

Is data for the Birds?

Latest Draft Version Submitted by Jeff Kitterman on 7/14/2022 13:24:23

OVERVIEW

Activity Overview: Students will program a Micro:bit and as a species counter, and to log the data that is collected. Then they will analyze the data collected and work to identify factors that may affect the data - eg time of day, time of year, weather conditions.

Target Grade Level: 6-8

Target Subject: Computer Science, Science

Notes for Educators: It will be necessary to have a place to observe birds.

Schedule a timeframe when you know that birds are in the area (eg Winter may not yield too many observations).

While the topic of this lesson is tabulation of bird species observation, The dat loggingand counters can be used to tabulate anything that can be counted, after which data can be analyzed.

Materials:

- Micro:bit version 2
- Micro:bit battery case.
- Batteries
- Computer for spreadsheet application use.

[OVERVIEW](#)

[PRE-TEST](#)

[OBJECTIVES](#)

[CATCH/HOOK](#)

[ACTIVITY INSTRUCTIONS](#)

[Supplemental Activity Document](#)

[REVIEW](#)

[POST-TEST](#)

[STANDARDS](#)

[CROSS-DISCIPLINARY](#)

[COMPUTER SCIENCE](#)

[Domains:](#)

[Practices:](#)

[Specific CS Standards:](#)



PRE-TEST

- What is the most prevalent bird species in Douglas during the month of -----?
- What factors affect observation of birds in the area at this time of the year?

OBJECTIVES

1. Program the Micro:bit to collect data.
2. Access the data stored on the device.
3. Analyze the data and make inferences that can be supported by the data collected.

CATCH/HOOK

Play the song of the Yellow Warbler, commonly heard near the school.

ACTIVITY INSTRUCTIONS

Teacher: Select up to 3 common bird species to observe.

Pre-assessment (5-10 minutes): Students respond to pretest questions in a suitable manner (class discussion, response system, etc)

Introduction (15-20 minutes): Show native birds found in the area, and play their calls. Images and calls are available at the Cornell Lab of Ornithology.

www.allaboutbirds.com

Micro:bit (20-40 minutes): NOTE: these directions are for Micro:bit version 2, which has built-in storage and other data features. The process and capabilities of version 1 devices has not been tested.

Depending on how much coding help you provide, this can take awhile. I suggest working through it yourself in order to decide.

Have students test and practice before gathering data. They will need to confirm that data is being stored as expected. Create and use a slideshow to have students practice recording.

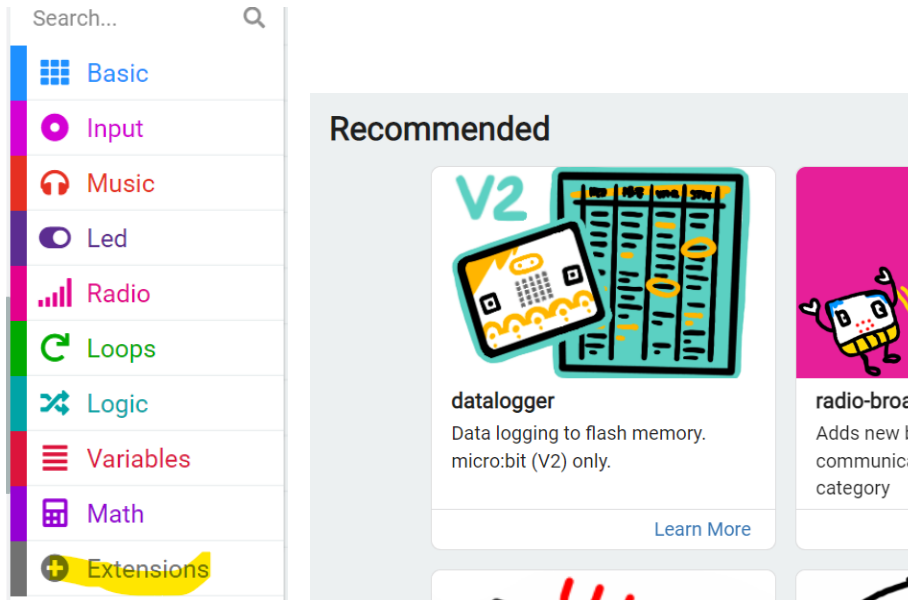
Resource for data-logging using Micro:bit:

