Computing Whole School Progression of Skills

Providing a first class education for our children is our core purpose. Within the primary phase we seek to lay the foundations of knowledge, skills and attitudes that prepare children extremely well for their next stage of education so that transition from one stage to another is natural, seamless and timely. We seek to develop in children a life-long love of learning and the underlying skills to enable them to succeed. Our curriculum aims to go beyond the merely academic, but also into the behaviours and attitudes we wish our children to demonstrate as citizens of the world.

At CHANGE Schools Partnership we believe that:

- The curriculum in our schools is everything that our pupils experience including the school and classroom environment, their interactions with staff and pupils and the quality of the daily pedagogy used in the delivery of a course of study.
- The content of our curriculum should build 21st century skills such as collaboration, critical thinking and communication, and will continue to evolve responding to our ever-changing world.
- We have a moral duty to our most vulnerable pupils for whom we know education is the best route for a successful future.
- All children are capable of excellence through becoming reflective and independent learners within an environment that exposes them to great outcomes.
- We seek to promote children's intrinsic motivation by giving them ownership over the direction of their learning.
- Children should love coming to school each day where their time will be filled with fun, purposeful and challenging learning.
- Children deserve learning experiences that will stick with them for a lifetime.

Purpose of study (from the National Curriculum)

A high-quality computing education equips pupils to use computational thinking and creativity to understand and change the world. Computing has deep links with mathematics, science, and design and technology, and provides insights into both natural and artificial systems. The core of computing is computer science, in which pupils are taught the principles of information and computation, how digital systems work, and how to put this knowledge to use through programming. Building on this knowledge and understanding, pupils are equipped to use information technology to create programs, systems and a range of content. Computing also ensures that pupils become digitally literate – able to use, and express themselves and develop their ideas through, information and communication technology – at a level suitable for the future workplace and as active participants in a digital world.

Aims (from the National Curriculum)

- can understand and apply the fundamental principles and concepts of computer science, including abstraction, logic, algorithms and data representation
- can analyse problems in computational terms, and have repeated practical experience of writing computer programs in order to solve such problems
- can evaluate and apply information technology, including new or unfamiliar technologies, analytically to solve problems
- are responsible, competent, confident and creative users of information and communication technology.

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Area	Key Stage 1 Aims	Key Stage 2 Aims
Computer Science (CS)	1. Understand what algorithms are; how they are implemented as programs on digital devices; and that programs execute by following precise and unambiguous instructions 2. Create and debug simple programs 3. Use logical reasoning to predict the behaviour of simple programs	4. Design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems; solve problems by decomposing them into smaller parts 5. Use sequence, selection, and repetition in programs; work with variables and various forms of input and output 6. Use logical reasoning to explain how some simple algorithms work and to detect and correct errors in algorithms and programs 7. Understand computer networks including the internet; how they can provide multiple services, such as the World Wide Web 8. Appreciate how [search] results are selected and ranked
Information Technology (IT)	1. Use technology purposefully to create, organise, store, manipulate and retrieve digital content	2. Use search technologies effectively 3. Select, use and combine a variety of software (including internet services) on a range of digital devices to design and create a range of programs, systems and content that accomplish given goals, including collecting, analysing, evaluating and presenting data and information
Digital Literacy (DL)	1. Recognise common uses of information technology beyond school 2. 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	3. Understand the opportunities [networks] offer for communication and collaboration 4. Be discerning in evaluating digital content 5. Use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact

