

Curriculum **Computing** combined



Love, Learn, Discover



Christ Church C.E
Primary School

Love, Learn, Discover



Lark Hill Community
Primary School

Love, Learn, Discover



Lewis Street
Primary School



Computing Curriculum

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Computing Curriculum

Aims

The National Curriculum for Computing aims to ensure that all pupils:

- can understand and apply the fundamental principles and concepts of computer science, including abstraction, logic, algorithms and data representation.
- can analyse problems in computational terms, and have repeated practical experience of writing computer programs in order to solve such problems.
- can evaluate and apply information technology, including new or unfamiliar technologies, analytically to solve problems.
- are responsible, competent, confident and creative users of information and communication technology.

Intent

What are we trying to achieve for our children in Computing?

- We want our children to be problem solvers.
- We aim for our children to be safe and responsible when using the internet.
- The skills they develop and learn at Lewis Street/Christ Church should be transferable to other aspects of the curriculum and their lives.
- We want our children to form strong links between maths and computer science.
- We want our children to be able to transfer skills from other subjects.
- We aim to provide sufficient challenge to all our learners.
- We aim to create and embed a current to develop resilience, whilst also being underpinned by the desire for our children to enjoy learning computational processes.
- We aim to develop the confidence of all children whilst focussing on providing the opportunity of mastery within the subject.

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Implementation

How is the curriculum delivered?

- Whole class differentiation through questioning and planning with additional pre/post teaching tasks for individual children.
- Through the use of Scratch computer coding software.
- Through the use of word processing.
- Through the use of the internet.
- Using staff meetings.
- Using skills workshops for less confident staff (including LSAs).
- Through steps of progression across year groups.
- Class set of laptops/Some classes have instant access to computers.
- Providing opportunities through cross-curricular links.
- Regular pupil voice.
- Regular staff questionnaires.

Impact

What difference is the curriculum making?

- Through observations, evidence of resilience and increased enjoyment has been observed.
- Assessment trialled in years 2 and 5 used to monitor progress over the year.
- Children are displaying that they are responsible, competent, confident and creative users of information and communication technology.
- Using the internet is a fundamental part of everything we do across the partnership.
- Children are aware of the role technology places in the wider world and their role as digital users.
- Children can blend their learning in school and at home through our platforms such as Seesaw and Google Classrooms.

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Threshold Concepts

In our curriculum, we define the threshold concepts which link all aspects of Computing as:

Problem Solving- design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems; solve problems by decomposing them into smaller parts

Interpretation- 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, analyzing, evaluating and presenting data and information

Responsible- use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact.

Creativity- Developing creative skills to use in manipulating basic coding

Representation and Structure- 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, analyzing, evaluating and presenting data and information

Resilience- To identify barriers or limited resources and plan how best to overcome them

Confidence- use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact

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EYFS curriculum

This section demonstrates which statements from the 2020 Development Matters are prerequisite skills for computing within the national curriculum. The table below outlines the most relevant statements taken from the Early Learning Goals in the EYFS statutory framework and the Development Matters age ranges for Three and Four-Year-Olds and Reception to match the programme of study for computing.

The most relevant statements for computing are taken from the following areas of learning:

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

What does an EYFS Computer Scientist need to understand?	What do they need to know?	How can they show they are Computer Scientists?
Personal, Social and Emotional Development	<ul style="list-style-type: none"> • Remember rules without needing an adult to remind them. Show resilience and perseverance in the face of a challenge. • Know and talk about the different factors that support their overall health and well-being: -sensible amounts of 'screen time'. 	<ul style="list-style-type: none"> • Be confident to try new activities and show independence, resilience and perseverance in the face of challenges. • Explain the reasons for rules, know right from wrong and try to behave accordingly.
Physical Development	<ul style="list-style-type: none"> • Match their developing physical skills to tasks and activities in the setting. 	<ul style="list-style-type: none"> • Be able to use technology correctly and with purpose.



