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STEAME ACADEMY
TEACHING FACILITATION LEARNING & CREATIVITY PLAN (L&C PLAN) - LEVEL 1 STUDENT TEACHERS:
How to feed 8 billion people?

(developed from the guide *Supporting Mathematics and Science Teachers in addressing Diversity and promoting fundamental Values* – MaSDiV)

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1. Overview

Title	**How to feed 8 billion people?**		
Driving Question or Topic	Can the Earth feed us? What are the causes of the food shortage? How can we avoid starvation? How to feed 8 billion people in a way that doesn't harm the planet?		
Ages, Grades, …	*Age selection: 12 - 15*	*K-12 grade level selection*	6 - 9
Duration, Timeline, Activities	*Number of learning hours 8*	*Timeline/frame, calendar*	*Number of activities 5*
Curriculum Alignment	Sciences/biology, mathematics, arts, entrepreneurship		
Contributors, Partners			
Abstract - Synopsis	This learning and creativity plan aims to raise awareness towards the link between hunger and climate change and the environmental impacts of food production. The main goal of this L&C plan is to identify means to feed the earth population without harming the planet. In the initial phase, the students' learning process will involve researching data to create a better understanding of the gravity of this problem. In the second phase, students will explore, analyze, and become aware of various ways to provide food for the population in order to eliminate hunger, but at the same time avoid upsetting the balance of nature. In the next phase, they will design and develop products closely related to the topic. In the final stage of this project, students will present and sell what they have created, demonstrating their skills and disseminating the results of their work.		

References, Acknowledgements	https://www.youtube.com/watch?v=NgLFJTzH1JI https://awellfedworld.org/food-insecurity-climate-change https://ourworldindata.org/environmental-impacts-of-food https://feeding9billion.com/F9B-VideosEquitable-Diets.htm

2. STEAME ACADEMY Framework*

Teachers' Cooperation	*Teacher 1 (biology, sciences) will outline the entire process.* *Teacher 2 (mathematics) will guide students during the activities involving the use of mathematics.* *Teacher 3 (arts) will guide students during the process of designing and creating the menu.* *Teacher 4 (entrepreneurship) will support students to organize and run an activity dedicated to the local community, during which they will sell their created menus.*
STEAME in Life (SiL) Organization	*Activity involving the local community, during which they will sell created menus.*
Action Plan Formulation	*Stage 1: Preparation by the team of 4 teachers.* *Stage 2: Action Plan Formulation. The 4 teachers collaborate to create the learning plan and define how to relate the students' outcomes to the curriculum. They guide the students during the project phases, according to their specific competences (STEPS 1-2), and they collaborate for the final assessment step.*

* *under development the final elements of the framework*

3. Objectives and Methodologies

Learning Goals and Objectives	Knowledge: ● Understand the concepts: food shortage; climate change; food production; dietary choices, famine, starvation, food waste. ● List the consequences of food production. ● Identify the causes of famine, scarcity of food, starvation. ● List the dietary choices that do not harm the planet. Skills: ● Analyze information about food production and its impact. ● Work effectively in teams, demonstrating collaborative skills such as communication, active listening, and task delegation to achieve common goals. ● Generate original ideas and practical solutions to address identified needs (creativity and problem-solving) ● Apply mathematical concepts to calculate quantities of the ingredients for a healthy menu. ● Compare different menus and decide which production of dishes has a bad impact on nature. ● Create healthy menus that do not cause harm to the planet. ● Execute the design of a healthy menu.

