

## Hunmanby Primary School Computing Curriculum Map

### Intent

With technology playing such a significant role in society today, the children at Humanby Primary will have a rich, high quality experience in computing so that they will be equipped with the skill 'computational thinking' and the creativity to understand and change the world.

At Hunmanby Primary, we teach all three elements of the Computing curriculum:

- **Computer Science**, where children will understand how computers work and how we work with them to complete everyday tasks
- **Information Technology**, where children will be given the chance to explore a variety of programs to complete a range of tasks.
- **Digital Literacy**, where children will explore how technology is used in everyday aspects of their daily life and how they can use technology to express themselves.

In order to allow the children to participate effectively and safely in the digital world.

At Humanby Primary, we understand that technology is ever-changing and becoming more and more prominent in our daily lives therefore have 3 aims that will prepare the children for the challenges of the rapidly developing and changing digital world.

- That the children become digital literate and can use technology to express themselves confidently, safely and independently.
- That the children become digital citizens and are responsible, competent, confident and creative users of information and communication technology.
- That the children can apply the science behind computing to everyday aspects in their lives to encourage independent learning in life (Problem solving, organisation, analysing, planning etc...)

### Implementation

In order to deliver a high-quality computing education the teachers at Hunmanby Primary must lead by example. All staff will have had CPD training on computing and e-safety. The Computing Subject Leader will provide training and/or signpost staff to relevant apps and programmes, so that all staff are confident in their use of technology.

Each year group will follow Teach Computing which was introduced in September 2023, in line with the National Curriculum, where teaching and learning will show clear progression across each year group. This will ensure the children's skills will build on previous years' skills in all three elements of computing.

Computing has deep links with mathematics, science, and design and technology, and provides insights into both natural and artificial systems. It can also enhance the teaching and learning; therefore Computing will be used in as many subjects as possible, allowing for cross curricular links. This provides opportunities for the children to see the benefits of becoming digitally literate. By implementing computing in different subjects will allow the children to use a variety of programmes encouraging the creativity and confident to express themselves. Ultimately, by not restricting computing to just our computing lessons will allow the children to see how computing can be used not only in different subjects but also into everyday life.

### Impact

Our computing curriculum is high quality and planned to demonstrate progression, if the children's key skills are built on and all 3 aspects of the curriculum is covered, they are deemed to be making progress and will be tracked on Curriculum Maestro.

The computing curriculum will encourage creativity so children will enjoy and be enthusiastic about computing. They should feel confident in using technology creatively and

should know how to keep themselves safe in the digital world. Children will develop a sound knowledge of the 3 aspects of the curriculum and how this can enhance their curriculum and learning and ultimately leave Hunmanby Primary ready for the challenges of the digital world in their future.

<b>Spiral Curriculum</b>	The units for Key Stage 1 and Key Stage 2 are based on a spiral curriculum. This means that each of the themes is revisited regularly (at least once in each year group), and pupils revisit each theme through a new unit that consolidates on prior learning within that theme.
<b>Physical Computing</b>	Our Curriculum acknowledges that physical computing plays an important role in modern pedagogical approaches in computing, both as a tool to engage pupils and as a strategy to develop pupils' understanding in more creative ways. Additionally, it supports and engages a diverse range of pupils in tangible and challenging tasks. The Physical Computing units are: <ul style="list-style-type: none"> <li>• Year 5 – Selection in physical computing, which uses a Crumble controller</li> <li>• Year 6 – Sensing moving, which uses a micro:bit</li> </ul>
<b>Online Safety</b>	The unit overviews for each Teach Computing unit, shows the links between the content of the lessons and the national curriculum and Education for a Connected World Framework ( <a href="https://www.ncce.io/efacw">ncce.io/efacw</a> ). Not all objectives in the Education for a Connected World framework are covered in our Computing curriculum, as some are better suited to personal, social, health and economic (PSHE) and spiritual, moral, social, and cultural (SMSC) development.

#### Declarative and Procedural Knowledge

<b>Declarative Knowledge</b>	Declarative knowledge, often referred to as conceptual knowledge, consists of facts, rules and principles and the relationships between them. <i>It can be described as 'knowing that'.</i>
<b>Procedural Knowledge</b>	In contrast, procedural knowledge is knowledge of methods or processes that can be performed. <i>It can be described as 'knowing how'.</i>

#### Examples of declarative and procedural knowledge in computing

Form of knowledge	Computer science	Information technology	Digital literacy
Declarative	Programming syntax  The purpose and function of different logic gates	Principles of effective multimedia design  Spreadsheet formulae	Features of unreliable content
Procedural	Performing binary addition  Implementing a repeat in a programming language	Setting up a slide master  Applying conditional formatting	How to perform an advanced web search

<b>Long Term Overview</b>						
	<b>Autumn 1</b>	<b>Autumn 2</b>	<b>Spring 1</b>	<b>Spring 2</b>	<b>Summer 1</b>	<b>Summer 2</b>
<b>EYFS Nursery</b>	Use paint program Build it up (I Pads to photograph models)	Digital art ('Hey Dugee') Computer reading – online stories. All shapes and sizes using technology	Number games Top marks program Patterns train	The story of 1, 2 etc. Amazing animals (searching for info)		Who lives on the seashore?
<b>Reception</b>	Barefoot Awesome Autumn	Barefoot Winter Warmers	Barefoot Busy Bodies	Barefoot Springtime	Barefoot Summer fun	Barefoot Boats Ahoy
<b>Year 1</b>	Computing systems and networks – Technology around us	Creating media – Digital painting	Programming A – Moving a robot	Data and information – Grouping data	Creating media – Digital writing	Programming B - Programming animations
<b>Year 2</b>	Computing Systems and Networks- IT around us	Creating Media- Digital Photography	Programming A- Robot Algorithms	Data and Information- Pictograms	Creating Media- Digital Music	Programming B- Programming quizzes
<b>Year 3</b>	Computing systems and networks – Connecting computers	Creating media - Stop-frame animation	Programming A - Sequencing sounds	Data and information – Branching databases	Creating media – Desktop publishing	Programming B - Events and actions in programs
<b>Year 4</b>	Computing systems and networks – The internet	Creating media – Audio production	Programming A – Repetition in shapes	Data and information – Data logging	Creating media – Photo editing	Programming B – Repetition in games
<b>Year 5</b>	Computing Systems and Networks – Systems and searching	Creating Media – Video Production	Programming A – Selection in physical computing	Data and information – fFat-file databases	Creating Media- Introduction to vector graphics	Programming B – Selection in quizzes
<b>Year 6</b>	Computing systems and networks - Communication and Collaboration	Creating Media- Web Page Creation	Programming A - Variables in Games	Data and Information – Introduction to Spreadsheets	Creating Media- 3D Modelling	Programming B- Sensing Movement

## Levels Expected at the End of EYFS

We have selected the **most relevant** statements from Development Matters Report Sept. 2023 - age ranges for Three and Four-Year-Olds and Reception as well as highlighting the statements within the ELGs **which feed into** the programme of study for Computing. The most relevant statements for computing are taken from the following areas of learning:

- Personal, Social and Emotional Development
- Physical Development
- Understanding the World
- Expressive Arts and Design

Computing In EYFS			
<b>Three and Four-Year-Olds</b>	Personal, Social and Emotional Development		<ul style="list-style-type: none"> <li>• Remember rules without needing an adult to remind them.</li> </ul>
	Physical Development		<ul style="list-style-type: none"> <li>• Match their developing physical skills to tasks and activities in the setting.</li> </ul>
	Understanding the World		<ul style="list-style-type: none"> <li>• Explore how things work.</li> </ul>
<b>Reception</b>	Personal, Social and Emotional Development		<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:               <ul style="list-style-type: none"> <li>- sensible amounts of 'screen time'.</li> </ul> </li> </ul>
	Physical Development		<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>
	Expressive Arts and Design		<ul style="list-style-type: none"> <li>• Explore, use and refine a variety of artistic effects to express their ideas and feelings.</li> </ul>
<b>ELG</b>	Personal, Social and Emotional Development	Managing Self	<ul style="list-style-type: none"> <li>• Be confident to try new activities and show independence, resilience and perseverance in the face of challenge.</li> <li>• Explain the reasons for rules, know right from wrong and try to behave accordingly.</li> </ul>
	Expressive Arts and Design	Creating with Materials	<ul style="list-style-type: none"> <li>• Safely use and explore a variety of materials, tools and techniques, experimenting with colour, design, texture, form and function.</li> </ul>

