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 programs 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
- E-safety in Computing is interwoven across each term so that relevant objectives are taught in conjuction with real world applications. E-safety is also explicitly taught as part of the HMSH curriculum.
- The curriculum has clear links to other aspects of the curriculum including humanities, HMSH 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. *Resources: cameras, CD player, microwave, IWB, Ipads, recordable microphones, portable speaker, phones* 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 *Resources: beebots, torches* 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	**Basic Skills:** Log in, Type with two fingers. Use shift, space and enter correctly. Use the left button on the mouse to click. Open document. Save document Type simple sentences Print document Use enter to start new line Use shift for capital letters **Computer Science** Understand what an algorithm is. Understand that digital devices work using programs. Begin to control devices through a series of clear and accurate algorithms to achieve a predefined outcome.	**Applying Technology: Data Handling** Sort, organise and classify objects based on their properties. Represent and interpret simple data as pictograms. **Digital Literacy** Access information comes from a variety of different sources and understand technology allows quick access to these resources Explore a variety of digital information as part of a given topic. Find / access information using technology.	**Computer Science** Control devices through a series of clear and accurate algorithms to achieve a predefined outcome. Recognise common uses of technology beyond school. For example programming Sky box or using a washing machine or microwave. **Applying Technology: Media** Communicate simple ideas through the use of text, images and sounds. Understand sound and music can be created using a range of simple technology. Record sound using simple technologies and play back the recordings. Create an image/animation in a simple graphics application. Capture images using a range of technologies and share with others.
	E-safety: Identify trusted adults and ensure a trusted adult knows what they are doing online and inform them if online content makes them feel sad, scared or confused. Behave in a kind and considerate way to others in the real and virtual world. Understand that the internet is fun but just like there are rules in the real world to keep you safe there are rules for keeping them safe in the online world.		

YEAR 2	**Basic Skills:** Save document with relevant name. Change font typeface. Change font style (bold, italic, underline). Align text (left, right, centre). Drag and select text. Cut, copy, and paste text. Use undo and redo. Insert image. Insert new slide. **Computer Science** Understand that real and virtual devices can be controlled by sequences of commands. Plan a set of commands to achieve a specific outcome. Predict the outcome of an algorithm using logical reasoning.	**Applying Technology: Data Handling** Represent information as a simple block graph or pictogram. Organise and interpret data as a simple graph. Sort and answer questions using yes/no answers. **Digital Literacy** Identify information through a range of appropriate forms of media Recognise the layout of a web page and interact with it appropriately. Search for information using child friendly search engines.	**Computer Science** Control devices through a series of commands. Write, test and debug simple programs. Understand the benefits of using technology beyond school. **Applying Technology: Media** Make simple changes to improve the look and clarity of their work. Organise and communicate ideas for a specific purpose using appropriate layout and media Record, locate and review sounds and add them to their digital creations. Add music and or a sound to affect the mood and atmosphere of their work. Capture and create images in different graphic applications.
	E-safety Know login details and passwords should only be shared with trusted adults. Understand that they can be connected to many people in their life (real life and online). Be polite and respectful when communicating & playing games online. Talk to a trusted adult before sharing information about themselves online. Know that some of the people they interact with online may not be who they say they are.		
YEAR 3	**Digital Literacy** Use search technologies effectively by identifying specific keywords. Find and choose appropriate information and use it in other digital forms. Locate specific information online and recognise that web pages can be organised in different ways. Send and receive an email. **Computer Science** Create, refine and debug a series of commands for virtual programmable devices. Understand and identify simple input and outputs. Create simple programs combining inputs and outputs.	**Applying Technology: Data Handling** Collect and organise information to find answers to questions. Sort groups of objects using yes/no questions Store and access data using a branching database. **Applying Technology: Media** Plan and create a simple animation. Understand how audio can enhance multimedia projects including radio and films by creating/choosing appropriate audio to fit a given context.	**Computer Science** Create simple programs combining inputs and outputs. Use repetition in programs to write code using the least number of lines and improving efficiency. Use programming extensions to adapt a program to a new context. **Applying Technology: Media** Combine and refine text, sound and graphics to communicate information for a given audience. Recognise the key features of different types of information/genres and use appropriate layouts. Capture, create and enhance new and existing digital images to communicate ideas. Understand that evaluation and improvement is a vital part of a design process and technology allows changes to be made quickly and efficiently.
	E-safety: Identify the dangers of clicking links they receive when using technology. Identify personal information about themselves and others. Explain the possible consequences of sharing personal information online. Know that bullying through the use of technology is called online bullying and how to report it. Understand that not all information you access online is accurate or reliable.		

