



Component 01: Computing Principles

Students are introduced to the fundamental technical principles of computing. This component covers the characteristics of contemporary processors, input, output and storage devices. Types of software and the different methodologies used to develop software in the software development life cycle. Looks at how Data is exchanged between different computer systems using different data types, data structures and algorithms. Pupils learn about legal, moral, cultural and ethical issues surrounding the manufacturing and use of computers.

Component 02: Algorithms and Programming

This unit builds on component 01 to include computational thinking and problem-solving, covering: Computational thinking (thinking abstractly, thinking ahead, thinking procedurally and concurrently). The use of algorithms and how they can be used to describe and design solutions to problems. Problem solving and programming – how computers and programs can be used to solve problems in the real world.

**OCR A Level Computer Science
Component 01 – Computing Principles**

**OCR A Level Computer Science
Component 02 – Algorithms and Programming**

Component 02: Computational Thinking, Algorithms and Programming

This component allows learners to develop skills and understanding in computational thinking: algorithms, programming techniques, producing robust programs, computational logic and translators. Students are to be given the opportunity to undertake a programming task(s) during their course of study, which allows them to develop their skills to design, write, test and refine programs using a high-level programming language.



Post
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**OCR GCSE Computer Science
Component 1 – Computer Systems**

Component 01: Computer Systems

This component introduces students to the central processing unit (CPU), computer memory and storage, data representation, wired and wireless networks, network topologies, system security and system software. It also looks at ethical, legal, cultural and environmental concerns associated with Computer Science. Pupils to learn basic programming skills and techniques in Python.



Year
11

**OCR GCSE Computer Science
Component 1 – Computer Systems**

CYCLE 2: Combined Project & Python

Learners will investigate techniques used by cyber criminals to steal data, disrupt systems and infiltrate networks.

Learners will undertake a creative project that involves selecting, using, and combining multiple applications that includes analysing data, presenting information and evaluating the results for a given scenario.

Learners to build on skills from Year 8 improving their knowledge on the text-based programming language Python. Further develop their understanding of arithmetic operations, selection, and iteration using real life problems. Learners will investigate how data can be represented and processed using lists and string

CYCLE 1: Computational Thinking & Binary

Learners will further develop skills to problem solve using computational thinking techniques of abstraction and decomposition to model the state and behaviour of real-world problems and physical systems.

Learners to build on knowledge from Year 7 improving their knowledge on hardware and software components that make up computer systems, and how they communicate with one another and with other systems.

Learner will understand how numbers can be represented in binary, and be able to carry out simple operations on binary numbers [for example, binary addition, and conversion between binary and decimal].

Year
10

**Year 9 Computer Science
Combined Project & Python**

**Year 9 Computer Science
Computational Thinking & Binary**

CYCLE 1 – The Impact of Technology

This module has been designed to allow students to investigate and evaluate new and emerging technologies and their impact on our everyday life. It covers technology basics, internet safety.

Scamming, hacking and phishing. Types and uses of storage, use of networks and cyber security. The first module will allow students to be responsible, competent, confident and creative users of a range of technology.

CYCLE 2 - Modelling Data & Introduction to Python

This unit of work ensures learners know how to use basic functions and formulas in Excel spreadsheets, understand how and why these functions can be used in real life problems. Students can select, analyse appropriate forms of data collection for specific purposes, present data using charts and graphs. Students can develop the skills needed to present data in both paper and digital format, using multiple applications and evaluate the uses of data collection in a real-world scenario.

In the Introduction to Python learners will understand the use of arithmetic operations in commands. Learners will use sequence, selection and iteration to solve real life problems. Learners will investigate how data can be represented and processed using lists and strings. Explore operations on sequences of data and learn basic validation techniques for coding in Python.



Year
9

**Year 8 Computer Science
The Impact of Technology**

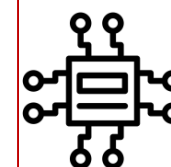
**Year 8 Computer Science
SPREADSHEETS & PYTHON**

Introduction to Scratch

This cycle of work has been designed to introduce or further develop a students knowledge of Scratch. Scratch uses a graphical programming language to help students learn to write code and engage in creative thinking. It provides students with the opportunity to develop an understanding of fundamental programming concepts such as variables, sequencing, selection and iteration. Learners will create their own subroutines, develop their understanding of decomposition and use lists. Build upon their problem-solving skills by working through a larger project.

Collaborating Online Responsibly

This unit of work ensures learners are able to use the school network. To create strong passwords and to access, save and manage files on a computer using cloud storage and email using office 365. Students will learn how to operate Teams/One Drive as a remote learning tool, to understand the risks of an online presence including risks to themselves and data. To know ways to keep users physically, mentally and emotionally safe and become responsible participants in the online community. To know the difference between input & output devices and hardware and software & learn how they interact and communicate to allow users to create multisensory outcomes



Year
8

**Year 7
Modelling Data**

**Year 7
Collaborating Online Responsibly**

The **Computer Science** curriculum at St. Anthony's enables students to **design, use and evaluate** computational abstractions that model the state and behaviour of **real-world problems and physical systems**. They can understand several **key algorithms** that reflect **computational thinking** for example sorting and searching. Learners are able to compare **alternative algorithms** for the same problem. Learners can use different **programming languages**, at least one of which is **textual**, to solve a variety of computational problems; make appropriate use of **data structures** for example, **lists, tables or arrays**; **design and develop modular programs** that use **procedures or functions**. They can then understand **simple Boolean logic** for example, **AND, OR and NOT** and some of its uses in **circuits and programming**; understand how numbers can be represented in **binary**, and be able to carry out simple operations on binary numbers for example, **binary addition, and conversion between binary and decimal**. Learners can understand the **hardware and software components** that make up **computer systems**, and how they communicate with one another and with other systems. They can then begin to understand how instructions are **stored and executed** within a computer system; understand **how data of various types (including text, sounds and pictures)** can be represented and manipulated digitally, in the form of binary digits. Learners can undertake **creative projects** that involve **selecting, using, and combining multiple applications**, preferably across a range of devices, to achieve **challenging goals**, including **collecting and analysing data** and meeting the needs of known users. They can then understand a **range of ways to use technology safely, respectfully, responsibly and securely**, including **protecting their online identity and privacy**; **recognise inappropriate content, contact and conduct**, and **know how to report concerns of others**.



Year
7

Welcome to
Computer
Science

Computer Science Curriculum Map 2022

