Bramcote Hills Primary School

‘Make the future better for all’

Computing

Curriculum Depth Map

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Curriculum Depth Map – Computing

Aims

The national curriculum for computing aims to ensure that all pupils:

- can understand and apply the fundamental principles and concepts of computer science, including abstraction, logic, algorithms and data representation.
- can analyse problems in computational terms and have repeated practical experience of writing computer programs in order to solve such problems.
- can evaluate and apply information technology, including new or unfamiliar technologies, analytically to solve problems.
- are responsible, competent, confident and creative users of information and communication technology.

Intent

At BHPS we aim to prepare our children for a rapidly changing world through the use of technology. Our computing curriculum is designed to enable them to use computational thinking and creativity to further understand our world. Our curriculum design has deep links with Mathematics, English, Science, and Design and Technology. At the core of our computing curriculum 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.

Our curriculum is led by Key Primary Themes, terms and vocabulary providing opportunities to build a shared and consistent understanding. Units are organised to ensure themes are revisited regularly as pupils move through the school. This ensures each unit builds effectively on prior learning and ensures connections are made between different units to help children know more and remember more. Our pupils are able to apply and consolidate understanding as they progress through the school to enable them to become computer scientists of the future.

We encourage curiosity about digital technology and encourage our pupils to ask questions about the digital systems around them. We explore how technology is used in the real world and how to use it in a safe and responsible way. We ensure all children are exposed to high quality computing teaching and a range of learning experiences. Building on this knowledge and understanding, we intend for our children to use information technology to create programs and systems, within a range of content. By the end of Key Stage 2, we want our children to become digitally literate -to able to 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.

School recognises the distinction between *conceptual* and *procedural* knowledge. Conceptual knowledge being the facts, rules and principles and the relationships between them. It can be described as '*knowing that'*. In contrast procedural knowledge is knowledge of methods or processes that can be performed. It can be described as '*knowing how'*.

Knowledge in the Teach Computing primary curriculum is organised into four key primary themes:

- **Computing systems and networks** (Computer Science)
- **Programming** (Computer Science)
- **Data and information** (Computer Science)
- **Creating media** (Digital Literacy)

As part of the work on each primary theme, children also explore and learn about:

- **The impact of technology** (Information Technology)
- **Safety and security** (Digital Literacy)

The units for key stages 1 and 2 are based on a spiral curriculum. This means that each of the themes is revisited regularly (at least once in each year group), and pupils revisit each theme through a new unit that consolidates and builds on prior learning within that theme.

This style of curriculum design reduces the amount of knowledge lost through forgetting, as topics are revisited yearly. It also ensures that connections are made even if different teachers are teaching the units within a theme in consecutive years.

Key Primary Themes have been identified to enable children to contextualise, link and understand knowledge. Key primary themes are subject specific and build progressively as pupils move through school. Pupils should be able to apply their knowledge of computing key primary themes and make connections between their learning and build the schema they need.

Pupils are also taught about the contributions that developments in digital technology have made and continue to make, to the world they live in.

Implementation

Computing skills are taught both discretely and cross-curricular, supporting other areas of learning across the school. In Foundation and Key Stage 1, children are taught to use equipment and software confidently and purposefully, to communicate and handle information and to support their problem solving, recording and expressive skills. In Key Stage 2, our children extend their use of computing that they use for communication, investigation and programming and work to understand how to communicate safely. Our planned curriculum for digital literacy that includes online safety is broad in covering a range of issues.

Our Computing curriculum is based upon the Teach Computing online resource designed to allow children time to think, discuss, practise, explore and embed. This allows time for teaching, practice and repetition – both in a year group and across both key stages. Curriculum coverage is mapped out carefully from EYFS to Year 6, which allows some key themes to be developed at a deeper level of learning, understanding and mastery.

Lessons seek to introduce new knowledge and themes in small, logical steps, in line with cognitive load theory. Children's knowledge will be built up gradually, making links, wherever possible, to previous knowledge and other areas of learning. We seek to further children's ability to commit new learning to long term memory by assessing their retention and revisiting key knowledge. Potential misconceptions will be addressed through carefully selected lesson content and effective feedback.

Online Safety is taught through a series of strands taken from the ProjectEVOLVE toolkit, which is based on UKCIS framework 'Education for a Connected World' (EFACW). These units cover knowledge, behaviours and attitudes across eight key strands of online learning from EYFS to Y6 and beyond.

Impact

The effective teaching of computing results in an engaging, high-quality education that allows pupils to understand the world around them and encourages them to explore digital technology further as they leave primary school.

The impact of learning is measured against the key primary themes within a sequence of learning and is a measure of how much knowledge has been acquired. This may be through practical work, use of quick quiz assessments, or oral outcomes to demonstrate understanding.

The expected impact of following the Computing Depth Map is that children will, by the end of KS2, be able to:

- Understanding how to use algorithms to solve problems.
- Be able to use a computer programme to write code to perform a task.
- Be able to use mathematical and logical concepts to solve problems.
- Understand different networks and how they communicate.
- Understand how to work safely and responsibly online, how to recognise and report security issues and concerns.
- Be able to explain the different hardware in computers and how they work together.

During the following Staging Points these will be identified as:

Foundation

The principal focus of computing teaching in Foundation is to foster curiosity about the world around them.

- Recognise that a range of technology is used in places such as homes and schools.
- Select and use technology for particular purposes.
- Operate software and technology when completing a range of simple programmes with an understanding of what they can achieve.

KS1

The principal focus of teaching computing in KS1 is to introduce foundational concepts and skills related to technology and digital literacy. The primary goal is to build a solid understanding of the basic elements of computing and to develop the early skills necessary for using digital tools.

- Be able to explain the sticky knowledge from a unit, using key vocabulary and giving examples.
- Describe what a search engine is and how to use them safely.
- Create and debug simple programs.
- Use logical reasoning to predict what would happen next in a simple program.
- Give examples of how information technology is used beyond school.
- Know how to keep personal information private.
- Identify where to go for help and support if they have concerns about content or contact online.

LKS2 - Years 3 & 4

The principal focus for the teaching of computing builds upon the foundational concepts introduced in Key Stage 1. The curriculum aims to deepen students' understanding and skills in various aspects of computing.

- Be able to explain the sticky knowledge from a unit, using key vocabulary and giving examples.
- Design, write and debug a program that fulfils a specific goal.
- Demonstrate how to use sequence, selection and repetition in programs.
- Explain how simple algorithms work.
- Detect and correct errors in algorithms and programs.
- Understand and explain how computer networks provide multiple services e.g. WWW and offer opportunities for communication and collaboration.
- Be able to use search technologies effectively and describe how results are selected and ranked.
- Understand how to evaluate digital content.
- Use and combine a variety of software to design and create a range of programs.
- Demonstrate the ability to collect, analyse, evaluate and present data and information.
- Use technology safely, respectfully and responsibly.
- Recognise acceptable and unacceptable behaviour online.
- Know how to report concerns about online content or contact.

UKS2 - Years 5 & 6

The principal focus for the teaching of computing in UKS2, aims to deepen students' understanding of Key Primary Themes and skills, preparing them for a more advanced study of technology.

