COMPUTING CURRICULUM- Progression of Skills and Knowledge

Intent:

At Freemantle C E Community Academy, our intent is to prepare our learners for their future by giving them opportunities to gain knowledge and develop skills that will equip them for an ever-changing digital world. We want all our pupils to be competent in the key areas of computing and Information and Communication Technology (ICT) and able to apply their knowledge and understanding safely in real-life and in ever-changing situations. Knowledge and understanding of ICT is of increasing importance for our children's future both at home and for employment.
Our knowledge, skills and practical Computing Curriculum focuses on a progression of skills in digital literacy, computer science, information technology and online safety to ensure that children become competent in safely using, as well as understanding, technology. In computer science we will teach the principles of information and computation, how digital systems work and how to put this knowledge to use through programming information. In addition, we aim to ensure our children are equipped to use information technology to create programs, systems and a range of content. Computing also ensures that our pupils become digitally literate – able to explore, use, and express themselves and develop their ideas through, information and communication technology – at a level suitable for the future workplace and as active participants in a digital world.
The curriculum is sequenced in 'developmental plans' to help pupils build cumulative knowledge towards agreed milestones or expected standards. "A high-quality computing education equips pupils to use computational thinking and creativity to understand and change the world…the core of computing is computer science, in which pupils are taught the principles of information and computation, how digital systems work, and how to put this knowledge to use through programming. Building on this knowledge and understanding, pupils are equipped to use information technology to create programs, systems and a range of content."

National Curriculum Implementation
Our computing curriculum is designed to equip children with the skills and understanding to live in a technological world, which includes being able to use a variety of computer software and coding programs. There is an emphasis on the importance of online safety for all year groups. To ensure high standards of teaching and learning in computing, we implement a curriculum that is progressive throughout the whole school.

Implementation:
The goal of *our computing curriculum* is to transform the way computing is taught at Freemantle– and enable more young people to benefit from studying this important subject. Through this, their skills and career opportunities will be enhanced in the future.
Below is the curriculum journey our computing will follow from Nursery to Year 6. The framework uses an innovative progression to allow to children to build on their prior learning year on year. Each year group will have a unit of work linked to each of the following areas:

- Computing systems and networks
- Data and information
- Creating media

- Programming (A and B).

At Freemantle, our pupils have access to a variety of digital devices which are used to support teaching across the curriculum. We have interactive screens in every classroom, a class set of iPads, class sets of computers, Chromebooks for every child in Years 6 to 3, 3-d virtual reality, 3d-printers, a 3-d camera, programmable toys, and other devices to help children apply their skills.

Our implementation of the Computing curriculum is in line with the Primary National Curriculum requirements for KS1 and KS2 and the Foundation Stage Curriculum in England. This provides a broad framework and outlines the knowledge and skills taught in each key stage. Computing teaching will deliver these requirements through our half-termly units.
Our Computing progression model is broken down into three strands that make up the computing curriculum.
These are;

- Computer science- Computer Science underlines the knowledge and skills relating to programming, coding, algorithms and computational thinking.
- Information Technology- Information Technology underlines the knowledge and skills relating to communication, multimedia and data representation and handling.
- Digital Literacy- Digital Literacy underlines the knowledge and skills relating to online safety and technology uses all of which are covered weather combined or discreetly.

We have created an application and experience curriculum for Early years, and a knowledge and skills curriculum from Year 1-6, ensuring consistency and progression throughout the academy. The knowledge and skills curriculum enables clear coverage of the computing curriculum; but supports less confident teachers to deliver lessons. Lessons are broken down into units that are practical and engaging and allow computing lessons to be hands-on. Units cover a broad range of computing components such as coding, spreadsheets, Internet and Email, Databases, Communication networks, touch typing, animation and online safety.
When teaching computing, teachers can follow the children's interests to ensure their learning is engaging, broad and balanced. Teachers should ensure that ICT and computing capability is also achieved through core and foundation subjects and where appropriate and necessary ICT and computing should be incorporated into work for all subjects using our wide range of interactive ICT resources. Teachers can deliver thematic, cross curricular lessons that also follow children's interests and provide flexibility. The academy uses a range of online portal of age-appropriate software, games and activities as well as topic materials and materials to support children's learning in other subject areas for all key stages.

