



Funded by the European Union. Views and opinions expressed are however those of the author(s) only and do not necessarily reflect those of the European Union or the European Education and Culture Executive Agency (EACEA). Neither the European Union nor EACEA can be held responsible for them.

STEAME ACADEMY TEACHING FACILITATION LEARNING & CREATIVITY PLAN (L&C PLAN) - LEVEL 1 STUDENT TEACHERS: The weather in my city

S



T



Eng

A

M



Ent

1. Overview

Title	Weather in my city		
Driving Question or Topic	<i>How would you describe the weather in your city? How do you think the weather will be like next month? Do you think that the weather is the same in another city?</i>		
Ages, Grades, ...	10-12 years old	Grades 5-6	
Duration, Timeline, Activities	6 hours	6 hours	6 hours
Curriculum Alignment	Temperature, light, calculations, web search, simple data handling		
Contributors, Partners	<i>Hellenic National Meteorological Service, Local Office of Civil Protection Service</i>		
Abstract - Synopsis	<i>Students are firstly introduced to basic concepts of the weather (temperature, sun time per day, waterfall) and the changes in weather for every season by the science teacher. Then they are taught by the Maths teacher and the IT teacher together, on calculating and interpreting the average of measures and how to perform that using spreadsheets. In the next phase the IT teacher focuses on the ways to perform searches for weather data in the website of the HNMS Service and collect data. A meteorologist from HNMS can explain to the students how the weather stations function and the data are collected. At the final stage students analyze the collected data about the weather in their city and another city of the country and present the synopsis of the data also making prediction for the weather for next month.</i>		
References, Acknowledgements	http://emy.gr/emy/en https://poseidon.hcmr.gr/ http://www.emy.gr/emy/el/climatology/climatology_city http://www.emy.gr/emy/el/climatology/climatology_month		

2. STEAME ACADEMY Framework*

Teachers' Cooperation	<p>Teacher 1: Science Teacher -He/she introduces and presents the theoretical aspects of the physical phenomena related to weather. He/she also helps with the connection of all the other activities together in order to formulate the final findings, organize and report them.</p> <p>Teacher 2: Maths Teacher – He/she is in charge of introducing the students to the mathematical calculations needed and to the interpretation and meaning making out of the results, in collaboration with the science and IT teachers.</p>
-----------------------	--

STEAME in Life (SiL) Organization	<p>Teacher 3: IT Teacher – He/she introduces and guides the students regarding the collection of the necessary data from the databases and helps with the use of spreadsheet software and presentation software.</p>
Action Plan Formulation	<p><i>Meeting with meteorologists, representatives of the HNMS</i></p> <p>Step 1. Theoretical background knowledge: Definition of the parameters that affect the weather in a region (e.g. surface temperature, hours of sunlight, humidity, seasonal variations etc) and the concept of regional climate conditions, through case studies and primary data analysis. Exemplary task for example the comparison of temperatures between two different locations, and information about weather conditions from Wikipedia.</p> <p>Step 2. Extension of theoretical knowledge: Meeting of the class with a meteorologist for acquiring expert knowledge and an overview of the weather monitoring system of weather stations in the country</p> <p>Step 3. Formulation and definition of the project: The science teacher together with the maths and IT teacher work with the students to define the task of the collection, analysis and presentation of the data and present the guidance from each teacher and the tools and scaffolds that will be provided (IT lab, work of the students, progress of the projects, evaluation etc).</p> <p>Step 4. Application of knowledge Together with the teachers of IT and Maths, the students access the sources for data collection, compile and analyze the data, gradually formulate the interpretations and the presentation of the project's outcomes and formulate the remarks on the differences of the weather between the two cities.</p> <p>Step 5. Evaluation. Each teacher follows the assessment methodologies agreed, for example evaluation of students' teamwork, mathematical skills, presentation and communication skills.</p>

