

Computing Long Term Coverage Map

<p>EYFS Development Matters Subject Content</p>	<p>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.</p> <p>Aims The national curriculum for computing aims to ensure that all pupils:</p> <ul style="list-style-type: none"> ● 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 	
<p>Early Learning Goal</p> <ul style="list-style-type: none"> ● Children recognise that a range of technology is used in places such as homes and schools. They select and use technology for particular purposes ● Seeks to acquire basic skills in turning on and operating equipment. ● Operates mechanical toys, e.g. turns the knob on a wind-up toy or pulls back on a friction car. ● Knows how to operate simple equipment. ● Shows an interest in technological toys with knobs or pulleys, or real objects. ● Shows skill in making toys work by pressing parts or lifting flaps to achieve effects such as sound, movements or new images. ● Knows that information can be retrieved from computers. ● Completes a simple program on a computer. ● Interacts with age-appropriate computer software. 	<p>KS1 National Curriculum Subject Content</p> <ul style="list-style-type: none"> ● 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. 	<p>KS2 National Curriculum Subject Content</p> <ul style="list-style-type: none"> ● 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.

Computing Key Concepts

These key concepts are the 'big ideas' which run as threads through the curriculum. The same key concepts are explored and revisited in each unit of work in every year group. This enables pupils to build on prior knowledge, deepen their contextual knowledge and always working towards the bigger picture of achievement at the end of each year group or phase.

Code

This concept involves developing an understanding of instructions, logic and sequences.

Connect

This concept involves developing an understanding of how to safely connect with others.

Communicate

This concept involves how to exchange information

Collect

This concept involves developing an understanding of databases and their uses.

Aspirations for the future

Pupils develop an understanding of how subjects and specific skills are linked to future jobs.

Here are some of the jobs you could aspire to do in the future:

Software Engineer

Mobile Application Developer

Video Game Designer

Information Security Analysts

Computer Systems Analysts

Computer and Information Research Scientists

Web Developer

Year Group	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Year 1	We are Treasure Hunters (1.1) Programming	We are Collectors (1.4) Communication/Collaboration	Safer Internet Day activities (Digital Literacy)	We are Painters (1.3) Creativity	We are Chefs (1.2) Computational Thinking	We are Celebrating (1.6) Computer Networks
	NC: 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. Recognise common uses of information technology beyond school.	NC: Understand what algorithms are; how they are implemented as programs on digital devices; and that programs execute by following precise and unambiguous instructions. NC: Use technology purposefully to create, organise, store, manipulate and retrieve digital content. NC: Recognise common uses of information technology beyond school. NC: 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.	NC: 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.	NC: 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.	NC: Understand what algorithms are; how they are implemented as programs on digital devices; and that programs execute by following precise and unambiguous instructions. NC: Use logical reasoning to predict the behaviour of simple programs. Use technology purposefully to create, organise, store, manipulate and retrieve digital content. NC: Recognise common uses of information technology beyond school.	NC: Use technology purposefully to create, organise, store, manipulate and retrieve digital content. NC: Recognise common uses of information technology beyond school. Use technology safely and respectfully, keeping personal information private; NC: Identify where to go for help and support when they have concerns about content or contact on the internet or other online technologies.
Key Concepts	Code- Begin to explore algorithms Connect- Use of devices safely Communicate- Explain end goal Collect- Explain different ways in which information can be displayed	Code- Predict what will happen in short sequences Connect- Explore copyright Communicate- Organise text Collect- Save data	Connect- What is personal information? How keep my password safe Communicate- Importance of kindness online Identify different platforms of communication	Connect- Keep my password safe Communicate- Identify different platforms of communication Collect- Basic understanding of how domain names are converted to numerical IP addresses	Connect- Working in a team Communicate- Collecting information using various devices Collect- Create cohesive flow of ideas	Connect- Use keyboard or word bank on device to enter text Communicate- Manipulate text Collect-Present ideas
Year 2	We are astronauts (2.1) Programming	We are Game Testers (2.2) Computational Thinking	Safer Internet Day activities Digital Literacy	We are Photographers (2.3) Creativity	We are Researchers (2.4) Computer networks	We are Detectives (2.5) Communication/Collaboration
	NC: 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.	NC: Understand what algorithms are; how they are implemented as programs on digital devices; and that programs execute by following precise and unambiguous instructions. NC: Use logical reasoning to predict the behaviour of simple programs. Recognise common uses of information technology beyond school. Use technology safely and respectfully, keeping personal information private	NC: 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.	NC: Use technology purposefully to create, organise, store, manipulate and retrieve digital content. NC: 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.	NC: Use technology purposefully to create, organise, store, manipulate and retrieve digital content. NC: 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	NC: Use technology purposefully to create, organise, store, manipulate and retrieve digital content. NC: 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 Concepts	Code- Program object to move Connect- Understand what terms and conditions of websites are - explore Scratch community Communicate- Identify potential errors and explain debugging Collect- Retrieve saved content	Code- use logical reasoning to make predictions of what a program will do Connect- Think critically about computer games and their use Communicate- Describe carefully what happens in computer games Collect- Awareness of how to use games safely and in balance with other activities.	Connect- Creating safe passwords Explore how to stay safe online Explore dangers online Communicate- Explain dangers of sharing passwords What digitally responsible citizen looks like Identify when to request help	Connect- Manipulate photos Edit and enhance their photograph Communicate- What to do if there are concerns of images encountered online Collect- Use a digital camera or camera app	Connect- What is a digital footprint Communicate- Respecting others ideas Collect- Saving data on multiple platforms	Connect- Develop skills in opening, composing and sending emails Become aware of e-safety issues when using email Communicate- Use appropriate language in emails Collect - Gain skills in opening and listening to audio files on the computer

