

*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 5: Building a Water Filtration through STEAM focus PBL  
approach for fighting against climate change**

*Presented by Eurasia 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
<b>Time/length</b>	4-5 hour.
<b>Key Learning Area:</b>	Use of soft skills for climate change and blending interdisciplinary subjects, including science, maths, art, and social studies
<b>Topic/focus:</b>	Filtration Investigation
<b>Lesson Name:</b> Use of recycled water with the help of water filtration for resource-saving or efficient use of resources and transferring STEAM skills around PBL focus.	
<b>Foreseen Outcomes:</b>	
<p><i>At the end of this lesson, students will be able to:</i>  <i>Know what water filtration is, what is it for,</i></p> <ul style="list-style-type: none"> <li>✓ Understand the natural process groundwater goes through and appreciate how long this process can take</li> <li>✓ To appreciate how outside impacts (e.g. pollution) can affect this source of freshwater</li> <li>✓ Understand how water cleans in the natural environment</li> <li>✓ To reveal the dynamics of water i.e. where it goes when it falls on the ground</li> <li>✓ Understand how modern water treatment methods work</li> </ul>	
<b>Lesson Description:</b>	
<p>This lesson shall demonstrate <i>what water filtration is, what is it for,</i>  <b>How to use water filtration for climate change.</b>          Why water filtration is key for drinking water for climate change.          Why building water filtration systems are so important?</p>	
Pre-requisites to this lesson plan (not applicable):	
<b>Length (Lesson procedure):</b>	
This lesson will take 3-4 hour, which also includes interdisciplinary learning.	

Depending on how to implement the planned lesson, the teaching shall need some materials, including videos, comics and papers. 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 water filtration. Ask students the importance of drinking water and the way to get it. Follow up by asking them to describe what they think about the reasons for water contamination. If needed, provide prompts to lead students to think about the importance of drinkable water, availability of water cleaning, the issues behind the lack of drinkable water, etc. Students will begin by describing today's water shortage problems and their reasons, following up with the solutions for these problems. 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 group 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 understanding the reason why water filtrations are key for drinkable water production for climate change.
- ✓ How to build a water treatment system through communication and cooperation (STEM focus PBL)
- ✓ Understand how to use water filtration in other words water treatment systems for climate change.
- ✓ Regarding this, it can be expected that understand the role the importance of water filtration. As land runs out of drinkable water and the need for water increases in both farming and society, could water filtration techniques solve the 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 national program.

### Enduring Understandings:

- ✓ The students will understand the core ideas and philosophy behind how to build a water filtration through communication and cooperation(STEM focus PBL)
- ✓ Understand on how to use water filtration for climate change.

The learning outcomes of the lesson shall be used by the students in their future careers. 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 between water filtration with STEAM skills?
- ✓ What are the connections between how to use water filtration for climate change with PBL?
- ✓ How does building a water filtration leads to the transfer of 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:

1. Ask students the importance of drinking water and the way to get it. Follow up by asking them to describe what they think about the reasons for water contamination. If needed, provide prompts to lead students to think about the importance of drinkable water, availability of water cleaning, the issues behind the lack of drinkable water, etc. Students will begin by describing today's water shortage problems and their reasons, following up with the solutions for these problems.

Ask students if this type of water treatment technique is abundantly available or if it is limited.

Explain to students that you are going to give them a list of criteria for a "Future of the world without water." Instruct them to think about each criteria as you read it and raise their hand IF they think it can be done.

- The water filtration can be located in any climate and still produce drinkable water year-round.
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- The water filtration can be located in a large, urban city with very little open space.
- Drinkable water produced from the contaminated water.
- Water recycling will decrease the amount of water we use today

'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 try to build water filtration, how would it be?
- ✓ Think about what you can do to contribute to water filtration
- ✓ Where the water filtration located?
- ✓ Think about what other products could be recycled chemically from contaminated water?
- ✓ Would you choose to drink recycled water? Why?

Questions for group B (Technology-minded students):

- ✓ How would you add technology in the recycling of contaminated water?
- ✓ What alternative methods can you think of for recycling contaminated water?
- ✓ What aspects of technology would you use and or benefit in the recycling of contaminated water.
- ✓ What technological design would you use, when you recycle contaminated water?

Questions for group C (Engineering-minded students):

- ✓ How do you recycle of contaminated water? Which tools?
- ✓ What products (chemicals) can be recycled from contaminated water?
- ✓ Who would work with while recycling contaminated water?

Questions for group D (Art-minded students):

- ✓ Can you design a poster for increasing the importance of environmental impact of drinkable water and the result of the massive consumption of water?
- ✓ Can you compose a song for sharing it?
- ✓ How can you design an advertisement for selling recycling water
- ✓ What campaign would you run for increasing the use of recycled of contaminated water in your local community?

Questions for group E (Math-minded students):

- ✓ What kind of measurement tools would you use to measure products made of recycled of contaminated water?
- ✓ How do you calculate its cost?

The teacher first, elicit the answers and then leads to the students take actions and leads to make sample designed, made of recycled water. (Materials can be brought by the students from their homes.)

#### Skill focus:

During the lesson, Cognitive Skills, Decision Making, Problem solving, Creative Thinking and

Interpersonal Skills will be the focus.

**Content:**

The content of the unit is based on the disciplinary or topic-area concepts.

Building Knowledge through learning by doing.

**Assessments:**

Describe the diagnostic, formative, and summative assessments employed in this lesson to gauge student learning.

**Evidence of Student Learning:**

Provide a list of the process documentation that you plan to acquire during the course of the lesson. These may include photographs of students engaged in learning, drafts of student work, quotes from students, interviews of students, video, etc.

**Texts/Resources:**

The collection of short and extended works aligned to the standards and content. Examples: texts, works of art, word wall, etc.

**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“

**Filtration Investigation”**

and the essential questions defined under “

**Case section”**

**Practice:**

Teacher will deeply explain the roles and importance of environmental impact of recycled contaminated water and a result of massive consumption of drinkable water 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.

**Presentation of Work**

**Suggested Extensions:**

Provide a bulleted list of potential next steps or subsequent learning activities that will extend the teaching and learning of arts content. Students could explore advanced topics in the area, research other artists and practitioners in the field, or develop either individual or group extensions, depending on the initial project.