Computing

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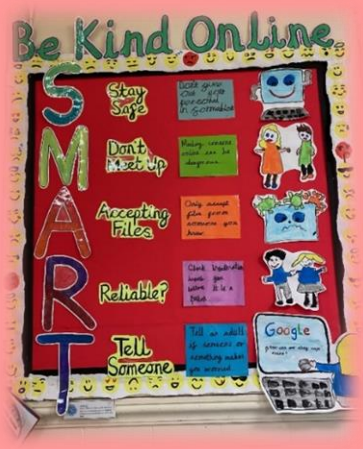
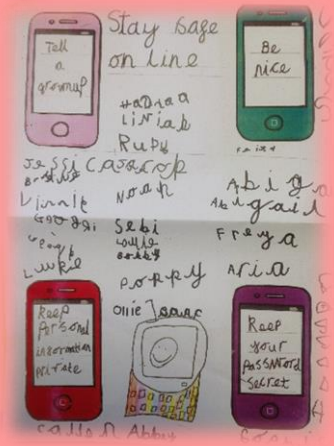
Mersey Park Primary School





Be Nice

Work Hard

Never Give Up

Computing at Mersey Park Primary School

What we teach

At Mersey Park Primary School, our Computing Curriculum follows the aims and objectives of the National Curriculum, and has been designed in conjunction with MGL. It provides a wealth of learning opportunities as it is woven throughout many subjects including Mathematics, Science and Design Technology. The design of our curriculum allows pupils time to revise and revisit key concepts as well as building upon prior knowledge to develop transferable skills, which will be valuable in their future learning. Teaching of computing starts in the Foundation Stage where pupils are provided with regular opportunities for play-based, unplugged activities that focus on building children's listening skills, curiosity and creativity and problem solving, following the guidance in the Early Years Foundation Stage Statutory Framework.

We teach a high quality computing education, which aims to equip our pupils with knowledge of Computer Science alongside Digital Literacy. Computer Science is at the core of the curriculum, giving pupils knowledge of the principles of information and how digital systems work, and applying this to programming. 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. We intend to teach children how to analyse, order and solve problems which will provide pupils with the skills to become digitally literate, which we see as vital for our pupils in order to be successful in their future careers. Our whole school approach to e-Safety helps to ensure children know how to stay safe online – both in and outside of school.

How we teach it

Teachers deliver our Computing Curriculum with confidence supported by professional development opportunities provided by experts from MGL to teach from the programme of study. This is done via a 6-8 week block of lessons where teachers team teach computer lessons alongside staff from MGL, not only to develop their own skills but also to provide the children with the most up-to-date technology and computing knowledge. This is something, as a school, we feel is very important. Technology is ever changing and very expensive and we want our pupils to be provided with the best opportunities to access this technology and become confident in using new technology so that they are not disadvantaged by circumstance.

We believe our pupils receive rich, deep learning experiences that teach pupils to analytically solve problems on new or unfamiliar technologies. Key concepts and skills are revised and revisited regularly through the use of knowledge organisers which pupils access each lesson to help them embed key knowledge and vocabulary. As part of our programme of study, we learn about significant individuals in the computing field such as Alan Turing and Konrad Zuse in Key Stage 1 and Barbara Liskov, Larry Page and Tim Berners-Lee in Key Stage 2.

We encourage an inclusive environment to ensure all pupils, including those most vulnerable and those who are disadvantaged, have the opportunity to access the full and broad curriculum, through carefully planned support and scaffolding as required.

Assessments are completed each half term and are taken from our scheme of work advised by MGL and NAACE guidance. These assessments are used to inform future teaching and allow misconceptions to be addressed and gaps to plugged. Class teachers record assessment outcomes using a tracking grid and the subject leader analyses gaps in knowledge and skills. Actions are identified and followed up.

