Computing Curriculum Overview

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Contents

Computing programmes of study: key stages 1 and 2

National curriculum in England

Purpose of study

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

The national curriculum for computing aims to ensure that all pupils:

- 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.

Attainment targets

By the end of each key stage, pupils are expected to know, apply and understand the matters, skills and processes specified in the relevant programme of study.

Subject content

Key stage 1

Pupils should be taught to:

- understand what algorithms are; how they are implemented as programs on digital devices; and that programs execute by following precise and unambiguous instructions
- create and debug simple programs
- use logical reasoning to predict the behaviour of simple programs
- use technology purposefully to create, organise, store, manipulate and retrieve digital content
- recognise common uses of information technology beyond school
- 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.

Key stage 2

Pupils should be taught to:

- design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems; solve problems by decomposing them into smaller parts
- use sequence, selection, and repetition in programs; work with variables and various forms of input and output
- use logical reasoning to explain how some simple algorithms work and to detect and correct errors in algorithms and programs
- understand computer networks including the internet; how they can provide multiple services, such as the world wide web; and the opportunities they offer for communication and collaboration
- use search technologies effectively, appreciate how results are selected and ranked, and be discerning in evaluating digital content
- 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
- use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact.

Curriculum Intent for Computing

At Masefield we reflect the National Curriculum's belief that high-quality Computing education provides the foundations for understanding the world through the specific disciplines of Computer Science, Information Technology and Digital Literacy. Technology has changed our lives and is vital to the world's future prosperity, and all pupils should be taught essential aspects of the knowledge, methods, processes and uses of science. Through building up a body of key foundational knowledge and concepts, pupils should be encouraged to recognise the power of rational explanation and develop a sense of excitement and curiosity about natural phenomena and the world.

The school's long term plan for Computing sets out the content of teaching within in each year group. This is supported by the school's Computing progression document which demonstrates learning outcomes within each strand of development within a Computing unit. Short term planning details how this content is developed over a series of lessons within the unit of work.

At Masefield computing is an integral part of our school and our aim is that:

- Children will enjoy computing and will tackle applications with confidence and a sense of achievement;

- Children will develop independence and use computing skills in a purposeful way;

- It will be valued through adequate provision of resources, a long term vision set out in the School Improvement & Development Plan, along with appropriate Continuing Professional Development for all staff;

- Computing will take a cross-curricular approach;

- Children will develop practical skills and the ability to solve problems using computational thinking;

- Subject co-ordinators will familiarise themselves with relevant software and provide computing resources for their subject.

Strands within the Computing Curriculum

What is Digital Citizenship?	What is Digital Literacy?
Children need to examine the consequences of their online activity–both good and bad. When teaching Digital Citizenship it is vital that we thoroughly embed the principles of staying safe online and then move onto web content and how they interact with it. It is important to use real world examples with our children to ensure that their learning is relevant to their life experiences. There are five key aspects of online education, adopted and incorporated from the Education for a Connected World framework, focalised within the teaching of Digital Citizenship at Masefield. These are: • Self-image and Identity • Online relationships • Online reputation • Online bullying • Health, wellbeing and lifestyle	Digital Literacy is essentially how to use a whole host of different software. Having high levels of Digital Literacy enables us to decide which software we need to complete any given task, how to transfer skills and ultimately, be confident when using software. The essential component of digital literacy when it comes to the field of pedagogy is deep learning; of which there are six core skills: • **Collaboration**: The ability to work collaboratively with others, with strong interpersonal and team-related skills. • **Creativity:** Being able to weigh up opportunities in an entrepreneurial manner and ask the right questions to generate new ideas. • **Critical thinking:** Being able to evaluate information and arguments, identify patterns and connections, and construct meaningful knowledge and apply it in the real world. • **Citizenship:** The ability to consider issues and solve complex problems based on a deep understanding of diverse values and a worldview. • **Character:** Traits such as grit, tenacity, perseverance, and resilience; alongside a desire to make learning an integral part of living. • **Communication:** Being able to communicate effectively through a variety of methods and tools to a range of different audiences.
What is Computer Science?	**What is Information Technology?**
Computer science has been deemed as important to the school curriculum because of its potential to teach children Computational Thinking or how to think. Computational Thinking can teach students how to be successful with design, logical reasoning, problem solving and resilience - all valuable well beyond the computer science classroom. The ability to create and adapt new technologies distinguishes computer science from computer literacy.	This is how we interface with technology using existing hardware. We need to teach children how to navigate around a variety of devices, type, save work, find and move files. In addition, they need to understand the internet and the web, use search engines, understand networks and generally be efficient and independent users of a range of technologies. There are three key aspects of online education, adopted and incorporated from the Education for a Connected World framework, focalised within the teaching of Information Technology at Masefield. These are: • Managing online information • Privacy and security • Copyright and ownership

