

Subject: Computing

Golden Concept: Computer Science

Purpose:

The Computer Science strand in the Computing National Curriculum serves several purposes. To build foundation knowledge it introduces concepts, such as algorithms, programming, and computational thinking.

Other reasons are to:

- Develop practical skills in programming.
- Prepare pupils for careers in computer science.
- Increase understanding of technology.
- Improve adaptability skills.

Overall, the Computer Science strand aims to provide students with both theoretical knowledge and practical skills to engage with and contribute to the world of computing.

Assessment:

KS1 and KS2 are through teacher Assessment. Teachers assess students' progress based on their understanding and application of the computing curriculum. This includes observing students' practical work exercises, End-of-Key-Stage Assessments, and demonstrations of progression over time.

At KS3 teachers assess students' progress in computing by evaluating their understanding of concepts, application of computational thinking, and practical skills. Project-Based Assessments may be used that involve problem-solving, coding, or working with technology. Assessment could be based on the completion and quality of these projects. The assessments in computing aim to evaluate not only students' technical skills but also their understanding of computational concepts, problem-solving abilities, and creativity in applying technology to solve problems.

Cross curriculum:

The computer science strand of computing often integrates cross-curricular themes to provide a comprehensive learning experience. Some of the key cross-curricular themes within the computer science strand include

- Encouraging students to develop problem-solving skills involving real-life scenarios.
- Critical thinking ability to analyse, evaluate information critically. Creativity and Innovation- Inspiring creativity in students to explore new ideas.
- Communication - Teaching students to work effectively in teams through writing, presenting, or explaining.
- Ethical and Social Considerations addressing social dilemmas.
- Numeracy and Data Analysis integrating mathematical concepts.

These cross-curricular themes are woven into the computer science curriculum to ensure that students develop broader competencies that can be applied across different subjects.

Key Stage or stage breakdown:

Computer Science strand at KS1 and 2 introduces simplified key aspects hardware, software, networks and programming. There is an introducing basic computer hardware component like a mouse, keyboard, screen, and their functions. This develops at KS2 to start understanding what networks are and how they work. This includes the internet, and how information can be shared between devices. The programming aspect is introduced through sequencing and instructions using simple programming environments like drag-and-drop interfaces focusing on creating simple algorithms using Scratch Jr and other apps. Encouraging computational thinking to problem-solve skills through simple puzzles and activities that require logical thinking. This is expanded at ks2 where students learn more about algorithms, debugging simple programs, and creating more complex sequences of instructions. At this stage, the focus is on introducing basic concepts and skills in a way that is engaging to young learners, setting the stage for deeper exploration and understanding in later stages of education. There is an emphasis is on developing a positive attitude towards technology, and building essential digital literacy skills.

The fundamental concepts of computer science covered at KS3 include understanding what algorithms are, how they work, and how to design and evaluating them. Introducing students to programming languages like Python or Scratch, teaching them basic programming techniques like variables, loops, problem-solving skills through coding.

Pupils are taught about hardware and software learning about the basic components of a computer like the CPU, memory, storage, operating systems. Also, how they interact and communicate with each other. This might include explaining how data is represented and stored in computers, covering binary, hexadecimal, and ASCII encoding. This leads to the introduction of the basics of networks and the internet, and how data is transmitted across them.

The curriculum aims to provide students with an understanding of essential skills in programming and computational thinking.