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	<ul style="list-style-type: none"> Develop their small motor skills so that they can use a range of tools competently, safely and confidently. 	
Understanding the World	<ul style="list-style-type: none"> Explore how things work. 	<ul style="list-style-type: none"> Able to identify which jobs use technology and use this within role play.
Expressive Arts and Design	<ul style="list-style-type: none"> Explore, use and refine a variety of artistic effects to express their ideas and feelings. 	<ul style="list-style-type: none"> Safely use and explore a variety of materials, tools and techniques, experimenting with colour, design, texture, form and function.

Years 1 to Year 6 Curriculum

Year 1	Computer Science	Information Technology	Digital Literacy	Online Safety
	<ul style="list-style-type: none"> To understand the functionality of the direction keys. To understand how to create and debug a set of instructions (algorithm). To use the additional direction keys as part of an algorithm. To understand how to change and extend the algorithm list. To create a longer algorithm for an activity. 	<ul style="list-style-type: none"> To sort items using a range of criteria. To sort items on the computer using the 'Grouping' activities in Purple Mash. To compare the effects of adhering strictly to instructions to completing tasks without complete instructions. To follow and create simple instructions on the computer. 	<ul style="list-style-type: none"> To understand that data can be represented in picture format. To contribute to a class pictogram. To use a pictogram to record the results of an experiment. To introduce e-books and the 2Create a Story tool. To add animation to a story. To add sound to a story, including voice recording and music the children have composed. 	<ul style="list-style-type: none"> To log in safely. To learn how to find saved work in the Online Work area and find teacher comments. To learn how to search Purple Mash to find resources. To become familiar with the icons and types of resources available in the Topics section. To start to add pictures and text to work.



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	<ul style="list-style-type: none"> To set challenges for peers. To use code to make a computer program. To understand what objects and actions are. To understand what an event is. To use an event to control an object. To begin to understand how code executes when a program is run. To understand what backgrounds and objects are. To plan and make a computer program. 	<ul style="list-style-type: none"> To consider how the order of instructions affects the result. 	<ul style="list-style-type: none"> To work on a more complex story, including adding backgrounds and copying and pasting pages. To share e-books on a class display board. 	<ul style="list-style-type: none"> To explore the Tools and Games section of Purple Mash. To learn how to open, save and print. To understand the importance of logging out.
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Year 2	Computer Science	Information Technology	Digital Literacy	Online Safety
	<ul style="list-style-type: none"> To understand what an algorithm is. To create a computer program using an algorithm. To create a program using a given design. To understand the collision detection event. To understand that algorithms 	<ul style="list-style-type: none"> To use 2Calculate image, lock, move cell, speak and count tools to make a counting machine. To learn how to copy and paste in 2Calculate. To use the totalling tools. To use a spreadsheet for money calculations. To use the 2Calculate equals tool 	<ul style="list-style-type: none"> To learn about data handling tools that can give more information than pictograms. To use yes/no questions to separate information. To construct a binary tree to identify items. To use 2Question (a binary tree database) to answer questions. 	<ul style="list-style-type: none"> To know how to refine searches using the Search tool. To use digital technology to share work on Purple Mash to communicate and connect with others locally. To have some knowledge and understanding about sharing more globally on the Internet.



