Cranborne
Church of England
First School and Nursery
Love, Learn, Fly
Do Everything in Love 1 Corinthians 16:14

Computing at Cranborne First School and Nursery

We provide a high-quality computing curriculum we intend to equip children to participate in a rapidly-changing world where work and leisure activities are increasingly transformed by technology. It is our intention that pupils become digitally literate to enable children to find, explore, analyse, exchange and present information. We also focus on developing the skills necessary for children to be able to use information in a safe and responsible way. Computing skills are a major factor in enabling children to be confident, creative and independent learners and it is our intention that children have every opportunity available to allow them to achieve this.

In addition, 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 has deep links with mathematics, science, and design and technology and we have found links to other areas of our curriculum to make learning fun and engaging for our pupils.

Curriculum Drivers

	In all subjects…	**In computing, this looks like…**
Curiosity	Curiosity is an eagerness to learn or know and being confident in asking questions and researching. This approach to learning enables inquisitive thinking such as exploration, investigation and learning and nurtures future problem solvers.	Our computing curriculum enables children to become life-long learners through teaching them how to access the learning opportunities that technology has to offer. We teach children to access the internet and how to use it to explore their curiosity in a manner that is safe. Our engagement opportunities inspire children to continue to develop their computing skills outside of school.
Communication	We believe that language is the tool that unlocks opportunities and enables children to share ideas effectively. We want our children to speak with clarity, confidence and eloquence, connecting the words they know (vocabulary)	Our computing curriculum provides opportunities for children to be expressive communicators by exploring how the internet can provide opportunities to communicate such as email and video conferencing. As well, children are taught how to encrypt and

	with what they know (knowledge) therefore becoming effective communicators. We know that vocabulary development and the ability to read fluently are key to life-long success and this is our intent for every child.	decrypt messages, and understand the algorithms set to instruct computers. Online safety lessons will also educate children in how to express themselves and communicate safely through the internet, exploring the dos and don'ts of social media. Additionally, computing offers opportunities for children to work collaboratively with peers sharing devices and working in groups or pairs to complete a project.
Resilience	Resilience means having the skills and resources to deal with challenges and barriers. Resilience is a measure of how much you want something and how much you are willing and able, to overcome obstacles to get it. Our children will develop the emotional and physical security needed to become resilient individuals who are able to take risks and deal with different challenges across the curriculum and in the wider world by thinking positively and having the confidence to 'have a go'.	Learning to code teaches children to persevere with trying to solve a problem, making improvements until all issues are resolved and the program works.
Independence	Independence is the ability to live your life to the full, confidently and to be self-sufficient. We aim to promote our children's independence and develop a commitment to learning and self-improvement, both inside and outside of the school environment. We will give our children opportunities to organise themselves, show personal responsibility, initiative, creativity and enterprise. We will nurture our children's awareness that actions have consequences and to make choices based on this awareness, understanding that they have ownership of their actions.	Encouraging pupil talk, listening to children's responses and valuing what they say all helps develop children feeling confident at expressing their viewpoint.
Aspiration	Aspiration is the hope, desire or ambition to strive to achieve something. To be the best they can possibly be and to challenge themselves as a learner. The development of aspirations encourages children to produce work of high quality, take pride in themselves and be the very best they can be.	Learning about inspiring individuals show children what is possible if we hope and desire to achieve something.

Learning knowledge is not an end point in itself, it is a springboard to learning more knowledge. Each unit in our overview is underpinned by rich, substantive knowledge and ambitious vocabulary, whilst also ensuring children are developing their disciplinary knowledge. Each unit of work is planned carefully to ensure concepts are taught in optimal order to support children's understanding. As well as developing a breadth of subject knowledge, we want our children to develop subject specific skills. In addition to substantive and disciplinary knowledge, children will develop their experiential knowledge through carefully planned enrichment activities.

