



Computing Curriculum overview

Digital Literacy and Online Safety

Computational Thinking

Computers and Hardware

Resilience

Curiosity

Respectfulness

Creativity

Independence

Confidence

Computing Curriculum Overview

Vision

At Darrick Wood Infant and Nursery School we believe that computational thinking is vital in helping children to solve problems, design systems, and understand the power and limits of human and machine intelligence. We believe it is a skill that empowers, and one that all pupils should be aware of and develop competence in. Pupils who can think computationally are better able to conceptualise, understand and use computer-based technology, and so are better prepared for today's world and future.

Intent

The aims of Computing are to enable children to:

- Become creative, logical, critical thinkers, who reason systematically and work collaboratively. Risk taking and innovation will be enriched through the computer science.
- Analyse problems in computational terms, and have repeated practical experience of writing computer programs in order to solve such problems.
- Appreciate the relevance of digital literacy in our society and that they see it as an essential tool for learning, communication, finding information and for controlling and understanding their environment.
- To explore their attitudes towards computing and its value to them. For example, to learn about issues of security, confidentiality, staying safe online and accuracy. As children's confidence grows they will be able to make informed and discerning choices about their use of information technology.

In line with the National Curriculum for Computing, our aim is to provide a high-quality computing education which equips children to use computational thinking and creativity to understand and change the world. Children will have gained key knowledge and skills in the three main areas of the computing curriculum: computer science (programming and understanding how digital systems work), information technology (using computer systems to store, retrieve and send information) and digital literacy (evaluating digital content and using technology safely and respectfully)



Key stage 1 Computing

Purpose of study

A high-quality computing education equips pupils to use computational thinking and creativity to understand and change the world. Computing has deep links with mathematics, science, and design and technology, and provides insights into both natural and artificial systems. The core of computing is computer science, in which pupils are taught the principles of information and computation, how digital systems work, and how to put this knowledge to use through programming. Building on this knowledge and understanding, pupils are equipped to use information technology to create programs, systems and a range of content. Computing also ensures that pupils become digitally literate – able to use, and express themselves and develop their ideas through, information and communication technology – at a level suitable for the future workplace and as active participants in a digital world.

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.

Pupils should be taught to:

- understand what algorithms are; how they are implemented as programs on digital devices; and that programs execute by following precise and unambiguous instructions
- create and debug simple programs
- use logical reasoning to predict the behaviour of simple programs
- use technology purposefully to create, organise, store, manipulate and retrieve digital content
- recognise common uses of information technology beyond school

use technology safely and respectfully, keeping personal information private; identify where to go for help and support when they have concerns about content or contact on the internet or other online technologies.

Computing in EYFS

EYFS	Overview	Key Knowledge	Vocabulary
Computing	Within the new EYFS curriculum the 'Technology' strand has been removed from 'Understanding the World' and has not been replaced with any updated guidance. However, computing and technology are still vitally important subjects to teach to Foundation children. Teaching computing within the curriculum ensures that children enter Year 1 with a strong foundation of knowledge. Computing in the Early Years is centred around play-based, unplugged (no computer) activities that focus on building children's listening skills, curiosity and creativity and problem solving. We live in a technological world and there is no escape from the reality that technology is integrated into the lives of young children. Just as we ensure the children in our care are ready for the adult world by teaching them maths and literacy, we should also make sure that they are fluent in computer literacy and all-important e-safety. Continuous Provision – available throughout the day for both focussed and self-chosen learning A range of technology is available within the classroom and <i>outside in the paddock for the children to access, both independently and with an adult.</i> - Tablets - Computers – games / activities linked to the topic or maths being covered each week. - Remote control toys – cars. - Battery operated toys - Beebots - CD players - Interactive white boards – Phonics Play / Topmarks / Google Earth / Digimap. - iPads - Purple Mash (mini mash) – drawing, sorting, information gathering. - Sound buttons – children can listen to a pr-recorded challenge or record their own answers. - exploring old typewriters / computers / mechanical toys. -phones taking a photograph with a camera or tablet searching for information on the internet playing games on the interactive whiteboard exploring an old typewriter or other mechanical toys using a Beebot watching a video clip listening to music	Sticky Knowledge: By the end of EYFS the children will know... Personal, Social and Emotional Development I can wait a short amount of time for something I want eg: a computer loading / an App to work.. I know how to complete a familiar task independently and with support will try new things. Eg: a computer programme / Beebot. I can select tools and resources that I need to complete a task of my own choosing. I know how to be safe online. I know that a password is secret. Physical Development I know how to use an iPad or tablet appropriately. I know how to use my fingers on a touch screen, and control a mouse/touchpad on a computer. Understanding the World I know how to use a camera ie: on an iPad. I know how to work a simple programable toy. I can select and use technology for particular purposes. I know how technology is used in my own home. I know that technology has changed since my adults were young. Expressive Art and Design Children can safely use a range of technology for a purpose.	<u>Vocabulary:</u> Computer, iPad, tablet, App, button, mouse, screen, keyboard, Google, information, control, instruction, internet, robot, save, sequence, instructions, search, safety, online, password,

