Crossflatts Computing Curriculum Long Term Plan

EYFS	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Activity	BUSY BODIES	AWESOME AUTUMN	WINTER WARMERS	SPRINGTIME	BOATS AHOY	SUMMER FUN
Description	Provides four activities that help children discover how bodies move and grow. Using the resources provided they explore and learn about parts of the body, growth and movement. Simple algorithms are created and adapted to form a routine of movements.	Three Autumn themed activities which see the children explore patterns in Garlands Galore, create a leaf labyrinth and make Pumpkin Soup using computational thinking skills.	Snowmen scarves and patterns, creating igloos and bird feeders- all take centre stage in our three winter themed activities.	Three Spring themed activities see the children make a Rabbit run, create Junk scarecrows and explore sequencing whilst planting seeds.	Takes children on a journey of discovery as they investigate boats. Four activities make up this set of resources. Includes different uses of boats, floating and sinking predictions, creating a good boat through exploring designs and role play.	Children explore their surroundings and get creative, take a journey and make a map, and discover seaside tangrams, in these three fun activities.
Curriculum Links	Curriculum Links: PSHE, English, Science	Curriculum Links: Early Years	Curriculum Links: Early Years	Curriculum Links: Early Years	Curriculum Links: Science, Maths, English, D&T	Curriculum Links: Science, Maths, English, D&T
Computing Concepts and approaches	Algorithms, Decomposition, Debugging, Logic, Patterns, Abstraction	Creating, Pattern, Logic, Algorithms, Decomposition, Collaborating	Algorithms, Creating, Collaboration, Decomposition, Tinkering, Persevering	Abstraction, Tinkering, Creating, Collaborating, Algorithms, Persevering, Decomposition	Algorithms, Decomposition, Creating, Tinkering, Logic, Patterns, Abstraction, Collaborating	Tinkering, Persevering, Patterns, Logic, Decomposition, Debugging, Collaborating, Algorithms

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Year 1	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Online Safety – Project Evolve. Create your own free account. Follow the curriculum for your year group. Choose most appropriate lesson for the time of year / planning. Online safety to be taught once a week, can be as part of your computing lesson.						
	Computer Science	Data Handling	Media	Computer Science	Media	Digital Literacy
Overview	In year one they learn what algorithms are and learn how to create their own. They find out that sequence can be important to make most algorithms work. Some algorithms don't need to be in the correct order. An example of this is a set of rules for how to behave at break time. Children have varied experiences of creating their own algorithms in key stage one. Sometimes these are written and sometimes they are recorded using technology. Children also get repeated opportunities to create their own programs. This is done using open ended programs (such as Scratch Junior, Scratch, Tickle and Micro:Bit Blocks). In key stage one the emphasis is on sequencing commands correctly to make a program work. We are keen to give children time to experiment or tinker with programming software so they can develop familiarity.	In year one children sort data and represent it in pictograms	Children should practice typing skills and create simple documents. They should be able to create simple piece of music and record then playback sounds. They should also be able to take then review photos and videos.	Children understand that we can control a real or virtual device to achieve a specific outcome by creating a set of instructions for the device called a program. Children create simple algorithms that they convert to a program for a specific digital device. Children demonstrate resilience through testing their program and amending / debugging their programs to achieve their preferred outcome. Children discuss a range of digital devices in their lives.		
	<u>Computer Science</u> <u>CS1</u> Understand and create simple algorithms. <u>CS2</u> Understand that digital devices can be controlled by simple commands	<u>Data Handling</u> <u>DH1</u> Sort, organise and classify objects based on their properties. <u>DH2</u> Represent and interpret simple data as pictograms.	<u>Media</u> <u>M1</u> Communicate simple ideas through the use of text, images and sounds. <u>M2</u> Understand sound and music can be created using a range of simple technology	<u>Computer Science</u> <u>CS3</u> Create and debug simple programs & algorithms to achieve an outcome. <u>CS4</u> Recognise common uses of technology in and beyond school and understand they are controlled by programs	<u>Media</u> <u>M3</u> Record sound using simple technologies and play back the recordings. <u>M4</u> Create an image/animation in a simple graphics application. <u>M5</u> Capture images using a range of technologies and share with others.	<u>Digital Literacy</u>
	A user in year one should be able to: • Understand what an algorithm is • Create and debug algorithms. • Create and debug programs.					

