SUSTAINABILITY IN THE CLASSROOM AND BEYOND – ENGAGE THE WHOLE SCHOOL!

Using the knowledge and ideas that you've gathered from the course, you will create an **action plan** in three chapters:

- **background**, where you provide some basic information about yourself and your school
- **preparation**, where you brainstorm about the role of sustainability in your class
- **action**, where you come up with a project and map out the steps needed to complete it

Don't forget to check the evaluation criteria by which your plan will be assessed.

CHAPTER 1: BACKGROUND

Introduce yourself. Simple as that!

My name:	Arșaluis - Luiza Rîpeanu
My country:	Romania
My role:	English teacher, Coordinator of Educative Programmes and Projects in our school
My school:	*"Lazar Edeleanu" High school is a technological and professional school situated in Năvodari, a town in Constanța County, region of Dobruja, Romania. The school concords with the town specificity - our high school students receive educational training in various fields, such as Industrial Chemistry, Tourism, Electricity, but also theoretical training in Natural Sciences, Social Sciences. They also study foreign languages, English and French and a wide range of subjects - History, Geography, Economy, Psychology, Philosophy. There are 808 students and 54 teachers in our high school. The school's offer includes also evening courses for adults-foreman-*

master school in crude oil processing and petrochemistry. The strategic goals derived from the school's mission are: Reducing school dropout and increasing the pass rate at the baccalaureate exam (ROSE project target), developing the material base and attracting financial resources, developing the school's human resources through continuous training of teaching and non-teaching staff , depending on the identified needs, development of educational and social partnerships for vocational training, in order to improve the socio-professional insertion of graduates, reconsideration of management at school and class in the perspective of introducing a climate of order and discipline. The patrimony of the institution is represented by: 5 laboratories specific to the field of chemistry / chemical industry, equipped with specific furniture, equipment and utensils, computer laboratories, physics, biology, chemistry and electrical engineering laboratories equipped according to the experiments necessary for the classes.

CHAPTER 2: PREPARATION

Think about a class that you currently teach, or a single lesson if you prefer. How can you add more sustainability elements to it?

You don't need to fill in all the blanks! Only fill in what is relevant to your subject, needs and goals. The point of this exercise is just to help you brainstorm and set priorities. **You can simply write 'N/A' if some cells are not relevant to your objectives.**

My class/lesson:	***Building a portable vertical greenhouse***
Environment ***Some related Sustainable Development Goals: affordable and clean energy; climate action; responsible consumption and production***	

Knowledge already in my class:	**A basic understanding of the properties of light, including the visible spectrum, reflection and refraction of light. Students should concurrently be taking Algebra 1 in order to complete the worksheet calculations.**
Knowledge I would like to add:	***Environmental Sustainability:*** **Students can learn about methods to support environmental sustainability by using the greenhouse to investigate specific environmental challenges. Lessons can demonstrate how human actions and some agricultural practices can lead to environmental degradation.** **Opportunities for student projects include:** **• Growing food with less water** **• Heating the greenhouse with a renewable energy source** **• Using compost to improve soil health** **• Protecting water resources through responsible management of pesticide and herbicide use** **• Lessening climate change by growing food locally and reducing greenhouse gas emissions.** **This assignment also integrates science, math, and technology and can be expanded to include language arts by having students create ad campaigns and marketing materials.** • **List the benefits (cost saving, efficiency) of using a greenhouse.** • **Explain the greenhouse effect in depth.** • **Provide an in-depth explanation of the greenhouse effect.**

Local issues already in my class:	**N/A**
Local issues I would like to add:	• **Raised awareness within the school about how important it is to look after our local environment that starts from the immediate environment – our school.** • **Improving our understanding of the essential requirements, both abiotic and biotic, for plants to thrive and how to reduce organic waste in our environment through compost bins.** • **Engage the whole school to work on biodiversity by engaging teachers,students, parents and the wider community.** • **Encourage the whole school to work on waste by engaging teachers, students, parents and the wider community.** • **Embed sustainability and being water smart into the life of the school and wider community.**
Competences already in my class:	**Mathematical competence** **teamwork and collaboration**
Competences I would like to add:	**This project links to:** • **General Capabilities - Personal and Social Capabilities, Civics and citizenship.** • **Student Led Activities: Might include expanding content knowledge, conducting research, gathering information, mastering new skills, conducting polls to determine stand location, determining use of proceeds, etc.** • **DEVELOPING LEARNING TO LEARN COMPETENCE**

