

*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:**

**Micro bit light and sound level**

*Presented by  
Malmö Sweden*

### Lesson procedure:

<b>Date:</b>	2022 __/ __09 __/ __15 __
<b>Teaching staff:</b>	Mr/Miss/Ms
<b>Term:</b>	2022-2023
<b>Week:</b>	2
<b>Year Level:</b>	Primary
<b>Time/length</b>	2 hours
<b>Key Learning Area:</b>	Understanding the effect of climate change Use of programming and logical thinking skills in the area of climate change with the help of interdisciplinary subjects, including science, math, art and social studies.
<b>Topic/focus:</b>	Programming with Micro:bit Climate change and Micro:bit
<b>Lesson Name: Micro:bit light and sound level</b>	
<b>Foreseen Outcomes:</b>	
At the end of this lesson, students will be able to:	
<ul style="list-style-type: none"> <li>✓ Create an animation consisting of 2 or more images. The example uses two images that are looped, with a pause of 100 ms (milliseconds).</li> <li>✓ Measurements of temperature, light levels, sound levels etc with Basic and input blocks</li> <li>✓ Improve their social skills, including group communication, interaction and discussion, to be aware of Global Goals.</li> <li>✓ Get an introduction about programming ex. Micro:bit and use of programming in the society</li> </ul>	
<b>Lesson Description:</b>	
In this lesson, you will create a program that responds to input. When button A is pressed, one image should be displayed, and when button B is pressed, another image should be displayed. You choose pictures!	
Prerequisites to this lesson plan: Students need to have access to digital technology and a computer in the classroom. 2-3 pupils can work together to know the key words in English about environmental problems and what they mean.	

### Length (Lesson procedure):

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

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

### Step 1. Lead in:

The teacher asks if students know the basic blocks of Micro:bit. 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 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 the Goal 13 “Climate Action”.

### 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 to measure light and sound levels by using micro:bits
- ✓ 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 with the different groups of students

Step 1. The teacher repeat the basic blocks and ask the students to create programs in the following area

- ✓ How does micro:bit to display an image using the LED screen
- ✓ How to use Micro:bit in measuring temperature
- ✓ How to use Micro:bit in measuring light level
- ✓ How to use Micro:bit in measuring sound level

Diskussions

Questions for discussions to Group A: 2-3 students, having science

- ✓ Why is it important to measure temperature, light levels, sound levels with micro:bit ?
- ✓ How programming could be useful in measuring sound level in the practice
- ✓ How programming could be useful in measuring light level in the practice

Questions for discussions to Group B: 2-3 students, having technology

- ✓ How programming could be useful construction of traffic light
- ✓ How light level measurement could be useful in climate change

Questions for discussions to Group C: 2-3 students, having engineering (creativity)

- ✓ How programming could be useful construction of traffic light
- ✓ How light level measurement could be useful in climate change

Group D: 2-3 students, having art learning

- ✓ How to design a low energy light
- ✓ How is use Micro:bit in art and design

✓ Group E: 2-3 students, having math learning

- ✓ How do you use micro:bit in different types maths / calculation

### Skill focus:

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

### Content:

Create animation programs using Basic and input; show light levels and sound levels  
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 the documentation of every program step by step

### Texts/Resources:

There are many examples in Micro:bit websites and there are many you tube films for constructions using microbots

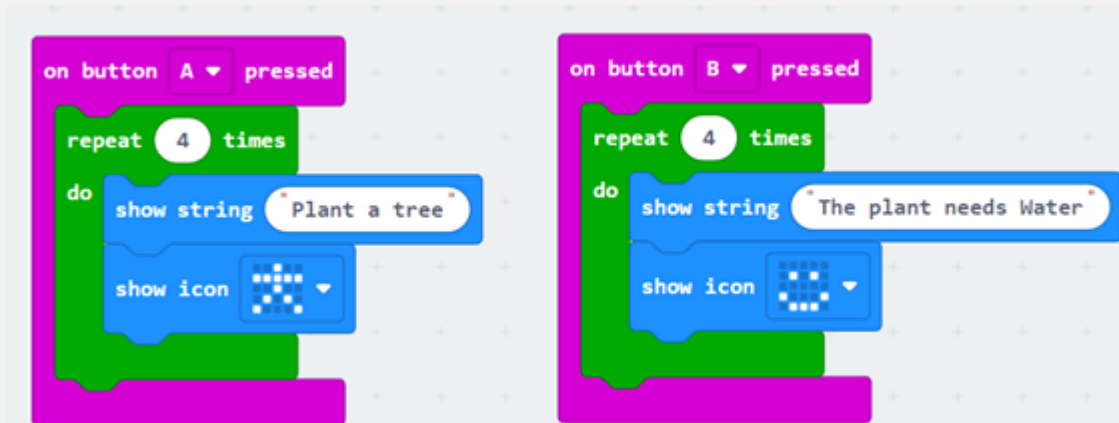
Website: <https://makecode.microbit.org/> . Open the website



### Learning Activities:

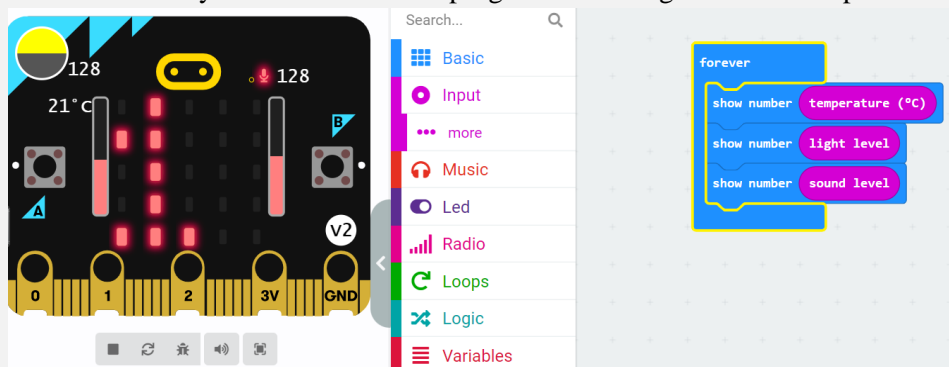
Create a program that shows animations when the buttons are pressed. One animation for the A button, and one for the B button.,

Create a program to show or explain or understand Global Goals using “Basic” and “Input”. You can use other blocks like “loop”, Music etc if you want. Document your program step by step.



### Practice:

Programming is very much about creativity. In all tasks, you will have the opportunity to use your creativity to change the result somewhat. Work more with input. You should use the built-in thermometer, and print the temperature on the LED screen. Try warming the micro:bit if you have a micro:bit kit in your hands when the program is running. Does the temperature change?



### Suggested Extensions:

- ✓ Explore basic blocks, input and loop create different program
- ✓ Have a idea to make a construction where these functions can be used
- ✓ Create a program that displays the compass direction (in degrees), instead of the temperature.  
ex. of programs
- ✓ Create a different programs by creating a new variable, using basic, input, math

