



SVC ICT and Computing Learning Pathway -Year 9



LP	Computer Science
8-9	<p>Students will fully decompose a problem into its sub-problems e.g. to make use of structured flowcharts to represent it.</p> <p>Students will analyse and present an algorithm for a task of their own e.g. Python.</p> <p>Students will explore the effects of changing the variables in a model or program.</p> <p>Students will try out and refine sequences of instructions</p> <p>Students will be able to independently select appropriate data types for their task e.g. defines data types: real numbers and Boolean.</p> <p>Students will design and use complex data structures e.g. select correct data type for a program.</p> <p>Students will reflect critically on programs in order to make improvements in their programming exercises</p> <p>Students will be able to explain binary and denary numbers and perform calculations</p>
6-7	<p>Students will partially decompose a problem into its sub-problems e.g. to make use of structured flowcharts to represent it.</p> <p>Students will analyse and present an algorithm for a given task e.g. Small Basic, Scratch, Python.</p> <p>Students will explore the effects of changing the variables in a model or program.</p> <p>Students will try out and refine sequences of instructions</p> <p>Students will be able to manipulate strings and select appropriate data types e.g. defines data types: real numbers and Boolean.</p> <p>Students will design and use simple data structures e.g. select correct data type for a program.</p> <p>Students will recognise similarities between simple problems and algorithms e.g. write algorithm for given program</p> <p>Students will reflect on programs in order to make improvements in further programming exercises</p> <p>Students will know that computers use binary to represent all data e.g. 0,1</p>
4-5	<p>Students will understand how bit patterns represent numbers and images.</p> <p>Students will understand & explain that iteration is the repetition of a process such as a loop e.g. smoke alarm e.g. algorithm/flowchart.</p> <p>Students will have practical experience of a high-level textual language e.g. python programming.</p> <p>Students will use a range of operators and expressions e.g. Boolean, and apply them in the context of program control e.g. python programming.</p> <p>Students will recognise and understand the function of the main internal parts of basic computer e.g. dismantling a PC.</p> <p>Students will understand the concepts behind the fetch-execute-cycle e.g. routine of instructions.</p> <p>Students will be able to suggest ways in which search engines rank search results e.g. use of keywords, site structure and quality of links.</p>

LP	Computer Science
2-3	<p>Students will analyse and represent symbolically a sequence of events. e.g. create an algorithm using symbols e.g. data flow diagram</p> <p>Students will recognise different types of data e.g. text, number, real/integer, instructions and string.</p> <p>Students will understand the need for care and accuracy when programming e.g. errors, debugging.</p> <p>Students will give instructions involving selection and repetition e.g. loop, if, else.</p> <p>Students will ‘think through’ an algorithm and predict an output showing an awareness of inputs.</p> <p>Students will present data in a structured format suitable for processing.</p> <p>Students will recognise tasks completed by humans or computers e.g. data entry (register) can be automated or by humans, CAD/CAM – car production line.</p> <p>Students will design solutions by breaking down a problem and create a sub-solution for each of these parts.</p> <p>Students will design, write and debug structured (modular) programs using steps (procedures) e.g. lots of mini procedures which make up a program.</p> <p>Students will understand why and when computers are used e.g. work (production), social (communicating), efficiency & effectiveness of tasks.</p> <p>Students will understand how to effectively use search engines e.g. knowing how to use advanced search to narrow down specific data.</p>
0-1	<p>Students will recognise similarities between storyboards of everyday activities e.g. brushing teeth, cooking, walking to school.</p> <p>Students will present data in an orderly way e.g. storyboard, set of instructions e.g. method for recipe, making a sandwich or smoothie.</p> <p>Students will design a simple linear (non-branching) sequence of instructions to make things happen e.g. Scratch, Small Basic, IF statement.</p> <p>Students will design simple algorithm flowchart to show solutions using repetition and two-way selection e.g. a flowchart with IF, then and else.</p> <p>Students will use algorithms to develop, improve instructions and create programs to achieve given goals.</p> <p>Students will recognise, state and assign variables.</p> <p>Students will use post-tested loop e.g. ‘until’, and a sequence of selection statements in programs, including and if, then and else statement e.g. Scratch – character to dance to music until it ends.</p> <p>Students will know that computers collect data from various input devices e.g. sensors – doors/lights and application software.</p> <p>Students will understand the difference between hardware and application software and their roles within a computer system e.g. labelling peripherals & components of computer system and what software to use for a particular purpose/task.</p>