<b>Nursery</b>						
	<b>Autumn 1</b>	<b>Autumn 2</b>	<b>Spring 1</b>	<b>Spring 2</b>	<b>Summer 1</b>	<b>Summer 2</b>
<b>Development Matters</b>	Use paint program Build it up (I Pads to photograph models)	Digital art ('Hey Dugee') Computer reading –online stories. All shapes and sizes using technology	Number games Top marks program Patterns train	The story of 1, 2 etc. Amazing animals (searching for info)		Who lives on the seashore?
<b>Reception</b>						
	<b>Autumn 1</b>	<b>Autumn 2</b>	<b>Spring 1</b>	<b>Spring 2</b>	<b>Summer 1</b>	<b>Summer 2</b>
<b>Development Matters</b>	Barefoot <b>Awesome Autumn</b>	Barefoot <b>Winter Warmers</b>	Barefoot <b>Busy Bodies</b>	Barefoot <b>Springtime</b>	Barefoot <b>Summer fun</b>	Barefoot <b>Boats Ahoy</b>
<b>Substantive Knowledge</b>	<p><b>Concepts &amp; Approaches:</b> Creating, Pattern, Logic, Algorithms, Decomposition, Collaborating</p> <p>Three Autumn themed activities which see the children explore patterns in Garlands Galore, create a leaf labyrinth and make Pumpkin Soup using computational thinking skills.</p>	<p><b>Concepts &amp; Approaches:</b> Persevering, Tinkering, Decomposition, Collaborating, Creating, Algorithms</p> <p>Snowmen scarves and patterns, creating igloos and bird feeders- all take centre stage in our three winter themed activities.</p>	<p><b>Concepts &amp; Approaches:</b> Algorithms, Decomposition, Debugging, Logic, Patterns, Abstraction</p> <p>Provides four activities that help children discover how bodies move and grow. Using the resources provided they explore and learn about parts of the body, growth and movement.</p> <p>Simple algorithms are created and adapted to form a routine of movements.</p>	<p><b>Concepts &amp; Approaches:</b> Abstraction, Tinkering, Creating, Collaborating, Algorithms, Persevering, Decomposition</p> <p>Three Spring themed activities see the children make a Rabbit run, create Junk scarecrows and explore sequencing whilst planting seeds.</p>	<p><b>Concepts &amp; Approaches:</b> Tinkering, Persevering, Patterns, Logic, Decomposition, Debugging, Collaborating, Algorithms</p> <p>Children explore their surroundings and get creative, take a journey and make a map, and discover seaside tangrams, in these three fun activities.</p>	<p><b>Concepts &amp; Approaches:</b> Algorithms, Decomposition, Creating, Tinkering, Logic, Patterns, Abstraction, Collaborating</p> <p>Takes children on a journey of discovery as they investigate boats. Four activities make up this set of resources. Includes different uses of boats, floating and sinking predictions, creating a good boat through exploring designs and role play.</p>
<i>SEE TEACHER'S WEEKLY PLANS FOR SKILLS, CORE KNOWLEDGE AND ACTIVITYDETAILS</i>						

Year 1						
	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
	Computing systems and networks – Technology around us	Creating media – Digital painting	Programming A – Moving a robot	Data and information – Grouping data	Creating media – Digital writing	Programming B - Programming animations
<b>Prior Learning &amp; Progression</b>	<p>This unit progresses students' knowledge and understanding of technology and how they interact with it in school from the <b>EYFS setting</b>. Learners will build their knowledge of parts of a computer and develop the basic skills needed to effectively use a computer keyboard and mouse. This unit directly precedes the <b>Y2 Computer systems and networks unit, IT around us</b></p>	<p>Learners should be familiar with:</p> <ul style="list-style-type: none"> <li>• How to switch their device on</li> <li>• Usernames</li> <li>• Passwords</li> </ul> <p>For an introduction to keyboard and mouse skills, learners may benefit from completing the <b>Year 1 Computing Systems &amp; Networks unit</b> prior to this unit.</p>	<p>This unit progresses learners' knowledge and understanding of giving and following instructions. It moves from giving instructions to each other to giving instructions to a robot by programming it.</p>	<p>This unit will introduce learners to data and information. It will introduce learners to the concept of labelling and grouping objects based on their properties. Learners will develop their understanding that objects can be given labels, which is fundamental to their future learning concerning databases and spreadsheets. In addition, learners will begin to improve their ability to use dragging and dropping skills on a device. Following this unit, <b>in year 2</b>, learners will present data graphically in pictograms.</p>	<p>This unit progresses the learners' knowledge and understanding of using computers to create and manipulate digital content, focussing on using a word processor. The learners will develop their ability to find and use the keys on a keyboard in order to create digital content. The learners are then introduced to manipulating the resulting text, making cosmetic changes, and justifying their reason for making these changes. Following this unit, learners will further develop their digital writing skills in the <b>Year 3 – 'Desktop publishing'</b> unit and the <b>Year 6 – 'Web page development'</b> unit.</p>	<p>This unit progresses learners' knowledge and understanding of programming and follows on from '<b>Programming A – Moving a robot</b>', where children will have learned to program a floor robot using instructions.</p>
<b>National Curriculum</b>  <b>Substantive Knowledge</b>	<p>Learners will develop their understanding of technology and how it can help them in their everyday lives. They will start to become familiar with the different components of a computer by developing their keyboard and mouse skills. Learners will also consider how to use technology responsibly and who to ask for help if they see any content or comments online that</p>	<p>Learners will develop their understanding of a range of tools used for digital painting. They then use these tools to create their own digital paintings, while gaining inspiration from a range of artists' work. The unit concludes with learners considering their preferences when painting with and without the use of digital devices.</p> <p><b>(lessons 1-6)</b></p>	<p>Learners will be introduced to early programming concepts. Learners will explore using individual commands, both with other learners and as part of a computer program. They will identify what each command for the floor robot does, and use that knowledge to start predicting the outcome of programs. The unit is paced to ensure time is</p>	<p>This unit introduces learners to data and information. Labelling, grouping, and searching are important aspects of data and information. Searching is a common operation in many applications, and requires an understanding that to search data, it must have labels. This unit of work focuses on assigning data (images) with different labels in order to demonstrate how</p>	<p>Learners will develop their understanding of the various aspects of using a computer to create and manipulate text. They will become more familiar with using a keyboard and mouse to enter and remove text. Learners will also consider how to change the look of their text, and will be able to justify their reasoning in making these changes.</p>	<p>Learners will be introduced to on-screen programming through ScratchJr. Learners will explore the way a project looks by investigating sprites and backgrounds. They will use programming blocks to use, modify, and create programs. Learners will also be introduced to the early stages of program design through the introduction of algorithms.</p>

