CROSSDALE

EQUALS TRUST

Sep 25 (v8)

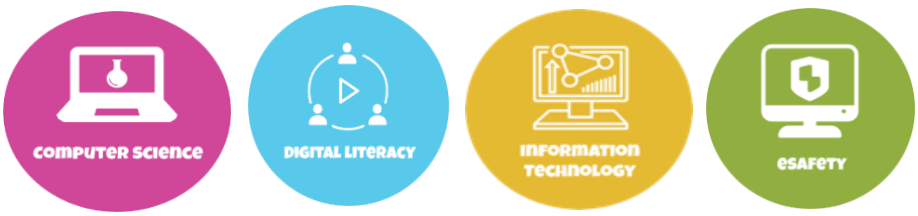
COMPUTING CURRICULUM

Intent – What do we want for our children as part of the Computing Curriculum?

At Crossdale, we offer a rich, broad and balanced computing curriculum that covers all three strands of the National Curriculum for computing:

- **Computer Science**
  -the scientific and practical study of computation: what can be computed, how to compute it, and how computation may be applied to the solution of problems.
- **Information Technology**
  -how computers and telecommunications equipment work and how they may be applied to the storage, retrieval, transmission and manipulation of data.
- **Digital Literacy (including eSafety)**
  -the ability to effectively, responsibly, safely and critically navigate, evaluate and create digital artefacts using a range of digital technologies.

Our curriculum acknowledges that the creation of digital artefacts is integral to much of the learning of computing. Digital artefacts can take many forms, including digital images, computer programs, spreadsheets, 3D animations and this electronic document.



At Crossdale, we aim to:

- ensure pupils can understand and apply the fundamental principles and concepts of computer science, including abstraction, logic, algorithms and data representation.
- ensure pupils can analyse problems in computational terms, and have practical experience of writing computer programs in order to solve such problems.
- ensure pupils can evaluate and apply information technology, including new or unfamiliar technologies, analytically to solve problems.
- enhance pupils' enjoyment, resilience, understanding and attainment in computing through comprehensive computing schemes of work that are designed for computing mastery. Mastery in computing means acquiring a deep, long-term, secure and adaptable understanding of the subject. We want children to skilfully apply their learning in computing to new situations in unfamiliar contexts.
- promote growth mindset and problem-solving approaches that enable pupils to develop resilience, persistence and confidence. All children are encouraged to believe in their ability to master computing and are empowered to succeed through curiosity, tinkering and perseverance.
- deliver lessons that are sequenced so that concepts are developed in logical steps with particular attention given to fundamental concepts. This ensures that all children can master concepts before moving to the next stage, with no pupil left behind.
- use ICT and computing as a tool to enhance learning throughout the curriculum.
- develop pupils' understanding of how to use ICT and computing safely and responsibly.
- equip pupils with the confidence and capability to use ICT and computing throughout their later life.

Although eSafety is embedded within all units the children are taught, discreet, additional units of eSafety are also taught across the year. Our Jigsaw PSHE lessons also cover esafety.

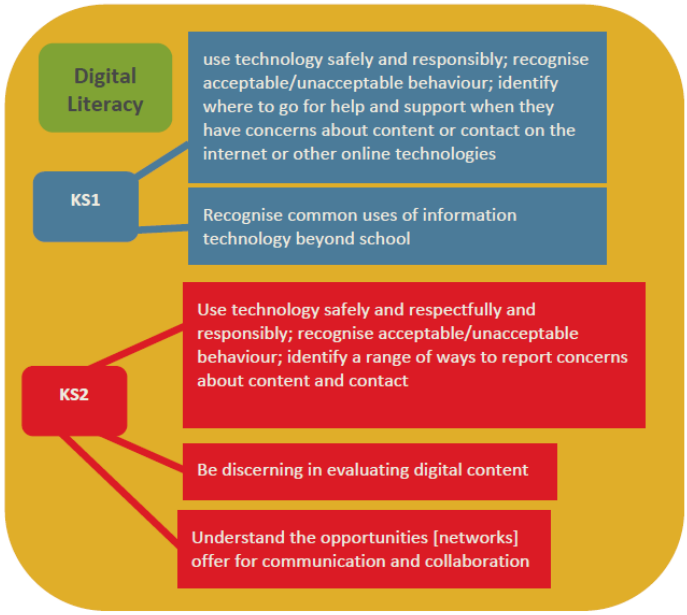
Implementation – How will we carry out our vision?

