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STEAME TEACHER ACADEMY

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STEAME ACADEMY
TEACHING FACILITATION LEARNING & CREATIVITY PLAN (L&C PLAN) - LEVEL 2
SERVICE TEACHERS: The weather in my city

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1. Overview

Title	**Weather in my city**		
Driving Question or Topic	*How is 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?* *Do you think that the weather is significantly different in that city compared to yours?* *What is the connection between weather and climate?*		
Ages, Grades, …	*12-15 years old*	*Grades 7th -8th(1st-2nd Gymnasium)*	
Duration, Timeline, Activities	8 hours	8 hours	8 hours
Curriculum Alignment	Temperature, light, weather, climate, web queries, calculations, algebra, data handling		
Contributors, Partners	*Hellenic National Meteorological Service, Local Office of Civil Protection Service, local National Meteorological Service agent*		
Abstract - Synopsis	*In the context of this intervention students are firstly introduced to the main constituents of the weather in a region (temperature, sun time per day, waterfall, wind intensity, humidity, etc) by the science teacher. Then, together with the collaborating teachers discuss the proposed project and agree on the ways It will be implemented. In the next stage they visit the local weather station to meet the agent of NMS together with the Science and IT teachers, in order to learn about the measurement of the weather phenomena and the different types of data that the HNM Service collects on weather and the ways to locate and acquire them. In the next phase the students meet with a representative of from the central offices of the HNMS and the Local Office of Civil Protection Service to learn about the flow of weather data and their interpretation and storing from the Civil Protection context also and together with the 3 teachers discuss and agree on the data that will be sent from the Civil Protection Service database. Following that they work with the maths teacher and the IT teacher based on the sample data received and the data from the online database of the website of the HNMS Service on the ways to collect the full dataset (database of HNMS service querying and sent data from the Civil Protection office transformation, storing) and the mathematical calculations that will be made. Then students work on the data calculations and on the modelling of the weather in their city and the selected other city. Following that with the science teacher they discuss the results and formulate the final*		

References, Acknowledgements	*deductions and model. Then they work with the IT and Science teachers on the final presentations. The project is completed with the presentations of the findings from the two teams.* 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 https://civilprotection.gov.gr/ https://civilprotection.gov.gr/polymesa

2. STEAME ACADEMY Framework*

Teachers' Cooperation	***Teacher 1**: Science Teacher -He/she introduces and presents the theoretical concepts about weather and climate. He/she also organizes the visits of the students and the meetings with the external actors and coordinates the actions of the other teachers during the progress of the project.* ***Teacher 2:** Maths Teacher – He/she guides, in collaboration with the other two teachers, the students during all the calculations needed and also coordinates with the IT teacher on the visualization and presentation of the results of the analyses.* ***Teacher 3:** IT Teacher – He/she helps and supports the students in order to use the spreadsheet application, the presentation applications and to access the online databases needed for the project. He/She also collaborates with the agent of the CP Service for the acquisition of the weather data required in the context of the project.*
STEAME in Life (SiL) Organization	*Connection of weather with civil safety, meeting with meteorologists, representatives of the HNMS, visit to weather station*
Action Plan Formulation	*According to the STEAME ACADEMY Action Plan Formulation* *STAGE I: Preparation {Steps 1-3}* *STAGE II: Action Plan Formulation {Steps 1-18}* *STAGE III: Actions and Cooperation in Creative Projects for school students {Table}*

* *under development the final elements of the framework*

3. Objectives and Methodologies

Learning Goals and Objectives	**Learning Goals** Main goals of the project: *- Understand better the parameters that outline the weather in a region* *- Develop a basic understanding of the differences between climate and weather* *- Understand better the interrelations between different weather phenomena* **Learning Objectives** **Knowledge** *- Understand the parameters that outline the weather in a region* *- Develop a basic understanding of the differences between climate and weather* *- Know how to acquire weather data* *- Understand better the system of weather monitoring* *- Develop a better understanding of climate and micro-climate* *- Know mathematical analysis methods (average, range, mode)* **Skills** *- use of spreadsheet and presentation software*