** under development the final elements of the framework*

3. Objectives and Methodologies	
Learning Goals and Objectives	<p><i>After completing the project, students should:</i></p> <ul style="list-style-type: none"> - Understand the basic parameters that outline the weather in a region - Know where to locate weather data - Know how to perform mathematical calculations on paper and with spreadsheet software - Understand better the system of weather monitoring - Develop a better understanding of micro-climate
Learning Outcomes and expected Results	<p>Learning Outcomes</p> <p><i>After completing the project students should:</i></p> <p>Knowledge</p> <ul style="list-style-type: none"> - understand better basic weather parameters - Know basic information about weather monitoring - Understand better regional differences in weather <p>Skills</p> <ul style="list-style-type: none"> - Search of data in online databases - Locate information online - Perform mathematical calculations (average, range) - Better use of spreadsheet and presentation software - Better communication and presentation skills

<p>Prior Knowledge and Prerequisites</p> <p>Motivation, Methodology, Strategies, Scaffolds</p>	<p>Attitudes</p> <ul style="list-style-type: none"> - develop the interest about weather - develop interest in climate change and environment preservation <p>Expected results</p> <ul style="list-style-type: none"> <i>Presentations containing weather data and conclusions</i> <i>Data spreadsheets with calculations</i> <i>Oral presentation of the summary of the results</i> <p>Prior knowledge - skills:</p> <ul style="list-style-type: none"> <i>Basic mathematical calculations</i> <i>Basic use of office applications suite (Microsoft Office, Libre office or equivalent)</i> <i>Working in teams</i> <i>Communication and cooperation skills</i> <p>Prerequisites:</p> <ul style="list-style-type: none"> Laboratory with access to the web Office suite (presentations, spreadsheets) Teleconference platform Presentation equipment (projector/presentation screen) <p>Motivation</p> <ul style="list-style-type: none"> <i>Weather and climate change discourse</i> <i>Project results that can be applied in local context</i> <p>Methodology</p> <ul style="list-style-type: none"> <i>Project based approach that presupposes the collaboration between teachers of science, maths and IT and the team work of the students in the project of local weather.</i> <p>Strategies</p> <ul style="list-style-type: none"> <i>Project based learning.</i> <i>Work in small teams.</i> <i>Guided discovery</i> <i>Autonomous work</i> <p>Scaffolds</p> <ul style="list-style-type: none"> <i>Guidance and consultancy</i> <i>Additional information sources</i> <i>Computer laboratory access and support</i> <i>Collaborative development of products and evaluation methods</i>
--	---

4. Preparation and Means

<p>Preparation, Space Setting, Troubleshooting Tips</p>	<p><i>The teacher mainly in charge of the project is the Science Teacher. The Science teacher discusses with the Maths and IT teachers the goals and the concept of the project and the implementation steps. He/She accesses initially the sources of information and together with the other teachers set the timeframe of their intervention. He/She prepares a project presentation sheet containing also the information from the other two teachers. They all have a preliminary access to the information sources. He/She prepares the first presentations of the theoretical background and contacts the external participants from the HNM Service to arrange for the meeting. All the teachers together decide on the timeframe of implementation of the project. For the realization of the project students work in their classroom and in the computer laboratory.</i></p> <p>Classroom</p>
---	---

Resources, Tools, Material, Attachments, Equipment	<p><i>A computer with access to the internet, office applications and teleconferencing applications is needed and presentation equipment for the presentation of new concepts, the presentation of the students works and the communication with the external actors.</i></p> <p>Computer laboratory</p> <p><i>In the laboratory students will work in teams for the access to online resources and for the collection, analysis and presentation of the data. Therefore computers with access to the internet and office applications installed are needed.</i></p> <p>Educational resources and materials</p> <p><i>Apart from the teachers' presentations additional learning resources and materials include physical maps and online maps (Google Maps/Earth)</i></p> <p><i>Videos:</i></p> <ul style="list-style-type: none"> • https://www.youtube.com/watch?v=XxELVix36tI • https://www.youtube.com/watch?v=nNmWAo0kDGk • https://www.youtube.com/watch?v=0qeUS_j3qjs
Health and Safety	<p><i>There are no particular health and safety concerns or precautions as the project is implemented inside the school unit.</i></p>

