

LUMINOUS SCIENCE LESSON: C1

INTRO TO USING THE MICRO:BIT LED SCREEN

Instructional Objectives: Students use the micro:bit to write simple programs using the LED screen as output and different inputs. Students upload programs to the micro:bit.

- **Before this lesson** - Complete lesson:
S3A: Selecting an Investigation Question and Hypothesis
A1: History of Nebuta Lanterns and Story Art
- **With this lesson** - The following lessons can be combined with or taught concurrently with these lessons:
A1: History of Nebuta Lanterns and Story Art
C2: Networking Using the Radio with Garden Data

TEACHER PREP

Before completing this activity teachers should:

Try out writing the program and pseudocode to get comfortable with the process, look at sample code, slides, and plan how students will store their micro:bit programs.

STUDENT PREP

Before completing this activity students should:

Be familiar with the garden and lantern and how they might work together.

MATERIALS LIST:

- Classroom Supplies**
 - Lab notebook or journal
 - Pencils
 - Paper
- Micro:bits and USB cables**
- Computers with internet browser**

STANDARDS

- K - 12** Hardware and Software
- CS** Algorithms

MINUTES

ACTIVITY INSTRUCTIONS:

3 Have a class discussion about the relationship between the garden and the lanterns. Remind students that they need to capture data from the garden and show it using lights in the lanterns. To do this they will need to use the micro:bit.

2 Give students a brief introduction to micro:bit hardware. Demonstrate which side is the front and back and where the sensors, buttons, and the LED screen are located.

5 Have students visit the MakeCode site. Prompt them to experiment with the simulator on the left side of the screen and to see what happens when they click or mouse over the micro:bit.

5 Have students share with a partner something they learned in the simulator.

15 Discuss software and writing programs with the class. Define “input” and “output”. Tell students that in this lesson they will use the LED screen as output and the buttons as input. Introduce pseudocode as a way to outline and plan what you want your program to do. As a class write pseudocode for pressing button A and have the LED screen show a smiley face then create that code in MakeCode together. Walk students through how to download the program to the micro:bit and discuss how only one program can be on the board at a time. Walk through how to name and save their code. (see Storing Micro:bit Files Tutorials slides)

20 Have students write pseudocode for displaying four different images on four different inputs (A, B, A+B, shake) using the provided worksheet. After students write pseudocode, prompt them to create a program in MakeCode based off of their psuedo code and have them download the program onto their micro:bit.

Tip: give a prize to students who discover how to print a string on the LED screen (or other interesting things).

Tip: it helps to get into a habit of saving code periodically, a gong or other noise maker every 15 minutes can help with this.