National Centre for Computing Education

Raspberry Pi

Year 6 – Sensing

Lesson	Brief overview	Learning objectives
1 The micro:bit	Pupils will be introduced to the micro:bit as an input, process, output device that can be programmed. Pupils will familiarise themselves with the device itself and the programming environment, before creating their own programs. They will then run their programs on the device. **Note:** This unit is written assuming that you will be using a desktop or laptop computer (not a tablet) to connect micro:bits.	To create a program to run on a controllable device • I can apply my knowledge of programming to a new environment • I can test my program on an emulator • I can transfer my program to a controllable device
2 Go with the flow	Pupils will explore how if, then, else statements are used to direct the flow of a program. They will initially relate if, then, else statements to real-world situations, before creating programs in MakeCode. They will apply their knowledge of if, then, else statements to create a program that features selection influenced by a random number to create a micro:bit fortune teller project.	To explain that selection can control the flow of a program • I can identify examples of conditions in the real world • I can use a variable in an if, then, else statement to select the flow of a program • I can determine the flow of a program using selection
3 Sensing inputs	Pupils will initially use the buttons to change the value of a variable using selection. They will then develop their programs to update the variable by moving	To update a variable with a user input

	their micro:bit using the accelerometer to sense motion. Finally, they will learn that a variable's value remains the same after it has been checked by the program.	• I can use a condition to change a variable • I can experiment with different physical inputs • I can explain that checking a variable doesn't change its value
4 Finding your way	Pupils will apply their understanding of the importance of order in programs. They will then use operands in selection to determine the flow of a program. Pupils will then modify a program which will enable the micro:bit to be used as a navigational device. To code this, they will adapt the code they completed to make a basic compass.	To use an conditional statement to compare a variable to a value • I can use an operand (e.g. <>=) in an if, then statement • I can explain the importance of the order of conditions in else, if statements • I can modify a program to achieve a different outcome
5 Designing a step counter	Pupils will be working at the design level. They will pick out features of a step counter, a piece of technology with which they are likely to be familiar. They will then relate those features to the sensors on a micro:bit. In the main activity, pupils will design the algorithm and program flow for their step counter project.	To design a project that uses inputs and outputs on a controllable device • I can decide what variables to include in a project • I can design the algorithm for my project • I can design the program flow for my project
6 Making a step counter	Pupils will use the design that they have created in Lesson 5 to make a micro:bit-based step counter. First they will review their plans, followed by creating their code. Pupils will test and debug their code, using the emulator and then the	To develop a program to use inputs and outputs on a controllable device

	physical device. To successfully complete this project, Pupils will need to demonstrate their understanding of all the programming lessons they've had so far.	• I can create a program based on my design • I can test my program against my design • I can use a range of approaches to find and fix bugs