Welton St Mary's Church of England Primary Academy

Computing Curriculum

'Whether you want to uncover the secrets of the universe, or you want to pursue a career in the 21st century, basic computer programming is an essential skill to learn'.

Stephen Hawking

Computing Intent

All pupils at Welton St Mary's Academy will be provided **opportunities** to engage in high quality learning experiences in the 3 core elements of computing: Information Technology, Computer Science and Online Safety. Technology plays an ever-increasingly important role in society and our lives. With this in mind, we aim to help children develop into digitally literate users of technology who are able to **flourish**, **creatively and safely** in this digital world. Learning about Information Technology will allow pupils to effectively use the functions of computers as well as to create a range of content and media. Through Computer Science, pupils are taught the principles of information and computation, how digital systems work and how to put this knowledge to use through programming. **Through challenge and support**, we guide children through a progressive computer science programme of study in small steps, with the teacher often facilitating and supporting the learning as the children are encouraged to self-discover and find solutions to problem themselves. A consistent focus on online safety will ensure that children are equipped with the knowledge and skills to evaluate content and use technology in a kind, responsible and safe manner.

The progressive objectives within each core concept ensure a solid grounding for future learning and for the future workplace so that our children can be **agents of positive change** in an increasingly digital world.

Core Concepts

CONCEPT – Computer systems and networks

- Understand how networks can be used to retrieve and share information and come with associated risks
- What is a computer, how do it's constituent parts function together as a whole

CONCEPT – Computer Science (through our programming units)

- Understand and apply the fundamental principles and concepts of computer programming, including abstraction, logic, sequencing, algorithms and data representation
- Solve problems through creating and manipulating instructions for computers to follow

CONCEPT – Safety and Security (delivered through our 8 strands from the framework above)

- Are competent and confident in using computer technology both creatively and for a specified purpose
- Are able to identify and avoid risks in order to use communication technology safely, responsibly and effectively

CONCEPT – Creating Media

- Select and create a range of media including text, images, sounds, and video
- Use software tools to support computing work

CONCEPT – Data and Information

- Understand how data is stored, organised, and used to represent real-world artefacts and scenarios

Implementation

At Welton St Mary's computing will be taught using the nationally recognised Teach Computing curriculum, which is created on behalf of the National Centre for Computing Education (NCCE). All learning outcomes can be described through a high-level taxonomy of ten strands. Whilst all strands are present at all phases, they are not always taught explicitly. These strands are ordered alphabetically as follows:

- Algorithms
- Computer Networks
- Computer Systems
- Creating Media
- Data and Information
- Design and Development
- Effective Use of Tools
- Impact of Technology
- Programming
- Safety and Security

The units are based on a spiral curriculum. This means that each of the themes is revisited regularly (at least once in each year group), and pupils revisit each theme through a new unit that consolidates and builds on prior learning within that theme. This style of curriculum design reduces the amount of knowledge lost through forgetting, as topics are revisited yearly. Our curriculum is inclusive and ambitious and research-informed, with every aspect of the Teach Computing Curriculum being reviewed each year and changes made as necessary. Our curriculum covers all aspects of the National Curriculum Programmes of Study.

At Welton St Mary's, children have access to a computer suite and each year group is equipped with a set of iPads providing a well-resourced and inspiring learning environment to learn in. This ensures that all year groups have the opportunity to use a range of devices and programs for many purposes across the wider curriculum, as well as in discrete computing lessons. Employing cross-curricular links motivates pupils and supports them to apply the knowledge and skills, and to recall previous knowledge which they have learned.

In an ever-changing digital world, ensuring pupils' safety online has never been more important. The Teach Computing curriculum that we follow teaches online safety as it is woven throughout the curriculum. However, due to its significance and the need for all 8 strands to be taught explicitly, we also supplement this with 8 online safety lessons per year group (progressive across the school) using the National Online Safety resources. The 8 strands taught are as follows:

