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

2021-1-SE01-KA220-SCH-000032448

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

LESSON PLAN 1:

Micro bit: Save the World

Presented by
Malmö Sweden

Lesson procedure:

Date:	2022__/_09_/__15__
Teaching staff:	**Mr/Miss/Ms**
Term:	**2022-2023**
Week:	**1**
Year Level:	**Primary**
Time/length	**2 hours**
Key Learning Area:	**Understanding the effect of climate change using Gapminder.** **Use of programming and logical thinking skills in the area of climate change.**
Topic/focus:	**Micro:bit and Gapminder**

Lesson Name: Micro:bit : Save the World

Foreseen Outcomes:

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

- ✓ Understand the effect of climate change by using Gapminder.
- ✓ Learn and understand more about digital technology and its use to understand the effect of climate change.
- ✓ Improve social skills, including group communication, interaction and discussion, to be aware of Global Goals.
- ✓ Get an introduction about programming ex. Micro:bit and use of programming in the society.
- ✓ Understand block programming and programming language and create the first program.

Lesson Description:

This lesson will show students what are the effects of climate change and what environmental problems can cause out of that, what some governments are doing to tackle the problems, what we can do as citizens and also about Goal 13.

Prerequisites to this lesson plan: Students need to have access to digital technology and a computer in the classroom. 2-3 pupils will work together to know the key words in English and any other language about environmental problems and what they mean using digital technology and programming (e.g. Google translate to translate a document in any other language or change the language in programming)

Length (Lesson procedure):

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

The teaching needs digital devices to make students watch videos individually or all together.

Step 1. Lead in:

The teacher asks if students know the main effects of climate change through videos. Then, students are divided according to their 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 understanding and taking action against climate change. Here, we focus on programming and climate change, Goal 13. Through collaborative learning, the students will understand what are the main effects of climate change and what they can do as citizens to solve them. They will also be aware of Goal 13.

Common Core State Standards:

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

Enduring Understandings:

The students will understand the device Micro:bit.

- ✓ Get basic knowledge of Block programming
- ✓ Java script and Python which is combined in Micro:bit
- ✓ Learn mathematics
- ✓ Increase logical thinking in order to solve Climate problems

The lesson will also answer the following questions:

- ✓ In which way programming helps the pupil to understand the Global Goals of Climate Change
- ✓ How does logical thinking and coding help the pupils to get interested in Climate problems
- ✓ How to use programming in order to solve a problem in a collaborative environment
- ✓ How to combine different subjects in coding with Micro: bits

Essential Questions:

- ✓ What are the connections of the effects of climate change with STEAM skills?
- ✓ What are the connections of the effects of climate change with PBL?
- ✓ How can the study of the effects of climate change transfer soft skills?
- ✓

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:

Step 1. The teacher will give an introduction of the lesson by showing the different aspects of climate change from Gapminder (CO2 emission per person)

discuss few questions from this website with the students
UN goals by making different students group according to their learning intelligence and or learning style. Here, teacher group students as:

Group A: 2-3 students, having science learning interest/intelligence/capability/style

- ✓ How does global warming affect the population in the water?
- ✓ Why do bubbles have different sizes for different countries?
- ✓ What is carbon dioxide?
- ✓ Write the chemical formula
- ✓ What is the most important use of carbon dioxide in nature?

Group B: 2-3 students, having technology learning interest/intelligence/capability/style.

- ✓ How does plastic waste from the world pollute the ocean?
- ✓ Is it possible to design a robot for removal of plastic from the ocean?

Group C: 2-3 students, having engineering (creativity) learning interest/intelligence/capability/style.

- ✓ How do you reduce carbon dioxide from the atmosphere?
- ✓ What kind of action can you take in order to reduce carbon dioxide emissions?

Group D: 2-3 students, having art learning interest/intelligence/capability/style.

- ✓ How does global warming affect the population in the water?
- ✓ Is tree plantation a solution to reduce carbon dioxide in the atmosphere?
- ✓ Why do you feel tired after sitting inside for a long time?

Group E: 2-3 students, having math learning interest/intelligence/capability/style.
Question:

- ✓ What percentage of the plastic waste from the world ends up in the ocean?
- ✓ What is the chemical formula of carbon dioxide and oxygen?
- ✓ What percentage of the energy we use worldwide comes from coal, oil or from natural gas?

