Lesson: Introduction to Flowcharts

Big Picture

A flowchart is a graphical representation of an algorithm. Flowcharts play a vital role in solving a problem and are quite helpful in understanding the logic of complicated and lengthy problems. Once the flowchart is drawn, it becomes easy to translate the solution to a program, recipe, or other form. This lesson will describe why and how we use flowcharts to represent algorithms for computer programs.

Objectives

Students will be able to:

- Describe why flowcharts are useful in designing algorithms that can then be translated into computer programs
- Demonstrate the use a flowchart to represent an algorithm and then use the flowchart to build a corresponding micro:bit program

Alabama Standards Alignment

Computational Thinker #3

Create an algorithm using a programming language that includes the use of sequencing, selections, or iterations.

Vocabulary and Concepts

Flowchart - a diagram of the sequence of movements or actions of people or things involved in a complex system or activity

Algorithm - is a step-by-step set of instructions designed to carry out a task (on a computer) that always works. Algorithms have 5 properties - Input, Output, Effectiveness, Definiteness, and Finiteness.

Problem solving - the process of finding solutions to difficult or complex issues

Agenda

Getting started (15 mins)

- The teacher will present the material covered in the student worksheet document to explain the concept of a flowchart and the different symbols and guidelines used when drawing a flowchart.

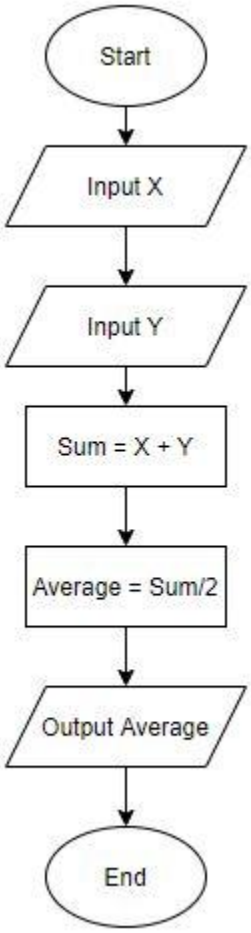
Activity (25 mins)

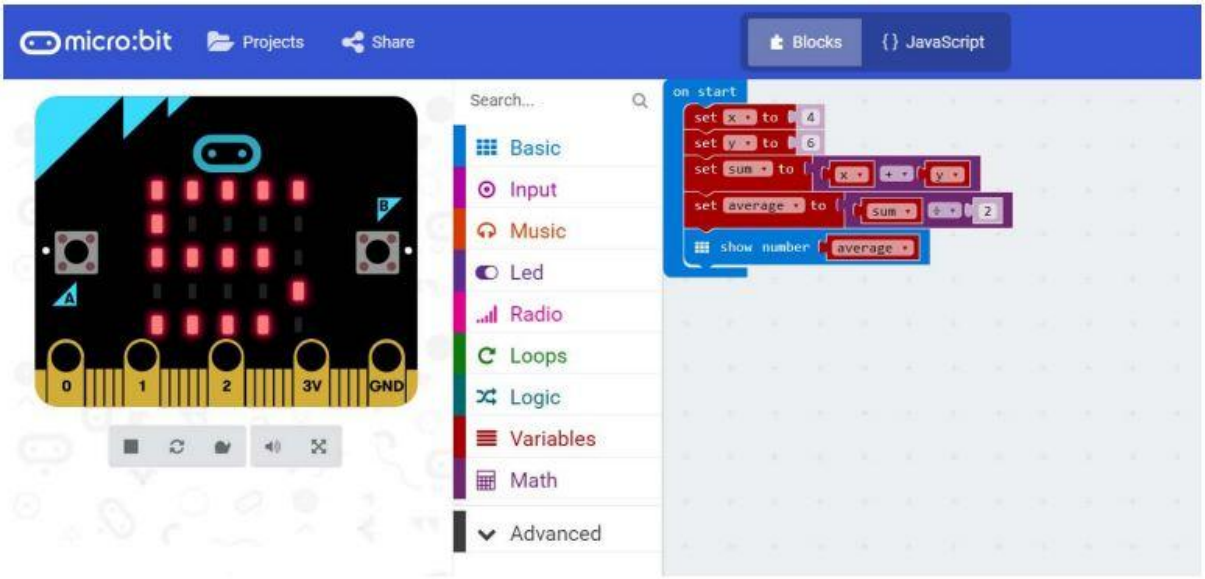
- The teacher will work with the students in class to complete the flowchart used to represent the algorithm for calculating the average of two numbers.
- The teacher will ask students to implement (write) the program for the flowchart above (calculating the average of two numbers) using the micro:bit. The micro:bit should display the average of the two numbers on the LED display.

Wrap up (5 mins)

- The teacher will then present the solutions to both the flowchart as well as the program.

Introduction Lab solutions




micro:bit
Projects
Share
Blocks
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Search...
Basic
Input
Music
Led
Radio
Loops
Logic
Variables
Math
Advanced
on start
set x to 4
set y to 6
set sum to x + y
set average to sum ÷ 2
show number average
0
1
2
3V
GND
A
B