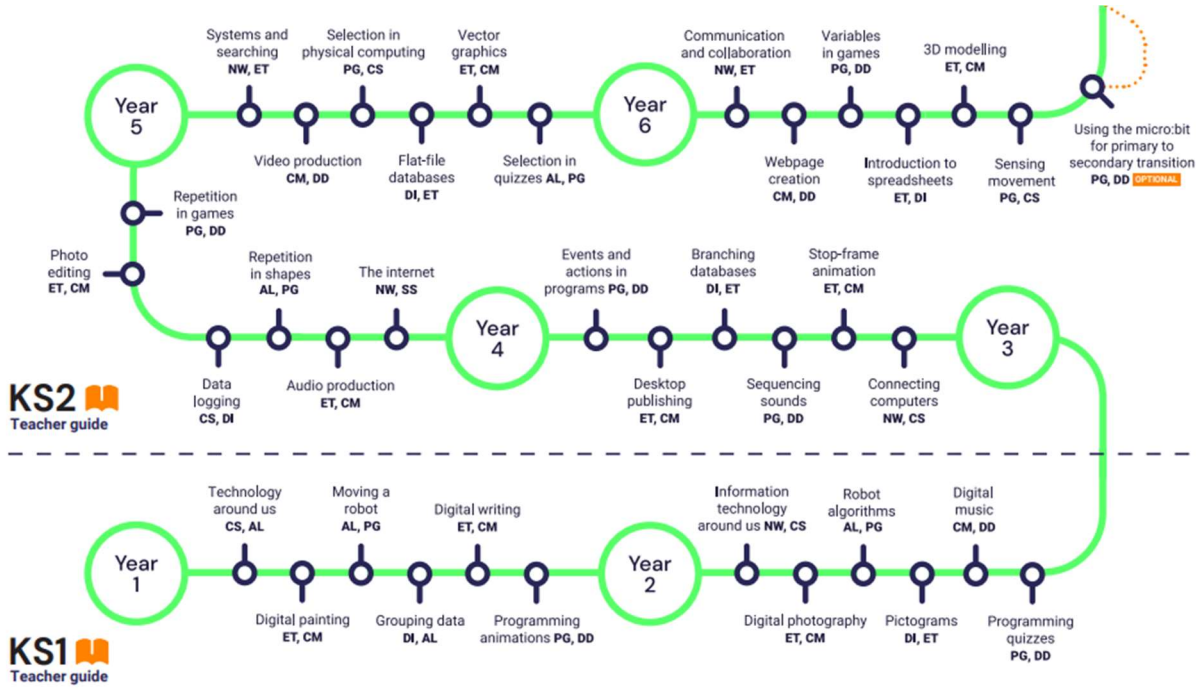
1) Self-Image and Identity
2) Online Relationships
3) Online Reputation
4) Online Bullying
5) Managing Online Information
6) Health and Wellbeing
7) Privacy and Security
8) Copyright and Ownership

The children also use Seesaw for their home learning, which is a digital learning platform allowing them to share their content, access learning and interact with the work of others in a safe, controlled environment.

Teach Computing Curriculum Journey

Key

AL Algorithms
CS Computing systems
CM Creating media
DI Data & information
DD Design & development
ET Effective use of tools
IT Impact of technology
NW Networks
PG Programming
SS Safety & security



Computing Overview

 This symbol shows where mouse and keyboard skills are explicitly taught or used greatly. All units using desktop computers will provide the opportunity for mouse skills to be practised and applied.

You will see on the document the software and hardware required to teach each unit of work. Online safety is woven throughout the curriculum and also taught explicitly (see online safety curriculum below for more detail).

On the overview, you will see where online safety links are made during each unit. Each number corresponds to the 8 **Education for a Connected World links** strands.

	Autumn term 1	Autumn term 2	Spring term 1	Spring term 2	Summer term 1	Summer term 2
Year 1	**Computer systems and networks**  **Technology around us**	**Data and information** **Grouping data** ***Could exclude lesson 6***	**Programming A** **Moving a robot (off screen)**	**Online Safety** 	**Creating media**  **Digital writing** ***Could exclude lesson 6***	**Programming B** **Programming animations (on screen)**
Cross curricular links			Maths – measure and geometry	PSHE	English - writing	Maths – measure and geometry
Software and Hardware required	paintz.app Desktop computers	Laptops or desktop computers	Bee-bots		Microsoft Word Laptops or desktop computers	Scratch Jr iPads
Online Safety strands	1, 5, 6, 8	5		1, 2, 3, 4, 6, 7		
Year 2	**Computer systems and networks** ***Could exclude lesson 6*** IT around us	**Online Safety** 	**Programming A** Robot algorithms	**Data and information** Pictograms	**Creating Media** Digital music ***Could exclude lesson 6***	**Programming B** Programming Quizzes ***Could exclude lesson 6***

