Creating an ECO online Natural Fit Virtual Programs to Prepare Students for boostIng 21st century Skills 4 the Future (UNITY)

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STE(A)M-focused PBL for transferring 2021st skills for fighting against climate change

LESSON PLAN 3: Water - the source of life

Presented by Osnovna škola Glina

Lesson procedure:

Date:	__/__/____
Teaching staff:	Mr/Mss/Ms
Term:	2022-2023
Week:	1
Year Level:	Primary/low secondary
Time/length	Project day (one school day)
Key Learning Area:	Use of soft skills for climate change and blending interdisciplinary subjects, including science, math, art and social studies
Topic/focus:	Prevent water pollution

Lesson Name: Water - the source of life

Foreseen Outcomes:

At the end of this lesson, students will be able to:

- ✔ define water formula
- ✔ define types of water on Earth
- ✔ define importance of drinkable water
- ✔ describe use of water energy
- ✔ describe ways of water purification
- ✔ design posters and artwork, relevant to topic,
- ✔ improve their social skills, including group communication, interaction and discussion, improve their soft skills such as design thinking, critical thinking, decision making, efficient use of resources.

Lesson Description:

This lesson shall demonstrate:

- What is the chemical formula of water?
- What type of water do we have on planet Earth?
- What is considered as drinkable water?
- What is waste water?
- What is water energy?
- How do we do water purification?
- Research the water consumption and prevention in the local community.

Prerequisites to this lesson plan (not applicable):

Length (Lesson procedure):

This lesson is organized as a school project day and will take 6 hour, which also includes interdisciplinary learning.

Depending on how to implement the planned lesson, the teacher will need some ICT materials (computers, tablets, etc.). The teaching staff shall follow the following steps to implement the lesson successfully:

Step 1. Lead in:

Teacher greets the students, and asks them to think about the importance of water in everyday life. After collecting the feedback from the students, the teacher asks for groping 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 importance of clean and healthy water and how to prevent its pollution.
- ✔ Through creating and performing, students will gain knowledge about how clean water is important for human existence.
- ✔ Regarding this, it can be expected that understanding of the topic will lead students to work on taking more care to prevent water pollution.

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 curriculum.

Enduring Understandings:

The students will understand the core ideas and philosophy behind the prevention of water pollution. Also they will find out what can be done to prevent water pollution and have clean drinkable water. Students will understand their role of doing it in everyday life. The learning outcomes of the lesson shall be used by the students in their future life and incorporated in their local communities. 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 is the chemical formula of water?
- What type of water do we have on planet Earth?
- What is considered as drinkable water?
- What is waste water?
- What is water energy?
- How do we do water purification?
- Research the water consumption and prevention in the local community.

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

Case section:

The teacher shall follow the following steps:

1. Teacher writes Water on the board and reads it to the students. Then he/she asks them to think and tell them how important it is to have clean water.
2. Teacher asks students to brainstorm what would happen if all water gets polluted. Students can give their answers freely by raising their hand.

'**Step 1. Lead in**''. Each question is asked to the students who are grouped from A to E. Each group should have a tablet or a computer.

Questions for group A (Science-mınded students):

- ✔ Look for the water chemical formula?
- ✔ What is the percentage of water on the planet Earth?
- ✔ What types of water do we have on our planet?
- ✔ What are water properties?

Questions for group B (Technology-minded students):

- ✔ Research basic information about drinkable water.
- ✔ What is waste water?
- ✔ Who produces most waste water and why?
- ✔ Can you produce homemade water purification and how?

Questions for group C (Engineering-minded students):

- ✔ Describe how water energy was used in the past.
- ✔ Describe modern water energy use.
- ✔ What are the ways of waste water purification?
- ✔ Which plants use water energy?

Questions for group D (Art-minded students):

- ✔ Can you design a poster and a slogan to prevent water pollution?
- ✔ Can you create artworks about the water?
- ✔ Research the internet and find a video about a water protected area.

Questions for group E (Math-minded students):

- ✔ Research the internet and find all volume units of measurement in your country.
- ✔ Search for volume units of measurement in other parts of the world.
- ✔ What are measuring instruments used for volume measures?
- ✔ Conduct an experiment. All members of the group will wash their teeth with the tap on. Collect the water from the tap while washing your teeth. Calculate what would be the amount of saved water with the tap off. Experiment

When all groups are done each group presents their findings to the rest of the class. Students from other groups when each presentation is over are free to ask questions.

'**Step 2. Make it real**''

To see real effects of how much water we use in vain in everyday life, students will conduct a research. For the research students will produce a questionnaire. A questionnaire can be made on paper or using an app like Google Forms. Questionnaire can have up to 15 questions. When done the questionnaire will be given to as many students, teachers, family members. After the questionnaires are done, students will do the data processing and create a chart presentation of the collected data. The presentation will be published on the school website.

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: materials for the questionnaires.

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 "**Water - the source of life"** and the essential questions defined under **Case section.**

Practice:

Teacher will deeply explain the roles and importance of the environmental impact of water pollution. 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:

Organize Eco outdoor activity - students clean a river, a lake or a beach in their local community.