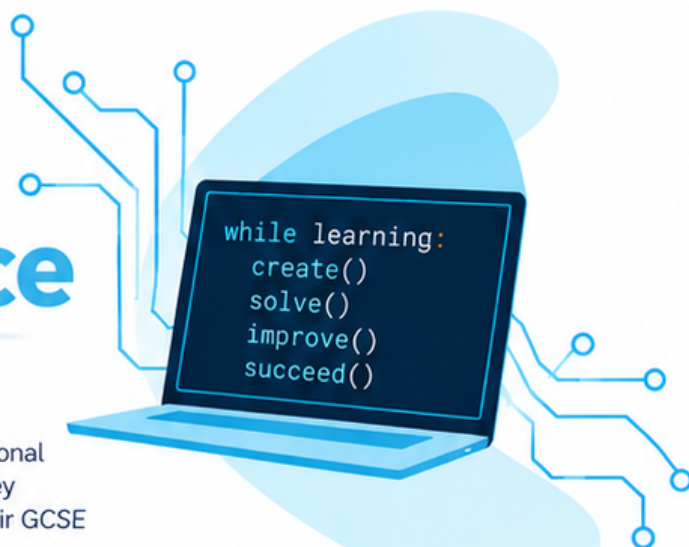




Year 11 Computer Science

CURRICULUM OVERVIEW

In Year 11, students deepen their programming skills, apply computational thinking to real problems, and develop a thorough understanding of key computer science concepts. The curriculum prepares students for their GCSE exams and builds the confidence and knowledge to progress beyond.



1

Algorithms



Using computational thinking to solve problems efficiently.

- Components of computational thinking (abstraction, decomposition, algorithmic thinking)
- Linear and binary search
- Bubble, merge and insertion sort
- Pseudocode and flow diagrams
- Applying algorithms to real-life scenarios

2

Programming Techniques



Writing effective programs using key programming concepts.

- Variables and constants
- Sequence, selection and iteration
- File handling (open, read, write, close)
- Working with SQL
- Arrays (lists)
- Functions and procedures
- Data types (integer, real, Boolean, character, string)
- Casting and data manipulation

3

Producing Robust Programs



Creating reliable, secure and maintainable code.

- Defensive design (input validation, contingencies, anticipating misuse, authentication)
- Maintainability (comments and indentation)
- Purpose and types of testing (iterative and final/terminal)
- Identifying and fixing syntax and logic errors

4

Computational Logic

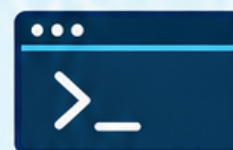


Understanding how logic is used inside a computer.

- Why data is represented in binary
- Logic gates and logic diagrams
- Truth tables
- Key mathematical operators (e.g. exponentiation, MOD, DIV)
- Using logic to solve problems

5

Translators and Facilities of Languages



Exploring how high-level code becomes machine code.

- High level and low level programming languages
- Translators (assembler, compiler, interpreter)
- How each translator works
- Common tools and facilities in an IDE (editors, error diagnostics, run time environments)



Developing Key Skills

Problem solving | Logical thinking
Creativity | Digital literacy
Collaboration | Independent learning



Wider Opportunities

- Bebras Challenge
- Further coding competitions
- Links with industry and higher education
- Exploring future careers in technology



Assessment

A range of practice questions, classwork and mock exams are used to check understanding and support progress towards the GCSE exams.



Where Next?

Year 11 completes the knowledge and skills needed for the GCSE Computer Science exam, providing a strong foundation for A Level Computer Science and a wide range of careers in technology.