



# Computing- Curriculum Overview

## Curriculum Intent

At Redlands Community Primary School, the intent for computing is to provide a broad and balanced curriculum that equips pupils with essential digital knowledge and skills, fostering creativity, problem-solving, and critical thinking. The computing curriculum is carefully designed to ensure progression, relevance, and coherence. The intent statement includes clear aims that outline the importance of computing in preparing pupils for the digital world and promoting their computational thinking.

## Curriculum Implementation

The computing curriculum is sequenced effectively, building on prior learning and enabling pupils to develop mastery in programming, digital literacy, and online safety. Cross-curricular links are utilised to enhance learning experiences and make connections with other subject areas. The school provides up-to-date resources and technology to support the teaching of computing. Pupils have access to a range of tools, software, and devices that enable them to explore coding, robotics, and digital creation effectively. Inclusive teaching strategies are employed to support pupils with diverse needs, ensuring that all children can access and succeed in computing. Differentiation, scaffolding, and targeted interventions are used where necessary.

## Curriculum Impact

We encourage our children to enjoy and value the curriculum we deliver. We will constantly ask the WHY behind their learning and not just the HOW. We want learners to discuss, reflect and appreciate the impact computing has on their learning, development and well being. Finding the right balance with technology is key to an effective education and a healthy life-style. We feel the way we implement computing helps children realise the need for the right balance and one they can continue to build on in their next stage of education and beyond. We encourage regular discussions between staff and pupils to best embed and understand this. The way pupils showcase, share, celebrate and publish their work will best show the impact of our curriculum. We also look for evidence through reviewing pupil's knowledge and skills. Progress of our computing curriculum is demonstrated through outcomes and the record of coverage in the process of achieving these outcomes.

# Computing Curriculum Overview

## Sequence of Learning

| Year Group | Subject Context (National Curriculum/ EYFS Framework)  |
|------------|--|
| EYFS       | <p>Personal, Social and Emotional Development</p> <ul style="list-style-type: none"> <li>Show resilience and perseverance in the face of a challenge.</li> <li>Know and talk about the different factors that support their overall health and wellbeing: -sensible amounts of 'screen time'.</li> </ul> <p>Physical Development</p> <ul style="list-style-type: none"> <li>Develop their small motor skills so that they can use a range of tools competently, safely and confidently.</li> </ul> <p>Expressive Arts and Design</p> <ul style="list-style-type: none"> <li>Explore, use and refine a variety of artistic effects to express their ideas and feelings.</li> </ul>  |
| Year 1     | <p>Pupils should be taught to:</p> <ul style="list-style-type: none"> <li>understand what algorithms are; how they are implemented as programs on digital devices; and that programs execute by following precise and unambiguous instructions</li> <li>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</li> <li>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.</li> </ul>  |
| Year 2     |  |
| Year 3     | <p>design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems; solve problems by decomposing them into smaller parts</p> <ul style="list-style-type: none"> <li>use sequence, selection, and repetition in programs; work with variables and various forms of input and output</li> <li>use logical reasoning to explain how some simple algorithms work and to detect and correct errors in algorithms and programs</li> <li>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</li> <li>use search technologies effectively, appreciate how results are selected and ranked, and be discerning in evaluating digital content</li> <li>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</li> <li>accomplish given goals, including collecting, analysing, evaluating and presenting data and information</li> <li>use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact.</li> </ul> |
| Year 4     |  |
| Year 5     |  |
| Year 6     |  |

| Year        | Code   | Connect  | Communicate   | Collect   |
|-------------|--|--|---|---|
|             | Using and writing codes to produce instructions and algorithms; to solve problems; to test and use logic and sequences against inputs and outputs. | Being able to safely, efficiently and confidently digitally connect with others. | Being able to safely, efficiently and confidently use apps and information technology to communicate ideas. | Being able to safely, efficiently and confidently find, evaluate, store, sort and use appropriate data. |
| EYFS        |  |  |   |   |
| KS1 Cycle A |  |  |   |   |
| KS1 Cycle B |  |  |   |   |
| LKS2 A      |  |  |   |   |
| LKS2 B      |  |  |   |   |
| Yr 5        |  |  |   |   |
| Yr 6        |  |  |   |   |

