

*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:**

**Variables and Global goals**

*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>	5
<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>	Variables and Global goals
<b>Lesson Name: Variables and Global goals</b>	
<b>Foreseen Outcomes:</b>	
At the end of this lesson, students will be able to:	
<ul style="list-style-type: none"> <li>✓ After this lesson you are able to understand the math, variables and loop, logic</li> <li>✓ Use and correlate different variables in climate change</li> <li>✓ Get an introduction about different variables</li> </ul>	
<b>Lesson Description:</b>	
Use of variables in Micro:bits	
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. The students need to have access to the internet to make online programs. The students need access to google apps for education to create diagrams with variables.

### Step 1. Lead in:

The teacher gives an introduction about variables by showing or drawing diagrams with different variables and explaining the use of variables. The teacher asks if students remember the basic blocks and input, loops etc of Micro:bit by doing a short repetition from the previous lesson. 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 using variables
- ✓ Java script and Python which is combined in Micro:bit
- ✓ Learn mathematics and variables using graphs and diagrams
- ✓ Increase logical thinking in order to solve Climate problems

The lesson will also answer the following questions:

- ✓ In which way graphs and diagrams help 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 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, measuring temperature, measuring light level, measuring sound level
- ✓ How to use Micro:bit in logic
- ✓ How to use Micro:bit in true / false and if statements
- ✓ How to count
- ✓ How to use variables

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

- ✓ Why is it important to use logic micro:bit ?
- ✓ How does logic is used in a scientific arguments

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

- ✓ How programming could be useful construction using logic
- ✓

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

✓

Group D: 2-3 students, having art learning

- ✓ How to design a low energy light using logic
- ✓ 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:

Soon all our instruments we are using at home like coffee makers, heating systems, refrigerating, toasters and other functions at our home can be controlled using our phones as we use remote control for the television. Development in technological skills always comes with benefits and risks. During the lesson, cognitive Skills, such as decision making, problem solving, creative thinking and interpersonal skills will be the focused.

**Content:**

Change of variables by making new variables.

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. Pupil will dokument every program stepwise in form av dokument 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

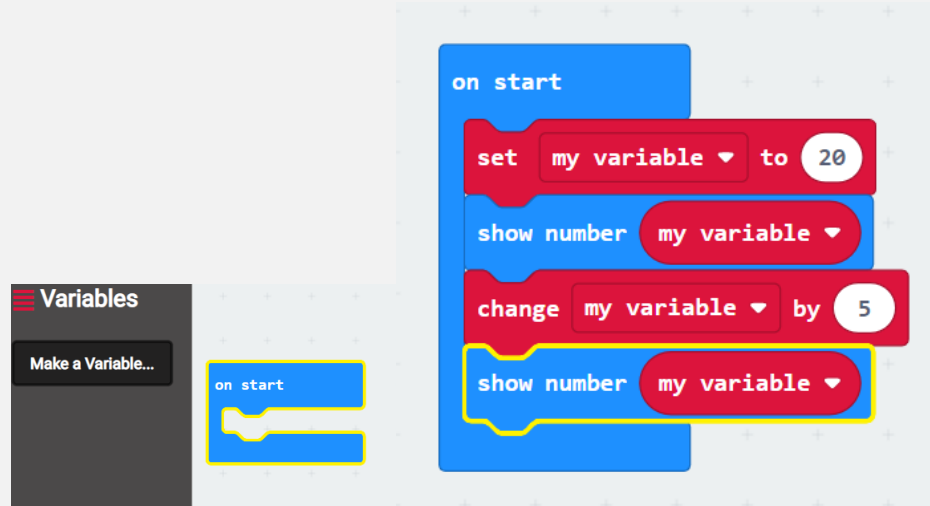
Website: <https://makecode.microbit.org/> . [Open the website](#)

### Learning Activities:

Create a program by making new variables

Change variables

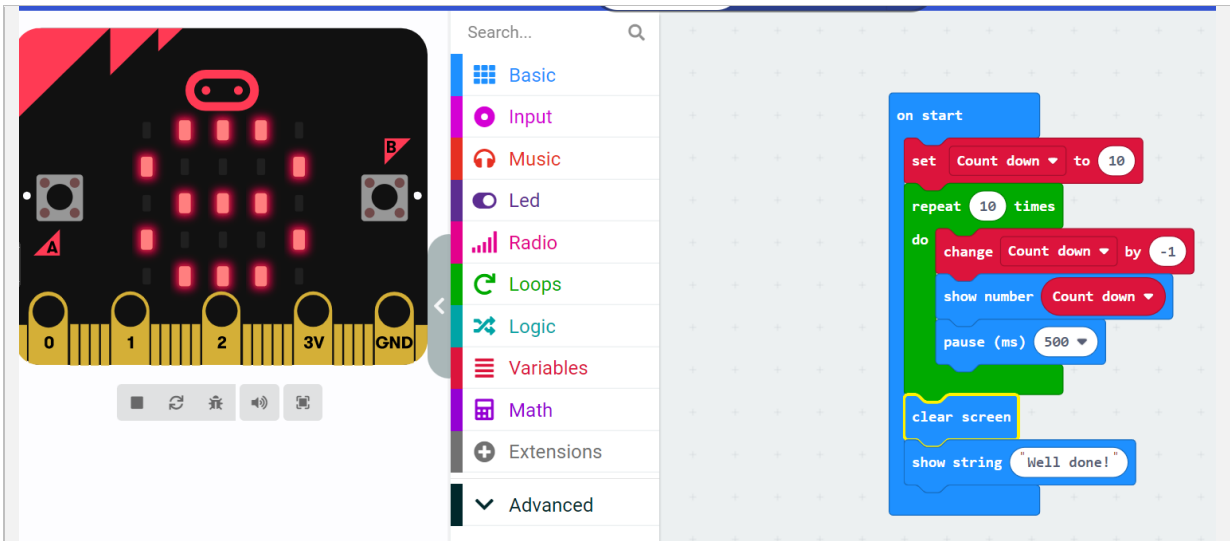
Create a few other variables



The image shows a Scratch code editor interface. On the left, a 'Variables' panel is open, displaying a 'Make a Variable...' button and a small 'on start' script block. The main workspace contains a larger 'on start' script block with the following steps: 'set my variable to 20', 'show number my variable', 'change my variable by 5', and 'show number my variable'. A yellow highlight is visible under the 'show number my variable' block in the workspace.

### Practice:

- Create a program using new variables such as steps, numbers and so on.
- Create a few other programs using variables.
- Discuss the term “variables”. Why is this term important in the climate context? Make a program about climate change using variables.



Now we raise the level! We will use a loop, a so-called for-loop! A loop does the same thing over and over, as many times as you want. Here you should set a variable to 10. Then you should again and again reduce the value by 1, until the value reaches 0. Then show “well done!”

#### Suggested Extensions:

- ✓ Create a program that counts up from 1 to 5 and then gives a compliment to whoever is looking at the LED screen.
- ✓ Count down the number you want related to the project.
- ✓ Create a program using new variables such as steps, numbers and so on.
- ✓ Discuss the term “variables”. Why is this term important in the climate context? Make a program about climate change using variables.