Kingfisher Computing Curriculum

Our intent at our schools is to ensure that Children will have the opportunity to use and tinker with computing resources in cross-curricular lessons and create a program, presentation, website or video to show an audience.
We want children will know, what an algorithm is, how to create a computer program, how to debug and predict what will happen with a program, how to use technology to manipulate data, how to use technology safely and the risks of being online and how to use social media
Each term we plan full coverage of the curriculum using the 'Rising Stars' scheme. Units are structured across the term as roughly one lesson per week, however class teachers have flexibility to 'block' groups of lessons if appropriate,
We have used our chosen scheme to carefully map learning so that children have secure and detailed knowledge of all aspects of computing across a two year rolling programme. Links are made across units to embed learning, as well as links across subject areas to support children to apply their learning. Units are structured to follow the key elements of:

- Computer science

o Problem solving
o Programming
o Logical thinking

- Information technology

o Creating content
o Searching

- Digital literacy

o E-safety
o Using IT beyond school

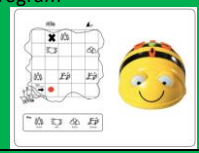
	Kingfisher Computing Curriculum – Units to be studied 2021-2022					
	Autumn A	**Autumn B**	**Spring A**	**Spring B**	**Summer A**	**Summer B**
EYFS	• In EYFS, children are given opportunities to practice the skills taught in their computing lessons as part of their continuous provision.					
Robins and Skylarks (Inc' Reception*)	Practice using school systems Google Classroom/Email	We are Celebrating	ESafety – Safer Internet Day	We are games testers	We are treasure hunters	We are photographers
Woodpecker		We are researchers We are presenters	ESafety – Safer Internet Day	We are photographers We are vloggers	We are programmers	We are bug fixers
Mallards and Barn Owls		We are presenters We are HTML editors	ESafety – Safer Internet Day	We are vloggers We are artists	We are programmers We are software developers	We are bug fixers We are toy designers
Swans and Golden Eagles		We are cryptographers	ESafety – Safer Internet Day	We are artists	We are APP developers	We are marketers

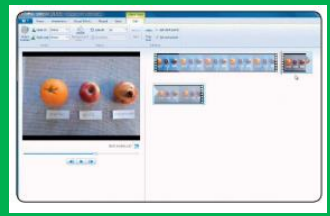
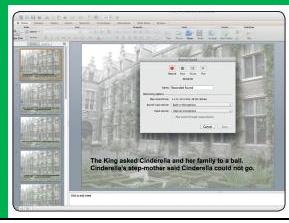
Kingfisher Computing Curriculum

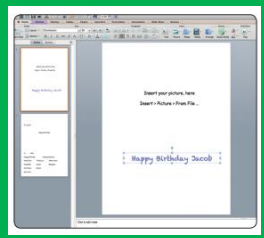
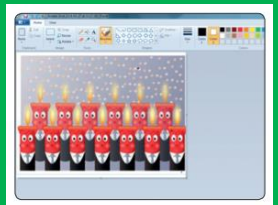
What do the children need to know and be able to do?