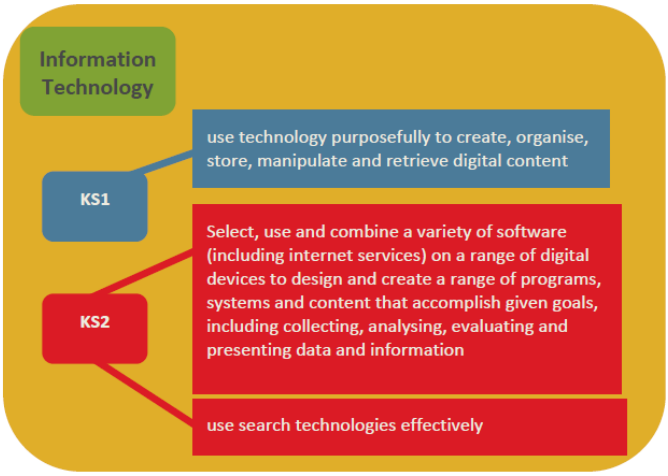
At Crossdale we use the 'iCompute' curriculum, a commercial scheme that offers a comprehensive set of resources:

- Long, medium and step-by-step short-term planning fully mapped to the National Curriculum for Computing at Key Stage 1 and Key Stage 2
- Curriculum progression throughout the primary phase for each strand of the National Curriculum

The curriculum is designed for progression where all learning builds towards clearly defined end points: end of unit, end of year and end of Key Stage.

The curriculum aims to equip young people with the knowledge, skills and understanding they need to thrive in the digital world of today and the future. All teaching units refer back to the 3 main strands of the National Curriculum which aim to cover the following in KS1 and KS2:





Early Years
Computing in our reception classes introduces pupils to key concepts that are then built upon throughout Key Stages 1 and 2. In Reception children experience explicit computing lessons designed to teach key skills and knowledge. Furthermore, we provide a broad, play-based experience of Computing in a range of contexts, including outdoor play. Computing is not just about computers. Our Early Year's learning environment feature technology-related scenarios based on experience in the real world, such as in role-play.

The iCompute curriculum is designed for progression where all learning builds towards clearly defined end points: end of unit, end of year and end of Key Stage.

Key Stages 1 and 2
Our curriculum aims to equip young people with the knowledge, skills and understanding they need to thrive in the digital world of today and the future. All teaching units refer back to the 3 main strands of the National Curriculum which aim to cover the following in KS1 and KS2:

Planning:

- All planning should be taken from the iCompute website which is regularly updated to reflect changes in technologies and approaches. (staff only links: KS1, LKS2, UKS2). The computing Overview on this document shows the order units should be taught in.
- When preparing a unit, teachers should first download the 'Unit Overview' which gives a summary of the main teaching objectives and vocabulary in each unit. (an example can be found here)
- When downloaded, planning should be saved in the planning folder on Allstaff each half term. Teachers should download planning afresh each time a unit is taught to ensure they are aware of any updates.
- Knowledge organisers (staff only link here)available from iCompute typically have vocabulary and key questions that the children should be able to answer by the end of the unit. An example of a knowledge organiser can be found here.

Inclusion:
All children have access to the same curriculum entitlement. Support is given in order to ensure that any barriers to learning such as EAL or SEND are overcome meaning that all children can take part fully in all lessons.
Further information can be found in our statement of equality information and objectives, and in our SEND policy and information report.

Impact – How will we assess what the children know, remember and understand?

