



Ogbourne CE Primary School Computing Curriculum

Technology is the pen and paper of our time, and the lens through which we experience much of our world.' David Warlick

Ogbourne CE Primary School's Intent

Why do we teach this? Why do we teach it the way we do?

Computers are now a key part of children's everyday lives at both home and school. It is our intent that children will leave Ogbourne C of E Primary School not just confident using a range of devices and applications but also with an understanding of how they work. As children's lives increasingly move online, we want the children to know how to keep themselves safe and how to make the most of the digital tools at their fingertips. We want to kindle in the children a knowledge and enjoyment of computer science and STEM learning which they can take forward into their future learning.

Implementation

What do we teach? What does this look like?

Computing at Ogbourne C of E Primary School is taught weekly and follows the '**Teach Computing**' scheme, which was developed by The National Centre for Computing Education (NCCE) and is funded by the Department for Education. The scheme has been carefully curated by a consortium made up of STEM Learning, the Raspberry Pi Foundation and BCS, The Chartered Institute for IT. The vision of the scheme is for every child in every school in England to have a world-leading computing education; which is something we value at Ogbourne too. The scheme champions diversity and inclusion within lessons; which is integral to the planning, programmes and materials used.

In recent years at Ogbourne, significant investment has been made in our IT and technology. This provides the children with aspirations that will support and guide them when they enter the ever-changing world of the future workplace. Technology changes daily and it is our aim at Ogbourne to ensure every child is confident and proficient in their use of modern-day technology.

There are four distinct strands to our computing curriculum. Each strand has its own clear skills progression. The strands are taught through a mixture of discrete, subject specific computing lessons and as part of other blocks of learning. The four strands are:

- coding and programming
- understanding networks (KS2 only)
- creative computing
- online safety

The whole curriculum has been designed with input from secondary colleagues to ensure a smooth transition through KS1 and KS2 and on into KS3.

Coding and Programming

This strand, which incorporates computational thinking, is mainly taught as discrete computing sessions, although some curriculum links will exist where appropriate. Children begin in EYFS with exploring technology in everyday life through their play and using programmable toys such as Beebots. In KS1 children use Beebots with a specific goal to complete tasks, they begin plan their code and debug where necessary. Children also begin to use on screen coding applications, such as the use of Scratch Jr and other apps. In KS2 children begin to use Scratch as a block programming tool. They learn to use repeats, selection, variables and mathematical operators to achieve a specific task. Their computational thinking is also developed as they plan their code using flow charts. By the end of KS2 children are confident and competent using block programming tools with a solid understanding of the principles that make their code up. They have a chance in upper KS2 to apply this to physical devices using Lego Mindstorms robots and BBC Microbits – using different visual block programming languages, but the same principles.

Understanding Networks

This strand, taught at KS2, is about introducing children to some of the concepts behind the technology they use. These are taught in a few dedicated, discrete lessons throughout the year, although teachers will be able to regularly reinforce concepts through the children's everyday use of the internet and technology. Learning includes how the internet works, how computers work together in the school network, how search engines work and what is inside a computer.

Creative Computing

This strand is usually taught as part of other areas of the curriculum, although it may start with a ‘tinkering’ session to familiarise children with an app, process or specific tool. The wider curriculum provides the focus and task aspect (for example make a podcast, digital publication or animation to showcase your learning about Ancient Greeks). Through KS1 and KS2 children will learn word processing, desktop publication, presentation, digital publishing, animation, audio content creation and video creation tools and skills. They will also learn to combine these, for example adding their own video or animation to an ebook. Throughout the school children are encouraged to make choices about layout, format and content to suit audience and purpose. By upper KS2, children are also encouraged to make choices about which apps and tools they want to use and combine. These choices are again based on the purpose and audience for their content.