Year 3	<p>We are programmers (3.1) Programming</p> <p>NC: Design, write and debug programs that accomplish specific goals; solve problems by decomposing them into smaller parts. NC: Use sequence ... in programs; work with variables and various forms of input and output. Use logical reasoning to detect and correct errors in algorithms and programs. Select, use and combine a variety of software ... to design and create ... content that accomplish (es) given goals, including ... presenting ... information</p>	<p>We are Bug Fixers (3.2) Computational Thinking Internet Alert</p> <p>NC: Debug programs that accomplish specific goals. NC: Use sequence, selection, and repetition in programs; work with variables and various forms of input and output. NC: Use logical reasoning to explain how some simple algorithms work and to detect and correct errors in algorithms and programs.</p>	<p>Safer Internet Day activities Digital Literacy Internet Sharp</p> <p>NC: Use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact.</p>	<p>We are Presenters (3.3) Creativity Internet Kind</p> <p>NC: 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. NC: Work with various forms of input and output. NC: Use technology safely, respectfully and responsibly.</p>	<p>We are network engineers (3.4) Computer networks Internet Kind</p> <p>NC: Understand computer networks, including the internet; how they can provide multiple services. Use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact.</p>	<p>We are communicators (3.5) Communication/Collaboration Internet Brave</p> <p>NC: 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. 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</p>
Key Concepts	<p>Code- Use of repeat commands Familiar with coding blocks such as motion, look, sound, event. Connect - Break task into smaller parts Explore how to put programming commands into a sequence to achieve a specific outcome Understand how to test my program and recognise when I need to debug Communicate - Describe algorithm</p>	<p>Code - Identify and explain different types of bugs Connect - Explore positive behaviour on the Scratch community Communicate - Explain different strategies and build on resilience</p>	<p>Connect- Explore how to make positive choices online Explore bystanders and upstander Communicate - Recognise positive and negative behaviour online Use the internet for different purposes</p>	<p>Connect - Understand and demonstrate respectful and responsible filming Communicate - Explain the different effects of different tools Collect- Explore working with different input and output</p>	<p>Connect- Develop a basic understanding of how domain names are converted to IP addresses. Communicate – Explain how the internet at this level empowers users Collect- Understand the physical hardware connections necessary for computer networks to work</p>	<p>Connect- Explore other services that use the internet to transfer data, such as email and video conferencing. Communicate - Become familiar with the risks of opening links and attachments in emails, and of communicating personal information, including via video link or email, to unknown people. Collect- Combine a variety of application software, including both desktop-based programs and internet-based services, in order to collect, analyse, evaluate and present information</p>
Year 4	<p>We are Software developers (4.1) Programming Internet Alert</p> <p>NC: Design, write and debug programs that accomplish specific goals. NC: Use sequence, selection, and repetition in programs; work with variables and various forms of input and output. NC: Use logical reasoning to explain how some simple algorithms work and to detect and correct errors in algorithms and programs.</p>	<p>We are Toy Designers (4.2) Computational Thinking Internet Alert</p> <p>NC: Design, write and debug programs that accomplish specific goals including controlling or simulating physical systems. NC: Use sequence, selection, and repetition in programs; work with variables and various forms of input and output. NC: Use logical reasoning to explain how some simple algorithms work and to detect and correct errors in algorithms and programs.</p>	<p>Safer Internet Day activities Digital Literacy Internet Sharp</p> <p>NC: Use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact.</p>	<p>We are Musicians (4.3) Creativity Internet Secure</p> <p>NC: Use sequence, selection and repetition in programs; work with variables and various forms of input and output. NC: Understand computer networks, including the internet; ... and the opportunities they offer for communication and collaboration. 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 NC: Use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour</p>	<p>We are HTML Editors (4.4) Computer networks Internet Kind</p> <p>NC: 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. NC: Use technology safely, respectfully and responsibly; know a range of ways to report concerns and unacceptable behaviour. NC: Use and combine a variety of software (including internet services) to accomplish given goals, including presenting information.</p>	<p>We are co-authors (4.5) Communication/Collaboration Internet Brave</p> <p>NC: Solve problems by decomposing them into smaller parts. NC: 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. NC: Use search technologies effectively. NC: Be discerning in evaluating digital content. Use ... a variety of software (including internet services) ... to ... create ... content ... including ... presenting information. NC: Use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact.</p>
Key Concepts	<p>Code - Understand the need to test the program as it's developed. Recognise an error and debug it Become confident in using 'forever' and 'if' loops Efficiently use the different blocks of coding: motion, looks, sound, events and control Connect - Become familiar with different ways of executing my code, e.g. by pressing the green flag, using arrow keys, etc. Communicate - Start to predict what my code will do before I execute it Collect- Familiar with using different tools within the software, e.g. importing sounds and pictures from the library, recording own sound, changing costumes, etc</p>	<p>Connect- Understand the impact of copyright Communicate - Explain purpose and audience of product</p>	<p>Connect - Explore understanding of an online virus How to post positivity online? Explore emotional impact of hateful online behaviour Communicate - Explain the dangers of a virus Understand parental permission and why it is important Discuss age restrictions of applications</p>	<p>Connect - Develop an awareness of how their composition can enhance work in other media. Understand the impact of copyright Communicate - Create and develop a musical composition, refining their ideas through reflection and discussion Collect- Use one or more programs to edit music</p>	<p>Connect – Understand some of the risks in using the web. Communicate - Explore using HTML tags for elementary mark up and hyperlinks to connect ideas and sources Collect-Understand some technical aspects of how the internet makes the web possible</p>	<p>Connect - Implications of uploading work online Communicate - Collect data using online services. Collect- Analyse and present for a target audience using a wiki tool</p>

