

Computing

Curriculum Principles

By the end of their education, students 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 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 narrow or dilute the curriculum, although staff do understand the need to scaffold or model for particular students
- In order to achieve a true understanding of computing, topics have been intelligently 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

We fully believe computing can contribute to the personal development of students at DMN:

- As children carry out computer science they develop a host of skills and competencies, knowledge and understanding. Logical reasoning and algorithmic thinking increase children's capacity to problem solve.
- 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 growing collection of computing based non-fiction books in the library which are very popular with our students, as well as STEM themed magazines

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Curriculum overview

	Cycle 1	Cycle 2	Cycle 3
Reception	Children will explore technological resources withing 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 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
YEAR 1	Online Safety and Exploring 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. Applying Technology: Data Handling Sort, organise and classify objects based on their properties. Represent and interpret simple data as pictograms.	Computer Science 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 Students are able to sort, collate, edit and store simple digital content e.g., name, save and retrieve their work and follow simple instructions to access online resources.	Computer Science Can work out what is wrong with a simple algorithm when the steps are out of order, can write own simple algorithm. Can debug own code. Applying Technology: Spreadsheets Students are able to sort, collate, edit and store simple digital content e.g., name, save and retrieve their work and follow simple instructions to access online resources, use Purple Mash 2Calculate. Information Technology Understand what technology is and identify a variety of examples. Make a distinction between objects that use modern technology and those that do not.
YEAR 2	Computer Science Understand what algorithms are. Create and debug simple programmes. Use logical reasoning to predict the behaviour of simple programes. Applying Technology: Spreadsheets Explain what rows and columns, open, save and edit a spreadsheet. Can add images from the image toolbox and allocate them a value and can add the count tool to count items. Automatically toal rows and colums and solve puzzles. Create a table of data and represent data through a block graph. Online safety Use technology safely and respectfully, keeping personal information private; identify where to go for help and support when they have concerns about content or contact on the internet or other online technologies.	Information technology Understand that information presented on pictogarms cannot be used to answer more complex questions. Design and understand binary tress, recognise that questions are limited to 'yes' and 'no'. Use and understand databases to answer simple and more complex questions. Digital Literacy Recall the meaning of key internet and searching terms. Identify the basic parts of a web search engine, search and read a web resuts page. Information Technology: creating pictures Describe, understand and recreate the main features of impressionism, pointillism, Piet Mondrain, patterns and surrealist art.	Inforamtion Technology: making music Introduction to 2Sequence to digitally make music. By exploration be able to make, edit and combine sounds and tunes. Consider how music can be used to express feelings. Record and upload sounds to use within a finshed tune. Information Technology: presenting ideas To explore how a story can be presented in different ways: mind map, quiz, e-book and a fact file. Extract information to make a publisher fact file on a non-fiction topic - using appropriate clipart, photos and structure data in tables to make it useful.



