



Smawthorne Henry Moore Academy

# Computing Curriculum



# Whole School Computing Curriculum Overview:

Yr Grp	Autumn Term		Spring Term		Summer Term	
<b>Early Years</b>	The Computing curriculum for the Early Years Foundation Stage is designed to introduce Pre-school, Nursery and Reception children to technology through engaging activities that foster familiarity with computing devices and recognition of technology in their environment. Children will develop basic operational skills, understanding of digital literacy and safety and creative expression through digital means. There is an introduction to coding and computational thinking and problem-solving with technology, while ensuring a focus on building a strong foundation in critical thinking and creativity in a safe, age-appropriate manner.					
<b>Concept</b>	<b>Computing systems and networks</b>	<b>Creating media</b>	<b>Programming A</b>	<b>Data and information</b>	<b>Creating media</b>	<b>Programming B</b>
<b>1</b>	<b>Technology around us</b> Recognising technology in school and using it responsibly.	<b>Digital painting</b> Choosing appropriate tools in a program to create art, and making comparisons with working non-digitally.	<b>Moving a robot</b> Writing short algorithms and programs for floor robots, and predicting program outcomes.	<b>Grouping data</b> Exploring object labels, then using them to sort and group objects by properties.	<b>Digital writing</b> Using a computer to create and format text, before comparing to writing non-digitally.	<b>Programming animations</b> Designing and programming the movement of a character on screen to tell stories.
<b>2</b>	<b>Information technology around us</b> Identifying IT and how its responsible use improves our world in school and beyond.	<b>Digital photography</b> Capturing and changing digital photographs for different purposes.	<b>Robot algorithms</b> Creating and debugging programs, and using logical reasoning to make predictions.	<b>Pictograms</b> Collecting data in tally charts and using attributes to organise and present data on a computer.	<b>Digital music</b> Using a computer as a tool to explore rhythms and melodies, before creating a musical composition.	<b>Programming quizzes</b> Designing algorithms and programs that use events to trigger sequences of code to make an interactive quiz.
<b>3</b>	<b>Connecting computers</b> Identifying that digital devices have inputs, processes, and outputs, and how devices can be connected to make networks.	<b>Stop-frame animation</b> Capturing and editing digital still images to produce a stop-frame animation that tells a story.	<b>Sequencing sounds</b> Creating sequences in a block-based programming language to make music.	<b>Branching databases</b> Building and using branching databases to group objects using yes/no questions.	<b>Desktop publishing</b> Creating documents by modifying text, images, and page layouts for a specified purpose.	<b>Events and actions in programs</b> Writing algorithms and programs that use a range of events to trigger sequences of actions.
<b>4</b>	<b>The internet</b> Recognising the internet as a network of networks including the WWW, and why we should evaluate online content.	<b>Audio production</b> Capturing and editing audio to produce a podcast, ensuring that copyright is considered.	<b>Repetition in shapes</b> Using a text-based Programming language to explore count-controlled loops when drawing shapes.	<b>Data logging</b> Recognising how and why data is collected over time, before using data loggers to carry out an investigation.	<b>Photo editing</b> Manipulating digital images, and reflecting on the impact of changes and whether the required purpose is fulfilled.	<b>Repetition in games</b> Using a block-based programming language to explore count-controlled and infinite loops when creating a game.
<b>5</b>	<b>Systems and searching</b> Recognising IT systems in the world and how some can enable searching on the internet.	<b>Video production</b> Planning, capturing, and editing video to produce a short film.	<b>Selection in physical computing</b> Exploring conditions and selection using a programmable microcontroller.	<b>Flat-file databases</b> Using a database to order data and create charts to answer questions.	<b>Introduction to vector graphics</b> Creating images in a drawing program by using layers and groups of objects.	<b>Selection in quizzes</b> Exploring selection in programming to design and code an interactive quiz.
<b>6</b>	<b>Communication and collaboration</b> Exploring how data is transferred by working collaboratively online.	<b>Webpage creation</b> Designing and creating webpages, giving consideration to copyright, aesthetics, and navigation.	<b>Variables in games</b> Exploring variables when designing and coding a game.	<b>Introduction to spreadsheets</b> Answering questions by using Spreadsheets to organise and calculate data.	<b>3D modelling</b> Planning, developing, and evaluating 3D computer models of physical objects.	<b>Sensing movement</b> Designing and coding a project that captures inputs from a physical device.

## Whole School Computing Curriculum Overview: Pre School

Pre School	Autumn Term		Spring Term		Summer Term	
	<u>Autumn 1</u>	<u>Autumn 2</u>	<u>Spring 1</u>	<u>Spring 2</u>	<u>Summer 1</u>	<u>Summer 2</u>
	All About Me	Let's Celebrate	Under the Sea	In the Garden	Once upon a time	All Creatures Great and Small
<b>Unit Overview</b>	In this unit children will have access to technology in their everyday play including telephones, microwave, kettles, laptops etc.	In this unit children will use the interactive whiteboard to look at videos of different celebrations.	In this unit children will use interactive aquarium apps or videos on the interactive whiteboard to explore underwater life.	In this unit children will look at the life cycle of a frog using the internet.	In this unit children will use interactive storybook apps with narration on the interactive whiteboard.	In this unit children will watch virtual zoo tour on the interactive whiteboard. Children will explore animal sounds using sound books and sound button app.
<b>Children will...</b>	-Explore technology appropriately in their play to represent their own experiences.	- Begin to understand that they can watch videos on the interactive whiteboard. - Be introduced to rules around the interactive whiteboard.	-Begin to understand that they can see videos of other places.	- Begin to understand you can use the internet to see pictures and videos about things they are interested in.	- Begin to understand that stories can be in a book or on the computer. - Listen to a story on the whiteboard and answer simple questions.	- Investigate sounds by pressing buttons on the book or interactive whiteboard. - Know that by pressing the button, a sound is made.
<b>Development Matters (Birth to three)</b>	-Enjoy singing, music and toys that make sounds -Repeat actions that have an effect	-Enjoy singing, music and toys that make sounds -Repeat actions that have an effect	-Enjoy singing, music and toys that make sounds -Repeat actions that have an effect	-Enjoy singing, music and toys that make sounds -Repeat actions that have an effect	-Enjoy singing, music and toys that make sounds -Repeat actions that have an effect	-Enjoy singing, music and toys that make sounds -Repeat actions that have an effect
<b>Technology in provision</b>	Throughout the year children use a range of everyday technology in their play and exploration. The role play area contains items such as kettle, toaster, microwave and washing machine as well as tills, laptops and computers for the children to use in their play. Children explore a range of wind up/moving toys to encourage an understanding of cause and effect. Children use the interactive whiteboard to watch videos and listen to music and stories and explore books with moving parts and sound buttons. In the music area there are microphones and battery operated musical instruments for the children to use.					
<b>Vocabulary</b> *New vocabulary in bold	Computer, telephone,	Interactive whiteboard, video	Picture, video, image	Search, internet	Story, play, pause	Press, sound, start, stop
<b>Prior learning</b>	Prior to starting in Pre School, children may have a basic understanding of technology in the home and prior use of ipads, tablets, laptops etc. They may have some experience of moving/wind up toys and how to work them.					
<b>Future Learning</b>	In Nursery, children will use a wide range of technology appropriately in their play and be able to talk about their own experiences of technology at home.	In Nursery, children will use the interactive whiteboard for games and mark making opportunities.	In Nursery, children will use Google and Google Earth to find out relevant information.	In Nursery, children will continue to develop their understanding of life cycles through time lapse videos.	In Nursery, children will continue to listen to stories and nursery rhymes on the interactive whiteboard.	In Nursery, children play various sound button games in phonics activities using the interactive whiteboard.

## Whole School Computing Curriculum Overview: Nursery

Nursery	Autumn Term		Spring Term		Summer Term	
	<u>Autumn 1</u>	<u>Autumn 2</u>	<u>Spring 1</u>	<u>Spring 2</u>	<u>Summer 1</u>	<u>Summer 2</u>
	Marvellous Me	Colour and Light	Out of This World	Ready, steady, grow	I need a hero....	Home and Away

