

Computing

Curriculum Principles

By the end of Year 6, a student of computing at Dixons Manningham will:

- Be equipped to thrive in a world with ever-changing technology.
- Understand how to be safe, responsible users of technology.
- Be able to solve problems using computational thinking.
- Be able to successfully use a wide range of programmes and know the best resource to use for a particular task.

The sequence of knowledge is underpinned by the following strategic anchors:

- As children engage in computer science, they develop a broad range of skills, knowledge and understanding. Through logical reasoning and algorithmic thinking, they strengthen their ability to solve problems effectively.
- Computing promotes independent thinking and reasoning alongside a host of qualities, including resilience, determination and confidence.
- Computing allows students to develop effective communication skills across a range of media. It broadens and deepens their vocabulary as technical vocabulary is learned, practised and used. Children are then able to communicate this evidence in a variety of ways to a range of different audiences.
- Students that wish to develop their computing knowledge beyond the curriculum can select to attend an after-school computing club. There is also a collection of computing-based non-fiction books in the library which are popular with our students.

The computing curriculum will address social disadvantage by addressing gaps in students' knowledge and skills:

We are careful not to assume any prior general knowledge or cultural capital – instead we aim to promote knowledge through explicit teaching and the recall of knowledge through the spiral curriculum.

- All students are taught the same rigorous curriculum. All teachers have the same high expectations of all students – we do not limit or reduce the curriculum, although staff do understand the need to scaffold or model if required.
- In order to achieve a true understanding of computing, topics have been sequenced based on the following rationale:
 - The computing curriculum is split into strands which are built on in later cycles and later years.
 - Each year begins with basic skills that will then be used across the rest of the year.
 - The curriculum has clear links to other aspects of the curriculum including humanities and science.

Computing Curriculum Overview

	Cycle 1	Cycle 2	Cycle 2
EYFS	Children will explore technological resources within provision, learning how to operate equipment, and beginning to incorporate technology into their imaginative play. <i>Resources: cameras, CD player, microwave, IWB, iPads, recordable microphones, portable speaker, phones</i> Know how to operate simple equipment, such as turning on a CD player or use a remote control. Show an interest in technological toys, and cameras and mobile phones. Know that information can be retrieved from computers.	Children will become familiar with technology used throughout the day: PC (register, information gathering, teaching tool), photocopier, microwave, ovens, microphones, phones, hoovers <i>Resources: BeeBots, torches</i> Complete a simple program on a computer. Use ICT hardware to interact with age-appropriate computer software. Recognise that a range of technology is used in places such as homes and schools. Select and use technology for particular purposes.	Children will begin to represent their own ideas, thoughts and feelings through technology, using photography, recording music they make, videoing one another and painting with the trackpad or mouse on screen. Children take photographs, record voices and use video cameras to capture their learning. Find out about and use a range of technology. Select appropriate applications that support an identified need, e.g. Make a record of a special event.



Information Technology:

Introduction to Purple Mash

Understand the importance of keeping sensitive information private demonstrating this in their lessons.

Take ownership of their work and save this in their own workspace.

Information Technology:

Creative Computing

Develop mouse skills and other key skills using Purple Mash tools.

Information Technology: Data

Explorers

Sort, organise and classify objects, relating this to organising and interpreting data. Represent and interpret simple data as pictograms.

Computer Science:

Creating and following instructions

Understand that an algorithm is a set of instructions used to solve a problem or achieve an objective. Know that an algorithm written for a computer is called a program. Can read code one line at a time and make good attempts to visualise the bigger picture of the overall effect of the program

Digital Literacy:

Technology Around Us

Understand what technology is and identify a variety of examples related to school, home, outside and the wider world. Make a distinction between objects that use modern technology and those that do not.

Animated Stories

Create and combine digital art and text to produce digital books.

Computer Science: Coding

Can use blocks to code.

Understand objects, actions and events in relation to coding. Plan and design a program. Begin to debug own code and work out what is wrong with a simple algorithm when the steps are out of order.

Information Technology: Making beats

Introduce the concept of digital music and begin to compose digital music.