Cross curricular links			Maths – measure and geometry	Maths – data inc pictograms, tally charts, block diagrams and simple tables	Music – The Planets by Gustav Holst	Maths – measure and geometry
Software and Hardware required	Microsoft PowerPoint Computers		Bee-bots	j2e pictogram and j2e chart iPads or Computers	Chrome Music Lab and Microsoft Word Computers	Scratch Jr iPads
Online Safety strands	6	1, 2, 3, 4, 7, 8		5		
Year 3	**Computing systems and networks** Connecting computers	**Online Safety** 	**Programming A** Sequencing sounds	**Data and information** Branching databases	**Creating media** ***Could exclude lesson 6***  Desktop publishing	**Programming B** Events and actions in programs
Cross curricular links				Maths – statistics Science - gathering, recording, classifying and presenting data	English - writing	
Software and Hardware required	paintz.app (or Microsoft Paint) Desktop computers in the ICT suite		Scratch Desktop computers or laptops	https://www.j2e.com/jit5#branch	https://www.canva.com/ Desktop computers	Scratch
Online Safety strands	7	1, 2, 3, 4, 6, 7			5, 8	
Year 4	**Computing systems and networks** The Internet	**Online Safety** 	**Programming A** Repetition in shapes	**Data and information** Data logging	**Creating media** Photo editing	**Programming B** Repetition in games
Cross curricular links				Science - taking measurements using data loggers. Maths - statistics		
Software and Hardware required	Chrome Music Lab iPads or Computers		FMSLogo or Turtle Academy on iPads Computers/iPads	Data Harvest Vu+ data logger and the EasySense2 App	Paint.net: https://www.getpaint.net/download.html Computers	Scratch

Online Safety strands	2, 5	2, 3, 4, 6, 7, 8			1	
Year 5	**Computing systems and networks** Systems and searching	**Creating media** Video production	**Online Safety** 	**Data and information** Flat-file databases	**Creating media** Introduction to vector graphics	**Programming B** Selection in quizzes
Cross curricular links				Maths - statistics	Art and design	
Software and Hardware required	iPads or computers	iMovie iPads		https://www.j2e.com/database/ Any device	Google Drawings and PowerPoint Computers	Scratch
Online Safety strands	5, 7	2	1, 2, 3, 4, 6, 8			
Year 6	**Computing systems and networks** Communication and collaboration	**Creating media** Web page creation	**Programming A** Variables in games	**Data and information** Introduction to Spreadsheets	**Online Safety** 	**Programming B** Sensing movement (using the micro:bit)
Cross curricular links				Maths - statistics		
Software and Hardware required	Google Slides or PowerPoint Any device	Microsoft Sway or PowerPoint	Scratch Computers	Excel Desktop computers		Micro:bits Desktop computers
Online Safety strands	1,2,5	8		5	1, 2, 3, 4, 6, 7	

Please see the links below for a curriculum map which details a progression of skills for each strand with links to the National Curriculum identified:

KS1 TCC Curriculum map_v1.2

KS2 TCC Curriculum map_1.2

Online Safety

Intent

At Welton St Mary's Primary Academy we believe that technology should be embraced as a way of improving and enriching the lives and learning of our pupils at school and beyond. However, we also recognise the risks posed by society's greater use of technology both to people in general and specifically for children. Online safety is about using technology in a responsible and respectful manner in order to stay safe and enjoy the benefits technology can bring to our lives. We believe that our school rules of being kind, safe and responsible must be applied to all areas of our lives, including our online activity.

'Safety and security' is one of our 5 key concepts in our computing curriculum at Welton St Mary's, and we view using technology safely as being pivotal to being digitally literate. As a result, we ensure that the children receive a progressive and explicit online safety curriculum which includes learning about 8 aspects of safety and security. These 8 aspects are set out in the UKCCIS Education for a Connected World Framework, and are as follows:

Self-image and identity

This strand explores the differences between online and offline identity beginning with self-awareness, shaping online identities and how media impacts on gender and stereotypes. It identifies effective routes for reporting and support and explores the impact of online technologies on self-image and behaviour.