<b>Unit Overview</b>	In this unit children will begin to use technology in their everyday play including telephones, microwave, kettles, laptops etc. Children will use technology to look at themselves and the people around them.	In this unit children will use the interactive whiteboard to draw firework pictures. They will begin to learn how to make marks on the board and choose a colour from the menu. Children will use torches to investigate light and dark.	In this unit children will use Google Earth to see images of Earth and see where they live. Children will use the internet to find videos of the first moon landing.	In this unit children will begin to understand how technology can be used to record changes in the environment. Time-lapse videos will be recorded of the life cycle of the butterfly.	In this unit children will use a digital drawing app on the interactive whiteboard to draw their own superhero. They will look at different superheroes and watch videos of superheroes and their powers.	In this unit the children will look at a route in the local area using google maps. Children will talk about the familiar places they can see on google maps and look at photos of local places and places further away.
<b>Children will...</b>	-learn to take photos of themselves using the ipads. - look at family photos and talk about what we use to take photos. - talk about what technology they have in their own homes and use this appropriately in their play.	- use the interactive whiteboard for mark making for a purpose - begin to learn how to select a colour using the menu - learn how to turn a torch on and off and begin to investigate light and shadows.	- begin to understand that the internet can be used to find things out. -look at images on the computer of places familiar to them. - watch videos of events that have happened in the past.	- investigate how to record videos using the ipads. - learn how to watch videos back that they have recorded. -take photos using a camera of changes they see in the natural environment	- draw their superhero on the interactive whiteboard. -select colours and learn how to delete their picture once finished -use the ipad to take photos on Superhero day using a green screen.	-begin to have an understanding that google maps can be used to look at our local area. -know that the computer can be used to plan a route -use the internet to look at places far away and places close to home.
<b>Development Matters (3-4yrs)</b>	-Select and use activities and resources, with help when needed. – Remember rules without needing an adult to remind them. – Match their developing physical skills to tasks and activities in setting. - Explore how things work	-Select and use activities and resources, with help when needed. – Remember rules without needing an adult to remind them. – Match their developing physical skills to tasks and activities in setting. - Explore how things work	-Select and use activities and resources, with help when needed. – Remember rules without needing an adult to remind them. – Match their developing physical skills to tasks and activities in setting. - Explore how things work	-Select and use activities and resources, with help when needed. – Remember rules without needing an adult to remind them. – Match their developing physical skills to tasks and activities in setting. - Explore how things work	-Select and use activities and resources, with help when needed. – Remember rules without needing an adult to remind them. – Match their developing physical skills to tasks and activities in setting. - Explore how things work	-Select and use activities and resources, with help when needed. – Remember rules without needing an adult to remind them. – Match their developing physical skills to tasks and activities in setting. - Explore how things work
<b>Technology in provision areas</b>	Throughout the year children use a range of everyday technology in their play and exploration. The role play area contains items such as phones, TV, kettle, toaster, microwave and washing machine as well as tills, laptops and computers for the children to use in their play. Children explore a range of wind up/moving toys to encourage an understanding of cause and effect and to discover how things work. Children use the interactive whiteboard for games, activities and mark making and are beginning to learn how to delete and select different options such as colour. Cameras and ipads are used with adult support to take pictures in provision areas. Children explore books with moving parts and sound buttons and use sound boxes to record and playback their voice.					
<b>Vocabulary</b> *New vocabulary in bold	Interactive whiteboard, <b>kettle, toaster, microwave, laptop, iPad</b>	Interactive whiteboard, computer, <b>select, torch, button, battery, shadow</b>	Internet, video, <b>Google, Google Earth, recording</b>	Video, record, iPad, <b>time, changes</b>	Interactive whiteboard, <b>select, delete, green screen, edit</b>	Internet, images, <b>Google maps, research</b>
<b>Prior learning</b>	Children may have experience of technology in the home and may be aware of it's use which is demnstrated in everyday play.	Children will have seen the whiteboard in use on a daily basis and may know general rules around it's use.	Children will have seen the whiteboard in use on a daily basis and may know general rules around it's use.	Children will have used the ipads to take photos.	Children should be familiar with mark making on the interactive whiteboard and know how to select a colour.	Children should be familiar with the use of the interent to find something out. Previous use of Google Earth.
<b>Future Learning</b>	In Reception, children will continue to develop their understanding of everyday use of technology and demonstrate this in their play.	In Reception, children will continue their use of the interactive whiteboard and learn how to edit and delete their mark making.	In Reception, children will use the internet to find out information.	In Reception, children will continue to develop their competence of using ipads for photos and videos.	In Reception, children will use different apps and programs for mark making and know how to edit, select and delete options.	In Reception, children will begin to use Beebots to program routes and directions.

# Whole School Computing Curriculum Overview: Reception

Reception	Autumn Term		Spring Term		Summer Term	
	<u>Autumn 1</u>	<u>Autumn 2</u>	<u>Spring 1</u>	<u>Spring 2</u>	<u>Summer 1</u>	<u>Summer 2</u>
	<b>Altogether now</b>	<b>It's Magic!</b>	<b>Looking to the Future</b>	<b>Grow, grow, growing</b>	<b>Grand Designs</b>	<b>Let's Discover</b>
E-Safety Focus	<i>Self-Image &amp; Identity</i>	<i>Online Relationships</i>	<i>Online Bullying</i>	<i>Online Reputation</i>	<i>Managing Online Information</i>	<i>Privacy &amp; Security</i>
Unit Overview	In this unit children will be taught rules and appropriate use of interactive whiteboard and iPads. They will use the whiteboard to create a digital painting of themselves.	In this unit children will use a simple app that simulates mixing different colored liquids and ingredients to create 'magic potions.' They can follow recipes that involve counting and measuring, leading to animated outcomes like changing colours or virtual fireworks.	In this unit children will learn about how technology is used in a range of occupations. They will learn about the use of technology in different work places.	In this unit children will use ipads to record changes in the natural environment. Children will take photos and record videos of signs of Spring and watch timelapse videos of changes and growth.	In this unit children will explore the Beebots and will be introduced to their simple functions. Children will use directional language when taking about the Beebots movements.	In this unit children will be introduced to the ICT suite. Children will become familiar with the set up of the room and expectations of behaviour and safe use.
Children will...	<ul style="list-style-type: none"> <li>-Know that technology equipment must be handled carefully</li> <li>- Know how to use the ipads to take a photo</li> <li>-Know how to look at photos they have taken</li> <li>- Draw themselves on the interactive whiteboard by selecting tools and colours.</li> </ul>	<ul style="list-style-type: none"> <li>-Drag, swipe and tap to select objects.</li> <li>- See the immediate effects of their actions, such as colour changes or animations, which help them understand cause and effect.</li> </ul>	<ul style="list-style-type: none"> <li>-Know that people use technology to carry out their jobs</li> <li>- Find out the different technology that police officers use e.g walkie talkies, radio etc.</li> <li>-Use the internet to find out about different jobs.</li> </ul>	<ul style="list-style-type: none"> <li>- Know how to record a video using the ipads.</li> <li>- Know how to watch the video they have recorded on the ipads.</li> <li>- Know how to pause the video and delete it.</li> </ul>	<ul style="list-style-type: none"> <li>-Learn how to turn the Beebots on and off.</li> <li>-Learn what the buttons on the Beebot are used for including the go, pause, delete and directional buttons.</li> <li>-Be able to move the Beebot in a certain direction.</li> </ul>	<ul style="list-style-type: none"> <li>-Know the expectations of behaviour in the ICT suite.</li> <li>-Learn how to turn on the computer.</li> <li>-Begin to become familiar with the keyboard and mouse</li> <li>- Be able to log in by typing username and password with adult support.</li> </ul>
Development Matters (Reception)	<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> <li>-Develop their small motor skills so that they can use a range of tools competently, safely and confidently.</li> <li>- Explore, use and refine a variety of artistic effects to express their ideas and feelings.</li> </ul>	<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> <li>-Develop their small motor skills so that they can use a range of tools competently, safely and confidently.</li> <li>- Explore, use and refine a variety of artistic effects to express their ideas and feelings.</li> </ul>	<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> <li>-Develop their small motor skills so that they can use a range of tools competently, safely and confidently.</li> <li>- Explore, use and refine a variety of artistic effects to express their ideas and feelings.</li> </ul>	<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> <li>-Develop their small motor skills so that they can use a range of tools competently, safely and confidently.</li> <li>- Explore, use and refine a variety of artistic effects to express their ideas and feelings.</li> </ul>	<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> <li>-Develop their small motor skills so that they can use a range of tools competently, safely and confidently.</li> <li>- Explore, use and refine a variety of artistic effects to express their ideas and feelings.</li> </ul>	<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> <li>-Develop their small motor skills so that they can use a range of tools competently, safely and confidently.</li> <li>- Explore, use and refine a variety of artistic effects to express their ideas and feelings.</li> </ul>
Early Learning Goal	ELG Personal, Social and Emotional Development – Managing Self -Be confident to try new activities and show independence, resilience and perseverance in the face of challenge. -Explain the reasons for rules, know right from wrong and try to behave accordingly. ELG Expressive Arts and Design – Creating with Materials -Safely use and explore a variety of materials, tools and techniques, experimenting with colour, design, texture, form and function.					
Technology in provision areas	Throughout the year children use a range of everyday technology in their play and exploration. The role play area contains items such as phones, TV, kettle, toaster, microwave and washing machine as well as tills, and laptops for the children to use in their play. Children explore a range of wind up/moving toys to encourage an understanding of cause and effect and to discover how things work. Children can access the interactive whiteboard independently for games, activities and mark making and are learning how to delete and select different options such as colour and tool. Cameras and ipads are accessible for the children to take photos of					

	their models, drawings and designs in the provision areas such as sand, playdough and construction and they are encouraged to save and delete photos appropriately. Children use age appropriate apps such as <b>ChatterPix kids and Chrome Music Lab</b> on the ipads.					
<b>Vocabulary</b> *New vocabulary in bold	Interactive whiteboard, select, delete, <b>technology</b>	<b>Drag, swipe, tap,</b>	Technology, equipment, <b>walkie talkie, radio</b>	Video, <b>record, pause, time lapse</b>	<b>Instructions, program, directional, forwards, backwards, left, right, Beebot</b>	Screen, computer, <b>ICT suite, keyboard, mouse, log on, username, password</b>
<b>Prior learning</b>	In Nursery, children will have used ipads and interactive whiteboards with adult support.	In Nursery, children will have played interactive games on the whiteboard with adult support.		In Nursery, children will have witnessed the butterfly life cycle and eatched videos of this.	In Nursery, children will have talked about different routes and used some directional language.	
<b>Future Learning</b>	In Year 1, children will learn about technology in school and how to use it responsibly.	In Year 1, children will use the computer for digital painting and be able to select the appropriate tools, colours and shapes.	In Year 1, children will be introduced to the use of computers for writing texts.	In Year 1, children will be introduced to data and information and how this can be grouped.	In Year 1, children will use Beebots to further develop their understanding of programming and algorithms.	In Year 1, children will have weekly ICT lessons in the ICT suite and will continue to develop their computer skills.