<https://microbit.org/get-started/user-guide/data-logging/>

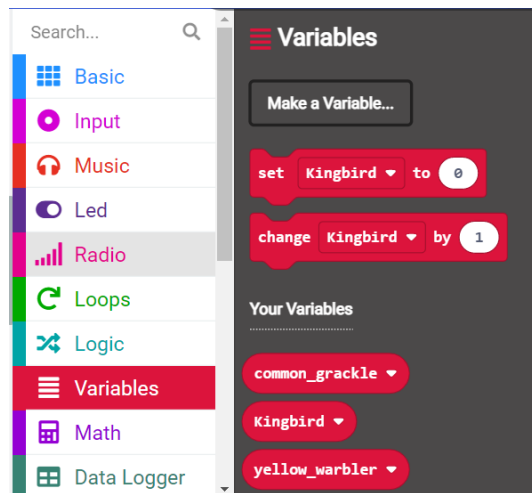
Coding -



- Add the datalogger extension. In the tray, click Extensions, and then datalogger.



- Set up: Place blocks in the On Start event block
 - Create three variables - one named for each bird species to be counted. Insert a block for each species setting the count to zero.

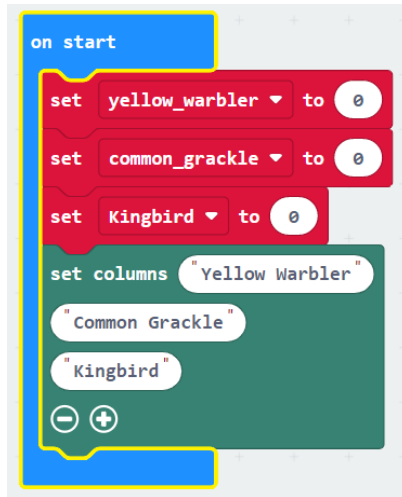


- Add set [variable name] to 0 to start the count at 0. Add blocks for each species

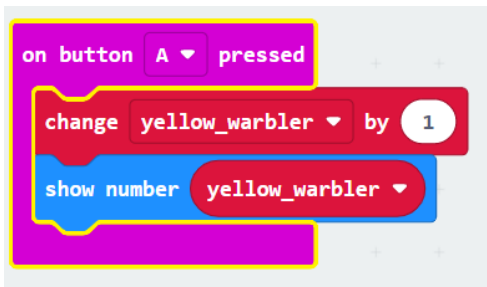


- Set the columns for data logging using the Set Columns block. Create a column for each species.

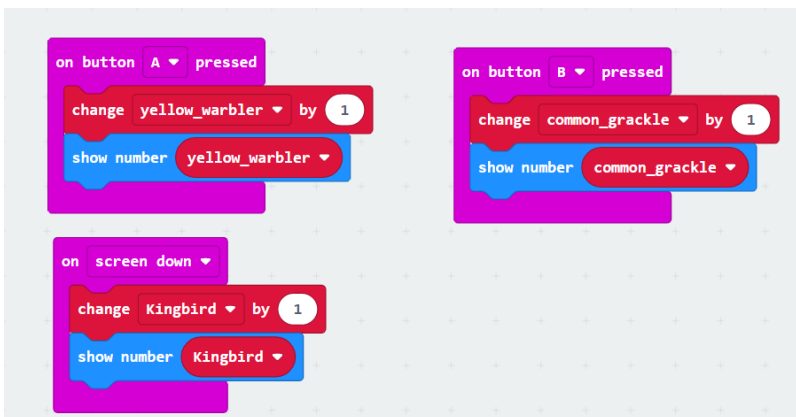
Final On Start block:



- Set up counters using different input methods for each. This will show the current count for the species after each button press. The example will add one to the total number of Yellow Warblers observed. And will show the current count each time one is added.



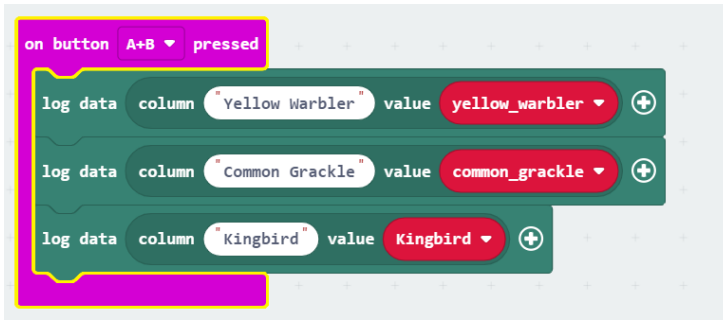
- Use 3 different inputs, one for each species. Example:



- Using the datalogger log data block, set the program to write the data to the Micro:bit when a selected input event happens. Add log data blocks for each species.

