



Abbey Road Primary School

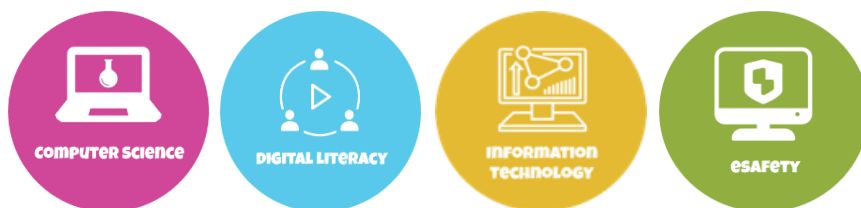
How we teach Computing



Computing Curriculum

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

At Abbey Road Primary School, we offer a rich, broad and balanced computing curriculum that covers the 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 Abbey Road, we aim to:

- meet the requirements of the National Curriculum programmes of study for computing.
- 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 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 technology as a tool to enhance learning throughout the curriculum.
- develop pupils' understanding of how to use technology safely and responsibly.
- equip pupils with the confidence and capability to use the skills they have learned throughout their life.

Computing at Abbey Road

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.....	

<p>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.</p>	<p>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.</p> <p>Children learn to analyse and evaluate data and information.</p>	<p>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.</p>	<p>Children show understanding of online safety which is taught during class assemblies each half term but also through other subject areas, such as PSHE and RSE.</p> <p>Whole school online safety assemblies are planned by the Computing Leader when appropriate.</p>
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The Skills Our Pupils Will Learn

Computer Science	Information Technology	Digital literacy	E-safety
<ul style="list-style-type: none"> • 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 	<ul style="list-style-type: none"> • Word processing • Using e-mail • Planning and creating animations • Creating and using spreadsheets • Creating 3D graphic models • Understanding cryptography • Digital drawing 	<ul style="list-style-type: none"> • Understanding the Internet and the World Wide Web • Searching online • Blogging • Podcasting • Combining media to present information • Creating web content using HTML/CSS 	<ul style="list-style-type: none"> • 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

Implementation – How will we carry out our vision?

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

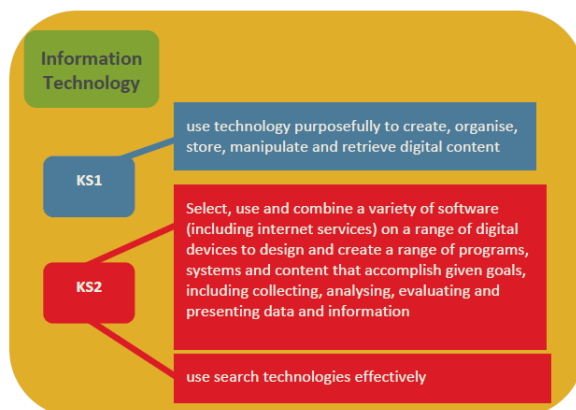
Early Years

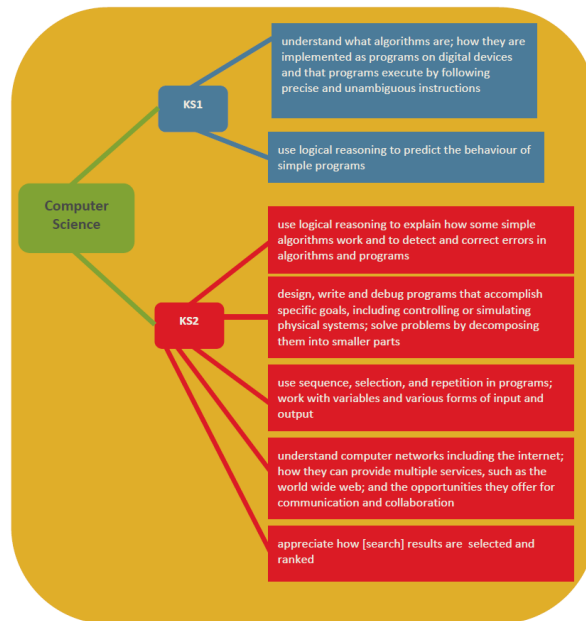
Computing in our reception classes introduces pupils to key concepts that are then built upon throughout Key Stages 1 and 2. In Reception children experience explicit computing lessons designed to teach key skills and knowledge. Furthermore, we provide a broad, play-based experience of Computing in a 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 is taken from the iCompute website which is regularly updated to reflect changes in technologies and approaches. The Whole School Computing Overview on this document shows the order in which units are taught.
- When preparing a unit, teachers 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](#))
- Teachers download planning afresh each time a unit is taught to ensure they are aware of any updates.
- Knowledge organisers 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](#). These Knowledge Organisers are available to support teachers and are not required to be given to pupils.