	• Develop informative materials relevant to the topic. • Communicate ideas clearly, using verbal, written, and visual communication techniques. Attitudes: • Maintain an open mindset and curiosity and seek new ideas. • Genuine interest in exploring the topic that is discussed - to feed the planet's population with minimal environmental impact. • Embrace challenges as opportunities and improvement during the creation of the healthy menu process and also during the local community event.
Learning Outcomes and Expected Results	1. *Research the suggested links and other sources to outline the impact of food production on the environment.* 2. *Understand the impact of food production and the benefits of using a diet that relies more on plant food than animal food.* 3. *Design and creation of a healthy menu, that does not harm the environment.* 4. *Reflect critically on the social impact of the product they created.*
Prior Knowledge and Prerequisites	*Mathematics and Science:* students should possess basic notions from mathematics, biology, and geography. *Arts and Technology:* Basic knowledge about editing programs: Canva, Pixton app or others. *Collaboration skills*: experience working in teams will help students to collaborate with their peers.
Motivation, Methodology, Strategies, Scaffolds	Inquiry-based learning; hands-on activities; group work; PBL. The main methodologies and techniques of the project are inquiry-based learning and project-based learning. Students are encouraged to explore the material, organize the material, and ask insightful questions. Students are deeply involved in conducting their scientific research. They build their knowledge through exploration, experience, and discussions. As they explore this learning plan, students build critical thinking, communication skills, and creativity.

4. Preparation and Means

Preparation, Space Setting, *Troubleshooting Tips*	Classroom with whiteboards and computers where students can collaborate, interact, and create. Presentation area: in the same class (when presenting the results at an initial phase) or in another space – when organizing the event dedicated to the local community.
Resources, Tools, Material, Attachments, Equipment	*Books, journals, computers for research.* *Paper and printer for editing the healthy menus.* Tools such as google classroom can be useful for managing assignments. Padlet for collaborative brainstorming and FLipgrid for video reflections. Provide access to scientific databases like Scopus, JSTOR or google scholar for in-depth research.
Health and Safety	*Safety rules for outdoor activities and hands-on activities.*

5. Implementation

Instructional Activities, Procedures, Reflections	*Activity 1: See, hear, feel* A video about food shortage around the world will be shown – https://www.youtube.com/watch?v=NgLFJTzH1JI (World Hunger Day). Students will watch it and then share their impressions based on the technique ”See, hear, feel”. Facilitate a discussion by providing students with additional data and resources on global hunger and food production challenges. *Activity 2: Clustering* Students, working in groups, will make a cluster with the causes of hunger, without using any sources of documentation. *Activity 3: Data search and processing of collected data* Teacher divides the class into groups. Each group will have to read and analyze information about: - the link between hunger/famine/starvation and climate change (they can use, for example: https://awellfedworld.org/food-insecurity-climate-change); - environmental impacts of food production (they can use, for example: https://ourworldindata.org/environmental-impacts-of-food). Then, they will complete the cluster developed at the beginning of the lesson. Students will present the results of their work to the whole class, using the ”Gallery tour” technique, emphasizing the link between hunger and climate change, on the one hand, and the environmental impacts of food production, on the other hand. They will try to answer an important concluding question: How to feed 8 billion people in a way that doesn't harm the planet? After the students propose their solutions, they can watch a video that will help them understand more about this particular topic: https://feeding9billion.com/F9B-VideosEquitable-Diets.htm *Activity 4: Product creation* Students, in groups, will receive a link about the 5 food groups (https://wordwall.net/resource/16211109/food-groups) **(Annex 1)** and based on this information they will **analyze their school's menu and the menus of several other schools and explain why this menu/those menus is/are suitable or is not/are not suitable for the recommendations in the previous video and the picture.** Students will put together **a healthy weekly menu for their school/family**, accompanied by explanations and pictures. They will take care that this menu will not harm the planet. They will have to calculate the optimal quantities for each person to avoid food waste. The menus will be accompanied by illustrations made by the students for information purposes. *Activity 5: Campaign to raise awareness about the food shortage* Create a campaign to raise awareness about the food shortage in the local community.

	A community activity will be organised during which students will present information about the problem of providing food for the earth's population. The menus will also be presented and, in collaboration with parents, dishes from the menus will be prepared and sold. The raised money will be donated to organisations that help people facing food shortages.
Assessment - Evaluation	*Continuous teacher observation, involving review and encouragement. Self-assessment and peer review.* Formative assessments such as quizzes, reflections and checkpoints throughout the project to monitor progress and provide feedback can be used during this project.
Presentation - Reporting - Sharing	*Almost all the activities involve the presentation and sharing of the results.*
Extensions - Other Information	Students could solve specific mathematical tasks, such as calculating the carbon footprint of various foods or optimizing food production processes using statistics.

