

Grade 5/6

Micro:Bits

Any questions?
Reach out
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Micro:Bits

Variables



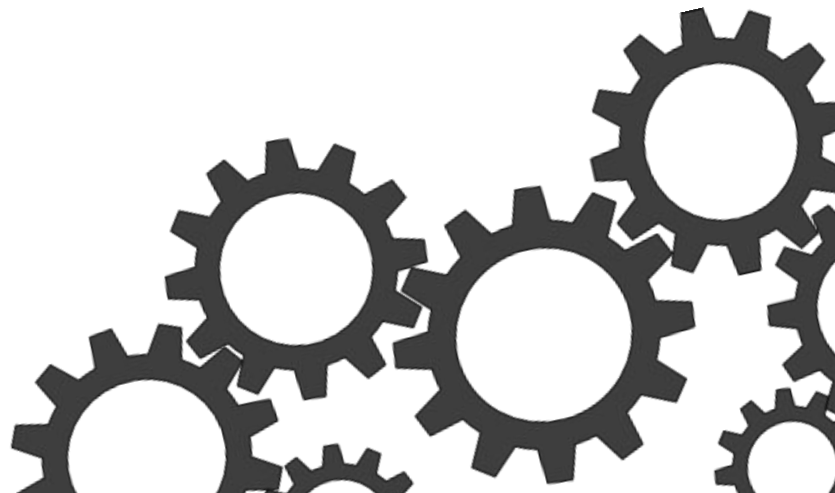
Students learn variables and constants in coding. Examine variables in everyday life situations and practice programming a Micro:bit to count and modify variables. This lesson introduces the use of variables to store data or the results of mathematical operations. Students will practice giving variables unique and meaningful names. We will also introduce the basic mathematical operations for adding, subtracting, multiplying, and dividing variables.

Lesson Objectives

- Understand what variables are and why and when to use them in a program
- Learn how to create a variable, set the variable to an initial value, and change the value of the variable within a micro:bit program
- Learn how to create meaningful and understandable variable names
- Understand that a variable holds one value at a time
- Understand that when you update or change the value held by a variable, the new value replaces the previous value
- Learn how to use the basic mathematical blocks for adding, subtracting, multiplying, and dividing variables
- Apply the above knowledge and skills to create a unique program that uses variables as an integral part of the program

Materials

- Micro:bit kit
 - 1 Micro:bit
 - 1 Battery pack
 - 1 Micro USB cable
- Optional: 1 Dongle adapter if using Mac



Micro:Bits

Variables



Additional Information

What is a variable?

- A variable holds a piece of information which can change as the code runs

Types of Variables

- String: A value made up of letters, words, or sentences
 - Eg. "abc", "Codemakers", "I am a scientist."
- Boolean: A truth value which is always True or False
- Sprite: A special Micro:bit variable type which contains the coordinates of an LED. We will learn more about coordinates on Thursday

What is a constant?

- A constant holds a piece of information which does not change as the program runs

Examples of Variables and Constants

Play games of Rock Paper Scissors against an opponent for one minute, recording all results on a piece of paper. Use this as a chance to ask what parts stayed the same and which parts changed over the course of the minute. In the context of our programming today, which information is useful to us? Try and answer the following questions:

- What type are the constants?
- What type are the variables?

In this case, our players were constant and did not change during the one minute. However, the results of our games (wins, losses and ties) were variable and would change from game to game.

- Where else can you find variables and constants in your everyday life?

