Computer Science Learning Journey

WE CAN

Year 11

Operators
- Arithmetic operators
- Relational operators
- Logical operators

Sub-Programs
- Procedures and functions
- Parameters
- Global and local variables

Input/Output
- Programs (accepting input)
- Programs (read and write)
- Validation

Data Types and Data Structures
- Data types
- Using variables
- String manipulation

Constructs
- Structural components
- Sequence, selection & iteration

Issues and Impacts of Digital Technology
- Environmental
- Ethical & legal
- Cyber security

Develop Code
- Analysis & problem solving
- Algorithms to flowcharts
- Techniques for programs

Develop Code
- Program errors
- Program evaluation

Networks
- Types of networks
- Network connectivity
- Protocols & topologies
- Network security

Computers
- Hardware
- Software
- Programming languages

Data
- Binary
- Data representation
- Data storage and compression

Computational Thinking
- Abstraction and decomposition
- Algorithms
- Truth tables

x	y	x·y
0	0	0
0	1	0
1	0	0
1	1	1

Year 10

Advanced Spreadsheets
- Remembering spreadsheets
- Conditional Formatting
- Validation

Safe Use of Computers and AI
- Remembering AI
- Remembering machine learning
- Neural networks and deep learning
- Ethical implications and future of AI

Planning a Project
- Researching Information
- Presenting Information with charts and web designs

Textual Programming Python II
- Remembering input/output variables
- Remembering selection statements
- Loops
- Sub-programs

Computational Thinking 2
- Abstraction and decomposition
- Algorithmic thinking (flowcharts)
- Pattern recognition
- Sub-programs
- Search and sort algorithms

Binary and Data Representation
- Binary and boolean logic
- Binary to denary/decimals conversion
- Binary addition
- Binary and images
- Binary and sound

Year 9

Cyber Security
- Computer misuse
- Protecting personal data
- Passwords and email scams
- Copyright
- Health and Safety

E-Safety, Machine Learning and AI
- Social media and digital footprint
- Data and online security
- Plagiarism
- Machine learning and AI

Networks
- Internet
- Connectivity
- Topologies
- Network types
- Encryption

Textual Programming Python 1
- Introduction to Python
- Input, output variables
- Data types and maths
- Selection

Block Programming
- Sequence
- Variables
- Turtle
- Operators

Year 8

Machine Learning and AI
- Introduction to AI
- Machine learning
- Ethical implications of AI

Introduction to Spreadsheets
- Introduction to spreadsheets
- Working with formulae
- Creating spreadsheet models and charts

Computational Thinking 1
- Flowcharts
- Sequencing
- Application of computational thinking (Edu Block, Python, Turtle)

Understanding Computers
- Elements of a Computer
- CPU
- Storage devices
- Convergence and new technologies

Introduction to Computing
- Health and Safety
- Files/Folders and School Resources
- Baseline Quiz
- Password
- Email etiquette and written communication

Year 7

Year 11 Overview

Understand programming constructs whilst working with various data types, variables, and string manipulation techniques to create more sophisticated programs. Develop skills in handling input and output operations with proper validation, apply arithmetic, relational, and logical operators effectively, and learn to write modular code using procedures, functions, and parameters.

Year 10 Overview

Develop fundamental computational thinking skills, whilst exploring how computers process and store data in binary format and examining hardware, software, and programming languages. Investigate network systems, connectivity protocols, and security measures, analyse the environmental, ethical, and legal impacts of digital technology, and apply problem-solving techniques to develop, debug, and evaluate programs.

Year 9 Overview

Understand data representation and binary operations; Extend theoretical and practical understanding of computational thinking and algorithm design; Further extend programming skills from year 8 (Python); Further extended data organisation and analysis through spreadsheet; Further extend knowlege and understanding of using computers safely and the ethical implications of AI; Consolidate computing skills through project research and design to show readiness for KS4.

Year 8 Overview

Build on practical application of computational thinking from year 7 (through block programming); Extend practical application of computational thinking from block programming to textual programming with Python; Understand computer networks and cyber security; Summarise social media and digital footprint and implications for data security, plagiarism as well as machine learning and AI.

Year 7 Overview

Understand how to use technology safely; Understand hardware and software components of a computer; Understand the basics of computational thinking and practical application of computational thinking; Understand machine learning and artificial intelligence; Understand using spreadsheets to organise and analyse data.