# Whole School Computing Curriculum Overview: Year 1

Year 1	Autumn Term		Spring Term		Summer Term	
	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
	<b>Computing systems and networks – Technology around us</b>	<b>Creating media – Digital painting</b>	<b>Programming A – Moving a robot</b>	<b>Data and information – Grouping data</b>	<b>Creating media – Digital writing</b>	<b>Programming B – Programming animations</b>
<b>E-Safety Focus</b>	<b><i>Self-Image &amp; Identity</i></b>	<b><i>Online Relationships</i></b>	<b><i>Online Bullying</i></b>	<b><i>Online Reputation</i></b>	<b><i>Managing Online Information</i></b>	<b><i>Privacy &amp; Security</i></b>
<b>Unit Overview</b>	<p>Within this unit of work children will develop their understanding of technology and how it can help them in their everyday lives. Children start to become familiar with the different components of a computer by developing their keyboard and mouse skills. Children will be introduced to saving their work in their documents. Children will also consider how to use technology responsibly.</p>	<p>Within this unit of work children 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. Children consider their preferences when painting with and without the use of digital devices.</p>	<p>Within this unit of work children will be introduced to early programming concepts. Children will explore using individual commands. Children will identify what each command for the floor robot does, and use that knowledge to start predicting the outcome of programs. Children will understand aspects of programming in a structured progressive sequence. Children are also introduced to the early stages of program design through the introduction of algorithms.</p>	<p>Within this unit of work children will be introduced to data and information. Children develop their understanding that labelling, grouping, and searching are important aspects of data and information. Children focus on assigning data (images) with different labels in order to demonstrate how computers are able to group and present data. Children will be logging on to the computers, opening their documents, and saving their documents.</p>	<p>Within this unit of work children 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. Children consider how to change the look of their text, and will be able to justify their reasoning in making these changes. Children will consider the differences between using a computer to create text, and writing text on paper. Children will be able to explain which method they prefer and explain their reasoning for choosing this.</p>	<p>Within this unit of work children will be introduced to on-screen programming through ScratchJr. Children will explore the way a project looks by investigating sprites and backgrounds. Children will use programming blocks to use, modify, and create programs. Children will design a project using ScratchJr to create algorithms and test whether their algorithms are effective.</p>
<b>Children will...</b>	<ul style="list-style-type: none"> <li>- Know how technology will help in their every day lives.</li> <li>- Know what is and is not technology in their school.</li> </ul>	<ul style="list-style-type: none"> <li>- Know what different freehand tools do.</li> <li>- Know how to use the shape tool and the line tools.</li> </ul>	<ul style="list-style-type: none"> <li>- Know how to explain what a given command will do.</li> <li>- Know how to use specific language when giving a direction.</li> </ul>	<ul style="list-style-type: none"> <li>- Know how to label objects.</li> <li>- Know that objects can be counted before they group them.</li> <li>- Know how to sort objects into groups.</li> </ul>	<ul style="list-style-type: none"> <li>- Know how to use a computer to write</li> <li>- Know how to add and remove text on a computer.</li> </ul>	<ul style="list-style-type: none"> <li>- Know how to navigate thr ScratchJr programme, testing commands and different programming tools.</li> <li>- Know that a series of commands can be joined</li> </ul>

	<ul style="list-style-type: none"> <li>- Know the different components of a computer.</li> <li>- Know how to use a mouse effectively.</li> <li>- Know how to use a keyboard and understand writing on a keyboard is called <b>'typing'</b>.</li> <li>- Know how to save their work using the 'save icon'.</li> <li>- Know to use technology safely and responsibly.</li> </ul> <p><i>See 'Teach Computing' unit overview – Year 1 Technology around us.</i></p>	<ul style="list-style-type: none"> <li>- Know how to make careful choices when painting a digital picture.</li> <li>- Know how to explain their choice of tools they have used.</li> <li>- Know how to use a computer to paint a picture.</li> <li>- Compare painting a picture on a computer and on paper.</li> </ul> <p><i>See 'Teach Computing' unit overview – Year 1 Digital Painting.</i></p>	<ul style="list-style-type: none"> <li>- Know how to combine forwards and backwards commands to make a sequence.</li> <li>- Know how to combine four direction commands to make sequences.</li> <li>- Know how to plan a simple program.</li> </ul> <p><i>See 'Teach Computing' unit overview – Year 1 Moving a Robot.</i></p>	<ul style="list-style-type: none"> <li>- Know how to describe properties of objects (<b>colour and size</b>) and group them based on these properties.</li> <li>- Know how to compare groups of objects.</li> <li>- Know how to group objects in different ways.</li> </ul> <p><i>See 'Teach Computing' unit overview – Year 1 Grouping Data.</i></p>	<ul style="list-style-type: none"> <li>- Know that the look of text can be changed on a computer.</li> <li>- Know how to change text based on personal choices. <b>E.g. – font, size, bold, italics and colour.</b></li> <li>- Know how to explain their choices of certain tools.</li> <li>- Compare writing on a computer with writing on paper.</li> </ul> <p><i>See 'Teach Computing' unit overview – Year 1 Digital Writing.</i></p>	<p>together to run their own programme.</p> <ul style="list-style-type: none"> <li>- Know the effect that changing a value has on their programme.</li> <li>- Know that they can add and delete sprites within ScratchJr.</li> <li>- Become project designers choosing appropriate background and sprite for a 'Space race' project, creating an algorithm that reflects this.</li> </ul> <p><i>See 'Teach Computing' unit overview – Year 1 Programming Animation</i></p>
<p><b>NC Objectives</b></p>	<p>Recognise common uses of information technology beyond school.</p> <p>Use technology purposefully to create, organise, store, manipulate, and retrieve digital content.</p> <p>Use technology safely and respectfully, keeping personal information private; identify where to go for help and support when they have concerns about content or contact on the internet or other online technologies.</p>	<p>Use technology purposefully to create, organise, store, manipulate, and retrieve digital content.</p>	<p>Understand what algorithms are, how they are implemented as programs on digital devices, and that programs execute by following precise and unambiguous instructions.</p> <p>Create and debug simple programs</p> <p>Use logical reasoning to predict the behaviour of simple programs.</p> <p>Recognise common uses of information technology beyond school.</p>	<p>Use technology purposefully to create, organise, store, manipulate, and retrieve digital content.</p> <p>Use technology safely and respectfully.</p>	<p>Use technology purposefully to create, organise, store, manipulate, and retrieve digital content.</p> <p>Use technology safely and respectfully, keeping personal information private.</p>	<p>Understand what algorithms are, how they are implemented as programs on digital devices, and that programs execute by following precise and unambiguous instructions.</p> <p>Create and debug simple programs.</p> <p>Use logical reasoning to predict the behaviour of simple programs.</p>

<b>New Vocabulary</b>	technology, computer, mouse, trackpad, keyboard, screen double-click, typing	paint, program, tool, paintbrush, erase, fill, undo, shape tools, line tool, fill tool, undo tool, colour, brush style, brush size, pictures, painting, computers	Bee-Bot, forwards, backwards, turn, clear, go, commands, instructions, directions, left, right, route, plan, algorithm, program.	object, label, group, search, image, property, colour, size, shape, value, data set, more, less, most, fewest, least, the same	keyboard, keys, letters, type, numbers, space, backspace, text cursor, capital letters, toolbar, bold, italic, underline, mouse, select, font, undo, redo, format, compare, typing, writing.	ScratchJr, command, sprite, compare, programming, area, block, joining, start, run, program, background, delete, reset, algorithm, predict, effect, change, value, instructions, design.
<b>Software &amp; equipment</b>	<ul style="list-style-type: none"> <li>- Desktop Computer</li> <li>- Microsoft Paint</li> </ul>	<ul style="list-style-type: none"> <li>- Desktop computer</li> <li>- Microsoft Paint</li> </ul>	<ul style="list-style-type: none"> <li>- Floor robots (<b>Bee-Bot</b>)</li> <li>- Floor mats</li> </ul>	<ul style="list-style-type: none"> <li>- Desktop Computer</li> </ul>	<ul style="list-style-type: none"> <li>- Desktop Computer</li> <li>- Microsoft Word</li> </ul>	<ul style="list-style-type: none"> <li>- iPads</li> <li>- ScratchJr (iPads)</li> </ul>
<b>Prior learning</b>	<b>In Reception</b> , children have already experienced how to turn a desktop computer on and become familiar with the keyboard and mouse. Children have already had a go at logging in by typing their username and password with adult support.	<b>In the previous unit</b> , children have continued to develop their skills in how to switch a desktop computer on and use usernames and passwords to log into their device. Children have continued to practise using a keyboard and mouse to complete tasks.	<b>In Reception</b> , children have already developed a basic understanding of following instructions and an awareness of instructional language.	<b>In Reception</b> , children have already developed mathematical knowledge of grouping and sorting objects during their play-based learning.	<b>In Reception</b> , children will have explored the components of a computer and that typing on a computer transcribes to text on the screen.	<b>In previous 'Programming A – Moving a Robot' unit</b> , children have already learned to program a floor robot using instructions.