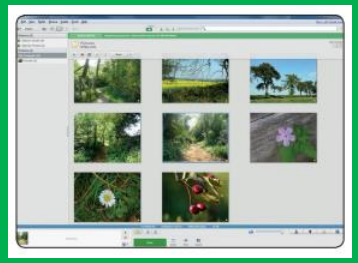
Kingfisher Ribbons		Key stage 1	Lower Key stage 2	Upper Key Stage 2
Computer Science	Problem Solving	The child can understand algorithms as sequences of instructions or sets of rules in everyday contexts. The child can recognise that common sequences of instructions or sets of rules can be thought of as algorithms. Examples could include recipes, but might also be procedures or rules in class, spelling rules, simple arithmetic operations or number patterns. The child can program on screen using sequences of instructions to implement an algorithm. The child can create programs as sequences of instructions when programming on screen. Their program could be written using simple programming apps (such as Blue Bot or Lightbot), ScratchJr or Scratch, perhaps using pre-prepared blocks and sprites in this case.	The child can design and write a program using a block language to a given brief, including simple interaction. The child can write a program in Scratch (or similar) in which the user has to provide some input, perhaps as an answer to a question on screen, or by using key presses or the mouse. The program could be a simple game or a set of questions and typed responses. The child can develop their own simulation of a simple physical system on screen. The child can create a Scratch (or similar) program to simulate a simple physical system. This could be in the form of a simple animation or an on-screen prototype for a product made in design and technology The child can work with others to plan a project. Given a particular project, the child can work as part of a team to plan how to accomplish their goal, breaking the project down into a set of tasks. Examples of projects could include creating an educational game, developing a wiki or monitoring the weather.	The child can design, write and debug a program using a second programming language based on their own ideas. The child can design a program of their own and write this in a programming language other than Scratch (or whichever language has formed the focus for their programming in other years), such as TouchDevelop or App Inventor. The second language does not need to be text based, but Logo or Python could be used. The child can test and debug their code, explain what bugs they found and how they fixed these. The program need not be complex - a simple app would suffice. The child can design, write and debug their own computer control application. The child can add computer control and/or sensors to a smartphone app or to products they design and make in design and technology, perhaps using Lego WeDo kits, MaKey MaKey or similar. The child can show evidence of designing, writing and debugging their program, ensuring that this functions correctly on the available hardware platform. The child can solve problems using decomposition, tackling each part separately. The child can take a complex problem, identify component parts, use decomposition to break this problem down and then plan how they can solve the problem by working through the elements they have identified. they can then use their plan to solve the original problem. Projects can be extended, such as developing a smartphone app.
	Programming	The child can create a simple program on screen, correcting any errors. The child can create a simple program on screen (e.g. using the Blue Bot app, ScratchJr or with prepared sprites and blocks in Scratch) with a particular goal or purpose in mind (e.g. drawing a shape or moving a sprite from one place to another). The child can debug any errors in their own code.	The child can use sequence and repetition in programs. The child's program, typically written in Scratch, or similar, should include sequences of commands or blocks and some repetition. Repetition would typically be for a fixed number of times, but might also include exit conditions (e.g. repeat...until...). Programs might include turtle graphics, simple music or a simple game. The child can write a program that accepts keyboard input and produces on-screen output. In Scratch (or similar), the child can write a program that displays a question, accepts typed input and responds in an appropriate way to what is typed. This might be used as the basis for a dialogue program or a simple maths game.	The child can use sequence, selection, repetition and variables in programs. The child's program should include sequences of commands or blocks, repetition, selection and variables. Repetition might include exit conditions (e.g. repeat...until...) and perhaps a counter-variable for iteration. Selection would normally be of an if...then or if...then...else type. At this level, expect the child to be able to combine repetition with selection and variables. Programs might include a simple smartphone app The child can write a program that accepts inputs other than keyboard and mouse and produces outputs other than screen or speakers. The child could create a smartphone app, using the touch screen and the GPS sensor or accelerometer for input, and the screen and speakers or headphones plus vibration motor or network connection for output.
	Logical thinking	The child can give logical explanations for what they think a program will do. The child can give logical explanations of what a program will do under given circumstances, including some attempt at explaining why it does what it does. The program could be one they themselves have written or it could be a computer game or a familiar piece of software. The child could use an audio recorder or a video camera to record their explanations.	The child can explain an algorithm using sequence and repetition in their own words. Given an algorithm using both sequence and repetition, the child can give a coherent, logically reasoned explanation of what it does and how it works. Repetition is likely to be 'forever' or for a set number of times, although end conditions (e.g. repeat...until...) could be used. The child can use logical reasoning to detect and correct errors in programs. The child can give well-thought-through reasons for errors they find in programs and explain how they have fixed these. The child can find and correct errors by reasoning logically about the program code; they might also be able to use logical reasoning to identify errors in programs when executed and confirm that they have fixed these by testing the new version of their program. The programs do not have to be written originally by the child. The child can understand that the internet transmits information as packets of data. When working online, the child can explain that the information they send and receive is automatically broken down into packets of data, and that these sometimes take different routes across the internet. The child can understand how the internet makes the web possible. The child can give an explanation of how requests for web pages, and the HTML for those pages, are transmitted via the internet.	The child can give clear and precise logical explanations of a number of algorithms. Given an algorithm, the child can describe what it does and, using logical reasoning, give precise explanations of how it works. Algorithms could be linked to programming projects, but might include a key algorithm such as binary search. The child can use logical reasoning to detect and correct errors in algorithms (and programs). When given an algorithm for a particular purpose, e.g. a rule-based algorithm for a smartphone app, the child can use logical reasoning to identify possible errors in the algorithm, explaining why they believe the algorithm is incorrect. The child can use logical reasoning to suggest possible corrections to the algorithm, explaining why these would correct the bug they identified. The child can understand how mobile phone or other networks operate. The child can give an explanation of how mobile phone (or other) networks operate: they should know that information is transmitted digitally, and have some understanding of the network topology involved. In the case of mobile phone networks, the child should show some understanding of the interactions between a phone, cell transmitters/receivers and the network's control systems. The child can understand how domain names are converted into IP addresses on the internet. The child can give some explanation of how a domain name is converted into an IP address using the distributed domain name system (DNS) using something similar to a set of phone books. The child should show an awareness of the looked-up addresses (DNS records) being copied (cached), and that more local records are used in preference to more authoritative records in most circumstances.
Information Techno	Creating Content	The child can store, organise and retrieve content on digital devices for a given purpose. With a given purpose, the child can use a range of digital technologies to retrieve, organise and store digital content. Technologies will typically include laptop	The child can use and combine a range of programs on a computer. The child can use multiple programs on laptop or tablet computers to achieve particular goals. E.g. They might record audio and then use this as samples in a composition; create	The child can select, use and combine a range of programs on multiple devices. The child can choose for themselves from a range of available programs on laptops, tablets or cloud-based services to achieve particular goals. E.g. They might choose which image editors and presentation software to use when making