Computing lessons will also use software to 'make music', design and make using animation software and make links with maths through Times Table Rockstars (TTRS) and Numbots. Computing teaching is practical and engaging and a variety of teaching approaches and activities are provided based on teacher judgement and pupil ability. Teachers and pupils are also aware of the importance of health and safety and pupils are always supervised when using technology and accessing the internet. Our pupils are fully encouraged to engage with ICT and technology outside of school to support learning. Each teacher and pupil at Freemantle has a google classrooms login and password.

Computing work can be stored and saved using pupil log in details and homework can also be set for pupils to access and complete tasks at home that link with their current class learning. We provide a variety of opportunities for computing learning inside and outside the classroom. Computing and safeguarding go hand in hand and we provide a huge focus on internet safety inside and outside of the classroom. Additional to all pupils studying an online safety unit through their computing lessons, every year we also take part in National Safer Internet Day in February. The teaching staff will plan additional internet safety lessons and activities to take part in following a specific yearly theme or where an issue has arisen outside of the academy environment.

Internet Safety lessons support pupils in understanding appropriate use of the internet and online world, whilst being able to minimise risk to themselves.

Impact:
By the end of the curriculum, the...

- Children develop essential skills including basic folder structures, formatting, Email, printing and the use of cloud computing.
- Children will be better able to work across all subjects through skills learned in ICT for example, Internet searching skills.
- Children will develop understanding that will make better and safer use of Smartphones, tablets and technology in general.
- Children will understand the basics of computers and how they work.
- Children able to extend their vocabulary using ICT related terminology.
- Children will have an improved knowledge of career options that relate to ICT.
- Children will learn how ICT can be useful in any career option.

Our pupils learn about the key aspects of computing (digital literacy, information technology, and computer science) through a variety of units that provide them with key skills that will serve them now and in later life.

The implementation of this curriculum ensures that when children leave Freemantle, they are competent and safe users of ICT with an understanding of how technology works. Our believe the Teach Computing curriculum equips children with the skills to become digital-literate. Children will learn key vocabulary and should be able to recall this in everyday life. They will have developed skills to express themselves and be creative in using digital media and be equipped to apply their skills in Computing to different challenges going forward. Our pupils will be equipped, not only with the skills and knowledge to use technology effectively and for their own benefit, but more importantly – safely.
The biggest impact we endeavour to provide for our children is that they understand the consequences of using the internet and that they are also aware of how to keep themselves safe online.

Rationale

We have based our computing curriculum on the *Teach Computing* curriculum, which was created by the Raspberry Pi Foundation on behalf of the National Centre for Computing Education (NCCE). We chose this as the basis of our computing curriculum design for two key reasons:

1. It is inclusive and ambitious. The *Teach Computing* curriculum has been written to support all pupils. Each lesson is sequenced so that it builds on the learning from the previous lesson, and where appropriate, activities are scaffolded so that all pupils can succeed and thrive. Scaffolded activities provide pupils with extra resources, such as visual prompts, to reach the same learning goals as the rest of the class. Exploratory tasks foster a deeper understanding of a concept, encouraging pupils to apply their learning in different contexts and make connections with other learning experiences. As well as scaffolded activities, embedded within the lessons are a range of pedagogical strategies which support making computing topics more accessible.
2. It is informed by research. The subject of computing is much younger than many other subjects, and as such, there is still a lot more to learn about how to teach it effectively. To ensure that our pupils are as prepared as possible, the *Teach Computing* curriculum builds on a set of pedagogical principles which are underpinned by the latest computing research. To remain up-to-date as research continues to develop, every aspect of our computing curriculum will be reviewed each year and improved as necessary.

Online Safety

For support with online safety at home please speak to your class teacher or visit our online safety page.