Step 2: The teacher will listen to the answer from different groups and create interest to the project from different aspects such as

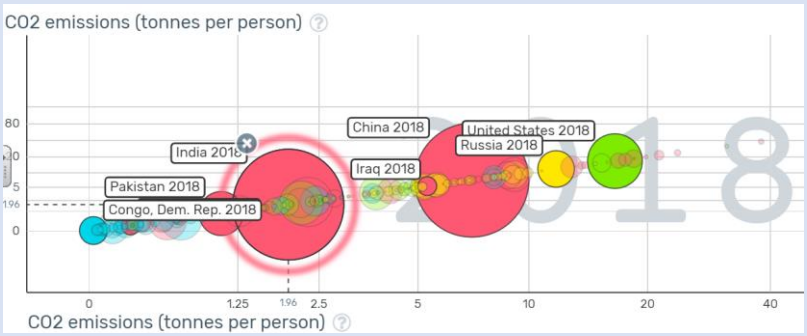
- ✓ Effect of climate change on the population in the water?
- ✓ How to minimize the use of coal, oil or natural gas with the help of new technology development.

Step 3: The teacher will introduce programming in that context of understanding and solving climate problems using programming and robotics. Explain the device micro:bit and its use in real life in the society and then follow the instructions stepwise in lesson plan.

Skill focus: During the lesson, Cognitive Skills, such as decision making, problem solving, creative thinking and interpersonal skills will be the focus.
Content: Create the first program in any language by using Basic blocks " Save the World" Building knowledge on the effects of climate change through STEAM-focused PBL approach.
Assessments: The teacher will use formative assessments during every lesson by giving feedback. Pupils will document every program stepwise in the form of a document or presentation. The pupils will help each other to improve individual skills in programming.
Evidence of Student Learning: Students' learning evidence will be from their discussions, answering the questions, participating in group discussions and documentation from programming.
Texts/Resources: 1. The teacher will give an introduction of the lesson by showing climate change from Gapminder (CO2 emission per person) 2. **Discuss few questions from this website with the students** **UN goals** by making different students group according to their learning intelligence and or learning style. Here, teacher group students as: 3. Programming website Website: https://makecode.microbit.org/ . Open the website

Learning Activities:

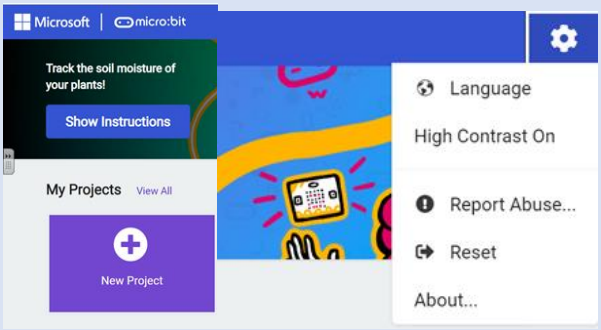
Gapminder

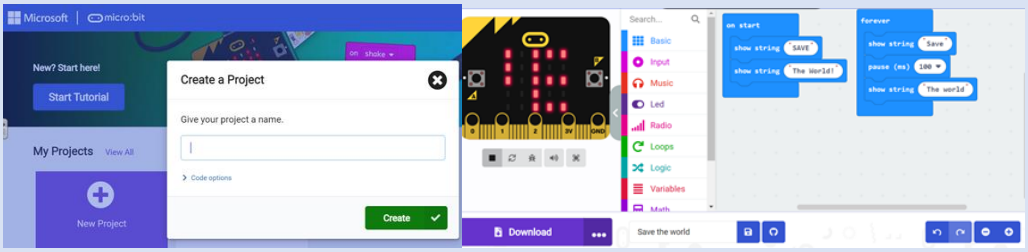


Programming Website: https://makecode.microbit.org/

Create your first lesson about Climate change by changing “Hello world!” to something unique.