Computing long-term overview – Early Years Foundation Stage

Autumn Term – Digital Citizenship and Digital Literacy	Spring Term – Computer Science and Digital Literacy	Summer Term – Information Technology and Digital Literacy
Objectives: • DC.EYFS.1 I can talk about my digital footprint Self-image and identity • DC.EYFS.2 I can recognise, online or offline, that anyone can say 'no' / 'please stop' / 'I'll tell' / 'I'll ask' to somebody who makes them feel sad, uncomfortable, embarrassed or upset Online Relationships • DC.EYFS.3 I can recognise some ways in which the internet can be used to communicate • DC.EYFS.4 I can give examples of how I (might) use technology to communicate with people I know Online Reputation • DC.EYFS.5 I can identify ways that I can put information on the internet Online Bullying • DC.EYFS.6 I can describe ways that some people can be unkind online • DC.EYFS.7 I can offer examples of how this can make others feel Health, wellbeing and lifestyle • DC.EYFS.8 I can identify rules that help keep us safe and healthy in and beyond the home when using technology • DC.EYFS.9 I can give some simple examples of these rules	Objectives: • CS.EYFS.1 I can name items we control in the everyday environment • CS.EYFS.2 I can use every day technology • CS.EYFS.3 I can explore on screen activities – by clicking (cause and effect) • CS.EYFS.4 I know that an algorithm is a set of instruction that can solve a problem • CS.EYFS.5 create a simple algorithm for a BeeBot/Blue-Bots or remote control toy	Objectives: Managing online information • IT.EYFS.1 I can talk about how to use the internet as a way of finding information online • IT.EYFS.2 I can identify devices I could use to access information on the internet Privacy and Security • IT.EYFS.3 I can identify some simple examples of my personal information (e.g. name, address, birthday, age, location) • IT.EYFS.4 I can describe who would be trustworthy to share this information with; I can explain why they are trusted Copyright and ownership: • IT.EYFS.5 I know that work I create belongs to me • IT.EYFS.6 I can name my work so that others know it belongs to me
Resources and Suggested Activities: MiniMash 2021 Framework – resources to support all seven areas of learning with lots of resources linked to topics Project Evolve for Early Years Foundation Stage Logging in Keyboard and mouse skills Online safety resources: Smarty Penguin/Digi Duck/Education for a Connected World	Resources and Suggested Activities: MiniMash 2021 Framework – resources to support all seven areas of learning with lots of resources linked to topics Small world/real life resources throughout continuous provision (phones, scanner, microphones, cameras etc) BeeBots and mats Remote control toys Logging in Keyboard and mouse skills	Resources and Suggested Activities: MiniMash 2021 Framework – resources to support all seven areas of learning with lots of resources linked to topics Project Evolve for Early Years Foundation Stage Logging in Keyboard and mouse skills
Vocabulary: Digital citizen, world wide web, self-Image and identity, online relationships, online reputation, online bullying, health and wellbeing.	Vocabulary: Technology, collaboration, microchip, directional language, algorithm, debugging.	Vocabulary: Information technology, computer networks, internet, world wide web, communication, collaboration, online information, personal information, ownership
Linked text: Webster's Friend – Hannah Whaley		Linked text: Winnie and Wilbur: The New Computer – Valerie Thomas and Korky Paul

*Computing in the Early Years Foundation Stage should filter through all the prime areas of learning and opportunities to interact with technology *

Computing long-term overview – Year 1

Autumn 1 – Digital Citizenship	Autumn 2 – Digital Literacy	Spring 1 – Consolidation of Computer Science from previous year	Spring 2 – New Computer Science Learning	Summer 1 – Information Technology	Summer 2 – Consolidation Project for Digital Literacy
Objectives: • **DC1.1** I can talk about my digital footprint Self-image and identity • **DC1.2** I can recognise that there may be people online who could make me feel sad, embarrassed or upset • **DC1.3** If something happens that makes me feel sad, worried, uncomfortable or frightened I can give examples of when and how to speak to an adult I can trust. Online relationships • **DC1.4** I can give examples of when I should ask permission to do something online and explain why this is important. • **DC1.5** I can explain why it is important to be considerate and kind to people online and to respect their choices Online reputation • **DC1.6** I recognise that information can stay online and could be copied Online bullying • **DC1.7** I can describe how to behave online in ways that do not upset others and can give examples Health, wellbeing and lifestyle • **DC1.8** I can explain rules to keep us safe when we are using technology both in and beyond the home	**Objectives:** • **DL1.1** I can input text and images using a simple publishing program • **DL1.2** I can type a simple sentence on the screen, making use of a word bank • **DL1.3** I can format my typing in a number of ways (size, colour, font) • **DL1.4** I