Teachers are provided with regular training, supported by MGL, to ensure their curriculum knowledge and e-Safety knowledge is as up-to-date as possible, to help keep children safe online. E-Safety is an essential aspect of the curriculum as it equips pupils with the skills to fully utilise the internet and technology in a safe and respectful way. We address the principles of online safety and teach them in an age appropriate way, encouraging pupils to ask questions, seek advice and raise concerns. We believe it is our duty to teach pupils how to conduct themselves in a respectable manner online. In recent years, we have booked One Day Creative to reinforce the importance of staying safe online via a range of workshops and role play activities.

SMSC through Computing and E-Safety

During Computing lessons we strive to create a learning environment which promotes respect, diversity and self-awareness and equips all of our pupils with the knowledge, skills, attitudes and values they will need to succeed in their future lives.
All teachers of Computing are familiar with the indicators of vulnerability to extremism and radicalisation and the procedures for dealing with concerns. When delivering lessons we look out for indicators and will report any concerns. We work to prevent pupils from developing extreme and radical views by embedding SMSC principles throughout the curriculum.

We deliver spiritual development through projects which require students to develop personalised content, allowing them to experience wonder, express their beliefs, or choose and comment on appropriate subject matter relevant to their developing beliefs and values for research and presentation tasks.

In Computing we deliver moral development through Digital Citizenship, Digital Literacy, and E-Safety modules, encouraging students to consider the moral and legal implications of their actions online and elsewhere.

We deliver social development through group tasks, peer assessment, and curricular elements which focus on the social applications of computers, with particular emphasis on using technology and computational thinking to solve problems for a given audience and purpose, encouraging learners to consider the needs and views of a range of members of school and wider communities.

In Computing we deliver cultural development through themed tasks requiring students to research and present information on a range of topics. We encourage students to recognise and celebrate the contributions of men and women from a range of cultures and countries to the development of the technologies they are learning to use

Impact

We enable pupils to explore, analyse and present digital information with a clear progression of knowledge and skills throughout the year groups. This ensures that learning is embedded and that pupils are competent in safely using and understanding technology. Pupils will have the skills to analyse why people behave differently online, access intensified online emotions and consider unacceptable online behaviour. With the rapidly changing world of technology, we see these skills fundamental in building confident and creative independent learners who can safely use technology.

By the end of KS2 we aim to have produced pupils who:

- Have knowledge of the concepts of computer science, including abstraction, logic, algorithms and data representation;
- Analyse problems in computational terms, and have repeated experiences of writing computer problems in order to solve problems;
- Evaluate and apply information technology analytically to solve problems;
- Model a responsible, competent and confident use of ICT.

Computing Subject Overview

	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Foundation Stage -Computational Thinking Skills (unplugged approach) Children have opportunities to develop their computational skills through everyday activities including adult-focused activities and in continuous provision. These skills include: **Tinkering** (playing and exploring) **Creating** (creating, checking and fixing things) **Collaboration** (playing and working collaboratively) **Persevering** (not giving up) **Logic** (anticipating and explaining) **Pattern** (Grouping things, comparing, spotting similarities and differences, working out rules) **Abstraction** – (naming and labelling, working out what is important, sticking to the main theme, ignoring what is not important, creating a summary) **Algorithms and Decomposition** – (Responding to instructions, ordering things, sequencing things, introducing storylines, working out different ways to do things, breaking problems down into steps)						
F1	Digital Literacy (MGL) – Using Technology Safely Can identify a device that uses technology Ask permission before using the Internet Tell an adult if something worrying or unexpected happens whilst using technology Talk about technology that is used at home, in school and in the world around them Use a safe part of the Internet to explore, play and learn		Information Technology (MGL) – Understanding the parts of a computer Talk about different kinds of information such as pictures, videos, text and sound Use a mouse and touch screen to move objects on a screen Create shapes and text on a screen		Computer Science (MGL) – Using Programmable Devices Be able to give a floor robot instruction to make it move Use simple software and explain what you are doing Understand what happens when you click a button or touch an icon.	
F2	Information Communication Technology (MGL) – I am a Super Surfer Can identify a device that uses technology Ask permission before using the Internet Tell an adult if something worrying or unexpected happens whilst using technology Talk about technology that is used at home, in school and in the world around them Use a safe part of the Internet to explore, play and learn		Information Communication Technology (MGL) – Look what I can do Talk about different kinds of information such as pictures, videos, text and sound Use a mouse and touch screen to move objects on a screen Create shapes and text on a screen		Computer Science (MGL) – I am a Computer Scientist Be able to give a floor robot instruction to make it move Use simple software and explain what you are doing Understand what happens when you click a button or touch an icon	