	• **competence in science, technology, engineering**
Society ***Some related Sustainable Development Goals: gender equality; reduced inequalities; peace, justice and strong institutions***	
Knowledge already in my class:	**N/ A**
Knowledge I would like to add:	• **Raising awareness within the school about our APHS Environmental Committee through our vertical greenhouse, which is visible to all students and staff.** • **Increased the sense of achievement and pride within students through seeing the plants they have sown grow and thrive.** • **Socio-cultural Sustainability: An ideal lesson about the importance of social justice is to have students investigate the connections between food access and poverty, education,environmental stewardship, and overall well being. Students will discover the inherent challenges to upholding the other two pillars of sustainability when people's basic needs are not met. There are a myriad of ways for students to usethe greenhouse to study how food access can support or challenge socioeconomic sustainability. For example, students can investigate food access within their community and the impact a school greenhouse can have on providing calories to areas in need of fresh and healthy vegetables.**

Local issues already in my class:	**N/ A**
Local issues I would like to add:	**This project links to:** • **General Capabilities - Personal and Social Capabilities, Civics and citizenship.** • **Improving students' wellbeing by providing them with a nice quiet green space to sit and relax during recess and lunch breaks.**
Competences already in my class:	**teamwork and collaboration**
Competences I would like to add:	**Civics: Use democratic process to select how funds will be used.** **Generating a sense of connection and responsibility toward the school greenhouse.** **Using seed catalogs or seed company websites, ask students to research and propose specific plant varieties to grow in the greenhouse. Create a system either on a white board or garden log for students to keep track of planting dates and other relevant data.** **Negotiation and is an interaction that encouraged awareness of one's own and others feelings** **LEADERSHIP, INCLUSION, STUDENT VOICE, PARTNERSHIPS, SUPPORT** **Growth mindset** **Citizenship competence**
Economy ***Some related Sustainable Development Goals: no poverty; affordable and clean energy; industry, innovation, and infrastructure***	
Knowledge already in my class:	**N/ A**

Knowledge I would like to add:	**Economic sustainability** **Students can create plans to grow, market, and distribute vegetables plants grown in a greenhouse. At the end of the assignment, students can be challenged to think of the environmental impacts of growing and distributing the crop.** **Assigning one group to grow for the highest profit, one to grow for the highest nutritional value for the greatest number of people, and one to grow with the lowest environmental impact possible.** **As students become involved in this project consider researching the history and evolution of greenhouse structures throughout the world. You can also explore their impact on commercial production, plant conservation, and food justice efforts.** • **List the benefits (cost saving, efficiency) of using a greenhouse.** • **incorporate learning about nutrition,** **agriculture, growing techniques, and health into the curriculum**
Local issues already in my class:	**N/A**
Local issues I would like to add:	**N/A**
Competences already in my class:	**N/ A**
Competences I would like to add:	**investigating the pillars of sustainability and systems-based thinking** **Critical thinking**

CHAPTER 3: READY, SET… ACTION PLAN!

Think about a class that you currently teach, or a single lesson if you prefer. How can you add more sustainability elements to it?

Now that you've identified some gaps and needs in your curriculum, try to think of a **whole-school sustainability project** that you can carry out to further them.

The project can be anything from a **pedagogical innovation** (*e.g., using issue analysis in your lessons, building a school garden*) to an **organisational change** (*e.g., setting up an eco-committee, collaborating with colleagues on a series of lessons*) to a **community effort** (*e.g., painting a 'Cut X%' mural, contacting a local NGO for workshops*). There are many paths to the same destination!

If you're not sure what project you want to carry out, you can write down a few possibilities on a sheet and give them a score between 1 and 5 based on 'importance' and 'availability of resources'. The project with the highest combined score should be a good candidate. Then...

1. Write the **title and/or summary** of your project in the first row
2. Outline the **steps you need to follow** to carry out the project
3. Note down **who will be involved** in each step and **how long you think it will take**

You can add or remove rows if you wish.

'Building a school Portable Vertical Greenhouse'

The purpose of this project is to build a Portable Vertical Greenhouse, which would support our students' understanding of environmental sustainability and improve our school's overall attitude towards caring for the environment. Students have been motivated to take action after attending a regional Schools summit organised by the Black Sea NGO in 2021. Developing the school garden was part of our plan, but after attending the Conference the students became more motivated and became more involved in the planning and set-up of the greenhouse.

We had an Environmental committee before the Black Sea NGO international conference, but the conference encouraged more students to become involved. Most of the students

ranged in age from Years 16 to 17, and this was an extra-curricular activity. Personally, I have used the gardens to assist in teaching content in Year 10 and 11 English.