Computing Curriculum Progression

How learning starts in the Early Years Nursery	Marvellous Me- Pupils to take a 'selfie' on an iPad to look at features of their face and hair/eye colour etc.	Let's Celebrate- adults to model using the laptop and Ipad to find out more about different celebrations	Once upon a Fairy Tale- Use the bee bots to travel to different fairy tale characters	Adventurous Explorers (people who help us)- Look at technology and uses that people use in different jobs e.g. a computer, telephone. Explore these within role play	Amazing animals- adults to model how to use the IPad to find out more about different animals.	The Great Outdoors- use the iPad camera to take pictures of different living things in the garden.
	Children can explore a range of simple ICT resources within their play: Home corner- washing machine, cooker, toy mobile phone, telephone, Shop- till, scales Cooking/making play dough with an adult using the microwave CD player- stop and start music Exploring programming the Beebots Scanning in/out books in the school library Using the IPads to record singing etc. Using camera/IPad to take photos of friends/things of interest Exploring cause and effect toys e.g. pop up caterpillar game					
How learning starts in the Early Years Reception Class	*Magical Me- Technology- something that has been made with a specific purpose to help other people. What do we use in school? What about home?*	*All that glitters- Engage in class interactive whiteboard games* Making marks and clicking to select colours *(we did this in spring)*	*Once upon a time- To use technology for the purpose of taking pictures.* *Once upon a time- Staying safe and healthy using technology e.g. 'sensible screen time,' staying safe online*	*Ticket to Ride- Play-based (unplugged) technology roleplay.*	*Our Wonderful World- Write name on computer/laptop/ipad (teacher will have selected Sassoon font in set up)*	*Pirate Adventure- Write caption on computer/laptop/ipad* *Pirate Adventure- Experiment with Beebot*
Continuous Provision:	Home corner- washing machine, cooker, Role Play- telephone, Shop- till, computer for ticket office Cooking- hob, soup maker (autumn-pumpkin soup), oven (spring- gingerbread men) Exploring programming the beebots (summer- journey for pirates) Scanning in/out books in the school library Using the IPads to take pictures. Paint open on teachers IWB to make and select colours etc.					
Opportunities	Key Stage 1		Key Stage 2			
	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Breadth of Study	**Online Safety** Use technology safely and respectfully **Grouping and Sorting** Use technology purposefully **Pictograms** Use technology purposefully	**Coding** Understand what algorithms are Create and debug simple programs Use logical reasoning **Online Safety** Use technology safely and respectfully	**Coding** Design, write and debug programs Use sequence, selection and repetition in programs Use logical reasoning **Online Safety** Use technology safely, respectfully and responsibly	**Coding** Design, write and debug programs Use sequence, selection and Repetition Use logical reasoning Select, use and combine a variety of software **Online Safety** Understand computer networks Use technology safely, respectfully and responsibly	**Coding** Design, write and debug programs Use sequence, selection and repetition Use logical reasoning Select, use and combine a variety of software **Online Safety** Understand computer networks Use technology safely, respectfully and	**Coding** Design, write and debug programs. Use sequence, selection and repetition. Use logical reasoning. Select, use and combine a variety of software. **Online Safety** Understand computer networks. Use search technologies effectively.

					responsibly Use technology safely, respectfully and responsibly.	
	Lego Builders Understand what algorithms are **Maze Explorers** Understand what algorithms are Create and debug simple programs Use logical reasoning to predict behaviour **Animated Story Books** Use technology purposefully	**Spreadsheets** Use technology purposefully **Questioning** Use technology purposefully **Effective Searching** Use technology purposefully Recognise common uses of information technology beyond school **Creating Pictures** Use technology purposefully	**Spreadsheets** **Touch-Typing** Select, use and combine a variety of software **Email** Understand computer networks Select, use and combine a variety of software Use technology safely, respectfully and responsibly **Branching Databases** Select, use and combine a variety of software	**Spreadsheets** Select, use and combine a variety of software **Writing for Different Audiences** Select, use and combine a variety of software **Logo** Design, write and debug programs Use sequence, selection and repetition Use logical reasoning	**Spreadsheets** Select, use and combine a variety of software **Databases** Select, use and combine a variety of software **Game Creator** Design, write and debug Programs Select, use and combine a variety of software	**Spreadsheets** Select, use and combine a variety of software. **Blogging** Understand computer networks. Select, use and combine a variety of software. Use technology safely, respectfully and responsibly.
	Coding Understand what algorithms are Create and debug simple programs Use logical reasoning to predict behaviour Use technology purposefully **Spreadsheets** Use technology purposefully **Technology Outside Of School** Recognise common uses of information technology beyond school	**Making Music** Use technology purposefully **Presenting Ideas** Use technology purposefully	**Simulations** Select, use and combine a variety of software **Graphing** Select, use and combine a variety of software	**Animation** Select, use and combine a variety of software **Effective Searching** Understand computer networks Use search technologies effectively **Hardware Investigators** Understand computer networks	**3D Modelling** Select, use and combine a variety of software **Concept Maps** Select, use and combine a variety of software Use search technologies effectively	**Text Adventures** Design, write and debug programs. Use sequence, selection and repetition. Use logical reasoning. Select, use and combine a variety of software. **Networks** Understand computer networks. **Quizzing** Select, use and combine a variety of software. **Understanding Binary** (optional)
Knowledge and Understanding						
	Online Safety and Exploring To login safely. To start to introduce to the	**Coding** To understand what an algorithm is.	**Coding** To review coding vocabulary that relates to Object, Action,	**Coding** To review coding vocabulary. To use a sketch or storyboard	**Coding** To review coding vocabulary. To use a sketch or storyboard to	**Coding** To review good planning skills.

