

Digital Garden Grade 4 - HABITATS AND COMMUNITIES

<h2>Digital Garden</h2>	Coding Tool	BBC Micro:bit
	Cross-curricular	Number sense and numeration

<p>Big ideas</p> <ul style="list-style-type: none"> Plants and animals are interdependent and are adapted to meet their needs from the resources available in their particular habitats. 	<p>Specific Expectations</p> <p>3.1 demonstrate an understanding of habitats as areas that provide plants and animals with the necessities of life</p> <p>3.3 identify factors that affect the ability of plants and animals to survive in specific habitats</p>
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Description
 In this lesson, students will explore what plants need to live by coding their Micro:bit to behave like a plant. Their plant will live in a digital environment but be reliant on sunlight and water both of which are provided by pressing the face buttons of the Micro:bit. After coding the digital plant, students will discuss the needs of a plant in a digital environment and compare it to an actual plant.

<p>Materials Per Group</p> <ul style="list-style-type: none"> 1 Micro:bit 1 PC/Mac/Chromebook 	<p>Computational Thinking Skills</p> <ul style="list-style-type: none"> Conditional statements Algorithmic thinking Variables Loops
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Introduction

- Introduce, or reintroduce the Micro:bit. Explain that it's what we call a "microcontroller" and can be coded to do all sorts of things. Explain that microcontrollers are small computers that are used to control electronic devices, but also mention that the Micro:bit is special because it already has plenty of functions built in.
- Discuss what a plant needs from their environment to survive: food, water, air, space and light.
- Explain to students that they will be creating a plant that lives in a digital environment. They will use their Micro:bits to provide the digital plant with water and sunlight.

Action

Step 1: Code Your Microbit

- Have students connect to their Micro:bit via usb and go to **makecode.microbit.org** create a new program and pair the Micro:bit by clicking on the **gear symbol** selecting **Pair → Pair Device → Select Micro:bit → Connect**
- Use the ‘*Teacher Coding Sheet*’ to guide students in coding their Micro:Bit. This sheet will detail what each line of code does to help direct students.
- The ‘*Student Coding Sheet*’ has the complete code that students can use to follow along. This will be especially useful for beginner coders so they can follow the colours of the code.

Step 2: Discuss the Plant’s Habitat

- Once the digital plant is coded, discuss the new plant and how it works. Ask students to consider the plants “habitat” and how it’s different from a real plant. (The plant is battery powered and 100% artificial)
- Provide students with the ‘*Digital Garden Handout*’. Students can work through this in groups, individually or be discussed as a class.
- What would we have to add to make it more realistic?
- What advantages does our plant have over real plants? (It doesn’t rely on as many factors to survive and doesn’t need sunlight or water as frequently)
- What disadvantages does our plant have? (It is reliant on human intervention and a non-renewable source of power, it doesn’t have any additional functions, such as being edible, etc.)

Consolidation/Extension

Students can modify their code to modify their plants digital habitats. Some things to consider could include:

- What changes would need to be made if it was a plant found in the desert compared to one found in a rain forest?
- How could you code your plant to require additional elements of their habitat to survive? For example, students could add a function where shaking the Micro:bit adds food.

Assessment

The ‘*Digital Garden Handout*’ can be used as a form of summative assessment to assess how well students understand which components of a plant’s habitat they need to survive.

Additional Resources

- Teacher Coding Sheet
 - Student Coding Sheet
 - Digital Garden Handout
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