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	<p>follow a sequence.</p> <ul style="list-style-type: none"> To design an algorithm that follows a timed sequence. To understand that different objects have different properties. To understand what different events do in code. To understand the function of buttons in a program. To understand and debug simple programs. 	<p>to check calculations.</p> <ul style="list-style-type: none"> To use 2Calculate to collect data and produce a graph. To learn the functions of the 2Paint a Picture tool. To learn about and recreate the Impressionist style of art (Monet, Degas, Renoir). To recreate Pointillist art and look at the work of pointillist artists such as Seurat. To learn about the work of Piet Mondrian and recreate the style using the lines template. To learn about the work of William Morris and recreate the style using the patterns template. To explore surrealism and eCollage. 	<ul style="list-style-type: none"> To use a database to answer more complex search questions. To use the Search tool to find information. To understand the terminology associated with searching. To gain a better understanding of searching on the Internet. To create a leaflet to help someone search for information on the Internet. 	<ul style="list-style-type: none"> To introduce Email as a communication tool using 2Respond simulations. To understand how we should talk to others in an online situation. To open and send simple online communications in the form of an email. To understand that information put online leaves a digital footprint or trail. To identify the steps that can be taken
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Year 3	Computer Science	Information Technology	Digital Literacy	Online Safety
	<ul style="list-style-type: none"> To understand what a flowchart is and how flowcharts are used in computer programming. To understand that there are different types of timers and 	<ul style="list-style-type: none"> To introduce typing terminology. To understand the correct way to sit on the keyboard. To learn how to use the home, top and bottom row keys. 	<ul style="list-style-type: none"> To use the symbols more than, less than and equal to, to compare values. To use 2Calculate to collect data and produce a variety of graphs. 	<ul style="list-style-type: none"> To know what makes a safe password. To learn methods for keeping passwords safe. To understand how the Internet



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	<p>select the right type you're your purpose.</p> <ul style="list-style-type: none"> To understand how to use the repeat command. To understand the importance of nesting. To design and create an interactive scene. 	<ul style="list-style-type: none"> To practise typing with the left and right hand. To sort objects using just 'yes' or 'no' questions. To complete a branching database using 2Question. To create a branching database of the children's choice. To understand the purpose of the Slides tool. To add slides to presentations. To add media to presentations. To format text appropriately. To add shapes and lines to enhance a presentation. To use the skills learnt to design and create an engaging presentation. 	<ul style="list-style-type: none"> To use the advanced mode of 2Calculate to learn about cell references. To understand the uses of PowerPoint. To create a page in a presentation. To add media to a presentation. To add animations to a presentation. To add timings to a presentation. To use the skills learnt to design and create an engaging presentation. 	<p>can be used in effective communication.</p> <ul style="list-style-type: none"> To understand how a blog can be used to communicate with a wider audience. To consider the truth of the content of websites. To learn about the meaning of age restrictions symbols on digital media and devices.
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Year 4	Computer Science	Information Technology	Digital Literacy	Online Safety
	<ul style="list-style-type: none"> To begin to understand selection in computer programming. To understand how an IF statement works. To understand how to use coordinates in computer 	<ul style="list-style-type: none"> To format cells as currency, percentages, and decimals to different decimal places or fractions. To use the formula wizard to calculate averages. To combine tools to make 	<ul style="list-style-type: none"> To explore how font size and style can affect the impact of a text. To use a simulated scenario to produce a news report. To use a simulated scenario to write for a community campaign. To learn the structure of the 	<ul style="list-style-type: none"> To understand how children can protect themselves from online identity theft. To understand that information put online leaves a digital footprint or trail and that this can aid identity theft.

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	<p>programming.</p> <ul style="list-style-type: none"> To understand the 'repeat until' command. To understand how an IF/ELSE statement works. To understand what a variable is in programming. To use a number variable. To create a playable game. 	<p>spreadsheet activities such as timed times tables tests.</p> <ul style="list-style-type: none"> To use a spreadsheet to model a real-life situation. To add a formula to a cell to automatically calculate in that cell. To discuss what makes a good animated film or cartoon. To learn how animations are created by hand. To find out how animation can be created in a similar way using the computer. To learn about onion skinning in animation. To add backgrounds and sounds to animations. To be introduced to 'stop-motion animation. To share animation on the class display board and by blogging. 	<p>coding language of Logo.</p> <ul style="list-style-type: none"> To input simple instructions in Logo. Using 2Logo to create letter shapes. To use the Repeat function in Logo to create shapes. To use and build procedures in Logo. To locate information on the search results page. To use search effectively to find out information. To assess whether an information source is true and reliable. 	<ul style="list-style-type: none"> To identify the risks and benefits of installing software including apps. To understand that copying the work of others and presenting it as their own is called 'plagiarism' and to consider the consequences of plagiarism. To identify appropriate behaviour when participating or contributing to collaborative online projects for learning. To identify the positive and negative influences of technology on health and the environment. To understand the importance of balancing game and screen time with other parts of their lives.
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Year 5	Computer Science	Information Technology	Digital Literacy	Online Safety
	<ul style="list-style-type: none"> To begin to simplify code. To create a playable game. To understand what a simulation is. 	<ul style="list-style-type: none"> To use formulae within a spreadsheet to convert measurements of length and distance. 	<ul style="list-style-type: none"> To learn how to search for information in a database. To contribute to a class database. To create a database around a 	<ul style="list-style-type: none"> To gain a greater understanding of the impact that sharing digital content can have. To review sources of support