	children the idea of 'ownership' of their creative work. To know how to find saved work in the Online Work files. To know how to search to find resources. To become familiar with the types of resources available in school. To become more familiar with the icons used in ICT. To start to add pictures and text to work. To explore the 'Tools' and to learn about common icons Save, Print, Open, New. To explore age appropriate educational games. To understand the importance of logging out when they have finished. **Grouping and Sorting** To sort items using a range of criteria. To sort items on the computer using the 'Grouping' activities **Pictograms** To understand that data can be represented in picture format To contribute to a class Pictogram To use a pictogram to record the results of an experiment. **Lego Builders**	To create a computer program using simple algorithms. To know what debugging means. To understand the need to test and debug a program repeatedly. To debug simple programs. To create programs using different kinds of objects whose behaviours are limited to specific actions. To predict what the objects will do in other programs, based on their knowledge of what the object is capable of. To discuss how logic helped them understand that they could only predict specific actions, as that is what the objects were limited to. To use all the coding knowledge, they have learned throughout their programming lessons to create a more complex program that tells a story. **Online Safety** To know how to refine searches using the Search tool. To know how to share work electronically using the display boards. To use digital technology to share work on Purple Mash to communicate and connect with others locally. To have some knowledge and understanding about	Output, Control and Event. To begin to develop sequential program design. To use the design to write the code for the program. To design and write a program that simulates a physical system. To look at the grid that underlies the design and relate this to X and Y properties. To introduce selection in their programming by using the various commands. To combine a timer in a program with selection. To understand what a variable is in programming. To use a variable to create a timer. To create a program with an object that repeats actions indefinitely. To use a timer to make characters repeat actions. To explore the use of the repeat command and how this differs from the timer. To know what debugging means. To understand the need to test and debug a program repeatedly. To debug simple programs. To understand the importance of saving periodically as part of the code development process.	to represent a program design and algorithm. To use the design to create a program. To introduce the If/else statement and use it in a program. To create a variable. To explore a flowchart design for a program with an if/else statement. To create a program which responds to the If/else command, using the value of the variable. To create a program with a character that repeats actions. To use the Repeat Until command to make characters repeat actions. To program a character to respond to user keyboard input. To make timers and counting machines using variables to print a new number to the screen every second. To explore how 2Code can be used to investigate control by creating a simulation. To know what decomposition and abstraction are in computer science. To take a real-life situation, decompose it and think about the level of abstraction. To design a decomposed feature of a real-life situation. **Online Safety**	represent a program design and algorithm. e design to create a program and write a program that simulates a physical system. To review the use of number variables in a code. e text variables. To create a playable, competitive game. To combine the use of variables, If/else statements and Repeats to achieve the desired effect in code so that it can be adapted, personalised and improved. To explore the launch command and use buttons within a program that launch other programs or open websites. **On line Safety** To gain a greater understanding of the impact that sharing digital content can have. To review sources of support when using technology. To review children's responsibility to one another in their online behaviour. To know how to maintain secure passwords. To understand the advantages, disadvantages, permissions and purposes of altering an image digitally and the reasons for this. To be aware of appropriate and inappropriate text, photographs and videos and the impact of sharing these online.	To design programs using their choice of objects, attributing specific actions to each using their new programming knowledge. To use variables within a game to keep track of the properties of objects. To use functions and understand why they are useful in 2Code. To debug a program and organise the code into tabs. To organise code into functions and Call functions to eliminate surplus code in the program. To explore the options for getting text input from the user in 2Code. How to include interactivity in programming. To use flowcharts to test and debug a program. To create a simulation of a room in which devices can be controlled. To explore how 2Code can be used to make a text-based adventure game. **Online Safety** Identify benefits and risks of mobile devices broadcasting the location of the user/device, e.g. apps accessing location. Identify secure sites by looking for privacy seals of approval, e.g. https, padlock icon. Identify the benefits and risks of giving personal information and device access to different software. To review the meaning of a digital footprint and understand how and why people use their information and online presence to create a virtual image of themselves as a