know the main keys for typing e.g. shift, space bar, full stop • **DL1.5** I can type simple sentences using the correct format (Capital letters, space and full stop) • **DL1.6** I know how to make text bold/ italics / text alignment etc. • **DL1.7** I can use simple keyboard shortcuts (Ctrl + B, I, U to edit my text style) • **DL1.8** I can move to different places in the text using the arrow keys or mouse • **DL1.9** I can use the 'undo' icon to fix a mistake	**Objectives:** • **CS.EYFS.1** I can name items we control in the everyday environment • **CS.EYFS.2** I can use every day technology • **CS.EYFS.3** I can explore on screen activities – by clicking (cause and effect) • **CS.EYFS.4** I know that an algorithm is a set of instructions that can solve a problem • **CS.EYFS.5** I can create a simple algorithm for a BeeBot/Blue-Bots or remote control toy	**Focus: Algorithms** **Objectives:** • **CS1.1** I can tell you what an algorithm is • **CS1.2** I can plan a simple algorithm • **CS1.3** I can give and follow commands, which include straight / turning commands – one at a time • **CS1.4** I can debug a simple algorithm that is causing an unexpected outcome. • **CS1.5** I can break an algorithm down into smaller parts (decomposing / chunking) • **CS1.6** I can predict if a simple algorithm will work	**Focus: Using the Internet** **Computing Pioneer: Jack Kilby and Robert Noyce** **Objectives:** Managing online information • **IT1.1** I can give simple examples of how to find information (e.g. search engine, browsers, voice activated searching) • **IT1.2** I know how to get help from a trusted adult if we see content that makes us feel sad, uncomfortable worried or frightened. Privacy and security • **IT1.3** I can explain how passwords can be used to protect information and devices • **IT1.4** I can recognise more detailed examples of information that is personal to someone (e.g. where I live, my family's names, where I go to school) • **IT1.5** I can explain why it is important to always ask a trusted adult before sharing any personal information online, belonging to myself or others Copyright and ownership • **IT1.6** I can explain why work I create using technology belongs to me (e.g. 'it is my idea' or 'I designed it') • **IT1.7** I can save my work under a suitable name so that others know it belongs to me (e.g. filename, name on content)	**Consolidation of Digital Literacy from Autumn 2.** **Objectives:** • **DL1.1** I can input text and images using a simple publishing program • **DL1.2** I can type a simple sentence on the screen, making use of a word bank • **DL1.3** I can format my typing in a number of ways (size, colour, font) • **DL1.4** I know the main keys for typing e.g. shift, space bar, full stop • **DL1.5** I can type simple sentences using the correct format (Capital letters, space and full stop) • **DL1.6** I know how to make text bold/ italics / text alignment etc. • **DL1.7** I can use simple keyboard shortcuts (Ctrl + B, I, U to edit my text style) • **DL1.8** I can move to different places in the text using the arrow keys or mouse • **DL1.9** I can use the 'undo' icon to fix a mistake
Resources and Suggested Activities: Project Evolve for complete lesson plans on above objectives Purple Mash Unit 1.1	**Resources and Suggested Activities:** KS1 Computing - BBC Bitesize PurpleMash – 2Type Pictograms – PurpleMash Unit 1.3 Music software – PurpleMash Music planning Animated Stories - PurpleMash Unit 1.6	**Resources and Suggested Activities:** MiniMash 2021 Framework – resources to support all seven areas of learning with lots of resources linked to topics BeeBots and mats Remote control toys Logging in Keyboard and mouse skills	**Resources and Suggested Activities:** KS1 Computing - BBC Bitesize CS Unplugged – Computer Science without a computer 2Go - Purple Mash planning and resources for 2Go Instructional writing	**Resources and Suggested Activities:** KS1 Computing - BBC Bitesize Project Evolve for complete lesson plans on above objectives	**Resources and Suggested Activities:** PurpleMash - 2Quiz/2Publish/2Create a Story/2Sequence Book Creator **Possible Project:** Personal presentation – All About Me
Vocabulary: Digital citizen, digital footprint, world wide web, self-Image and identity, online relationships, online reputation, online bullying, health and wellbeing. **Linked text:** Dot – Randi Zuckerberg	**Vocabulary:** Digital literacy, word processing, keyboard keys, caps lock, shift, space bar, document, cursor, insert, formatting, abstraction.	**Vocabulary:** Technology, collaboration, microchip, directional language, algorithm, debugging.	**Vocabulary:** Computer science, computational thinking, algorithm, decompose, debugging, abstraction, input, output, unplugged, event blocks, directional language	**Vocabulary:** Information technology, computer networks, internet, world wide web, communication, collaboration, online information, personal information, ownership **Linked text:** Winnie and Wilbur: Gadgets Galore – Valerie Thomas and Korky Paul	**Vocabulary:** Digital literacy, word processing, keyboard keys, caps lock, shift, space bar, document, cursor, insert, formatting, abstraction.