YEAR 3	Computer Science Use a flowchart to create a computer programme. Use the repeat command with an object and a computer programme. Code, test and debug using prior knowledge. Design and make an interactive scene making several different things happen in a program. Online safety Understand how to create a good password, Think critically about results and access and create a 'spoof' website. Understand why PEGI restrictions exist. Relate cyberbullying to bullying in the real-world and develop strategies for dealing with online bullying. Information technology: spreadsheets To be able to use a spreadsheet to automatically create charts and graphs from data. Use the 'spin' tool to count through times tables. Describe a cell location and find specified locations in a spreadsheet.	Information Technology: Touch Typing Introduction to typing terminology including the names of the fingers. Understand what is meant by the home, bottom and top rows. Use two hands to type the letters on the keyboard. Children can touch type using the left and right hand. Digital literacy: emails 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: Graphing Set up a graph with a given number of fields and enter data. Produce and share graphs made on a computer. Solve a maths investigation and present data, use the sorting option to analyse data	Information Technology: Branching Database Understand how YES/NO questions are structured and answered. Use YES/NO questioning to play a simple game with a friend. Explain why they choose a particular question to split their database. Information Technology: PowerPoint 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.
YEAR 4	Computer Science Design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems; solve problems by decomposing them into smaller parts. Online Safety Understand risks of installing software. Understand that malware is designed to disrupt, damage or gain access to a computer. Understand copyright and the importance of citing sources. Understand how to keep identity safe online, using key vocabulary and applying them to our everyday computer use. Information Technology: Spreadsheets Add a formula to a cell to automatically make a calculation in that cell. Convert data in a spreadsheet into different graph types for different purposes. Change elements of a spreadsheet and understand the effects on other calculations.	Information Technology: Writing for Different Audiences Look at and discuss a variety of written material where the font size and type are tailored to the purpose of the text. Use ideas to write a persuasive letter or poster as part of the campaign. Assess their texts using criteria to judge their suitability for the intended audience. Computer Science Follow simple 2Logo instructions to create shapes on paper. Create 2Logo instructions to draw patterns of increasing complexity. Information Technology: Animation Understand animation frames. Make a simple animation using 2Animate. Create an animation that uses backgrounds and sounds and present these in their Purple Mash blogs.	Information Technology: Effective Searching Structure search queries to locate specific information. Use information on webpage to check for credibility. Computer Science To know the different parts of a desktop computer. Create an information leaflet to show the function of the main parts. Information Technology: Making Music Use appropriate musical language to discuss a composed piece of music. Identify sounds and discuss how the music makes them feel. Create, explore and explain a simple melodic pattern.



YEAR 5	Computer Science: Coding Use simplified codes and variables to create a game Plan an algorithm to sequence a series of events Decompose a situation Create and use strings and variable values Digital Literacy:Online Safety Think critically about online content Understand how to protect privacy through secure passwords and awareness of altered images Cite sources in their work	Information Technology: Spreadsheets Use formula to convert measurements and distance Create a formula in a spreadsheet Create simple formulae that use different variables Model a real life situation and create solutions Information Technology: Data Handling Search for information in a database Design an avatar Enter information into a database on a chosen topic and create records Computer Science: Game Creator Plan and design a game Share the game Self and peer-evaluate.	Computer Science: 3D Modelling Move points when designing Design a 3D model to fit criteria Digital Literacy: Word Processing Create a word processing document Add, edit and search for images Wrap images and text Change the look of a document and add features to enhance look and useability Use tables Use templates and format pages
YEAR 6	Computer Science: Coding Create and debug computer programmes, design their own text based adventure game based on one they have played. Adapt an existing text adventure so it reflects their own ideas. Online Safety: Research steps to take to protect themselves including protecting their digital footprint, where to go for help, smart rules and security software. Understand consequences of promoting inappropriate content online and how to put a stop to such behaviour when they experience it or witness it as a bystander. Information Technology: Spreadsheets Can use a spreadsheet to model a real-life situation and come up with solutions.	Information Technology: Blogging Understand how a blog can be used to communicate and inform. Create a blog or blog post with a specific purpose. Computer Science: Text Adventures Describe, create and evaluate a text adventure. Make logical attempts to debug their code when it does not work correctly. Computer Science: Networks Know the difference between the World Wide Web and the internet. Know about their school network.	Information Technology: Quizzing Create a picture-based quiz considering the audience's ability level and interests when setting the quiz. Children have shared their quiz and responded to feedback. Use their knowledge of quiz types to create a quiz show quiz based on a curriculum area. Computer Science: Understanding Binary Explain how all data in a computer is saved in the computer memory in a binary format. Explain that binary uses only the integers 0 and 1. Can make use of a variable set to 0 or 1 to control game states. Information Technology: Microsoft Excel Can use and navigate Microsoft Excel. Can use a variety of methods including flash fill, convert text to tables and splitting cells for organising and presenting their data in a spreadsheet.