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Scorekeeper

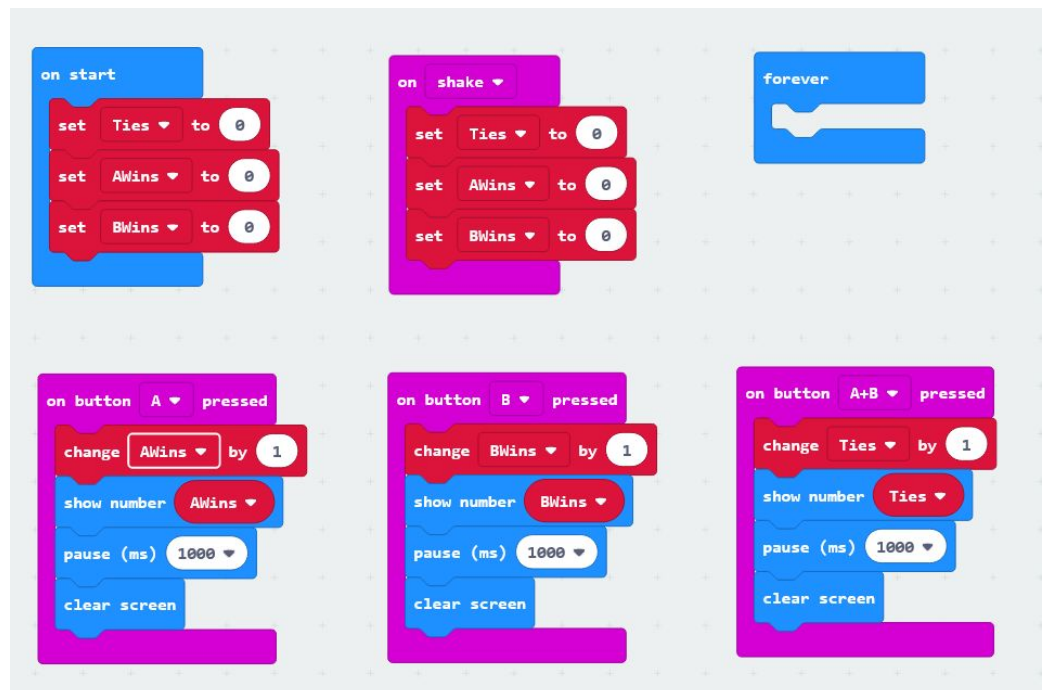
Now that you've highlighted where in a game of Rock Paper Scissors variables and constants occur, let's create a scorekeeper program for our Micro:Bit that tracks that information.

<https://makecode.microbit.org/courses/csintro/variables/activity>

The most important feature we will use during this activity is the variable function. To create a variable, click the 'variable' tab and name your variable. Having clean names for your variables will be important when working with multiple in one program, make sure their names reflect what they are tracking!

There are many different ways to create a scorekeeper program! Practicing your programming skills by trying out different ways to manipulate variables and re-write your program, here are a few different ways we came up with:

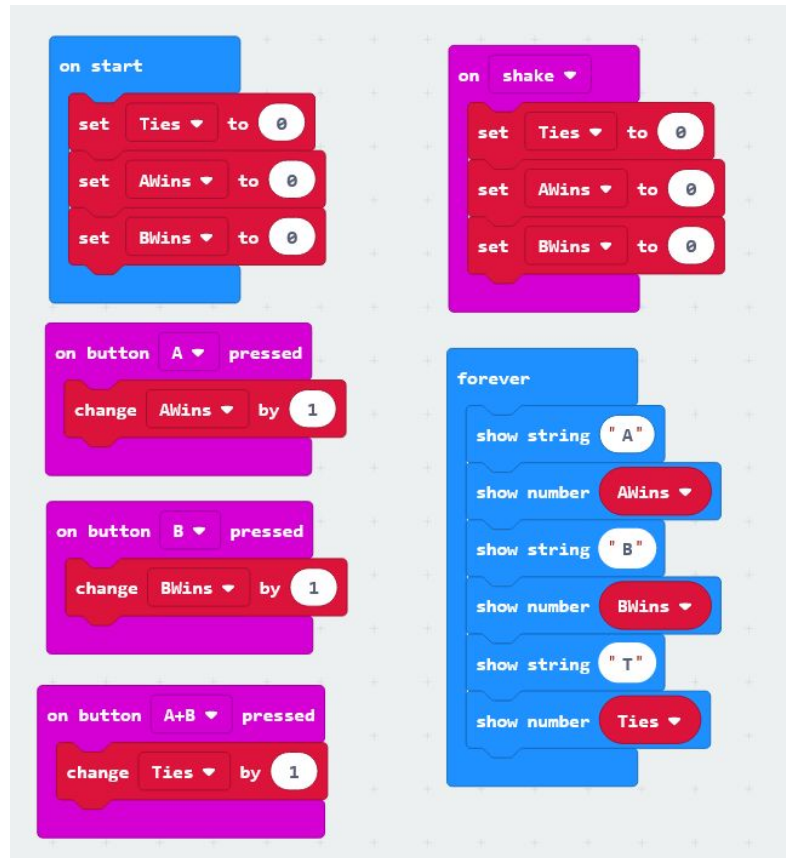
Alternative scorekeeper: example 1



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Alternative scorekeeper example 2



Other Variable Counters

The following activities are different applications of programs that count variables. These programs will keep track of an input by storing values as variables while also providing an output in the form of a change on the visual display.

<https://makecode.microbit.org/projects/stopwatch>

<https://makecode.microbit.org/projects/step-counter>

The step-counter suggests attaching the microbit to your ankle. Make sure you secure the Micro:Bit in a way that prevents the device from being damaged. Seek assistance from an adult if you are having troubles.