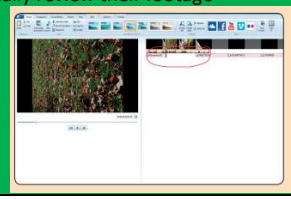
		computers, tablets and smartphones with access to the internet, but the child might also be expected to use digital cameras, video cameras and audio recorders (or the equivalent apps on a tablet or smartphone). Projects might include digital photography, searching for images online and creating image-based presentation slides. The child can create and edit original content for a given purpose using digital technology. The child can create and edit their own original digital content using a range of technologies. Content-creation technology might include laptop computers, tablets, smartphones with network connections, digital cameras, video cameras and audio recorders, although editing is likely to take place on laptops or tablets. Projects might include digital photography, creating image-based presentation slides, composing an email and creating simple charts. Look for some indication of the child's creativity in this work and evidence that they have edited content	HTML content in a text editor and preview it in a browser; analyse data in a spreadsheet and then create a presentation to show the results of their analysis. The child can design and create content on a computer in response to a given goal. With a given goal, the child can plan and execute a project in which they use software on a laptop or tablet to create digital content with some degree of independence. E.g. They could plan and compose original music using sequencing software; plan and create a web page; plan how they could contribute to a shared wiki and then do so; plan and create a presentation about the weather. They should evaluate how effectively they have met the requirements of the original goal. The child can collect and present data. The child can use computers to collect numerical data and present this to an audience. E.g. They could collect and present data about the weather over a period of time. They should be able to do this with a degree of independence	a presentation; which image and audio editors to use when creating media content for an app; which DTP, video editor and website tools to use when developing marking materials for an app. The child can design and create systems in response to a given goal. The child can plan, design and implement a system with multiple, interrelated components with a given goal in mind. E.g. They could develop a smartphone app, taking into account input, output and connectivity, the operating system, the algorithms, code and user interface of their own program. The child can analyse and evaluate data. The child can evaluate the quality of numerical data, deciding the extent to which it is affected by systematic or random errors. They should analyse their data, perhaps producing summary statistics, looking for relationships, trends and exceptions. E.g. They could conduct market research for a smartphone app, and analyse and evaluate the data they obtain.
	Searching	The child can search for information on a web page.	The child can use a standard search engine to find information. The child can use a common search engine (such as Google with safe search mode locked in place) effectively, to search for particular information on the web, such as answers to questions they identify in a research project. The child can understand that search engines rank pages according to relevance. The child can demonstrate their understanding that search engine results are ranked according to relevance, and that normally the top results on the first page are likely to be those most relevant to their query. If the child is unable to find good results on the first page, expect them to reconsider their keywords rather than looking at further pages of results.	The child can make use of a range of search engines appropriate to finding information that is required. The child can show that they can use effectively a range of different search technologies, including alternatives to Google (such as Bing or Yahoo) and site-specific search engines (such as those for the App Store or Google Play). E.g. They could demonstrate how they would use a range of search engines when researching available smartphone apps for a particular purpose. The child can appreciate that search engines rank pages based on the number and quality of in-bound links. The child can demonstrate some awareness of the Page Rank algorithm, explaining that the quality of a page is determined largely on the basis of the number and quality of links pointing to that page in the engine's cached copy of the web, and that quality is itself determined recursively through Page Rank.
Digital Literacy	Using IT beyond sc	The child can show an awareness of how IT is used for a range of purposes beyond school. The child can name a number of purposes for which IT is used beyond school. The child might know that adults can share work and discuss ideas in online communities; that photos can be taken, edited and shared easily using digital technology; that the web is made up of information shared by people and organisations; that people use email for a range of purposes and in a variety of contexts; that scientists use computers when collecting and analysing data.		
	Esafety	The child can keep safe and show respect to others while using digital technology. The child should know that they need to keep themselves safe when using digital technology. E.g. They should know to use filtered SafeSearch when looking for images on the web and that they should close the lid of a laptop (or similar action) if they find inappropriate images. They should know to respect others' rights, including privacy and intellectual property when using computers, so should not look at someone else's work or copy it without permission and acknowledgement. They should observe age restrictions on computer games. The child can understand that they should not share personal information online. The child should understand that personal information should be kept private: it should not be posted online to a public audience and should only be shared privately with those who they (or their parents) would trust. E.g. The child should recognise that photos they take in school should not normally be posted to the open web. They should know that photos taken with smartphones often contain hidden information about where the photo was taken The child can understand what to do if they have concerns about content or contact online. The child should know to close the laptop lid or turn the tablet over if they find content, such as inappropriate images, which might disturb them or other children; if someone they don't trust contacts them online; if someone makes inappropriate contact online. They should know to tell their teacher or their parents if this happens, and be aware that they could talk to another trusted adult or to ChildLine about this	The child can demonstrate that they can act responsibly when using computers. The child can act responsibly when using computers. E.g. They should act responsibly when developing computer games or prototype products. They should behave responsibly when using sampled music or creating a composition. They should show responsibility when creating or remixing online content, including observing copyright and any terms and conditions. They should contribute positively to a shared wiki. The child can understand the difference between acceptable and unacceptable behaviours when using digital technology. The child can discuss the difference between acceptable and unacceptable behaviours when using digital technology in a range of contexts. Contexts could include the Scratch website, or other online communities; the use of others' original content, such as music samples or web pages; wikis, including Wikipedia. Know who to talk to about concerns and inappropriate behaviour at home or in school. Pupils should know to report inappropriate behaviour when using technology in school to their teacher, the network manager or another trusted adult, and that they can discuss any concerns they have with their teacher or other trusted adults in school. They should also know that any concerns over, or inappropriate behaviour with, digital technology at home can be discussed with their parents, with you or with another trusted adult. The child can decide whether digital content is relevant for a given purpose or question. The child can form a judgement about whether a web page, such as a Wikipedia article, or other digital content is appropriate for finding out the answer to a question they have or a given purpose. The child can work collaboratively with classmates on a shared wiki. The child can work collaboratively with their peers on a shared project, such as a class wiki, making useful contributors and providing feedback to others.	The child can show that they can think through the consequences of their actions when using digital technology. The child can discuss likely and potential consequences of their actions when using digital technology in a range of contexts. Contexts might include developing smartphone apps; using online project management tools; collecting information for market research; posting original content online. The child can form an opinion about the effectiveness of digital content. Taking into account the intended audience and purpose of the content, the child can form a judgement as to, and provide reasons for, the extent to which they consider digital content to be effective. The content might be an app, media resources or marketing materials. The child can use online tools to plan and carry out a collaborative project. The child can make use of an online tool to plan and carry out a collaborative project (such as developing an app).

