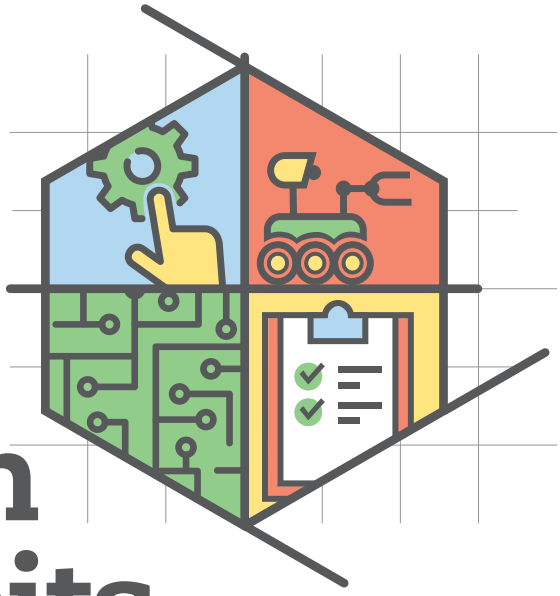

Observing Plant Growth with Micro:bits

7th grade science & technology lesson

STEM

6.24.20

ABOUT THIS UNIT

These units were developed by students taking their first pedagogy courses (Fundamentals of Instruction and Methods of Technology Integration) at Washington State University Vancouver's College of Education. ESD 112 and WSUV have partnered together to integrate computer science fundamentals into teacher education courses with the goal of demystifying computer science and encouraging more elementary teachers to expose students to computer science/computational thinking concepts across the curriculum.

This lesson also contains links to online resources created by other organizations which may use a different license. Please make sure that you understand the terms of use of third-party resources before reusing them. Prior to publishing this lesson, we have reviewed the content of this unit to ensure that all materials are in accordance with creative commons regulations. If you notice that a part of this lesson infringes another's copyright, please contact us.

A digital copy of this document is available on the STEM Materials Center website at:
https://www.stemmaterials.org/plantgrowth

ATTRIBUTION

This lesson is a result of a collaborative effort between Educational Service District 112 and Washington State University Vancouver.

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STEM
Science
Technology
Engineering
Math

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OSPI

Overview

Summary/Purpose

The purpose of this lesson is to help students understand the different genetic and environmental factors that influence an organism's growth. Students will be able to use this information in future courses, as well as in their daily lives, as they are still growing, if they have animals at home, plants, etc.

Next Generation Science Standard

MS-LS1-5
Construct a scientific explanation based on evidence for how environmental and genetic factors influence the growth of organisms.

CS or Ed Tech Standard

EDUCATIONAL TECHNOLOGY LEARNING STANDARDS: GRADES 6–8:
4.A. Students engage in a design process and employ it to generate ideas, create innovative products or solve authentic problems.

4.C. Students engage in a design process to develop, test and revise prototypes, embracing the cyclical process of trial and error and understanding problems or setbacks as potential opportunities for improvement.

5.C. Students break problems into component parts, identify key pieces and use that information to problem solve.

5.D. Students demonstrate an understanding of how automation works and use algorithmic thinking to design and automate solutions.

Background/Prior Knowledge

We have gone over plant needs, growth, and ideal conditions earlier in this unit. Students are familiar with micro:bits.

Learning Targets & Assessments

TARGET	ASSESSMENT(S)
Students will create a digital artifact to demonstrate factors that influence the growth of plants using physical computing.	Summative: technology micro:bit project

Sample Artifact

Watering micro:bit program

Materials Needed

- Computers
- Micro:bits
- Plants
- Soil moisture censors
- Alligator clips
- Batteries
- Water pumps
- Water
- USB

Instructional Sequence

WHAT WILL THE TEACHER BE DOING?	WHAT WILL THE STUDENTS BE DOING?
Intro: Teacher will bring in micro:bit watering system for plants, demonstrate how it works, and show the code.	Students will observe the demonstration and are encouraged to take notes.
Instruction: Teacher will explain the requirements of the project and provide handout with instructions: • Students will select one of three plant species to work with, and will choose which environmental factor they would like to study for their project (temperature, soil moisture, etc.) using micro:bits. • Students will write/modify code to measure these factors using micro:bit and sensors. • Students will record growth data and present findings. • Students also have the option of creating a watering system, using heat lamps, etc.	Students will research and select plant species for project. Students will select factor (soil moisture or temperature) to observe and record. Students will begin coding project for micro:bit. Students will get teacher approval for pairings/small groups and check out materials.
Teacher will check out supplies to students. **This will be the first of several classes for students to develop a physical computing project and collect data.*	