<b>Future Learning</b>	<b>In Year 2</b> , children will continue developing knowledge about IT and become familiar with identifying common features of IT. Children will continue developing knowledge on how to use technology safely and responsibly.	<b>In Year 2</b> , children will further develop their knowledge of 'creating media' through digital photography by capturing, retaking and editing photographs.	<b>In Year 2</b> , children will develop their knowledge by looking at how the order of commands affects outcomes and use this knowledge and logical reasoning to trace programs and predict outcomes.	<b>In Year 2</b> , children will develop their data and information knowledge by presenting data graphically in digital pictograms.	<b>In Year 3</b> , children will further develop their digital writing skills and knowledge during the 'Desktop Publishing' unit. <b>In Year 6</b> , children will even further develop their digital writing skills and knowledge during the 'Web page creation' unit.	<b>In Year 2</b> , children will develop their programming learning further by understanding that sequences of commands have an outcome, and make predictions based on their learning.
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## Whole School Computing Curriculum Overview: Year 2

Year 2	Autumn Term		Spring Term		Summer Term	
	<u>Autumn 1</u>	<u>Autumn 2</u>	<u>Spring 1</u>	<u>Spring 2</u>	<u>Summer 1</u>	<u>Summer 2</u>
<b>E-Safety Focus</b>	<i>Self-Image &amp; Identity</i>	<i>Online Relationships</i>	<i>Online Bullying</i>	<i>Online Reputation</i>	<i>Managing Online Information</i>	<i>Privacy &amp; Security</i>
<b>Unit Overview</b>	<p>Within this unit of work children 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. Children will then investigate how IT improves our world, and they will learn about the importance of using IT responsibly.</p>	<p>Within this unit of work children will learn to recognise that different devices can be used to capture photographs and will gain experience capturing, editing, and improving photos. Children will use this knowledge to recognise that images they see may not be real.</p>	<p>Within this unit of work children will develop understanding of instructions in sequences and the use of logical reasoning to predict outcomes. Children will use given commands in different orders to investigate how the order affects the outcome. Children will also learn about design in programming. Children will develop artwork and test it for use in a program. Children continue to embed their understanding of program design through testing algorithms as programs and debug them.</p>	<p>Within this unit of work children will begin to understand what the term data means and how data can be collected in the form of a tally chart. Children will learn the term 'attribute' and use this to help them organise data. Children will then progress onto presenting data in the form of pictograms and block diagrams. Children will use the data presented to answer questions.</p>	<p>Within this unit of work children will be using a computer to create music. Children will listen to a variety of pieces of music and consider how music can make them think and feel. Children will compare creating music digitally and non-digitally. Children will look at patterns and purposefully create music.</p>	<p>Within this unit of work children initially recap learning from the Year 1 unit 'Programming B – Programming animations'. Children will begin to understand that sequences of commands have an outcome, and make predictions based on their learning. Children use and modify designs to create their own quiz questions in ScratchJr, and realise these designs in ScratchJr using blocks of code. Children will evaluate their work and make improvements to their programming projects.</p>

<p><b>Children will...</b></p>	<ul style="list-style-type: none"> <li>- Develop their understanding of what information technology (IT) is, learning to identify devices that are computers.</li> <li>- Identify examples of IT and be able to explain the purpose of different examples of IT in our school.</li> <li>- Explore IT in environments beyond school and be able to talk about benefits of using information technology.</li> <li>- Understand the importance of using different forms of information technology safely.</li> <li>- Know that IT must be used responsibly.</li> </ul> <p><i>See 'Teach Computing' unit overview – Year 2 IT around us</i></p>	<ul style="list-style-type: none"> <li>- Recognise what devices can be used to take photographs and develop their ability to capture a photograph.</li> <li>- Develop an understanding of how to capture images, learning that a photograph can be taken in portrait or landscape formats.</li> <li>- Discover what constitutes good photography composition and will know how to compose and capture photos of their own.</li> <li>- Understand that light and focus are important aspects of photography and how these can alter the digital image.</li> <li>- Know that a camera flash will alter the image taken by the camera/digital device.</li> <li>- Know that images can be changed for a purpose and develop an awareness that not all images they see are real.</li> </ul> <p><i>See 'Teach Computing' unit overview – Year 2 Digital Photography</i></p>	<ul style="list-style-type: none"> <li>- Understand that instructions come in a sequences and be able to use logical reasoning to predict outcomes.</li> <li>- Follow instructions given to them and give instructions to others, knowing that a series of instructions are a sequence.</li> <li>- Know that language needs to be clear and precise, when considering an algorithm.</li> <li>- Understand sequences of instructions, and consider the importance of the order of instructions within a sequence.</li> <li>- Use logical reasoning to make predictions to predict the outcome of a program.</li> <li>- Design, create, and test a mat for a floor robot.</li> <li>- Design an algorithm, create and debug a program that they have written.</li> </ul> <p><i>See 'Teach Computing' unit overview – Year 2 Robot Algorithms</i></p>	<ul style="list-style-type: none"> <li>- Understand importance of organising data effectively for counting and comparing, creating their own tally charts and pictograms.</li> <li>- Know the advantages of using computers rather than written methods for collecting data.</li> <li>- Compare different data collection methods.</li> <li>- Children will use computing vocabulary to present and explain how they've organised their data electronically.</li> <li>- Children will take part in a project thinking about the ways in which objects can be grouped by attributes.</li> <li>- Know how to present their data using tally charts and pictograms digitally.</li> </ul> <p><i>See 'Teach Computing' unit overview – Year 2 Pictograms</i></p>	<ul style="list-style-type: none"> <li>- Listen to and consider different pieces of music both digital and non-digital.</li> <li>- Explore how music makes them feel, explore rhythm and patterns.</li> <li>- Know how to use Chrome Music Lab to create music using '<b>song maker tool</b>'.</li> <li>- Experiment with pitch of notes using a computer, creating their own piece of music.</li> <li>- Use their imagination to relate a piece of music to physical object. <b>E.g. – Animal.</b></li> <li>- Know how to use a computer to create and refine musical patterns, using Chrome Lab Music.</li> <li>- Review and edit their pieces of music, making improvements.</li> </ul> <p><i>See 'Teach Computing' unit overview – Year 2 Digital Music</i></p>	<ul style="list-style-type: none"> <li>- Use ScratchJr to identify the start of sequences and that a sequence of commands has a start.</li> <li>- Know that a sequence of commands has an outcome.</li> <li>- Be able to predict the outcome of a sequence of commands.</li> <li>- Know that they can change the outcome of a sequence of commands by editing the sequence.</li> <li>- Know how to change background from a range of predefined designs to create an animation based on the season.</li> <li>- Create a program based on a new design, choosing backgrounds and characters.</li> <li>- Create an algorithm and build sequences of blocks to match their design.</li> <li>- Reflect on design choices and evaluate any improvements needed.</li> </ul> <p><i>See 'Teach Computing' unit overview – Year 2 Programming quizzes</i></p>
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<p><b>NC Objectives</b></p>	<p>Recognise common uses of information technology beyond school. Use technology purposefully to create, organise, store, manipulate, and retrieve digital content. Use technology safely and respectfully, keeping personal information private; identify where to go for help and support when they have concerns about content or contact on the internet or other online technologies.</p>	<p>Use technology purposefully to create, organise, store, manipulate, and retrieve digital content. Recognise common uses of information technology beyond school. Use technology safely and respectfully, keeping personal information private; identify where to go for help and support when they have concerns about content or contact on the internet or other online technologies.</p>	<p>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>use technology purposefully to create, organise, store, manipulate and retrieve digital content. use technology safely and respectfully, keeping personal information private; identify where to go for help and support when they have concerns about content or contact on the internet or other online technologies.</p>	<p>Use technology purposefully to create, organise, store, manipulate, and retrieve digital content.</p>	<p>Understand what algorithms are; how they are implemented as programs on digital devices; and that programs execute by following precise and unambiguous instructions. Create and debug simple programs. Use logical reasoning to predict the behaviour of simple programs. Use technology purposefully to create, organise, store, manipulate and retrieve digital content.</p>
<p><b>New Vocabulary</b></p>	<p>technology, computer, mouse, trackpad, keyboard, screen, double-click, typing</p>	<p>device, camera, photograph, capture, image, digital, landscape, portrait, framing, subject, compose, light sources, flash, focus, background, editing, filter, format, framing, lighting,</p>	<p>instruction, sequence, clear, unambiguous, algorithm, program, order, prediction, artwork, design, route, mat, debugging, decomposition</p>	<p>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</p>	<p>music, quiet, loud, feelings, emotions, pattern, rhythm, pulse, pitch, tempo, rhythm, notes, create, emotion, beat, instrument, open, edit.</p>	<p>sequence, command, program, run, start, outcome, predict, blocks, design, actions, sprite, project, modify, change, algorithm, build, match, compare, debug, features, evaluate, decomposition, code.</p>
<p><b>Software &amp; equipment</b></p>		<ul style="list-style-type: none"> <li>- iPad</li> <li>- Desktop computers</li> <li>- Pixlr Editor - Click <a href="#">here</a></li> <li>-</li> </ul>		<ul style="list-style-type: none"> <li>- Desktop computers</li> <li>- J2e Pictogram tool – Click <a href="#">Here</a></li> </ul>	<ul style="list-style-type: none"> <li>- Desktop computers.</li> <li>- Headphones</li> <li>- Chrome Music Lab – Click <a href="#">here</a></li> </ul>	<ul style="list-style-type: none"> <li>- iPads</li> <li>- ScratchJr (iPads)</li> </ul>