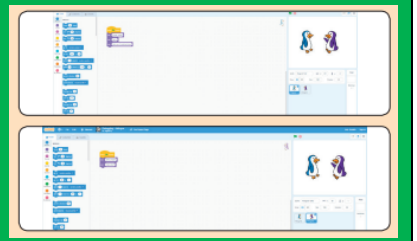
		Kingfisher Computing Curriculum – Unit detail				
		What do the children need to know and be able to do?				
Unit	Kingfisher Ribbons	Rationale	Knowledge/Skills	Vocabulary	Esafety	Assessment
We are Treasure Hunters	Computer Science	In this unit, the children will program a toy to move around a map to find buried treasure. They will start by thinking of algorithms for their routes, then input these as stored programs for the robot. They predict how the robot will move and will debug their programs.	Understand that a programmable toy can be controlled by inputting a sequence of instructions. Develop and record sequences of instructions as an algorithm. Program the toy to follow their algorithm. Debug their programs. Predict how their programs will work.	algorithm debug instructions predict programming robot treasure	If children will be accessing the internet, ensure that access to inappropriate material is blocked by filters. If children are filmed, or film one another, working with the robots, ensure any necessary permission has been obtained.	Give one another instructions to move around a large space Understand input, program and output in the context of a robotic toy Create a program to move a toy to a particular location Debug a program 
We are Painters	Information Technology Digital Literacy	This unit will particularly engage children who love the illustrations in the books they read. It is a great opportunity for the children to work creatively.	Use the web safely to find ideas for an illustration select and use appropriate painting tools to create and change images on the computer understand how this use of ICT differs from using paint and paper create an illustration for a particular purpose know how to save, retrieve and change their work reflect on their work and act on feedback received.	Character eBook edit illustration traditional tale	Internet access is likely to be filtered in school, but check that these filters are in place and are appropriate (check your school policy). Talk to the children about what to do if they encounter inappropriate material – many schools operate a 'turn the screen off/turn the tablet over and tell an adult' system. Check that your search engine's safe search filters are turned on. If the children's work is uploaded to a public area, check compliance with school policy, in particular regarding the children's identities and their intellectual property. If email is used (see Extensions), remind children about its safe and respectful use. Ensure all correspondence is via school email addresses.	Use a paint program to create an illustration that conveys character Make improvements to an image using paint software Be able to retrieve previously saved work Give constructive feedback to other pupils 