Computing long-term overview – Year 2

Autumn 1 – Digital Citizenship	Autumn 2 – Digital Literacy	Spring 1 – Consolidation of Computer Science from previous year	Spring 2 – New Computer Science Learning	Summer 1 – Information Technology	Summer 2 – Consolidation Project for Digital Literacy
Objectives: • **DC2.1** I can talk about my digital footprint _Self-image and identity_ • **DC2.2** I can explain how other people may look and act differently online and offline • **DC2.3** I can give examples of issues online that might make me feel sad, worried, uncomfortable or frightened; I can give examples of how I might get help. _Online relationships_ • **DL2.4** I can give examples of how someone might use technology to communicate with others they don't also know offline and explain why this might be risky. (e.g. email, online gaming, a pen-pal in another school / country) • **DL2.5** I can explain why I have a right to say 'no' or 'I will have to ask someone'. • **DL2.6** I can explain why I should always ask a trusted adult before clicking 'yes', 'agree' or 'accept' online _Online reputation_ • **DL2.7** I can explain how information put online about me can last for a long time _Online bullying_ • **DL2.8** I can explain what bullying is, how people may bully others and how bullying can make someone feel • **DL2.9** I can give examples of bullying behaviour and how it could look online _Health, wellbeing and lifestyle_ • **DL2.10** I can explain simple guidance for using technology in different environments and settings, e.g. accessing online technologies in public places and the home environment.	**Objectives:** • **DL2.1** I can use spell checker to check my work • **DL2.2** I can use the return/enter key to insert relevant line breaks • **DL2.3** I can save an image from the internet rather than using copy & paste • **DL2.4** I can add a page border • **DL2.5** I can insert a basic table • **DL2.6** I can select the page orientation that would best suit my work. e.g. portrait to landscape • **DL2.7** I can transfer these skills into PowerPoint	**Focus: Algorithms** **Objectives:** • **CS1.1** I can tell you what an algorithm is • **CS1.2** I can plan a simple algorithm • **CS1.3** I can give and follow commands, which include straight / turning commands – one at a time • **CS1.4** I can debug a simple algorithm that is causing an unexpected outcome. • **CS1.5** I can break an algorithm down into smaller parts (decomposing / chunking) • **CS1.6** I can predict if a simple algorithm will work	**Focus: Programs and Events** **Objectives:** • **CS2.1** I can tell you what a program is • **CS2.2** I can tell you what an event is • **CS2.3** I know programs need an event to begin • **CS2.4** I can give and follow instructions, which include direction and turning command – several in order • **CS2.5** I know that computers need precise instructions • **CS2.6** I can plan use logical reasoning to predict outcomes • **CS2.7** I can create a program that contains several commands for a device or software programme • **CS2.8** I can debug a program independently that has caused an unexpected outcome • **CS2.9** I can use different events to start my programs – timing / on click / on button press	**Focus: Effective Searching** **Computing Pioneer: Tim Berners-Lee** **Objectives:** _Managing online information_ • **IT2.1** I can use simple keywords in search engines • **IT2.2** I can demonstrate how to navigate a simple webpage to get to information I need (e.g. home, forward, back buttons; links, tabs and sections) • **IT2.3** I can explain the difference between things that are imaginary, 'made up' or 'make believe' and things that are 'true' or 'real' _Privacy and security_ • **IT2.4** I can explain how passwords can be used to protect information, accounts and devices • **IT2.5** I can explain and give examples of what is meant by 'private' and 'keeping things private' • **IT2.6** I can explain how some people may have devices in their homes connected to the internet and give examples (e.g. lights, fridges, toys, televisions) _Copyright and ownership_ • **IT2.7** I can recognise that content on the internet may belong to other people	**Consolidation of Digital Literacy from Autumn 2.** **Objectives:** • **DL2.1** I can use spell checker to check my work • **DL2.2** I can use the return/enter key to insert relevant line breaks • **DL2.3** I can save an image from the internet rather than using copy & paste • **DL2.4** I can add a page border • **DL2.5** I can insert a basic table • **DL2.6** I can select the page orientation that would best suit my work. e.g. portrait to landscape • **DL2.7** I can transfer these skills into PowerPoint
Resources and Suggested Activities: Project Evolve for complete lesson plans on above objectives Purple Mash Unit 1.1 Jessie & Friends	**Resources and Suggested Activities:** Purplemash – 2Type Questioning – PurpleMash Unit 2.4 Creating Pictures - PurpleMash Unit2.6 Making Music - PurpleMash Unit2.7 Presenting Ideas - PurpleMash Unit2.8	**Resources and Suggested Activities:** KS1 Computing - BBC Bitesize CS Unplugged – Computer Science without a computer Teacher CPD for Computer science – https://learninghub.bolton365.net 2Go - Purple Mash planning and resources for 2Go Instructional writing	**Resources and Suggested Activities:** KS1 Computing - BBC Bitesize CS Unplugged – Computer Science without a computer Teacher CPD for Computer science – https://learninghub.bolton365.net 2Code: Free code Chimp level Scratch	**Resources and Suggested Activities:** KS1 Computing - BBC Bitesize Project Evolve for complete lesson plans on above objectives PurpleMash Unit 2.5	**Resources and Suggested Activities:** Purplemash – 2Type Questioning – PurpleMash Unit 2.4 Creating Pictures - PurpleMash Unit2.6 Making Music - PurpleMash Unit2.7 Presenting Ideas - PurpleMash Unit2.8 **Possible Project:** Combining sound, images and video e.g. Trailers in iMovie
Vocabulary: Digital citizen, digital footprint, world wide web, self-Image and identity, online relationships, online reputation, online bullying, health and wellbeing. **Linked text:** #Goldilocks – Jeanne Willis	**Vocabulary:** Digital literacy, word processing, document, punctuation, exclamation marks, question marks, caps lock, shift, space bar, table, row, column, border, cursor, insert, formatting, abstraction	**Vocabulary:** Computer science, computational thinking, algorithm, decompose, debugging, abstraction, input, output, unplugged, event blocks, directional language	**Vocabulary:** Computer science, computational thinking, algorithm, program, decompose, debugging, abstraction, input, output, unplugged, event blocks, directional language	**Vocabulary:** Information technology, computer networks, internet, world wide web, communication, collaboration, online information, privacy, security, copyright, ownership **Linked text:** Tim Berners-Lee (Inspirational Lives) – Claudia Martin	**Vocabulary:** Digital literacy, word processing, document, punctuation, exclamation marks, question marks, caps lock, shift, space bar, table, row, column, border, cursor, insert, formatting, abstraction