	<p>make them feel uncomfortable.</p> <p><b>(lessons 1-6)</b></p> <ol style="list-style-type: none"> <li>1. To identify technology</li> <li>2. To identify a computer and its main parts</li> <li>3. To use a mouse in different ways</li> <li>4. To use a keyboard to type on a computer</li> <li>5. To use the keyboard to edit text</li> <li>6. To create rules for using technology responsibly</li> </ol>	<ol style="list-style-type: none"> <li>1. To describe what different freehand tools do</li> <li>2. To use the shape tool and the line tools</li> <li>3. To make careful choices when painting a digital picture</li> <li>4. To explain why I chose the tools I used</li> <li>5. To use a computer on my own to paint a picture</li> <li>6. To compare painting a picture on a computer and on paper</li> </ol>	<p>spent on all aspects of programming, and builds knowledge in a structured manner. Learners are also introduced to the early stages of program design through the introduction of algorithms.</p> <p><b>(lessons 1-6)</b></p> <ol style="list-style-type: none"> <li>1. To explain what a given command will do</li> <li>2. To act out a given word</li> <li>3. To combine 'forwards' and 'backwards' commands to make a sequence</li> <li>4. To combine four direction commands to make sequences</li> <li>5. To plan a simple program</li> <li>6. To find more than one solution to a problem</li> </ol>	<p>computers are able to group and present data.</p> <p><b>(lessons 1-6)</b></p> <ol style="list-style-type: none"> <li>1. To label objects</li> <li>2. To identify that objects can be counted</li> <li>3. To describe objects in different ways</li> <li>4. To count objects with the same properties</li> <li>5. To compare groups of objects</li> <li>6. To answer questions about groups of objects</li> </ol>	<p>Finally, learners will consider the differences between using a computer to create text, and writing text on paper. They will be able to explain which method they prefer and explain their reasoning for choosing this.</p> <p><b>(lessons 1-6)</b></p> <ol style="list-style-type: none"> <li>1. To use a computer to write</li> <li>2. To add and remove text on a computer</li> <li>3. To identify that the look of text can be changed on a computer</li> <li>4. To make careful choices when changing text</li> <li>5. To explain why I used the tools that I chose</li> <li>6. To compare typing on a computer to writing on paper</li> </ol>	<p><b>(lessons 1-6)</b></p> <ol style="list-style-type: none"> <li>1. To choose a command for a given purpose</li> <li>2. To show that a series of commands can be joined together</li> <li>3. To identify the effect of changing a value</li> <li>4. To design the parts of a project</li> <li>5. To design the parts of a project</li> <li>6. To use my algorithm to create a program</li> </ol>
<b>Assessment Opportunities</b>	<p><b>Formative assessment</b></p> <p>Assessment opportunities are detailed in each lesson plan. The learning objective and success criteria are introduced in the slide deck at the beginning of each lesson and then reviewed at the end</p>	<p><b>Formative assessment</b></p> <p>Assessment opportunities are detailed in each lesson plan.</p>	<p><b>Formative assessment</b></p> <p>Assessment opportunities are detailed in each lesson plan</p>	<p><b>Formative assessment</b></p> <p>Assessment opportunities are detailed in each lesson plan.</p>	<p><b>Formative assessment</b></p> <p>Assessment opportunities are provided throughout each of the lesson plan documents and the learning objectives and success criteria can be used to observe learners' progress for summative assessment.</p>	<p>Assessment opportunities are detailed in each lesson plan. The learning objective and success criteria are introduced in the slide deck at the beginning of each lesson and then reviewed at the end.</p>
<b>Vocabulary</b>	<p>technology, computer, mouse, trackpad, keyboard, screen, double-click, typing.</p>	<p>paint program, tool, paintbrush, erase, fill, undo, shape tools, line tool, fill tool, undo tool, colour, brush style, brush size, pictures, painting, computers</p>	<p>Bee-Bot, forwards, backwards, turn, clear, go, commands, instructions, directions, left, right, route, plan, algorithm, program.</p>	<p>object, label, group, search, image, property, colour, size, shape, value, data set, more, less, most, fewest, least, the same</p>	<p>word processor, keyboard, keys, letters, type, numbers, space, backspace, text cursor, capital letters, toolbar, bold, italic, underline, mouse, select, font, undo, redo, format, compare, typing, writing.</p>	<p>ScratchJr, command, sprite, compare, programming, area, block, joining, start, run, program, background, delete, reset, algorithm, predict, effect, change, value, instructions, design.</p>

SEE TEACHER'S WEEKLY PLANS FOR SKILLS, CORE KNOWLEDGE AND ACTIVITY DETAILS						

Year 2						
	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
	<b>Computing Systems and Networks- IT around us</b>	<b>Creating Media- Digital Photography</b>	<b>Programming A- Robot Algorithms</b>	<b>Data and Information- Pictograms</b>	<b>Creating Media- Digital Music</b>	<b>Programming B- Programming quizzes</b>
<b>Prior Learning &amp; Progression</b>	This unit progresses learners' understanding of technology and how they interact with it. They will develop this understanding to become familiar with the term information technology and will be able to identify common features of IT. This unit also <b>builds on the learners' understanding of using technology safely and responsibly.</b>	This unit begins the learners' understanding of how photos are captured and can be manipulated for different purposes. Following this unit, learners will develop their photo editing skills in <b>Year 4.</b>	In advance of the lessons in this Year 2 unit, <b>learners should have had some experience of creating short programs using floor robots and predicting the outcome of a simple program.</b> This unit progresses learners' knowledge and understanding of algorithms and how they are implemented as programs on digital devices. Learners will spend time looking at how the order of commands affects outcomes. Learners will use this knowledge and logical reasoning to trace programs and predict outcomes.	This unit progresses students' knowledge and understanding of grouping data. It builds on the <b>Year 1</b> Data and Information unit where learners labelled objects and grouped them based on different properties. In <b>Year 3</b> learners develop their understanding of attributes (properties) using branching databases to structure data according to different object attributes.	<b>Learners should have experience of making choices on a tablet/computer,</b> and they should be able to navigate within an application. <b>Learners should also have some experience of patterns.</b>  This unit progresses students' knowledge through listening to music and considering how music can affect how we think and feel. Learners will then purposefully create rhythm patterns and music.	This unit initially recaps on learning from the <b>Year 1 ScratchJr unit 'Programming B – Programming animations'.</b>  This unit progresses learners' knowledge and understanding of instructions in sequences and the use of logical reasoning to predict outcomes.
<b>National Curriculum</b>  <b>Substantive Knowledge</b>	Learners will develop their understanding of what information technology (IT) is and will begin to identify examples. They will discuss where they have seen IT in school and beyond, in settings such as shops, hospitals, and libraries. Learners will then investigate how IT improves our world, and they will learn about the importance of using IT responsibly.	Learners will learn to recognise that different devices can be used to capture photographs and will gain experience capturing, editing, and improving photos. Finally, they will use this knowledge to recognise that images they see may not be real.  <b>(lessons 1-6)</b> 1. To use a digital device to take a photograph	This unit develops learners' understanding of instructions in sequences and the use of logical reasoning to predict outcomes. Learners will use given commands in different orders to investigate how the order affects the outcome. They will also learn about design in programming. They will develop artwork and test it for use in a program. They will design	Learners will begin to understand what the term data means and how data can be collected in the form of a tally chart. They will learn the term 'attribute' and use this to help them organise data. They will then progress onto presenting data visually using software. Learners will use the data presented to answer questions.  <b>(lessons 1-6)</b>	In this unit, learners will listen to a variety of pieces of music and consider how music can make them think and feel. Learners will compare creating music digitally and non-digitally. Learners will look at patterns and purposefully create music.  <b>(lessons 1-6)</b> 1. To say how music	Learners begin to understand that sequences of commands have an outcome, and make predictions based on their learning. They use and modify designs to create their own quiz questions in ScratchJr, and realise these designs in ScratchJr using blocks of code. Finally, learners evaluate their work and make improvements to their programming