Online Safety

We teach online Safety using the resources and lessons on www.projectevolve.co.uk These take the 350 statements from the UKCIS (UK Council for Internet Safety) framework “Education for a Connected World” and provide resources for each. These cover 8 strands of online safety:

- Self-Image and Identity
- Online Relationships
- Online Reputation
- Online Bullying
- Managing Online Information
- Health, Well-being and Lifestyle
- Privacy and Security
- Copyright and Ownership

Online safety is an all year, ongoing focus, which is constantly returned to – teachers will use Project Evolve resources to support their online safety teaching and messages throughout the year. There is also an overlap into our Jigsaw PSHE curriculum here.

Impact

What will this look like?

At the end of a block of learning on a specific strand, teachers identify children who did not achieve the skills and knowledge set out in the curriculum. They also identify children who demonstrated they were working beyond the age-related expectations of the curriculum.

Long Term Overview

Class	Year	Autumn	Spring	Summer
KS1	A	Term 1: Computing Systems and Networks – Technology all around Us/Online Safety Term 2: Creating Media – Digital Painting	Term 3: Programming A – Moving a Robot Term 4: Data and Information: Grouping Data/Online Safety	Term 5: Creating Media – Digital Writing Term 6: Programming B: Introduction to Animation
	B	Term 1: Computing Systems: IT around us/Online Safety Term 2: Creating Media: Digital photography	Term 3: Programming A: Robot Algorithms Term 4: Data and Information: Pictograms /Online Safety	Term 5: Creating Media: Making Music/Online Safety Term 6: Programming B: An introduction to quizzes.
LKS2	A	Term 1: Computing Systems and Networks: Connecting Computers Term 2: Creating Media: Stop Frame Animation/Online Safety	Term 3: Programming A: Sequence in Music Term 4: Data and Information: Branching Databases	Term 5: Creating Media: Desktop Publishing/Online Safety Term 6: Programming B: Events and Actions
	B	Term 1: Computing Systems and Networks: The Internet Term 2: Creating Media: Audio Editing/Online Safety	Term 3: Programming A: Repetition in Shapes Term 4: Data and Information: Data logging	Term 5: Creating Media: Photo Editing Term 6: Programming B: Repetition in Games
UKS2	A	Term 1: Computing Systems and Networks: Sharing Information Term 2: Creating Media: Video Production/Online Safety	Term 3: Programming A: Selection in Physical Computing Term 4: Data and Information: Flat-file databases	Term 5: Creating media: Flat-file databases Term 6: Programming B: Selection in Quizzes

B	Term 1: Computing Systems and Networks: Communication Term 2: Creating Media: Web page creation/Online Safety	Term 3: Programming A: Variables in games Term 4: Data and Information: Spreadsheets	Term 5: Creating Media: 3D Modelling Term 6: Programming B: Sensing
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Progression, Knowledge and Skills, Vocabulary

	Key Stage 1		Key Stage 2			
	Oaks (Y1)	Oaks (Y2)	Willows (Y3)	Willows (Y4)	Poplars (Y5)	Poplars (Y6)
Breadth of Study	Technology around us Digital painting Digital writing Grouping data Moving a robot Introduction to animation	IT around us Digital photography Making music Pictograms Robot algorithms An introduction to quizzes	Connecting computers Animation Desktop publishing Branching databases Sequence in music Events and actions	The Internet Audio editing Photo editing Data logging Repetition in shapes Repetition in games	Sharing information Vector Drawing Video Editing Flat-file databases Selection in physical computing Selection in quizzes	Communication 3D Modelling Web page creation Spreadsheets Variables in games Sensing
Knowledge and Understanding	Technology around us To identify technology To identify a computer and its main parts. To use a mouse in	IT around us To recognise the uses and features of information technology. To identify the uses of information technology	Connecting computers To explain how digital devices function. To identify input and output devices. To	The Internet To describe how networks physically connect to other networks. To recognise how	Sharing information To explain that computers can be connected together to form systems. To recognise the role of	Communication To explain the importance of internet addresses. To recognise how data is transferred across the