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<ul style="list-style-type: none"> • To program a simulation using 2Code. • To know what decomposition and abstraction are in computer science. • To take a real-life situation, decompose it and think about the level of abstraction. • To understand how to use friction in code. To begin to understand what a function is and how functions work in code. • To understand what the different variable types are and how they are used differently. • To understand how to create a string. • To understand what concatenation is and how it works. • To plan a game. • To design and create the game environment. • To design and create the game quest. • To finish and share the game. • To self and peer evaluate. 	<ul style="list-style-type: none"> • To use the count tool to answer hypotheses about common letters in use. • To use a spreadsheet to model a real-life problem. • To use formulae to calculate the area and perimeter of shapes. • To create formulae that use text variables. • To use a spreadsheet to help plan a school cake sale. • To know what a word processing tool is for. • To add and edit images to a word document. • To know how to use word wrap with images and text. To change the look of text within a document. • To add features to a document to enhance its look and usability. • To use the sharing capabilities in Google Docs. • To use tables within to present information. • To introduce children to templates. 	<p>chosen topic.</p> <ul style="list-style-type: none"> • To be introduced to 2Design and Make and the skills of computer-aided design. • To explore the effect of moving points when designing. • To design a 3D Model to fit certain criteria. • To refine and print a model. • To understand the need for visual representation when generating and discussing complex ideas. • To understand the uses of a 'concept map'. • To understand and use the correct vocabulary when creating a concept map. • To create a concept map. • To understand how a concept map can be used to retell stories and information. • To create a collaborative concept map and present this to an audience. 	<p>when using technology and children’s responsibility to one another in their online behaviour.</p> <ul style="list-style-type: none"> • To know how to maintain secure passwords. • To understand the advantages, disadvantages, permissions and purposes of altering an image digitally and the reasons for this. • To be aware of appropriate and inappropriate text, photographs and videos and the impact of sharing these online. • To learn about how to reference sources in their work. • To search the Internet with consideration for the reliability of the results of sources to check the validity and understand the impact of incorrect information. To ensure reliability through using different methods of communication.
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Year 6	Computer Science	Information Technology	Digital Literacy	Online Safety
	<ul style="list-style-type: none"> ● To design a playable game with a timer and a score. ● To plan and use selection and variables. ● To understand how the launch command works. ● To use functions and understand why they are useful. ● To understand how functions are created and called. ● To use flowcharts to create and debug code. ● To create a simulation of a room in which devices can be controlled. ● To understand how user input can be used in a program. ● To understand how 2Code can be used to make a text-adventure game. 	<ul style="list-style-type: none"> ● To use a spreadsheet to investigate the probability of the results of throwing many dice. ● To use a spreadsheet to calculate the discount and final prices in a sale. ● To use a spreadsheet to plan how to spend pocket money and the effect of saving money. ● To use a spreadsheet to plan a school charity day to maximise the money donated to charity. ● To find out what a text adventure is. ● To use 2Connect to plan a story adventure. ● To make a story-based adventure using 2Create a Story. ● To introduce an alternative model for a text adventure which has a less sequential narrative. ● To use written plans to code a map-based adventure in 2Code. ● To create a picture-based quiz for young children. ● To learn how to use the question types within 2Quiz. 	<ul style="list-style-type: none"> ● To identify the purpose of writing a blog. ● To identify the features of a successful blog. ● To plan the theme and content for a blog. ● To understand how to write a blog and a blog post. ● To consider the effect upon the audience of changing the visual properties of the blog. ● To understand how to contribute to an existing blog. ● To understand how and why blog posts are approved by the teacher. ● To understand the importance of commenting on blogs. ● To learn about what the Internet consists of. ● To find out what a LAN and a WAN are. ● To find out how the Internet is accessed in school. ● To research and find out about the age of the Internet. ● To think about what the future 	<ul style="list-style-type: none"> ● To identify the benefits and risks of mobile devices broadcasting the location of the user/device. ● To identify secure sites by looking for privacy seals of approval. ● To identify the benefits and risks of giving personal information. ● To review the meaning of a digital footprint. ● To have a clear idea of appropriate online behaviour. ● To begin to understand how information online can persist. ● To understand the importance of balancing game and screen time with other parts of their lives. ● To identify the positive and negative influences of technology on health and the environment.