# Computing - Disciplinary Knowledge Progression

| Year          | Code  | Connect   | Communicate  | Collect   |
|---------------|---|---|--|---|
|               | Using and writing codes to produce instructions and algorithms; to solve problems; to test and use logic and sequences against inputs and outputs.                                  | Being able to safely, efficiently and confidently digitally connect with others.                | Being able to safely, efficiently and confidently use apps and information technology to communicate ideas.  | Being able to safely, efficiently and confidently find, evaluate, store, sort and use appropriate data. |
| <b>EYFS</b>   | Make a programmable toy move.   | Find and start apps on an ipad.   | Using a keyboard to communicate  | Sorting a group of objects using two given criteria   |
| <b>KS1 A</b>  | Find and run a command on a device,   | Use a mouse, a keyboard and art package.  | Use Microsoft to produce a simple written narrative.   | Identify and use properties to sort.  |
| <b>KS1 B</b>  | Following and creating different algorithms for a range of sequences (using the same commands).   | Understanding that images can be altered- they are not always the original version.             | Recognising that information technology can be connected. Experimenting with different functions which can change written, pictorial or audio communication. | Asking simple questions of data collected.  |
| <b>LKS2 A</b> | Use code to make a musical instrument. Learn how to debug a programme.  | Managing online information   | Use text and images to communicate clearly   | Use a branching database to answer questions.   |
| <b>LKS2 B</b> | Command program that uses count controlled loops to produce a given outcome and includes repetition.  | Understanding that writing or images might have a both negative or positive effect on others.   | Using a digital device to record sound and to experiment with changing the composition of an image .   | Using a variety of collected data to answer questions   |
| <b>Yr 5</b>   | Using sequence, selection, and repetition in programs; work with variables and various forms of input and output.<br>Using logical reasoning to explain how some simple algorithms. | Using a search engine responsibly and understanding the ownership and use of images (copyright) | Recognise the implications of linking to content owned by other People when presenting data.   | Applying formulas to data, including duplicating data.  |
| <b>Yr 6</b>   | Develop a program to use inputs and outputs on a controllable device  | Using a search engine responsibly and understanding the ownership and use of images (copyright) | Recognise the implications of linking to content owned by other People when presenting data.   | Applying formulas to data, including duplicating data.  |

# Computing- Overview of Substantive Concepts

|            | Substantive Concepts |                                 |                      |                         |  |
|------------|----------------------|---------------------------------|----------------------|-------------------------|--|
| Year Group | Systems              | Programming                     | Data and information | Media                   | Keeping Safe   |
| EYFS       | Using I pads         | Moving a robot                  |                      | Digital Painting        | Project Evolve- ongoing- specific lessons taught in each unit. |
| Year 1     | Technology around us | Moving a robot                  | Grouping Data        | Digital painting        |  |
|            |                      | Programming animations          |                      | Digital writing         |  |
| Year 2     | IT around us         | Robot algorithms                | Pictograms           | Making music            |  |
|            |                      | Introduction to quizzes         |                      | Digital photography     |  |
| Year 3     | Connecting computers | Events and actions              | Branching databases  | Animation               |  |
|            |                      | Sequencing sound                |                      | Desktop publishing      |  |
| Year 4     | The internet         | Repetition in shapes            | Data logging         | Photo and audio editing |  |
|            |                      | Repetition in games             |                      | Video editing           |  |
| Year 5     | Sharing information  | Selection in physical computing | Flat file database   | Vector drawing          |  |
|            |                      | Selection in quizzes            |                      |                         |  |
| Year 6     | Communication        | sensing                         | spreadsheets         | Webpage creation        |  |
|            |                      | variables                       |                      | 3d modelling            |  |