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.

Online Safety

At Abbey Road we take e-safety very seriously. Children have dedicated e-safety lessons each half term as outlined within the 'iSafe' units for each year group. E-Safety is also part of our PSHE curriculum and is referred to across the curriculum when it is relevant. Lesson content will be reviewed regularly to ensure it remains up-to-date and reflects current needs. Children are taught how to act online and how to minimise the risk when working on the Internet. Lessons cover a range of topics:

- how to identify and manage personal information
- how to recognise online bullying and what to do about it
- how to consider our own and others' wellbeing
- to be aware of our digital footprint
- how to respect copyright

Our plans provide children with an understanding of the expectations we have of them at a level appropriate to their age. Further details about filtering/monitoring as well as roles and responsibilities within our school are available in our Online Safety Policy.

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 the information and vocabulary featured on Knowledge Organisers

The Computing subject leader 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 Leader also has responsibility for monitoring the way in which resources are stored and managed. All the monitoring information is used by the Subject Leader 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







Whole School Overview







		Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Foundation Stage	e-safety lesson	 <p>There are rules to being safe online. What is personal information? Who is a trusted person? (Jessie and Friends Video)</p>	 <p>Online Bullying I can describe ways that people can be unkind with devices (not sharing devices, taking photos without permission) Jessie and Friends (video 1)</p>	 <p>EYFS Blog Looking at the school blog and understanding that we can share pictures online with permission</p>	 <p>Don't believe everything you read on the internet. Penguin Pig book</p>	 <p>iStay Safe lesson Children visit websites and learn how to do this safely.</p>	 <p>Recap that there are rules to being safe online. What have we learned this year?</p>
	Session 1	 <p>iMake Algorithm Sequencing nursery rhymes using a flow chart</p>	 <p>iCan Sort Sorting leaves into groups</p>	 <p>iTell Stories (1) Create puppets to help retell a traditional tale</p>	 <p>iCan Program Program a BeeBot to move around a floor mat</p>	 <p>iMake Pictograms Create a pictogram based on The Very Hungry Caterpillar.</p>	 <p>iCan Model Dress a doll or teddy in appropriate clothes for the weather, then use modelling software to dress a teddy online</p>
	Session 2	 <p>iCan Sequence Sequencing making a sandwich</p>	 <p>iAm Logical Playing 'guess who' with toys.</p>	 <p>iTell Stories (2) Use puppets from previous session to retell a traditional tale,</p>	 <p>iCan Control Programming BeeBots to do jumps on a numberline</p>	 <p>iOrganise Data (1) Create bar graphs using cubes, use technology to make the charts the children make on paper.</p>	 <p>iGuess Beasts A treasure hunt using QR codes</p>
	Session 3	 <p>iCan Direct Play games and move round an obstacle course using direction language. Play games online.</p>	 <p>iMake Pixel Art To know that digital images are made of pixels</p>	 <p>iTell Stories (3) Children record each other and create a digital book including images and sound</p>	 <p>iCan Direct Play games and move round an obstacle course using direction language. Play games online.</p>	 <p>iOrganise Data (2) Continue to use technology to make the charts the children make on paper.</p>	 <p>iFind Patterns Recapping maths from earlier in the year – repeating patterns</p>