Teachers will monitor the impact of their teaching using:

- AFL during lessons
- Spaced retrieval activities based on Key Questions featured on Knowledge Organisers

The Computing subject leaders monitors the way this subject is taught throughout the school by looking at the intent, implementation and impact using:

- Planning scrutiny
- Pupil Interviews & Learning Walks
- SIL & Governor visits
- Planning and delivering CPD

The Subject Leaders also have responsibility for monitoring the way in which resources are stored and managed. All the monitoring information is used by the Subject Leaders to ensure our provision and pupil outcomes are the very best they can be. Any next steps to move the subject and the children's learning forward are fed into the Subject Leader's monitoring and action plans, which form part of the whole school improvement plan.
Governors monitor whether the school is complying with its funding agreement and teaching a "broad and balanced curriculum" which includes the required subjects, through:

- Governor monitoring visits
- Head Teacher reports
- The School Development Plan

Computing Crossdale

Technology enables us to code, create and connect

The Four Elements of Computing

Computer Science	Information Technology	Digital literacy	E-safety

Knowledge and Understanding

Substantive Knowledge **(declarative knowledge)** (The facts, information and vocabulary that are needed to understand Computing) **Knowing that…. Understanding that….**		Disciplinary Knowledge **(procedural knowledge)** (The procedural skills that are needed to use technology effectively) **Knowing *how to*…..**	
Children show understanding of computational thinking and coding concepts when they get to tinker with programming software and robotics. Pupils have time to apply what they have learned in open exploration with block-based code and/or robotics play.	Children use technology purposefully and effectively to create, organize, store, manipulate and retrieve digital content. Children use a variety of software on a range of digital devices to design and create programs, systems and content to achieve a goal. Children learn to analyse and evaluate data and information.	Children use technology safely and responsibly. Showing an understanding of the uses of information technologies outside of school. They evaluate digital content and understand the opportunities that digital literacy offers for communication and collaboration.	Children show understanding of online safety which is taught as a thread during computing lessons but also through Jigsaw PSHE lessons. Whole school online safety assemblies are planned by the Computing Leader when appropriate and bespoke teaching takes place if safety problems arise.

The Skills Our Pupils Will Learn

Computer Science	Information Technology	Digital literacy	E-safety
• Developing computational thinking skills: decomposition, abstraction, pattern spotting, algorithm design, debugging and evaluating. • Designing algorithms and building code • Using and creating computer models • Understanding computer networks • Understanding what databases are and why they are useful	• Word processing • Using e-mail • Planning and creating animations • Creating and using spreadsheets • Creating 3D graphic models • Understanding cryptography • Digital drawing	• Understanding the Internet and the World Wide Web • Searching online • Blogging • Podcasting • Combining media to present information • Creating wed content using HTML/CSS	• Understanding that there are benefits and risks to using the internet • Understanding what personal information is • Understanding how to speak to others online • Understanding the importance of permission when it comes to sharing and using information/pictures • Understanding what to do when something goes wrong • Identifying adults who can help • Understanding how to act safely and responsibly