	<p><b>(lessons 1-6)</b></p> <ol style="list-style-type: none"> <li>1. To recognise the uses and features of information technology</li> <li>2. To identify the uses of information technology in the school</li> <li>3. To identify information technology beyond school</li> <li>4. To explain how information technology helps us</li> <li>5. To explain how to use information technology safely</li> <li>6. To recognise that choices are made when using information technology</li> </ol>	<ol style="list-style-type: none"> <li>2. To make choices when taking a photograph</li> <li>3. To describe what makes a good photograph</li> <li>4. To decide how photographs can be improved</li> <li>5. To use tools to change an image</li> <li>6. To recognise that photos can be changed</li> </ol>	<p>algorithms and then test those algorithms as programs and debug them.</p> <p><b>(lessons 1-6)</b></p> <ol style="list-style-type: none"> <li>1. To describe a series of instructions as a sequence</li> <li>2. To explain what happens when we change the order of instructions</li> <li>3. To use logical reasoning to predict the outcome of a program</li> <li>4. To explain that programming projects can have code and artwork</li> <li>5. To design an algorithm</li> <li>6. To create and debug a program that I have written</li> </ol>	<ol style="list-style-type: none"> <li>1. To recognise that we can count and compare objects using tally charts</li> <li>2. To recognise that objects can be represented as pictures</li> <li>3. To create a pictogram</li> <li>4. To select objects by attribute and make comparisons</li> <li>5. To recognise that people can be described by attributes</li> <li>6. To explain that we can present information using a computer</li> </ol>	<p>can make us feel</p> <ol style="list-style-type: none"> <li>2. To identify that there are patterns in music</li> <li>3. To experiment with sound using a computer</li> <li>4. To use a computer to create a musical pattern</li> <li>5. To create music for a purpose</li> <li>6. To review and refine our computer work</li> </ol>	<p>projects.</p> <p><b>(lessons 1-6)</b></p> <ol style="list-style-type: none"> <li>1. To explain that a sequence of commands has a start</li> <li>2. To explain that a sequence of commands has an outcome</li> <li>3. To create a program using a given design</li> <li>4. To change a given design</li> <li>5. To create a program using my own design</li> <li>6. To decide how my project can be improved</li> </ol>
<b>Assessment Opportunities</b>	<b>Formative assessment</b> Assessment opportunities are detailed in each lesson plan. The learning objective and success criteria are introduced in the slide deck at the beginning of each lesson and then reviewed at the end.	Formative assessment opportunities are provided throughout each of the lesson plan documents and the learning objectives and success criteria can be used to observe learners' progress for summative assessment.	Formative assessment opportunities are provided in each of the lesson plan documents, and the learning objectives and success criteria can be used to observe learners' progress for summative assessment.	<b>Formative assessment</b> Assessment opportunities are detailed in each lesson plan.	<b>Formative assessment</b> Assessment opportunities are detailed in each lesson plan. The learning objective and success criteria are introduced in the slide deck at the beginning of each lesson and then reviewed at the end.	<b>Formative assessment</b> Assessment opportunities are detailed in each lesson plan.
<b>Vocabulary</b>	Information technology (IT), computer, barcode, scanner/scan	device, camera, photograph, capture, image, digital, landscape, portrait, framing, subject, compose, light sources, flash, focus, background, editing, filter, format, framing, lighting,	instruction, sequence, clear, unambiguous, algorithm, program, order, prediction, artwork, design, route, mat, debugging, decomposition	more than, less than, most, least, common, popular, organise, data, object, tally chart, votes, total, pictogram, enter, data, compare, objects, count, explain, attribute, group, same, different, conclusion, block diagram, sharing	music, quiet, loud, feelings, emotions, pattern, rhythm, pulse, pitch, tempo, rhythm, notes, create, emotion, beat, instrument, open, edit.	sequence, command, program, run, start, outcome, predict, blocks, design, actions, sprite, project, modify, change, algorithm, build, match, compare, debug, features, evaluate, decomposition, code.
<i>SEE TEACHER'S WEEKLY PLANS FOR SKILLS, CORE KNOWLEDGE AND ACTIVITY DETAILS</i>						

Year 3						
	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
	<b>Computing systems and networks – Connecting computers</b>	<b>Creating media – Stop-frame animation</b>	<b>Programming A - Sequencing sounds</b>	<b>Data and information – Branching databases</b>	<b>Creating media – Desktop publishing</b>	<b>Programming B – Events and actions in programs</b>
<b>Prior Learning &amp; Progression</b>	This unit progresses learners' knowledge and understanding of technology by focusing on digital and non-digital devices, from the following units; <a href="#">Technology around me Year 1</a> and <a href="#">IT around us Year 2</a> , and introducing the concept of computers connected together as a network.	This unit progresses learner's knowledge and understanding of using digital devices to create media, exploring how they can create stop-frame animations. It builds on learners previous understanding of images from the <a href="#">Digital Photography Year 2</a> unit	This unit assumes that learners will have some prior experience of programming; via the <b>KS1 NCE units</b> . They will have experienced programming via floor robots; <a href="#">Moving A Robot Year 1</a> and <a href="#">Robot algorithms Year 2</a> , alongside the use of ScratchJr through <a href="#">Programming animations Year 1</a> and <a href="#">Programming quizzes Year 2</a> .	This unit progresses learners' knowledge and understanding of the categories of data handling, with a particular focus on implementation. It builds on their knowledge of data and information from <b>key stage 1</b> . They will continue to develop their understanding of attributes and begin to construct and interrogate branching databases as a means of displaying and retrieving information.	This unit progresses learners' knowledge and understanding of using digital devices to combine text and images building on work from the following units; <a href="#">Digital Writing Year 1</a> , <a href="#">Digital painting Year 1</a> , and <a href="#">Digital Photography Year 2</a> .	This unit assumes that learners will have some prior experience of programming. <b>The key stage 1 National Centre for Computing Education units</b> focus on floor robots and ScratchJr, however experience of other languages or environments may also be useful. The <b>Year 3</b> — Programming A unit introduces the Scratch programming environment and the concept of sequences.
<b>National Curriculum</b>  <b>Substantive Knowledge</b>	Learners will develop their understanding of digital devices, with an initial focus on inputs, processes, and outputs. They will also compare digital and non-digital devices. Next, learners will be introduced to computer networks, including devices that make up a network's infrastructure, such as wireless access points and switches. Finally, learners will discover the benefits of connecting devices in a network.  <b>(lessons 1-6)</b> 1.To explain how digital devices function 2.To identify input and output devices 3.To recognise how digital devices can change the way we work 4.To explain how a	Learners will use a range of techniques to create a stop-frame animation. Next, they will apply those skills to create a story-based animation. This unit will conclude with learners adding other types of media to their animation, such as music and text.  <b>(lessons 1-6)</b> 1. To explain that animation is a sequence of drawings or photographs 2. To relate animated movement with a sequence of images 3. To plan an animation 4. To identify the need to work consistently and carefully 5. To review and improve an animation 6. To evaluate the impact of adding other media to an animation	This unit explores the concept of sequencing in programming through Scratch. It begins with an introduction to the programming environment, which will be new to most learners. They will be introduced to a selection of motion, sound, and event blocks which they will use to create their own programs, featuring sequences. The final project is to make a representation of a piano. The unit is paced to focus on all aspects of sequences, and make sure that knowledge is built in a structured manner. Learners also apply stages of program design through this unit.  <b>(lessons 1-6)</b> 1. To explore a new	Learners will develop their understanding of what a branching database is and how to create one. They will use yes/no questions to gain an understanding of what attributes are and how to use them to sort groups of objects. Learners will create physical and on-screen branching databases. To conclude the unit, they will create an identification tool using a branching database, which they will test by using it. They will also consider real-world applications for branching databases.  <b>(lessons 1-6)</b> 1. To create questions with yes/no answers 2. To identify the attributes needed to collect data about an object 3. To create a branching database	Learners will become familiar with the terms 'text' and 'images' and emojis and understand that they can be used to communicate messages offline and online. They will use desktop publishing software and consider careful choices of font size, colour and type to edit and improve premade documents. Learners will be introduced to the terms 'templates', 'orientation', and 'placeholders' and begin to understand how these can support them in making their own template for a magazine front cover. They will start to add text and images to create their own pieces of work using desktop publishing software. Learners will look at a	This unit explores the links between events and actions, while consolidating prior learning relating to sequencing. Learners begin by moving a sprite in four directions (up, down, left, and right). They then explore movement within the context of a maze, using design to choose an appropriately sized sprite. This unit also introduces programming extensions, through the use of <b>Pen</b> blocks. Learners are given the opportunity to draw lines with sprites and change the size and colour of lines. The unit concludes with learners designing and coding their own maze-tracing program.  <b>(lessons 1-6)</b> 1. To explain how a sprite

