KS3 Computer Science: National Curriculum Map (Customised)

Information Technology	Digital Literacy	Computer Science*			
		Computational Thinking	Hardware/Software	Data Representation	Programming
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	Understand a range of ways to use technology safely, respectfully, responsibly and securely, including protecting their online identity and privacy; recognise inappropriate content, contact and conduct, and know how to report concerns	Design, use and evaluate computational abstractions that model the state and behaviour of real-world problems and physical systems	Understand how instructions are stored and executed within a computer system	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]	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
Create, reuse, revise and repurpose digital artefacts for a given audience, with attention to trustworthiness, design and usability		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	Understand the hardware and software components that make up computer systems, and how they communicate with one another and with other systems	Understand how data of various types (including text, sounds and pictures) can be represented and manipulated digitally, in the form of binary digits	

* Computer Science divided into sub-strands to allow mapping to GCSE Computer Science topics of study.

Pleckgate
HIGH SCHOOL

YEAR 8 CURRICULUM MAP:
Computer Science

🟩 Computer Science   🔺 Information Technology   🔴 Digital Literacy

Computer Science - National Curriculum Strands

CT - Computational Thinking
HS - Hardware/Software
DR - Data Representation
PR - Programming

HT1: Data Representation

Overarching unit intent (KSU):

Investigate how data is represented in computer systems and how arithmetic and logic operations are carried out

DR

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. Understand how characters and images are represented on computer system

HT2: Digital Graphics

Overarching unit intent (KSU):

Use graphics software to create suitable graphics for use in both print and online applications.

IT
create, reuse, revise and repurpose digital artefacts for a given audience, with attention to trustworthiness, design and usability

DR
understand how data of various types (including text, sounds and pictures) can be represented and manipulated digitally, in the form of binary digits

Assessment Point: Summative or AFL

HT1 Assessment of Data Representation & key terms from Y7
HT2 Assessment Rubric-based

Key Outcomes:
HT1
Be able to convert between binary, denary and hexadecimal number bases
Understand how logic gates are used.
Know the logic gate symbols for AND, OR, NOT.
Be able to represent the results of binary logic using basic truth tables.
Compare the character sets ASCII and Unicode.
Understand how computers represent images
HT2
Understand the graphic file types BMP,TIFF, JPEG,GIF and PNG
Understand the difference between Vector and Bitmap graphics.
Use of Hexadecimal numbers to represent colour values (link back to HT1)

HT3: Creating a Mobile App

Overarching unit intent (KSU):

Plan and produce a mobile application that can be used on a phone and/or tablet

IT
Utilise software tools to produce practical work
Carry out research using the Internet
Present work in a suitable format

PR
Develop a suitable user interface
Use of events to trigger actions (e.g On Click) in Javascript
Use of HTML/CSS to create user interface

CT
Break problems down into smaller sub-problems (Decomposition)
Recognise repeating patterns. (Pattern Matching)
Remove unnecessary detail and focus on the specifics of a problem (Abstraction)

HT4: Adventures in Python Programming

Overarching unit intent (KSU):

Investigation of key concepts in programming and development of simple programs using a text-based programming language

PR
Exploring key concepts of programming - Sequence,Selection,Iteration.
Use of variables and other data structures (e.g Lists)
The purpose of functions and procedures.

CT
Break problems down into smaller sub-problems (Decomposition)
Recognise repeating patterns. (Pattern Matching)
Remove unnecessary detail and focus on the specifics of a problem (Abstraction)

Assessment Point: Summative or AFL

HT3 Assessment to include some questions from HT1 & HT2

HT4 Assessment to include questions on all units from HT1-4

Key Outcomes:

HT1
Research existing mobile applications
Design & develop a suitable user interface.
Use Javascript to add functionality.
Review finished product against brief

HT2
Develop a text-adventure game concept
Demonstrate an understanding of using Selection to control program sequence
Demonstrate the use of variables, constants and other data structures (e.g lists, dictionaries)
Make use of subroutines (functions/procedures) to make the program more efficient.
HPA Only: *Explore OOP approaches to development*

HT5: Artificial Intelligence

Overarching unit intent (KSU):

Understand how computers can be programmed to display seemingly intelligent behaviour and assess the future impact of AI technology on society

IT
Utilise software tools to produce practical work
Carry out research using the Internet
Present work in a suitable format

DL
Understand some of the dangers posed by changing technology (e.g Smart speakers, self driving cars)

PR
Investigate programs that use machine learning.
Develop a simple program that demonstrates some degree of AI.

HT6: Cyber Security

Overarching unit intent (KSU):

Understand threats posed to computer systems and their users.

IT
create, reuse, revise and repurpose digital artefacts for a given audience, with attention to trustworthiness, design and usability

DL
Understand online threats to computer systems
Recognise common online scams
Take appropriate steps to protect computer systems

EOY Assessment Point

HT5 & HT6: Individual topic assessments

Understanding of HT1-6 to be assessed through end of year assessment.

Key Outcomes:

HT5

Investigate the work of Alan Turing and the Turing test.
Investigate the history of AI in computing
Understand how machine learning can be used
Understand the role of algorithms in artificial intelligence
Discuss the ethical issues around AI

HT6
Protecting against online threats (Malware)
Consequences of data loss
Types of online scam
Common vulnerabilities and Exploits