Year 2	Computer Science: Route Explorers Writing simple instructions to move a character considering direction and distance. Developing on creating commands and building algorithms. Information Technology: The internet Understand what the internet is including defining the World Wide Web, recognising browsers and websites and connecting to the internet. Information Technology: Creating Pictures Using digital art tools to create art in different traditional styles and create own online art portfolio and compare digital effects to non-digital effects.	Information Technology: Spreadsheets Introduce spreadsheets and the way they organise data including how to understand cells and columns, insert images and values, use tools and create graphs. Information Technology: Questioning Investigating data, how it is collected and can be presented. Information Technology: Presenting Ideas Create mind maps to organise and present ideas.	Computer Science: Coding Developing coding skills including understanding algorithms, introduce sequencing, interactions between objects, use timers, and debugging. Information Technology: Making Music Composing digital melodies by understanding the digital music tools, relating functions to musical terms and composing music digitally.
Year 3	Computer Science: Route planners To plan algorithms and write code that includes angles of turn to create routes for screen turtles and test the code created. Information Technology Touch Typing Introduce touch typing using correct posture, finger positioning and typing techniques to develop speed and accuracy, while understanding how these skills support safe and effective computer use. Digital Literacy: Email Open and respond to emails, search the address book to find and send an email to a classmate. Create a set of rules about how to use emails safely. Use the functions of email.	Information Technology: Spreadsheets To use the advanced mode of the spreadsheet software and move beyond basic data entry to explore how spreadsheets can calculate and solve problems. Information Technology: Presentations To know what PowerPoint is. Can open, add text, design, add shapes, edit pictures, add videos and audio to a page. Plan and present a presentation using animations.	Computer Science: Coding To explore timers, the repeat command and the importance of nesting code building up to using design documentation to code a program. Information Technology: Branching Databases To explore and create branching databases. Learn how binary questioning is used to sort data records and the importance of testing and debugging databases.



Information Technology: Unpacking Hardware and Software

Further understanding of technology and computer systems in relation to their hardware and software.

Information Technology: Introduction to AI

Introduces Artificial Intelligence (AI), explores what it is, what it can do and how it is used in today's digital world.

Digital Literacy: Effective Searching

To use search technologies effectively by selecting clear keywords, refining searches for accuracy, and evaluating online content to judge whether it is reliable and trustworthy.

Information Technology: Sound Stories

To introduce audio recording software and explore the features of effective audio books and work in teams to script, record and edit.

Information Technology: Animation

To use Digital animation techniques used by animators. Using traditional methods and compare these with using animation software.

Computer Science: Coding

To build on learning from previous coding experience, learning to use selection, co-ordinates, looping and variables.

Computer Science: Logo

To introduce Logo programming focusing on developing the understanding of basic commands and programming concepts to create shapes and letters using instructions.

Information Technology: Composing Beats

To explore the different elements of music, experiment with beats and compose engaging music.

Digital Literacy: Word Processing

To introduce word processing by using industry standard software, exploring how to edit, format and create documents.

Information Technology: Quizzing

The process of designing and creating interactive quizzes, considering the features of quizzes, choosing appropriate question types, making the use of feedback and titles and testing and editing.

Information Technology: Concept Maps

Explore how concept maps can be used to organise, develop and present ideas, learning to create structured concept maps based on non-fiction topics and present them to an audience.

Information Technology: Spreadsheets

Through measurement conversions, graphing, weather analysis, budgeting and planning a holiday, learning how spreadsheets support real-world decision making.

Information Technology: Databases

Use table-based databases to create databases and query existing databases to find information.

Computer Science: Coding

To learn the importance of simplifying code, as well as how tags, functions and different variable types can be used within a program.

Computer Science: Game Creator

To design and create 3D maze adventure games and assess the effectiveness of their own and others' creations.

Information Technology: Coding External Devices

Coding programs which enable an external device to be used as a game controller and explore ways that a host device and an external device can be used in real world scenarios.



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Information Technology: Blogging

To explore blogs and their features, including how they can be used to engage an audience effectively.

Computer Science: Data Detectives

Exploration of 'big data' using Data Detectives; an interactive set of databases challenges to interpret information being requested and query databases to find the information.

Computer Science: Networks

To learn more about what networks are, what they do and how they connect devices as well as consider the safety aspects of networks.

Computer Science: Coding

Coding, cloning and hotspots within programs, using more complex flowcharts to help them test and debug existing simulations and programs.

Computer Science: Understanding Binary

Introduce the concept of binary helping to understand that all digital systems store and process information using patterns of 1's and 0's.

Computer Science: Introduction to Python

To introduce text-based Python coding using the Python in Pieces platform which translates between block-code and Python.

Online Safety: Online Safety is delivered throughout the year for all pupils covering: Self-Image and identity; Online Relationships; Online Reputation; Online Bullying; Health, Wellbeing and Lifestyle; Privacy and Security; Managing Online Information; and Copyright and Ownership.

