Raspberry Pi Foundation

Learning graph 4
KS4 – Programming
Subroutines

Conceptual background and design processes

Lesson 18

- Describe a subroutine
- Describe the purpose of parameters in subroutines
- Describe how subroutines are used for decomposition
- List the advantages of subroutines

Lesson 19

- Describe a procedure
- Describe what a function does (input, process, output)
- Explain the differences between a function and a procedure

Lesson 20

- Describe scope of variables
- Describe how parameters can reduce the need for global variables
- Describe the purpose of a constant in programming

Lesson 21

- Describe the function of an XOR Boolean operator
- Design a program that involves function calls

Lesson 22

- Describe the structured approach to programming
- List the advantages of the structured approach

Lesson 23 & 24

- Describe iterative testing
- Describe types of testing (boundary, erroneous, normal)
- Design a program that builds on skills developed

Programming skills

General and Python-specific programming skills

- Perform a walkthrough of procedures that accept parameters
- Use procedures that accept parameters
- Perform a walkthrough of function code given the arguments provided during the call
- Use functions to return values in programs
- Identify global and local variables in programs
- Identify when to implement global variables
- Use Python naming conventions for constants
- Create a program that involves function calls
- Use the structured approach in programming
- Create a program that builds on skills developed
- Use testing whilst creating a program

Control structures

- Use subroutines to control the flow of execution in programs

Language features

Programming constructs in Python

- subroutines
  - `(parameter)`
- functions
  - `return`
- constants
  - `ALLCAPS`

Key:

- Concept *(Concept box)*
- Skill *(Skill box)*

Links:

- Direct prerequisite
- Scaffolding not direct prerequisite