	• Log on to devices by entering user names and passwords. • Create simple documents. • Take photos, videos and record sounds. • Create pictograms. • Locate information from a single source. • Identify their trusted adults and ask for help if online content concerns them.

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Year 2	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
	Computer Science	Data Handling	Media	Computer Science	Media	Digital Literacy
Online Safety – Project Evolve. Create your own free account. Follow the curriculum for your year group. Choose most appropriate lesson for the time of year / planning. Online safety to be taught once a week, can be as part of your computing lesson.						
Overview	In year two children are explicitly taught to predict the outcome of algorithms and code using logical thinking. They should be able to look at code and explain what it will do before running a program. Debugging skills are vital for children to develop when creating their own algorithms and programs. They are encouraged to try a variety of potential solutions even though many may not work. It's important children understand it is not their teacher's responsibility to make their code and algorithms 'work.' They need to develop resilience and perseverance to get to the desired outcome. A working solution is hardly ever the first one attempted. This skill is used throughout school.	Children should represent data using graphs and pictograms. They should sort data by using yes/no questions. (Children may create branching databases in your school has Purple Mash or J2e)	Children progress to making documents with more formatting such as font, colour and size. They should also add titles and paragraphs. There should still be opportunities to practice typing skills. Children should progress to being able to add audio to their work (such as in Book Creator). They should continue to have experience of taking photos and videos but now be able to edit images with simple tools such as cropping. You may also introduce animation. You might want to use on screen animation or create a very short stop motion animation.	Children predict the outcome of simple, predefined programs and demonstrate the necessary skills and processes to interpret code from different sources. Children debug existing programs by recognising there is a problem with the program, identifying the code that needs amending, and making appropriate amendments to the code.		
	Computer Science CS5 Understand that more complex problems can be broken down into smaller parts. CS6 Create and develop algorithms & programs to achieve pre-defined outcomes. CS7 Predict the outcome of a program using logical reasoning.	Data Handling DH3 Represent information as a simple block graph or pictogram DH4 Organise and interpret data as a simple graph. DH5 Sort and answer questions using yes/no answers.	Media M6 Make simple changes to improve the look and clarity of their work. M7 Organise and communicate ideas for a specific purpose using appropriate layout and media. M8 Record, locate and review sounds and add them to their digital creations.	Computer Science CS8 Demonstrate the ability to debug pre-defined programs. CS9 Identify digital technologies around us and describe how they work	Media M9 Add music and or a sound to affect the mood and atmosphere of their work. M10 Capture and create images in different graphic applications M11 Understand and create simple animations.	Digital Literacy
	A user in year two should be able to: • Create and debug programs and algorithms. • Use logical reasoning to predict the behavior of programs and algorithms. • Create and format documents. • Take and edit video and photos. • Create simple animations. • Present information as graphs and pictograms. • Understand why passwords should be kept secret.					

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Year 2	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
	Computer Science	Data Handling	Media	Computer Science	Media	Digital Literacy
	• Children find information from child friendly search engines and online encyclopedias.					

