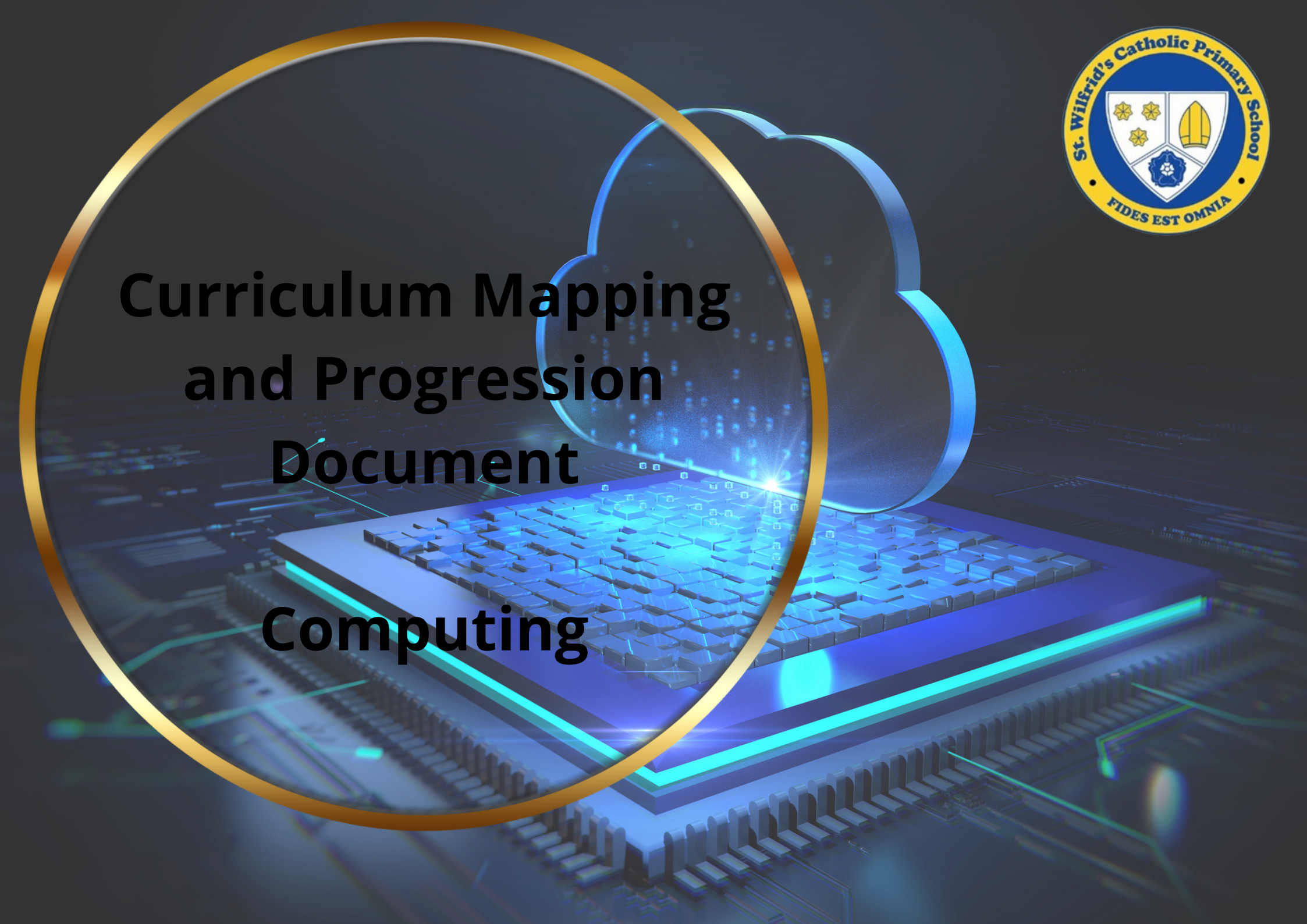

Curriculum Mapping and Progression Document

Computing

Vision for Computing

Our Computing curriculum addresses the challenges and opportunities offered by the technologically rich world in which we live. We use computing to enrich our curriculum across the key stages and ensure coverage of the national curriculum expectations. Following a clear progression of skills throughout the school, there are opportunities for children to solve problems, create online games and create videos.

