Year 8 - Computer Science - Topic: Python

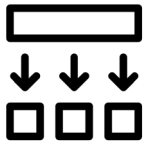
Specification:

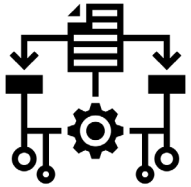
"Design, use and evaluate computational abstractions that model the state and behaviour of real-world problems and physical systems."

"Use 2 or more programming languages, at least one of which is textual, to solve a variety of computational problems; make appropriate use of data structures [for example, lists, tables, or arrays]; design and develop modular programs that use procedures or functions."

"Understand simple Boolean logic [for example, and, or and not]"

Key Information:

Algorithm 	An algorithm is a plan, a set of step-by-step instructions to resolve a problem.	Remember that in Scratch you are creating an algorithm whenever you start a new project.
Decomposition 	Decomposition helps by breaking down complex problems into more manageable parts.	When you create your quiz in Scratch you will be breaking down that problem into smaller steps.
Variable 	A variable is a storage location that can change.	`age = 21` `subject = "Computer Science"`

Casting 	Converting a variable from one data type to another is called casting.	`age = "21"`
		`age = int(age)`
		`age = 18`
		`age = str(age)`

Year 8 - Computer Science - Topic: Python

Assessment:

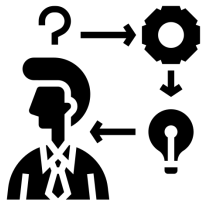
Midpoint low stakes assessment on Microsoft Forms.
Python programming practical standard assessment at the end of the unit.

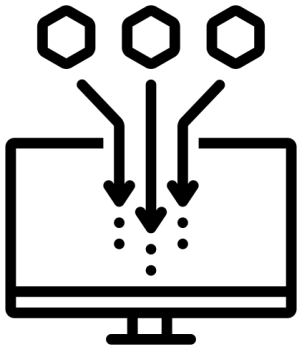
Take it Further:

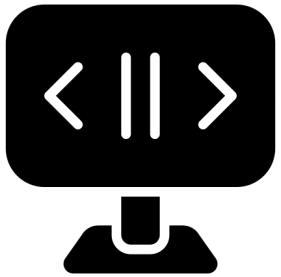
https://www.101computing.net/category/python-beginner/

Support:

https://www.csnewbs.com/keystage3
https://www.w3schools.com/python/

Sequence
 
	When designing algorithms, it is important to make sure that all the steps are presented in the correct order. This is known as sequencing and can be displayed in pseudocode or flowcharts.	`def ticketprice(adultTicket, childTicket):`
		`  adult = 19.99`
		`  child = 8.99`
		
		`  totalAdult = adultTicket * adult`
		`  totalChild = childTicket * child`
		
		`  total = totalAdult + totalChild + 2.50`
		
		`  return total`
		
		`print(ticketprice(6,10))`

Selection
 
	Selection is a decision or question.
	
	At some point in an algorithm there may need to be a question because the algorithm has reached a step where one or more options are available. Depending on the answer given, the algorithm will follow certain steps and ignore others.
		`age = 18`
		
		`if age == 18:`
		`  print("You are 18")`
		`else:`
		`  print("You are not 18")`

Data Types
 
	• **String** – A sequence of alphanumeric characters (e.g. "Hello!" or "Toy Story 4" or "Boeing 747")
	• **Integer** – A whole number (e.g. 1470 or 0 or -34)
	• **Float (also called Real)** – A decimal number (e.g. -32.12 or 3.14)
	• **Boolean** – A logical operation (True or False)
		`film = "Toy Story"`
		`year = 2023`
		`pi = 3.14`

Year 8 - Computer Science - Topic: Scratch

SCRATCH

Specification:

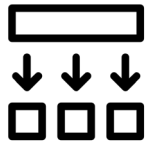
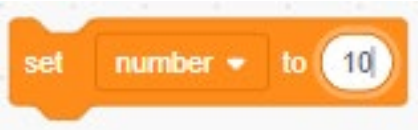
"Design, use and evaluate computational abstractions that model the state and behaviour of real-world problems and physical systems."

"Use 2 or more programming languages, at least one of which is textual, to solve a variety of computational problems; make appropriate use of data structures [for example, lists, tables, or arrays]; design and develop modular programs that use procedures or functions."

"Understand simple Boolean logic [for example, and, or and not]"

"Create, reuse, revise and repurpose digital artefacts for a given audience, with attention to trustworthiness, design, and usability.

Key Information:

Algorithm 	An algorithm is a plan, a set of step-by-step instructions to resolve a problem.	Remember that in Scratch you are creating an algorithm whenever you start a new project.
Decomposition 	Decomposition helps by breaking down complex problems into more manageable parts.	When you create your quiz in Scratch you will be breaking down that problem into smaller steps.
Variable 	A variable is a storage location that can change.	

Year 8 - Computer Science - Topic: Scratch

Assessment:

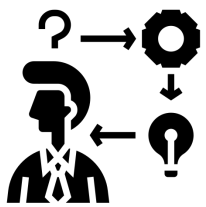
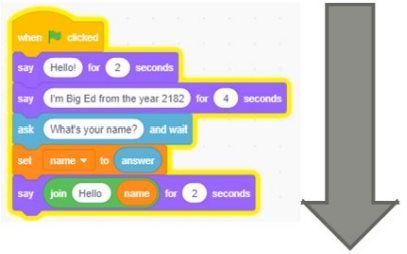
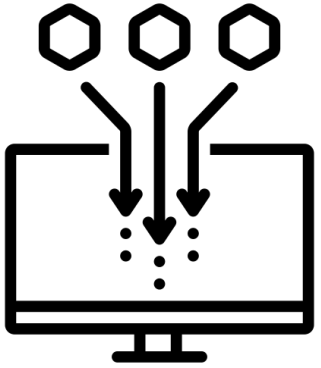
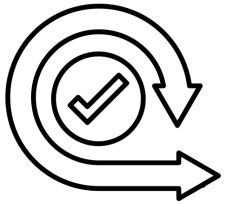
- Midpoint low stakes assessment on Microsoft Forms /10
- Written standard assessment at the end of the unit /20

Take it Further:

https://thepixelgang.co.uk/free/index.php
https://www.codewizardshq.com/scratch-tutorial-for-kids/

Support:

https://www.bbc.co.uk/bitesize/topics/z7d634j
https://scratch.mit.edu/
https://classroom.thenational.academy/units/programming-essentials-in-scratch-part-i-b4aa
https://classroom.thenational.academy/units/programming-essentials-in-scratch-part-ii-02a3

Sequence 	When designing algorithms, it is important to make sure that all the steps are presented in the correct order. This is known as sequencing and can be displayed in pseudocode or flowcharts.	
Selection 	Selection is a decision or question. At some point in an algorithm there may need to be a question because the algorithm has reached a step where one or more options are available. Depending on the answer given, the algorithm will follow certain steps and ignore others.	
Iteration 	Iteration in programming means repeating steps, or instructions, repeatedly. This is often called a 'loop'.