

*Creating an ECO online Natural Fit Virtual Programs to Prepare Students for  
boosting 21<sup>st</sup> century Skills 4 the Future (UNITY)*

*2021-1-SE01-KA220-SCH-000032448*

*STE(A)M-focused PBL for transferring 2021<sup>st</sup> skills for fighting against  
climate change*

**LESSON PLAN 2:**

**Understanding greenhouse effect**

*Presented by Fthia in Action team*

### Lesson procedure:

<b>Date:</b>	__/__/__
<b>Teaching staff:</b>	Mr/Mss/Ms
<b>Term:</b>	2022-2023
<b>Week:</b>	1
<b>Year Level:</b>	Primary/low secondary (6-15 years old)
<b>Time/length</b>	1-2 hour.
<b>Key Learning Area:</b>	<b>Use of soft skills for climate change and blending interdisciplinary subjects, including science, math, art and social studies</b>
<b>Topic/focus:</b>	<b>Learn about greenhouse effect by building a greenhouse</b>
<b>Lesson Name:</b> Greenhouse effect, build a greenhouse by using STEAM skills.	
<b>Foreseen Outcomes:</b>	
At the end of this lesson, students will be able to:	
<ul style="list-style-type: none"> <li>✓ understand the importance and physics behind the greenhouse effect,</li> <li>✓ build their own small greenhouse,</li> <li>✓ run small-scale campaigns, relevant to greenhouse effect,</li> <li>✓ design posters and brochures, relevant to environment issues, especially greenhouse effect,</li> <li>✓ improve their social skills, including group communication, interaction and discussion,</li> </ul>	
<b>Lesson Description:</b>	
This lesson shall demonstrate what the greenhouse effect is, how it works, why it happens, how it connects with climate change, what to do to build a greenhouse and what skills are required solidly and the simplest ways.	
Pre-requisites to this lesson plan (not applicable):	

**Length (Lesson procedure):**

This lesson will take 1-2-hours, which also includes interdisciplinary learning.

Depending on how to implement the planned lesson, the teacher shall need some materials, including videos, papers, 2 plastic cups (for each student or team), soil, seeds and tape. The teaching staff shall follow the following steps to implement the lesson successfully:

**Step 1. Lead in:**

Teacher greets the students, and asks what they know about the greenhouse effect. After collecting the feedback from the students, the teacher asks for grouping in accordance with the students' learning intelligence and or learning style. Here, teacher groups students as:

- ✓ Group A: 2-3 students, having science learning interest/intelligence/capability/style
- ✓ Group B: 2-3 students, having technology learning interest/intelligence/capability/style.
- ✓ Group C: 2-3 students, having engineering (creativity) learning interest/intelligence/capability/style.
- ✓ Group D: 2-3 students, having art learning interest/intelligence/capability/style.
- ✓ Group E: 2-3 students, having math learning interest/intelligence/capability/style.

**Note:** As grouping the students, the number of students can change according to the class-size.

**Lesson standard:**

The lesson is standardized around STEAM-focused PBL for transferring 2021st skills for fighting against climate change. Here, we focus on the role of the greenhouse effect on our planet. Through creating and performing, understand how the greenhouse effect works, Specifically in a smaller scale as a greenhouse. Regarding this, it is expected that the students will understand the role of the results of the greenhouse effect for climate change and the future of our planet earth if we don't solve this problem.

**Common Core State Standards:**

The teacher shall connect and correlate the lesson with the national syllabus and or program, which shall incorporate the lesson with the national program.

**Enduring Understandings:**

The students will understand the core ideas and philosophy behind the greenhouse effect. The learning outcomes of the lesson shall be used by the students in their future lives. Besides, the lesson is connected with following areas:

- ✓ soft skills development,
- ✓ interdisciplinary learning,
- ✓ blended/hybrid learning,

The lesson will also answer the following questions:

- ✓ Is the lesson transferable for skills development?
- ✓ Can it be teachable over and over again?
- ✓ Does it connect to real-life issues?

### Essential Questions:

- ✓ What are the connections of a greenhouse with STEAM skills?
- ✓ What are the connections of a greenhouse with PBL?
- ✓ How can greenhouse building lead to transferring soft skills?

Before the lesson implementation, the teaching staff shall brainstorm the above questions with the colloquies at the same school.

### Case section:

The teacher shall follow the following steps:

#### Step 1. Creation of the case:

Each year greenhouse gasses are increasing especially in Greece. As a demonstration lesson the teacher shall use visuals, posters, videos, etc. Then, the teacher asks the following questions to the students who are grouped in ‘**Step 1. Lead in**’. Each question is asked to the students who are grouped from A to E.

Questions for group A (Science-minded students):

- ✓ If you design a greenhouse how would it be?
- ✓ Where would you use the greenhouse?
- ✓ What purposes would you use the greenhouse?

Questions for group B (Technology-minded students):

- ✓ How would you add technology in greenhouses, if you were an expert?
- ✓ What aspects of technology would you use and or benefit in creating a greenhouse?
- ✓ What technological design would you use, if you create a greenhouse?

Questions for group C (Engineering-minded students):

- ✓ Where would you set the greenhouse and for what purposes?
- ✓ Who would work with building a greenhouse?
- ✓ What static design would you use in building a greenhouse?

Questions for group D (Art-minded students):

- ✓ Can you design a poster for the greenhouse to be known?
- ✓ Can you compose a song for sharing it?
- ✓ What campaign would you run to increase the awareness of the greenhouse effect in your local community?

Questions for group E (Math-minded students):

- ✓ How can you define the right location of the greenhouse?
- ✓ What calculation would you use?
- ✓ How do you calculate its cost?

The teacher first elicits the answers and then leads to the students taking actions and make a sample plant from papers and other materials.

**Skill focus:**

During the lesson, Cognitive Skills, such as decision making, problem solving, creative thinking and interpersonal skills will be the focus.

**Content:**

Building knowledge on greenhouse effect through STEAM-focused PBL approach.

**Assessments:**

The teacher will use summative assessments employed in this lesson to gauge student learning.

**Evidence of Student Learning:**

Students' learning evidence will be the quotes, graphics, pictures, prototype, song, posters etc. that they improved during the lesson.

**Texts/Resources:**

Teacher uses the needy sources for the implementation of this lesson: The resources/texts are to be created by the teacher (Please see the annex 1 attached under the lesson plan, which are to be used for this lesson).

**Learning Activities:**

A series of tasks the student will engage in over the lesson. The activities are based on what students need to understand and be able to do for the performance and are aligned to the defined standards "Learn about greenhouse effect by building a greenhouse" and the essential questions defined under "Case section"

**Practice:**

Teacher will deeply explain the negative effects of climate change and the roles of greenhouse effect for energy saving and skills transfer. Here, the teacher shall elaborate or describe the lesson using these prompts provided).

The teachers shall create a flexible learning environment for the students. Here, the teacher uses:

Warm-up: ask about the questions and make the students ready for learning for the topic-specific subject.

Practice: The teacher sets-up demonstration/modeling (I do-we do-you do)  
Studio/Rehearsal/Workshop (students engage in creating/planning/refining).

Clean-up: During the procedure, the teacher walks around the class and observes the students on what they need and control. If the students have questions, the teacher answers them.

**Suggested Extensions:**

- ✓ The teacher may arrange a visit to a real greenhouse for the students.
- ✓ The teacher may lead the students to create a human-size or smaller greenhouse for the school.
- ✓ The teacher may lead the students to present their works in a science festival.