# Computing- Substantive Knowledge

|                       |   |  |
|-----------------------|---|--|
| <b>EYFS</b>           | Make a programmable toy move.   | Being able to safely, efficiently and confidently use apps and information technology to communicate ideas.  |
| Substantive Concepts  | Programming   | Systems  |
| Substantive Knowledge | <p>Use commands to make a toy move and stop.</p> <p>Use the direction buttons to make the toy turn.</p> <p>Programme a sequence of commands into a toy.</p> | <p>Open an app using a thumbnail.</p> <p>Scan a QR code to open an app.</p> <p>Digitally ink on a drawing app.</p> <p>Press buttons to select answers on an app.</p> |

| Year 1                | Computing systems and networks  | Creating media  | Creating media   |
|-----------------------|---|---|--|
| Year 1                | Technology around us  | Digital painting  | Digital writing  |
| Substantive Knowledge | <p>Technology should be used safely</p> <p>Personal information should be kept private</p> <p>There are people and places you can go to for help about concerns</p> <p>Technology is something that has been made for a specific purpose</p> <p>Technology helps us accomplish tasks a lot quicker</p> <p>Technology helps us accomplish tasks a lot quicker</p> <p>A computer is made up of: a mouse/track pad, a keyboard, a monitor and a screen.</p> <p>A computer is made up of: a mouse/track pad, a keyboard, a monitor and a screen.</p> <p>A keyboard is an input device that helps us write letters and numbers on a computer</p> | <p>Technology should be used purposefully</p> <p>Technology can be used to create digital content</p> <p>Technology can be used to store and retrieve digital content</p> <p>Different digital applications can be used to create digital content eg. Paint app</p> | <p>Technology should be used purposefully</p> <p>Technology can be used to create digital content</p> <p>Technology can be used to store and retrieve digital content</p> <p>Word processors are used to create and manipulate digital writing on a computing device</p> |

| Year 1                | Data and Information   | Programming A   | Programming B  |
|-----------------------|--|---|--|
| Substantive Concepts  | Grouping data  | Moving a robot  | Animation  |
| Substantive Knowledge | <p>Technology should be used purposefully</p> <p>Technology can be used to create digital content</p> <p>Technology can be used to store and retrieve digital content</p> <p>Data is information that be be sorted and grouped</p> <p>Computers can be used to store, group and present data</p> | <p>Algorithm is a clear set of instructions</p> <p>Digital devices programme algorithms for an outcome eg using a robots</p> <p>Debugging is finding the problem in the algorithm and fixing it</p> | <p>Algorithm is a clear set of instructions</p> <p>Digital devices programme algorithms for an outcome eg using animation</p> <p>Debugging is finding the problem in the algorithm and fixing it</p> |

# Computing- Substantive Knowledge

| Year 2                | Computing systems and networks  | Creating media  | Creating media   |
|-----------------------|---|---|--|
| Substantive Concepts  | Technology around us  | Digital photography   | Making music   |
| Substantive Knowledge | <p>It is imperative that educators emphasise the importance of teaching pupils to utilise technology in a secure and respectful manner, safeguarding their personal information and privacy meticulously. Pupils must be equipped with the skills to discern where to seek assistance and guidance should they encounter any worrisome content or interactions online. Furthermore, learners are encouraged to explore the positive impacts of information technology on society, along with fostering a sense of responsibility when engaging with various digital tools. By nurturing these competencies, individuals are better prepared to navigate the digital landscape conscientiously and productively.</p> | <p>Pupils are instructed to use technology purposefully for the creation, organisation, and manipulation of digital content. Additionally, they are guided in utilising technology to store and retrieve digital materials, as well as to understand the various applications of information technology outside the educational setting. Through practical engagements with devices, students will acquire proficiency in capturing, editing, and enhancing photographs, enhancing their digital literacy skills in alignment with the curriculum's objectives.</p> | <p>Pupils are taught to utilise technology in a purposeful manner to generate, organise, and manipulate digital content. Furthermore, they are instructed to effectively employ technology for storing, retrieving digital content, while also understanding the diverse applications of information technology outside of the school environment. In the current unit, learners engage in creating music using a computer. Through analysing various music pieces, learners explore the emotional and cognitive impact of music. They compare digital and non-digital music creation, identify patterns, and purposefully develop their musical compositions.</p> |
|                       | <b>Pictograms</b>   | <b>Robot Algorithms</b>   | <b>An introduction to quizzes</b>  |
|                       | Data & Information  | Programming   | Programming  |
|                       | <p>Pupils should be taught to use technology purposefully to store and retrieve digital content and to recognise common uses of information technology beyond school.</p> <p>Pupils should be taught to use technology purposefully to create, organise and manipulate digital content</p>  | <p>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</p>   | <p>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</p>  |



