

| Year / Topic | Term | National Curriculum Links | Length of Topic |
|--|--|---------------------------|-----------------|
| 8.6 Python Programming | Summer 2 | CS3.1, CS3.3 | 7 Weeks |
| Resources Kodu Internet Explorer Hour of Code JavaScript | <p style="text-align: center;"><u>Key Classroom ICT Activity</u></p> <p>In this unit students learn the basics of programming using Python, using loops, functions, methods, lists, dictionaries and tuples.</p> <p>By the end of the topic students will be able to:</p> <ul style="list-style-type: none"> • Develop their problem solving skills. • Understand what text based programming is. <p>Assessment - Progression Pathways</p> <p>All children should – <i>CS, Understands the difference between, and appropriately uses if and if, then and else statements. Uses a variable and relational operators within a loop to govern termination. Designs, writes and debugs modular programs using procedures. Knows that a procedure can be used to hide the detail with sub-solution. Understands that iteration is the repetition of a process such as a loop. Recognises that different algorithms exist for the same problem. Represents solutions using a structured notation. Can identify similarities and differences in situations and can use these to solve problems. Understands that programming bridges a gap between algorithmic solutions and computers. Has practical experience of a high-textual language including using standard libraries when programming. Uses a range of operators and expressions e.g. Boolean and applies them in the context of program control.</i></p> <p>Most children should – <i>CS, Understands a recursive solution to a problem repeatedly applies the same solution to smaller instances of the problem. Recognise that some problems share the same characteristics and use the same algorithm to solve both. Understands the notion of performance of algorithms and appreciates that some algorithms have different performance characteristics for the same task. Uses nested selection statements. Detects and corrects syntactical errors.</i></p> <p>Some children should - <i>CS, Recognises that the design of an algorithm is distinct from its expression in a programming language. Evaluates the effectiveness of algorithms and models similar problems. Appreciates the effect of the scope of a variable. Designs a solution to a problem that depends on solutions to smaller instances of the same problem. Designs and write nested modular programs that enforce reusability utilising sib-routines where ever possible,</i></p> | | |
| Target Skills Programming Skills Collaboration | | | |
| Curriculum Links Maths – use of variables. English – Speaking and listening. D&T – Designing a game. | | | |

| Assessment Criteria | 8.6 Python Programming |
|---------------------|---|
| Emerging | <ul style="list-style-type: none"> ✓ I can understand the difference between and appropriately use if, then and else statements. ✓ I can use a variable within a loop to stop the loop from running. ✓ I can design, write and debug programs. |
| Developing | <ul style="list-style-type: none"> ✓ I understand that iteration is the repetition of a process such as a loop. ✓ I can identify similarities and differences in situations and can use these to solve problems. ✓ I can use standard libraries when programming. ✓ I can use a range of operators and expressions. |
| Secure | <ul style="list-style-type: none"> ✓ I can recognise that some problems share the same characteristics and use the same algorithm to solve both. ✓ I can detect and correct syntactical errors. ✓ I can use nested selection statements. |
| Mastered | <ul style="list-style-type: none"> ✓ I can evaluate the effectiveness of an algorithm. ✓ I can design a solution to a problem that depends on the solution of a previous problem. |