<p>different ways. To use a keyboard to type on a computer. To use the keyboard to edit text. To create rules for using technology</p>	<p>in the school. To identify information technology beyond school. To explain how information technology</p>	<p>recognise how digital devices can change the way that we work. To explain how a computer network can be used to share</p>	<p>networked devices make up the internet. To outline how websites can be shared via the World Wide Web. To describe how</p>	<p>computer systems in our lives. To experiment with search engines. To describe how search engines select results.</p>	<p>internet. To explain how sharing information online can help people to work together. To evaluate different</p>
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<p>responsibly. Digital painting To describe what different freehand tools do. To use the shape tool and the line tools. To make careful choices when painting a digital picture. To explain why I chose the tools I used. To use a computer on my own to paint a picture. To compare painting a picture on a computer and on paper. Digital writing To use a computer to write.</p>	<p>helps us To explain how to use information technology safely. To recognise that choices are made when using information technology. Digital photography To use a digital device to take a photograph. To make choices when taking a photograph. To describe what makes a good photograph. To decide how photographs can be improved. To use tools to change an image. To recognise that photos can be</p>	<p>information. To explore how digital devices can be connected. To recognise the physical components of a network. Animation To explain that animation is a sequence of drawings or photographs. To relate animated movement with a sequence of images. To plan an animation. To identify the need to work consistently and carefully. To review and improve an animation.</p>	<p>content can be added and accessed on the World Wide Web. To recognise how the content of the WWW is created by people. To evaluate the consequences of unreliable content. Audio editing To identify that sound can be recorded. To explain that audio recordings can be edited. To recognise the different parts of creating a podcast project. To apply audio editing skills independently. To combine audio to enhance my podcast project.</p>	<p>To recognise why the order of results is important, and to whom. Vector Drawing To identify that drawing tools can be used to produce different outcomes. To create a vector drawing by combining shapes. To use tools to achieve a desired effect. To recognise that vector drawings consist of layers of objects. To group objects to make them easier to work with. To apply what I have learned about vector drawings.</p>	<p>ways of working together online. To recognise how we communicate using technology. To evaluate different methods of online communication. 3D Modelling To recognise that you can work in three dimensions on a computer. To identify that digital 3D objects can be modified. to recognise that objects can be combined in a 3D model. To create a 3D model for a given purpose. To plan my own 3D model. To create my own digital 3D model.</p>
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	<p>To add and remove text on a computer. To identify that the look of text can be changed on a computer. To make careful choices when changing text. To explain why I used the tools that I chose. To compare typing on a computer to writing on paper.</p> <p>Grouping data To label objects. To identify that objects</p>	<p>changed.</p> <p>Making music To say how music can make us feel. To identify that there are patterns in music. To experiment with sound using a computer. To use a computer to create a musical pattern. To create music for a purpose. To review and refine our computer work.</p>	<p>To evaluate the impact of adding other media to an animation.</p> <p>Desktop publishing To recognise how text and images convey information. To recognise that text and layout can be edited. To add content to a desktop publishing publication. To choose appropriate page</p>	<p>To evaluate the effective use of audio.</p> <p>Photo editing To explain that the composition of digital images can be changed. To explain that colours can be changed in digital images. To explain how cloning can be used in photo editing. To explain that images</p>	<p>Video Editing To explain what makes a video effective. To use a digital device to record video. To capture video using a range of techniques. To create a storyboard. To identify that video can be improved through reshooting and editing. To consider the impact of the choices made</p>	<p>Web page creation To review an existing website and consider its structure. To plan the features of a web page. To consider the ownership and use of images. To recognise the need to preview pages. To outline the need for</p>