# Computing- Substantive Knowledge

| Year 3                | Connecting computers  | Sequencing Sound   | Animation   |
|-----------------------|---|--|---|
| Substantive Concepts  | Systems   | Programming  | Media   |
| Substantive Knowledge | Learners enhance their comprehension of digital devices, beginning with a study of inputs, processes, and outputs. They further explore the distinctions between digital and non-digital devices. Subsequently, learners delve into the realm of computer networks, exploring the components essential for network infrastructure like wireless access points and switches. The unit culminates in learners uncovering the advantages of connecting devices within a network. | Sequencing in programming using Scratch. Commencing with an introduction to the programming environment, learners encounter motion, sound, and event blocks, utilising these to construct their programs with sequences. Culminating in the creation of a piano simulation, the unit is meticulously structured to develop a comprehensive understanding of sequences whilst integrating stages of program design. | Develop their skills in creating stop frame animations using tablets, exploring various techniques to bring their ideas to life. Building upon this foundation, they will apply their acquired skills to craft story-based animations, focusing on narrative structure and character development. Students enhance their animations by incorporating additional media elements, such as music and text, to produce comprehensive and engaging final pieces. |

| Year 3                | Branching Databases   | Events and Actions   | Desktop publishing   |
|-----------------------|---|--|--|
| Substantive Concepts  | Data and information  | Programming  | Media  |
| Substantive Knowledge | Throughout this unit, learners will enhance their comprehension of branching databases and their construction. They will grasp the concept of attributes and their application in categorising objects through binary questioning. Practical implementation will involve the creation of both tangible and digital branching databases. By critically assessing their efficacy, students will determine the appropriateness of various data types for representation in a branching database. | The interconnected nature of events and actions, reinforcing the concept of sequencing learned previously. Students commence by guiding a sprite in four directions - up, down, left, and right. Subsequently, they navigate movement within a maze, selecting an appropriately sized sprite to enhance their design skills. Additionally, the module introduces programming extensions involving Pen blocks, enabling learners to create lines using sprites and modify line size and colour. Culminating in the independent development of a maze-tracing program, this unit is designed to foster analytical thinking and creativity. | Throughout this unit, learners will develop a comprehensive understanding of the terms 'text' and 'images' while exploring how these elements effectively convey messages. They will utilise desktop publishing software to enhance pre-existing documents by making informed decisions regarding font size, colour, and type. Introduction to concepts such as 'templates', 'orientation', and 'placeholders' will enable learners to construct a magazine front cover template. By incorporating text and images into their creations, students will embrace practical skills in desktop publishing. Critical analysis of various page layouts will deepen their comprehension of how desktop publishing is utilised in real-world contexts. |

| Year 4                | The Internet  | Audio Editing   | Data logging  |
|-----------------------|---|---|---|
| Substantive Concepts  | <b>Computing systems and networks -</b>   | Creating Media  | Data and information  |
| Substantive Knowledge | Pupils should be taught to comprehend computer networks, such as the internet, understanding how they deliver various services like the worldwide web. Moreover, students should explore the possibilities networks present for communication and collaboration. This knowledge equips pupils to navigate the digital age effectively, enabling them to engage with online resources, communicate globally, and collaborate with others virtually. Understanding computer networks is crucial in empowering pupils to be competent digital citizens, utilising technology thoughtfully and responsibly. By grasping these concepts, pupils are better equipped to thrive in a continually evolving digital landscape. | Pupils should be taught to use technology purposefully to create, organise and manipulate digital content, to use technology purposefully to store and retrieve digital content and to recognise common uses of information technology. | Pupils should be taught to 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. |