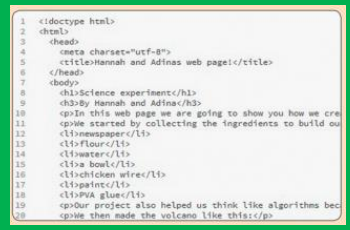
We are TV Chefs	Computer science Information Technology Digital literacy	In this unit, pupils produce short videos of themselves making a healthy meal or snack. They also decompose a complex problem into smaller parts – an important idea from computer science.	Break down a process into simple, clear steps, as in an algorithm use different features of a video camera use a video camera to capture moving images develop collaboration skills discuss their work and think about how it could be improved.	algorithm clip edit film instructions recipe robot video camera	Even if video footage is used only within school, you may still need to seek consent from pupils and their parents or carers (see My Rising Stars for a parent consent letter template). WeVideo's terms and conditions require parental consent under the age of 13. Remove any information in the videos that might identify pupils. Note: if parents have not given their permission for children to be filmed, ensure that these pupils do not appear in the background of videos. Check the school's internet filters are activated and appropriate (check your school policy). Talk with pupils about what to do if they encounter inappropriate material. Many schools operate a 'turn the screen off/turn the tablet over and tell an adult' system. As you will be asking permission from pupils (and their parents or carers) to use their original work, this unit would be a good opportunity to introduce pupils to the concept of copyright.	Create a recipe with clear steps Predict what will happen when someone follows their recipes Film video, keeping the camera still and steady Join video clips together 
We are story tellers	Information Technology Digital literacy	In this unit, the children create a talking book that they can share with others.	Use sound recording equipment to record sounds develop skills in saving and storing sounds on the computer develop collaboration skills as they work together in a group understand how a talking book differs from a paper-based book talk about and reflect on their use of ICT share recordings with an audience	audio book copyright microphone recording sound effects talking book	The children's performances may be uploaded to the learning platform or class blog. Uploading to external websites should only be allowed if this is in accordance with school policy and any relevant permissions are obtained. Where children are reading others' stories, be aware of copyright and take care to observe any associated conditions.	Review and improve sound effect recordings Review and improve dialogue recordings Organise sound effect recordings Give constructive feedback to other pupils Compare audio books with printed books 

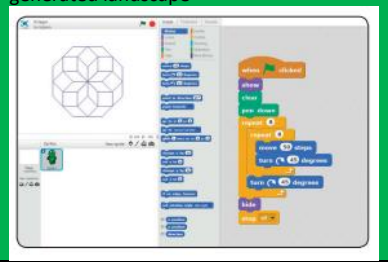
We are celebrating	Information Technology Digital literacy	In this unit, pupils will have the opportunity to create a digital greetings card, which could be used for a religious festival such as Diwali or Christmas, pupils' birthdays, or simply to say thank you or good luck.	Develop basic keyboard skills, through typing and formatting text develop basic mouse skills use the web to find and select images develop skills in storing and retrieving files develop skills in combining text and images discuss their work and think about whether it could be improved.	Celebrate copyright edit greeting keyboard save type	Check that filters are in place but allow access to the commercial websites needed. Discuss what to do if the children encounter inappropriate material – many schools operate a 'turn the screen off/turn the tablet over and tell an adult' system. Check that Google's safe search filters are on. School policy should be followed if they use any photographs of themselves, and any necessary permissions should be obtained. Take precautions over the protection of the children's identity and copyright if they share work beyond the school. If email is used to send the completed cards, it is recommended that you use a class email address. Always check the copyright details of any images sourced from the web; where possible, use public domain or Creative Commons licensed images.	Understand how to use the keyboard to enter non-alphabetic characters Modify the appearance of text on their card Edit images to personalise them Combine text and an image to make a greetings card with a clear sense of purpose Think about the relative merits of printed greetings cards and e-cards.  
We are games testers	Computer science Digital literacy	In this unit, the pupils will try to work out how some simple Scratch games work. They also look at free online or open source games and share their favourite games with the class.	describe carefully what happens in computer games u se logical reasoning to make predictions of what a program will do test these predictions think critically about computer games and their use be aware of how to use games safely and in balance with other activities.	algorithm predict rules Scratch test	Take care when choosing games for pupils to play, or allowing them to bring in or recommend games, that PEGI (https://pegi.info) age restrictions are observed. Ensure that your browser's adblock filters (if available) are switched on. Precautions over the protection of the children's identity, contact details and intellectual property should be in place. The pupils can access the Scratch website, including the example games, without registration. They can register for accounts with parental permission, allowing them to upload their own games to the site or to remix those that are there, including these examples. Comments on the Scratch website are not moderated before they appear, although you and your pupils can report any that are inappropriate. This could be a useful teaching point for identify where to go for help and support when they have concerns about content or contact.	Describe clearly what happens in a computer game Conduct tests to check their predictions Notice common features in several game algorithms Understand that playing computer games should be balanced with other activities 