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	<p>can be counted. To describe objects in different ways. To count objects with the same properties. To compare groups of objects. To answer questions about groups of objects.</p> <p>Moving a robot To explain what a given command will do.</p>	<p>Pictograms To recognise that we can count and compare objects using tally charts. To recognise that objects can be represented as pictures. To create a pictogram. To select objects by attribute and make comparisons. To recognise that people can be</p>	<p>settings. To consider how different layouts can suit different purposes. To consider the benefits of desktop publishing.</p> <p>Branching databases To create questions with yes/no answers. To identify the attributes needed to collect data about an</p>	<p>can be combined. To combine images for a purpose. To evaluate how changes can improve an image.</p> <p>Data logging To explain that data gathered over time can be used to answer questions. To use a digital device to collect data automatically. To explain that a data</p>	<p>when making and sharing a video.</p> <p>Flat-file databases To use a form to record information. To compare paper and computer-based databases. To outline how you can answer questions by grouping and then sorting data. To explain that tools can be used to</p>	<p>a navigation path. To recognise the implications of linking to content owned by other people.</p> <p>Spreadsheets To create a data set in a spreadsheet. To build a data set in a spreadsheet. To explain that formulas can be used to produce calculated data.</p>
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	<p>To act out a given word. To combine 'forwards' and 'backwards' commands to make a sequence.</p> <p>To combine four direction commands to make sequences.</p> <p>To plan a simple program.</p> <p>To find more than one solution to a problem.</p> <p>Introduction to animation</p> <p>To choose a command for a given purpose.</p> <p>To show that a series of commands can be joined together.</p> <p>To identify the effect of changing a value.</p> <p>To explain that each sprite has its own instructions</p>	<p>described by attributes. To explain that we can present information using a computer.</p> <p>Robot algorithms</p> <p>To describe a series of instructions as a sequence.</p> <p>To explain what happens when we change the order of instructions.</p> <p>To use logical reasoning to predict the outcome of a program.</p> <p>To explain that programming projects can have code and artwork.</p> <p>To design an algorithm. To create and debug a program that I have written.</p>	<p>object.</p> <p>To create a branching database.</p> <p>To explain why it is helpful for a database to be well structured. To plan the structure of a branching database. To independently create an identification tool.</p> <p>Sequence in music To explore a new programming environment.</p> <p>To identify that commands have an outcome.</p> <p>To explain that a program has a start.</p> <p>To recognise that a sequence of commands can have an order.</p> <p>To change the appearance of my</p>	<p>logger collects 'data points' from sensors over time.</p> <p>To recognise how a computer can help us analyse data.</p> <p>To identify the data needed to answer questions.</p> <p>To use data from sensors to answer questions.</p> <p>Repetition in shapes</p> <p>To identify that accuracy in programming is important. To create a program in a text-based language.</p> <p>To explain what 'repeat' means.</p> <p>To modify a</p>	<p>select specific data. To use a real-world database to answer questions.</p> <p>Selection in physical computing</p> <p>To control a simple circuit connected to a computer.</p> <p>To write a program that includes count-controlled loops. To explain that a loop can stop when a condition is met.</p> <p>To explain that a loop can be used to repeatedly check whether a condition has been met.</p> <p>To design a physical project that includes selection.</p>	<p>To apply formulas to data.</p> <p>To create a spreadsheet to plan an event.</p> <p>To choose suitable ways to present data.</p> <p>Variables in games</p> <p>To define a 'variable' as something that is changeable.</p> <p>To explain why a variable is used in a program.</p> <p>To choose how to improve a game by using variables.</p> <p>To design a project that builds on a given example. To use my design to create a project.</p> <p>To evaluate my project.</p> <p>Sensing</p>