<p><b>Prior Learning</b></p>	<p><b>In Year 1</b>, children have already explored technology specifically looking at components of a computer and how they interact with it. Children have already considered how to use technology responsibly and safely.</p>	<p><b>In Year 1</b>, children have already experienced how to switch a desktop computer on and use usernames and passwords to log into their device. Children have already used a keyboard and mouse to complete tasks and know how to save their work following the correct steps.</p>	<p><b>In Year 1</b>, children have had some experience of creating short programs using floor robots (Bee-Bot) predicting the outcome of a simple program.</p>	<p><b>In Year 1</b>, children have already labelled objects and grouped them based on different properties.</p>	<p><b>In Year 1</b>, children have already learnt that writing on a computer is called 'typing' and how to write their own name. Children are becoming more confident at switching their device on and using usernames and passwords to log into their device.</p>	<p><b>In Year 1</b>, Children have already explored on-screen programming through ScratchJr. Children have already used programming blocks to modify and create programs.</p>
<p><b>Future Learning</b></p>	<p><b>In Year 3</b>, children will develop their knowledge of computer systems &amp; networks further by exploring digital and non-digital devices and becoming familiar with computers connected together as a network.</p>	<p><b>In Year 3</b>, children will use knowledge of using digital devices to create media to make stop-frame animations. <b>In Year 4</b>, children will develop their photo editing skills during the 'Photo Editing' unit.</p>	<p><b>In Year 3</b>, children will further develop their knowledge of programming through the concept of 'sequencing'.</p>	<p><b>In Year 3</b>, children will develop their understanding of attributes (properties) using branching databases to structure data according to different object attributes.</p>	<p><b>In Year 3</b>, children will develop knowledge and understanding of using digital devices to combine text and images building on work from <b>KS1</b>.</p>	<p><b>In Year 3</b>, children will continue to develop and embed their existing programming knowledge with the introduction of 'pen blocks'.</p>

# Whole School Computing Curriculum Overview: Year 3

Year 3	Autumn Term		Spring Term		Summer Term	
	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
	Computing systems and networks – <i>Connecting computers</i>	Creating media – <i>Stop-frame animation</i>	Programming A – <i>Sequencing sounds</i>	Data and information – <i>Branching data bases</i>	Creating media – <i>Desktop publishing</i>	Programming B – <i>Events and actions in programs</i>
E-Safety Focus	<i>Self-Image &amp; Identity</i>	<i>Online Relationships</i>	<i>Online Bullying</i>	<i>Online Reputation</i>	<i>Managing Online Information</i>	<i>Privacy &amp; Security</i>
Unit Overview	<p>Within this unit children 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. Children will be introduced to computer networks, including devices that make up a network's infrastructure, such as wireless access points and switches. Children will discover the benefits of connecting devices in a network.</p>	<p>Within this unit, children will use a range of techniques to create a stop-frame animation using tablets. Then, children will apply those skills to create a story-based animation. This unit will conclude with children adding other types of media to their animation, such as music and text.</p>	<p>Within this unit, children explore 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.</p>	<p>Within this unit children 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. Children 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.</p>	<p>Within this unit, children will become familiar with the terms 'text' and 'images' and understand that they can be used to communicate messages. They will use desktop publishing software and consider careful choices of font size, colour and type to edit and improve premade documents. Children will be introduced to publishing vocabulary and begin to understand how these can support them in making their own template for a magazine front cover.</p>	<p>Within this unit children explore the links between events and actions, while consolidating prior learning relating to sequencing. Children 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. Children are given the opportunity to draw lines with sprites and change the size and colour of lines. The unit concludes with children designing and coding their own maze-tracing program.</p>
Children will...	<ul style="list-style-type: none"> <li>- Know how digital devices function by understanding the concepts of input, process and output.</li> <li>- Be able to identify input and output devices.</li> <li>- Know the relationship between input processes and outputs.</li> </ul>	<ul style="list-style-type: none"> <li>- Know that animation is sequence of drawings or photographs.</li> <li>- Learn simple animation techniques to create their own animations.</li> <li>- Relate animated movement with a sequence of images.</li> <li>- Undertake a project to plan, develop and review an stop-frame animation.</li> </ul>	<ul style="list-style-type: none"> <li>- Explore the concept of sequencing in programming through Scratch.</li> <li>- Compare Scratch to other programming environments they may have experienced.</li> <li>- Know how to create movement for more than one sprite.</li> </ul>	<ul style="list-style-type: none"> <li>- Further develop their knowledge of data collection about a question or object.</li> <li>- Understand ordering objects / images into branching database structure</li> <li>- Know how to use database online tool to arrange objects into a branching data base.</li> </ul>	<ul style="list-style-type: none"> <li>- Know how text and images convey and communicate information.</li> <li>- Recognise that text and layout can be edited when publishing. <b>E.g. – Choices of font size and colour</b></li> <li>- Know how to choose appropriate page settings.</li> </ul>	<ul style="list-style-type: none"> <li>- Investigate how a sprite moves using existing knowledge.</li> <li>- Learn to program a sprite's movement in four directions (<b>up, down, left and right</b>).</li> <li>- Know how to manipulate their sprite so it is suitable for a given project. <b>E.g. –</b></li> </ul>

	<ul style="list-style-type: none"> <li>- Recognise how digital devices change the way we work.</li> <li>- Develop an understanding how a computer network can share information. <b>E.g. – computers through wires, tablets through WiFi and smartphones through mobile phone networks.</b></li> <li>- Explore how digital devices can be connected, including a server and wireless access points.</li> <li>- Recognise physical components of a network by seeing examples of a network infrastructure in a real world setting.</li> </ul> <p><i>See 'Teach Computing' unit overview – Year 3 Connecting computers</i></p>	<ul style="list-style-type: none"> <li>- Know how to add other media to their animations. <b>E.g. – music and text.</b></li> </ul> <p><i>See 'Teach Computing' unit overview – Year 3 Stop-frame animation</i></p>	<ul style="list-style-type: none"> <li>- Understand the concept of sequences by joining blocks of code together and recognise that a sequence of commands can have an order.</li> <li>- Understand how to combine motion and sounds in one sequence.</li> <li>- Create their own project, including sequences, sprites with costumes, and multiple backdrops.</li> <li>- Know how to create a musical instrument in Scratch.</li> </ul> <p><i>See 'Teach Computing' unit overview – Year 3 Sequencing sounds</i></p>	<ul style="list-style-type: none"> <li>- Test the effectiveness of their branching database.</li> <li>- Explain why it is helpful for a database to be well structured.</li> <li>- Undertake a project to create a branching database, <b>E.g. - Identifying different types of dinosaurs.</b></li> <li>- Work collaboratively to test whether their database works.</li> </ul> <p><i>See 'Teach Computing' unit overview – Year 3 Branching databases</i></p>	<ul style="list-style-type: none"> <li>- Learn how to add their own content to a given template. <b>E.g. – Magazine template</b></li> <li>- Make their own choices when desktop publishing for a given purpose.</li> <li>- Understand the benefits of desktop publishing.</li> </ul> <p><i>See 'Teach Computing' unit overview – Year 3 Desktop publishing</i></p>	<p><b>character, size and movement.</b></p> <ul style="list-style-type: none"> <li>- Begin to draw lines in ScratchJr using the pen down block.</li> <li>- Explore the functions of new blocks and experiment with them.</li> <li>- Know how to add new blocks to their own projects and test their effectiveness.</li> <li>- Know the process of 'debugging' and how to fix errors in a program.</li> <li>- Create their own project (<b>designing a maze</b>) and move a sprite around the maze leaving a pen trail.</li> </ul> <p><i>See 'Teach Computing' unit overview – Year 3 Events &amp; actions in programmes</i></p>
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<p><b>NC Objectives</b></p>	<p>Use sequence, selection, and repetition in programs; work with variables and various forms of input and output. 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.</p> <p>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.</p>	<p>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</p> <p>use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact.</p>	<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> <p>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.</p> <p>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.</p>	<p>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</p> <p>use technology safely, respectfully and responsibly</p>	<p>Use search technologies effectively, appreciate how results are selected and ranked, and be discerning in evaluating digital content.</p> <p>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</p>	<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> <p>Use sequence, selection, and repetition in programs; work with variables and various forms of input and output</p> <p>Use logical reasoning to explain how some simple algorithms work and to detect and correct errors in algorithms and programs.</p> <p>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.</p>
<p><b>New Vocabulary</b></p>	<p>digital device, input, process, output, program, digital, non-digital, connection, network, switch, server, wireless access point, cables, sockets</p>	<p>animation, flip book, stopframe, frame, sequence, image, photograph, setting, character, events, onion skinning, consistency, evaluation, delete, media, import, transition.</p>	<p>Scratch, programming, blocks, commands, code, sprite, costume, stage, backdrop, motion, turn, point in direction, go to, glide, sequence, event, task, design, run the code, order, note, chord, algorithm, bug, debug, code.</p>	<p>attribute, value, questions, table, objects, branching, database, objects, equal, even, separate, structure, compare, order, organise, selecting, information, decision tree.</p>	<p>text, images, advantages, disadvantages, communicate, font, style, landscape, portrait, orientation, placeholder, template, layout, content, desktop publishing, copy, paste, purpose, benefits.</p>	<p>motion, event, sprite, algorithm, logic, move, resize, extension block, pen up, set up, pen, design, action, debugging, errors, setup, code, test, debug, actions.</p>
<p><b>Software &amp; equipment</b></p>	<ul style="list-style-type: none"> <li>- Desktop computer</li> <li>- Paint (Mirosoft)</li> </ul>	<ul style="list-style-type: none"> <li>- iPad</li> <li>- iMotion</li> </ul>	<ul style="list-style-type: none"> <li>- Desktop computer</li> <li>- iPads</li> <li>- ScratchJr</li> </ul>	<ul style="list-style-type: none"> <li>- Desktop computers?</li> <li>- J2E.com (Branching databases) – Click <a href="#">here</a></li> </ul>	<ul style="list-style-type: none"> <li>-Desktop computers</li> <li>- Canva for Education Click <a href="#">here</a></li> </ul>	<ul style="list-style-type: none"> <li>- Desktop computer</li> <li>- ScratchJr</li> </ul>