	- perform mathematical calculations *- perform online database queries* *- manipulate parameters in weather parameters* *- work better in teams* **Attitudes** *- develop the interest on weather phenomena* *- raise awareness about climate and climate change* *- appreciate teamwork and collaboration*
Learning Outcomes and expected Results	**Learning Outcomes** *After completing the project students should:* ***Knowledge*** *- Understand the basic weather parameters* *- Know basic information about weather monitoring* *- pinpoint regional differences in weather* ***Skills*** *-Search of data in online databases* *- Locate information online* *- Perform mathematical calculations (average, range, mode)* *- Better use of spreadsheet and presentation software* *- Demonstrate better communication and presentation skills* ***Attitudes*** *- develop the interest about weather* *- develop interest in climate change and environment preservation* **Expected Results** *Presentations containing weather data and conclusions* *Data spreadsheets with calculations* *Oral and visual presentation of the summary of the results* *Development of a basic model about the weather in a region*
Prior Knowledge and Prerequisites	**Prior knowledge - skills:** *Basic mathematical calculations* *Basic use of office applications suite (Microsoft Office, Libre office or equivalent)* *Working in teams* *Communication and cooperation skills* **Prerequisites:** *Laboratory with access to the web* *Office suite (presentations, spreadsheets)* *Teleconference platform* *Presentation equipment (projector/presentation screen)* Arrangements for the field trip (permissions, travel arrangements)
Motivation, Methodology, Strategies, Scaffolds	**Motivation** *Weather and climate change discourse* *Project results that can be applied in local context* *Contant with experts in the field* *Field trip to weather station* **Methodology** *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.* **Strategies** *Project based learning.* *Work in small teams.* *Guided discovery* *Systems thinking*

	Autonomous work **Scaffolds** *Guidance and consultancy* *Additional information sources* *Computer laboratory access and support* *Collaborative development of products and evaluation methods* *Information from experts in meteorology*

4. Preparation and Means

Preparation, Space Setting, *Troubleshooting Tips*	*The science teacher is the leading teacher in this project.* *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 in collaboration with the other two teachers prepares a first draft of the activities and steps to be taken, gets in contact with the representatives of the external services that will be involved in the project and checks for the availability of the infrastructures.* *All the teachers have preliminary access to the information and data sources to assert their availability and fitness for purpose.* *All the teachers together prepare an outline of the project to be undertaken and discuss and agree with the students on the implementation and the evaluation of the project.* *Then the science teacher makes the preparations for the field trip of the students to the local weather station, together with the other teachers verifies again that the classroom and computer laboratory settings are in line with the project's needs and activities, fills the documentation needed in the context of the project and prepares a brief project presentation for the students containing initial information on the subject.* *Important factor to be taken into account during the preparation is the scheduling of the field visit and of the meetings with the external participants from the other services.*
Resources, Tools, Material, Attachments, Equipment	*The implementation of the project takes place the realization in the classroom, in the computer laboratory which should have the necessary equipment and includes also a field trip.* **Classroom** *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.* **Computer laboratory** *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.* **Field trip** *Students should be informed on the code of conduct during the field trip* *A special permit has to be acquired from the school management.* *Arrangements have to be made for the transport of the students.* **Educational resources and materials**

	Apart from the teachers' presentations additional learning resources and materials include physical maps and online maps (Google Maps/Earth) *Videos:* • *https://www.youtube.com/watch?v=XxELVix36tI* • *https://www.youtube.com/watch?v=nNmWAo0kDGk* • *https://www.youtube.com/watch?v=0geUS_j3gis*
Health and Safety	*Special attention should be given to the health and safety of the students during the field trip to the local weather station*

5. Implementation

Instructional Activities, Procedures, Reflections	*This plan is developed under the assumption that it extents 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.* *Lesson 1* *T1* *15 minutes presentation of the project to the students and raising motivation* *T1,T2,T3* *10 minutes presentation of collaboration* *T1,T2,T3* *20 minutes definition of project and agreement of evaluation with the students* *Lesson 2* *T1* *25 minutes presentation on weather and basic weather parameters* *10 minutes discussion and conclusion about the interaction of the parameters* *10 minutes team building and city choice* *Lesson 3* *T1,T3* *30 minutes research online for weather information and data and familirization with the use of the database of HNM Service acquisition* *T1,T2,T3* *15 minutes guidance on the next steps* *Lesson 4* *T1 with students field trip to the local weather station and meeting with the representative* *Lesson 5* *T1,T2,T3* *10 minutes discussion of the field trip experience* *35 minutes preliminary examination of the weather data to be analyseds* *Lesson 6* *T1,T2,T3* *35 minutes team work on the analysis of the weather data* *10 minutes discussion on primary results* *Lesson 7*

	T1 *15 minutes work on the modelisation of the weather system* *10 minutes discussion guided discussion on the findings between the teams* *20 minutes work on the presentation of the results* *Lesson 8* *T1,T2,T3* *15 minutes finalization of presentations* *20 minutes presentation of the final results from each team* *10 minutes conclusion of the project and evaluation*
Assessment - Evaluation	*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.*
Presentation - Reporting - Sharing	*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.*
Extensions - Other Information	*Results can be presented to students of other classes* *The project can be extended to micro-climate analysis*

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: _____
Brief Description/Outline of Organizational Arrangements / Responsibilities for Action

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