	<p>computer network can be used to share information</p> <p>5.To explore how digital devices can be connected</p> <p>6.To recognise the physical components of a network</p>		<p>programming environment</p> <p>2. To identify that commands have an outcome</p> <p>3. To explain that a program has a start</p> <p>4. To recognise that a sequence of commands can have an order</p> <p>5. To change the appearance of my project</p> <p>6. To create a project from a task description</p>	<p>4. To explain why it is helpful for a database to be well structured</p> <p>5. To plan the structure of a branching database</p> <p>6. To independently create an identification tool</p>	<p>range of page layouts thinking carefully about the purpose of these and evaluate how and why desktop publishing is used in the real world.</p> <p><b>(lessons 1-6)</b></p> <p>1. To recognise how text and images convey information</p> <p>2. To recognise that text and layout can be edited</p> <p>3. To choose appropriate page settings</p> <p>4. To add content to a desktop publishing publication</p> <p>5. To consider how different layouts can suit different purposes</p> <p>6. To consider the benefits of desktop publishing</p>	<p>moves in an existing project</p> <p>2. To create a program to move a sprite in four directions</p> <p>3. To adapt a program to a new context</p> <p>4. To develop my program by adding features</p> <p>5. To identify and fix bugs in a program</p> <p>6. To design and create a maze-based challenge</p>
<b>Assessment Opportunities</b>	<p><b>Formative assessment</b> Assessment opportunities are detailed in each lesson plan</p> <p><b>Summative assessment</b> Please see the summative assessment document of multiple-choice questions for this unit</p>	<p><b>Formative assessment</b> Assessment opportunities are detailed in each lesson plan. The learning objectives and success criteria are introduced in the slide decks at the beginning of each lesson and then reviewed at the end.</p> <p><b>Summative assessment</b> Please see the assessment rubric document for this unit. The rubric can be used to assess student's work from lessons 3 to 6.</p>	<p><b>Formative assessment</b> Assessment opportunities are detailed in each lesson plan.</p> <p><b>Summative assessment</b> Please see the assessment rubric document for this unit. The rubric can be used to assess student's work from lesson 6.</p>	<p><b>Formative assessment</b> opportunities are provided in each of the lesson plan documents. For summative assessment, please see the document of multiple choice questions for this unit.</p>	<p><b>Formative assessment</b> Assessment opportunities are detailed in each lesson plan.</p> <p><b>Summative assessment</b> Please see the assessment rubric document for this unit. The rubric can be used to assess student's work from lessons 3 to 6.</p>	<p><b>Formative assessment</b> Assessment opportunities are detailed in each lesson plan.</p> <p><b>Summative assessment</b> See the assessment questions and solutions for this unit.</p>
<b>Vocabulary</b>	<p>digital device, input, process, output, program, digital, non-digital, connection, network, switch, server, wireless</p>	<p>animation, flip book, stop-frame, frame, sequence, image, photograph, setting, character, events, onion skinning,</p>	<p>Scratch, programming, blocks, commands, code, sprite, costume, stage, backdrop, motion, turn, point in direction, go to,</p>	<p>attribute, value, questions, table, objects, branching, database, objects, equal, even, separate, structure, compare, order, organise,</p>	<p>text, images, advantages, disadvantages, communicate, font, style, landscape,</p>	<p>motion, event, sprite, algorithm, logic, move, resize, extension block, pen up, set up, pen, design, action, debugging,</p>

	access point, cables, sockets	consistency, evaluation, delete, media, import, transition.	glide, sequence, event, task, design, run the code, order, note, chord, algorithm, bug, debug, code.	selecting, information, decision tree.	portrait, orientation, placeholder, template, layout, content, desktop publishing, copy, paste, purpose, benefits.	errors, setup, code, test, debug, actions.
<i>SEE TEACHER'S WEEKLY PLANS FOR SKILLS, CORE KNOWLEDGE AND ACTIVITY DETAILS</i>						

Year 4						
	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
	<b>Computing systems and network – The internet</b>	<b>Creating media – Audio production</b>	<b>Programming A – Repetition in shapes</b>	<b>Data and information – Data logging</b>	<b>Creating media – Photo editing</b>	<b>Programming B – Repetition in games</b>
<b>Prior Learning &amp; Progression</b>	This unit progresses students' knowledge and understanding of networks from that developed in the <a href="#">Year 3 Connecting Computers unit</a> . In <b>Year 5</b> , they will continue to develop their knowledge and understanding of computing systems and understand how search engines work via the internet and the world wide web.	This unit progresses students' knowledge and understanding of creating media, by focusing on the recording and editing of sound to produce a podcast. Following this unit, learners will explore combining audio with video in the 'Video editing' unit in <b>Year 5</b> .	This unit progresses students' knowledge and understanding of programming. Within the <b>Year 3 units</b> , <a href="#">Programming A- Sequencing Sounds</a> and <a href="#">Programming B- Events and Actions in programs</a> , learners will have an awareness of the sequence of commands in a program. This unit progresses on to using count-controlled loops in those sequences. Pupils will create algorithms and then implement those algorithms as code.	This unit progresses learners' knowledge and understanding of data and how it can be collected over time to answer questions. Specifically, it builds on the concept of answering questions with data which is first introduced in the <b>KS1 data and information units</b> . The unit also introduces the idea of automatic data collection. Learners are also introduced to data in tables and graphs, knowledge they will build on in the Year 5 unit (flat file databases) and the Year 6 unit (spreadsheets).	This unit progresses students' knowledge and understanding of digital photography and using digital devices to create media. Learners will have had some exposure to images and their manipulation through the Teach Computing <a href="#">Digital Photography- Year 2</a> unit. Following this unit, learners will further develop their image editing skills in <b>Year 5</b> – Vector drawing.	This unit assumes that learners will have some prior experience of programming. The <b>KS1 NCCE units</b> cover floor robots and ScratchJr, and Scratch, and the skill of sequence, is introduced in the <b>Year 3 programming units</b> : <a href="#">Sequencing Sounds</a> and <a href="#">Events and actions in programs</a> . However, experience of other languages or environments may also be useful.
<b>National Curriculum Substantive Knowledge</b>	Learners will apply their knowledge and understanding of networks, to appreciate the internet as a network of networks which need to be kept secure. They will learn that the World Wide Web is part of the internet, and will be given opportunities to explore the World Wide Web for themselves in order to learn about who	Learners will identify the input device (microphone) and output devices (speaker or headphones) required to work with sound digitally. Learners will discuss the ownership of digital audio and the copyright implications of duplicating the work of others. In order to record audio themselves, learners will use Audacity to	Learners will create programs by planning, modifying, and testing commands to create shapes and patterns. They will use Logo, a text-based programming language. This unit is the first of the two programming units in Year 4 and looks at repetition and loops within programming.	In this unit, learners will consider how and why data is collected over time. Learners will consider the senses that humans use to experience the environment and how computers can use special input devices called sensors to monitor the environment. Learners will collect data as well as access data captured over long periods of time. They	Learners will develop their understanding of how digital images can be changed and edited, and how they can then be resaved and reused. They will consider the impact that editing images can have and evaluate the effectiveness of their choices.	Learners will explore the concept of repetition in programming using the Scratch environment. The unit begins with a Scratch activity similar to that carried out in Logo in Programming unit A, where learners can discover similarities between two environments. Learners look at the difference