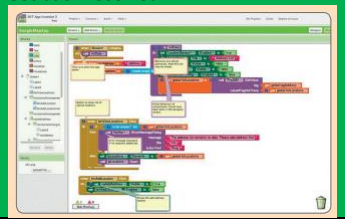
We are photographers	Computer science Information Technology Digital literacy	In this unit, the children review photos online, practise using a digital camera, take photos to fit a given theme, edit their photos, and then select their best images to include in a shared portfolio.	consider the technical and artistic merits of photographs use a digital camera or camera app take digital photographs review and reject or pick the images they take edit and enhance their photographs select their best images to include in a shared portfolio.	camera image Picasa pixel portfolio theme	Ensure appropriate safeguards are in place to filter inappropriate content, and that any safe search or safe mode settings are enabled. Remind the children what to do if they have concerns over online content. Many schools operate a policy of 'turn the screen off/turn the tablet over and tell an adult'. If the children upload work they create for others to see, make sure their identity, contact details and intellectual property are protected. You may wish to limit online sharing to the school learning platform or website. Talk to the children about what it is acceptable and unacceptable to photograph. It is not a good idea to take or share photographs in which children can be identified, or that might reflect badly on the children, you, the school, or an organisation hosting an educational visit.	Review others' photos, considering their technical merits Take focused, sharp photos Crop and straighten digital photos Explain why they should not post some photographs publicly 
We are researchers	Information Technology Digital literacy	The children research a topic – safely, effectively and efficiently – using a structured approach (mind mapping). They share their findings with others through a short multimedia presentation.	Develop collaboration skills through working as part of a group develop research skills through searching for information on the internet improve note-taking skills through the use of mind mapping develop presentation skills through creating and delivering a short multimedia presentation.	Google mind map presentation research search search engine	Internet access in school is likely to be filtered, but make sure these filters are in place and are appropriate (check your school policy). It is strongly advised to discuss with children what they should do if they encounter inappropriate material. Many schools operate a 'turn the screen off/turn the tablet over and tell an adult' system. Check that Google's and/or Bing's safe search filters are turned on. Check the terms and conditions of any software you install or online services you use, to ensure they comply with your school's online safety policy. Remind the children about respecting other people's intellectual property. They should credit the sources they've used, and should use Creative Commons or public domain images.	Organise questions on a mind map Cite the sources of the information they include Find information using a general purpose search engine Add appropriate images to a presentation Present their findings to an audience 

We are programmers	Computer science Digital literacy	In this unit, the children create an animated cartoon using characters they design. They use a paint tool to create characters and backgrounds. They then create an animation by translating a storyboard into a series of scripted instructions (program) for graphic objects.	create an algorithm for an animated scene in the form of a storyboard write a program in Scratch to create the animation correct mistakes in their animation programs	algorithm animation input output program script storyboard	If working in PowerPoint, you might want to use images downloaded from the web. Make sure you follow your school's online safety policy. If children are going to upload their animations to the Scratch website, they will need to create accounts: this requires parental permission. Exploring online animation galleries may expose the children to inappropriate content. Talk about what to do if they see something inappropriate. Some schools operate a 'turn the screen off/turn the tablet over and put your hand up' system. Review the appropriateness of any animations you show, including the related comments. Tools such as quietube (see Useful links) or YouTube's own safety mode can be used to remove comments when videos are shown in class	Correct mistakes in their animation programs Create their own sound and graphics for the sprites and the backdrop Explain the connection between their storyboard and the scene they're animating 
We are presenters	Computer science Information Technology Digital literacy	Do your children love watching sport or other performances on TV? This unit gives them a chance to make a short narrated video of themselves practising a sport or other skill, and to use this to help improve their performance.	gain skills in shooting live video, such as framing shots, holding the camera steady, and reviewing edit video, including adding narration and editing clips by setting in/out points understand the qualities of effective video, such as the importance of narrative, consistency, perspective and scene length.	audio close-up editing footage panning shooting video camera zooming	Even if video footage is used only within the school, parental consent should be sought. Brief the children and parents in advance. With the consent of the children and parents, some of the edited video might be made available on the school website or external sites. Keep to school policy. Never include any information in the videos that might identify children. If you are using WeVideo, make sure you obtain parental consent.	Analyse existing sports coverage to learn how this is shot Record high quality footage Record a detailed, informative commentary Export the movie in a standard format Critically review their footage 