<b>Prior Learning</b>	In <b>KS1</b> , children have developed an understanding of types of technology both in school and the wider world.	In <b>KS1</b> , children have developed some knowledge and understanding using digital devices to create media.	In <b>KS1</b> , children have some knowledge of programming through floor robots and ScratchJr during previous taught units.	In <b>KS1</b> , children have explored attributes and how to group data based on them. Children have explored how to present a given set of data digitally through tally charts and pictograms.	In <b>KS1</b> , children have an understanding of how to use digital devices to create and manipulate text and images.	In <b>KS1</b> , children have experience of programming a 'Bee Bot' and understand that sequences of commands have an outcome. <b>In Year 3 'Programming A'</b> children have been introduced to the concept of sequences using ScratchJr.
<b>Future Learning</b>	In <b>Year 4</b> , children will apply their knowledge of networks to learn that the internet is a network which needs to be kept secure.	In <b>Year 5</b> , children will further develop their video editing skills during the 'Video Production' unit.	In <b>Year 4</b> , children will progress to developing an understanding of programming with count controlled loops.	In <b>Year 4</b> , children will consider how and why data is collected over time. Children will collect a set of data collected over longer periods of time looking at data points, data sets and logging intervals.	In <b>Year 4</b> , children will develop their understanding of how digital images can be changed and edited.	In <b>Year 4</b> , children will explore the concept of repetition in programming using the Scratch environment.

## Whole School Computing Curriculum Overview: Year 4

Year 4	Autumn Term		Spring Term		Summer Term	
	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
<b>E-Safety Focus</b>	<i>Self-Image &amp; Identity</i>	<i>Online Relationships</i>	<i>Online Bullying</i>	<i>Online Reputation</i>	<i>Managing Online Information</i>	<i>Privacy &amp; Security</i>
<b>Unit Overview</b>	Within this unit, children 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 owns content and	Within this unit, children will identify the input device (microphone) and output devices (speaker or headphones) required to work with sound digitally. Children will discuss the ownership of digital audio and the copyright implications of duplicating the work of others. In order to record audio themselves, children will use Audacity to	Within this unit, children will create programs by planning, modifying, and testing commands to create shapes and patterns. Children 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.	Within this unit children will consider how and why data is collected over time. Children 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. Children will collect data as well as	Within this unit, children will develop their understanding of how digital images can be changed and edited. They will consider the impact that editing images can have, and evaluate the effectiveness of their choices. Children will manipulate digital images for given purposes.	Within this unit, children will explore the concept of repetition in programming using the Scratch environment. Children look at the difference between count-controlled and infinite loops, and use their knowledge to modify existing animations and games using repetition. Their final project is to

	<p>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>produce a podcast, which will include editing their work, adding multiple tracks, and opening and saving the audio files. Children will evaluate their work and give feedback to their peers.</p>		<p>access data captured over long periods of time. They will look at data points, data sets, and logging intervals. Children will spend time using a computer to review, analyse and question data.</p>		<p>design and create a game which uses repetition, applying stages of programming design throughout.</p>
<p><b>Children will...</b></p>	<ul style="list-style-type: none"> <li>- Know how networks physically connect to other networks.</li> <li>- Explore how a network can share messages with another network to form the internet.</li> <li>- Recognise how networked devices make up the internet.</li> <li>- Explore what can be shared on World Wide Web and where websites are stored.</li> <li>- Know how content can be added and accessed on the World Wide Web.</li> <li>- Understand what factors they should consider before adding content to a website.</li> <li>- Use a website to create their own content online. <b>E.g. – Chrome Music Lab</b></li> <li>- Understand that not everything they see is true, honest or accurate.</li> <li>- Evaluate the consequence of unreliable content.</li> </ul> <p><i>See 'Teach Computing' unit overview – Year 4 The internet</i></p>	<ul style="list-style-type: none"> <li>- Understand the input devices used to record sound and the output devices needed to listen.</li> <li>- Know that sound can be recorded. <b>E.g. – record their voices using a computer/ microphone.</b></li> <li>- Know that audio recordings can be edited.</li> <li>- Recognise the different parts of creating a podcast and undertake this as a project.</li> <li>- Apply audio editing skills to combine audio to enhance a podcast project.</li> <li>- Evaluate the effectiveness of their podcast project.</li> </ul> <p><i>See 'Teach Computing' unit overview – Year 4 Audio production</i></p>	<ul style="list-style-type: none"> <li>- Know how to create programs by planning, modifying, and testing commands to create shapes and patterns.</li> <li>- Create algorithms (a precise set of ordered instructions, which can be turned into code) for their initials.</li> <li>- Consider examples of patterns in everyday life, recognising where numbers, shapes, and symbols are repeated, and how many times repeats occur.</li> <li>- Understand count-controlled loops, initially for real-life examples, then moving on to using count-controlled loops in regular 2D shapes.</li> <li>- Learn about decomposition, they will break down everyday tasks into smaller parts and how code snippets can be broken down to make them easier to plan and work with.</li> </ul>	<ul style="list-style-type: none"> <li>- Consider what data can be collected over time.</li> <li>- Know that some questions can be answered using data.</li> <li>- Know that data can be collected automatically by computers. <b>E.g. – 'data loggers'.</b></li> <li>- Know that computers capture data from the physical world using input devices called 'sensors'.</li> <li>- Understand that sensors don't always have to be attached to a computer to collect data.</li> <li>- Be able to analyse data collected over time.</li> <li>- Be able to pose a question and plan the data logging process to answer this question.</li> <li>- Set-up data loggers to gather their data</li> </ul>	<ul style="list-style-type: none"> <li>- Know that the composition of digital images can be changed. <b>E.g. – rotating or cropping an image.</b></li> <li>- Experiment with the concept of 'recolouring' an image, exploring different colours and filters.</li> <li>- Know how to change the composition of an image. <b>E.g. – retouching, cloning and removing parts of an image.</b></li> <li>- Experiment with software tools to combine multiple images.</li> <li>- Consider when it's appropriate to edit an image.</li> <li>- Discuss some of the ethics around retouching photos.</li> <li>- Know that not all images are real.</li> </ul> <p><i>See 'Teach Computing' unit overview – Year 4 Photo editing</i></p>	<ul style="list-style-type: none"> <li>- Understand the use of count-controlled loops in a programming environment.</li> <li>- Know that in programming there are different types of loops. <b>E.g. – infinite loops and count-controlled loops, practising these within Scratch Jr</b></li> <li>- Create a design using two or more loops that run at the same time.</li> <li>- Know how to modify an infinite loop in a given program.</li> <li>- Design a project that includes repetition. <b>E.g. – designing, building and evaluating their own game.</b></li> </ul> <p><i>See 'Teach Computing' unit overview – Year 4 Repetition in games</i></p>

			<ul style="list-style-type: none"> <li>- Create their own program containing a count-controlled loop.</li> </ul> <p><i>See 'Teach Computing' unit overview – Year 4 Repetition in shapes</i></p>	<p>for analysis and review.</p> <p><i>See 'Teach Computing' unit overview – Year 4 Data logging</i></p>		
<p><b>NC Objectives</b></p>	<p>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.</p> <p>Use search technologies effectively, appreciate how results are selected and ranked, and be discerning in evaluating digital content.</p> <p>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.</p> <p>Use technology safely, respectfully, and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact.</p>	<p>Use search technologies effectively, appreciate how results are selected and ranked, and be discerning in evaluating digital content.</p> <p>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.</p> <p>Use technology safely, respectfully, and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact.</p>	<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> <p>Use sequence, selection, and repetition in programs; work with variables and various forms of input and output.</p> <p>Use logical reasoning to explain how some simple algorithms work and to detect and correct errors in algorithms and programs.</p> <p>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.</p>	<p>Use sequence, selection, and repetition in programs; work with variables and various forms of input and output.</p> <p>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.</p>	<p>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.</p> <p>Use technology safely, respectfully, and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact.</p>	<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> <p>Use sequence, selection, and repetition in programs; work with variables and various forms of input and output.</p> <p>Use logical reasoning to explain how some simple algorithms work, and to detect and correct errors in algorithms and programs.</p> <p>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,</p>

						evaluating and presenting data and information.
<b>New 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.
<b>Software &amp; equipment</b>	<ul style="list-style-type: none"> <li>- Desktop computers, laptops or iPads.</li> <li>- Chrome Music Lab</li> <li>- Various websites (<b>teacher to make the informed judgement on what is appropriate</b>)</li> </ul>	<ul style="list-style-type: none"> <li>- Desktop computers or laptops</li> <li>- Microphones</li> <li>- Headphones</li> </ul> <p>and the free program Audacity (<a href="https://audacityteam.org/download">https://audacityteam.org/download</a>) ?</p>	<ul style="list-style-type: none"> <li>- Desktop computers or laptops</li> <li>- <a href="https://fmslogo.sourceforge.io/">https://fmslogo.sourceforge.io/</a> ( FMS Logo , Jan to look at and download software?)</li> </ul>		<ul style="list-style-type: none"> <li>- Desktop computer</li> <li>- Paint.NET (Microsoft Windows)</li> </ul>	<ul style="list-style-type: none"> <li>- Desktop computers or laptop</li> <li>- Scratch – Click <a href="#">here</a></li> </ul>
<b>Prior Learning</b>	<b>In Year 3</b> , children have developed knowledge and understanding of networks.	<b>In Year 3</b> , children have developed knowledge and understanding of creating media when completing their stop-frame animation.	<b>In Year 3</b> , children have become familiar with the concept of programming in a sequence.	<b>In KS1</b> , children have explored attributes and how to group data based on them. Children have explored how to present a given set of data digitally through tally charts and pictograms. <b>In Year 3</b> , children have explored how data can be used to answer questions using an online branching database.	<b>In KS1</b> , children have used different devices to capture photographs and had experience of capturing, editing and improving photos. <b>In Year 3</b> , children have further developed their KS1 knowledge by capturing and editing digital still images to produce a stop-frame animations.	<b>In KS1</b> , children have already learnt on-screen programming through floor robots and ScratchJr. <b>In Year 3</b> , children were introduced to using Scratch.