	To emphasise the importance of following instructions. To follow and create simple instructions on the computer. To consider how the order of instructions affect the result. **Maze Explorers** To understand the functionality of the basic direction keys in Challenges 1 and 2. To be able to use the direction keys to complete the challenges successfully. To understand the functionality of the basic direction keys in Challenges 3 and 4. To understand how to create and debug a set of instructions (algorithm). To use the additional direction keys as part of their algorithm. To understand how to change and extend the algorithm list. To create a longer algorithm for an activity. To provide an opportunity for the children to set challenges for each other. To provide an opportunity for the teacher to set these new challenges as 2Dos for all the class to try. **Animated Story Books** To be introduced to e-books and to Create a Story.	sharing more globally on the Internet. To introduce Email as a communication tool using 2Respond simulations. To understand how we talk to others when they aren't there in front of us. To open and send simple online communications in the form of email. To understand that information put online leaves a digital footprint or trail. To begin to think critically about the information they leave online. To identify the steps that can be taken to keep personal data and hardware secure. **Spreadsheets** Reviewing prior use of Spreadsheets Copying and Pasting Totalling tools Using a spreadsheet to add Amounts Creating a table and block graph **Questioning** To show that the information provided on pictogram is of limited use beyond answering simple questions. To use YES or No questions to separate information. To construct a binary tree to separate different items.	**Online Safety** To know what makes a safe password, how to keep passwords safe and the consequences of giving your passwords away. To understand how the Internet can be used to help us to communicate effectively. To understand how a blog can be used to help us communicate with a wider audience. For children to consider if that they read on websites is true? To look at some 'spoof' websites. To create a 'spoof' webpage. To think about why these sites might exist and how to check that the information is accurate. To learn about the meaning of age restrictions symbols on digital media and devices. To discuss why PEGI restrictions exist. To know where to turn for help if they see inappropriate content or have inappropriate contact from others. **Spreadsheets** To create pie charts and bar graphs. To use the 'more than', 'less than' and 'equals' tools. **Touch-Typing** To discuss the need for correct posture when typing. To introduce typing terminology.	To understand how children can protect themselves from online identity theft. Understand that information put online leaves a digital footprint or trail and that this can aid identity theft. To Identify the risks and benefits of installing software including apps. To understand that copying the work of others and presenting it as their own is called 'plagiarism' and to consider the consequences of plagiarism. To identify appropriate behaviour when participating or contributing to collaborative online projects for learning. To select an appropriate website from search results and begin to consider if the content is reliable. To identify the positive and negative influences of technology on health and the environment. To understand the importance of balancing game and screen time with other parts of their lives. **Spreadsheets** Using the formula wizard in the advanced mode to add formulae and explore formatting cells. Timer and spin button. Line graphs. Using a spreadsheet for budgeting.	To learn about how to reference sources in their work To search the Internet with a consideration for the reliability of the results of sources to check validity and understand the impact of incorrect information. Reliability through using different methods of communication. **Spreadsheets** Create a spreadsheet to plan an event. Know to search for information on a database. Contribute to a class database. Create a database around a chosen topic. **Maps** Understand the need for visual representation when generating and discussing complex ideas. To understand and use the correct vocabulary when creating a concept map. To create a concept map. Understand how a concept map can be used to retell stories and information. Create a collaborative concept map and present this to an audience.	user. To have a clear idea of appropriate online behaviour and how this can protect themselves and others from possible online dangers, bullying and inappropriate behaviour. To begin to understand how information online can persist and give away details of those who share or modify it. To understand the importance of balancing game and screen time with other parts of their lives, e.g. explore the reasons why they may be tempted to spend more time playing games or find it difficult to stop playing and the effect this has on their health. To identify the positive and negative influences of technology on health and the environment. **Spreadsheets** Exploring Probability. Use of spreadsheets in 'real life'. Creating a computational model. Use a spreadsheet to plan pocket money spending. Planning a school event. **Blogging** To identify the purpose of writing a blog. To identify the features of successful blog writing. To plan the theme and content for a blog. To understand how to write a blog. To consider the effect upon the audience of changing the visual properties of the blog.