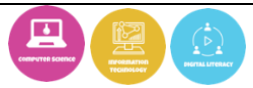
Whole School Computing Overview

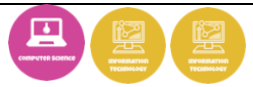
		Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Foundation Stage	e-safety lesson	Jessie and Friends Video 1 We learn that the internet can be enjoyable but there are sometimes things online that can be upsetting. We learn to speak to a grownup who will be able to help and to put down the tablet if we see anything worrying.	Jessie and Friends Video 2 We learn about the sharing of images and the importance of consent.	iInvestigate To understand the need to check information online is reliable	iProtect To understand the need for passwords and for keeping them private	iDetail To understand what personal information is	Jessie and Friends Video 3 We learn that when playing online games children should keep their personal information private, only talk to people they know in real life and that they can tell an adult they trust if anything worries them.
	Session 1	**iMake Algorithm** Sequencing nursery rhymes using a flow chart	**iCan Sort** Sorting leaves into groups	**iTell Stories (1)** Create puppets to help retell a traditional tale	**iCan Program** Program a BeeBot to move around a floor mat	**iMake Pictograms** Create a pictogram based on The Very Hungry Caterpillar.	**iCan Model** Dress a doll or teddy in appropriate clothes for the weather, then use modelling software to dress a tedding online
	Session 2	**iCan Sequence** Sequencing making a sandwich	**iAm Logical** Playing 'guess who' with toys.	**iTell Stories (2)** Use puppets from previous session to retell a traditional tale,	**iCan Control** Programming BeeBots to do jumps on a numberline	**iOrganise Data (1)** Create bar graphs using cubes, use technology to make the charts the children make on paper.	**iGuess Beasts** A treasure hunt using QR codes
	Session 3	**iCan Direct** Play games and move round an obstacle course	**iMake Pixel Art** To know that digital images are made of pixels	**iTell Stories (3)** Children record each other and create a	**iCan Direct** Play games and move round an obstacle course using direction	**iOrganise Data (2)** Continue to use technology to make the	**iFind Patterns** Recapping maths from earlier in the year – repeating patterns

		using direction language. Play games online.		digital book including images and sound	language. Play games online.	charts the children make on paper.	

		Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Year 1	e-safety lesson		iWatch	iPlay	iShare	iPlay more	
	Element of computing	 **iProgram (1) 6 sessions**	 **iProgram (2) 6 sessions**	 **iModel 5 sessions**	 **iDraw 5 sessions**	 **iData 4 sessions**	 **iAlgorithm 6 sessions**
	Overview	An introduction to algorithms and programming. Using physical and virtual toys to perform actions and understanding that computers are controlled by instructions.	An introduction to the app 'Scratch Jr'. The children will design and program animated stories. This will lay the foundations for their ongoing work in computing.	An introduction to computer modelling to represent real and imaginary environments. The children can make choices and investigate alternatives whilst creating their own representations.	In this unit, children explore and develop skills using digital tools to create and edit graphical art.	A range of unplugged/ tablet and computer lessons to explain the collection of data and its uses. Links to maths and data handling.	Predominantly unplugged activities to introduce the concepts of algorithms being a set of instructions that need to be followed in order.
	Apps/ programs / resources required	Programmable toys (beebots), online links	Scracth Jr, online links	Online links	Paintz website	Unplugged worksheets and online links	Unplugged worksheets

		Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Year 2	e-safety lesson	iDetail	iCarnival	iGame	iInfo	iHero	
	Element of computing	 **iProgram – 1 6 sessions**	 **iAnimate 6 sessions**	 **iSearch 6 sessions**	 **iProgram – 2 6 sessions**	 **iDo Mail 4 sessions**	 **iBlog 6 sessions**
	Overview	An introduction to visual programming language using Scratch. The children will create simple animations	The children will explore stop motion animation through story telling.	Children will use the internet to find out answers to questions, learning the importance of accuracy and checking multiple sources.	In this unit, the children explore coding and computational thinking practices using technology as a tool for creativity, expression and learning with Scratch Jr.	An introduction to emails. Exploring how emails are transmitted and how they can transmit communication over distance.	Children will learn that a blog is an online conversation with an audience that can respond. They will develop their writing and digital literacy skills by creating and responding to blog posts.
	Apps/ programs / resources required	Unplugged worksheets. Scratch	Unplugged worksheets. iPads. Craft resources	Unplugged worksheets. Online links	Unplugged worksheets. Scratch	Email accounts for pupils	Worksheets. Blogging software

		Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Year 3	e-safety lesson	iBlock	iFind out	iFriend	iFeel	iProtect	iChat
	Element of computing	 **iProgram 6 sessions**	 **iSimulate 5sessions**	 **iNetwork 4 sessions**	 **iData 5 sessions**	 **iConnect 6 sessions**	 **iPodcast 6 sessions**
	Overview	A visual introduction to programming language using the context of game development. Children will develop their own animations.	Children begin to understand that computer simulations can represent real and imaginary situations. They explore simulations, investigate options and test predictions. They evaluate the usefulness of simulations.	Introduction to networks. Children explore real-world examples of networks. They learn how digital devices are connected to form networks and how computer networks connect to form the internet.	Children learn how information in databases is organised and interrogated. They use databases and add records using information found online.	Children explore the differences between the internet and the world wide web involving surfing, searching and evaluating. They learn how to use search engines safely and effectively.	Children will explore, develop, and edit audio by podcasting. They will use technology to capture and manipulate sound, amend and modify their work and explore various podcasting features and audio effects.
	Apps/ programs / resources required	Scratch. Resources from website.	Simulation games (links), worksheets, Scratch.	Drawing software. Links, Craft resources, Worksheets	Worksheets, links, Google Earth.	Links. Worksheets. Post-It notes. PowerPoint	Links. Technology capable of playing and recording sound.

		Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Year 4	e-safety lesson	iPrivate	iPower	iSearch iKnow spam iBeat cyber bullying	iRespect	iSecure	iCommunicate
	Element of computing	 **iProgram** **6 sessions**	 **iData** **6 sessions**	 **iAnimate** **5 sessions**	 **iLearn AI** **5 sessions**	 **iPhotoEdit** **5 sessions**	 **iProgram 2** **6 sessions**
	Overview	A visual introduction to programming language using the context of game development. Children will develop their own animations.	Introduction to the concept of data being represented digitally on computers. Children will begin to understand that data is represented using numbers and learn how data is stored and manipulated.	Introduction to designing and creating computer animations. The children will create narratives and combine them with artwork to make their own animated story.	This unit introduces children to the world of Artificial Intelligence (AI). They explore how computers can learn from examples, understand what AI can and can't do, and even create their own simple AI projects.	This unit introduces children to the world of photo editing. They explore how digital images can be changed, improved, and combined, and use their skills to create their own photo collage.	Using visual programming language using the context of art. This unit also introduces text-based coding language. Children use both of these to investigate angles and negotiate mazes.
	Apps/ programs / resources required	Scratch. Resources from website.	Worksheets. Beads and bead strings. Online resources	Links. Worksheets. Paper to create flipbooks. Tracing paper.	Worksheets and links to websites	Canva pupil account	Lightbot. Links. Stackable bricks.

				Animation software. iPads.			

		Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Year 5	e-safety lesson	iCommunicate	iPersonal	iStay Safe	iTrust	iChat	iKnow Bullying
	Element of computing	**iDraw 6 sessions**	**iCrypto 6 sessions**	**iWeb 6 sessions**	**iEditVideo 6 sessions**	**iModel 6 sessions**	**iProgram (1) 8 sessions**
	Overview	An introduction to graphical drawing using digital tools. Children will explore how images are constructed from shapes and use a variety of geometric shapes, lines, colours, effects and layering to create graphic images.	An introduction to cryptography. Children will learn how to communicate securely over distances. They will explore a number of different methods of cryptography and understand the need for secure communication.	Children will explore how the World Wide Web allows people to connect, work together and share information. This includes working with the basic components of website programming HTML and how webpages are constructed.	This unit introduces children to the world of video production. They learn how to plan, film, and edit videos, adding effects, sounds, and transitions to create their own short films.	Introduces children to graphical modelling in 3D. Children will explore working with 3D shapes and design and build a model of their ideal school playground.	Using visual programming language using the context of art. This unit also introduces text-based coding language. Children use both of these to investigate angles and negotiate mazes.
	Apps/ programs / resources required	Computers, Sketchup	Links, worksheets, spreadsheet, torches	Printed and laminated resources, links, well known song, information books.	Canva or iMovie	Lego, links, graph paper, rulers, protractors, online resources.	Worksheets. Turtle software. Robomind. Links

		Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Year 6	e-safety lesson	iSecure	iPrivate	iPlay iKind	iUpstand	iNice	iTone iGet Help iReport
	Element of computing	**iProgram (1) 6 sessions**	**iNetwork 6 sessions**	**iData 6 sessions**	**iApp- Unit 1 6 sessions**		**iLearn AI 6 sessions**
	Overview	Children return to the visual coding language of Scratch in the context of games development to design games and explore the concepts of conditionals (true/false), data iteration (repeat of instructions until a condition is met), incremental development (adding a little detail at a time to a design until it is correct) and systematic testing.	Children explore how computers connect people to allow them to work together to share information and resources.	An introduction to spreadsheets. Children find out how information is entered into a spreadsheet and how formulae can be used to calculate totals. They then move on to producing charts and creating their own spreadsheets.	Children extend their programming skills by introducing mobile app development using MIT's app inventor. This units involves computer science learning in a context that is meaningful to children's digital lives. The children learn the value and uses of apps and develop their own.		This unit introduces children to Artificial Intelligence (AI). They explore what makes something "intelligent," look at the benefits and challenges of AI, and create their own simple AI projects using Scratch.
	Apps/ programs / resources required	Scratch, Worksheets, Online resources	Plastic cups, string, making tape, links, online resources, laptops	Excel, online resources	Links, App Inventor 2		Scratch Various websites

Progression and National Curriculum coverage

Documents detailing the progression of skills, knowledge, understanding and vocabulary across the units featured above can be found here.
These documents also show where and how the National Curriculum is mapped to the teaching units above –
further details of NC coverage feature on each unit overview

Computing Road Map

iCompute
PRIMARY COMPUTING

Year 1

Computer Science	Digital Literacy (incl. eSafety)	Information Technology
Algorithms, programming and computational thinking Creating computer models. Collecting, organising, interpreting and presenting and data.	Using digital tools and technology to communicate, collaborate and express themselves and ideas. Staying safe online.	Using technology for specific purposes. Presenting information, creating charts and using a word processor.
iProgram iModel iData	iSafe	iWrite

Year 2

Computer Science	Digital Literacy (incl. eSafety)	Information Technology
Computer modelling. Developing computational thinking skills, algorithms and programming with unplugged activities and Scratch.	Presenting information and ideas using multi-media. Searching online. Blogging. Acting safely and responsibly.	Using a range of tools and technologies: Email. Planning and creating animations
iProgram	iSearch iBlog iPub iSafe	iDo Mail iAnimate

Year 3

Computer Science	Digital Literacy (incl. eSafety)	Information Technology
Computer Simulations Computer Networks. Developing computational thinking, problem solving, creating computer programs with Scratch. Understanding computer networks.	Combining media to present information and express ideas. The Internet and the World Wide Web. Online searching, podcasting and being safe online.	Using a range of information technology for specific purposes. Data representation Spreadsheets
iProgram iNetwork iSimulate	iConnect iPodcast iSafe	iData

Year 4

Computer Science	Digital Literacy (incl. eSafety)	Information Technology
Computational Thinking, algorithms and programming using TurtleArt, Robomind, Lightbot and Scratch Data representation. Databases	Using digital tools creatively and informatively. Creating animations. eSafety	Using tools and technology. Communicating and collaborating using email
iAlgorithm iProgram	iAnimate iSafe	iEmail iData

Year 5

Computer Science	Digital Literacy (incl. eSafety)	Information Technology
Computing unplugged. Algorithms and programming with Scratch and Microsoft Kodu.	Using multi-media and tools to create web content. Data representation HTML/CSS Being Internet Awesome.	Using a range of tools and technology. 3D graphical modelling. Cryptography. Digital Drawing
iProgram	iWeb iSafe	iModel iCrypto iDraw

Year 6

Computer Science	Digital Literacy (incl. eSafety)	Information Technology
Computational thinking, algorithms and programming using App Inventor, Bitsbox, Scratch and Looking Glass. Computer Networks.	Using technology creatively to communicate, collaborate and express ideas and yourself. Creating web content using HTML/CSS	Using and evaluating a range of tools and technologies for specific purposes and audiences. Data representation and spreadsheets.
iProgram iApp	iNetwork iSafe	iData