		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	  iAlgorithm 6 sessions	  iModel 5 sessions	  iDraw 5 sessions	 iProgram (1) 6 sessions	 iProgram (2) 6 sessions	  iData 4 sessions
	Overview	Predominantly unplugged activities to introduce the concepts of algorithms being a set of instructions that need to be followed in order.	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.	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.	A range of unplugged/ tablet and computer lessons to explain the collection of data and its uses. Links to maths and data handling.
	Apps/ programs required	Unplugged worksheets	Online links	Paintz website	Programmable toys (beebots), online links	Scratch Jr, online links	Unplugged worksheets and online links







		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	 iSearch 6 sessions	 iAnimate 6 sessions	 iPub 6 sessions	 iBlog 6 sessions	 iDo Mail 4 sessions
	Overview	An introduction to visual programming language using Scratch. The children will create simple animations	Children will use the internet to find out answers to questions, learning the importance of accuracy and checking multiple sources.	The children will explore stop motion animation through story telling.	Children will learn about the advances in technology over time. They will present their findings and develop digital literacy skills through interactive e-books.	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.	An introduction to emails. Exploring how emails are transmitted and how they can transmit communication over distance.
	Apps/ programs required	Unplugged worksheets. Scratch	Unplugged worksheets. Online links	Unplugged worksheets. iPads. Craft resources	Laptops/iPads. Online lines Presentation software.	Unplugged worksheets. Laptops.	Laptops

Year 3














		Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
	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 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	iRespect	iSecure iKnow spam	iCommunicate iBeat cyber bullying
	Element of computing	 iProgram 6 sessions	 iData 6 sessions	 iAnimate 5 sessions	 iMail 5 sessions	 iProgram (1) 6 sessions	 iProgram (2&3) 8 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.	Children learn to use email to send and receive messages. They will learn about communicating over distances and how to use email safely.	Children develop their storytelling skills through a variety of design and programming activities using Scratch.	An extension of children's experiences developing algorithms and programs to solve puzzles.
	Apps/ programs required	Scratch. Resources from website.	Worksheets. Beads and bead strings. Online resources	Links. Worksheets. Paper to create flipbooks. Tracing paper. Animation software. iPads.	Communication devices (or photos of them). Email account.	Scratch. Links.	Lightbot. Links. Stackable bricks.

Year 5

		Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
	e-safety lesson	iCommunicate	iPersonal	iStay Safe	iTrust	iChat	iKnow Bullying
	Element of computing	 iProgram (1) 6 sessions	 i Draw 6 sessions	 iCrypto 6 sessions	 iWeb 6 sessions	 iProgram (2) 8 sessions	 iModel 6 sessions
	Overview	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.	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.	An introduction to a different visual programming language – Microsoft Kodu (which allows pupils to compute games using a PC or X-Box). Children will develop algorithm and programming skills and use storytelling and problem solving to design and program 3D games.	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.
	Apps/ programs required	Worksheets. Turtle software. Robomind. Links	Computers, Sketchup	Links, worksheets, spreadsheet, torches	Printed and laminated resources, links, well known song, information books.	Kdo (app), worksheets, online resources.	Lego, links, graph paper, rulers, protractors, online resources.

Year 6

		Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
	e-safety lesson	iSecure/ iPrivate	iPlay/ iKind	iUpstand/ iNice	iTone	iGet Help	iReport
	Element of computing	  iModel 6 sessions	  iProgram (1) 6 sessions	  iNetwork 6 sessions	  iData 6 sessions	   iApp 6 sessions	  iProgram (2) 6 sessions
	Overview	Return to the visual coding language in Scratch but 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) and incremental development (adding a little detail at a time to a design until it is correct).	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.	An introduction to a new programming environment – 'looking glass'. Children create animations and games through creative exploration, developing the fundamental principles of programming.
	Apps/ programs required	Scratch, cups and sticky notes, worksheets	Scratch, Worksheets, Online resources	Plastic cups, string, making tape, links, online resources, laptops	Excel, online resources	Links, App Inventor 2	Laptops, Looking Glass app, links, online resources.

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.

