilities for Action

STAGE	Activities/Steps Teacher 1(T1) Cooperation with other teachers and student guidance	Activities /Steps By Students Age Group: 12-15	Activities /Steps Teacher 2 (T2) Cooperation with other teachers and student guidance	Activities /Steps Teacher 3 (T3) Cooperation with other teachers and student guidance	Activities /Steps Teacher 4 (T3) Cooperation with other teachers and student guidance
A	Preparation of steps 1,2,3	-	Cooperation in step 3	Cooperation in step 3	Cooperation in step 3
B	Guidance in step 9	4,5,6,7,8,9,10	Support guidance in step 9	Support guidance in step 9	Support guidance in step 9
C	Creative Evaluation	11	Creative Evaluation	Creative Evaluation	Creative Evaluation
D	Guidance	12	Guidance	Guidance	Guidance
E	Guidance	13 (9+12)	Guidance	Guidance	Guidance
F	Organization (SIL) STEAME in Life	14 Meeting with representatives + visit a manufacturing plant	Organization (SIL) STEAME in Life	Organization (SIL) STEAME in Life	Organization (SIL) STEAME in Life
G	Preparation of step 15		Cooperation in step 15	Cooperation in step 15	Cooperation in step 15
H	Guidance	16 (repetition 5-11)	Support Guidance	Support Guidance	Support Guidance
I	Guidance	17	Support Guidance	Support Guidance	Support Guidance
K	Creative Evaluation	18	Creative Evaluation	Creative Evaluation	Creative Evaluation