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	<p>To design the parts of a project. To use my algorithm to create a program.</p>	<p>An introduction to quizzes To choose a command for a given purpose. To show that a series of commands can be joined together. To identify the effect of changing a value. To explain that each sprite has its own instructions. To design the parts of a project. To use my algorithm to create a program.</p>	<p>project. To create a project from a task description. Events and actions To explain how a sprite moves in an existing project. To create a program to move a sprite in four directions. To adapt a program to a new context. To develop my program by adding features. To identify and fix bugs in a program. To design and create a maze-based challenge.</p>	<p>count-controlled loop to produce a given outcome. To decompose a task into small steps. To create a program that uses count-controlled loops to produce a given outcome. Repetition in games To develop the use of count-controlled loops in a different programming environment. To explain that in programming there are infinite loops and count-controlled loops. To develop a design that includes two or more loops which run at the same time. To modify an infinite loop in a given program. To design a project that includes repetition. To create a project that includes repetition.</p>	<p>To create a program that controls a physical computing project. Selection in quizzes To explain how selection is used in computer programs. To relate that a conditional statement connects a condition to an outcome. To design and create a program that uses selection.</p>	<p>To create a program to run on a controllable device. To explain that selection can control the flow of a program. To update a variable with a user input. To use a conditional statement to compare a variable to a value. To design a project that uses inputs and outputs on a controllable device. To develop a program to use inputs and outputs on a controllable device.</p>
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Key Concepts	Computing systems Algorithms Creating media Effective use of tools	Computing systems Networks Creating media Effective use of tools	Computing systems Networks Creating media Effective use of tools	Computing systems Networks Creating media Effective use of tools	Computing systems Networks Creating media Effective use of tools	Computing systems Networks Creating media Effective use of tools
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	Programming Data and Information Design and Development	Algorithms Programming Data and Information Design and Development	Programming Design and Development Data and Information	Programming Design and Development Data and Information Safety and Security Algorithms	Programming Design and Development Data and Information Algorithms	Programming Design and Development Data and Information
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<p>Vocabulary</p>	<p>Technology around us Technology, computer, mouse, trackpad, keyboard, screen, trackpad, double-click, typing</p> <p>Digital painting Paint program, tool, paintbrush, erase, fill, undo, Piet Mondrian, primary colours, shape tools, line tool, fill tool, undo tool, Henri Matisse, shape tool, fill tool, Wassily Kandinsky, tools, feelings, colour, brush style, Georges Seurat, pointillism, brush size, pictures, painting, computers, like, prefer, dislike</p>	<p>IT around us Information technology (IT), computer, barcode, scanner/scan</p> <p>Digital photography Device, camera, photograph, capture, image, digital, landscape, portrait, framing, subject, compose, light sources, flash, focus, background, editing, filter, format, lighting</p> <p>Making music Music, planets, Mars, Venus, war, peace, quiet, loud, feelings, emotions, pattern, rhythm, pulse, Neptune, pitch, tempo, notes, notes,</p>	<p>Connecting computers Digital device, input, process, output program, digital, non-digital, connection, network, network switch, server, wireless access point, network cables, network sockets</p> <p>Animation Animation, flip book, stop-frame animation, frame, sequence, image, photograph, setting, character, events, onion skinning, consistency, evaluation, delete, media, import, transition</p> <p>Desktop publishing</p>	<p>The Internet Internet, network, router, network security, network switch, server, wireless access point (WAP), website, web page, web address, routing, web browser, World Wide Web, content, links, files, use, content, download, sharing, ownership, permission, information, sharing, accurate, honest, content, adverts</p> <p>Audio editing Audio, microphone, speaker, headphones, input device, output device, sound, podcast, edit, trim, align, layer, import, record,</p>	<p>Sharing information System, connection, digital, input, process, output, system, connection, digital, input, process, output, search engine, refine, Index, crawler, bot, web crawler, content creator, selection, ranking</p> <p>Vector Drawing Vector, drawing tools, object, toolbar, move, resize, colour, rotate, duplicate/copy, zoom, select, rotate, align, resize, modify, layers,</p>	<p>Communication Communication, protocol, data, address, Internet Protocol (IP) address, Domain Name Server (DNS), packet, header, data payload, chat, explore, slide deck, reuse, remix, collaboration, internet, public, private, one-way, two-way, one-to-one, one-to-many</p> <p>3D Modelling 2D, 3D, shapes, select, move, perspective, view, handles, resize, lift, lower, recolour, rotate, duplicate, group, cylinder, placeholder, hollow, choose,</p>