Year 1	IT: Basic Computing Skills Log in and shut down a computer accurately. Develop keyboard and mouse skills Digital Literacy: Passwords Why we have passwords	Digital Literacy: Producing Digital Media Use a word processing program to write and format text. Add in digital images and consider audience	Computer Science: Unplugged Algorithms What an algorithm is and apply it to both off-computer (unplugged) and on computer tasks	Computer Science: Programming Robots Program a physical device such as a Beebot. Compare it with programming on screen versions of the devices. Build upon their knowledge of algorithms	IT: Data Handling - Pictograms Explore how to transfer physical data from a tally chart into a digital pictogram. Compare the difference with creating a physical pictogram	Digital Literacy: Presenting Information Consider a variety of ways to present cross curricular information digitally. Compare the advantages and disadvantages with paper based content Websites: How to know if a website is right for them or not.
Year 2	IT: What is a Computer Describe different computers and their peripherals. The roles computers play in society Digital Literacy: Using a computer responsibility in terms of both time and purpose.	Computer Science: Unplugged Algorithms Explore what algorithms are and what strategies they can use to find bugs when their algorithm is not working	Computer Science: Scratch Jr Use the Scratch Jr app to write their own block code in a number of different projects that can easily be made cross curricular	Digital Literacy: Storing and Presenting Data Look at what data is and compare different methods of data storage. How to turn data into information by creating different styles of graphs and charts Personal Information: Identifying what personal information is and whom it should be shared with.	IT: Modifying Texts and Images Build on keyboard skills and learn how to format text in a number of different ways. Work with images, editing them to meet a purpose	Digital Literacy: Presenting Data Create a presentation of their class topic using the app Shadow Puppet EDU. Learn how to edit fonts and photos to make an engaging presentation
Year 3	IT: Use of Different Software - Composing Emails Explore the different advanced features of Microsoft Word. Use these skills to compose an email Digital Literacy: Consider their responsibilities to others online.	Computer Science: Programming a Game Explore sequencing, selection, repetition, inputs and outputs in programs created	Computer Science: Creating a Programmable World Creating a programmable world using Kodu	IT: Altering Digital Media Look at the skills behind taking a good photograph and how these photos can be edited in various ways Digital Literacy: Consider that all of the media they see could have been altered.	Computer Science: How Things Work including Networks Develop an understanding of networks and the hardware required	IT: Design - Publishing Online Content Learn about graphic design, publishing and promoting their own content

Year 4	IT: Use of Different Software - Branching Databases Pupils learn about the concept of branching database and create their own using presentation software.	Computer Science: Programming Skills - Repetition and Forever Loops Learn to use repeat loops in their code	Computer Science: Programming Project - Coding with Scratch Create a game using repeat loops	IT: Media - Creating a Video Create their own videos and apply special effects to them Digital Literacy: Learn how photos/videos can be edited online for advertisement.	Computer Science: How Things Work - Networks and Online Services Understand what a network is and the parts of the local network in our school Digital Literacy: Understand why a password is important and what a good password looks like.	IT: Design - Spreadsheets Create art using and creating a key in Microsoft Excel
Year 5	IT: Design - 3D Modelling Learn to design models using online CAD software programming language	IT: Use of Different Software - Create/ Search a Database Using Excel to create and search a database	Computer Science: Programming Project - Creating Music using Code Create music using computer code	IT: Media - Stop Motion Animation Learn about all aspects of stop frame animation. Storyboard their own story before using a software package to create their own stop frame animation Digital Literacy: Create a short animation about relationships online, who can you trust?	Computer Science: How Things Work - Difference between WWW and the Internet Understand the difference between the internet and the World Wide Web and how one uses the other to work. Understand what is meant by IP address Digital Literacy: Learn what an online footprint is and the reasons technology holds onto our information.	Computer Science: Programming Skills - If Statements / If Else Statements Introduce If and if else statements in Scratch or similar
Year 6	IT: Use of Different Software - Creating Formula in Excel Learn how to organise data and make calculations using the application Microsoft Excel.	Computer Science: Programming Skills - Using Variables Learn what variables are and how to use them when programming, using the application Scratch 3.0.	Computer Science: Programming Project - Program for an Audience Create an animation using the application Scratch 3.0.	IT: Media - Plan and Compose Music Learn how to compose music and how to record and edit a simple podcast. Digital Literacy: Learn about copywriting and using someone else's work responsibly	Computer Science: How Things Work - How Data is Stored Learn and explore how data is transferred and received	IT: Design - HTML Learn how to use HTML coding to program a webpage Digital Literacy: Learn about fake news and how it can be used as click bait.