Year 3	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
	Computer Science	Data Handling	Media	Computer Science	Media	Digital Literacy
Online Safety – Project Evolve. Create your own free account. Follow the curriculum for your year group. Choose most appropriate lesson for the time of year / planning. Online safety to be taught once a week, can be as part of your computing lesson.						
Overview	In year three children learn what input and output devices are, they also learn to create simple programs using inputs and outputs. They also learn what repetition is and how to use it in programs. They learn the three types of repetition which are repeat forever, repeat until… and repeat a certain number of times. Children find real world examples of repetition to help them develop their understanding of the concept. Repeating events in programs are sometimes referred to as loops.	Children should collect and interpret data, they should also represent data using a range of charts and graphs. If your school has Purple Mash or J2e children can also create databases.	Children continue to have opportunities to practice typing skills. Their document creation progresses to learning cut, copy, paste, using spell checkers and using further formatting tools such as text boxes and columns. They should be able to add sounds to projects such as slideshows or short videos. They should progress to short stop motion animations.	Children create programs to control virtual or physical devices using a variety of input method. Children identify examples of repetition (also known as loops) in real life and discuss the benefits of loops in their programming.		
	A user in year three should be able to: • Understand what inputs and outputs are. • Understand the concept of repetition in Computer Science. • Create programs that use inputs and outputs. • Create programs and algorithms that use repetition. • Create documents using more advanced formatting tools. • Add sounds to short films or slideshows. • Create simple stop motion animation. • Collect and present information as charts, graphs (and databases if you have J2e or Purple Mash). • Find information online using child friendly sources and present it in digital form. • Understand what online bullying is and how to report it.					
	Computer Science CS10 Understand that all computers allow data to be input, processed and output.	Data Handling DH6 Collect and organise information to find answers to questions.	Media M12 Combine and refine text, sound and graphics to communicate information for a given audience.	Computer Science CS13 Create and refine programs that use simple inputs and output to control events.	Media M15 Capture, create and enhance new and existing digital images to communicate ideas	Digital Literacy

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	CS11 Understand all computer systems need programs / software to work. CS12 Decompose and sequence a range of algorithms & programs.	DH7 Create different graphs that show data for different purposes across the curriculum. DH8 Store and access data using a database.	MI3 Recognise the key features of different types of information/genres and use appropriate layouts MI4 Understand how audio can enhance multimedia projects including radio and films by creating/choosing appropriate audio to fit a given context	CS14 Understand and use the concept of repetition to write more efficient code.	MI6 Plan and create a simple animation MI7 Understand that evaluation and improvement is a vital part of a design process and technology allows changes to be made quickly and efficiently (no resources, discuss in class)	

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<table>
<tr><td rowspan="2">Year 4</td><td>Autumn 1</td><td>Autumn 2</td><td>Spring 1</td><td>Spring 2</td><td>Summer 1</td><td>Summer 2</td></tr>
<tr><td>Computer Science</td><td>Data Handling</td><td>Media</td><td>Computer Science</td><td>Media</td><td>Digital Literacy</td></tr>
<tr><td colspan="7">Online Safety – Project Evolve.
Create your own free account.
Follow the curriculum for your year group. Choose most appropriate lesson for the time of year / planning.
Online safety to be taught once a week, can be as part of your computing lesson.</td></tr>
<tr><td>Overview</td><td>In year four children decompose existing programs into smaller parts and compare the features of different programs. This is done by comparing different games. They practice turning code into algorithms to show their understanding of the code. They also practice debugging programs with deliberately placed bugs and learn some of the basic features of the Scratch programming software. In this year group children learn about selection (if x happens do y). After learning about the concept and finding real world examples they modify existing code before creating their own programs with selection. In some programs such as Scratch most forms of selection will need to use repetition to work properly so that a question is asked repeatedly. Therefore, repetition is taught before selection.</td><td>If you have Purple Mash or J2e -Children create databases, they also search exiting databases to find information. They are introduced to spreadsheets where they learn to input data and perform simple calculations.</td><td>In year four children learn about different camera shots and combine two or more shots to make short films. They may create longer animations which include additional features such as titles and credits. They will also create audio using layers to combine sounds which can be used for short adverts, interviews or news broadcasts. Children also learn about 2D design to create bird's eye view style plans.</td><td>Children demonstrate their ability to create an abstraction of their program, decompose the game into its key functions, construct an appropriate algorithm and code for each aspect of their program and then test and refine it. Understand and describe the difference between standalone computers and a network. Describe the advantages and disadvantages of using a network.</td><td></td><td></td></tr>
<tr><td></td><td colspan="6">A user in year four should be able to:
Be able to explain the concept of selection in Computer Science.
Modify, create and debug programs that use selection and repetition.
Convert code into everyday language.
Decompose existing programs.
Understand different camera shots and combine them to make a short film.
Create longer stop motion animations and add titles and credits.
Combine layers of sound to make audio productions.</td></tr>
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	• Combine 2D shapes to create plan views. • Use spreadsheets to perform simple calculations. • Use keywords effectively in searches. They also check results for relevancy and accuracy. • Create and use strong passwords and learn to communicate respectfully online.					
	Computer Science CS15 Understand the composition of a range of programs by decomposing them into their key components. CS16 Understand and apply the concept of selection in their own algorithms and programs. CS17 Predict what a specific piece of code will do and alter it to achieve a chosen outcome	Data Handling DH9 Represent data in a database using appropriate data types. DH10 Turn questions into search criteria and use database tools to find answers DH11 Use a spreadsheet to enter data and perform simple calculations. DH12 Convert data in a spreadsheet into different graph types for different purposes. DH13 Change elements of a spreadsheet and understand the effects on other calculations.	Media M18 Capture appropriate, quality still and moving images. M19 Develop an understanding of differing film shots and their effective use. M20 Create a 2D plan view using basic shapes M21 Plan, create and edit an animation, film or slideshow.	Computer Science CS18 Design and create programs using selection purposefully CS19 Understand what a computer network is and describe different parts of a network.	Media M22 Compose, combine and refine music or sounds. M23 Identify features of good digital creation design M24 Collect, create and insert appropriate (fit for purpose) graphics and sound files to create a multimedia presentation	Digital Literacy