Autumn 1 – Digital Citizenship	Autumn 2 – Digital Literacy	Spring 1 – Consolidation of Computer Science from previous year	Spring 2 – New Computer Science Learning	Summer 1 – Information Technology	Summer 2 – Consolidation Project for Digital Literacy
Objectives: • **DC3.1** I can talk about my digital footprint Self-image and identity • **DC3.2** I can explain what is meant by the term 'identity' • **DC3.3** I can explain how people can represent themselves in different ways online Online relationships • **DC3.4** I can explain what is meant by 'trusting someone online', why this is different from 'liking someone online', and why it is important to be careful about who to trust online including what information and content they are trusted with • **DC3.5** I can explain how someone's feelings can be hurt by what is said or written online Online reputation • **DC3.6** I can give examples of what anyone may or may not be willing to share about themselves online • **DC3.7** I can explain the need to be careful before sharing anything personal Online bullying • **DC3.8** I can describe appropriate ways to behave towards other people online and why this is important. • **DC3.9** I can give examples of how bullying behaviour could appear online and how someone can get support. Health, wellbeing and lifestyle • **DC3.10** I can explain why spending too much time using technology can sometimes have a negative impact on anyone, e.g. mood, sleep, body, relationships.	**Objectives:** • **DL3.1** I can type a number of sentences using the keyboard • **DL3.2** I can use tab to indent paragraphs • **DL3.3** I can use cut, copy and paste to re-order text • **DL3.4** I can use keyboard shortcuts e.g. Ctrl + V, X, C to re-order text. • **DL3.5** I can use bullet points, speech bubbles, auto shapes and text boxes • **DL3.6** I can format wrapping/layout of text boxes and images in word • **DL3.7** I can format images - move, rotate and re-size shapes • **DL3.8** I can use the format tab to alter word art to enhance my work • **DL3.9** I can use a variety of table tools (merge cells, fill, columns etc.) • **DL3.10** I can explain the difference between save and save as • **DL3.11** I can create a folder to save my work in • **DL3.12** I can give a file a name to identify it • **DL3.13** I can transfer these skills into PowerPoint	**Focus: Programs and Events** **Objectives:** • **CS2.1** I can tell you what a program is • **CS2.2** I can tell you what an event is • **CS2.3** I know programs need an event to begin • **CS2.4** I can give and follow instructions, which include direction and turning command – several in order • **CS2.5** I know that computers need precise instructions • **CS2.6** I can plan use logical reasoning to predict outcomes • **CS2.7** I can create a program that contains several commands for a device or software programme • **CS2.8** I can debug a program independently that has caused an unexpected outcome • **CS2.9** I can use different events to start my programs – timing / on click / on button press	**Focus: Sequence** **Objectives:** • **CS3.1** I know that a sequence is a list of instructions in a particular order • **CS3.2** I know that if I change the sequence I may change the outcome of the program • **CS3.3** I can sequence a simple program on Logo to produce a line drawing of a 2D shape • **CS3.4** I can solve problems by decomposing them into smaller parts • **CS3.5** I can detect and debug errors in my sequence • **CS3.6** I can use and edit a pre-written program to achieve a specific outcome • **CS3.7** I can use logical reasoning to explain what will happen next • **CS3.8** I can predict how a change in a sequence may impact on the outcome of a program	**Focus: Online Communication** **Computing Pioneer: Ada Lovelace and Charles Babbage** **Objectives:** Managing online information • **IT3.1** I can demonstrate how to use key phrases in search engines to gather accurate information online • **IT3.2** I can explain the difference between a 'belief', an 'opinion' and a 'fact. and can give examples of how and where they might be shared online, e.g. in videos, memes, posts, news stories Privacy and security • **IT3.3** I can describe simple strategies for creating and keeping passwords private • **IT3.4** I can give reasons why someone should only share information with people they choose to and can trust • **IT3.5** I can explain that if they are not sure or feel pressured then they should tell a trusted adult. Copyright and ownership • **IT3.6** I can explain why copying someone else's work from the internet without permission isn't fair and can explain what problems this might cause	**Consolidation of Digital Literacy from Autumn 2.** **Objectives:** • **DL3.1** I can type a number of sentences using the keyboard • **DL3.2** I can use tab to indent paragraphs • **DL3.3** I can use cut, copy and paste to re-order text • **DL3.4** I can use keyboard shortcuts e.g. Ctrl + V, X, C to re-order text. • **DL3.5** I can use bullet points, speech bubbles, auto shapes and text boxes • **DL3.6** I can format wrapping/layout of text boxes and images in word • **DL3.7** I can format images - move, rotate and re-size shapes • **DL3.8** I can use the format tab to alter word art to enhance my work • **DL3.9** I can use a variety of table tools (merge cells, fill, columns etc.) • **DL3.10** I can explain the difference between save and save as • **DL3.11** I can create a folder to save my work in • **DL3.12** I can give a file a name to identify it • **DL3.13** I can transfer these skills into PowerPoint
Resources and Suggested Activities: Project Evolve for complete lesson plans on above objectives Purple Mash Unit 3.2	**Resources and Suggested Activities:** Touch Typing – Purplemash Unit3.4 Branching database – Purplemash Unit 3.6 Graphing - PurpleMash Unit 3.8 Making Music – PurpleMash Unit 4.9	**Resources and Suggested Activities:** KS1 Computing - BBC Bitesize CS Unplugged – Computer Science without a computer Teacher CPD for Computer science – https://learninghub.bolton365.net 2Code: Free code Chimp level Scratch	**Resources and Suggested Activities:** KS2 Computing – BBC Bitesize CS Unplugged – Computer Science without a computer Teacher CPD for Computer science – https://learninghub.bolton365.net Logo – PurpleMash Unit 4.5 Scratch	**Resources and Suggested Activities:** KS2 Computing – BBC Bitesize Project Evolve for complete lesson plans on above objectives PurpleMash 2Type	**Resources and Suggested Activities:** PurpleMash: 2Publish/2Create a Story/2Animate PhotoStory Book Creator, Garage band, iMovie Appropriate SICT's STEM project loan box **Possible Project:** Keep fit video Animation/Stop motion animation
Vocabulary: Digital citizen, digital footprint, world wide web, self-Image and identity, online relationships, online reputation, online bullying, health and wellbeing. **Linked text:** Tek: The Modern Cave Boy – Patrick McDonnell	**Vocabulary:** Digital literacy, formatting, layout, audience, appropriate, relevant, abstraction, background, border, animation, transition, keyboard, shortcut, insert, cursor	**Vocabulary:** Computer science, computational thinking, algorithm, program, decompose, debugging, abstraction, input, output, unplugged, event blocks, directional language	**Vocabulary:** Computer science, computational thinking, algorithm, program, sequence, decompose, debugging, abstraction, input, output, unplugged, event blocks, directional language	**Vocabulary:** Information technology, computer networks, internet, world wide web, communication, collaboration, online information, privacy, security, copyright, ownership **Linked text:** Little People, Big Dreams: Ada Lovelace – Maria Isabel Sanchez Vegara	**Vocabulary:** Digital literacy, formatting, layout, audience, appropriate, relevant, abstraction, background, border, animation, transition, keyboard, shortcut, insert, cursor

