

*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 7:

Scratch Programming and Food

*Presented by
Malmö Sweden*

Lesson procedure:



Date:	2022__/__/____
Teaching staff:	Mr/Miss/Ms
Term:	2022-2023
Week:	7
Year Level:	Primary
Time/length	2 hours
Key Learning Area:	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.
Topic/focus:	Programming with Scratch Learning about Climate change and need of food
Lesson Name: Scratch programming and food	
Foreseen Outcomes:	
At the end of this lesson, students will be able to:	
<ul style="list-style-type: none"> ✓ understand Global Goal 13 and 2 of sustainable development ✓ create a program with Scratch programming related to climate change ✓ improve their social skills, including group communication, interaction and discussion, to be aware of Global Goals. ✓ use their creativity to generate different sprites relevant to the program ✓ develop a game about climate change ✓ create a relevant picture ✓ understand the variables ✓ Get an introduction about programming and use of programming in the society 	
Lesson Description:	
In this lesson, the students will create a game with scratch programming related to clean city and climate change . The students will be able to play the game with other students.	
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 develop a game with Scratch programming.	

Length (Lesson procedure):

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

The teaching shall need digital devices and access to the network in order to develop a game online using block programming Scratch. The students may need to have a basic idea of analogue or block programming.

Step 1. Lead in:

The teacher needs to show a film or discuss the impact of climate change

The teacher introduces the term “Block” programming. The teacher needs to show the website and a few simple examples of scratch programming. The students task is to develop a game particularly on the Global Goals 13. Then, students will be grouped to focus on the Global Goal 13 of climate change 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 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.

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 Scratch programming

- ✓ Get basic knowledge of block programming
- ✓ soft skills development,
- ✓ interdisciplinary learning, math, art, variables, music
- ✓ blended/hybrid learning,

The lesson will also answer the following questions:

- ✓ Is the lesson transferable for skills development?
- ✓ How to use logical thinking i programming
- ✓ How to create sprites
- ✓ How to use variables
- ✓ How coordinates is used in developing games
- ✓ 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 Scratch

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 film about rich and poor from <https://www.gapminder.org/answers/how-many-are-rich-and-how-many-are-poor/>

Step 2: The teacher will introduce programming in that context of understanding and solving climate problems using block programming. Show different blocks and the use of each block.

Step 3: **The teacher show the website Scratch and the examples**
<https://scratch.mit.edu/>

Step 4: **The teacher will ask the students to develop a game about “Clean City” using Scratch**
<https://scratch.mit.edu/>

Skill focus:

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

Content:

The students will develop a game about Clean City use the help of Scratch programming
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:

The students will document. the program.
The student will play the game they develop
The students have the learn the program if the game works
The students will be able to find the mistakes if the game does not work

Texts/Resources:

Please see the annex 1 attached to the lesson plan, which is to be used for this lesson.
Video to show and image:
change from <https://www.gapminder.org/>

Scratch

<https://scratch.mit.edu/>

Learning Activities:

Practice:

Sprite 1 : apple

The image displays two screenshots of the Scratch programming environment. The top screenshot shows the code editor with the following logic:

- When green flag clicked:
 - Set poäng to 0
 - Set Missar to 0
 - Set y to 180
 - Forever loop:
 - Change y by -8
 - If touching Beetle? then:
 - Start sound Chomp
 - Change poäng by 1
 - Set y to 180
 - Set x to pick random -240 to 240
 - If y position < -180 then:
 - Start sound Alert
 - Change Missar by 1
 - If Missar > 4 then:
 - Broadcast Game Over
 - Play sound Cave until done
 - Stop all
 - Else:
 - Set y to 180
 - Set x to pick random -240 to 240

The bottom screenshot shows the same code editor but with the 'Game Over' broadcast triggered. The stage preview shows the 'Game Over' text in red on a beach background, with a beetle sprite and an apple sprite. The 'Sprite' panel shows the 'Apple' sprite selected, and the 'Stage' panel shows the 'Game Over' backdrop selected.

Scratch code editor for Sprite 2: Insect. The code is as follows:

```

when green flag clicked
  forever loop
    if key right arrow pressed? then
      move 10 steps
    if key left arrow pressed? then
      move -10 steps
  
```

The right panel shows the stage with a beach background, the text "Game Over" in red, and a beetle sprite. The sprite's properties are: Beetle, x: -113, y: -114, Size: 100, Direction: 90. The stage has 2 backdrops.

Sprite 2 : Insect
Sprite 3 : Game over

Scratch code editor for Sprite 3: Game over. The code is as follows:

```

when green flag clicked
  hide
  when I receive Game Over
  show
  
```

The right panel shows the stage with a beach background, the text "Game Over" in red, and a beetle sprite. The sprite's properties are: Sprajt1, x: -2, y: -89, Size: 100, Direction: 90. The stage has 2 backdrops.

Suggested Extensions:

- ✓ Explore block programming to create different games related to “Global Goal 13”; and develop other games related to “Agenda 2030”.
- ✓ You can try to create different pictures
- ✓ Different sprite
- ✓ Variables
- ✓ Coordinates