- Be able to explain the sticky knowledge from a unit, using key vocabulary and giving examples.
- Solve complex problems including, debugging detailed algorithms, whilst putting them together logically in program that contains various forms of inputs and outputs.
- Understand and explain how computer networks provide multiple services e.g. WWW and offer opportunities for communication and collaboration.
- Demonstrate understanding of how to search efficiently on different search engines (applying filters)
- Explain how you know a web page has credible information and why some may not
- Collaborate and communicate online in different ways (e.g podcasts and blogs)
- Use and combine a variety of software to design and create a range of programs for a specific audience.
- Demonstrate the ability to collect, analyse, evaluate and present data and information.
- Use technology safely, respectfully and responsibly.
- Recognise acceptable and unacceptable behaviour online.
- Know how to report concerns about online content or contact.
- Show awareness of digital footprints and the need for privacy online.

KS3

In KS3, the principal focus of the computing curriculum is to further develop and extend a pupil's understanding of computing concepts.

- Understand technology can be used to overcome problems (including issues of equity).
- Know the law in relation to copyright.
- Use the language of programming to generate a programme for a specific purpose.
- Explicitly articulate a wide range of dangers that exist online and how to stay safe.
- Explain what computational thinking is and how to use this to solve a problem

The Foundations for Learning Computing in the Early Years

The foundations for learning computing begin in the early year's classroom. At BHPS, our curriculum aligns the EYFS area 'Understanding the World' with the Computing National Curriculum. In Foundation, children experience a combination of direct teaching and child led exploration to achieve an understanding of computing concepts. Children's interests and curiosities are equally valued and fostered and therefore we have included a continuous provision element to summarise the potential learning that may arise within the environment.

Our EYFS curriculum ensures sufficient coverage of Key Primary Themes including computing systems, creating media, programming, data and information and online safety. The sticky knowledge is explicitly taught and then embedded through pedagogical approaches appropriate for EYFS. Our Foundation unit is a vocabulary rich environment where adults enhance children's computing specific language through a purposeful play-based approach.

Early Years curriculum is based around the basic knowledge that the children need to operate a simple programme on a computer or tablet. This may be a drawing programme or a programme linked to maths, literacy or topics. Simple mouse skills and operation skills are learnt during foundation stage. Additionally, as research suggests that children in the early years are now more digitally aware than ever before, it is essential that children are taught about internet safety. Online Safety is taught through a series of strands taken from the ProjectEVOLVE toolkit, which is based on UKCIS framework 'Education for a Connected World' (EFACW). These units cover knowledge, behaviours and attitudes across eight key strands of online learning from EYFS to Y6 and beyond.

Learning is carefully sequenced, considering the small steps children need to achieve the ELG and considers the interplay between conceptual and procedural knowledge that children need in order to access the National Curriculum. KS1 staff draw upon the Understanding of the World ELG assessment to support future teaching. The ELG assesses only a small proportion of the learning children experience. As KS1 teachers begin Components of Learning, they teach and assess initial knowledge that children may have acquired previously.

Foundation	Autumn Term		Spring Term		Summer Term	
	1	**2**	**1**	**2**	**1**	**2**
Topic Title	I wonder… what makes us special and what I can do?	I wonder… where the story will take us?	I wonder…. what's out there?		I wonder….how living things grow?	
Links to Key Concepts in Computing	**Self-Image and identity**	**Online Relationships** **Online Bullying**	**Managing Online information** **Online Reputation**	**Privacy and Security** **Copyright and Ownership**	**Health, well-being and lifestyle**	
Sticky knowledge	Know to say 'no' / 'please stop' / 'I'll tell' / 'I'll ask' if somebody was to asks them to do something that makes them feel sad, embarrassed or upset	• Know what being 'unkind online' means. • Name different emotions someone may feel in their online experiences. • Know examples of ways in which the internet can be used to communication	• Know how to use the internet as a way of finding information online • Identify devices that could be used to access information on the internet • Know what 'online' means • Know that information can be put online for others to see	• Know examples of information that is personal • Name people who can be trusted and why • Know how and why digital work is owned by the person who created it.	• Know rules to keep safe and healthy in and beyond the home when using technology • Name at least one trusted adult to help stay safe when using technology/internet • Know what to do if they are worried or unsure about something online	
Link to KS1 Key Concepts	**Self-Image and identity**	**Online Relationships** **Online Bullying**	**Managing Online information** **Online Reputation**	**Privacy and Security** **Copyright and Ownership**	**Health, well-being and lifestyle**	
Explore and Learn in continuous provision	Continuous Provision – available throughout the day for both focussed and self-chosen learning – computer and tablets/cameras for recording learning. A range of technology will be explored continuously throughout the year for the children to access, both independently and with an adult. - Tablets - Computers – games / activities linked to the topic or maths being covered each week. - Remote control toys – cars. - Battery operated toys - Beebots - CD players - Interactive white boards – Phonics Play / Top marks / Google Earth / Digi map. - iPads - Purple Mash (mini mash) – drawing, sorting, information gathering. - Sound buttons – children can listen to a pr-recorded challenge or record their own answers. - exploring old typewriters / computers / mechanical toys.					

Computing Curriculum Depth Map – Progression of Knowledge by Key Themes

Computing Systems and Networks					
Year 1	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**Year 6**
Technology Around Us	**IT Around Us**	**Connecting Computers**	**The Internet**	**Systems & searching**	**Communication & collaboration**
Identify technology and give examples of these	Recognise the uses and features of information technology	Explain how digital devices function	Describe how networks physically connect to other networks	Explain that computers can be connected together to form systems	Identify how to use a search engine
Identify a computer and its main parts	Identify the uses of information technology in the school	Identify input and output devices	Recognise how networked devices make up the internet	Recognise the role of the computer systems in our lives	Describe how search engines select results
Use a mouse in different ways	Identify information technology beyond school	Recognise how digital devices can change the way we work	Outline how websites can be shared via the World Wide Web	Recognise how information is transferred over the internet	Explain how search results are ranked
Use a keyboard to type and edit text	Explain how information technology helps us	Explain how a computer network can be used to share information	Describe how content can be added and accessed on the World Wide Web	Explain how sharing information online lets people in different places work together	Recognise why the order of results is important, and to whom
Identify rules to keep us safe and healthy when using technology	Explain how to use information technology safely				
	Recognise that choices are made when using information technology	Explore how digital devices can be connected	Recognise how the content of the WWW is created by people	Contribute to a shared project online	Recognise how we communicate using technology