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		<ul style="list-style-type: none"> To explore the grammar quizzes. To make a quiz that requires the player to search a database 	might hold.	
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Vocabulary

	Nursery	Reception	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Computer Science								
Problem-solving	pull click turn scroll	movement image	algorithm create command organise sequence software store program	algorithm blocks command debug execute manipulate organise scripted sequence software sprite store predict program retrieve reverse engineer	algorithm block language command debug execute input-output loops manipulate organise program repetition scripted sequence simulation sprite software store program physical system	algorithm block language command collaboration debug encrypted execute HTTP input output loops manipulate organise program repetition scripted sequence simulation sprite software store packets of data program physical system repetition retrieve reverse	algorithm block language command control collaboration debug decomposition encrypted execute HTTP input output loops manipulate organise program repetition scripted	algorithm block language command control collaboration debug decomposition encrypted execute hardware HTTP input IP address output loops manipulate organise program repetition

Christ Church CE, Lark Hill and Lewis Street Primary Schools



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					repetition retrieve reverse engineer	engineer URL	selection sequence simulation sprite software store packets of data program physical system repetition retrieve reverse engineer URL	scripted selection sequence simulation sprite software store packets of data program physical system repetition retrieve
Information Technology Creating content Searching	button headphones computer Click mouse tablet	monitor speaker type technology equipment screen mouse keyboard	digital content digital devices computer network	data digital content digital devices network	data digital content digital devices network safe search mode search technologies software	cached collecting data digital content digital devices network safe search mode search technologies server software	cached collecting data digital content digital devices evaluating network safe search mode search technologies server software	cached collecting data digital content digital devices evaluating network safe search mode search technologies server software



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Digital Literacy	safe	choices internet safety	personal information world wide web	password personal information private world wide web	command evaluating digital content password personal information private world wide web	acceptable/unacceptable behaviours command evaluating digital content password personal information private world wide web	acceptable/unacceptable behaviours command encryption evaluating digital content password personal information private world wide web	acceptable/unacceptable behaviours command detect encryption evaluating digital content password personal information private responsibility world wide web
Online Safety								
Using IT beyond school								

Computer Science sentence starters to be displayed on working walls:

- I wonder if...
- I predict that...
- If I can do this... X could happen...
- The evidence shows...
- This data suggests that...
- From my observations, I can conclude...
- The pattern I noticed is...

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Useful Links

Resources

National Online Safety- <https://nationalonlinesafety.com/>

Purple Mash- <https://www.purplemash.com/sch/christ-m30#/>

KS1 Materials- <https://teachcomputing.org/curriculum/key-stage-1>

KS2 Materials- <https://teachcomputing.org/curriculum/key-stage-2>

Google Classroom- <https://edu.google.com/workspace-for-education/classroom/>

Content Knowledge

Computing National Curriculum

https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/239033/PRIMARY_national_curriculum_-_Computing.pdf

Computing Programme of Study

<https://www.gov.uk/government/publications/national-curriculum-in-england-computing-programmes-of-study>