Our Computing Curriculum Will Enable Pupils to:

- Use and express and develop their ideas through, information and communication technology
- Create simple algorithms and programmes
- Debug programming errors
- Create, store, manipulate and retrieve digital content using a mixture of word processing, paint packages, digital photography and video packages
- Be aware of their responsibilities online and know what to do if they have any concerns
- Know how information is stored on computers and how it travels, connecting people across the world through the use of the World Wide Web
- Explain their thinking behind their programmes
- Explore how search engines work
- Consider how their online actions can impact on others
- Know when and how to report an online concern
- Create computer games
- Use technology safely and respectfully
- Use logical reasoning to predict the behaviour of simple programs
- Identify where to go for help and support when they have concerns about content or contact on the internet or other online technologies

Intent

The goal of the computing curriculum at St WIlfrid's Catholic Primary School is to provide our children with vital skills that will follow them to their adult life. Our aim is to help children become capable users of technology. This entails providing them with the skillset to use technology to aid their lives socially, in their education, and – eventually – the workplace.

As well as our children becoming adept technology users and becoming responsible digital citizens, we want to encourage our children to understand that computing involves far more than just computers. We want them to understand that, through computational thinking, they can develop their creativity, become better at problem-solving through abstraction and become critical thinkers.

Computing in the Early Years Foundation Stage

EYFS	Development Matters 3&4 Years will learn to:	Development Matters Children in Reception will learn to:	Statutory Framework Early Learning Goals
Personal, Social and Emotional Development	Remember rules without needing an adult to remind them.	Show resilience and perseverance in the face of a challenge. Know and talk about the different factors that support their overall health and wellbeing: -sensible amounts of 'screen time'.	Be confident to try new activities and show independence, resilience and perseverance in the face of challenge. Explain the reasons for rules, know right from wrong and try to behave accordingly.
Physical Development	Match their developing physical skills to tasks and activities in the setting.	Develop their small motor skills so that they can use a range of tools competently, safely and confidently.	
Expressive Arts and Design		Explore, use and refine a variety of artistic effects to express their ideas and feelings.	Safely use and explore a variety of materials, tools and techniques, experimenting with colour, design, texture, form and function.
Understanding the world	Explore how things work.		
Topics	**Autumn** **Who is a good friend?** **Once upon a time**	**Spring** **What happens when we are asleep?** **Ready, Steady, Grow**	**Summer** **Are we there yet?** **Fun in the sun!**

Computing and the National Curriculum

	Key Stage 1	Key Stage 2
Computer Science and Programming	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	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 Understand computer networks including the internet: how they can provide multiple services, such as the World Wide Web Appreciate how [search] results are selected and ranked
Information Technology - Data Handling, Databases and Spreadsheets	Use technology purposefully to create, organise, store, manipulate and retrieve digital content	Use search technologies effectively 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
Information Technology - Collecting, Evaluating and Presenting Information	Use technology purposefully to create, organise, store, manipulate and retrieve digital content	Use search technologies effectively 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
Digital Literacy – Education for a Connected World framework and Project Evolve Toolkit	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	Understand the opportunities [networks] offer for communication and collaboration Be discerning in evaluating digital content Use technology safely, respectfully and responsibly: recognise acceptable/unacceptable behaviour: identify a range of ways to report concerns about content and contact