Computing long-term overview – Year 4

Autumn 1 – Digital Citizenship	Autumn 2 – Digital Literacy	Spring 1 – Consolidation of Computer Science from previous year	Spring 2 – New Computer Science Learning	Summer 1 – Information Technology	Summer 2 – Consolidation Project for Digital Literacy
Objectives: • **DC4.1** I can talk about my digital footprint Self-image and identity • **DC4.2** I can explain how my online identity can be different to my offline identity • **DC4.3** I can explain that others online can pretend to be someone else, including my friends, and can suggest reasons why they might do this Online relationships • **DC4.4** I can give examples of how to be respectful to others online and describe how to recognise healthy and unhealthy online behaviours • **DC4.5** I can explain how content shared online may feel unimportant to one person but may be important to other people's thoughts feelings and beliefs Online reputation • **DC4.6** I can describe how to find out information about others by searching online Online bullying • **DC4.7** I can describe ways people can be bullied through a range of media (e.g. image, video, text, chat) • **DC4.8** I can explain why people need to think carefully about how content they post might affect others, their feelings and how it may affect how others feel about them (their reputation) Health, wellbeing and lifestyle • **DC4.9** I can explain how using technology can be a distraction from other things, in both a positive and negative way	**Objectives:** • **DL4.1** I can transfer my word processing skills into other multimedia packages e.g. PowerPoint • **DL4.2** I can include importing images, hyperlinks and the use of sounds recorded • **DL4.3** I can enter a basic mathematical formula into Excel • **DL4.4** I can add basic mathematical formulas • **DL4.5** I can use SUM to calculate the total of a set of numbers in a range of cells • **DL4.6** I can change the look of a spreadsheet by using different formats e.g. text styles, colour, number format inc, currency and date, row and column heights • **DL4.7** I can insert and delete columns and rows in a spreadsheet • **DL4.8** I can use spreadsheets to create a graph • **DL4.9** I can decide on the most appropriate form of graph for a data set and give reasons for my choice • **DL4.10** I can interpret graphs of data collected from sensors	**Focus: Sequence** **Objectives:** • **CS3.1** I know that a sequence is a list of instructions in a particular order • **CS3.2** I know that if I change the sequence I may change the outcome of the program • **CS3.3** I can sequence a simple program on Logo to produce a line drawing of a 2D shape • **CS3.4** I can solve problems by decomposing them into smaller parts • **CS3.5** I can detect and debug errors in my sequence • **CS3.6** I can use and edit a pre-written program to achieve a specific outcome • **CS3.7** I can use logical reasoning to explain what will happen next • **CS3.8** I can predict how a change in a sequence may impact on the outcome of a program	**Focus: Repeats and loops** **Objectives:** • **CS4.1** I know what a repeat is • **CS4.2** I know that a repeat is used to repeat a set of instructions • **CS4.3** I can use repeats in programs confidently • **CS4.4** I can independently select repeat and sequence code to make my own program • **CS4.5** I can detect and debug errors in algorithms and programs. • **CS4.6** I can transfer my coding skills between software • **CS4.7** I can explain why it is important to use the repeat function in a particular place in my sequence	**Focus: Computer Networks** **Computing Pioneer: Hedy Lamarr and Radia Perlman** **Objectives:** Managing online information • **IT4.1** I can analyse information to make a judgement about probable accuracy and I understand why it is important to make my own decisions regarding content and that my decisions are respected by others • **IT4.2** I can describe how to search for information within a wide group of technologies and make a judgement about the probable accuracy (e.g. social media, image sites, video sites) • **IT4.3** I can explain what is meant by fake news e.g. why some people will create stories or alter photographs and put them online to pretend something is true when it isn't Privacy and security • **IT4.4** I can describe strategies for keeping personal information private, depending on context • **IT4.5** I know what the digital age of consent is and the impact this has on online services asking for consent Copyright and ownership • **IT4.6** When searching on the internet for content to use, I can explain why I need to consider who owns it and whether I have the right to reuse it. • **IT4.7** I can give some simple examples of content which I must not use without permission from the owner, e.g. videos, music, images. • **IT4.8** I can explain a range of internet standards (e.g. HTTP, URL)	**Consolidation of Digital Literacy from Autumn 2.** **Objectives:** • **DL4.1** I can transfer my word processing skills into other multimedia packages e.g. PowerPoint • **DL4.2** I can include importing images, hyperlinks and the use of sounds recorded • **DL4.3** I can enter a basic mathematical formula into Excel • **DL4.4** I can add basic mathematical formulas • **DL4.5** I can use SUM to calculate the total of a set of numbers in a range of cells • **DL4.6** I can change the look of a spreadsheet by using different formats e.g. text styles, colour, number format inc, currency and date, row and column heights • **DL4.7** I can insert and delete columns and rows in a spreadsheet • **DL4.8** I can use spreadsheets to create a graph • **DL4.9** I can decide on the most appropriate form of graph for a data set and give reasons for my choice • **DL4.10** I can interpret graphs of data collected from sensors
Resources and Suggested Activities: Project Evolve for complete lesson plans on above objectives Purple Mash Unit 4.2	**Resources and Suggested Activities:** 2Type Word, PowerPoint and Excel Spreadsheets - PurpleMash Unit 3.3 then Unit 4.3	**Resources and Suggested Activities:** KS2 Computing – BBC Bitesize CS Unplugged – Computer Science without a computer Teacher CPD for Computer science – https://learninghub.bolton365.net Logo – PurpleMash Unit 4.5 Scratch	**Resources and Suggested Activities:** KS2 Computing – BBC Bitesize CS Unplugged – Computer Science without a computer Teacher CPD for Computer science – https://learninghub.bolton365.net Teach repeats with Scratch then transfer skills into 2Code (Free code Gibbon)	**Resources and Suggested Activities:** KS2 Computing – BBC Bitesize Project Evolve for complete lesson plans on above objectives PurpleMash Unit 4.7 2Type Word, Powerpoint or Excel	**Resources and Suggested Activities:** PurpleMash 2Animate Appropriate SICT's STEM project loan box Book Creator app **Possible Project:** Green Screening (DoInk)
Vocabulary: Digital citizen, digital footprint, world wide web, self-Image and identity, online relationships, online reputation, online bullying, health and wellbeing. **Linked text:** But it's Just a Game – Julia Cook	**Vocabulary:** Digital literacy, spreadsheet, formula, SUM, AutoSum, sort, filter, abstraction, formatting, layout, appropriate, border, insert	**Vocabulary:** Computer science, computational thinking, algorithm, program, sequence, decompose, debugging, abstraction, input, output, unplugged, event blocks, directional language	**Vocabulary:** Computer science, computational thinking, algorithm, program, sequence, repeat, loops, decompose, debugging, abstraction, input, output, unplugged, event blocks, directional language	**Vocabulary:** Information technology, computer networks, internet, world wide web, communication, collaboration, online information, privacy, security, copyright, ownership, HTML, HTTP, URL and Web Server **Linked text:** Hedy Lamarr's Double Life – Laurie Wallmark	**Vocabulary:** Digital literacy, spreadsheet, formula, SUM, AutoSum, sort, filter, abstraction, formatting, layout, appropriate, border, insert