Online relationships

This strand explores how technology shapes communication styles and identifies strategies for positive relationships in online communities. It offers opportunities to discuss relationships and behaviours that may lead to harm and how positive online interaction can empower and amplify voice.

Online reputation

This strand explores the concept of reputation and how others may use online information to make judgements. It offers opportunities to develop strategies to manage personal digital content effectively and capitalise on technology's capacity to create effective positive profiles.

Online bullying

This strand explores bullying and other online aggression and how technology impacts those issues. It offers strategies for effective reporting and intervention and considers how bullying and other aggressive behaviour relates to legislation.

Managing online information

This strand explores how online information is found, viewed and interpreted. It offers strategies for effective searching, critical evaluation and ethical publishing.

Health, well-being and lifestyle

This strand explores the impact that technology has on health, well-being and lifestyle. It also includes understanding negative behaviours and issues amplified and sustained by online technologies and the strategies for dealing with them.

Privacy and security

This strand explores how personal online information can be used, stored, processed and shared. It offers both behavioural and technical strategies to limit impact on privacy and protect data and systems against compromise.

Copyright and ownership

This strand explores the concept of ownership of online content. It explores strategies for protecting personal content and crediting the rights of others as well as addressing potential consequences of illegal access, download and distribution.

There are 8 strands to online safety (see above). This online safety unit includes 6 of these strands, with each one having a separate lesson dedicated to it. The other 2 strands are integrated into the rest of the computing curriculum. The strands explicitly taught can be seen below. These 6 lessons, along with the online safety strands incorporated into the main computing curriculum, ensures that all 8 strands are delivered in each year group. Teaching online safety is responsive and teachers will use the following elements to inform and adapt the lessons as set out so that learning is relevant for the pupils: their own professional judgement, knowledge of the outcomes of pupil and parent online safety surveys, knowledge and understanding of the needs of the year group through incidents or discussions that have arisen.

Year 1	**Self-Image and Identity** Feeling sad, uncomfortable, embarrassed or upset and trusted adults	**Online Bullying** Kind and unkind behaviour online	**Online Reputation** Sharing information online	**Online Relationships** Asking permission and communicating with technology	**Privacy and security** Mt private information	**Health and Wellbeing** Being healthy with technology and rules

Year 2	**Self-Image and Identity** What I want to look like online and risky situations online	**Online Bullying** What is bullying and how does it make someone feel. Getting support.	**Online Reputation** My profile and speaking to trusted adults	**Online Relationships** How to ask permission and consent	**Privacy and security** Stronger passwords and the internet at home.	**Copyright and ownership** Does it belong to me/them?
Year 3	**Self-Image and Identity** Usernames and changing identity online	**Online Bullying** Appropriate behaviour online and getting support	**Online Reputation** Being unsure and seeking help	**Online Relationships** Hurtful situations online	**Health and Wellbeing** Age ratings and positive activities	**Privacy and security** Reporting and blocking *(specific to the apps the children are using)*
Year 4	**Health and Wellbeing** Taking care of your mind Our free time	**Online Bullying** Positive and negative comments	**Online Reputation** Tips for searching online Finding reliable information online	**Online Relationships** Healthy online behaviour and respect and privacy	**Privacy and security** Consent and data saved online	**Copyright and ownership** The impact of plagiarism and usage rights
Year 5	**Health and Wellbeing** Spending money in games Pros and cons of being online	**Online Bullying** Online and offline bullying Telling jokes/banter	**Online Reputation** The perfect profile Making judgements	**Online Relationships** Strangers online and our communities	**Self-Image and Identity** Copy, modifying and altering avatars Photos online	**Copyright and ownership** Google SafeSearch Using online content
Year 6	**Self-Image and Identity** Challenging stereotypes and managing online situations	**Online Bullying** Screengrabs and screen shots Impact of online bullying	**Online Reputation** Creating a positive online presence	**Health and Wellbeing** Pressure and technology	**Privacy and security** Real or fake? Phishing	**Online Relationships** To share or not to share? My digital footprint