We are bug fixers	Computer science Digital literacy	In this unit, the children work with six example Scratch projects. They explain how the scripts work, finding and correcting errors in them, and explore creative ways of improving them. The children learn to recognise some common types of programming error, and practise solving problems through logical thinking.	develop a number of strategies for finding errors in programs build up resilience and strategies for problem solving increase their knowledge and understanding of Scratch recognise a number of common types of bug in software.	algorithm bugs debug instruction program script	Pupils don't need accounts to download Scratch or to use Scratch or Snap! online. If pupils do register for accounts, they need to give a parent's or carer's email address, so you should check with parents or carers that they're happy for their children to do this. Once registered, pupils can share their corrected and refined programs with the global Scratch community in a safe online space. Alternatively, pupils can upload their completed projects to the school's learning platform or blog. If pupils upload screencasts of their solutions, make sure you take the usual precautions to protect their identity. If pupils use the web for research (see Extensions), ensure all usual internet safety protocols are in place.	Describe how the times-table program works Describe how the circle-drawing program works Describe how the two joke scripts work together Correct the 'Pong'-style game so the bounce is more realistic Describe how the racing car simulator works 
We are vloggers	Computer science Information Technology Digital literacy	In this unit, the pupils choose a topic to teach to others. They research this using web-based sources, plan a presentation, source and create visual content and record a spoken commentary.	use a search engine to learn about a new topic plan, design and deliver an interesting and engaging presentation search for, and evaluate, online images create their own original images create a screencast video of a narrated presentation develop their understanding of how the internet, the web and search engines work.	vlogging search engine internet presentation narration Creative Commons copyright images audio screencast	Remind pupils that everything they do online is part of their digital footprint – that searching the web automatically leaves a trail. Discuss what pupils should do if they encounter inappropriate content, e.g. close the lid of their laptop or turn their tablet over and immediately tell a teacher. Let your network manager/technician know if the pupils encounter such content. Ensure that Google is locked in safe-search mode. Consider using safe search engines, such as Swiggle (www.swiggle.org.uk/) or Kidrex (www. kidrex.org/). Remind pupils that they should only copy online content if they have the owner's permission (typically, this would mean Creative Commons licensed content) and if they acknowledge where the material came from.	Know what to do if they have concerns over inappropriate content at home Be able to research a topic efficiently Be able to find appropriate, Creative Commons licensed images using Google Understand that text and information is communicated as numbers across the internet Understand that Google results are based on the key words in its index of a copy of the web Design and record an effective presentation 

We are HTML editors	Information Technology Digital literacy	In this unit the children learn about the history of the web, before studying HTML (hypertext mark-up language), the language in which web pages are written. They learn to edit and write HTML, and then use this knowledge to create a web page.	understand some technical aspects of how the internet makes the web possible use HTML tags for elementary mark up use hyperlinks to connect ideas and sources code up a simple web page with useful content understand some of the risks in using the web.	code HTML HTTP (hyper text transfer protocol) hyperlink tag URL web page	Ensure the usual safe search settings and filters are in place while the pupils are working on the web. Precautions over the protection of the children's identities and contact details should be in place if the children publish any of their material on the open web. Creating accounts on some of the web-based applications in this unit (e.g. Thimble) require parental permission. Use these lessons as an opportunity to address the risks of the web. It is vital that the pupils learn to keep themselves safe when online, as well as knowing how to use the web responsibly. Encourage the pupils to let you know if they have any concerns or see anything inappropriate. Remind them that they can also report concerns to Childline on 0800 1111 or via https://www.childline. org.uk/get-support/.	Explain the parts of a URL Recognise the importance of links for the web Use the ... tag correctly to insert a link Create a web page by writing HTML Create web pages that show due regard for safety and responsibility 
We are toy designers	Computer science Digital literacy	In this unit, the children work together to design a simple toy that incorporates sensors and outputs and then create an on-screen prototype of their toy in Scratch. Finally, they pitch their toy idea to a Dragons' Den-style panel.	design and make an on-screen prototype of a computer-controlled toy understand different forms of input and output (such as sensors, switches, motors, lights and speakers) design, write and debug the control and monitoring program for their toy.	algorithm debug input interactive output pitch prototype simulation	Pupils don't need accounts to download their own copy of Scratch or to use Scratch or Snap! online. Pupils can incorporate images and sound effects that they download from the web, but should respect any license conditions when doing so. If you do decide that the pupils should work with control hardware, conduct a risk assessment and ensure safe practices are adhered to.	Make a virtual prototype of a toy with computer-controlled input and output Create a working virtual prototype with scripts to control a sprite responding to mouse and keyboard input Debug problems they encounter 