Data and Information					
Year 1	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**Year 6**
Grouping Data	**Pictograms**	**Branching Databases**	**Data Logging**	**Flat-File Databases**	**Spreadsheets**
Identify the label for a group of objects	Enter data onto a computer	Create questions with yes/no answers	Explain that data gathered over time can be used to answer questions	Use a form to record information	Identify questions which can be answered using data
Demonstrate that objects can be grouped and counted	Use a computer to view data in different forms, including pictograms	Identify the object attributes needed to collect relevant data	Use a digital device to collect data automatically	Compare paper and computer-based databases	Explain that objects can be described using data
Describe objects in different ways, recognising similarities and differences	Use a tally chart to create a pictogram and explain what the pictogram shows	Create a branching database	Explain that a data logger collects data points from sensors over time	Outline how grouping and then sorting data allows us to answer questions	Explain that formulas can be used to produce calculated data
Compare groups of objects, choosing how to group and record	Organise date into a tally chart	Explain why it is helpful for a database to be well structured	Use data collected over a long duration to find information	Explain that tools can be used to select specific data	Apply formulas to data, including duplicating
Decide how to answer questions about groups of objects	Select objects by attribute and make comparisons such as 'more than'/'less than' and 'most/least'	Identify objects using a branching database	Identify the data needed to answer questions	Explain that computer programs can be used to compare data visually	Create a spreadsheet to plan an event
Record and share information found	Use a computer program to present information in different ways	Compare information shown in a pictogram with a branching database	Use collected data to answer questions	Apply knowledge of a database to ask and answer real-world questions	Choose suitable ways to present data

Creating Media					
Year 1	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**Year 6**
Digital Painting	**Digital Photography**	**Animation**	**Audio Editing**	**Vector Graphics**	**Webpage Creation**
Describe what different freehand tools do	Use a digital device to take a photograph	Explain that animation is a sequence of drawings or photographs	Identify that sounds can be digitally recorded	Identify that drawing tools can be used to produce different outcomes	Review an existing website and consider its structure
Use the shape tool and the line tools	Take photos in both landscape and portrait, explaining why a photo looks better in this format	Plan an animation	Use a digital device to record sound	Use tools to achieve a desired effect	Plan the features of a webpage
Explain how and why tools are used		Relate animated movement with a sequence of images	Explain that a digital recording is stored as a file	Create a vector drawing by combining shapes	Consider the ownership and use of images (copyright)
Use a computer to paint a picture					
Make careful choices when painting a digital picture	Describe what makes a good photograph	Identify the need to work consistently and carefully	Explain that audio can be changed through editing	Recognise that vector drawings consist of layers	Recognise the need to preview pages
Compare painting a picture on a computer and on paper	Decide how photographs can be improved by exploring the effect of light on a photo.	Review and improve an animation	Show that different types of audio can be combined/ played together	Group objects to make them easier to work with	Outline the need for a navigation path
Demonstrate how to open a word processor	Use tools to change an image	Evaluate the impact of adding other media to an animation	Evaluate editing choices made	Apply what I have learned about vector drawings	Recognise the implications of linking content owned by other people
Digital Writing	**Making Music**	**Desktop Publishing**	**Photo Editing**	**Video Editing**	**3D Modelling**
Recognise keys on a keyboard	Identify photos which are real and those which have been changed.	Recognise how text and images convey information	Explain that the composition of digital images can be changed	Recognise video as moving pictures which can include audio	Recognise that you can work in three dimensions on a computer
Identify and find keys on a keyboard	Identify simple difference in pieces of music	Recognise that text and layout can be edited	Explain that colours can be changed in digital images	Identify digital devices that can record video	Identify that digital 3D objects can be modified
Demonstrate how to add and remove text on a computer:	Connect images with sounds.	Choose appropriate page settings	Explain how cloning can be used in photo editing	Capture video using a digital device	Recognise that objects can be combined in a 3D model
	Create music for a purpose				
Make careful choices when changing text	Identify patterns and rhythm in music	Add content to a desktop publishing publication	Explain that images can be combined	Recognise the features of an effective video	Create a 3D model for a given purpose
Explain why tools and changes have been used to improve writing	Use a computer to experiment with pitch	Consider how different layouts can suit different purposes	Combine images for a purpose	Identify that video can be improved through reshooting and editing	Plan a 3D model
Explain the differences between typing on a computer and writing, saying which is preferred.	Use the computer to create a musical pattern	Consider the benefits of desktop publishing	Evaluate how changes can improve an image	Consider the impact of choices made when making and sharing a video	Create a digital 3D model

Programming					
Year 1	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**Year 6**
Moving a robot	**Robot Algorithms**	**Sequencing Sounds**	**Repetition in Shapes**	**Selection in Physical Computing**	**Variable in Games**
Explain what a given command can do	Describe a series of instructions as a sequence	Explore a new programming environment	Identify that accuracy in programming is important	Control a simple circuit connected to a computer	Define a 'variable' as something that is changeable
Predict the outcome of a command on a device	Explain what happens when we change the order of instructions	Identify that commands have an outcome	Create a program in a text-based language	Write a program that includes count-controlled loops	Explain why a variable is used in a program
Follow instructions and give directions when acting out a given word	Use logical reasoning to predict the outcome of a program	Explain that a program has a start	Explain what "repeat" means	Explain that a loop can stop when a condition is met e.g. Number of times	Choose how to improve a game by using variables
Combine forward and backwards commands to make a sequence	Explain that programming projects can have code and artwork	Recognise that a sequence of commands can have an order	Modify a count-controlled loop to produce a given outcome	Conclude that a loop can be used to repeatedly check whether a condition has been met	Design a project that builds on a given example
Combine four direction commands to make a sequence	Design an algorithm	Change the appearance of a project	Decompose a task into small steps	Design a physical project that includes selection	Use my design to create a project
Choose the order of a set of commands in a sequence, when planning a simple program.	Create and debug a program that I have written	Create a project from a task description	Create a program that uses count-controlled loops to produce a given outcome	Create a controllable system that includes selection	Evaluate my project
Find more than one solution to a problem	Describe a series of instructions as a sequence				
Animations	**Quizzes**	**Events & actions in programs**	**Repetition in Games**	**Selection in quizzes**	**Sensing Movement**
Choose a command for a given purpose	Explain that a sequence of commands has a start	Explain how a sprite moves in an existing project	Develop the use of count-controlled loops in a different programming environment	Explain how selection is used in computer programs	Create a program to run on a controllable device
Show that a series of commands can be joined together	Explain that a sequence of commands has an outcome	Create a program to move a sprite in 4 directions	Explain that in programming there are infinite loops and count-controlled loops	Relate that a conditional statement connects a condition to an outcome	Explain that selection can control the flow of a program
Identify the effect of changing a value	Create a program using a given design	Adapt a program to a new context	Develop a design that includes two or more loops which run at the same time	Explain how selection directs the flow of a program	Update a variable with a user input
Explain that each sprite has its own instructions	Change a given design	Develop a program by adding features	Modify an infinite loop in a given program	Design a program which uses selection	Use a conditional statement to compare a variable to a value
Design the parts of a project	Create a program using own design	Identify and fix bugs in a program	Design a project that includes repetition	Create a program which uses selection	Design a project that uses inputs and outputs on a controllable device
Use an algorithm to create a program	Decide how a project can be improved	Design and create a maze-based challenge	Create a project that includes repetition	Evaluate my program	Develop a program to use inputs and outputs on a controllable device

