

Lesson: Introduction to Variables

Big Picture

All useful computer programs store and manipulate information. In order to store information that can be changed (i.e. vary), we need variables. This lesson will describe why and how we use variables in computer programs.

Objectives

Students will be able to:

- Describe why we need variables in computer programs
- Demonstrate the use a variable in a micro:bit program

Alabama Standards Alignment

7: Create a program that includes selection, iteration, or abstraction, and initializes, and updates, at least two variables.

- Examples: Make a game, interactive card, story, or adventure game

Links to Resources

<https://makecode.microbit.org/lessons/variables>

Preparation

Review the PowerPoint presentation and exercises prior to class

The following files will be needed:

- lesson-6_slides.pptx: Introduction to variables powerpoint on lesson page
- lesson-6_student_handout: Tutorial handout found on lesson page

Materials Required

Each student (or pair of students) requires:

- Tutorial handout
- Micro:bit kit
- USB cable
- Internet connected computer with modern browser

**Note: Browsers known to work with micro:bit software includes Firefox, Chrome, Safari, and Microsoft Edge
For a complete list, visit this page: <https://makecode.microbit.org/browsers>*

Vocabulary and Concepts

- Variable - a named location in memory that stores a value that may change
- Data type - describes the kind of data a variable may store, the range of values, the allowed operations, and the amount of memory required
 - Variables may hold numbers, letters, characters, etc.

Teaching Guide

Getting started (10 mins)

The teacher will present the slideshow presentation **lesson-6_slides.pptx** to explain the concepts of variables, assignment statements, assignment operators, and data types.

The first three slides will introduce variables. Ask students to complete the exercises featured on slide four of the presentation file. This exercise should be completed on paper, not on their micro:bit. The slideshow closes with one more activity to be completed on paper and an overview of data types.

Activity (30 mins)

Now that variables have been introduced, explain variables in the context of the micro:bit using the activity file **lesson-6_student_handout** as a guide. Walk students through the guide and ensure all students create the sample program in the instructional file.

Wrap Up (15 mins)

Review the program they created using the section in the document titled “What does this code do?”. If time allows, encourage students to make variations of the program so that they may gain a better understanding of variables. Variations may include counting up by 5’s instead of 1’s, using button B instead of A, using A to count up and B to count down, etc.