<b>Future Learning</b>	<b>In Year 5</b> , children will continue to develop their knowledge and understanding of computing systems and online collaborative working.	<b>In Year 5</b> , children will explore combining audio with video in the <b>'video editing'</b> unit.	<b>In Year 5</b> , children will explore combining	<b>In Year 5</b> , children will build on the knowledge of automatic data collection learning about flat file databases. <b>In Year 6</b> , this will progress to spreadsheets.	<b>In Year 5</b> , children will further develop their image editing skills, creating vector drawings.	<b>In Year 5</b> , children will develop their understanding of programming through the use of algorithms.
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# Whole School Computing Curriculum Overview: Year 5

Year 5	Autumn Term		Spring Term		Summer Term	
	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
	Computing systems and networks – <i>Systems and searching</i>	Creating media – <i>Video production</i>	Programming A – <i>Selection in physical computing</i>	Data and information – <i>Flat-file databases</i>	Creating media – <i>Introduction to vector graphics</i>	Programming B – <i>Selection in quizzes</i>
E-Safety Focus	<i>Self-Image &amp; Identity</i>	<i>Online Relationships</i>	<i>Online Bullying</i>	<i>Online Reputation</i>	<i>Managing Online Information</i>	<i>Privacy &amp; Security</i>
Unit Overview	<p>Within this unit, children develop their understanding of computer systems and how information is transferred between systems and devices. Children 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. Children 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>Within this unit, children 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. Children are guided with step-by-step support to take their idea from conception to completion. At the conclusion of the unit, children have the opportunity to reflect on and assess their progress in creating a video.</p>	<p>Within this unit, children 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.</p>	<p>Within this unit, children will look at how a flat-file database can be used to organise data in records. Children 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>Within this unit, children start to create vector drawings. They learn how to use different drawing tools to help them create images. Children recognise that images in vector drawings are created using shapes and lines, and each individual element in the drawing is called an object. Children layer their objects and begin grouping and duplicating them to support the creation of more complex pieces of work.</p>	<p>Within this unit children 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.</p>
Children will...	<ul style="list-style-type: none"> <li>- Begin to understand the concept of a system and that components can work together to perform a task</li> <li>- Know that computers can be connected together to form systems.</li> <li>- Know the function of a search engine.</li> </ul>	<ul style="list-style-type: none"> <li>- Know that video is a media format and can explain what makes a video effective.</li> <li>- Use a digital device to record a video.</li> <li>- Consider different camera angles and how they can be used for different purposes.</li> <li>- Capture a video using a range of techniques.</li> </ul>	<ul style="list-style-type: none"> <li>- Explore the concept of selection in programming.</li> <li>- Understand how to control a simple circuit connected to a computer.</li> <li>- Develop an understanding of how to use infinite loops.</li> <li>- Know how to design sequences of actions to</li> </ul>	<ul style="list-style-type: none"> <li>- Know how to create a data set about a set theme. <b>E.g. – Animals</b></li> <li>- Know how to compare paper and computer based data bases.</li> <li>- Know that a database consists of records and each record contains 'fields'.</li> <li>- Know how to use grouping and sorting to</li> </ul>	<ul style="list-style-type: none"> <li>- Know that drawing tools can be used to produce different outcomes.</li> <li>- Know that vector drawings are made up of simple shapes and lines.</li> <li>- Know how to create a vector drawing by combining shapes, moving, resizing,</li> </ul>	<ul style="list-style-type: none"> <li>- Know how selection is used in computer programs.</li> <li>- Know how conditions are used to control the flow of actions in a program.</li> <li>- Know a conditional statement connects a condition to an outcome. <b>E.g. – if... then... else...' structure</b></li> </ul>

	<ul style="list-style-type: none"> <li>- Know how to use a search engine, gaining an understanding of why search engines are important.</li> <li>- Know how search engines select results.</li> <li>- Explore how search results are ranked. Recognise why the order of results is important and to whom.</li> </ul> <p><i>See 'Teach Computing' unit overview – Year 5 Systems and searching</i></p>	<ul style="list-style-type: none"> <li>- Undertake a project to create a video using multiple scenes, using editing techniques.</li> <li>- Evaluate the impact of their choices when making and sharing a video.</li> </ul> <p><i>See 'Teach Computing' unit overview – Year 5 Video production</i></p>	<ul style="list-style-type: none"> <li>- connect a Sparkle and a motor to the Crumble controller.</li> <li>- Learn about conditions, and how they can be used in programs to control their flow.</li> <li>- Understand how the flow of actions in algorithms and programs can be controlled by conditions.</li> <li>- Understand how to run their programs to identify any bugs, and then return to the code or algorithm to debug it where necessary.</li> </ul> <p><i>See 'Teach Computing' unit overview – Year 5 Selection in physical computing</i></p>	<ul style="list-style-type: none"> <li>- answer questions about data.</li> <li>- Know that tools can be used to select specific data.</li> <li>- Know that computer programs can be used to compare visually and be able to refine a chart by selecting a particular filter.</li> <li>- Use a real-life database to ask questions and find answers. <b>E.g. – A flight search base.</b></li> </ul> <p><i>See 'Teach Computing' unit overview – Year 5 Flat-file databases</i></p>	<ul style="list-style-type: none"> <li>- rotating and changing colours.</li> <li>- Explore different tools to achieve a desired effect, increasing complexity of their vector drawing.</li> <li>- Know that vector drawings consist of layers and explore how to build layers within their drawing.</li> <li>- Explore grouping and duplicating objects.</li> <li>- Create vector drawings for a given purpose.</li> </ul> <p><i>See 'Teach Computing' unit overview – Year 5 Introduction to vector graphics</i></p>	<p><b>in algorithms and programs.</b></p> <ul style="list-style-type: none"> <li>- Apply their knowledge to write their own program with two outcomes.</li> <li>- Know that the answer to a question is the 'condition', and use algorithms with a branching structure to represent the action.</li> <li>- Design, create and evaluate a program that uses selection.</li> </ul> <p><i>See 'Teach Computing' unit overview – Year 5 Selection in quizzes</i></p>
<p><b>NC Objectives</b></p>	<p>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.</p> <p>Use search technologies effectively, appreciate how results are selected and ranked, and be discerning in evaluating digital content.</p>	<p>Use search technologies effectively, appreciate how results are selected and ranked, and be discerning in evaluating digital content.</p> <p>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.</p> <p>Use technology safely, respectfully, and responsibly; recognise</p>	<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> <p>Use sequence, selection, and repetition in programs; work with variables and various forms of input and output.</p> <p>Use logical reasoning to explain how some simple algorithms work and to detect and correct errors in algorithms and programs.</p>	<p>Use search technologies effectively, appreciate how results are selected and ranked, and be discerning in evaluating digital content.</p> <p>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,</p>	<p>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.</p>	<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> <p>use sequence, selection, and repetition in programs; work with variables and various forms of input and output.</p> <p>use logical reasoning to explain how some simple algorithms work and to detect and correct errors in algorithms and programs.</p>

		acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact.	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.	evaluating, and presenting data and information.		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
<b>New Vocabulary</b>	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	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.	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	database, data, information, record, field, sort, order, group, search, value, criteria, graph, chart, axis, compare, filter, presentation.	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	Selection, condition, true, false, count-controlled loop, outcomes, conditional statement, algorithm, program, debug, question, answer, task, design, input, implement, test, run, setup, operator
<b>Software &amp; equipment</b>	- Desktop computer or laptop	- iPads - iMovie (IOS)		- Desktop computer - Database – Click <a href="#">here</a>	- Desktop Computers - Google drawings ? - Vectr – Click <a href="#">here</a>	- Desktop computers Scratch – Click <a href="#">here</a>

	- Google slides – Click <a href="#">here</a>				- Microsoft Visio	
<b>Prior Learning</b>	In <b>LKS2</b> , children have developed knowledge and understanding of computing systems including how devices can be connected to make networks and the internet as a network of networks.	In <b>LKS2</b> , children have experienced photo editing and stop-frame animation. This allowed children to explore some features of video production.	In <b>Year 4</b> , children have already been introduced to count-controlled loops and commands.	In <b>LKS2</b> , children have learnt to present data using branching database. Children have used data loggers to capture data over a period of time.	In <b>LKS2</b> , children developed knowledge and understanding of digital images through desktop publishing.	In <b>previous years</b> , children have experienced using block-based construction (e.g. – Scratch) understanding concepts of ‘sequence’ ‘repetition’ and ‘selection’.
<b>Future Learning</b>	In <b>Year 6</b> , children will explore how data is transferred over the internet.	In <b>Year 6</b> , children will develop knowledge of creating media to design their own webpage.	In <b>Year 6</b> , children will	In <b>Year 6</b> , children will progress their understanding of organising data digitally by learning to use spreadsheets to present data.	In <b>Year 6</b> , children will be introduced to the concept of 3D digital modelling using a computer.	In <b>Year 6</b> , children will bring together all 4 programming constructs from their KS2 programming learning.

