Computer Science Overview

Computer Science and L4L

In L4L themes are designed to provide students with a coherent knowledge and understanding of computing with links to Maths, Science and many other core subjects. Students are taught the key principles of computing which covers information and computation, how systems work and how. Our curriculum enables students to become digitally literate allowing them to use express and develop their ideas through information communication technology.

The Threads of Learning have been purposely designed and created to ensure themes have been placed so that students are able to build on their skills effectively throughout across KS3 to prepare them for the workplace and become active participants of the digital word we live in.

Content and Skills

Throughout the L4L KS3 curriculum and our use of the technological competencies, students analyse, classify digital data responsibly and safely. Design write and evaluate programs. The promotion of literacy and the use of key information computing technology terminology allows students to communicate their knowledge in increasingly sophisticated ways.

Key Outputs and Assessments

In L4L, key competencies are identified by Heads of Department. These skills are essential to be developed throughout KS3 to ensure they success at Key Stage 4. As a result of this, the key competencies are assessed across KS3 to ensure students are making progress and moving closer to mastering that skill.

Students are provided with colour-coded feedback sheets which provide a current working at grade and target for the next piece of work.

Below is an example of our competency assessment programme for Computer Science in L4L, which shows a key competency being assessed throughout L4L:

TL.PU.01 Presenting Information Using ICT (Word, PowerPoint, Websites, Media)		
Y7 **Silent Movies** Editing	**Y8** **Grand Designs** Web design	**Y9** **America** Skyscrapers and Technology

Staff Training

The L4L staff are supported with the delivery of the KS3 Computer Science curriculum by regular CPD sessions, planning meetings with subject specialist staff, pre-reading material, learning walks and sharing of best practice. Subject specialist staff also provide training sessions, recorded video tutorials and drop-in sessions in order to upskill all staff in the delivery of Computer Science.

How are the Technological Competencies Mapped Across L4L Themes?

Competency	Links to NC	Year 7	Year 8	Year 9
TL.PU.01 Presenting Information Using ICT (Word, PowerPoint, Websites, Media)	• Can understand and apply the fundamental principles and concepts of computer science, including abstraction, logic, algorithms and data representation.	<u>Silent Movies</u> • The Language of Silent Movies and Storyboarding • Editing	<u>Grand Designs</u> • Web Design	<u>America</u> • Skyscrapers and Technology
TL.PU.02 Analysing Information Using ICT (Excel)	• Can analyse problems in computational terms, and have repeated practical experience of writing computer programs in order to solve such problems.	<u>Growing</u> • Introduction to spreadsheets		
TL.PU.03 Storing Information Using ICT (SharePoint, File Management, Databases)				
TL.PU.04 Using technology safely, respectfully, responsibly and securely.				
TL.CS.01 Logic and Algorithms (Boolean Logic, Binary)	• Can understand and apply the fundamental principles and concepts of computer science, including abstraction, logic, algorithms and data representation.	<u>iRobot</u> • Coding • Algorithms and choreography	<u>Please Sir</u> • Victorian Inventors – George Boole • Charles Babbage, Binary and Coding	

TL.CS.02 Programming (Java)	• Can understand and apply the fundamental principles and concepts of computer science, including abstraction, logic, algorithms and data representation.	<u>iRobot</u> • Algorithms and choreography		
TL.CS.03 Hardware and Networks	• Can understand and apply the fundamental principles and concepts of computer science, including abstraction, logic, algorithms and data representation.			

NC Link	Year	Theme	Lesson
Computational Abstractions Design, use and evaluate computational abstractions that model the state and behaviour of real-world problems and physical systems.	8	Please Sir	Charles Babbage, binary and coding
Algorithms and reasoning Understand several key algorithms that reflect computational thinking [for example, ones for sorting and searching]; use logical reasoning to compare the utility of alternative algorithms for the same problem.	7 7	iRobot Growing	Algorithms and choreography Introduction to spreadsheets
Programming Language Use two 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.			
Boolean Logic Understand simple Boolean logic [for example, AND, OR and NOT] and some of its uses in circuits and programming; understand how numbers can be represented in binary, and be able to carry out simple operations on binary numbers [for example, binary addition, and conversion between binary and decimal].	8 8	Please Sir Please Sir	Victorian Inventors – George Boole Charles Babbage, binary and coding
Hardware and Software Understand the hardware and software components that make up computer systems, and how they communicate with one another and with other systems.	8	Grand Designs	Web Design Victorian Inventors George Boole
Computer systems Understand how instructions are stored and executed within a computer system; understand how data of various types (including text, sounds and pictures) can be represented and manipulated digitally, in the form of binary digits.	7 8	iRobot Please Sir	Coding Charles Babbage, binary and coding
Creative Projects Undertake creative projects that involve selecting, using, and combining multiple applications, preferably across a range of devices, to achieve challenging goals, including collecting and analysing data and meeting the needs of known users.	7 7 7 8 9	Growing Silent Movies Silent Movies Grand Designs America	Introduction to spreadsheets The language of silent film and storyboarding Editing Web Designs Skyscrapers and Technology