

## Computing: we aim to ...

"Everybody should learn to program a computer, because it teaches you how to think."

— Steve Jobs

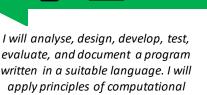




thinking to a practical problem. I will

apply appropriate principles from an

agile development approach.





I can describe a range of data types including performing basic operations on data. I understand data structure, and can use Boolean logic and expressions.



I will understand and evaluate computing related legislation, and explore a wide range of moral and ethical issues around computing.



I will be able to describe a variety of programming techniques and tools, as well as the features that make a problem computationally solvable.



**13** 

**YEAR** 





I can describe and compare

different types of processor,

register, storage, software,

development techniques,

and types of programming

language





compression, encryption, and hashing, and describe features of the technology used to build connected applications.



I will be familiar with the elements of computational thinking and their application to problem solving and programming



I will be able to examine, analyse, and design algorithms for a give situation, as well as describing the efficiency of algorithms and knowing standard algorithms.





I will undertake a practical programming task in a high-level text based programming language (usually Python), showing that I can design, write, test, and refine.



I will describe and apply the principles of defensive design and testing of code. I will explain different types of programming language,

and use Boolean logic.



I will formalise my understanding of operating system software and its functions. I will discuss and evaluate the impacts of digital technology on wider society, and relevant legislation.



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I will learn about the architecture of computer systems, including the operation of the CPU, the purpose of the different types of memory and storage, and how computers store data.



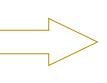


I will be able to explain

how computer networks operate, including describing the different technologies and protocols which underpin them, as well as how networks are secured.



I will explore more advanced algorithms, how they are described in English and in code/pseudocode, and apply the principles of computational thinking to the problems these algorithms solve













YEAR

I can discuss the latest developments in the field of computer science

I can apply computing skills and knowledge to a range of business applications

I will apply my coding skills to create a simple game from scratch using text-based code

I can produce code for an embedded system (micro:bit) and explain how the code operates











I can describe the development of video game systems over time

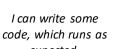
I can create sprites and graphics to use in my own video game

I can use a block based coding system to create a functional video game

I can evaluate my game and suggest improvements for subsequent versions









I have created a spreadsheet. I have explored the hardware and software in common computer systems.



I can use a flowchart to represent a series of steps that a system will carry out.



computer system and Google Classroom. I know how to stay safe online.

## Concepts

Computational Thinking

Key Terms and

**Wider Concepts** 

Understanding how to teach

computers to be useful.

computers operate and

Computers: **Understanding how** 

communicate.

The Online World:

Computer Science.

Understanding the personal and business uses of computers, the hazards of the online world, and the latest developments in

**Boolean Logic** Pseudocode Abstraction Selection Iteration Variables and Data Types Algorithms Input and Output Flowchart **Data Structures** Functions and Procedures Debugging **Binary Representation** Memory (RAM and ROM) **Operating System** Networks Internet **Data Security** Encryption

Cybersecurity Online Safety

Object-Oriented

Programming (OOP) Recursion Dynamic Data Structures Complexity Analysis (Big O Notation) **Databases** SQL **Regular Expressions** Artificial Intelligence (AI) Machine Learning Algorithms **Data Warehousing** Compiler Design **Operating System Principles** Turing Machine Digital Logic and Gates Low-Level Programming (Assembly Language) **Cryptographic Protocols** Concurrency **Parallel Computing** Ethical and Legal Aspects of Computing System Architecture Microarchitecture