## Whole School Computing Curriculum Overview: Year 6

Year 6	Autumn Term		Spring Term		Summer Term	
	<u>Autumn 1</u>	<u>Autumn 2</u>	<u>Spring 1</u>	<u>Spring 2</u>	<u>Summer 1</u>	<u>Summer 2</u>
	<b>Computing systems and networks – Communication and collaboration</b>	<b>Creating media – Webpage 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>E-Safety Focus</b>	<b><i>Self-Image &amp; Identity</i></b>	<b><i>Online Relationships</i></b>	<b><i>Online Bullying</i></b>	<b><i>Online Reputation</i></b>	<b><i>Managing Online Information</i></b>	<b><i>Privacy &amp; Security</i></b>
<b>Unit Overview</b>	Within this unit, children will explore how data is transferred over the internet. Children will initially focus on addressing, before they move on to the makeup and structure of data packets. Children then look at how the internet facilitates online communication and collaboration; they complete shared projects online and evaluate different methods of communication. Children will learn how to communicate responsibly by considering what should and	Within this unit children will be introduced to creating websites for a chosen purpose. Children identify what makes a good web page and use this information to design and evaluate their own website using Google Sites. Throughout the process, children pay specific attention to copyright and fair use of media, the aesthetics of the site, and navigation paths.	Within this unit, children explore the concept of variables in programming through games in Scratch. Children find out what variables are and relate them to real-world examples of values that can be set and changed. Children use variables to create a simulation of a scoreboard. Children experiment with variables in an existing project, then modify them, before they create their own project.	Within this unit, children are introduced to spreadsheets. Children will be supported in organising data into columns and rows to create their own data set. Children 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. Children will be taught how to apply formulas that include a range of cells, and apply formulas to multiple cells by duplicating them. Children will use	Within this unit, children will develop their knowledge and understanding of using a computer to produce 3D models. Children 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 objects. Children 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.	Within this unit, children will bring together learnt elements of all the four programming constructs: <b>sequence from Year 3, repetition from Year 4, selection from Year 5, and variables (introduced in Year 6 – ‘Programming A’.</b> Children have the opportunity to use all of these constructs in a different, but still familiar environment, while also utilising a physical device. <b>E.g. - The micro:bit.</b>

	should not be shared on the internet.			spreadsheets to plan an event and answer questions.		
Children will...	<ul style="list-style-type: none"> <li>- Understand the importance of internet addresses.</li> <li>- Explore what is necessary for effective communication.</li> <li>- Recognise how data is transferred across the internet by introducing the concept of 'packets'.</li> <li>- Create a collaborative online project. <b>E.g. – make simple slides, include text and images.</b></li> <li>- Deepen their understanding of 'communication', by understanding that there a variety of ways to communicate over the internet.</li> </ul> <p><i>See 'Teach Computing' unit overview – Year 6 Communication and collaboration</i></p>	<ul style="list-style-type: none"> <li>- Explore and review existing websites and consider their structures.</li> <li>- Plan features of a webpage and the different layout features available.</li> <li>- Understand the terms 'fair use' and 'copyright', considering the ownership and use of images.</li> <li>- Create their own webpage and recognise the need to preview pages.</li> <li>- Know that there is a need to plan the structure of a webpage carefully, outlining the need for a navigation path.</li> <li>- Know what a navigation path is.</li> <li>- Learn how to link content owned by other people by creating hyperlinks.</li> </ul> <p><i>See 'Teach Computing' unit overview – Year 6 Webpage creation</i></p>	<ul style="list-style-type: none"> <li>- Explore the concept of variables in programming through games in Scratch.</li> <li>- Understand variables, exploring examples of real-world before they explore them in a Scratch project.</li> <li>- Understand that variables are used in programs, and that they can only hold a single value at a time.</li> <li>- Apply the concept of variables to enhance an existing game in Scratch.</li> <li>- Consider the 'design' level of abstraction, where they create their artwork and algorithms in a project.</li> <li>- Progress to design the sprites and backgrounds for their project, then design algorithms to create their program flow.</li> </ul> <p><i>See 'Teach Computing' unit overview – Year 6 Variables in games</i></p>	<ul style="list-style-type: none"> <li>- Collect and organise data, exploring how to structure in a table.</li> <li>- Know how to input data into a spreadsheet.</li> <li>- Develop their understanding of spreadsheets. <b>E.g. structure, cell references, data items and concept of formatting cells.</b></li> <li>- Begin to understand formulas to produce calculated data and construct a formula in spreadsheets.</li> <li>- Know the advantage of duplicating in order to apply formulas to multiple cells.</li> <li>- Undertake a project to calculate a cost of an event.</li> </ul> <p><i>See 'Teach Computing' unit overview – Year 6 Introduction to spreadsheets</i></p>	<ul style="list-style-type: none"> <li>- Know how to create an account on 'Tinkercad' in order to access this unit.</li> <li>- Know that you can work in 3 dimensions using a computer.</li> <li>- Create a range of 3D shapes and manipulate 3D objects digitally.</li> <li>- Explore how to manipulate 3D objects. <b>E.g.- resizing, combining and recolouring.</b></li> <li>- Plan and create a 3D model for a given purpose using knowledge of 3D designing.</li> <li>- Be able to evaluate their 3D digital model, making any necessary modifications to improve their model.</li> </ul> <p><i>See 'Teach Computing' unit overview – Year 6 3D modelling</i></p>	<ul style="list-style-type: none"> <li>- Explore using a micro:bit as an input process, output device that can be programmed.</li> <li>- Create a program to run on a controllable device.</li> <li>- Know a selection can control the flow of a program.</li> <li>- Know how to update a variable with user input.</li> <li>- Know the importance of order in programs.</li> <li>- Use a conditional statement to compare a variable to a value.</li> <li>- Undertake a design project that uses inputs and outputs on a controllable device.</li> <li>- Use knowledge to develop a program to use inputs and outputs on a controllable device.</li> </ul> <p><i>See 'Teach Computing' unit overview – Year 6 Sensing movement</i></p>

<p><b>NC Objectives</b></p>	<p>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.</p> <p>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.</p> <p>Use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact.</p>	<p>Use search technologies effectively, appreciate how results are selected and ranked, and be discerning in evaluating digital content.</p> <p>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.</p> <p>Use technology safely, respectfully, and responsibly; recognise acceptable/unacceptable behaviour.</p>	<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> <p>Use sequence, selection, and repetition in programs; work with variables and various forms of input and output.</p> <p>Use logical reasoning to explain how some simple algorithms work and to detect and correct errors in algorithms and programs.</p> <p>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.</p>	<p>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.</p>	<p>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.</p> <p>Use technology safely, respectfully, and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact.</p>	<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> <p>Use sequence, selection, and repetition in programs; work with variables and various forms of input and output.</p> <p>Use logical reasoning to explain how some simple algorithms work and to detect and correct errors in algorithms and programs.</p> <p>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.</p>
<p><b>New Vocabulary</b></p>	<p>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.</p>	<p>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.</p>	<p>variable, change, name, value, set, design, event, algorithm, code, task, artwork, program, project, code, test, debug, improve, evaluate, share, assign, declare</p>	<p>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.</p>	<p>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.</p>	<p>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.</p>

<b>Software &amp; equipment</b>	<ul style="list-style-type: none"> <li>- Desktop computers</li> <li>- Google slides – Click <a href="#">here</a></li> </ul>	<ul style="list-style-type: none"> <li>- Desktop computers</li> <li>- Google slides – Click <a href="#">here</a></li> </ul>	<ul style="list-style-type: none"> <li>- Desktop computers</li> <li>- Scratch</li> </ul>	<ul style="list-style-type: none"> <li>- Microsoft Office – Excel 2016</li> <li>- Desktop computers</li> </ul>	<ul style="list-style-type: none"> <li>- Desktop computers.</li> <li>- Tinkercad – Click <a href="#">here</a></li> </ul> <p><b>(Teacher to sign up, create a class and share class code to add students).</b></p> <p><i>'See 'Teach Computing' unit overview – Year 6 3D modelling' for more information.</i></p>	<ul style="list-style-type: none"> <li>- Desktop computers</li> <li>- Micro:bit</li> <li>- Microsoft MakeCode</li> </ul>
<b>Prior Learning</b>	<p><b>In LKS2</b>, children have experience of desktop publishing unit, which may need to be revisited during this unit. Children will have some knowledge of computing systems and online collaborative.</p>	<p><b>In previous years</b>, children have developed knowledge and understanding of digital writing, digital painting, desktop publishing, digital photography, photo editing and vector drawing.</p>	<p><b>In KS2</b>, children will be familiar with the programming constructs of sequence, repetition, and selection. These constructs are covered in <b>Year 3, 4, and 5</b>.</p>	<p><b>In LKS2</b>, children have learnt to present data using branching database. Children have used data loggers to capture data over a period of time.</p> <p><b>In Year 5</b>, children will have experienced flat-file databases to organise data.</p>	<p><b>In LKS2</b>, children have worked with 2D graphics applications using a text-based programming language to explore count-controlled loops when drawing shapes.</p>	<p><b>In LKS2</b>, children have experience of sequence and repetition when programming.</p> <p><b>In Year 5</b>, children have understanding of selection.</p> <p><b>In Year 6</b>, 'Programming A' children have experience of variables.</p>
<b>Future Learning</b>	<b>See KS3 Computing curriculum -</b>					