Expected End Points in Computing

	Information Technology - Handling data, databases and spreadsheets	Information Technology – Collecting, evaluating and presenting information	Programming and Computer Science
By the end of KS1	• Ask questions and collect data for a specific purpose. • Construct simple tally charts, tables, charts and pictograms. • Ask and answer simple questions from data displayed in simple tally charts, tables, charts and pictograms about totalling and comparing data.	• Create a range of digital content using software under the control of the teacher that includes word processing, creating pictures using a paint package, taking and manipulating digital photographs and video, including animation. • Store, organise and retrieve digital content – save a file, know where the file is saved and open it, organise files in a workspace. • Combine content from different sources (word processing, paint, photos/video/animation and • charts) to create a digital portfolio (J2Mix) Recognise common uses of technology beyond school	• Use logical reasoning to predict the behaviour of simple programs using route-based programming. • Know what an algorithm is. Write and debug simple programs showing an understanding of sequencing, with help from the teacher, using simple movements for a floor turtle and an onscreen turtle/sprite. •

Expected Endpoints in Computing

	Information Technology - Handling data, databases and spreadsheets	Information Technology – Collecting, evaluating and presenting information	Programming and Computer Science
By the end of LKS2	• Ask questions to organise and sort data into groups or to classify things. • Gather, record and present data in a simple database to help in answering questions. • Use sort and search techniques to locate data in a simple database based on specific criteria. • Interpret and present discrete and continuous data in charts and graphs.	• Create a range of digital content using software with increasing independence that includes word processing, creating pictures using a paint package, animation, multimedia including sound, video and hyperlinks to present content. • Store, organise and retrieve digital content – save a file, know where the file is saved and open it, organise files in a workspace.	• Begin to use logical reasoning to explain how simple algorithms and programs work. • Independently detect errors in algorithms and programs using block-based programming and correct errors with support. • Know the difference between an algorithm and a program. • Write new or modify algorithms and programs with increasing independence, showing an awareness of sequencing, inputs, outputs, and repetition. • Identify patterns in instructions to begin using repetition for count controlled loops and indefinite loops including nested loops. Begin to use selection 'if... then' and repetition using condition loops. • Begin to show an awareness of how data is stored in a computer's memory as a bit using either a 1 or 0 symbol. • Know how RAM is used by the CPU to process data. • Know that 8 bits makes a byte and decode bytes using ASCII Code. • Create binary images.

Expected Endpoints in Computing

	Information Technology - Handling data, databases and spreadsheets	Information Technology – Collecting, evaluating and presenting information	Programming and Computer Science
By the end of UKS2	• Complete, read and interpret information in spreadsheets. • Use data presented in spreadsheets through constructing formulae to solve problems or model outcomes to ask and explore 'what if' questions. • Interpret and present discrete and continuous data using appropriate graphical methods, including bar charts and time graphs	• Create a range of digital content using software with increasing independence that includes word processing, animation, multimedia including sound, video and hyperlinks to present content. • Show an awareness of audience and purpose when presenting content through careful choice of layout, colours, images, sound and overall content to convey appropriate meanings and styles. • Use a range of digital technologies to communicate and collaborate with one another in real time, understanding that different technologies work with different-sized groups and know when one method is more appropriate to use compared to another. • Are aware that terms and conditions of services do apply to them and recognise acceptable and unacceptable behaviour. • Show an awareness of being discerning in evaluating digital content. • Show an awareness of their own digital footprint and how data is collected and used by companies online. • Show an awareness of the implications and capabilities of artificial intelligence and machine learning technology. • Know how Big Data, the Internet of Things and Artificial Intelligence technologies gather data from connected devices. This data is used by businesses within their key processes and daily tasks, assisting new developments in technology moving towards a 'smart' and more efficient society.	• Use logical reasoning to explain how simple algorithms and programs work. • Independently detect and correct errors in algorithms and programs using block-based programming. Use decomposition to solve complex problems. • Know that there is more than one way to solve a problem through programming and effectively select the most efficient method. Use sequence, repetition, and selection with increasing • confidence. Developing selection from 'if…then' to 'if…then…else' and integrate into loops and nested loops where appropriate. Understand and use variables in code.Know when to use a placeholder variable or a variable to store and change numbers in code. • Understand what the internet is, how it provides a variety of services to networked computers and how data travels as packets from one computer to another. • Show an awareness of how search engines work in relation to page ranking and algorithms. • Be discerning in evaluating digital content with an awareness of fake news