The lesson can be planned in any Language, in a visual environment which will focus on the problem solving abilities together in a creative way. Micro:bit simulation can be used without having a micro:bit kit in the school. There is no need to download. You can use it from computers, ipads …

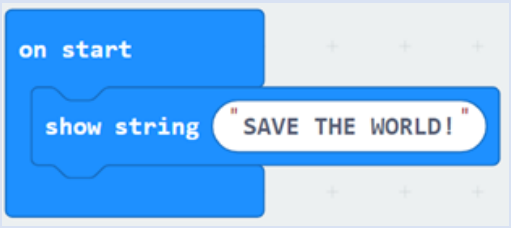




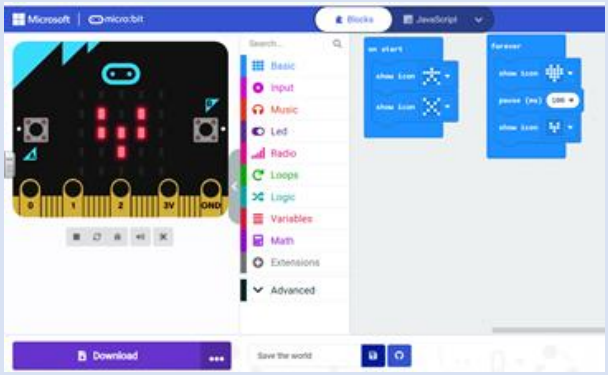
Practice:

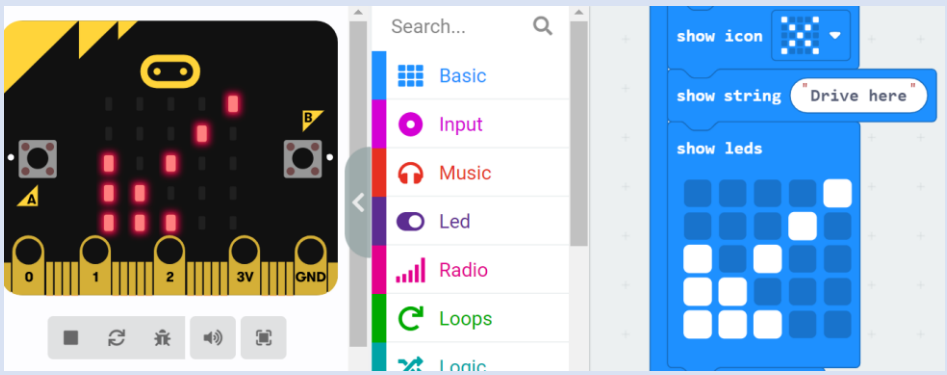
Programming is very much about creativity. In all tasks, you will have the opportunity to use your creativity to change the result somewhat. It could be, for example, to replace the text in task 1 from "Hello world!" to something that you think fits better to create something unique! For example: “save the animals”; “Stop” “Work together” etc.

"Hello world!" is a common programming task where it is necessary to get a system in some way. In this task, you will make the micro:bit say " Hello" by displaying a *string* (a piece of text). You can decide by yourself what the greeting should be. In this example, the greeting is "Hello world!".



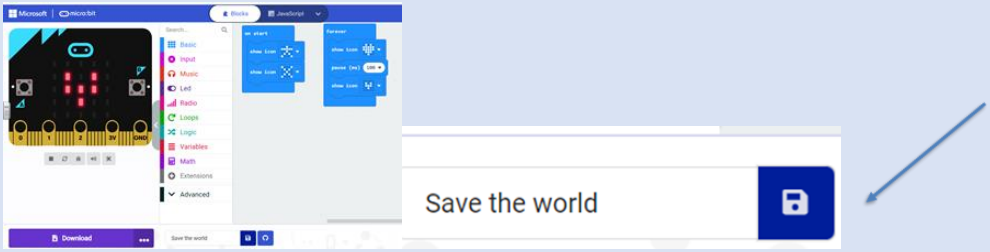
- Website: [https://makecode.microbit.org/ . Open the website](https://makecode.microbit.org/)
- Set the language you like to use. In these lessons the language is set in English.
- Click on a new project and create a project by giving a project name. "Save the world"
- Come to the starting page. Both block programming or programming can be used such as JavaScript or Python. When a new project starts, two blocks "on start "and "forever" appear.
- Go back to "Blocks". Different colors represent different functions. Click on Basic and find "show string" and write "Hello world!". Now change the text to "Save the World".
- Use one block and write the whole text "Save the World" or right click on the block and duplicate and use several blocks. Use "pause" between different blocks. Change to JavaScript or Python to see the "codes"





Suggested Extensions:

- ✓ Explore basic blocks to create different text or image Ex. “Show string” write “Global Goal 13”; duplicate it and write “Agenda 2030”.
- ✓ In order to follow and continue your work, you must document. Open a document or a presentation and “Copy / Paste “your programs as pictures. You need to click on save to save your programs.
- ✓ You can try now to create different pictures. Ex:



- ✓ Learn more about Micro:bit and its different functions