Autumn 1 – Digital Citizenship	Autumn 2 – Digital Literacy	Spring 1 – Consolidation of Computer Science from previous year	Spring 2 – New Computer Science Learning	Summer 1 – Information Technology	Summer 2 – Consolidation Project for Digital Literacy
Objectives: • **DC5.1** I can talk about my digital footprint _Self-image and identity_ • **DC5.2** I can demonstrate responsible choices about my online identity, depending on context • **DC5.3** I can explain how identity online can be copied, modified or altered _Online relationships_ • **DC5.4** I can explain how someone can get help if they are having problems and identify when to tell a trusted adult _Online reputation_ • **DC5.5** I can describe ways that information about anyone online can be used by others to make judgments about an individual and why these may be incorrect _Online bullying_ • **DC5.6** I can recognise online bullying can be different to bullying in the physical world and can describe some of those differences • **DC5.7** I can describe the helpline services which can help people experiencing bullying, and how to access them (e.g. Childline/CEOP/ The Mix) _Health, wellbeing and lifestyle_ • **DC5.8** I can describe ways technology can affect health and well-being both positively (e.g. mindfulness apps) and negatively • **DC5.9** I can describe some strategies, tips or advice to promote health and well-being with regards to technology • **DC5.10** I recognise the benefits and risks of accessing information about health and well-being online and how we should balance this with talking to trusted adults and professionals	**Objectives:** • **DL5.1** I can select appropriate tools to add emphasis and effect to my work • **DL5.2** I can explain why I have chosen my layout and formatting • **DL5.3** I can review and edit my work and talk about the changes I made • **DL5.4** I can explain why my work is suitable for the audience • **DL5.5** I can create a database structure of my own and enter the data • **DL5.6** I can prepare a data collection form and collect quality information • **DL5.7** I can use databases to create a graph • **DL5.8** I can select the most appropriate form of graph for a data set giving reasons for my choice • **DL5.9** I can interpret graphs of data collected from a variety of sources	**Focus: Repeats and loops** **Objectives:** • **CS4.1** I know what a repeat is • **CS4.2** I know that a repeat is used to repeat a set of instructions • **CS4.3** I can use repeats in programs confidently • **CS4.4** I can independently select repeat and sequence code to make my own program • **CS4.5** I can detect and debug errors in algorithms and programs. • **CS4.6** I can transfer my coding skills between software • **CS4.7** I can explain why it is important to use the repeat function in a particular place in my sequence	**Focus: Conditional/Selection** **Objectives:** • **CS5.1** I can tell you what a conditional / selection is • **CS5.2** I can plan algorithm and the write a program using the following: commands, sequence, repetition and selection / condition ('if…then') • **CS5.3** I can detect and debug errors in more complex algorithms and programs • **CS5.4** I can use selection to create games in which the user must make a choice • **CS5.5** I can use my skills and understanding of conditional / selection in more than 2 programs	**Focus: Evaluation** **Computing Pioneer: Bill Gates, Grace Hopper and Steve Wozniak** **Objectives:** • **IT5.1** I know what an operating system is and why it important • **IT5.2** I can identify the key internal parts of a computer – RAM, memory, processor and motherboard and describe what each part does _Managing online information_ • **IT5.3** I can explain what is meant by 'being sceptical'; I can give examples of when and why it is important to be 'sceptical' • **IT5.4** I can evaluate digital content and can explain how to make choices about what is trustworthy e.g. differentiating between adverts and search results • **IT5.5** I can explain key concepts including: information, reviews, fact, opinion, belief, validity, reliability and evidence _Privacy and security_ • **IT5.6** I can explain what a strong password is and demonstrate how to create one • **IT5.7** I can explain what app permissions are and can give some examples _Copyright and ownership_ • **IT5.8** I can assess and justify when it is acceptable to use the work of others • **IT5.9** I can give examples of content that is permitted to be reused and know how this content can be found online	**Consolidation of Digital Literacy from Autumn 2.** **Objectives:** • **DL5.1** I can select appropriate tools to add emphasis and effect to my work • **DL5.2** I can explain why I have chosen my layout and formatting • **DL5.3** I can review and edit my work and talk about the changes I made • **DL5.4** I can explain why my work is suitable for the audience • **DL5.5** I can create a database structure of my own and enter the data • **DL5.6** I can prepare a data collection form and collect quality information • **DL5.7** I can use databases to create a graph • **DL5.8** I can select the most appropriate form of graph for a data set giving reasons for my choice • **DL5.9** I can interpret graphs of data collected from a variety of sources
Resources and Suggested Activities: Project Evolve for complete lesson plans on above objectives	**Resources and Suggested Activities:** PurpleMash 2Type Databases - PurpleMash Unit 5.4 3D modelling – PurpleMash Unit 5.6 Evaluating websites – Save the Tree Octopus Evaluating websites – Dog Island	**Resources and Suggested Activities:** KS2 Computing – BBC Bitesize CS Unplugged – Computer Science without a computer Teacher CPD for Computer science – https://learninghub.bolton365.net Teach repeats with Scratch then transfer skills into 2Code (Free code Gibbon)	**Resources and Suggested Activities:** KS2 Computing – BBC Bitesize CS Unplugged – Computer Science without a computer Teacher CPD for Computer science – https://learninghub.bolton365.net Teach conditional/selection with Scratch then transfer skills into 2Code (Free code Gibbon)	**Resources and Suggested Activities:** KS2 Computing – BBC Bitesize Project Evolve for complete lesson plans on above objectives PurpleMash Unit 4.8 2Type	**Resources and Suggested Activities:** PurpleMash 2DIY, 2DIY 3D, 2Quiz, 2Code Book Creator app Appropriate SICT's STEM project loan box **Possible Project:** Game Creator Scratch
Vocabulary: Digital citizen, digital footprint, world wide web, self-Image and identity, online relationships, online reputation, online bullying, health and wellbeing. **Linked text:** Troll Stinks – Jeanne Willis	**Vocabulary:** Digital literacy, database, record, field, spreadsheet, formula, sort, filter, abstraction, appropriate, formatting, layout	**Vocabulary:** Computer science, computational thinking, algorithm, program, sequence, repeat, loops, decompose, debugging, abstraction, input, output, unplugged, event blocks, directional language	**Vocabulary:** Computer science, computational thinking, algorithm, program, sequence, repeat, loops, conditional, selection, decompose, debugging, abstraction, input, output, unplugged, event blocks, directional language	**Vocabulary:** Information technology, computer networks, internet, world wide web, communication, evaluate, collaboration, search engine, online information, privacy, security, copyright, ownership **Linked text:** The Bill Gates Story – Studio Cheongbi	**Vocabulary:** Digital literacy, database, record, field, spreadsheet, formula, sort, filter, abstraction, appropriate, formatting, layout