	EYFS	**Year 1 and Year 2**	**Year 3 and Year 4**
Cycle 1	Planning purposeful ways for the children to create with video, photographs and digital images, control devices and learn the social skills, rules and responsible use when using devices and the internet Taking a photograph with a camera or tablet Searching for information on the internet Playing games on the interactive whiteboard	Online Safety & Exploring Purple Mash Grouping and Sorting Pictograms Lego Builders Maze Explorers Animated Story Books Coding Spreadsheet Technology outside school	Coding Online Safety Spreadsheets Touch Typing Email (including email safety) Branching Databases Simulations Graphing Presenting
Cycle 2	Exploring an old typewriter or other mechanical toys Using a Beebot Watching a video clip Listening to music	Coding Online Safety Spreadsheets Questioning Effective Searching Creating Pictures Making Music Presenting Ideas	Coding Online Safety Spreadsheets Writing for Different Audiences Logo Animation Effective Searching Hardware Investigators Making Music

Substantive Concepts – these are the concepts that give a subject substance or content

Our curriculum is refined yearly, but it maintains a consistent knowledge base to ensure conceptual progression. We have identified a set of key substantive concepts that children will repeatedly revisit throughout their time at Cranborne First. Our substantive concepts are:

	Logic	Algorithms	Decomposition	Patterns	Abstraction	Evaluation
	Predicting and analysing	Making steps and rules	Breaking down into parts	Spotting and using similarities	Removing unnecessary detail	Making judgements
EYFS	Make a floor robot move.	Use simple software to make something happen.	Operate simple equipment.	Create shapes and text on a screen.		Use a safe part of the Internet to play and learn. Talk about different kinds of information such as pictures, video, text and sound.
KS1	Press the buttons in the correct order to make their robot do what they want.	Tell others the order they need to do things to make something happen and talk about this as an algorithm.	Use programming software to make objects move.	Begin to use software/apps to create movement and patterns on a screen.	Watch a program execute and spot where it goes wrong so that they can debug it.	Look at their friend's program and talk about what will happen.
LKS2	Organise data in different ways. Collect data and identify where it could be inaccurate.	Recognise that an algorithm will help them to sequence more complex programs.	Use logical thinking to solve an open-ended problem by breaking it up into smaller parts. Use an efficient procedure to simplify a program.	Recognise that using algorithms will also help solve problems in other learning such as Maths, Science and Design and Technology.	Create, modify and present documents for a particular purpose.	Talk about the ways they can protect themselves and their friends from harm online. Recognise an error in a program and debug it.

Second Order Concepts – Shape the Enquiry

Tinkering • Design, write and debug programs that accomplish specific goals • Use logical reasoning to explain how some simple algorithms work and to find and correct errors in algorithms and programs. • Use technology safely, respectfully and responsibly		**Creating** • including abstraction, sequence, selection and repetition, logic, algorithms and data representation • Select, use and combine software on a range of digital devices to create a program, that accomplish given goals, including collecting, analysing, evaluating and presenting data • Use search technologies effectively, be discerning in evaluating digital content
Debugging • Apply the fundamental principles and concepts of computer science	**Persevering** • Solve problems by breaking them down into smaller parts. • Evaluate and apply information technology, including new or unfamiliar technologies, analytically to solve problems	**Collaborating** • Working together to solve problems

Progression in Computing EYFS & Key Stage 1

Programming

Key Stage 1 National Curriculum Expectations

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

EYFS	Year 1	Year 2
Make a floor robot move. Use simple software to make something happen. Make choices about the buttons and icons they press, touch or click on. Talk about different kinds of information such as pictures, video, text and sound.	Give instructions to their friend and follow their instructions to move around. Describe what happens when they press buttons on a robot. Press the buttons in the correct order to make their robot do what they want. Describe what actions they will need to do to make something happen and begin to use the word algorithm. Begin to predict what will happen for a short sequence of instructions. Begin to use software/apps to create movement and patterns on a screen. Use the word debug when they correct mistakes when they program.	Give instructions to a friend (using forward, backward and turn) and physically follow their instructions. Tell others the order they need to do things to make something happen and talk about this as an algorithm. Program a robot or software to do a particular task. Look at their friend's program and talk about what will happen. Use programming software to make objects move. Watch a program execute and spot where it goes wrong so that they can debug it.

Multi Media and Handling Data

Key Stage 1 National Curriculum Expectations

Pupils should be taught to:

- use technology purposefully to create, organise, store, manipulate and retrieve digital content

EYFS	Year 1	Year 2
Move objects on a screen. Create shapes and text on a screen. Use technology to show my learning.	Be creative with different technology tools. Use technology to create and present my ideas. Use the keyboard or a word bank on their device to enter text. Name and save information in a special place and retrieve it again. Talk about the different ways in which information can be shown. Use technology to collect information, including photos, video and sound. Sort different kinds of information and present it to others. Add information to a pictograph and talk about what they have found out.	Use technology to organise and present their ideas in different ways. Use the keyboard on their device to add, delete and space text for others to read. Tell you about an online tool that will help them to share their ideas with other people. Name, save and open files on the device they use. Talk about the different ways they use technology to collect information, including a camera, microscope or sound recorder. Make and save a chart or graph using the data they collect. Talk about the data that is shown in their chart or graph. Start to understand a branching database. Tell you what kind of information they could use to help them investigate a question.