	To continue a previously saved story. To add animation to a story. To add sound to a story including voice recording and music the children have created. To work on a more complex story including adding backgrounds and copying and pasting pages. To use additional features to enhance their stories. To share their e-books on a display board. **Coding** To understand what coding means in computing. To create unambiguous instructions like those required by a computer. To build one- and two-step instructions using the printable code cards. To introduce Code. To use the Code programs to create a simple program. To use Design Mode to add and change backgrounds and characters. They will use the Properties table to change the look of the objects. To use the Properties table to change the look of the objects. To design a scene for a program. To use code blocks to make the characters move	Use 2Question (a binary tree- optional) to answer questions. To use a database to answer more complex search questions. To use the search tool to find information. **Effective Searching** To understand the terminology associated with searching. To gain a better understanding about searching on the Internet. To create a leaflet to help someone search for information on the Internet. **Creating Pictures** To be introduced to Paint A Picture. To look at the impressionist style of art (Monet, Degas, Renoir). To recreate pointillist art and look at the work of pointillist artists such as Seurat. To look at the work of Piet Mondrian and recreate it using the Lines template. To look at the work of William Morris and recreate it using the Patterns template. **Making Music** To be introduced to making music digitally using Sequence. To explore, edit and combine sounds using 2Sequence.	To practise and improve typing skills. To start to type words. To improve the speed and efficiency of typing skills. **Email** To think about the different methods of communication. To open and respond to an email. To write an email to someone, using an address book. To learn how to use email safely. To add an attachment to an email. To explore a simulated email scenario. **Branching Databases** To sort objects using just YES/NO questions. To complete a branching Database. To create a branching database of the children's choice. **Simulations** To look at what simulations are. To explore a simulation. To analyse and evaluate a simulation. **Graphing** To enter data into a graph and answer questions. To solve an investigation and present the results in graphic form.	Exploring Place Value with a spreadsheet. **Writing for Different Audiences** To explore how font size and style can affect the impact of a text. To use a simulated scenario to produce a news report. To use a simulated scenario to write for a community campaign. **Logo** To learn the language of Logo. To input simple instructions on Logo. For the children to use Logo to create letters. To use the Repeat function in Logo to create shapes. To use the Build feature in Logo. **Animation** To discuss what makes a good animated film or cartoon and what their favourites are. To learn how animations are created by hand. To find out how 2Animate can be created in a similar way using the computer. To learn about onion skinning in animation. To add backgrounds and sounds to animations. To be introduced to stop motion animation. To share animation on the class display board and by		To understand the importance of regularly updating the content of a blog. To understand how to contribute to an existing blog. To understand how and why blog posts are approved by the teacher. To understand the importance of commenting on blogs. To peer-assess blogs against the agreed success criteria. To find out what a text adventure is. To plan a story adventure. To make a story-based adventure. To introduce map-based text adventures. To code a map-based text adventure. **Networks** To discover what the children know about the internet. To find out what a LAN and a WAN are. To find out how we access the internet in school. To research and find out about the age of the internet. To think about what the future might hold. **Quizzing** To make a picture quiz for young children. To explore the grammar quizzes. To make a quiz that requires the player to search a database.