Computing Early Years

Development Matters

Birth to Three	Three and Four Year Olds (Foundation 1)	Children in Foundation 2
Personal, Social and Emotional Development Expresses preferences and decisions. Tries new things and is starting to establish autonomy. **Physical Development** Developing manipulation and control. Explores different materials and tools. **Understanding the World** Explores materials with different properties. Repeats actions that have an effect.	**Personal, Social, and Emotional Development** Remember rules without needing an adult to remind them**.** **Physical Development** Match their developing physical skills to tasks and activities in the setting. **Understanding the World** Explore how things work.	**Personal, Social, and Emotional Development** Show resilience and perseverance in the face of a challenge. Know and talk about different factors that support their overall health and well-being. Sensible amounts of screen time. **Physical Development** 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.

Early Learning Goals

Personal, Social and Emotional Development- Managing Self
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.

Expressive Arts and Design- Creating with Materials
Safely use and explore a variety of materials, tools and techniques, experimenting with colour, design, texture, form and function.

Computing National Curriculum Subject Content

Key Stage 1

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.

Key Stage 2

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

Computing Progression of Knowledge and Skills: Computer Science						
F2	**Year 1**	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**Year 6**
• Be able to give a floor robot instruction to make it move. • Use simple software and explain what you are doing. • Understand what happens when you click a button or touch an icon	• Give instructions to a friend and follow their instructions to move around a space. • Describe what happens when buttons are pressed on a robot or device. • Press buttons in the correct order to make a robot follow a short sequence. • Understand what an algorithm is and be able to create a simple algorithm. • Understand and explain how algorithms are used in everyday life. • Begin to predict what will happen for a short sequence of instructions. • Begin to use different software or applications to create movement and patterns on a screen. • Use the word debug to correct an algorithm that doesn't work in the way it was intended.	• Understand what an algorithm is and demonstrate simple linear algorithms. • Be able to explain the order needed to do things to make something happen and to talk about it as an algorithm. • Programme a robot or software to do a particular task. • Look at a basic program and explain what will happen. • Use programming software and applications to make objects move. • Use logical reasoning to predict and debug more complex programs. • Can create and debug with improved confidence & efficiency. • Begin to program using simple block code.	• Understand how an algorithm is implemented using a sequence of precise instructions. • Can predict the outcome of a sequence of precise instructions. • Repeatedly test a program and recognise when they need to debug it. • Detect a problem in an algorithm, which could result in a different outcome to the one intended. • Understand what inputs and outputs are, how they can be used. • Provide examples of how to use inputs and outputs effectively. • Designs, writes, executes and debugs programs of increasing complexity that accomplish a specific goal. • Use logical reasoning to predict and debug more complex programs including inputs and outputs.	• Design simple algorithms using loops and repeats, whilst detecting and correcting errors is debugging. • Write and execute an efficient program, using loops such as forever, repeat & repeat until commands. • Decompose a problem into smaller parts with some verbal reasoning. • Has an understanding of how sequencing, using inputs and repetition in programs has specific effects on the output, works with 'loops' and understands their effect. • Recognise that an algorithm will help to sequence more complex programs. • Use logical reasoning to predict and debug more complex programs including loops and repeats.	• Program a condition that uses a sensor to detect a change, which can select an action within a program. • Decomposes more open ended problems into smaller parts, provides some reasoning for their choices. • Approaches a range of problems using computationally thinking concepts, helping them to design other algorithms for other specific outcomes. • Design, write and execute an efficient program, including selection (IF…THEN) command. • Change an input to a program to achieve a different output. • Use logical reasoning to predict and debug more complex programs including selection. • Uses programs linked to physical systems and sensors e.g. the alarm goes off when the sensor is triggered. • Design, write and execute an efficient program, which demonstrates and understanding of the difference between, and appropriate use of IF…THEN, IF…THEN…ELSE, and nested IF statements.	• Understand the importance of planning, testing and correcting algorithms. • Demonstrate a range of different strategies to solve a problem including: abstraction, decomposition, logic & evaluation. • Understand why sequence & patterns are important when creating simple algorithms that are part of a more complex program. • Gives reasoning for each step within algorithms and applying them to a program. • Understand & develop complex flow diagrams. • Use a variable to increase programming possibilities. • Use a variable and relational operator (e.g. < = >) within a loop to stop a program. • Evaluate the effectiveness and efficiency of an algorithm while continually testing the programming of that program. • Use different inputs (including sensors) to control a device or onscreen action and predict what will happen. • Use logical reasoning to predict and debug more complex programs including: selection, variables and operators.