Technology in our Lives

Key Stage 1 National Curriculum Expectations:

Pupils should be taught to:

- recognise common uses of information technology beyond school

EYFS	Year 1	Year 2
Talk about technology that is used at home and in school. Operate simple equipment. Use a safe part of the Internet to play and learn.	Recognise the ways that technology is used in the classroom. Recognise ways that technology is used at home and in the community. Use links to websites to find information. Begin to identify some of the benefits of using technology.	Talk about how and why technology is used in the classroom. Talk about how and why technology is used in the home and community. Start to understand that other people have created the information they use. Identify benefits of using technology including finding information, creating and communicating. Talk about the differences between the Internet and things in the physical world.

E-Safety

Key Stage 1 National Curriculum Expectations:

Pupils should be taught to:

- 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.

EYFS	Year 1	Year 2
Ask an adult when they want to use the Internet. Tell an adult when something is worrying them or unexpected happens while they are using the Internet. Be kind to their friends. Talk about the amount of time they spend using a computer / tablet / game device. Be careful with technology devices.	Keep their password private. Tell you what personal information is. Tell an adult when they see something unexpected or worrying online. Talk about why it's important to be kind and polite. Recognise an age-appropriate website. Agree and follow sensible e-Safety rules.	Explain why they need to keep their password and personal information private. Describe the things that happen online that they must tell an adult about. Talk about why they should go online for a short amount of time. Talk about why it is important to be kind and polite online and in real life. Know that not everyone is who they say they are on the Internet.

Progression in Computing
Lower Key Stage 2

Programming

Key Stage 2 National Curriculum Expectations

Pupils should be taught to:

- design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems; solve problems by decomposing them into smaller parts
- use sequence, selection, and repetition in programs; work with variables and various forms of input and output
- use logical reasoning to explain how some simple algorithms work and to detect and correct errors in algorithms and programs

Year 3	Year 4
Break an open-ended problem up into smaller parts. Put programming commands into a sequence to achieve a specific outcome. Keep testing their program and can recognise when they need to debug it. Use repeat commands. Describe the algorithm they will need for a simple task. Detect a problem in an algorithm which could result in unsuccessful programming.	Use logical thinking to solve an open-ended problem by breaking it up into smaller parts. Use an efficient procedure to simplify a program. Use a sensor to detect a change which can select an action within my program. Know that they need to keep testing their program while they are putting it together. Use a variety of tools to create a program. Recognise an error in a program and debug it. Recognise that an algorithm will help them to sequence more complex programs. Recognise that using algorithms will also help solve problems in

	other learning such as Maths, Science and Design and Technology.

Multi Media & Handling Data

Key Stage 2 National Curriculum Expectations

Pupils should be taught to:

- use search technologies effectively, appreciate how results are selected and ranked, and be discerning in evaluating digital content
- select, use and combine a variety of software (including internet services) on a range of digital devices to design and create a range of programs, systems and content that accomplish given goals, including collecting, analysing, evaluating and presenting data and information.

Year 3	Year 4
Create different effects with different technology tools. Combine a mixture of text, graphics and sound to share their ideas and learning. Use appropriate keyboard commands to amend text on their device, including making use of a spellchecker. Evaluate their work and improve its effectiveness. Use an appropriate tool to share their work online. Talk about the different ways data can be organised. Search a ready-made database to answer questions. Collect data to help them answer a question. Add to a database.	Use photos, video and sound to create an atmosphere when presenting to different audiences. They are confident to explore new media to extend what they can achieve. Change the appearance of text to increase its effectiveness. Create, modify and present documents for a particular purpose. Use a keyboard confidently and make use of a spellchecker to write and review their work. Use an appropriate tool to share their work and collaborate online. Give constructive feedback to their friends to help them improve their work and refine their own work. Organise data in different ways.

Make a branching database. Use a data logger to monitor changes and talk about the information collected.	Collect data and identify where it could be inaccurate.