Computing in Year 1

Year 1	Overview	Key Knowledge	Vocabulary
Autumn	Online safety: An introduction to online safety: children learn what it means to be 'online' and how to stay safe whilst treating others with respect. Digital Literacy Understanding that they need to be kind on the internet, as they would in real life Discovering which devices connect to the internet Understanding some tips for staying safe and why this is important	Know the meaning of 'sharing' and 'posting' in an online context Know the 4 top tips for staying safe online 1) People you do not know are strangers 2) Be nice to people like you would be in the real world 3) Keep your personal information private 4) If you are unsure about anything, then tell an adult you trust	• communicate • connect • devices • digital footprint • emotion • feelings • internet • internet safety • online • personal information • posting • respect • sharing • smart device • strangers • trust • wired • wireless
	Computing systems and networks: Improving mouse skills Introducing children to logging in and using technology for a purpose, including creating art. Digital Literacy Recognising common uses of information technology. Logging in and saving work on their own account. Knowing what to do if they have concerns about content or contact online. Understanding of how to create digital art using an online paint tool. Information Technology Learning to locate where keys are on the keyboard. Developing basic mouse skills.	Keyboard skills – locating the letters of individual names Computer menus - file, open, save, close Using a mouse – click and drag, drag and drop, left/right click, mouse mat	• account • clipart • computer • log on/off • password • resize • screen (monitor) • software • tools • username
Spring	Data handling: Introduction to data Learning about what data is and how it can be represented and using these skills to show the findings of a mini beast hunt. Digital Literacy Using technology purposefully to create, organise, store, manipulate and retrieve digital content. Selecting software appropriately. Information Technology Recognising uses of technology beyond school.	How branching databases work Other ways of collecting data – tally chart, bar graph, line graph, pictogram	• categorise • chart • computer • data • information • label • pictogram • record • sort • table • text
	Creating media: Digital imagery Taking and manipulating digital photographs, including adding images found via a search engine. Digital Literacy	How sequences work Camera types and basic photography techniques Tell a trusted adult about any online safety concerns	• crop • delete • download • drag and drop • editing software • image • import • resize • save as • search engine • sequence • smart device • storage space • visual effects

	Using technology purposefully to create, organise, store, manipulate and retrieve digital content. Knowing what to do if they have concerns about content or contact online. Information Technology Using cameras or tablets to take photos. Computer Science Using logical reasoning to predict the behaviour of simple programs.		
Summer	Programming: Algorithms unplugged Learning how computers handle information by exploring 'unplugged' algorithms- completing tasks away from the computer Computer Science Understanding how to create algorithms. Learning that computers need information to be presented in a simple and clear way. Understanding how to break a computational thinking problem into smaller parts in order to solve it.	Planning and execution of an algorithm/set of instructions for a simple activity Basic debugging concepts Decomposition – how to breakdown objects into separate parts and categorise them	● algorithm ● bug ● computer ● debug ● decompose ● device ● input ● instructions ● output ● solution

Computing in Year 2

Year 2	Overview	Key Knowledge	Vocabulary
Autumn	Online safety: Pupils learn about how to keep personal information safe online, including their right to give or deny permission for information to be shared online	The difference between 'online' and 'offline.' How to create a strong password. Tell a trusted adult about any online safety concerns	● accept ● consent ● content ● offline ● online ● password ● permission ● personal information ● terms and conditions ● trusted adult
	Word processing: This unit is taught throughout the year. The knowledge and skills are used and applied across the curriculums.	Learn about word processing and how to stay safe online as well developing touch-typing skills. Introduce important keyboard shortcuts, as well as simple editing tools within a word processor including bold, italics, underline and font colour as well as how to import images.	
Spring	Computing systems and networks : What is a computer? Computer Science Children explore what a computer is, learning about inputs and outputs, how computers are used in the wider world and designing an invention Information Technology	Learning about inputs and outputs and how they are used in algorithms. Understanding what a computer is and the role of individual components. Different types of technology – cameras, phones, torches, microwave, alarm clock, remote control Inputs e.g. keyboard, mouse Outputs e.g. monitor, speakers, printers	● battery ● buttons ● computer ● desktop ● device ● electricity ● invention ● laptop ● technology ● wire
	Algorithms and Debugging Dinosaur algorithm Programming : Identifying problems with code using both 'unplugged' and 'plugged' systems to debug (identify and correct) errors in an algorithm Computer Science	Creating and debugging simple programs. Using logical reasoning to predict the behaviour of simple programs. Understanding what algorithms are; how they are implemented as programs on digital devices; and that programs execute by following precise and unambiguous instructions.	● artificial intelligence (AI) ● bug ● correct ● data ● debug ● decompose ● error ● key features ● loop ● predict ● unnecessary
Summer	Programming: Scratch Jr Computer Science Using 'ScratchJr', pupils programme a familiar story and an animation, make their own musical instruments and follow an algorithm to record a joke. Digital Literacy Coding – Scratch Jr, code blocks, algorithms, sprites/speeds, repeat and loop control blocks, start/finish, direction Blocks – triggering, motion, looks, sound, end, control	Creating and debugging simple programs. Using logical reasoning to predict the behaviour of simple programs. Understanding what algorithms are; how they are implemented as programs on digital devices; and that programs execute by following precise and unambiguous instructions. Using technology purposefully to create, organise, store, manipulate and retrieve digital content.	● animation ● bug ● code ● debug ● icon ● imitate ● instructions ● sequence

	Creating media: Stop motion Pupils create simple animations, plan a storyboard, then decompose it into small chunks of action to be captured. Digital Literacy Using technology purposefully to create, organise, store, manipulate and retrieve digital content. Information Technology Understanding how to use tablets or computers to take photos.	Animations – how still images become moving images Use of animation software Sketching and planning	• animator • storyboard • - contraption • upload • - decompose • design • - download • film review • - filming • import • image • - plan • sketch • software • - stop-motion
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