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	<p>Digital writing Word processor, keyboard, keys, letters, type, numbers, space, backspace, text cursor, capital letters,</p>	<p>instrument, tempo, create, pulse/beat, instrument, rhythm</p> <p>Pictograms More than, less than, most, least, organise, data,</p>	<p>Text, images, advantages, disadvantages, communicate, font, font style, template landscape, portrait, orientation, placeholder, layout,</p>	<p>playback, edit, selection, load, import, save, export, MP3, editing, evaluate, feedback</p> <p>Photo editing</p>	<p>order, Copy, paste, group, ungroup, duplicate, object, vector drawing, reuse,</p> <p>Video Editing</p>	<p>combine, construct, evaluate, modify</p> <p>Web page creation Website, web page, browser, media, Hypertext Markup Language (HTML),</p>
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	<p>toolbar, bold, italic, underline, mouse, select, undo, redo, font, format, compare, typing</p> <p>Grouping data Object, search, image, property, label, colour, size, shape, group, value, data set, more, less, most, fewest</p> <p>Moving a robot Forwards, backwards, turn, clear, go, commands, instructions, directions, left, right, turn, plan, algorithm, program, route</p> <p>Introduction to animation ScratchJr, Bee-Bot, command, sprite, compare, programming, programming area, block, joining,</p>	<p>object, tally chart, votes, total, pictogram, enter, data, compare, common, least common, attribute, conclusion</p> <p>Robot algorithms Instruction, sequence, clear, unambiguous, algorithm, program, order, prediction, program, artwork, design, route, mat, debugging, decomposition</p> <p>An introduction to quizzes Sequence, command, program, run, start, outcome, predict, blocks, sprite, algorithm, blocks, design, actions, project, design, modify, change, build, match, compare,</p>	<p>content, desktop publishing, copy, paste</p> <p>Branching databases Attribute, value, questions, table, objects, branching database, database, equal, even, separate, structure, compare, order, organise, decision tree</p> <p>Sequence in music Scratch, programming, blocks, commands, code, sprite, costume, stage, backdrop, motion, turn, point in direction, go to, glide, sequence, event, task, design, code, run the code, design, algorithm, bug, debug</p> <p>Events and actions</p>	<p>Image, edit, digital, crop, rotate, undo, save, adjustments, effects, colours, hue, saturation, sepia, vignette, retouch, clone, select, copy, paste, combine, made up, real, composite, cut, alter, background, foreground, rotate, crop, zoom, clone, select, undo, font</p> <p>Data logging Data, table, layout, input device, sensor, data logger, logging, data point, interval, analyse, data set, import, export, logged, collection, review, conclusion</p> <p>Repetition in shapes Program, turtle, commands, code snippet, algorithm</p>	<p>Flat-file databases</p> <p>Selection in physical computing</p> <p>Selection in quizzes</p>	<p>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>Spreadsheets Data, collecting, table, structure, spreadsheet, cell, cell reference, data item, format, formula, calculation, input, output, data, calculate, operation, formula, range, duplicate, sigma, question, organised, formula, chart, evaluate, results, comparison, questions, software, tools</p> <p>Variables in games</p>
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	<p>command, Start block, run, program, background, delete, reset, algorithm, predict, effect, change, value, instructions, delete, program</p>	<p>debug, features, evaluate</p>	<p>Motion, event, sprite, algorithm, logic, move, resize, extension block, pen up, set up, pen, design, event, action, debugging, errors, setup, design, code, setup, test, debug, actions, events</p>	<p>design, debug, logo, Pattern, repeat, repetition, count-controlled loop, algorithm, value, repeat, repetition, count-controlled loop, trace, value, repeat, count-controlled loop, decompose, procedure</p> <p>Repetition in games Scratch, programming, sprite, blocks, code, loop, repeat, value, block, forever, infinite loop, count-controlled loop, costume, modify, design, repetition, design, sprite, algorithm, duplicate, debug, refine, evaluate</p>		<p>Variable, change, name, value, set, design, event, algorithm, code, task, artwork, program, project, code, test, debug, improve, evaluate, share</p> <p>Sensing Microbit, Make Code, input, process, output, flashing, USB, trace, selection, condition, if then else, variable, random, sensing, accelerometer, value, compass, direction, navigation, design, task, algorithm, step counter, code, test, debug</p>
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