



Computing

Year 6

Term 6

Programming & Control: Sensing

Key Question: What is a micro:bit and how can it be used?

National Curriculum Objectives:

- design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems; solve problems by decomposing them into smaller parts
- use sequence, selection, and repetition in programs; work with variables and various forms of input and output
- use logical reasoning to explain how some simple algorithms work and to detect and correct errors in algorithms and programs
- Select, use and combine a variety of software (including internet services) on a range of digital devices to design and create a range of programs, systems and content that accomplish given goals, including collecting, analysing, evaluating and presenting data and information

Vocabulary

Micro:bit, MakeCode, input, process, output, flashing, USB, trace, selection, condition, if then else, variable, random, sensing, accelerometer, value, compass, direction, navigation, algorithm,, step counter, debug

Prior Learning:

- This unit is the final KS2 programming unit and brings together elements of all the four programming constructs: sequence from Year 3, repetition from Year 4, selection from Year 5, and variables (introduced in Year 6).

End Point:

The children will design, make and improve a micro:bit-based step counter.

Use assessment rubric.

Safe and Responsible Use:

use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact.

Digital Literacy Skills:

- apply knowledge of programming to a new environment
- Connect devices using a USB
- Locate external devices and files
- Download files
- Copy files to external devices

Knowledge:

I know:

- That a 'variable' is something that is changeable
- that a variable can be used in a program, e.g. 'score'
- that a program variable is a placeholder in memory for a single value
- that a variable has a name and a value
- that the value of a variable can be used by a program
- that the value of a variable can be updated
- that variables can hold numbers (integers) or letters (strings)
- how a variable is changed
- that a variable can be set as a constant (fixed value)
- the importance of setting up a variable at the start of a program (initialisation)
- that there is only one value for a variable at any one time
- that if you change the value of a variable, you cannot access the previous value (cannot undo)
- that if you read a variable, the value remains
- that the name of a variable is meaningless to the computer
- that the name of a variable needs to be unique

Skills:

I can:

- **create a program to run on a controllable device**
- test my program on an emulator
- transfer my program to a controllable device
- experiment with different physical inputs
- identify a variable in an existing program
- experiment with the value of an existing variable
- choose a name that identifies the role of a variable to make it more usable (to humans)
- decide where in a program to set a variable
- update a variable with a user input
- use an event in a program to update a variable
- use a variable in a conditional statement to control the flow of a program
- use the same variable in more than one location in a program

Cross Curricular Links:

Maths - number, angles

Geography - compass and direction

Oracy:

-

Key Questions:

1. How do we learn about stereotypes of boys and girls from the world around us?
2. What is a micro:bit and how does it work?
3. How can selection be used to direct the flow of a program?
4. What different inputs does a micro:bit have?
5. How can a micro:bit sense direction?
6. How can a micro:bit be used to make a product?
7. How can a micro:bit be used to make a product?