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Subject Content	EYFS	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Computer Science *Algorithms, problem solving and programming*	Identify algorithms used in everyday life. Begin to sequence instructions. Recognise, use and understand directional language. Perform a simple program on the floor robot. Recognise that a string of instructions or commands placed together can create a simple program. Record the program used using symbols.	Describe algorithms as sequences of instructions in everyday contexts. Plan a sequence of steps to solve real-life problems. Program floor robots using sequences of instructions (using directional language) to implement an algorithm. Create programs for floor robots and sprites on the screen using a number of steps in order before pressing the Go button. Begin to use conditional language like "if" and "when."	Describe algorithms as sequences of instructions or sets of rules in everyday contexts; understand the importance of order and accuracy of these. Program on screen using sequences of instructions to implement an algorithm. Create programs as sequences of instructions when programming on screen, correcting any errors. Begin to experiment with variables.	Design and write a program using a block language (programs to include movement, dialogue, sound effects, stages, sprites, loops and variables) without user interactions. Use sequence in programs. Write a program to produce output on screen. Explain how loops and random numbers are used in a program. Explain how conditional statements are used in a program. Understand what it means to decompose an algorithm and decompose a program into smaller parts.	Design and write a program using a block language to a given brief, including simple interaction (programs to include variables, stages, artificial intelligence and a scoring system). Use sequence and repetition in programs. Write a program that accepts keyboard input and produces on-screen output. Develop their own simulation of a simple physical system on screen.	Design, write and debug a program using a block language based on their own ideas (programs to include multiple sprites, multiple variables, sensors and conditional statements). Use sequence, selection and repetition in programs. Write a program that accepts keyboard and mouse input and produces output on screen and through speakers. Develop their own simple computer control application. Plan a solution to a problem using decomposition.	Design, write and debug a program using a second programming language based on their own ideas (using loops, sprites that move in a variety of ways, allowing them to disappear and appear randomly, manipulate variables and use operators that determine an outcome of a conditional statement). Use sequence, selection, repetition and variables in programs. Write a program that accepts inputs other than keyboard and mouse and produces outputs other than screen or speakers. Design, write and debug their own computer control application. Solve problems using decomposition, tackling each part separately. Understand that coding is the use of programming languages to make games, programs and computers things. Write and adapt programmes using Javascript and Python (print command, run button, input command, random command).

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Computer Science *Logical Reasoning*	Describe what they think a program will do.	Explain what they think a program will do.	Give logical explanations of what a program will do under given circumstances, including some attempt at explaining why it does what it does.	Use logical reasoning to predict outcomes and detect errors in programs. Use and explain a simple, sequence-based algorithm in their own words.	Use logical reasoning to detect and correct errors in programs. Explain an algorithm using sequence and repetition in their own words.	Explain a rule-based algorithm in their own words. Use logical reasoning to detect errors in algorithms.	Give clear and precise logical explanations of a number of algorithms. Use logical reasoning to detect and correct errors in algorithms (and programs).
Computer Science *Networks and search engines*	-	-	Explain and understand how an email is sent.	Understand that email and videoconferencing are made possible through the internet.	Use and explain how search engines work. Explain how the internet makes the web possible. Understand that search engines rank pages according to relevance. Create a webpage and explain how web pages are created and transmitted.	Explain how search engines are ranked. Understand how data routing works on the internet. Explain how web pages are created and transmitted in their own words.	Understand how mobile phone or other networks operate. Understand how domain names are converted into IP addresses on the internet. Appreciate that search engines rank pages based on the number and quality of in-bound links.

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Information Technology *Digital Productivity Creating content*	Use digital technology to store and access content with some support. Create content using digital technology. Begin to use a mouse to navigate around a computer screen.	Use digital technology to store and retrieve content. Identify different kinds of content. Create original content using digital technology. Use a mouse to navigate around the computer screen.	Store, organise and retrieve content on digital devices for a given purpose. Create and edit original content for a given purpose using digital technology. Present findings using software and interpret the data. Input data accurately and present this information in graphical format.	Use a range of programs on a computer. Design and create content on a computer. Collect and present information.	Use and combine a range of programs on a computer. Design and create content on a computer in response to a given goal. Collect, analyse and present data.	Use and combine a range of programs on multiple devices. Design and create programs on a computer in response to a given goal. Analyse and evaluate information.	Select, use and combine a range of programs on multiple devices. Design and create systems in response to a given goal. Analyse and evaluate data using their chosen software and graphs.
Information Technology *Searching*	-	-	-	Search for information within a single site. Describe how search engines select pages according to keywords found in the content.	Use a standard search engine to find information using a range of strategies to be more successful in finding reliable information.	Use filters to make more effective use of a standard search engine. Understand that search engines use a cached copy of the crawled web to select and rank results.	Make use of a range of search engines appropriate to finding information that is required.