We are software developers	Information Technology Digital literacy	The pupils start by playing and analysing educational computer games, identifying those features that make a game successful. They then plan and design a game, with a clear target audience in mind. They create a working prototype, and then develop it further to add functionality and improve the user interface. They test their game and make any necessary changes.	develop an educational computer game using selection and repetition understand and use variables start to debug computer programs recognise the importance of user interface design, including consideration of input and output.	debug input interface output program prototype repetition variable	Pupils don't need accounts to download Scratch or to use Scratch or Snap! online. If pupils do register for accounts, they need to give a parent's or carer's email address. Check that parents/carers are happy about this. Once registered, pupils can share their work with the global Scratch community in a safe, moderated online space. Alternatively, pupils can upload their games to the school's learning platform or blog. Pupils should respect licence conditions and intellectual property rights when incorporating images and sound effects that are downloaded from the web.	Use a repeat block correctly Keep track of random numbers and the score Integrate sound into their game Correct mistakes in their game 
We are artists	Computer science Information Technology Digital literacy	The pupils use vector and turtle graphics to explore geometric art, taking inspiration from the work of Escher, Riley and traditional Islamic artists, as well as experimenting with complex 'fractal' landscapes.	Develop an appreciation of the links between geometry and art become familiar with the tools and techniques of a vector graphics package develop an understanding of turtle graphics experiment with the tools available, refining and developing their work as they apply their own criteria to evaluate it and receive feedback from their peers develop some awareness of computer-generated art, in particular fractal-based landscapes.	Geometric landscape op art sprite symmetry tessellations	If the pupils use Google Image Search to study examples of artists' work, ensure that 'safe search' is locked to 'strict'. Precautions over the protection of identity and intellectual property should be in place if the pupils upload work they create for others to see – you may wish to limit this to the school learning platform or website.	Create a tessellating pattern using more complex shapes Use repetition in a program to draw a more complex geometric figure Create a pattern using repeating, varied shapes using the tile clone tool or similar Create an aesthetically pleasing computer generated landscape 

We are cryptographers	Digital literacy	The pupils learn more about communicating information securely through an introduction to cryptography (the science of keeping communication and information secret). They investigate early methods of communicating over distances, learn about two early ciphers, and consider what makes a secure password.	be familiar with semaphore and Morse code understand the need for private information to be encrypted encrypt and decrypt messages in simple ciphers appreciate the need to use complex passwords and to keep them secure have some understanding of how encryption works on the web.	Binary code cipher decrypt encrypt Morse code password security semaphore	The pupils will be making use of the web throughout the unit, so the usual precautions over online access should be in place.If the pupils upload work they create for others to see, make sure precautions are in place to protect their identity, contact details and intellectual property. One of the key messages in the unit is the need for password security. The pupils should understand that they should not share passwords with anyone else. The unit also introduces the pupils to the use and importance of encrypted internet connections. Check with your network manager whether the integrity of encrypted (HTTPS) connections is observed by the school and its service provider.	Send and receive messages using Morse and semaphore beyond line-of-sight Decrypt messages using the Caesar cipher with an unknown key Recognise the importance of using complex passwords Understand how to check if a web page is Encrypted 
We are APP developers	Computer science Information Technology Digital literacy	In this unit, the pupils draw on their work from the previous Year 6 units to create a working app. They write down their algorithms, and use a programming toolkit to code them.	become familiar with another programming toolkit or development platform import existing media assets to their project write down the algorithms for their app program, debug and refine the code for their app thoroughly test and evaluate their app.	Algorithm Assets Components Debug Program Pseudocode Toolkit	Precautions over the protection of the children's identity and contact details should be in place if they upload work they create for others to see. You may wish to limit this to the school learning platform or website. If the pupils use school-owned tablets, discuss and agree sensible conditions for their use. If, after discussion with your senior leadership team, you allow the pupils to bring in their own smartphones or tablets to school, ensure you have parental consent, agree conditions under which the devices can be used, and have some way to keep them safe and secure when not needed.	Use logical reasoning to detect errors in their algorithms Use sequence, selection, repetition and variables in their code Use logical reasoning to detect errors in their code Make changes to their code on the basis of feedback received 

We are marketers	Computer science Information Technology Digital literacy	The pupils work collaboratively to produce marketing materials for the app they have been developing in the Year 6 units. They create a poster or flyer, develop a simple website, and shoot a short video.	consider key marketing messages, including identifying a unique selling point develop a printed flyer or brochure incorporating text and images further develop knowledge, skills and understanding in relation to creating a website further develop skills relating to shooting and editing video.	Audience Flyer Platform Promote Rough cut Unique selling point	Ensure the usual precautions and procedures are in place when the pupils research marketing materials or source third-party content via the web. Precautions over the protection of the children's identity and contact details should be in place if they upload work they create for others to see – you may wish to limit this to the school learning platform or website. If pupils need to film off site, or around the school site, ensure that risk assessments and all appropriate arrangements are completed. Emphasise that the pupils should abide by any licence terms involving third-party copyright materials if they wish to use these in their own marketing materials. Discuss with the senior leadership team the implications of pupils making their apps publicly available, and ensure that neither they nor the school are exposed to excessive risk as a result.	Create an effective and well-designed marketing flyer Develop a well-designed and easy-to navigate site for their app Be aware of their responsibilities as creators of online content Edit original and third-party content to create a promotional video