	<p>owns content and what they can access, add, and create. Finally, they will evaluate online content to decide how honest, accurate, or reliable it is, and understand the consequences of false information.</p> <p><b>(lessons 1-6)</b></p> <ol style="list-style-type: none"> <li>1. To describe how networks physically connect to other networks</li> <li>2. To recognise how networked devices make up the internet</li> <li>3. To outline how websites can be shared via the World Wide Web (WWW)</li> <li>4. To describe how content can be added and accessed on the World Wide Web (WWW)</li> <li>5. To recognise how the content of the WWW is created by people</li> <li>6. To evaluate the consequences of unreliable content</li> </ol>	<p>produce a podcast, which will include editing their work, adding multiple tracks, and opening and saving the audio files. Finally, learners will evaluate their work and give feedback to their peers.</p> <p><b>(lessons 1-6)</b></p> <ol style="list-style-type: none"> <li>1. To identify that sound can be recorded</li> <li>2. To explain that audio recordings can be edited</li> <li>3. To recognise the different parts of creating a podcast project</li> <li>4. To apply audio editing skills independently</li> <li>5. To combine audio to enhance my podcast</li> <li>6. To evaluate the effective use of audio</li> </ol>	<p><b>(lessons 1-6)</b></p> <ol style="list-style-type: none"> <li>1. To identify that accuracy in programming is important</li> <li>2. To create a program in a text-based language</li> <li>3. To explain what 'repeat' means</li> <li>4. To modify a count-controlled loop to produce a given outcome</li> <li>5. To decompose a task into small steps</li> <li>6. To create a program that uses count-controlled loops to produce a given outcome</li> </ol>	<p>will look at data points, data sets, and logging intervals. Learners will spend time using a computer to review and analyse data. Towards the end of the unit, learners will pose questions and then use data loggers to automatically collect the data needed to answer those questions.</p> <p><b>(lessons 1-6)</b></p> <ol style="list-style-type: none"> <li>1. To explain that data gathered over time can be used to answer questions</li> <li>2. To use a digital device to collect data automatically</li> <li>3. To explain that a data logger collects 'data points' from sensors over time</li> <li>4. To recognise how a computer can help us analyse data</li> <li>5. To identify the data needed to answer questions</li> <li>6. To use data from sensors to answer questions</li> </ol>	<p><b>(lessons 1-6)</b></p> <ol style="list-style-type: none"> <li>1. To explain that the composition of digital images can be changed</li> <li>2. To explain that colours can be changed in digital images</li> <li>3. To explain how cloning can be used in photo editing</li> <li>4. To explain that images can be combined</li> <li>5. To combine images for a purpose</li> <li>6. To evaluate how changes can improve an image</li> </ol>	<p>between count-controlled and infinite loops and use their knowledge to modify existing animations and games using repetition. Their final project is to design and create a game which uses repetition, applying stages of programming design throughout.</p> <p><b>(lessons 1-6)</b></p> <ol style="list-style-type: none"> <li>1. To develop the use of count-controlled loops in a different programming environment</li> <li>2. To explain that in programming there are infinite loops and count-controlled loops</li> <li>3. To develop a design that includes two or more loops which run at the same time</li> <li>4. To modify an infinite loop in a given program</li> <li>5. To design a project that includes repetition</li> <li>6. To create a project that includes repetition</li> </ol>
<p><b>Assessment Opportunities</b></p>	<p><b>Formative assessment</b> Assessment opportunities are detailed in each lesson plan. The learning objectives and success criteria are introduced in the slide decks at the beginning of each lesson and then reviewed at the end.</p> <p><b>Summative assessment</b> Please see the summative assessment document of multiple-choice questions for this unit.</p>	<p><b>Formative assessment</b> Assessment opportunities are detailed in each lesson plan.</p> <p><b>Summative assessment</b> Please see the assessment rubric document for this unit. The rubric can be used to assess student's work from lesson 6.</p>	<p><b>Formative assessment</b> Assessment opportunities are detailed in each lesson plan.</p> <p><b>Summative assessment</b> Please see the summative assessment document of multiple-choice questions for this unit. This can be downloaded as a paper copy, with answers, or in a digital format to be shared.</p>	<p><b>Formative assessment</b> Assessment opportunities are detailed in each lesson plan</p> <p><b>Summative assessment</b> Please see the assessment rubric document for this unit. The rubric can be used to assess student's work from lessons 5 and 6.</p>	<p><b>Formative assessment</b> Assessment opportunities are detailed in each lesson plan. The learning objectives and success criteria are introduced in the slide decks at the beginning of each lesson and then reviewed at the end.</p> <p><b>Summative assessment</b> Please see the assessment rubric document for this unit. The rubric can be used to assess student's work from Lessons 5</p>	<p><b>Formative assessment</b> Assessment opportunities are detailed in each lesson plan</p> <p><b>Summative assessment</b> Please see the assessment rubric document for this unit. The rubric can be used to assess student's work from lessons 5 and 6.</p>

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<b>Vocabulary</b>	internet, network, router, security, switch, server, wireless access point (WAP), website, web page, web address, routing, web browser, World Wide Web, content, links, files, use, download, sharing, ownership, permission, information, accurate, honest, content, adverts	audio, microphone, speaker, headphones, input device, output device, sound, podcast, edit, trim, align, layer, import, record, playback, selection, load, save, export, MP3, evaluate, feedback.	Logo (programming environment), program, turtle, commands, code snippet, algorithm, design, debug, pattern, repeat, repetition, count-controlled loop, value, trace, decompose, procedure.	data, table, layout, input device, sensor, logger, logging, data point, interval, analyse, dataset, import, export, logged, collection, review, conclusion.	image, edit, digital, crop, rotate, undo, save, adjustments, effects, colours, hue, saturation, sepia, vignette, image, retouch, clone, select, combine, made up, real, composite, cut, copy, paste, alter, background, foreground, zoom, undo, font.	Scratch, programming, sprite, blocks, code, loop, repeat, value, infinite loop, count-controlled loop, costume, repetition, forever, animate, event block, duplicate, modify, design, algorithm, debug, refine, evaluate.
<i>SEE TEACHER'S WEEKLY PLANS FOR SKILLS, CORE KNOWLEDGE AND ACTIVITY DETAILS</i>						

Year 5						
	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
	<b>Computing Systems and Networks – Systems and searching</b>	<b>Creating Media – Video Production</b>	<b>Programming A – Selection in physical computing</b>	<b>Data and information – Flat-file databases</b>	<b>Creating Media - Introduction to vector graphics</b>	<b>Programming B – Selection in quizzes</b>
<b>Prior Learning &amp; Progression</b>	<p>This unit progresses learners' knowledge and understanding of computing systems.</p> <p>This unit progresses students' knowledge and understanding of the internet from that developed in the <a href="#">Year 4 The Internet</a> unit. In <b>Year 6</b>, they will continue to develop their knowledge and understanding of the internet, looking at how data is transferred and how the internet facilitates communication and collaboration online.</p>	<p>This unit progresses learners' knowledge and understanding of creating media by guiding them systematically through the process involved in creating a video. The unit builds on the <a href="#">Year 4 Photo editing</a> unit where composition is introduced and the <a href="#">Year 3 unit 'Stop-frame animation'</a> where learners explored some of the features of video production. By the end of this unit, learners will have developed the skills required to plan, record, edit, and share a video.</p>	<p>This unit assumes that learners will have prior experience of programming using a block-based language (e.g. Scratch) and understand the concepts of sequence and repetition. <b>The National Centre for Computing Education Key Stage 1 units</b> focus on floor robots and ScratchJr, however, experience of other languages or environments may also be useful.</p>	<p>This unit progresses learners' knowledge and understanding of why and how information might be stored in a database and looks at how tools within a database can help us to answer questions about our data. It moves on to demonstrate how a database can help us display data visually, and how real-life databases can be used to help us solve problems. Finally, the learners create a presentation showing understanding and application of all the tools used within the unit.</p>	<p>This unit progresses learners' knowledge and understanding of digital painting and has some links to the <a href="#">Year 3 'Creating media – Desktop publishing'</a> unit, in which learners used digital images. In this <b>Year 5 unit</b>, learners create images that could be used in desktop publishing documents.</p>	<p>This unit assumes that learners will have prior experience of programming using block-based construction (e.g. Scratch), understand the concepts of 'sequence' (<b>Year 3 units:</b> <a href="#">Sequencing Sounds</a> and <a href="#">Events and actions in programs</a>) and 'repetition' (<b>Year 4 units:</b> <a href="#">Repetition in shapes</a> and <a href="#">Repetition in games</a>), and have some experience of using 'selection'. Ideally, learners will have completed '<a href="#">Programming A – Selection in physical computing</a>' before undertaking this unit, as this will provide them with the required knowledge of 'selection'.</p>

