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 9 (P-Band) 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: Be Internet Citizens	HT2: Computer Networks	*Assessment Point: Summative or AFL*	HT3: Cryptography	HT4: Machine Learning	*Assessment Point: Summative or AFL*	HT5: SQL Databases	HT6: Python Project	EOY Assessment Point
Overarching unit intent (KSU): Investigate common causes of conflict online and how they can be avoided. (Google/Creators for Change Project) **DL** 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 **IT** create, reuse, revise and repurpose digital artefacts for a given audience, with attention to trustworthiness, design and usability	**Overarching unit intent (KSU):** *Investigate computer networks including common topologies and transfer protocols* **HS** Demonstrate an understanding of the Bus, Ring, Star and Mesh topologies including advantages and disadvantages of both. Identify the hardware required in a computer network and how it works. Investigate data transfer mediums including wired and wireless technologies. DR MAC addressing - links with hexadecimal number base.	*HT1 Assessment of Data Representation & key content from Y7&Y8* *HT2 Assessment: combination of practical assessment using rubric and online test to also include HT1 and some Y7&8 content* ***Key Outcomes:*** ***HT1*** *Explore how online communication can be shaped by different agendas* *Understand the terms Fake News, Echo Chamber and Filter Bubble.* *Discuss the rise of hate speech online.* *Understand how to use social media responsibly* ***HT2*** *Understand how different network topologies work.* *Investigate hardware required in computer networks* *Understand IP and MAC addresses.* *Explore data transfer mediums* *Understand key networking protocols*	**Overarching unit intent (KSU):** *Investigating the history of cryptography and modern encryption technologies.* **CT** Recognising repeating patterns Breaking problems down into smaller chunks Removing unnecessary detail and simplifying a problem **DR** Use of binary/hexadecimal to encode messages **PR** Writing suitable programs to assist with codebreaking	**Overarching unit intent (KSU):** *Investigation of how machine learning is used in AI (Artificial Intelligence) systems.* **CT** Recognising repeating patterns Breaking problems down into smaller chunks Removing unnecessary detail and simplifying a problem **PR** Use of both graphical and text-based languages to apply ML concepts to practical examples. **IT** Discussion of legal and ethical implications of ML technology and its impact on everyday life.	*HT3 & HT4 (with elements of HT1 & HT2) End of topic online assessment.* ***Key Outcomes:*** ***HT1*** *Investigate the history of encryption - use of shift and substitution ciphers.* *Understand how password hashing works* *Explore modern cryptographic uses.* *Understand the use of blockchain technologies including cryptocurrency* ***HT2*** *Recap of development of artificial intelligence technology.* *Investigate how computers can analyse data using machine learning* *Develop simple programs that demonstrate machine learning/AI.*	**Overarching unit intent (KSU):** *Understand the role of databases, specifically how they are used in conjunction with other web technologies.* **CT** Recognising repeating patterns Breaking problems down into smaller chunks Removing unnecessary detail and simplifying a problem **IT** create, reuse, revise and repurpose digital artefacts for a given audience, with attention to trustworthiness, design and usability	**Overarching unit intent (KSU):** *Investigation of key concepts in programming and development of a range programs (including a GUI) using a text-based programming language. (Links with revised OCR GCSE Computing Specification from 2020)* **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)	*HT1 – HT6 KSU* *HT5-* *EOY Assessment to cover all topics* ***Key Outcomes:*** ***HT1*** ***Understand the role of databases in modern applications.*** ***Create a database consisting of multiple tables.*** ***Understand how to connect to a database.*** ***Use SQL syntax to query a database.*** ***Create a simple web-based application that uses a database.*** ***HT2*** ***Students to work independently to plan, design, develop and evaluate a program to meet a specific set of requirements. Students can develop their own project or choose from 3 given scenarios. (This links with GCSE Computer Science programming project)***

YEAR 9 (Q-Band) 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: Be Internet CItizens

Overarching unit intent (KSU):

Investigate common causes of conflict online and how they can be avoided. (Google/Creators for Change Project)

DL
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

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

HT2: Computer Networks

Overarching unit intent (KSU):

Investigate computer networks including common topologies and transfer protocols

HS
Demonstrate an understanding of the Bus, Ring, Star and Mesh topologies including advantages and disadvantages of both.
Identify the hardware required in a computer network and how it works.
Investigate data transfer mediums including wired and wireless technologies.

DR
MAC addressing - links with hexadecimal number base.

Assessment Point: Summative or AFL

HT1 Assessment of Data Representation & key content from Y7&Y8

HT2 Assessment: combination of practical assessment using rubric and online test to also include HT1 and some Y7&8 content

Key Outcomes:

HT1
Explore how online communication can be shaped by different agendas
Understand the terms Fake News, Echo Chamber and Filter Bubble.
Discuss the rise of hate speech online.
Understand how to use social media responsibly

HT2
Understand how different network topologies work.
Investigate hardware required in computer networks
Understand IP and MAC addresses.
Explore data transfer mediums
Understand key networking protocol

HT3: Graphic Design for Social Media

Overarching unit intent (KSU):

Use graphics software to create compelling promotional graphics for use in online applications.

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

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

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

HT4: Game Design in Python

Overarching unit intent (KSU):

Investigation of key concepts in programming and development of a range programs (including a GUI) 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 & HT4 (with elements of HT1 & HT2)

Key Outcomes:

HT1
Research existing digital graphics.
Develop digital graphics for a specified purpose/audience
Explore different graphical file types
Understand the difference between vector and bitmap graphics

HT2
Develop a graphical game using Python and Pygame
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: Online Business

Overarching unit intent (KSU):

Understanding how new businesses are created and the role that technology plays in business.

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

Links with elements of GCSE Business -
Changing use of ICT – in business and economic activities;

HT6: Planning IT Projects

Overarching unit intent (KSU):

RO81 - Pre-production documents (From Creative iMedia specification). Be able to use appropriate planning documentation for design projects.

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

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

EOY Assessment Point

HT1 – HT6 KSU
HT5-

EOY Assessment to cover all topics

HT1
Explore the role the changing role that technology plays in business
Investigate how businesses engage with customers online.
Understand how businesses can target customers online.
Undertake a practical enterprise project.

HT2
Investigate types of pre-production documents.
Develop pre-productions documents for a design concept.
Be able to plan an IT project using a GANTT chart.
Understand copyright legislation and the licensing of intellectual property (images, sound, video)