Computing Progression of Knowledge and Skills: Information Technology

F2	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
• Talk about different kinds of information such as pictures, videos, text and sound. • Use a mouse and touch screen to move objects on a screen. • Create shapes and text on a screen.	• Talk about the different ways in which information can be shown. • Use technology to collect information, including photos, videos and sound. • Sort different kinds of information and present it to others. • Add information to a pictogram and talk about their findings. • Use software with support, to create, store and edit digital content using appropriate file and folder names. • Use the keyboard or a word bank on a device to enter text into a program. • Understand some of the basic functions on a keyboard (Backspace, Caps Lock, Enter) • Save information in a specific place and retrieve it again. • Use technology to collect information, including photos, videos and sounds.	• Create a graph or chart using data collected on a specific topic area. • Talk about the data that is shown in their chart or graph. • Explain how investigating data can be used to answer a question. • Use a variety of software to manipulate and present digital content in different ways with increasing independence. • Talk about the different ways to use technology to collect information, including a camera or sound recorder. • Use the keyboard on their device to add, delete, edit and format text. • Talk about an online tool that will help them to share their ideas with other people. • Save and open files on the device they use from a specific file location.	• Understand the difference between data and information. • Talk about the different ways data can be converted into information. • Search a ready-made database to answer specific questions. • Collect data to help answer questions about a specific topic or theme. • Add to and edit an existing database. • Combine a mixture of text, graphics and sound to share ideas and learning. • Use appropriate keyboard commands to amend text. • Be able to effectively use a spell checker. • Evaluate their work and improve its effectiveness. • Use an appropriate tool to share their work online.	• Demonstrate the different ways data can be organised. • Demonstrate the different ways data can be converted into information. • Make a branching database. • Collect data and identify where it could be inaccurate. • Plan, create and search a database. • Select the best way to present data to a specific audience. • Log data using a device. • Use photos, video and sound to create an atmosphere when presenting to different audiences. • Be confident to explore new media to extend what they can achieve. • Change the appearance of text to increase its effectiveness depending on the audience or mood. • Create, modify and present documents for a particular purpose and audience. • 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. • Be able to evaluate other people's work and give them constructive feedback to help them improve their work.	• Choose an appropriate tool to help them collect data. • Present data in an appropriate way depending on the theme or audience. • Use a spreadsheet and database to collect, record and evaluate data. • Search a database using different operators to refine a search. • Talk about errors in data and suggest how it could be checked. • Use text, photo, sound and video editing tools to evaluate and refine their work. • Be able to use a variety of familiar and unfamiliar software by using a pre-existing skill set. • Select, use and combine the appropriate technology tools to create effects in media. • Select an appropriate online or offline tool to create and share ideas. • Evaluate and improve their own work and support others in improving their work. • Acknowledges sources of information appropriately.	• Select the most effective tool to collect data for their investigation. • Check the data they collect for accuracy and plausibility, • Plan the process needed to investigate a set environment or setting. • Interpret and present the data they collect. • Use the skills developed to interrogate a database. • Uses a range of strategies to increase the accuracy of keyword searches. Makes confident inferences about their effectiveness. • Talk about audience, atmosphere and structure when planning a particular media outcome. • Combine a range of media, recognising the contribution of each to achieve a particular outcome. • Confidently identify the potential of unfamiliar technology and how it can be used effectively. • Explain why they select a particular online tool for a specific purpose. • Be digitally discerning when evaluating the effectiveness of their own work and the work of others. • Recognises the importance of copyright and how to acknowledge the sources of information.