Technology in our Lives

Key Stage 2 National Curriculum Expectations

Pupils should be taught to:

- understand computer networks including the internet; how they can provide multiple services, such as the world wide web; and the opportunities they offer for communication and collaboration

Year 3	Year 4
Save and retrieve work on the Internet, the school network or their own device. Talk about the parts of a computer. Tell you ways to communicate with others online. Describe the World Wide Web as the part of the Internet that contains websites. Use search tools to find and use an appropriate website. Make decisions about whether I can use images that I find online in my own work.	Tell you whether a resource they are using is on the Internet, the school network or their own device. Identify key words to use when searching safely on the World Wide Web. Think about the reliability of information they read on the World Wide Web. Tell you how to check who owns photos, text and other information. Create a hyperlink to a resource on the World Wide Web.

E-safety

Key Stage 2 National Curriculum Expectations

Pupils should be taught to:

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

Year 3	Year 4
Talk about what makes a secure password and why they are important. Protect their personal information when they do different things online. Use the safety features of websites as well as reporting concerns to an adult. Recognise websites and games appropriate for their age. Make good choices about how long they spend online. Ask an adult before downloading files and games from the Internet. Post positive comments online.	Choose a secure password when they are using a website. Talk about the ways they can protect themselves and their friends from harm online. Use the safety features of websites as well as reporting concerns to an adult. Know that anything they post online can be seen by others. Choose websites and games that are appropriate for their age. Help their friends make good choices about the time they spend online. Talk about why they need to ask a trusted adult before downloading files and games from the Internet. Comment positively and respectfully online.

Vocabulary Cycle 1

EYFS					
on	off	switch	backwards	forwards	instruction
sound	moving	buttons	keyboard	mouse	screen
camera	photograph	Internet	website	information	I-pad
bee-bot	laptop	computer			

Key Stage 1								
Online Safety	**Grouping and Sorting**	**Pictograms**	**Lego Builders**	**Maze Explorers**	**Animated Storybooks**	**Coding**	**Spreadsheets**	**Technology outside school**
log in username log out password avatar notification topics tools save	sort criteria	pictogram data collate	Instruction algorithm computer program debug	direction challenge arrow undo rewind forward backward right turn left turn debug instruction algorithm	animation e-book font file sound effect display board	action algorithm background code command debugging event execute input instructions object properties output scale run sound when clicked scene	arrow keys backspace key cursor columns cells clipart count tool delete key image toolbox move cell tool rows lock tool speak tool spreadsheet	technology

Lower Key Stage 2							
Coding	**Online Safety**	**Spreadsheets**	**Touch Typing**	**Email**	**Branching Databases**	**Simulations**	**Graphing**
action algorithm background alert blocks of command button collision detection debugging command develop execute event nesting object flowchart plan predict output procedure repeat properties timer sequence sound scene test values	password internet blog concept map username website webpage spoof website PEGI rating	< > = advance mode copy and paste columns cells delete key equals tool spin tool move cell tool rows spreadsheet	posture top row keys home row keys bottom row keys space bar	communication email compose send CC attachment formatting report to teacher password address book save to draft	branching database data database question	simulation	graph field data bar chart block graph line graph

Vocabulary Cycle 2

EYFS					
on	off	switch	backwards	forwards	instruction
sound	moving	buttons	keyboard	mouse	screen
camera	photograph	Internet	website	information	I-pad
bee-bot	laptop	computer			

Key Stage 1							
Coding	**Online Safety**	**Spreadsheets**	**Questioning**	**Effective Searching**	**Creating Pictures**	**Making Music**	**Presenting Ideas**
action algorithm background code command debugging event execute	search display board internet sharing email attachment digital footprint	backspace key copy and paste column cells count tool delete key equals tool image toolbox lock tool move cell tool rows speak tool	pictogram question data collate binary tree avatar database	internet search search engine	impressionist palette pointillism share surrealism template	composition digitally music sound effects soundtrack tempo volume	concept map quiz presentation node animated non-fiction narrative audience

Lower Key Stage 2							
Coding	**Online Safety**	**Spreadsheets**	**Writing for different audiences**	**Logo**	**Animation**	**Effective Search**	**Hardware Investigators**
action background alert button command coordinates debugging develop execute flowchart if if/else nesting prompt predict objects type procedure repeat until properties sequence variable variable value	computer virus cookies copyright digital footprint email identity theft malware phishing plagiarism spam	average advance mode copy and paste columns cells charts equal tools formula formula wizard move cell tool random tool rows spin tool spreadsheet timer	font bold italic underline	LOGO BK FD RT LT REPEAT SETPC SETPS PU PD	animation background frame flipbook onion skinning stop motion play sound video clip	easter egg internet internet browser search search engine spoof website website	motherboard CPU RAM graphics Card network card monitor speakers keyboard and mouse