YEAR 4	**Digital Literacy** Understand what networks (including the internet) are and how they are used to transfer information. Check the relevancy and accuracy of search results. Locate online content using some of the available advanced features in search engines. Understand ownership and copyright on the internet. Attach files to emails from a variety of sources. **Computer Science** Solve problems by decomposing them into smaller parts. Convert lines of code into everyday language and vice versa Understand and use loops to repeat an action.	**Applying Technology: Data Handling** Use sensors to collect data and use computers to review and analyse it. Understand data points, data sets and logging intervals. Use a spreadsheet to enter data and perform simple calculations. Convert data in a spreadsheet into different graph types for different purposes. **Applying Technology: Media** Use digital devices to record sound. Apply effects to recorded sounds using layering. Compose, combine and refine music or sounds. Source, edit and refine music and sound for a given audience or project.	**Computer Science** To understand and select infinite and count-controlled loops. Use selection in programming to create a game aimed at an audience. To become familiar with inputs and outputs and create programs using them to control or simulate physical systems. **Applying Technology: Media** Capture appropriate, quality still and moving images. Develop an understanding of differing film shots and their effective use. Identify features of good digital creation design. Madipulate still images for different purposes. Collect, create and insert appropriate (fit for purpose) graphics and sound files to create a multimedia presentation.
	E-safety: Identify age limits and PEGI ratings for games and understand the importance of only accessing age appropriate content. Explain the possible consequences of submitting personal information online. Ensure information submitted online is only accessed by the people they trust. Identify the similarities and differences of virtual and real world communication to develop an understanding of positive online communication. Use strong passwords for all online accounts and devices.		
YEAR 5	**Digital Literacy** Understand large and small scale computer systems and their impact on everyday life Recognise that the Internet may contain material that is irrelevant, biased, implausible and inappropriate. Use the internet to transfer information and work collaboratively through shared projects using Teams/ One Drive. **Computer Science** Connect and program components (including output devices — LEDs and motors)to a micro controller. Use conditions as a means of controlling the flow of actions, and explore how these can be used in algorithms and programs through the use of an input device (push switch). Write algorithms and programs that utilise the concept of 'if, then'. Design and build a program that incorporates understanding of midrocontrollers.	**Applying Technology: Data Handling** Understand how a flat-file database can be used to organise data in records. Use tools within a database to order and answer questions. Create graphs and charts from their data to help solve problems. Present results and draw simple conclusions from data. **Applying Technology: Media** Understand that vector images are made up of shapes. Use different drawing tools and create images in layers. Group and duplicate images to create more complex images. .	**Computer Science** Understand how the 'if… then… else...' structure can be used to select different outcomes Write programs that ask questions and select outcomes using conditions Design a program and evaluate it **Applying Technology: Media** Understand how images and videos have developed throughout history. Use digital devices to record video. Make edits to videos including cropping, selecting, adding audio and transitions Publish edited video files including titles and credits.
	E-safety: Understand the terms plagiarism and copyright and be aware of the implications of copying and sharing content without permission. Use blocking / unsubscribing / reporting mechanisms appropriately. Control who they interact with online and the information they share. Describe the causes and consequences of online bullying and discuss behaviours and strategies to prevent and stop online bullying .		

YEAR 6	**Digital Literacy** Describe and explain how search engines rank results and the importance of this Evaluate different methods of communication on the internet. Understand digital footprints and how to keep safe when publishing on social media. **Computer Science** Identify variables in real world contexts and explain why they are uses in programming. Make predictions and test outcomes in a program, using debugging to correct errors. Design and implement algorithms that use variables to affect the outcome.	**Applying Technology: Data Handling** Identify and collect appropriate data to answer their questions. Identify and collect appropriate data to answer their questions. Refine, search, filter, sort and graph data for purpose in a database or spreadsheet. Use a spreadsheet to create real life models of information to offer a solution to a real life problem. Collect and represent data using infographics. **Applying Technology: Media** Combine 3D objects to make images and examining the differences between working digitally with 2D and 3D graphics. Create accurate 3D models of physical objects, which include using 3D objects as placeholders Group 3D object to create new objects Plan, develop, and evaluate a 3D model.	**Computer Science** Create a program that runs on a controllable device. Use selection to control the flow of a program. Use conditional statements to compare variables and values. Design and develop a program to use inputs and outputs on a controllable device. **Applying Technology: Media** Understand the key features of a webpage. Create hyperlinks. Explain what plaigarism is and describe the importance of referencing other people's work. Design and evaluate a simple webpage.
	E-safety: Explain the importance of a balanced lifestyle with respect to technology use. Explain the importance of a positive 'digital footprint'. Appropriately configured and secure all devices used to access personal data.		