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<table>
<tr><th rowspan="2">Year 5</th><th>Autumn 1</th><th>Autumn 2</th><th>Spring 1</th><th>Spring 2</th><th>Summer 1</th><th>Summer 2</th></tr>
<tr><th>Computer Science</th><th>Data Handling</th><th>Media</th><th>Computer Science</th><th>Media</th><th>Digital Literacy</th></tr>
<tr><td colspan="7">Online Safety – Project Evolve.
Create your own free account.
Follow the curriculum for your year group. Choose most appropriate lesson for the time of year / planning.
Online safety to be taught once a week, can be as part of your computing lesson.</td></tr>
<tr><td>Overview</td><td>In year five children get repeated practice of creating programs using selection. They also have practice at turning algorithms into code and vice versa. Children learn about variables in year five and why they are important in programs. They learn about variables in non-programming contexts such as traditional games that use scores. They then modify existing games programs to add lives and possibly scores and timers. Most variables they will use need a condition to be met to make them change (if character hits wall subtract 1 from lives). This is why we teach variables after we have taught selection. Children also use physical computing devices in year five, so they are not simply programming characters on a screen but are controlling physical devices. For this we use Micro:Bits/ Makey Makeys/ Crumbles/Lego Wedo / Codebugs (delete as appropriate).</td><td>Children create and use formulae in spreadsheets. They sort through large databases to answer questions. If you have Purple Mash or J2e they may create larger databases and be able to use them to retrieve information.</td><td>Children continue to create animations, films and slideshows but add further features such as audio and transitions. They also use a wider variety of film shots. They should also have the chance to deliver presentations to others, this may be an individual, a group of a class. Children create longer multi track audio productions sourcing sound files as necessary. They also learn about 3D graphics and create basic objects in 3D design software.</td><td>Children share their understanding of how computers / digital devices work based on the 'input – process – output' model.
Discuss the apps and content they access on a computer /
digital device and where this data is stored.
Children identify a variety of search engines and use them
effectively to search for content identifying the results that are
sponsored or adverts.</td><td></td><td></td></tr>
<tr><td></td><td colspan="6">A user in year five should be able to:
• Understand the concept of variables in Computer Science.
• Modify, create and debug programs that use repetition, selection and variable.
• Experience programming using physical devices
• Create animations, films and slideshows with further features such as animations and transitions.
• Create and deliver presentations.
• Create short films that use approaching and retreating shots.
• Create basic objects using 3D design software.
• Create longer multi track audio productions.
• Create and use formulae in spreadsheets.
• Create and questions larger databases (only if you have J2e or Purple Mash).
• Cross reference information from a variety of sources to check for bias and implausibility.</td></tr>
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	• Understand strategies to prevent and report online bullying.					
	Computer Science CS20 Understand and use variables in algorithms and programs. CS21 Understand and use conditional repetition in algorithms and programs CS22 Use two-way selection in algorithms and programs.	**Data Handling** DH14 Create charts using appropriate data to interpret and answer a specific question. DH15 Create a database to store and search relevant information. DH16 Interrogate a database using suitable questions. DH17 Use technology to search and sift through large amounts of different types of information. DH18 Use a range of calculations and functions in a spreadsheet. DH19 Use a spreadsheet to model given problems	**Media** M25 Create and amend a range of 2D graphic representations using appropriate applications. M26 Create simple 3D graphics using a CAD application.	**Computer Science** CS23 Use a broad range of input and output devices in their programs CS24 Understand that a computer system comprises input, process, memory and output. CS25 Understand how search engines work and use them effectively.	**Media** M27 Plan, create and edit an animation, film, slideshow or presentation, then reflect on its efficacy. M28 Source, edit and refine music and sound for a given audience or project. M29 Develop criteria for evaluating theirs and others work.	**Digital Literacy**