Project Evolve – Online Safety					
Year 1	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**Year 6**
Self-Image and Identity					
Recognise that there may be people online who could make someone feel sad, embarrassed or upset.	Explain how other people may look and act differently online and offline.	Explain what is meant by the term 'identity'.	Explain how my online identity can be different to my offline identity.	Explain how identity online can be copied, modified or altered.	Identify and critically evaluate online content relating to gender, race, religion, disability, culture and other groups.
Give examples of when and how to speak to an adult I can trust	Give examples of issues online that might make someone feel sad, worried, uncomfortable or frightened	Explain how people can represent themselves in different ways online	Describe positive ways for someone to interact with others online and understand how this will positively impact on how others perceive them.	Demonstrate how to make responsible choices about having an online identity, depending on context.	Explain why it is important to challenge and reject inappropriate representations online.
Explain how a trusted adult can help, if something happens online that makes me feel sad, worried, uncomfortable or frightened	Give examples of how to get help for online issues.	Explain ways in which someone might change their identity depending on what they are doing online and why.	Explain that others online can pretend to be someone else, including my friends, and can suggest reasons why they might do this.		Describe issues online that could make anyone feel sad, worried, uncomfortable or frightened.
					Know and can give examples of how to get help, both on and offline.
					Explain the importance of asking until getting the help needed.
Online Relationships					
Give examples of when I should ask permission to do something online and explain why this is important.	Give examples of how someone might use technology to communicate with others they don't also know offline and explain why this might be risky.	Describe ways people who have similar likes and interests can get together online.	Describe strategies for safe and fun experiences in a range of online social environments	Give examples of technology-specific forms of communication	Explain how sharing something online may have an impact either positively or negatively
Use the internet with adult support to communicate with people I know	Explain who I should ask before sharing things about myself or others online. Describe different ways to ask for, give, or deny my permission online and can identify who can help me if I am not sure.	Know & explain what it means to 'know someone' online and why this might be different from knowing someone offline.	Give examples of how to be respectful to others online and describe how to recognise healthy and unhealthy online behaviours.	Explain that there are some people who communicate online who may want to do me or my friends harm.	Describe how to be kind and show respect for others online including the importance of respecting boundaries regarding what is shared about them online and support if others do not.
Explain why it is important to be considerate and kind to people online and to respect their choices.	Explain why I have a right to say 'no' or 'I will have to ask someone'. Identify who can help me if something happens online without my consent.	Explain what is meant by 'trusting someone online', why this is different from 'liking someone online'.	Explain how content shared online may feel unimportant to one person but may be important to other people's thoughts feelings and beliefs.	Recognise that this is not my / our fault.	Describe how things shared privately online can have unintended consequences for others
Explain why things one person finds funny or sad online may not always be seen in the same way by others.	Explain who can help me if I feel under pressure to agree to something I am unsure about or don't want to do.	Know and explain why it is important to be careful about who to trust online including what information and content they are trusted with.		Describe some of the ways people may be involved in online communities and describe how they might collaborate constructively with others and make positive contributions	Explain that taking or sharing inappropriate images of someone, even if they say it is okay, may have an impact for the sharer and others; and who can help if someone is worried about this.
	Explain how it may make others feel if I do not ask their permission or ignore their answers before sharing something about them online.	Know & explain why someone may change their mind about trusting anyone with something if they feel nervous, uncomfortable or worried.		Explain how someone can get help if they are having problems and identify when to tell a trusted adult.	
	Explain why I should always ask a trusted adult before clicking 'yes', 'agree' or 'accept' online.	Know & explain how someone's feelings can be hurt by what is said or written online.		Demonstrate how to support others (including those who are having difficulties) online.	

Online Reputation					
Recognise that information can stay online and could be copied.	Explain how information put online about someone can last for a long time.	Explain how to search for information about others online	Describe how to find out information about others by searching online.	Search for information about an individual online and summarise the information found.	Explain the ways in which anyone can develop a positive online reputation
Describe what information I should not put online without asking a trusted adult first.	Describe how anyone's online information could be seen by others.	Give examples of what anyone may or may not be willing to share about themselves online.	Explain ways that some of the information about anyone online could have been created, copied or shared by others.	Describe ways that information about anyone online can be used by others to make judgments about an individual and why these may be incorrect	Explain strategies anyone can use to protect their 'digital personality' and online reputation, including degrees of anonymity.
	Know who to talk to if something has been put online without consent or if it is incorrect.	Explain the need to be careful before sharing anything personal.			
		Explain who someone can ask if they are unsure about putting something online.			
Online Bullying					
Describe how to behave online in ways that do not upset others and can give examples.	Explain what bullying is, how people may bully others and how bullying can make someone feel.	Describe appropriate ways to behave towards other people online and why this is important.	Recognise when someone is upset, hurt or angry online.	Recognise online bullying can be different to bullying in the physical world and can describe some of those differences.	Describe how to capture bullying content as evidence to share with others who can help me.
	Explain why anyone who experiences bullying is not to blame	Give examples of how bullying behaviour could appear online and how someone can get support.	Describe ways people can be bullied through a range of media	Describe how what one person perceives as playful joking and teasing (including 'banter') might be experienced by others as bullying.	Explain how someone would report online bullying in different contexts.
	Talk about how anyone experiencing bullying can get help.		Explain why people need to think carefully about how content they post might affect others, their feelings and how it may affect how others feel about them (their reputation).	Explain how anyone can get help if they are being bullied online and identify when to tell a trusted adult Explain how to block abusive users	
				Identify a range of ways to report concerns and access support both in school and at home about online bullying	
				Describe the helpline services which can help people experiencing bullying, and how to access them	
Managing Online Information					
Give simple examples of how to find information using digital technologies, e.g. search engines, voice activated searching.	Use simple key words in search engines.	Demonstrate how to use key phrases in search engines to gather accurate information online.	Analyse information to make a judgement about probable accuracy	Explain the benefits and limitations of using different types of search technologies	Explain how search engines work and how results are selected and ranked.
Know / understand that we can encounter a range of things online including things we like and don't like as well as things which are real or make believe / a joke.	Demonstrate how to navigate a simple webpage to get to information I need.	Explain what autocomplete is and how to choose the best suggestion	Describe how to search for information within a wide group of technologies and make a judgement about the accuracy	Explain what is meant by 'being sceptical'; I can give examples of when and why it is important to be 'sceptical'.	Explain how to use search technologies effectively. Describe how some online information can be opinion and can offer examples.
Know how to get help from a trusted adult if we see content that makes us feel sad, uncomfortable, worried or frightened.	Explain what voice activated searching is and how it might be used, and know it is not a real person.	Explain how the internet can be used to sell and buy things	Describe some of the methods used to encourage people to buy things online (and can recognise some of these when they appear online Explain why lots of people sharing the same opinions or beliefs online do not make those opinions or beliefs true.	Evaluate digital content and can explain how to make choices about what is trustworthy Explain Key Primary Themes including: information, reviews, fact, opinion, belief, validity, reliability and evidence.	Explain how and why some people may present 'opinions' as 'facts'; why the popularity of an opinion or personalities of those promoting it does not necessarily make it true, fair or perhaps even legal.
	Explain the difference between things that are imaginary, 'made up' or 'make believe' and things that are 'true' or 'real'	Explain the difference between a 'belief', an 'opinion' and a 'fact. and can give examples of how and where they might be shared online,	Explain that technology can be designed to act like or impersonate living things and describe what the benefits and the risks might be.	Identify ways the internet can draw us to information for different agendas	Define the terms 'influence', 'manipulation' and 'persuasion' and explain how someone might encounter these online
	Explain why some information I find online may not be real or true.		Understand the importance of making my own decisions regarding content and that my decisions are respected by others.	Describe ways of identifying when online content has been commercially sponsored or boosted,	Understand the concept of persuasive design and how it can be used to influences peoples' choices.

