Scheme of Work: Computer Science – GCSE / A Level

Topic	Learning Objectives	Learning Activities	Resources	Assessment Opportunities	Cross-curricular links – Subjects & Themes
Linear Search and Algorithms	Understand how the linear search method works, in what case is it used, and what are its best and worst case run times. Learners should also understand the importance of algorithms.	Introduce the concept of linear search and talk about how it is important to follow an algorithm to get the correct solution. Start the potions class in game and allow learners to follow and complete the tutorial. Once complete ask learners about how they implemented and used linear search and algorithms.	Download and import the ABACWS world template file.	Talk to learners whilst they are completing the potions class and question them on what steps they plan on taking. After the class ask learners about how linear search was implemented and how algorithms was used in creating a potion.	Literacy – learners will practice basic literacy concepts such as reading, processing and interpreting instructions within NPC dialogue and tutorials. Digital Competency – learners will practice basic digital competency skills via logging in and importing/exporting worlds in Minecraft for Education. Numeracy – learners will practice basic arithmetic concepts.
Data Types	Understand various data types that are used within programming and why certain data types are more appropriate over others in certain circumstances.	Introduce learners to the following data types: Integer, String, Boolean, Float, Tuple, and Array. Ensure some understanding before starting the game.	Download and import the ABACWS world template file.	Observe learners when they are completing the class. Ask why they think the data type they've chosen is suitable. A quiz can be done after completion of the class.	Literacy – learners will practice basic literacy concepts such as reading, processing and interpreting instructions within NPC dialogue and tutorials. Digital Competency – learners will practice basic digital competency skills via logging in and importing/exporting worlds in Minecraft for Education.

		Start the herbology class in game and allow learners to follow and complete the tutorial. Upon completion quiz learners on each data type.			Biology – Various plants are covered within the class. Further information about them could be provided by a biology teacher to make links to their subject.
Input, Process, Output	Understand the concept of input, process, output (IPO)	Show learners an example of this model such as a simple Celsius to Fahrenheit converter. Cover how to deal with human error, e.g., produce an error message as output. Start the Spells class in game and allow learners to follow and complete the tutorial.	Download and import the ABACWS world template file.	Ask learners about the game, what is the input, process, and output.	Literacy – learners will practice basic literacy concepts such as reading, processing and interpreting instructions within NPC dialogue and tutorials. Digital Competency – learners will practice basic digital competency skills via logging in and importing/exporting worlds in Minecraft for Education. Numeracy – learners will practice basic arithmetic concepts.
Binary	Understand how numbers are represented in binary and how to apply additions and shifts.	Initially explain what binary is and what it is used for. Start the alchemy class in game and allow learners to follow and complete the tutorial.	Download and import the ABACWS world template file.	Learners can be given a quiz with various questions regarding binary addition and shifts.	Math – Learners will practice mathematical skills when adding and shifting binary numbers. More complicated questions can be given where binary numbers need to be converted from binary to decimal to hexadecimal and vice versa. Math – Possible to link current math topics such as algebra. Such as solving

		Additional questions can be given once complete.			algebraic equations using binary, decimal, or hexadecimal. Literacy – learners will practice basic literacy concepts such as reading, processing and interpreting instructions within NPC dialogue and tutorials. Digital Competency – learners will practice basic digital competency skills via logging in and importing/exporting worlds in Minecraft for Education. Numeracy – learners will practice basic arithmetic concepts.
1-dimensional and 2-dimensional arrays	Understand the difference between 1d and 2d arrays and how to index and loop through them.	Start with showing examples of 1d and 2d arrays. Explain how you can access certain elements and how to traverse through them using for loops. Start the astronomy class in game and allow learners to follow and complete the tutorial.	Download and import the ABACWS world template file.	Observe the code written by learners. Ask what the expected output should be when using a single for loop and nested for loops on 1d and 2d arrays. Point to certain elements in an array and ask how they can retrieve it.	Physics – Constellations are plotted within the class. Further information about constellations and their stars could be covered to make the link with physics. Literacy – learners will practice basic literacy concepts such as reading, processing and interpreting instructions within NPC dialogue and tutorials. Digital Competency – learners will practice basic digital competency skills via logging in and importing/exporting worlds in Minecraft for Education. Numeracy – learners will practice basic arithmetic concepts.