| Year 4                | Audio/video editing   | Repetition in shapes/games  | Repetition in Games - Unit 6   |
|-----------------------|---|---|--|
| Substantive Concepts  | Media   | Programming   | Programming  |
| Substantive Knowledge | pupils are expected to utilise technology meaningfully for various purposes such as creating, organising, and manipulating digital content. Additionally, it is crucial for pupils to be proficient in using technology purposefully to store and retrieve digital material, as well as to identify common applications of information technology. These skills not only equip pupils with the necessary digital literacy but also enable them to navigate the technology-driven world efficiently. Therefore, integrating these aspects into the curriculum ensures that pupils are adequately prepared for the demands of modern society. | Pupils are expected to be proficient in designing, writing, and debugging programs to achieve specific outcomes, which may involve controlling physical systems or simulating them. They should demonstrate the ability to solve problems by breaking them down into smaller components, utilising sequence, selection, and repetition in their programs. Additionally, pupils should be adept at working with variables, various input and output forms, as well as employing logical reasoning to explain simple algorithms and rectify errors. Moreover, they are encouraged to use a diverse range of software, including internet services, across different digital devices to craft programs, systems, and content that meet predetermined objectives. | 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. Children can 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. Pupils can 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. |

| Year 5                | Sharing Information   | Vector Drawing   | Video Editing   |
|-----------------------|---|--|---|
| Substantive Concepts  | Computing systems and networks  | Creating Media   | Creating Media  |
| Substantive Knowledge | Pupils should be taught to 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.   | Pupils should be taught to use technology purposefully to create, organise and manipulate digital content<br>Pupils should be taught to use technology purposefully to store and retrieve digital content and to recognise common uses of information technology beyond school.  | Pupils should be taught to use technology purposefully to create, organise and manipulate digital content<br>Pupils should be taught to use technology purposefully to store and retrieve digital content and to recognise common uses of information technology beyond school. |
|                       | <b>Flat File Databases</b>  | <b>Selection in Physical Computing</b>   | <b>Selection in quizzes</b>   |
| Substantive Concepts  | Data and Information  | Programming  | Programming   |
| Substantive Knowledge | Pupils should be taught to 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. | 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. 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. | Pupils will design a quiz in response to a given task and implement it as a program. To conclude the unit, learners evaluate their program by identifying how it meets the requirements of the task, the ways they have improved it, and further ways it could be improved.     |

# Computing- Substantive Knowledge

| Year 6                | Computing Systems and Networks  | Creating Media   | Data and Information  |
|-----------------------|---|--|---|
| Substantive Concepts  | Communication   | 3D Modelling   | Spreadsheets  |
| Substantive Knowledge | <ul style="list-style-type: none"> <li>Understand computer networks, including the internet and the various services they provide.</li> <li>Explore different forms of communication.</li> <li>Assess and decide which internet communication methods are most suitable for specific purposes.</li> </ul> | <ul style="list-style-type: none"> <li>Use technology purposefully to create, organise, and manipulate digital content.</li> <li>Understand how to use technology to store and retrieve digital content.</li> <li>Recognise common uses of technology beyond the school environment.</li> <li>Plan, develop, and evaluate own 3D model.</li> </ul> | <ul style="list-style-type: none"> <li>Use a variety of software and internet services to design and develop programs, systems, and content to meet specific objectives.</li> <li>Collect, analyse, evaluate, and present data on a spreadsheet effectively.</li> <li>Develop graphs and charts based on the collected data.</li> <li>Evaluate results in relation to questions posed.</li> </ul> |

| Year 6                | Programming A  | Creating Media  | Programming B   |
|-----------------------|--|---|---|
| Substantive Concepts  | Variables  | Webpage Creation  | Sensing   |
| Substantive Knowledge | <ul style="list-style-type: none"> <li>Understand the concept of variables and how they are used in programming.</li> <li>Apply the use-modify-create model to experiment with variables and create their own projects.</li> <li>Develop problem-solving skills through identifying and rectifying issues with variables in programming projects.</li> </ul> | <ul style="list-style-type: none"> <li>Use technology purposefully to create, organise, and manipulate digital content.</li> <li>Understand how to use technology to store and retrieve digital content.</li> <li>Identify elements that contribute to a good web page.</li> <li>Design and evaluate own website.</li> <li>Consider copyright and fair use of media.</li> </ul> | <ul style="list-style-type: none"> <li>Design, write, and debug programs to achieve specific goals.</li> <li>Problem-solving by breaking down tasks into smaller parts using sequence, selection, and repetition in programs.</li> <li>Manipulate variables and different forms of input and output.</li> <li>Provide logical reasoning to explain simple algorithms and rectify errors.</li> </ul> |