Health, Well-being and Lifestyle					
Explain rules to keep myself safe when using technology both in and beyond the home.	Explain simple guidance for using technology in different environments and settings	Explain why spending too much time using technology can sometimes have a negative impact on anyone.	Explain how using technology can be a distraction from other things, in both a positive and negative way.	Describe ways technology can affect health and well-being both positively and negatively.	Describe common systems that regulate age-related content and describe their purpose.
	Say how those rules / guides can help anyone accessing online technologies	Explain why some online activities have age restrictions.	Identify times or situations when someone may need to limit the amount of time they use technology	Identify strategies, tips or advice to promote health and wellbeing with regards to technology.	Recognise and can discuss the pressures that technology can place on someone and how / when they could manage this.
		Understand how children can be pressured into watching or doing something online.		Recognise the benefits and risks of accessing information about health and well-being online and how we should balance this with talking to trusted adults and professionals.	Recognise features of persuasive design and how they are used to keep users engaged
		Know who to talk to if other people pressure me into doing something that makes me feel uncomfortable		Explain how and why some apps and games may request or take payment for additional content	Assess and action different strategies to limit the impact of technology on health
				Explain the importance of seeking permission from a trusted adult before purchasing.	
Privacy and Security					
Explain how passwords are used to protect information, accounts and devices.	Explain how passwords can be used to protect information, accounts and devices.	Describe simple strategies for creating and keeping passwords private	Describe strategies for keeping personal information private, depending on context.	Explain what a strong password is and demonstrate how to create one.	Describe effective ways people can manage passwords
Recognise more detailed examples of information that is personal to someone.	Explain and give examples of what is meant by 'private' and 'keeping things private'.	Give reasons why someone should only share information with people they choose to and can trust	Explain that internet use is never fully private and is monitored	Explain how many free apps or services may read and share private information with others.	Explain what to do if a password is shared, lost or stolen.
Explain why it is important to always ask a trusted adult before sharing any personal information online, belonging to myself or others.	Describe and explain some rules for keeping personal information private	Explain that if they are not sure or feel pressured then they should tell a trusted adult	Describe how some online services may seek consent to store information about me	Explain what app permissions are and can give some examples.	Describe how and why people should keep their software and apps up to date
					Know that online services have terms and conditions that govern their use.
	Explain how some people may have devices in their homes connected to the internet and give examples	Describe how connected devices can collect and share anyone's information with others.	Know how to respond appropriately and who to ask if I am not sure.		Describe simple ways to increase privacy on apps and services that provide privacy settings.
			Know what the digital age of consent is and the impact this has on online services asking for consent.		Describe ways in which some online content targets people to gain money or information illegally and strategies to help individuals identify such content.
Copyright and Ownership					
Explain why work I create using technology belongs to me and say why it belongs to me e.g. I designed it or I filmed it'	Recognise that content on the internet may belong to other people.	Explain why copying someone else's work from the internet without permission isn't fair and what problems this might cause.	When searching on the internet, explain why it is important to consider who owns the information and whether I have a right to use it.	Assess and justify when it is acceptable to use the work of others.	Demonstrate the use of search tools to find and access online content which can be reused by others.
Save my work under a suitable title or name so that others know it belongs to me.	Describe why other people's work belongs to them			Give examples of content that is permitted to be reused and know how this content can be found online.	Demonstrate how to make references to and acknowledge sources I have used from the internet.
Understand that work created by others does not belong to me even if I save a copy					

Knowledge Overview

Key Primary Themes & Units		EYFS	1	2	3	4	5	6
Computing Systems and Networks	Technology around us		√					
	IT Around us			√				
	Connecting Computers				√			
	The Internet					√		
	Systems & searching						√	
	Communication & Collaboration							√
Creating Media	Digital Painting		√					
	Digital Writing		√					
	Digital Photography			√		√		
	Digital Music			√				
	Stop-frame animation				√			
	Desktop Publishing				√			
	Audio Production/Video Production					√	√	
	Vector Graphics						√	
	Web Page Creation							√
	3D Modelling							√
Programming	Moving a robot		√					
	Animations		√					
	Robot Algorithms			√				
	Quizzes			√				
	Sequencing Sounds				√			
	Events & actions in programs				√			
	Repetition in Shapes & Games					√		
	Selection including quizzes						√	
	Variables in games							√
	Sensing Movement							√
Data & Information	Grouping Data		√					
	Pictograms			√				
	Branching Databases				√			
	Data Logging					√		
	Flat-file databases						√	
	Introduction to Spreadsheets							√
Online Safety (ProjectEvolve)	Self-Image and Identity	√	√	√	√	√	√	√
	Online Relationships	√	√	√	√	√	√	√
	Online Reputations	√	√	√	√	√	√	√
	Online Bullying	√	√	√	√	√	√	√
	Managing Online Information	√	√	√	√	√	√	√
	Health, Well-being and Lifestyle	√	√	√	√	√	√	√
	Privacy and Security	√	√	√	√	√	√	√
	Copyright and Ownership	√	√	√	√	√	√	√

Half Termly Components of Learning Overview per year group

		Autumn Term		Spring Term		Summer Term	
		1	2	1	2	1	2
Foundation		Copyright & Ownership	Health, Well-being & Lifestyle				
Year 1	Teach Computing	Computing Systems and Networks	Data & Information	Programming A	Programming B	Creating Media Digital Painting	Creating Media Digital Writing
	Project Evolve	Self-image & Identity	Online Reputation Copyright & Ownership	Online Relationships Health, Well-being & Lifestyle	Privacy & Security	Online Bullying	Managing Online Information
Year 2	Teach Computing	Computing Systems and Networks	Creating Media	Creating Media	Programming A	Data & Information	Programming B
	Project Evolve	Self-image & Identity	Online Relationships	Online Reputation Online Bullying	Managing Online Information	Health, Well-being & Lifestyle	Privacy & Security Copyright & Ownership
Year 3	Teach Computing	Creating Media	Computing Systems and Networks	Creating Media	Data & Information	Programming A	Programming B
	Project Evolve	Privacy & Security Copyright & Ownership	Health, Well-being & Lifestyle Online Bullying	Online Relationships Online Reputation	Managing Online Information	Online Relationships Online Reputation	Self-image & Identity
Year 4	Teach Computing	Computing Systems and Networks A	Programming A	Programming B	Creating Media	Creating Media	Data & Information
	Project Evolve	Self-image & Identity	Managing Online Information	Online Reputation Privacy & Security	Online Bullying	Copyright & Ownership	Online Relationships Health, Well-being & Lifestyle
Year 5	Teach Computing	Computing Systems and Networks	Creating Media	Creating Media	Data & Information	Programming A	Programming B
	Project Evolve	Copyright & Ownership Privacy & Security	Health, Well-being & Lifestyle	Online Reputation	Self-image & Identity	Online Relationships Online Bullying	Managing Online Information
Year 6	Teach Computing	Computing Systems and Networks	Programming A	Programming B	Creating Media	Creating Media	Data & Information
	Project Evolve	Copyright & Ownership Privacy & Security	Self-image & Identity	Health, Well-being & Lifestyle	Online Relationships Online Bullying	Managing Online Information	Online Reputation