5. Implementation

Instructional Activities, Procedures, Reflections	<p><i>This plan is developed under the assumption that it extends to 6 study hours based on a 45-minute lesson. Classes are held once a week in the context of additional activities in primary school. The leading teacher (Teacher of Science - T1) is involved in all lessons while the Maths Teacher (T2) and IT teacher in the definition of the project stage and during implementation following the organization and scheduling of the project.</i></p> <p><i>Lesson 1</i></p> <p><i>T1</i></p> <p><i>15 minutes presentation of the project to the students and raising motivation</i></p> <p><i>T1, T2, T3</i></p> <p><i>10 minutes presentation of collaboration</i></p> <p><i>T1, T2, T3</i></p> <p><i>20 minutes definition of project and agreement of evaluation with the students</i></p> <p><i>Lesson 2</i></p> <p><i>T1</i></p> <p><i>25 minutes presentation on weather and basic weather parameters</i></p> <p><i>10 minutes discussion and conclusion about the interaction of the parameters</i></p> <p><i>10 minutes team building and city choice</i></p> <p><i>Lesson 3</i></p> <p><i>T1, T3</i></p> <p><i>30 minutes research online for weather information and data and familiarization with the use of the database of HNM Service acquisition</i></p> <p><i>T1, T2, T3</i></p> <p><i>15 minutes guidance on the next steps</i></p> <p><i>Lesson 4</i></p> <p><i>T1, T2, T3</i></p> <p><i>25 minutes data analysis and interpretation</i></p> <p><i>20 minutes meeting with representative of the HNM Service</i></p>
---	--

	<p><i>Lesson 5</i> <i>T1,T2,T3</i> <i>15 minutes discussion of the findings and interpretations provided</i> <i>30 minutes work in teams on the presentation of the results</i></p> <p><i>Lesson 6</i> <i>T1,T2,T3</i> <i>15 minutes finalization of presentations</i> <i>15 minutes presentation of the results from each team</i> <i>15 minutes conclusion of the project and evaluation</i></p>
Assessment - Evaluation	<i>Evaluation is based on the final product of the students and is carried out by the 3 teachers and the students of the other team, based on the agreed criteria.</i>
Presentation - Reporting - Sharing	<i>The final result of the project is presented to the 3 teachers and the students of the other team. Other participants, like students from another class can also be present.</i>
Extensions - Other Information	<p><i>Results can be presented to students of other classes</i></p> <p><i>The project can be extended to micro-climate analysis</i></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

18. Presentation of Conclusions - Communication Tactics.

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

Title of Project: **Weather in my city**

Brief Description/Outline of Organizational Arrangements / Responsibilities for Action

STAGE	Activities/Steps Teacher 1(T1 - Science) Cooperation with T2, T3 and student guidance	Activities /Steps Teacher 2 (T2 - Maths) Cooperation with T1, T3 and student guidance	Activities /Steps Teacher 3 (T3 - IT) Cooperation with T1, T2 and student guidance	Activities /Steps By Students Age Group: 10-12
A	Preparation of steps 1,2,3, 4,5	Cooperation in step 3,4,5	Cooperation in step 3,4,5	
B	Guidance and support in steps 4-10	Guidance and support in steps 4-10	Guidance and support in steps 4-10	Steps 4-10
C	Creative Evaluation	Creative Evaluation	Creative Evaluation	11
D	Guidance and support	Guidance and support	Guidance and support	12
E	Guidance and support	Guidance and support	Guidance and support	13 (9+12)
F	Organization (SIL) STEAME in Life	Organization (SIL) STEAME in Life	Organization (SIL) STEAME in Life	14 Meeting with HNMS representative
G	Preparation of step 15			
H	Guidance and support	Guidance and support	Guidance and support	17
I	Evaluation	Evaluation	Evaluation	18