

Lesson Plan – Micro:bit

Introduction to Variables

Code Playground



Learning objectives

*I understand what a variable is and can use them to programme my micro:bit with various outputs”

Pupils should be taught to design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems; solve problems by decomposing them into smaller parts

“I understand the operation of a process and its outcome. I can structure related items of information.”

“I can compare, describe and show number relationships, using appropriate vocabulary and the symbols for equals, not equal to, less than and greater than.”

Resources

- Laptops or desktop computers
- BBC Micro:bits (one per computer)
- <https://microbit.org>
- Some experience with a block based programming language is helpful, but not essential

Main activity

Ask the children what they think a variable is. It may help to think about what other words it sounds like in order to work out its definition (i.e. vary, variation etc)

In a program, data values can be constant or variable. If values are variable they can be changed by the program and the user. Variables are data values that can change when the user is asked a question, for example, their age. Variables may change during program execution

Examples of numerical variables found in a game or computer programme may include a score, time or number of lives.

Ask the children to work in pairs, and give one minute to flip a coin. The children should record how many times the coin lands on heads and how many times the coin lands on tails in one minute. Ask the children to compare their scores with other pairs, and decide what is the example of a variable on their paper? What is a constant?

There are two variables:

- Number of heads
- Number of tails

Write the key words (variable and constant) on the board or somewhere visible

Now the children will be programming their micro:bit to keep score of their coin tosses.

Using the micro:bit MakeCode editor, the children should create two variables, thinking carefully about what to name them so a stranger could read and understand their programme

Think about which two inputs you will use to track the code (e.g. the A button and B button)

How will the children check the final score at the end of one minute?

Use the guidance notes to help create the code

Differentiation

Lower Ability/ASN

Create one block of code for the 'Heads' variable as a guide for the 'Tails' variable code to be created

Higher Ability/Extension

Think about what other variable is important in this activity (the one minute timer). Is there a way we can programme the micro:bit the measure this variable?

As an extension or follow-on activity, use the Rock, Paper, Scissors game activity/lesson (Introduction to Conditionals)

Plenary

Have the children try out each other's' code – did they all use the same blocks? What was different?

What is the benefit of using variables in your programme, instead of keeping score on paper?

Assessment Questions

What is the difference between a variable and a constant?