Teach Computing – Key Primary Themes

	Unit	Key Themes	Detail
KS 1 - Year 1	Technology around us	**Computing Systems and Networks**	Systems, networks and how they are used, the internet, hardware and software)
	Digital Painting	**Creating Media**	Design and development, communicating and collaborating online, evaluating online content, respectful and responsible communication, presenting, creating content
	Digital Writing		
	Moving a robot	**Programming**	Interpreting, creating and evaluating algorithms, programming to accomplish specific goals, detecting and correcting errors
	Animations		
	Grouping Data	**Data and Information**	Collecting, analysing, evaluating, presenting data and information
KS 1 - Year 2	IT Around us	**Computing Systems and Networks**	Systems, networks and how they are used, the internet, hardware and software)
	Digital Photography	**Creating Media**	Design and development, communicating and collaborating online, evaluating online content, respectful and responsible communication, presenting, creating content
	Digital Music		
	Robot Algorithms	**Programming**	Interpreting, creating and evaluating algorithms, programming to accomplish specific goals, detecting and correcting errors
	Quizzes		
	Pictograms	**Data and Information**	Collecting, analysing, evaluating, presenting data and information
KS 2 - Year 3	Connecting Computers	**Computing Systems and Networks**	Systems, networks and how they are used, the internet, hardware and software)
	Stop-frame animation	**Creating Media**	Design and development, communicating and collaborating online, evaluating online content, respectful and responsible communication, presenting, creating content
	Desktop Publishing		
	Sequencing Sounds	**Programming**	Interpreting, creating and evaluating algorithms, programming to accomplish specific goals, detecting and correcting errors
	Events & actions in programs		
	Branching Databases	**Data and Information**	Collecting, analysing, evaluating, presenting data and information
KS 2 - Year 4	The Internet	**Computing Systems and Networks**	Systems, networks and how they are used, the internet, hardware and software)
	Digital Photography	**Creating Media**	Design and development, communicating and collaborating online, evaluating online content, respectful and responsible communication, presenting, creating content
	Audio/Video Production		
	Repetition in Shapes & Games	**Programming**	Interpreting, creating and evaluating algorithms, programming to accomplish specific goals, detecting and correcting errors
	Data Logging	**Data and Information**	Collecting, analysing, evaluating, presenting data and information
KS 2 - Year 5	Systems & searching	**Computing Systems and Networks**	Systems, networks and how they are used, the internet, hardware and software)
	Audio/Video Production	**Creating Media**	Design and development, communicating and collaborating online, evaluating online content, respectful and responsible communication, presenting, creating content
	Vector Graphics		
	Selection including quizzes	**Programming**	Interpreting, creating and evaluating algorithms, programming to accomplish specific goals, detecting and correcting errors
	Flat-file databases	**Data and Information**	Collecting, analysing, evaluating, presenting data and information
KS 2 - Year 6	Communication & Collaboration	**Computing Systems and Networks**	Systems, networks and how they are used, the internet, hardware and software)
	Web Page Creation	**Creating Media**	Design and development, communicating and collaborating online, evaluating online content, respectful and responsible communication, presenting, creating content
	3D Modelling		
	Variables in games	**Programming**	Interpreting, creating and evaluating algorithms, programming to accomplish specific goals, detecting and correcting errors
	Sensing Movement		
	Introduction to spreadsheets	**Data and Information**	Systems, networks and how they are used, the internet, hardware and software)

ProjectEvolve - Strands

KS1 & KS2	Self-Image and Identity	**Online Safety**	Self-image referrers to how a person sees themselves, including appearance, abilities and characteristics. Identity encompasses the characteristics, beliefs, values and interests that make a person unique
	Online Relationships		Recognising that not everyone online is a friend and caution is needed when interacting with strangers
	Online Reputations		Being a responsible digital citizen. Teach them to use the internet positively, to treat others with kindness, and to report any online behaviour that goes against these principles.
	Online Bullying		Online bullying, also known as cyberbullying, is when someone uses digital devices and platforms to deliberately hurt, threaten, or embarrass another person.
	Managing Online Information		Personal information such as full name, address, school, or phone number should not be shared with strangers online, just as they wouldn't share these details with strangers in person.
	Health, Well-being and Lifestyle		The importance of a balanced lifestyle, encouraging a healthy balance between screen time, physical activities and face-to-face interactions with friends and family.
	Privacy and Security		Keep Your Information Safe - Be a Privacy Guardian. Being a privacy guardian means taking steps to protect your personal information and ensuring a safe online environment.
	Copyright and Ownership		Respecting Creative Work - Be a Digital Creator and Respect Others' Rights. Being a digital creator means understanding the value of creative work and respecting the rights of others by not using or sharing content without permission.

Appendix – Key Knowledge and Vocabulary

Tier 1	Tier 2	Tier 3
Basic vocabulary *To be used but require little or no explicit instruction.*	***Academic vocabulary*** *To be taught and assessed. Words that could be used across disciplines.*	**Context Specific** *Specific vocab that will normally relate to one subject – to be taught and assessed*

Computing – KS1	**Year 1**		
Key Knowledge	**Key Vocabulary**		
Topic: Technology around us	**Tier 1**	**Tier 2**	**Tier 3**
Key Primary Theme: Computing Systems and Networks Systems, networks and how they are used, the internet, hardware and software)	computer keyboard mouse	double-click screen technology typing	trackpad
Initial knowledge ❑ Technology, which can be found at home and at school (interactive whiteboards, TV's, speakers, games consoles, mobile phones, Alexa) is something that is made with a specific purpose to help people. ❑ Tapping on a keyboard allows you to write letters and words.			
❑ Work can be saved in specifically named 'folders' so it is not lost. ❑ Keyboard arrows can be used to move the text cursor into a textbox ❑ A mouse is used to control the small cursor on the screen. ❑ Computers can be turned on and then logged into ❑ Rules are needed so we can use computer technology safely			

Topic: Digital Painting/Digital Writing	**Tier 1**	**Tier 2**	**Tier 3**
Key Primary Theme: Creating Media Design and development, communicating and collaborating online, evaluating online content, respectful and responsible communication, presenting, creating content	colour erase fill keyboard keys pictures tool underline	bold cursor font format italic redo/undo select	backspace toolbar word processor
Initial knowledge ❑ Digital paintings are those created on a computer. ❑ The text cursor shows where text will appear when we type.			
Sticky knowledge: taught & assessed for end goal. ❑ 'Tools' can be used to edit and improve an image. ❑ Word processing software allows you to write on a computer. ❑ Text can be edited using the bold, italic, and underline toolbar buttons; text style (font) can be amended within a piece of text ❑ Text can be selected by using the 'click and drag' method			

Topic: Moving a robot/Animations	**Tier 1**	**Tier 2**	**Tier 3**
Key Primary Theme: Programming Interpreting, creating and evaluating algorithms, programming to accomplish specific goals, detecting and correcting errors	design forwards, backwards go left right run start turn	background block code commands delete direction program reset route value	sprite
Initial knowledge ❑ 'Bee-Bot' can be controlled by entering a series of instructions into its control panel.			
Sticky knowledge: taught & assessed for end goal. ❑ The way Bee-Bot moves can be changed by debugging it. ❑ Algorithms are a set of clear, precise, and ordered instructions, and that a computer program is the implementation of an algorithm on a digital device. ❑ Reading 'code' is used to predict what a program will do.			

