TSST Computing 2017_18

Dates: 25-Sept-17, 31-Oct-17, 10-Jan-18, 01-Mar-18 and 02-Apr-18

Within your group choose 5 units to be completed during the 5 day course.

Unit 1	• Programming theory and decomposition. • Computational thinking and troubleshooting. • Systems analysis / abstraction. • Applying abstraction to real world problems. • Choice of algorithms and the effect on systems. • Planning algorithms using pseudocode and flowcharts. • Practical application of solutions using scratch.	• Understand computational thinking. • Use computational thinking to decompose a problem. • Take a decomposed problem and map a solution using various techniques. • Practice/learn basic scratch skills and take away teaching resources for scratch.
Unit 2	• Introduction to text based programming using python. • Input / output. • Variables. • Selection (If statements). • Arrays (using Lists in python).	• The basics of text based programming. • Understand input / output in programming terms. • Use variables and lists to store data.
Unit 3	• Teaching Python in KS3. • Repetition (while and for loops). • Using loops to process the contents of lists. • File handling (reading and writing).	• Gain insight into how loops fit on to programming and how they work. • Use loops to manage data processes. • Gain contexts to deliver computing concepts when teaching programming.
Unit 4	• Binary and binary maths. • Conversion between Binary, Denary, Octal and Hex. • Logic gates. • Truth tables. • Constructing truth tables from logic diagrams and vice versa.	• Learn to manipulate the common number bases used in computing. • Be able to practise the maths using the various bases and take away resources to help teach. • Be able to work with logic gates and truth tables.
Unit 5	• Hardware components. • Networking (becoming familiar with topologies). • TCP/IP and other protocols (SMTP, FTP, POP, HTTP, IMAP. • Internet vs Web. Compare and understand why they are commonly mixed up. • Fetch / Execute cycle. • Basic look at client / Server model.	• Basic look at client / server model. • Understand the components of the computer. • Understand the basic structure of the TCP/IP protocol. • Understand what a protocol is and what functions the main protocols perform. • Gain a basic understanding of the fetch execute cycle and take a teaching resource away to demonstrate it.

Unit 6	• Physical computing using the BBC micro:bit. • Adding peripherals to the micro:bit. • Cross-curricular opportunities with physical computing. • You will be able to program the micro:bit for a number of real world tasks.	• Attach extra devices to the micro:bit to make things happen in the real world. • Understand how a micro:bit can be used to support cross curricular STEM projects.
Unit 7	• Scratch Programming for KS3. • Learn basic programming theory using scratch. • Learn how to program the solution to algorithms in scratch. • Understand how to create procedural programmes in scratch.	• You will program the solutions to a number of problems using scratch. • Understand how to use variables and when to transition students into variable use. • Understand the 3 kinds of Loop and when to use which.
Unit 8	• What is a computer? • The Basic components of a computer. • Bottlenecks and relative speeds. • How the components work together. • Operating systems and what they do. • You will strip down a PC to look at the components.	• Research and understand what the main components are and how they work. • Look at BUS speeds of various components. • Capacity and speed of RAM, ROM. • Solid State VS traditional storage and the pros and cons.