Beech Hill Primary School Knowledge Organiser

Topic: Computing	Year group	Term
Computer Science : Python and Micro Bits	Year 6	Spring 2 6 sessions

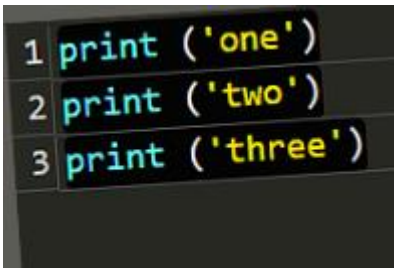
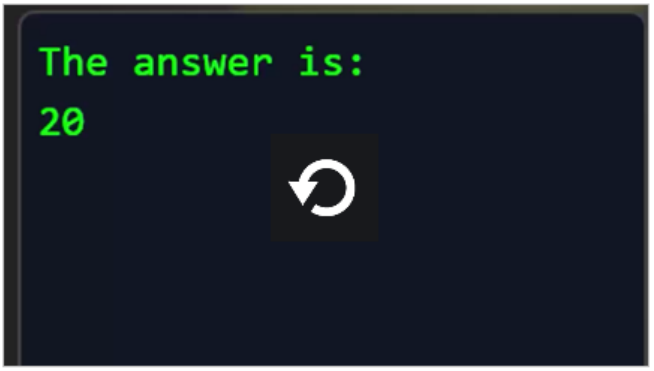
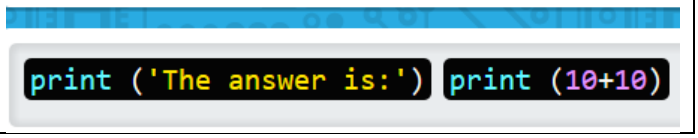
Background knowledge
A BBC MicroBit is a pocket-sized codeable computer. It has 25 red LEDs that light up, flash messages etc. It has two programmable buttons. It can be used as a games controller (e.g Kodu). It has an on board motion detector, a built in compass and Bluetooth connectivity. They will have experienced some non-block coding last year in Year 5 when they were introduced to HTML.

What should I already know?
Children will have used BBC Micro Bits in Year 3, using block coding. They will have experience of connecting the Microbit to a PC, to a battery pack, to a motor. They have experience of simple algorithms and debugging. They will know how to download the code to the PC and then onto the MicroBit. The children then moved on to use Microbit2s in Year 4, learning to use new features not previously featured on the original devices. Children will move on from block coding to Python, which they will have practised during Summer 1 using Discovery Education Coding.

National Curriculum Objectives / Key Skills	The Journey
To design, write and debug programs using sequences and variables. To use sequence, selection, and repetition in programs; work with variables and various forms of input and output including some non block coding.	1. Learn to input information in Python and generate an output by running the code. (Discovery Coding, Python, Python Printing). 2. To understand what turtle graphics are and how to code lines and shapes using the turtle. (Discovery Coding, Python, Introducing Python Graphics). 3. To create a step counter using python. Practical activity to show the the microbit has a real world function. https://makecode.microbit.org/projects/step-counter https://www.youtube.com/watch?v=TTI0OfoclcU&list=PLMMBk9hE-SepocOwueEtTDyOPI_TBE9yC 4. Children create a thermometer by inputting code using Python instead of block coding. Extend to intermediate level to create a max-min thermometer. https://microbit.org/projects/make-it-code-it/thermometer/?editor=makecode

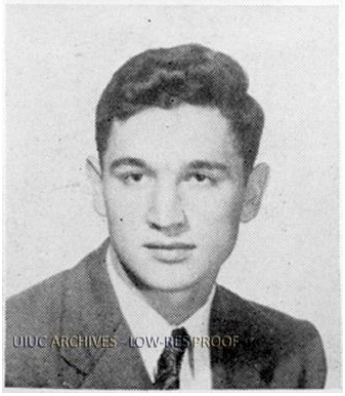
To use logical reasoning to explain how some simple algorithms work and to detect and correct errors in algorithms and programs with support. I can create programs that use sequences and variables to achieve given goals. I can explain how my algorithm works and begin to detect errors with support. I can use some non block coding.	https://www.youtube.com/watch?v=uv4NtRzMwaA&list=PLMMBk9hE-SepocOwueEtTDyOPI_TBE9yC 5. To create a compass using infinite loops, along with a range of mathematical skills such as degrees, greater than and less then. https://makecode.microbit.org/projects/compass https://www.youtube.com/watch?v=9IyssvevhJ0&list=PLMMBk9hE-SepocOwueEtTDyOPI_TBE9yC 6. Children use two microbits to send radio messages in secret to each other using python code. https://makecode.microbit.org/projects/micro-chat

Outcomes
An overview of what children will know / can do Working towards: With support from an adult or my friends, I can create a simple programmes to make the LEDs on my MicroBit respond and I can start to create intermediate level codes including some use of Python. Expected: Children can work with a partner write and debug codes for a piece of hardware. They will use different input commands, conditionals and variables in block coding form and in Python. They will make the MicroBit respond in ways beyond just LED light displays including practical usages. Exceeding: Children can take the lead in writing and debugging codes for a piece of hardware using Python. They will use different input commands, conditionals and variables, and can predict and experiment with what happens when these are changed.

Key Vocabulary	Timeline / Diagrams
Algorithm - a set of instructions which can be given to complete a task both on hardware and unplugged activities. Code - A list of commands in a computer program. Conditional – a part of the code that will only happen "if". Debug – to spot errors and correct them. Input – the commands you give to the device. Instructions – to tell someone or a device what to do. LED – a light emitting diode. Output – the outcomes produced by the input. Print – to make text appear on the screen in Program - A set of instructions in a programming language or code that tells a computer what to do. Python – a computer programming language. Variable - An object used to store a simple piece of information, such as a score or the time taken. Run - To make a program follow its instructions. Text – the words on the screen.	   

Key people / places

The first visible-spectrum (red) LED was developed in 1962 by Nick Holonyak, Jr. while working at General Electric.





Guido van Rossum created the programming language Python in the Netherlands. It was first released in 1991.

Questions of the week:

1. What is the function of the print command? What does the print command make happen?
2. Can you give instructions to a classmate so that they can make a shape like the turtle in Python?
3. What is the name of the motion sensor found on Microbit2s and in devices like mobile phones? (an accelerometer)
4. How can a Microbit be used to measure the weather?
5. If the degrees on a compass is less than 45 degrees, which direction is it pointing? (north). If the degrees are more than 45 but less than 135, which direction is it pointing? (east)
6. A message sent on a microbit to another is sent using a block called a ….? (string)