This will write the totals for the species count. Important: **This should only be done once after a collection session ends.** Otherwise, you'll end up with duplicate data.

Example code:

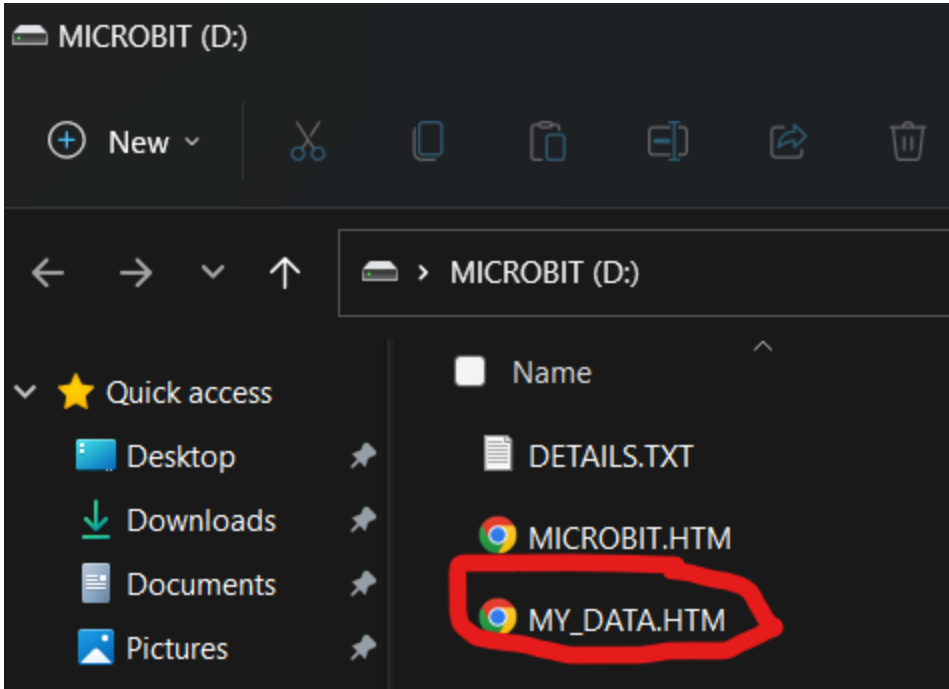


Dry run (see Practice and Troubleshoot below)

Gather data (30-40 minutes): Walking on teacher prescribed path, students will record bird species as they observe them.

Extract data from Micro:bit:

1. Connect the Micro:bit to the computer.
2. Open the drive that is mapped (usually it is called Microbit).



3. Open the file called My_Data. It will open in the default browser and should show the collected data with options for viewing and downloading:

micro:bit

micro:bit data log

Download Copy Update data... Clear log... Visual preview

This is the data on your micro:bit. To analyse it and create your own graphs, transfer it to your computer. You can copy and paste your data, or download it as a CSV file which you can import into a spreadsheet or graphing tool. [Learn more about micro:bit data logging.](#)

Time (seconds)	Yellow Warbler	Common Grackle	Kingbird
19.86	2		
19.87		3	



To work with the data, choose Download. The result file is an Excel CSV formatted file.

Practice and troubleshoot:

- Create a slideshow with random images of the 3 bird species. Have students use their programmed Micro:bits to tally what they see.
- Display accurate solution (prepared before lesson).
- Troubleshoot with students. Possible issues:
 - Connection to Micro:bit
 - Coding problems.
 - Failure to reset Micro:bits between sessions.

Supplemental Activity Document

Complete code: [microbit-collectbirddata.hex](#)

REVIEW

Students will share their data to a shared spreadsheet where the class will work in groups to note larger trends, as well as similarities and differences.

POST-TEST

What is the most prevalent bird species in Douglas during the month of _____.

What factors affect observation of birds in the area?

STANDARDS

CROSS-DISCIPLINARY

[WY] Science MS-ETS1-1

COMPUTER SCIENCE

Domains:

Data Analysis, Algorithms and Programming

Practices:

Collaborating Around Computing, Recognizing and Defining Computational Problems, Creating Computational Artifacts, Testing and Refining Computational Artifacts

Specific CS Standards:

[WY]

DA.CVT, AP.V