<p><b>National Curriculum</b></p> <p><b>Substantive Knowledge</b></p>	<p>Learners develop their understanding of computer systems and how information is transferred between systems and devices. Learners consider small-scale systems as well as large-scale systems. They explain the input, output, and process aspects of a variety of different real-world systems. Learners discover how information is found on the World Wide Web, through learning how search engines work (including how they select and rank results) and what influences searching, and through comparing different search engines.</p> <p><b>(lessons 1-6)</b></p> <ol style="list-style-type: none"> <li>1. To explain that computers can be connected together to form systems</li> <li>2. To recognise the role of computer systems in our lives</li> <li>3. To identify how to use a search engine</li> <li>4. To describe how search engines select results</li> <li>5. To explain how search results are ranked</li> <li>6. To recognise why the order of results is important, and to whom</li> </ol>	<p>Learners will learn how to create short videos by working in pairs or groups. As they progress through this unit, they will be exposed to topic-based language and develop the skills of capturing, editing, and manipulating video. Learners are guided with step-by-step support to take their idea from conception to completion. At the conclusion of the unit, learners have the opportunity to reflect on and assess their progress in creating a video.</p> <p><b>(lessons 1-6)</b></p> <ol style="list-style-type: none"> <li>1. To explain what makes a video effective</li> <li>2. To use a digital device to record video</li> <li>3. To capture video using a range of techniques</li> <li>4. To create a storyboard</li> <li>5. To identify that video can be improved</li> <li>6. To consider the impact of the choices made when making and sharing a video</li> </ol>	<p>In this unit, learners will use physical computing to explore the concept of selection in programming through the use of the Crumble programming environment. Learners will be introduced to a microcontroller (Crumble controller) and learn how to connect and program it to control components (including output devices — LEDs and motors). Learners will be introduced to conditions as a means of controlling the flow of actions in a program. Learners will make use of their knowledge of repetition and conditions when introduced to the concept of selection (through the 'if...then...' structure) and write algorithms and programs that utilise this concept. To conclude the unit, learners will design and make a working model of a fairground carousel that will demonstrate their understanding of how the microcontroller and its components are connected, and how selection can be used to control the operation of the model. Throughout this unit, learners will apply the stages of programming design</p> <p><b>(lessons 1-6)</b></p> <ol style="list-style-type: none"> <li>1. To control a simple circuit connected to a computer</li> <li>2. To write a program that includes count-controlled</li> </ol>	<p>This unit looks at how a flat-file database can be used to organise data in records. Learners will use tools within a database to order and answer questions about data. They will create graphs and charts from their data to help solve problems. They will also use a real-life database to answer a question, and present their work to others.</p> <p><b>(lessons 1-6)</b></p> <ol style="list-style-type: none"> <li>1. To use a form to record information</li> <li>2. To compare paper and computer-based databases</li> <li>3. To outline how you can answer questions by grouping and then sorting data</li> <li>4. To explain that tools can be used to select specific data</li> <li>5. To explain that computer programs can be used to compare data visually</li> <li>6. To use a real-world database to answer questions</li> </ol>	<p>In this unit, learners start to create vector drawings. They learn how to use different drawing tools to help them create images. Learners recognise that images in vector drawings are created using shapes and lines, and each individual element in the drawing is called an object. Learners layer their objects and begin grouping and duplicating them to support the creation of more complex pieces of work.</p> <p><b>(lessons 1-6)</b></p> <ol style="list-style-type: none"> <li>1. To identify that drawing tools can be used to produce different outcomes</li> <li>2. To create a vector drawing by combining shapes</li> <li>3. To use tools to achieve a desired effect</li> <li>4. To recognise that vector drawings consist of layers</li> <li>5. To group objects to make them easier to work with</li> <li>6. To apply what I have learned about vector drawings</li> </ol>	<p>Learners will develop their knowledge of 'selection' by revisiting how 'conditions' can be used in programming, and then learning how the 'if... then... else...' structure can be used to select different outcomes depending on whether a condition is 'true' or 'false'. They represent this understanding in algorithms, and then by constructing programs in the Scratch programming environment. They learn how to write programs that ask questions and use selection to control the outcomes based on the answers given. They use this knowledge to 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.</p> <p><b>(lessons 1-6)</b></p> <ol style="list-style-type: none"> <li>1. To explain how selection is used in computer programs</li> <li>2. To relate that a conditional statement connects a condition to an outcome</li> <li>3. To explain how selection directs the flow of a program</li> <li>4. To design a program that uses selection</li> <li>5. To create a program that uses selection</li> <li>6. To evaluate my program</li> </ol>
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			<p>loops</p> <p>3. To explain that a loop can stop when a condition is met</p> <p>4. To explain that a loop can be used to repeatedly check whether a condition has been met</p> <p>5. To design a physical project that includes selection</p> <p>6. To create a program that controls a physical computing project</p>			
<b>Assessment Opportunities</b>	<p><b>Formative assessment</b> Assessment opportunities are detailed in each lesson plan</p> <p><b>Summative assessment</b> Please see the summative assessment document of multiple-choice questions for this unit.</p>	<p><b>Formative assessment</b> Assessment opportunities are detailed in each lesson plan. The learning objectives and success criteria are introduced in the slide decks at the beginning of each lesson and then reviewed at the end</p> <p><b>Summative assessment</b> Please see the assessment rubric document for this unit. The rubric can be used to assess student's work from lessons 4 to 6.</p>	<p><b>Formative assessment</b> Assessment opportunities are detailed in each lesson plan</p> <p><b>Summative assessment</b> Please see the assessment rubric document for this unit. The rubric can be used to assess student's work from <b>lessons 5 and 6</b>.</p>	<p><b>Formative assessment</b> Assessment opportunities are detailed in each lesson plan.</p> <p><b>Summative assessment</b> Please see the summative assessment document of multiple-choice questions for this unit.</p>	<p><b>Formative assessment</b> Assessment opportunities are detailed in each lesson plan</p> <p><b>Summative assessment</b> Please see the assessment rubric document for this unit. The rubric can be used to assess student's work from <b>lessons 3 to 6</b></p>	<p><b>Formative assessment</b> Assessment opportunities are detailed in each lesson plan.</p> <p><b>Summative assessment</b> Please see the summative assessment document of multiple-choice questions for this unit.</p>
<b>Vocabulary</b>	<p>system, connection, digital, input, process, storage, output, search, search engine, refine, index, bot, ordering, links, algorithm, search engine optimisation (SEO), web crawler, content creator, selection, ranking.</p>	<p>video, audio, camera, talking head, panning, close up, video camera, microphone, lens, mid-range, long shot, moving subject, side by side, angle (high, low, normal), static, zoom, pan, tilt, storyboard, filming, review, import, split, trim, clip, edit, reshoot, delete, reorder, export, evaluate, share.</p>	<p>microcontroller, USB, components, connection, infinite loop, output component, motor, repetition, count-controlled loop, Crumble controller, switch, LED, Sparkle, crocodile clips, connect, battery box, program, condition, Input, output, selection, action, debug, circuit, power, cell, buzzer</p>	<p>database, data, information, record, field, sort, order, group, search, value, criteria, graph, chart, axis, compare, filter, presentation.</p>	<p>vector, drawing tools, object, toolbar, vector drawing, move, resize, colour, rotate, duplicate/copy, zoom, select, align, modify, layers, order, copy, paste, group, ungroup, reuse, reflection</p>	<p>Selection, condition, true, false, count-controlled loop, outcomes, conditional statement, algorithm, program, debug, question, answer, task, design, input, implement, test, run, setup, operator</p>
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Year 6						
	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
	<b>Computing systems and networks - Communication and Collaboration</b>	<b>Creating Media - Web Page Creation</b>	<b>Programming A - Variables in Games</b>	<b>Data and Information – Introduction to Spreadsheets</b>	<b>Creating Media - 3D Modelling</b>	<b>Programming B – Sensing Movement</b>
<b>Prior Learning &amp; Progression</b>	This unit progresses learners' knowledge and understanding of computing systems and online collaborative working.	This unit progresses students' knowledge and understanding of the following: digital writing, digital painting, desktop publishing, digital photography, photo editing, and vector drawing.	This unit assumes that learners have some prior experience of programming in Scratch. Specifically, they should be familiar with the programming constructs of sequence, repetition, and selection. <b>These constructs are covered in the Year 3, 4, and 5 National Centre for Computing Education programming units</b> respectively. Each year group includes at least one unit that focuses on Scratch.	This unit progresses students' knowledge and understanding of data, and teaches them how to organise and modify data within spreadsheets. Specifically, learners will have experienced data in tables and charts in the <b>Y4 data logging and Y5</b> branching database units.	This unit progresses students' knowledge and understanding of creating 3D graphics using a computer. Prior to undertaking this unit, learners should have worked with 2D graphics applications in <b>Y5</b> .	This unit is the final KS2 programming unit and brings together elements of all the four <b>programming constructs: sequence from Year 3, repetition from Year 4, selection from Year 5, and variables (introduced in Year 6 – 'Programming A')</b> . It offers pupils the opportunity to use all of these constructs in a different, but still familiar environment, while also utilising a physical device — the micro:bit. The unit begins with a simple program for pupils to build in and test within the new programming environment, before transferring it to their micro:bit. Pupils then take on three new projects in Lessons 2, 3, and 4, with each lesson adding more depth.
<b>National Curriculum</b>  <b>Substantive Knowledge</b>	In this unit learners explore how data is transferred over the internet. Learners initially focus on addressing, before they move on to the makeup and structure of data packets. Learners then look at how the internet facilitates online communication and collaboration; they complete shared projects online and evaluate	Learners will be introduced to creating websites for a chosen purpose. Learners identify what makes a good web page and use this information to design and evaluate their own website using Google Sites. Throughout the process, learners pay specific attention to copyright, fair use of media and creative commons, the aesthetics of the site, and	This unit explores the concept of variables in programming through games in Scratch. First, learners find out what variables are and relate them to real-world examples of values that can be set and changed. Then they use variables to create a simulation of a scoreboard.  <b>(lessons 1-6)</b>	This unit introduces the learners to spreadsheets. They will be supported in organising data into columns and rows to create their own data set. Learners will be taught the importance of formatting data to support calculations, while also being introduced to formulas and will begin to understand how they can be used to produce calculated data. Learners	Learners will develop their knowledge and understanding of using a computer to produce 3D models. Learners will initially familiarise themselves with working in a 3D space, moving, resizing, and duplicating objects. They will then create hollow objects using placeholders and combine multiple	Design features prominently in this unit. A design template is introduced in Lesson 3, initially scaffolded to give pupils the opportunity to create code from a given design. In Lesson 4 that scaffolding is gradually reduced, then in Lesson 5, pupils create their own design, using the same template. In the final lesson, pupils will apply