Progression for Coding

Year	Coding		
1	Children understand that an algorithm is a set of instructions used to solve a problem or achieve an objective. They know that a computer program turns an algorithm into code that the computer can understand.	Children can work out what is wrong with a simple algorithm when the steps are out of order and can write their own simple algorithm. Children know that an unexpected outcome is due to the code they have created and can make logical attempts to fix the code.	When looking at a program, children can read code one line at a time and make good attempts to envision the bigger picture of the overall effect of the program.
2	Children can explain that an algorithm is a set of instructions to complete a task. When designing simple programs, children show an awareness of the need to be precise with their algorithms so that they can be successfully converted into code.	Children can create a simple program that achieves a specific purpose. They can also identify and correct some errors. Children's program designs display a growing awareness of the need for logical, programmable steps.	Children can identify the parts of a program that respond to specific events and initiate specific actions. For example, they can write a cause and effect sentence of what will happen in a program.
3	Children can turn a simple real-life situation into an algorithm for a program by deconstructing it into manageable parts. Their design shows that they are thinking of the desired task and how this translates into code. Children can identify an error within their program that prevents it following the desired algorithm and then fix it.	Children demonstrate the ability to design and code a program that follows a simple sequence. They experiment with timers to achieve repetition effects in their programs. Children are beginning to understand the difference in the effect of using a timer command rather than a repeat command when creating repetition effects.	Children's designs for their programs show that they are thinking of the structure of a program in logical, achievable steps and absorbing some new knowledge of coding structures. For example, repetition and use of timers. They make good attempts to 'step through' more complex code in order to identify errors in algorithms and can correct this.
4	When turning a real-life situation into an algorithm, the children's design shows that they are thinking of the required task and how to accomplish this in code using coding structures for selection and repetition. Children make more intuitive attempts to debug their own programs.	Children's use of timers to achieve repetition effects are becoming more logical and are integrated into their program designs. They understand 'IF statements' for selection and attempt to combine these with other coding structures including variables to achieve the effects that they design in their programs. As well as understanding how variables can be used to store information while a program is executing, they are able to use and manipulate the value of variables. Children can make use of user inputs and outputs.	Children's designs for their programs show that they are thinking of the structure of a program in logical, achievable steps and absorbing some new knowledge of coding structures. For example, 'IF' statements, repetition and variables. They can trace code and use step-through methods to identify errors in code and make logical attempts to correct this.
5	Children may attempt to turn more complex real-life situations into algorithms for a program by deconstructing it into manageable parts. Children are able to test and debug their programs as they go and can use logical methods to identify the approximate cause of any bug but may need some support identifying the specific line of code.	Children can translate algorithms that include sequence, selection and repetition into code with increasing ease and their own designs show that they are thinking of how to accomplish the set task in code utilising such structures. They are combining sequence, selection and repetition with other coding structures to achieve their algorithm design.	When children code, they are beginning to think about their code structure in terms of the ability to debug and interpret the code later, e.g. the naming of variables.
6	Children are able to turn a more complex programming task into an algorithm by identifying the important aspects of the task (abstraction) and then decomposing them in a logical way using their knowledge of possible coding structures and applying skills from previous programs. Children test and debug their program as they go and use logical methods to identify the cause of bugs, demonstrating a systematic approach to try to identify a particular line of code causing a problem.	Children translate algorithms that include sequence, selection and repetition into code and their own designs show that they are thinking of how to accomplish the set task in code utilising such structures, including nesting structures within each other. Coding displays an improving understanding of variables in coding, outputs such as sound and movement, inputs from the user of the program such as button clicks and the value of functions.	Children are able to interpret a program in parts and can make logical attempts to put the separate parts of a complex algorithm together to explain the program as a whole.