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. Targeting Age Group of Students – Focus on connections 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 revise 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.

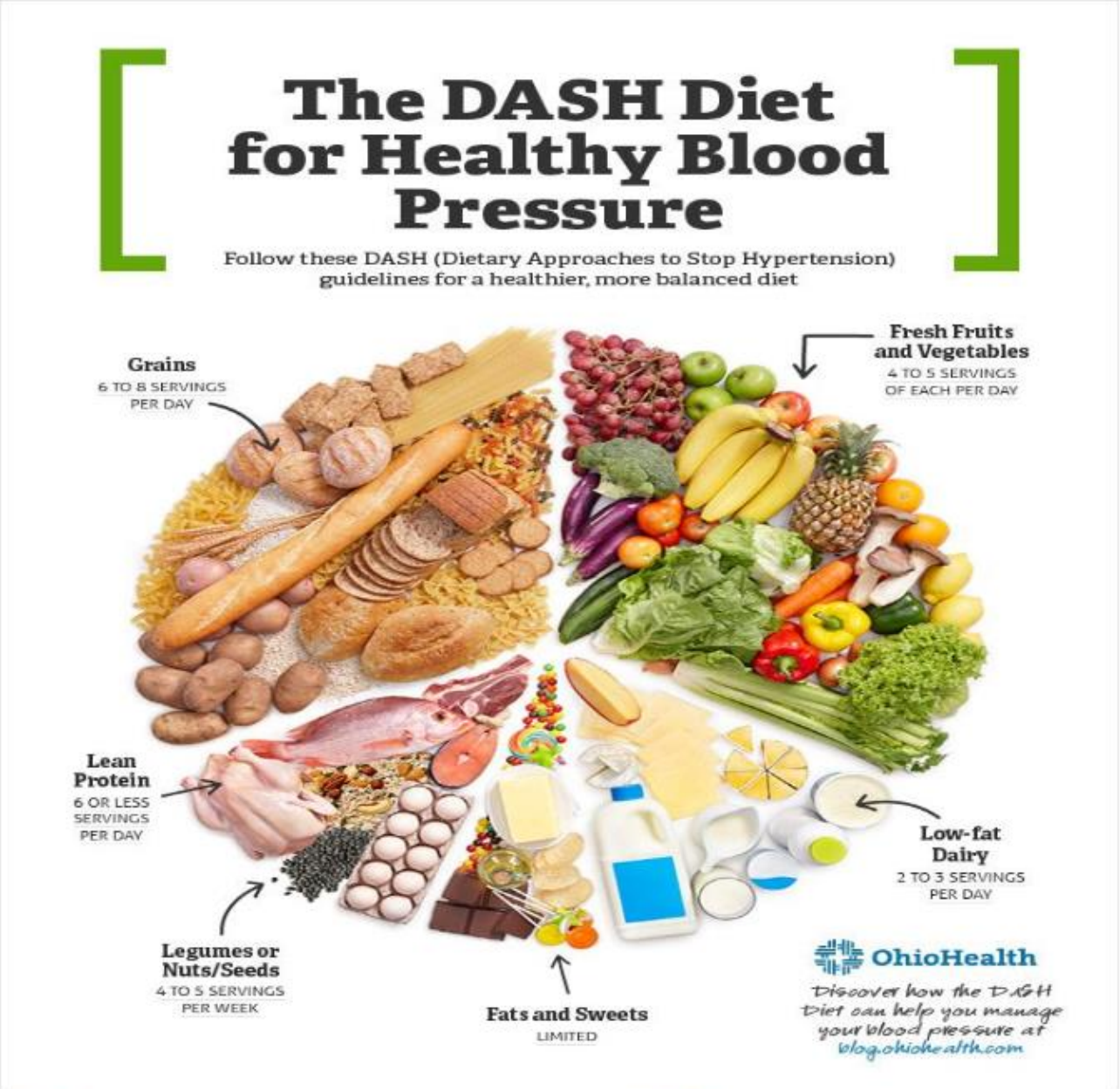
STAGE III: STEAME ACADEMY Actions and Cooperation in Creative Projects for school students

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

Annex 1



The source of the image: https://wordwall.net/resource/16211109/food-groups