	automatically when the green Play button is clicked. To add an additional character who moves when clicked. To explore the When Key and When Swiped commands (on tablets if available). To use the Stop button to make characters stop when the background is clicked. To explore a method to code interactivity between objects. **Spreadsheets** Introduction to spreadsheets. Adding images to a spreadsheet and using the image toolbox. Using the 'speak' and 'count' tools in to count items. **Technology Outside of School** To walk around the local community and find examples of where technology is used. To record examples of technology outside school.	To add sounds to a tune they've already created to change it. To think about how music can be used to express feelings and create tunes which depict feelings. To upload a sound from a bank of sounds into the Sounds section. To record their own sound and upload it. To create their own tune **Presenting Ideas** To explore how a story can be presented in different ways. To make a quiz about a story or class topic. To make a fact file on a non-fiction topic.		blogging. **Effective Searching** To locate information on the search results page. To use search effectively to find out information. To assess whether an information source is true and reliable. **Hardware Investigators** To understand the different parts that make up a computer. To recall the different parts that make up a computer.		Are you smarter than a 10- (or 11-) year-old? To make a quiz to test your teachers or parents. **Understanding Binary** (optional) Examine how whole numbers are used as the basis for representing all types of data in digital systems through: Recognising that digital systems represent all types of data using number codes that ultimately are patterns of 1s and 0s (called binary digits, which is why they are called digital systems). Understand that binary represents numbers using 1s and 0s and these represent the on and off electrical states respectively in hardware and robotics. Recognising that the numbers 0, 1, 2 and 3 could be represented by the patterns of two binary digits of 00, 01, 10 and 11. Representing whole numbers in binary, for example counting in binary from zero to 15, or writing a friend's age in binary. Representing whole numbers in binary, for example counting in binary from zero to 15, or writing a friend's age in binary. Exploring how division by two can be used as a technique to determine the binary representation of any whole number by collecting remainder terms. Representing the state of an object in a game as active or inactive using the respective binary values of 1 or 0. Are you smarter than a 10- (or 11-) year-old? To make a quiz to test your teachers or parents.

Key Concepts	To code	To code	To code	To code	To code	To code
	Motion – Control motion by specifying the number of steps to travel, direction and turn. Looks – Add text strings, show and hide objects, and change the features of an object. Sound – Select sounds and control when they are heard, their duration and volume. Draw – Control when drawings appear and set the pen colour, size and shape. Events – Specify use inputs (such as clicks) to control events. Control – Specify the nature of events (such as a single event or a loop). Sensing – Create conditions for actions by waiting for a user input (such as responses to questions like: What is your name?) **To Communicate** Understand online risks and the age rules for sites. Use a range of applications and devices in order to communicate ideas, work and messages. **To Collect** Use simple databases to record information in areas across the curriculum. **To Connect** Understand online risks and the age rules for sites.		Motion – Use specified screen coordinates to control movement. Looks – Set the appearance of objects and create sequences of changes. Sound – Create and edit sounds. Control when they are heard, their volume, duration and rests. Draw – Control the shade of pens. Events – Specify conditions to trigger events. Control – Use IF – THEN conditions to control events or objects. Sensing – Create conditions for actions by sensing proximity or by waiting for a user input (such as proximity to a specified colour or a line or responses to questions). Variables and lists – Use variables to store a value. Variables and lists – Use the functions define, set, change, show and hide to control the variables. Operators – Use the Reported operators () + () () – () () / () to perform calculations. **To Communicate** Use some of the advanced features of applications and devices in order to communicate ideas, work or messages professionally. **To Collect** Device and construct databases using applications designed for this purpose in areas across the curriculum. **To Connect** Give examples of the risks posed by online communications. Understand the term ‘copyright’. Understand that comments made online that are hurtful or offensive are the same as bullying. Understand how online services work.		Looks – Change the position of objects between screen layers (send to back, bring to front) Sound – Upload sounds from a file and edit them. Add effects such as fade in and out and control their implementation. Draw – Combine the use of pens with movement to create interesting effects. Events – Set events to control other events by ‘broadcasting’ information as a trigger. Control – Use IF – THEN – ELSE conditions to control events. Sensing – Use a range of sensing tools (including proximity, user inputs, loudness and mouse position) to control events or actions. Variables and lists – Use lists to create a set of variables. Operators – Use the Boolean operators () < () () = () () > () () and () () or () Not () to define conditions. Operators – Use the Reporter operators () + () () – () () * () () / () to perform calculations. Pick random () to () Join () () Letter () of () Length of () () Mod () (this reports the reminder after a division calculation). Round () () of (). **To Communicate** Choose the most suitable applications and devices for the purposes of communication. Use many of the advanced features in order to create high-quality, professional or efficient communications. **To Collect** Select appropriate applications to devise, construct and manipulate data and present it in an effective and professional manner. **To Connect** Give examples of the risks of online communities and demonstrate knowledge of how to minimise risk and report problems. Understand and demonstrate knowledge that it is illegal to download copyrighted material, including music or games, without express written permission from the copyright holder. Understand the effect of the online comments and show responsibility and sensitivity when online. Understand how simple networks are set up and used.	