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Digital Literacy *Digital Citizenship & Technology* *Digital Creativity*	Describe what personal information is. Understand the importance of asking for help from an adult when on the internet. Identify some ways technology is used at home and in school.	Identify what personal information is. Identify what to do if they see disturbing content online at home or at school. Identify ways to keep themselves safe while using digital technology. Understand that information on the internet can be seen by others. Describe some of the risks that occur on the internet. Show an awareness of how IT is used for communication beyond school.	Explain what personal information is and develop awareness of why it is special and should not be shared. Explain what to do if they have concerns about content or contact online. Keep safe and show respect to others while using digital technology. Identify ways they can use the Internet to communicate with family and friends. Show an awareness of how IT is used for a range of purposes beyond school.	Identify who they can trust and share their personal information with online. Use digital technology safely and show respect for others when working online. Identify how to report concerns and inappropriate behaviour in school. Recognise unacceptable behaviour when using digital technology. Decide whether a web page is relevant for a given purpose or question. Use email and videoconferencing in class appropriately. Explain and understand online protocols, in order to stay safe on the web. To identify cyberbullying and its consequences. Identify the risks on online gaming and know how to protect themselves.	Demonstrate that they can act responsibly when using computers. Identify and explain the differences between acceptable and unacceptable behaviours when using digital technology. Know who to talk to about concerns and inappropriate behaviour at home or in school. Decide whether digital content is relevant for a given purpose or question. Collaboratively communicate with peers on a shared wiki appropriately. Begin to use a range of online communication tools, such as forums, email and polls in order to formulate, develop and exchange ideas. Describe the meaning of copyright and the importance of acknowledging sources.	Demonstrate that they can act responsibly when using the internet. Discuss the consequences of particular behaviours when using digital technology. Know how to report concerns and inappropriate behaviour in a range of contexts. Decide whether digital content is reliable and unbiased. Work collaboratively with peers on a class website or blog. Explain what is meant by copyright	Show that they can think through the consequences of their actions when using digital technology. Identify principles underpinning acceptable use of digital technologies. Know a range of ways to report concerns and inappropriate behaviour in a variety of contexts. Articulate an opinion about the effectiveness of digital content. Use online tools to plan and carry out a collaborative project successfully.

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Apptivity Units Planning Links							
Subject Area	**EYFS**	**Year 1**	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**Year 6**
Computing Science	*Junior Explorers* *A is for Algorithm*	*Walking with Dinosaurs* *App Attack- Game Design* *Crazy Creatures* *Ready, Steady, Go*	*You've got mail* *Code-tastic* *Let's Fix IT*	*Big Robots* *Get Blogging* *We love Games* *Young Coders*	*We Built this City* *Back to the Future* *Making Games* *Heroes* *Interface Designer*	*Cars* *Website Designers* *Earth and Space (Let's Our Galaxy)*	*Let's Learn a Language* *Appy Times Part 2* *Heroes and Villains Graphics* *The Ministry of Crazy Coding (We are Game Developers)*
Information Technology	*Little Computers* *Art Attack* *Let's Celebrate*	*App Attack* *Young Investigators* *We are all Connected* *Our Local Area (Out and About Exploring with Technology)* *Ready, Steady, Go*	*You've Got Mail* *Super Sci-Fi* *Whatever the Weather* *Young Author Vehicles (Making, Designing and Building)* *Mythical Creatures (The golden age of animation)*	*We are Publishers* *Class Democracy* *We Love Games* *My First Program* *Going for Gold (My Body, My Fitness)* *Young Coders (Learn, Code and Create!)*	*Final Score* *Back to the Future* *Making Games* *Interface Designer* *Heroes* *We've Got the Power*	*Cars* *Website Designers* *Newsroom* *Interactive Art Exhibition* *Code Breakers* *Let's Change the World: Inventors* *Grand Designs (3D Designs)* *Earth and Space (Let's Explore our Galaxy)*	*Young Authors* *Appy Times Part 1* *Appy Times Part 2* *Heroes and Villains – Graphics* *Building Battle Bots* *The Ministry of Crazy Coding (We are Game Developers)*
Digital Literacy	*Digital Citizenship and Technology* *Little Computers* *Art Attack* *Fantastic Tales* *Let's Celebrate*	*Digital Citizenship and Technology* *Pictures Tell a Thousand Words* *App Attack* *Young Investigators* *We are all Connected* *Our Local Area (Out and About Exploring with Technology)*	*Digital Citizenship and Technology* *You've Got Mail* *Sci-Fi* *Young Author Vehicles (Marking, Designing and Building)*	*Digital Citizenship We are Publishers* *Class Democracy* *Big Robots* *Going for Gold (My Body, My Fitness)*	*Digital Citizenship and Technology* *We Built this City* *Final Score* *Hurray for Hollywood* *We've Got the Power*	*Digital Citizenship and Technology* *Newsroom* *Interactive Art Exhibition* *Code Breakers* *Grand Designs (3D Designs)* *Earth and Space (Let's Explore our Galaxy)*	*Digital Citizenship and Technology* *Young Authors* *Stocks and Shares* *Appy Times Part 2* *Building Battle Bots* *The Ministry of Crazy Coding (We are Game Developers)*