Computing Progression of Knowledge and Skills: Digital Literacy (including e-Safety)						
F2	**Year 1**	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**Year 6**
• Can identify a device that uses technology. • Ask permission before using the Internet. • Tell an adult if something worrying or unexpected happens whilst using technology.	• Understand why we need passwords. • Understand that we must keep passwords private. • Explain what personal information is. • Understand that we must keep personal information private. • Communicate safely and respectfully online. • Know what to do when concerned about online content. • Know what to do if someone tries to contact you online.	• Understand the need to keep a password private. • Understand the need to keep personal information private. • Demonstrate the use of technology responsibly in terms of how we use it and the time we spend using it. • Know how to report inappropriate content.	• Children consider their responsibilities and actions to others online. • Children consider that all of the media they see could have been altered. • Understand how to use a search engine responsibly and safety	• Understand that media can be edited online for advertising and other purposes. • Recognise what is acceptable and unacceptable behaviour when using technology and online services. • Children understand how effective a strong password is and what a strong password looks like.	• Be aware of their digital footprint. • Understand the dangers of building online relationships. • Explain what the consequences might be to using technology inappropriately or accessing inappropriate content intentionally.	• Be aware of fake news and how to dissect it. • Understand the difference between misinformation and disinformation. • Understand what Copywriting is and using someone else's work responsibly. • Manage their conduct and contact appropriately and safely when using technology and online services.

Computing Progression of Knowledge and Skills: IT Beyond the Classroom						
F2	**Year 1**	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**Year 6**
• Talk about technology that is used at home, in school and in the world around them. • Use a safe part of the Internet to explore, play and learn.	• Recognise that a range of digital devices and products can be considered computers. • Recognise the ways in which technology is used in their homes and community. • Understand that computers have no intelligence and can do nothing without being programmed. • Begin to identify some of the benefits to using technology.	• Children can explain why they use technology in the classroom, in their homes and in the community. • Identify the benefits of using technology, such as creating content and communicating efficiently. • Can identify a computer by knowing that it has inputs, a processor and outputs. • Can identify parts of a computer including what an input and output is.	• Save and retrieve work online, on the school network and their own device. • Tell you ways to communicate with others online. • Knows how navigate the web responsibly. • Can carry out effective web searches to collect digital content. • Think about whether they can use images that they find online in their own work.	• Understand the difference between the Internet and online services such as the World Wide Web, instant messaging and email. • Tell you whether a resource they are using is from the World Wide Web, the school network or their own work. • Identify key words to use when searching safely on the World Wide Web. • Show an awareness of a range of Internet services such as the World Wide Web, email and instant messaging. • Explain how to check who owns photos, text and clipart.	• Use different online tools for different purposes. • Use a search engine effectively to find appropriate information and check the reliability of a website. • Understand how search results are selected and ranked and the algorithms they use. • Recognise and evaluate different types of information they find on the World Wide Web. • Think about the reliability of information they read on the World Wide Web or other Internet services (Fake News).	• Explain the Internet services they need to use for different purposes. • Describe the different parts of a webpage. • Understands how to construct a website using basic HTML tags. • Explain what copyright is and acknowledge the sources of information that they find online. • Understands how data is transmitted across a network. • Understand what IP is and how it's used. • Can explain how networks use the Internet to send and receive data.