	<p>different methods of communication. Finally, they learn how to communicate responsibly by considering what should and should not be shared on the internet and how to report concerns about inappropriate content online.</p> <p><b>Note:</b> Some of the content in this unit was previously included in the Year 5 – ‘Computer systems and networks’ unit, so some learners may have already completed similar activities. Where this is the case, the context for the activity has been changed.</p> <p><b>(lessons 1-6)</b></p> <ol style="list-style-type: none"> <li>1. To explain the importance of internet addresses</li> <li>2. To recognise how data is transferred across the internet</li> <li>3. To explain how sharing information online can help people to work together</li> <li>4. To evaluate different ways of working together online</li> <li>5. To recognise how we communicate using technology</li> <li>6. To evaluate different methods of online communication</li> </ol>	<p>navigation paths. This will enable the learners to understand how to be a respectful and responsible user of technology online.</p> <p><b>(lessons 1-6)</b></p> <ol style="list-style-type: none"> <li>1. To review an existing website and consider its structure</li> <li>2. To plan the features of a web page</li> <li>3. To consider the ownership and use of images (copyright)</li> <li>4. To recognise the need to preview pages</li> <li>5. To outline the need for a navigation path</li> <li>6. To recognise the implications of linking to content owned by other people</li> </ol>	<ol style="list-style-type: none"> <li>1. To define a ‘variable’ as something that is changeable</li> <li>2. To explain why a variable is used in a program</li> <li>3. To choose how to improve a game by using variables</li> <li>4. To design a project that builds on a given example</li> <li>5. To use my design to create a project</li> <li>6. To evaluate my project</li> </ol>	<p>will be taught how to apply formulas that include a range of cells, and apply formulas to multiple cells by duplicating them. Learners will use spreadsheets to plan an event and answer questions. Finally, learners will create charts, and evaluate their results in comparison to questions asked.</p> <p><b>(lessons 1-6)</b></p> <ol style="list-style-type: none"> <li>1. To create a data set in a spreadsheet</li> <li>2. To build a data set in a spreadsheet</li> <li>3. To explain that formulas can be used to produce calculated data</li> <li>4. To apply formulas to data</li> <li>5. To create a spreadsheet to plan an event</li> <li>6. To choose suitable ways to present data</li> </ol>	<p>objects to create a model of a desk tidy. Finally, learners will examine the benefits of grouping and ungrouping 3D objects, then go on to plan, develop, and evaluate their own 3D model of a building.</p> <p><b>(lessons 1-6)</b></p> <ol style="list-style-type: none"> <li>1. To recognise that you can work in three dimensions on a computer</li> <li>2. To identify that digital 3D objects can be modified</li> <li>3. To recognise that objects can be combined in a 3D model</li> <li>4. To create a 3D model for a given purpose</li> <li>5. To plan my own 3D model</li> <li>6. To create my own digital 3D model</li> </ol>	<p>their knowledge of the programming constructs and use their design to create their own micro:bit-based step counter.</p> <p><b>(lessons 1-6)</b></p> <ol style="list-style-type: none"> <li>1. To create a program to run on a controllable device (micro:bit)</li> <li>2. To explain that selection can control the flow of a program</li> <li>3. To update a variable with a user input</li> <li>4. To use an conditional statement to compare a variable to a value</li> <li>5. To design a project that uses inputs and outputs on a controllable device</li> <li>6. To develop a program to use inputs and outputs on a controllable device</li> </ol>
<p><b>Assessment Opportunities</b></p>	<p><b>Summative assessment</b> Please see the assessment question and answer documents for this unit.</p>	<p><b>Formative assessment</b> Assessment opportunities are detailed in each lesson plan. <b>Summative assessment</b> Please see the assessment rubric document for this unit. The</p>	<p><b>Formative assessment</b> Assessment opportunities are detailed in each lesson plan. The learning objectives and success criteria are introduced in the slide deck at the beginning of each lesson</p>	<p>Formative assessment opportunities are provided throughout each of the lesson plan documents. For summative assessment, please see the MCQ document for this unit.</p>	<p><b>Formative assessment</b> Assessment opportunities are detailed in each lesson plan. <b>Summative assessment</b> Please see the</p>	<p><b>Formative assessment</b> Assessment opportunities are detailed in each lesson plan. The learning objectives and success criteria are introduced in the slide deck at the beginning of each lesson.</p>

		rubric can be used to assess student's work from <b>lessons 2 to 6.</b>	<b>Summative assessment</b> Please see the assessment question and answer documents for this unit.		assessment rubric document for this unit. The rubric can be used to assess student's work from lessons 5 and 6.	It is recommend that teachers collect the programming work which the pupils complete either by sharing the URLs with their teacher when they select 'Share' and 'Publish Project' or by downloading the code file and saving it on the school's computer system. This will aid assessment throughout this unit. <b>Summative assessment</b> Please see the assessment rubric document for this unit. The rubric can be used to assess student's work from <b>lessons 5 and 6.</b>
<b>Vocabulary</b>	communication, protocol, data, address, Internet Protocol (IP), Domain Name Server (DNS), packet, header, data payload, chat, explore, slide deck, reuse, remix, collaboration, internet, public, private, oneway, two-way, one-to-one, one-to-many.	website, web page, browser, media, Hypertext Markup Language (HTML), logo, layout, header, media, purpose, copyright, fair use, home page, preview, evaluate, device, Google Sites, breadcrumb trail, navigation, hyperlink, subpage, evaluate, implication, external link, embed.	variable, change, name, value, set, design, event, algorithm, code, task, artwork, program, project, code, test, debug, improve, evaluate, share, assign, declare	data, collecting, table, structure, spreadsheet, cell, cell reference, data item, format, formula, calculation, spreadsheet, input, output, operation, range, duplicate, sigma, propose, question, data set, organised, chart, evaluate, results, sum, comparison, software, tools.	TinkerCAD, 2D, 3D, shapes, select, move, perspective, view, handles, resize, lift, lower, recolour, rotate, duplicate, group, cylinder, cube, cuboid, sphere, cone, prism, pyramid, placeholder, hollow, choose, combine, construct, evaluate, modify.	Micro:bit, MakeCode, input, process, output, flashing, USB, trace, selection, condition, if then else, variable, random, sensing, accelerometer, value, compass, direction, navigation, design, task, algorithm, step counter, plan, create, code, test, debug
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