Progression for Handling Data

Year	Handling Data
1	Children are able to sort, collate, edit and store simple digital content e.g. children can name, save and retrieve their work and follow simple instructions to access online resources or use pictogram software.
2	Children demonstrate an ability to organise data using, for example, a database and can retrieve specific data for conducting simple searches. Children are able to edit more complex digital work. Children are confident when creating, naming, saving and retrieving content.
3	Children can collect, analyse, evaluate and present data and information using a selection of software, for example Excel. Children can consider what software is most appropriate for a given task.
4	Children can use data tools to help them make decisions, for example using Excel to calculate totals and compare these to other data such as a budget.
5	Children can create a database for a specific task and can confidently populate this database and use this data in their work.
6	Pupils can incorporate data handling software into other work, for example, using a spreadsheet or database to keep track of information in their coding work.

Progression for Digital Literacy and Computer Technology

Year	Digital Literacy (Including E-Safety) & Computer Technology			
1	Children understand what is meant by technology and can identify a variety of examples both in and out of school. They can make a distinction between objects that use modern technology and those that do not e.g. a microwave vs. a chair.		Children understand the importance of keeping information, such as their usernames and passwords, private and actively demonstrate this in lessons. Children take ownership of their work and save this in their own private space such.	
2	Children can effectively retrieve relevant, purposeful digital content using a search engine. They can apply their learning of effective searching beyond the classroom. They can share this knowledge. Children make links between technology they see around them, coding and multimedia work they do in school e.g. animations, interactive code and programs.		Children know the implications of inappropriate online searches. Children begin to understand how things are shared electronically. They develop an understanding of using email safely and know ways of reporting inappropriate behaviours and content to a trusted adult.	
3	Children can list a range of ways that the Internet can be used to provide different methods of communication. They can use some of these methods of communication, e.g. being able to open, respond to and attach files to emails. They can describe appropriate email conventions when communicating in this way.	Children can carry out simple searches to retrieve digital content. They understand that to do this, they are connecting to the internet and using a search engine.		Children demonstrate the importance of having a secure password and not sharing this with anyone else. Furthermore, children can explain the negative implications of failure to keep passwords safe and secure. They understand the importance of staying safe and the importance of their conduct when using familiar communication tools such as Email. They know more than one way to report unacceptable content and contact
4	Children recognise the main component parts of hardware which allow computers to join and form a network. Their ability to understand the online safety implications associated with the ways the internet can be used to provide different methods of communication is improving.	Children understand the function, features and layout of a search engine. They can appraise selected webpages for credibility and information at a basic level.	Children are able to make improvements to digital solutions based on feedback. Children make informed software choices when presenting information and data. They create linked content using a range of software. Children share digital content within school.	Children can explore key concepts relating to online safety using concept mapping such as 2Connect. They can help others to understand the importance of online safety. Children know a range of ways of reporting inappropriate content and contact
5	Children understand the value of computer networks but are also aware of the main dangers. They recognise what personal information is and can explain how this can be kept safe. Children can select the most appropriate form of online communications contingent on audience and digital content.	Children search with greater complexity for digital content when using a search engine. They are able to explain in some detail how credible a webpage is and the information it contains.	Children are able to make appropriate improvements to digital solutions based on feedback received and can confidently comment on the success of the solution. They objectively review solutions from others. Children are able to collaboratively create content and solutions using digital features within software such as collaborative mode.	Children have a secure knowledge of common online safety rules and can apply this by demonstrating the safe and respectful use of a few different technologies and online services. Children implicitly relate appropriate online behaviour to their right to personal privacy and mental wellbeing of themselves and others.
6	Children understand and can explain in some depth the difference between the internet and the World Wide Web. Children know what a WAN and LAN are and can describe how they access the Internet in school	Children readily apply filters when searching for digital content. They are able to explain in detail how credible a webpage is and the information it contains. They compare a range of digital content sources and are able to rate them in terms of content quality and accuracy. Children use critical thinking skills in everyday use of online communication.	Children make clear connections to the audience when designing and creating digital content. They are able to use criteria to evaluate the quality of digital solutions and are able to identify improvements, making some refinements.	Children demonstrate the safe and respectful use of a range of different technologies and online services. They identify more discreet inappropriate behaviours through developing critical thinking. They recognise the value in preserving their privacy when online for their own and other people's safety.