Computing long-term overview – Year 6

Autumn 1 – Digital Citizenship	Autumn 2 – Digital Literacy	Spring 1 – Consolidation of Computer Science from previous year	Spring 2 – New Computer Science Learning	Summer 1 – Information Technology	Summer 2 – Consolidation Project for Digital Literacy
Objectives: • **DC6.1** I can talk about my digital footprint Self-image and identity • **DC6.2** I can talk about the importance of asking until I get the help needed • **DC6.3** I can describe issues online that could make anyone feel sad, worried, uncomfortable or frightened and explain how to get help if this happens. • **DC6.4** I can identify and critically evaluate online content relating to gender, race, religion, disability, culture and other groups, and explain why it is important to challenge and reject inappropriate representations online. Online relationships • **DC6.5** I can explain how sharing something online may have an impact either positively or negatively • **DC6.6** I can describe how to be kind and show respect for others online including the importance of respecting boundaries regarding what is shared about them online and how to support them if others do not Online reputation • **DC6.7** I can explain strategies anyone can use to protect their 'digital personality' and online reputation, including degrees of anonymity Online bullying • **DC6.8** I can describe how to capture bullying content as evidence (e.g. screen-grab, URL, profile) to share with others who can help me Health, wellbeing and lifestyle • **DC6.9** I can describe common systems that regulate age-related content (e.g. PEGI, BBFC, parental warnings) and describe their purpose • **DC6.10** I can assess and action different strategies to limit the impact of technology on health (e.g. night-shift mode, regular breaks, correct posture, sleep, diet and exercise)	**Objectives:** I can use skills I have learnt across multiple application programs, including: • **DL6.1** I can choose, select and use a combination of software to present my work • **DL6.2** I can select appropriate tools to add emphasis and effect to my work • **DL6.3** I can explain why I have chosen my layout and formatting • **DL6.4** I can review and edit my work and talk about the changes I made • **DL6.5** I can consider whether my work is suitable for the audience • **DL6.6** I can draft and redraft my work by deleting, inserting and replacing text • **DL6.7** I can interpret graphs of data collected from a variety of sources	**Focus: Conditional/Selection** **Objectives:** • **CS5.1** I can tell you what a conditional / selection is • **CS5.2** I can plan algorithm and the write a program using the following: commands, sequence, repetition and selection / condition ('if…then') • **CS5.3** I can detect and debug errors in more complex algorithms and programs • **CS5.4** I can use selection to create games in which the user must make a choice • **CS5.5** I can use my skills and understanding of conditional / selection in more than 2 programs	**Focus: Variable** **Objectives:** • **CS6.1** I can explain what a variable is • **CS6.2** I can confidently use events, repeats, selection and variables • **CS6.3** I can use a variable in a variety of programming software • **CS6.4** I can confidently decompose a problem and methodically create a program to solve it, testing and adapting as I go • **CS6.5** I can evaluate the effectiveness of my programming and suggest improvements • **CS6.6** I confidently use the Blockly programming language	**Focus: History and the future of Computing** **Computing Pioneers: Alan Turing and Elon Musk** **Objectives:** Managing online information • **IT6.1** I can explain how search engines work and how results are selected and ranked • **IT6.2** I can explain how to use search technologies effectively • **IT6.3** I can explain how and why some people may present 'opinions' as 'facts'; why the popularity of an opinion or the personalities of those promoting it does not necessarily make it true, fair or perhaps even legal • **IT6.4** I can describe how some online information can be opinion and can offer examples • **IT6.5** I can define the terms 'influence', 'manipulation' and 'persuasion' and explain how someone might encounter these online (e.g. advertising and 'ad targeting' and targeting for fake news) Privacy and security • **IT6.6** I can describe how and why people should keep their software and apps up to date, e.g. auto updates • **IT6.7** I can describe simple ways to increase privacy on apps and services that provide privacy settings • **IT6.8** I can describe ways in which some online content targets people to gain money or information illegally; I can describe strategies to help me identify such content (e.g. scams, phishing) Copyright and ownership • **IT6.9** I can demonstrate how to make references to and acknowledge sources I have used from the internet	**Consolidation of Digital Literacy from Autumn 2.** **Objectives:** I can use skills I have learnt across multiple application programs, including: • **DL6.1** I can choose, select and use a combination of software to present my work • **DL6.2** I can select appropriate tools to add emphasis and effect to my work • **DL6.3** I can explain why I have chosen my layout and formatting • **DL6.4** I can review and edit my work and talk about the changes I made • **DL6.5** I can consider whether my work is suitable for the audience • **DL6.6** I can draft and redraft my work by deleting, inserting and replacing text • **DL6.7** I can interpret graphs of data collected from a variety of sources
Resources and Suggested Activities: Project Evolve for complete lesson plans on above objectives PurpleMash Unit 6.2	**Resources and Suggested Activities:** Full range of software including Word, PowerPoint, Excel, 2Investigate, 2Design and Make, 2Quiz, iMovie	**Resources and Suggested Activities:** KS2 Computing – BBC Bitesize CS Unplugged – Computer Science without a computer Teacher CPD for Computer science – https://learninghub.bolton365.net Teach conditional/selection with Scratch then transfer skills into 2Code (Free code Gibbon)	**Resources and Suggested Activities:** KS2 Computing – BBC Bitesize CS Unplugged – Computer Science without a computer Teacher CPD for Computer science – https://learninghub.bolton365.net Teach variables with Scratch then transfer skills into 2Code (Free code Gibbon)	**Resources and Suggested Activities:** KS2 Computing – BBC Bitesize Project Evolve for complete lesson plans on above objectives PurpleMash Unit 6.6 2Type Technology timeline	**Resources and Suggested Activities:** Children given the opportunity to plan and create using any software/app appropriately to produce digital content. **Possible Projects:** Memory book of time in school Create own app – thunkable
Vocabulary: Digital citizen, digital footprint, world wide web, self-Image and identity, online relationships, online reputation, online bullying, health and wellbeing **Linked text:** Pretty – Canizales	**Vocabulary:** Digital literacy, appropriate, relevant, audience, formatting, layout, abstraction, data, sort, filter	**Vocabulary:** Computer science, computational thinking, algorithm, program, sequence, repeat, loops, conditional, selection, decompose, debugging, abstraction, input, output, unplugged, event blocks, directional language	**Vocabulary:** Computer science, computational thinking, algorithm, program, sequence, repeat, loops, conditional, selection, variable, decompose, debugging, abstraction, input, output, unplugged, event blocks, directional language	**Vocabulary:** Information technology, computer networks, internet, world wide web, communication, evaluate, collaboration, search engine, online information, privacy, security, copyright, ownership, cyber-crime **Linked text:** Elon: (Musk) – Tracey Turner	**Vocabulary:** Digital literacy, appropriate, relevant, audience, formatting, layout, abstraction, data, sort, filter