The time frame to set up the vertical greenhouse is 12 months. The €1,000-budget is covered by an Erasmus project grant from the European Union.

Its purpose is to support and expand the planting and use of school gardens and greenhouses, Farm to School activities, and the integration of plant science in the curriculum.

The greenhouse offers an innovative learning lab in which students can study the interconnected pillars of sustainability: environmental sustainability, economic sustainability, and socio-cultural sustainability. Investigating sustainability in a greenhouse can serve as a catalyst for solutions to local and global challenges.

Students learn about the advantages and disadvantages of the greenhouse effect. They construct their own miniature greenhouses and explore how their designs take advantage of heat transfer processes to create controlled environments. They record and graph measurements, comparing the greenhouse indoor and outdoor temperatures over time. Students are also introduced to global issues such as greenhouse gas emissions and their relationship to global warming. This engineering curriculum aligns to Next Generation Science Standards (NGSS).

Project-Based Learning Greenhouses are powerful teaching tools when used for interdisciplinary project-based activities that use real-world situations. When students can apply what they learn to real-life situations, they develop a deeper understanding and improve their ability to make connections between ideas. The team approach used in performance tasks helps students build life skills, including critical thinking. The possibilities for greenhouse-based projects are endless whether they happen over just a few days, across a semester, or even throughout an entire school year. They can be built on student interests, school opportunities, or student-driven solutions to identified challenges. The best ones usually include educators across multiple disciplines and reinforce concepts that students are currently learning in the classroom in individual subject areas.

What?	Who?	How long?
1. Drafting learning objectives	*Me & Biology teacher*	*1 week max*
2. Establishing the working team	*Me, teacher coordinators, students, parents*	*1 week*
3. Meeting and discussing with a specialist (engineer) about the design, the necessary	*Me and the specialist*	*1 day*

components of a portable vertical greenhouse and the budget		
4. Meeting with school head	*Me & school head & groundskeeper*	*2 days*
5. Placing a greenhouse	*Me & gardening experts*	*1-2 days*
6. Taking into account Infrastructure Elements: Temperature, Orientation, Ventilation & Light	*Me, Geography, Biology & ICT teachers*	*1 week*
7. Creating an Interior Layout	*Me & the specialist*	*1-2 days*
8. Budgeting for a School Greenhouse and basic time ***Once my team has designed a plan for our greenhouse project including the type of structure, location, methods for heating/cooling and ventilation, and interior design, it is time to create a budget that takes into consideration construction, maintenance, material, and possibly even programming costs. A budget is a strong tool in helping organize our vision so that it can be most clearly shared with the rest of my school and potential supporters.***	*The specialist, my team* *Me & administration/ accountant*	*2 weeks maximum*
9. Planning with the School Year & Growing Season *Before planting the first seed it is very helpful to create a plan for the season. If seeds are being germinated for the purpose of production, a plan can help you chart the best start dates for your*	*volunteers, students, or staff to care for plants over long breaks in winter, spring, and fall.*	*April - September*

geographic location as well as guide how the greenhouse will be used and organized. A very important item to take under consideration during the creation of this plan is your school's seasonal breaks. Aligning the growing season with the school schedule, assigning students or volunteers to check on the greenhouse plants on weekends and when school is not in session, and setting up automated systems for watering, temperature, and humidity control are all management practices to consider as you plan your planting schedule.		
10. Creating a Planting Schedule	*students*	*One week*
11. Greenhouse Planting with Students ***- Getting Started with Seeds*** ***- Determining How Many Seeds to Start*** ***- From Seed to Seedling: Soil, Water & Nutrients*** ***Providing nutrient rich soil using post-consumer organic material is great way*** *to promote sustainability.* ***- Steps for Starting Seeds***	*A dozen students and biology and chemistry teachers* *a number of committed community volunteers*	*9 months*
12. Caring for seedlings ***- Start vegetable seedlings*** ***- Transplant seedlings into small pots to allow root growth before putting in bucket gardens*** ***- Make bucket gardens for week 6***	*a team of dedicated teachers and students*	*Week 1* *Weeks 2-5* *Week 5*

- Plant seedlings in bucket gardens ***- Distribute bucket gardens to homes/families of choice by sale or donation***		*Week 6* *Week 8*
13. Problem Solving: Pest & Disease Management	*Specialist*	*3 weeks*
14. Participating in recycling and composting programs	*the support of community members, grants, and student-led efforts*	*During the school year*

This worksheet is adapted from UNESCO's Education for sustainable development toolkit. We hope you will find good use for this action plan in your school.

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