<p>Year 5</p>	<p>We are Game Developers (5.1) Programming Internet Secure</p>	<p>We are Cryptographers (5.2) Computational Thinking Internet Alert</p>	<p>Safer Internet Day activities Digital Literacy Internet Sharp</p>	<p>We are Artists (5.3) Creativity Internet Kind</p>	<p>We are Web Developers (5.4) Computer networks Internet Secure</p>	<p>We are Bloggers (5.5) Communication/Collaboration Internet Brave</p>
<p>Key Concepts</p>	<p>Code - Create use of multiple variables including time and scores Plan and break a complex task into smaller parts Explore import/edit pictures and use other useful functions of Scratch Connect - Explore personal choices of how much time should be spent online and on what (impact of violent video games) Communicate - Predict, describe, evaluate and explain to others from the view of game developers and audience. Collect - Recognise the importance of multiple variables</p>	<p>Connect - Understanding of how encryption works on the web. Communicate- Explain and understand the need for private information to be encrypted Collect- Attempt encrypting and decrypting messages in simple ciphers</p>	<p>Connect - Understand phishing hooks Importance of communicating respectfully and kindly How to protect personal information Exploring impact of weak passwords and unsafe websites Communicate - Explain impact of positive online community Explain the negative impact of phishing hooks Discuss effects of leaked personal information Collect- Explain the purpose of encryption</p>	<p>Connect - Develop an appreciation of the links between geometry and art Communicate - Experiment with the tools available, refining and developing their work as they apply their own criteria to evaluate it and receive feedback from Collect- Explore use of different tool</p>	<p>Connect - Develop their research skills to decide what information is appropriate. Explore validity and authenticity of information. Communicate - Develop and refine their ideas and text collaboratively Critically analyse others work with view of end goal Collect - Develop their understanding of e-safety and responsible use of technology.</p>	<p>Connect- How to share safely Communicate- Discerning content online and evaluating the appropriateness Collect- Gage the material appropriate for the target audience</p>
<p>Year 6</p>	<p>We are Adventure Gamers Programming Internet Sharp</p>	<p>We are Computational Thinkers (6.2) Computational Thinking Internet Alert</p>	<p>Safer Internet Day activities Digital Literacy Internet Sharp</p>	<p>We are Advertisers (6.3) Creativity Internet Secure</p>	<p>We are Network Technicians (6.4) Computer networks Internet Kind</p>	<p>We are Publishers (6.5) Communication/Collaboration Internet Brave</p>
<p>Key Concepts</p>	<p>Code- Simplify algorithm and use advanced method of movements when necessary, e.g. using XY coordinates for movement Use different blocks of coding more independently Connect - Use of logical reasoning Evaluate effectiveness of algorithm whilst continuously testing the programme Communicate - Explore and explain a range syntax of text based language Collect - Aware of other text based language</p>	<p>Connect - Explore the role of moderators on forums Understand the concept of oversharing Communicate - Explain difference between search algorithms (random and linear searching) and binary (divide and conquer). Explore consequences of oversharing</p>	<p>Connect - Explore positive and negative impact of the internet and technology on humans Explain how to protect myself and my computer from the internet Communicate - Discuss reality vs online persona Evaluating content online for validity</p>	<p>Connect - Think critically about how video is used to promote a cause Communicate - Work collaboratively to shoot suitable original footage and source additional content, acknowledging intellectual property rights</p>	<p>Connect - Appreciate that computer networks transmit and receive information digitally Communicate - Understand key features of internet communication protocols Collect- Understand the basic hardware needed for computer networks to work</p>	<p>Connect- Explore how to positively contribute to a shared document Communicate- Combine a range of media to achieve a particular outcome Collect- Discern the benefits of different software</p>