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<table>
<tr><td rowspan="2">Year 6</td><td>Autumn 1</td><td>Autumn 2</td><td>Spring 1</td><td>Spring 2</td><td>Summer 1</td><td>Summer 2</td></tr>
<tr><td>Computer Science</td><td>Data Handling</td><td>Media</td><td>Computer Science</td><td>Media</td><td>Digital Literacy</td></tr>
<tr><td colspan="7">Online Safety – Project Evolve.
Create your own free account.
Follow the curriculum for your year group. Choose most appropriate lesson for the time of year / planning.
Online safety to be taught once a week, can be as part of your computing lesson.</td></tr>
<tr><td>Overview</td><td>In year six we don't teach the children any new concepts, but we reinforce their understanding of sequence, repetition, input, output, selection and variable. We apply these skills to programs in different context and children get the opportunity to create programs for a purpose and an audience. This involves using abstraction (a representation with all extraneous detail removed) in the form of a sketch with notes. They then use resources to create games and learning guides for others. In year six children get further opportunities to create programs using physical devices that use selection and in some cases variables too.</td><td>Children collect large amounts of information that is presented to others. Children use databases or spreadsheets to sort and filter information. They also create and test hypotheses using spreadsheets or databases.</td><td>Children build on their knowledge of using 3D graphics tools covered in year five to create more complex objects by combining shapes. They also combine media tools they have used in previous year groups to create a more complex project. This gives children more freedom to use a variety of media creation tools in different contexts.</td><td>They create their programs, debug mistakes and improve their program through testing and evaluation. Children test each other's programs and feedback suggestions for improvement.
Children discuss what a network is, identify different networks in their lives and explain the purposes of those networks?
Children understand the Internet is a network and explain a simple model of how it works including describing how data is transferred across the Internet in packets.</td><td></td><td></td></tr>
<tr><td></td><td colspan="6">A user in year six should be able to:
Plan and create programs for purpose and audience using sequence selection, repetition, and variables using abstraction, algorithms and decomposition.
Create more complex programs and projects using physical computing devices.
Use 3D design software to create a more complex representation of an object.
Combine a variety of media which may include video, sound, animation, images and text to create a product.
Plan record and edit an audio production using several audio layers.
Collect large amounts of information then use databases or spreadsheets to sort and filter.
Create and test hypotheses using spreadsheets or databases.
Check for bias and implausibility and develop their own criteria for checking information online.
Talk about the importance of a balanced digital life.
Explain the importance of a positive digital footprint.</td></tr>
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	Computer Science CS26 Understand procedures and use them in their programs CS27 Design, create, evaluate and amend a program to meet a design brief	Data Handling DH20 Identify and collect appropriate data to answer their questions. DH21 Use data in an appropriate application to test a theory/hypothesis. DH22 Refine, search, filter, sort and graph data for purpose in a database or spreadsheet. DH23 Use a spreadsheet to create real life models of information to offer a solution to a real life problem. DH24 Collect and represent data using infographics.	Media M30 Independently combine various forms of media purposefully as part of a project. M31 Use a CAD application (3D design tool) to create a representation of an object.	Computer Science CS28 Use selection, variable, input and output to create a program using a physical device. CS29 Understand the difference between the internet and the world wide web and how data is transferred across the Internet.	Media M32 Edit and manipulate multi-track music and sound and refine for a given audience or project. M33 Evaluate and adapt individual features to enhance the overall presentation.	Digital Literacy