Topic: Grouping Data	**Tier 1**	**Tier 2**	**Tier 3**
Key Primary Theme: Data and Information Interpreting, creating and evaluating algorithms, programming to accomplish specific goals, detecting and correcting errors	drag drop fewest group least/less more/most the same value	data set label object property search	
Initial knowledge ❑ Computers only do what humans tell them to do. ❑ The term 'object' is used to describe anything that can be labelled with properties.			
Sticky knowledge: taught & assessed for end goal. ❑ Labelling, grouping, and searching are important aspects of data and information. Searching is a common operation in many applications, and requires an understanding that to search data, it must have labels. ❑ A label is a property used to describe an object - this is the data that is collected about the object. ❑ A collection of data is called a 'data set'.			

Topic: Project Evolve	Tier 1	Tier 2	Tier 3
Strand: Online Safety (see detailed overview in ProjectEvolve – Strands section) Introducing to basic concepts to help them understand how to use the internet and digital devices safely. ***Initial knowledge*** ❑ There may be people online who could make someone feel sad, embarrassed or upset. ❑ Always ask permission before going online. ***Sticky knowledge: taught & assessed for end goal.*** ❑ If something happens that makes me feel sad, worried, uncomfortable or frightened it is important to speak to a trusted adult. ❑ Be kind online and respect people's choices; we need to behave online in ways that do not upset others. ❑ Information can stay online and could be copied. ❑ Passwords are used to protect information and should not be shared with others.		deleted information internet online passwords permission responsible trusted adult upload	

Tier 1	Tier 2	Tier 3
Basic vocabulary *To be used but require little or no explicit instruction.*	***Academic vocabulary*** *To be taught and assessed. Words that could be used across disciplines.*	**Context Specific** *Specific vocab that will normally relate to one subject – to be taught and assessed*

Computing – KS1	**Year 2**		
Key Knowledge	**Key Vocabulary**		
Topic: IT around us	**Tier 1**	**Tier 2**	**Tier 3**
Key Primary Theme: Computing Systems and Networks Systems, networks and how they are used, the internet, hardware and software)	computer	Barcode devices scanner	Information Technology (IT)
Initial knowledge ❑ IT can be described as information technology			
Sticky knowledge: taught & assessed for end goal. ❑ IT can be seen as computers, devices with computers inside, or things made to work with computers. ❑ IT can be found all around us e.g barcodes, scanners, tills, chip & pin machines, crossing machines.			

Topic: Digital Photography/Digital Music	**Tier 1**	**Tier 2**	**Tier 3**
Key Primary Theme: Creating Media Design and development, communicating and collaborating online, evaluating online content, respectful and responsible communication, presenting, creating content	background beat image	capture digital editing filter focus format framing pattern	
Initial knowledge ❑ Many devices can be used to take photographs. ❑ Photographs can be taken in portrait or landscape format.			
Sticky knowledge: taught & assessed for end goal. ❑ Photographs can be improved with good lighting and focus. ❑ Photographs can be changed by editing. ❑ Images can be downloaded and saved ❑ Pixlr is an online photo editing tool ❑ A computer can be used to create and refine musical patterns			

Topic: Robot Algorithms/Quizzes	**Tier 1**	**Tier 2**	**Tier 3**
Key Primary Theme: Programming Interpreting, creating and evaluating algorithms, programming to accomplish specific goals, detecting and correcting errors	command order outcome run sequence start	actions code debugging decomposition evaluate modify sequence	algorithm sprite
Initial knowledge ❑ A computer program carries out instructions.			
Sticky knowledge: taught & assessed for end goal. ❑ Algorithms are a set of clear, precise and ordered instructions. ❑ 'Code' can be read ❑ Code can be used to predict what a program will do. ❑ More complicated tasks can be broken down into chunks and an algorithm written for each chunk. This is called 'decomposition'			

Topic: Pictograms	**Tier 1**	**Tier 2**	**Tier 3**
Key Primary Theme: Data and Information Interpreting, creating and evaluating algorithms, programming to accomplish specific goals, detecting and correcting errors	data object total	compare pictogram record tally chart	
Initial knowledge ❑ Computers can be used to create tally charts and pictograms quickly and easily. ❑ Data can be organised effectively for counting and comparing.			
Sticky knowledge: taught & assessed for end goal. ❑ Objects can be grouped by attribute. ❑ Data can be changed quickly and easily. ❑ Data can be presented in different ways to suit different purposes.			

Topic: Project Evolve	Tier 1	Tier 2	Tier 3
Key Primary Theme: Online Safety (see detailed overview in ProjectEvolve – Strands section) Introducing to basic concepts to help them understand how to use the internet and digital devices safely.	keyword password safety security	bystanders online bullying pop-ups restrictions search engine	browser
Initial knowledge ❑ Other people may look and act differently online. ❑ Bullying can be done online and can upset others. ❑ Too much use of technology can affect a person's wellbeing.			
Sticky knowledge: taught & assessed for end goal. ❑ Personal details should not be shared online e.g. age, address, phone number. ❑ Online information can be seen by anyone and can last a long time. ❑ Anyone can put information online and some of it may not be true. ❑ Some people may have devices in the home that are connected to the internet. ❑ Passwords should be secure and kept private. ❑ Content on the internet could belong to other people.			

Tier 1	Tier 2	Tier 3
Basic vocabulary *To be used but require little or no explicit instruction.*	***Academic vocabulary*** *To be taught and assessed. Words that could be used across disciplines.*	**Context Specific** *Specific vocab that will normally relate to one subject – to be taught and assessed*

Computing – KS2	**Year 3**		
Key Knowledge	**Key Vocabulary**		
Topic: Connecting Computers	**Tier 1**	**Tier 2**	**Tier 3**
Key Primary Theme: Computing Systems and Networks Systems, networks and how they are used, the internet, hardware and software)	Cables device digital input/output non-digital sockets switch	connection network process program server	wireless access point
Initial knowledge ❑ The difference between a digital device and a non-digital device is a digital device is capable of some processing i.e. it has functions beyond being on or off. ❑ Some devices can have just one input which leads to several outputs, whilst others have many inputs which lead to a single output ❑ Information (data) flows around a computer network			
Sticky knowledge: taught & assessed for end goal. ❑ IPO stands for input, process, output. It underpins all digital devices ❑ A network switch manages the way in which data moves around a network ❑ A server is a location to store files ❑ Wireless access points send and receive wireless signals from wireless devices such as tablets and laptops			

