CURRICULUM OVERVIEW KS3 Computing

Purpose of the Curriculum

Students live in a digital age, their work environments and lives are ever adapting and technology plays a bigger role than ever. The role of the computing curriculum is to equip students with computational thinking skills and understanding of the digital age so that they can better understand and live in a digital world.

Computing ensures that students are digitally literate and able to express themselves digitally. This is important as it prepares them for a job market where computational thinking skills are in demand.

Not all students will study Computer Science at KS4 so it is essential that students gain a broad set of skills and an awareness of the subject and its impact on the modern world. Part of this involves developing students' problem solving abilities, which are transferable skills and impact a variety of other STEM subjects.

KEY LEARNING OBJECTIVES

Key Objectives

A. To be able to create computer programs using both visual(1) and written(2) languages
B. Understand how computer systems work
C. Understand how data is represented
D. Learn how to solve computational problems including the searching and sorting of data
E. To understand how to manipulate and repurpose data

Knowledge and understanding will be assessed in summative assessments and through students applying their knowledge when demonstrating skills in lesson.

Computational thinking skills will be assessed through a variety of programming opportunities in a variety of languages and environments.

CURRICULUM OVERVIEW *Computing*

KEY CONCEPTS

Programming Concepts
- Syntax
- Sequence, selection and iteration
- Data structures
- Subroutines and subprograms

These concepts will allow students to develop a working knowledge of how programs are written.

Problem Solving Concepts
- Abstraction
- Decomposition
- Sorting and Searching Algorithms

These concepts will develop students' ability to problem solve.

Data Representation Concepts
- Why computers use binary?
- Converting binary numbers
- How images and text are stored in binary

These concepts will develop an awareness of how and why computers store data.

Information and Data Concepts
- HTML
- Using spreadsheets to manipulate and model

These concepts will develop an awareness of how information is processed and presented.

Computer Systems Concepts
- Understanding the Internet and networks
- Understanding computer components
- Understanding how computers store data

These concepts will develop an understanding of how computers communicate.

CURRICULUM OVERVIEW *Computing*

SEQUENCE OF LEARNING

	1	2	3	4	5	6
Year 7	Introduction to Computing	Flowcharts and Flowol	Programming in Scratch	Data Representation and Binary	Programming Micro:bits	Cyber Crime
Year 8	Introduction to Python	Understanding Computing Systems	Abstraction/ Decomposition	Sorting and Searching Algorithms	Websites and the Internet	Spreadsheets

In year 7 students build a solid foundation of knowledge and skills. Students learn programming via visual drag and drop style programming languages which allows the concepts of programming to be taught without the worry for of syntax. As they progress they will then be able to apply these concepts using more complex written languages (Python) which continues into year 8. The sequence of learning is important with students developing problems solving skills and an understanding of programming concepts before applying these in more complex ways.

The learning of data representation is placed so that it comes after students have studied place value in Mathematics as these units share common concepts.

The foundation of skills and knowledge which students learn in year 7 are embedded, developed and applied in year 8 which has a bigger focus on problem solving and understanding. The skills learnt in year 7 such as Scratch will be used in year 8 as students use these skills to apply their knowledge and demonstrate problem solving.