Topic: Stop-frame animation/Desktop Publishing	**Tier 1**	**Tier 2**	**Tier 3**
Key Primary Theme: Creating Media Design and development, communicating and collaborating online, evaluating online content, respectful and responsible communication, presenting, creating content	events font sequence text	animation communicate import layout media placeholder template transition	stop-frame
Initial knowledge ❑ Text and images need to be used carefully to communicate clearly ❑ Software can be used to create on-screen animations. ❑ Animations are a series of still images stitched together to create a motion video			
Sticky knowledge: taught & assessed for end goal. ❑ Animations can be created using on-screen or off-screen (flipbooks) images. ❑ Content that is added can be changed and rearranged on the page ❑ 'Onion skinning' is showing part of a transparent photo to demonstrate the previous frame to make small movements more consistent			

Topic: Sequencing Sounds/Events and actions in Programs	**Tier 1**	**Tier 2**	**Tier 3**
Key Primary Theme: Programming Interpreting, creating and evaluating algorithms, programming to accomplish specific goals, detecting and correcting errors	action code debug design events test	block-based programming programs sequencing	algorithms sprite
Initial knowledge ❑ The order of sequencing when programming is important.			
Sticky knowledge: taught & assessed for end goal. ❑ When programming there are 4 levels which can help describe a project – these are known as levels of abstraction: ➢ Task – what is needed ➢ Design – what it should do ➢ Code – how it is done ➢ Running the code – what it does ❑ In programming events cause actions ❑ The order of actions can have an impact on the outcome of a program			

Topic: Branching Database	Tier 1	Tier 2	Tier 3
Key Theme: Data and Information Interpreting, creating and evaluating algorithms, programming to accomplish specific goals, detecting and correcting errors	equal even objects order selecting separate table value	attribute branching database decision tree information	
Initial knowledge ❑ In computer science branching databases are known as binary trees			
Sticky knowledge: taught & assessed for end goal. ❑ A branching database is a collection of data organised in a tree structure using yes/no or true/false questions ❑ A pictogram is a pictorial representation of information, usually used to present numerical data, such as common methods of transport amongst a group of people ❑ An attribute includes its name and a value e.g. a ball will have a colour which might be red; colour is the attribute name, red is the attribute value			

Topic: Project Evolve	Tier 1	Tier 2	Tier 3
Strand: Online Safety (see detailed overview in ProjectEvolve – Strands section) Introducing to basic concepts to help them understand how to use the internet and digital devices safely.	bullying offline online	identity search engines social media	
Initial knowledge ❑ Know what is meant by the term 'identity'. ❑ People can represent themselves in different ways online and the ways in which someone might change their identity depending on what they are doing online and why.			
Sticky knowledge: taught & assessed for end goal. ❑ There is a difference between a 'belief', an 'opinion' and a 'fact. ❑ Some online activities have age restrictions, why it is important to follow them and know who to talk to if others pressure me to watch or do something online that makes me feel uncomfortable ❑ Copying someone else's work from the internet without permission isn't fair and can explain what problems this might cause.			

Tier 1	Tier 2	Tier 3
Basic vocabulary *To be used but require little or no explicit instruction.*	***Academic vocabulary*** *To be taught and assessed. Words that could be used across disciplines.*	**Context Specific** *Specific vocab that will normally relate to one subject – to be taught and assessed*

Computing – KS2	**Year 4**		
Key Knowledge	**Key Vocabulary**		
Topic: The Internet	**Tier 1**	**Tier 2**	**Tier 3**
Key Theme: Computing Systems and Networks Systems, networks and how they are used, the internet, hardware and software)	adverts content files internet	download network ownership permission security	router web address web browser web page website wireless access point (WAP) World Wide Web
Initial knowledge ❑ Computers can form networks ❑ The World Wide Web is part of the internet ❑ Data is routed around the internet			
Sticky knowledge: taught & assessed for end goal. ❑ Websites are 'stored' and contain different elements such as text content, images, video etc ❑ There is a high volume of inaccurate, misleading or false content on the internet ❑ Search results are influenced by adverts and sponsored content ❑ Information can spread very quickly around the World Wide Web			

Topic: Digital Photography/Audio & Video Production	**Tier 1**	**Tier 2**	**Tier 3**
Key Theme: Creating Media Design and development, communicating and collaborating online, evaluating online content, respectful and responsible communication, presenting, creating content	crop edit playback record	align clone composite export foreground import layer saturation sepia vignette	podcast mp3
Initial knowledge ❑ Audacity is a program that is able to record sound ❑ Digital devices often have inputs and outputs			
Sticky knowledge: taught & assessed for end goal. ❑ Audio recordings can have ownership and copyright issues ❑ Audio can be edited, including altering the volume ad fading sections of audio in and out ❑ Podcasts can be exported as an audio file ❑ Images can be searched for and saved from copyright-free websites, these can be 'fake' or 'real'			

Topic: Repetition in Shapes & Games	**Tier 1**	**Tier 2**	**Tier 3**
Key Theme: Programming Interpreting, creating and evaluating algorithms, programming to accomplish specific goals, detecting and correcting errors	forever repetition	animate decompose duplicate modify snippet trace	count-controlled loop infinite loop
Initial knowledge ❑ Algorithms are a precise set of ordered instructions, which can be turned into code ❑ Debugging code is finding and fixing problems within it ❑ Repetition is where actions or commands in programming are repeated ❑ Repeated commands can be placed into loops.			
Sticky knowledge: taught & assessed for end goal. ❑ Loops can be repeated indefinitely or set a number of times – the latter are called 'count-controlled loops' ❑ Code tracing is when someone reads through code line by line stating what will happen when the code runs ❑ Procedures are code snippets that are named and can be reused in their programming ❑ When programming there are 4 levels which can help describe a project – these are known as levels of abstraction: Task/Design/Code/Running			

Topic: Data Logging	Tier 1	Tier 2	Tier 3
Key Theme: Data and Information Interpreting, creating and evaluating algorithms, programming to accomplish specific goals, detecting and correcting errors	collection data table layout import/export	analyse conclusion. data point, interval dataset logger review sensor	
Initial knowledge ❑ A data logger is a digital device that can collect data over time and store it ❑ Data loggers will usually have built-in sensors for light, temperature, and sound as well as the option to connect external sensors			
Sticky knowledge: taught & assessed for end goal. ❑ Input devices such as keyboards, mice and microphones allow data to be entered into a computer ❑ A sensor is a type of input designed to allow computers to capture data from the physical environment: temperature, light, sound, humidity, pressure etc ❑ Data loggers capture data at given time intervals, which is a regular time period between each data capture and can vary according to the experiment			

Topic: Project Evolve	Tier 1	Tier 2	Tier 3
Strand: Online Safety (see detailed overview in ProjectEvolve – Strands section) Introducing to basic concepts to help them understand how to use the internet and digital devices safely.	interact social media technology	consent gaming platforms impersonate in-app purchases livestreaming reputation	
Initial knowledge ❑ Know what is meant by fake news ❑ Using technology can be a distraction, in both a positive and negative way			
Sticky knowledge: taught & assessed for end goal. ❑ Know what the digital age of consent is and the impact this has on online services asking for consent ❑ Internet use is never fully private and is monitored ❑ Technology can be designed to act like or impersonate living things and describe what the benefits and the risks might be ❑ Information about anyone online could have been created, copied or shared by others.			

Tier 1	Tier 2	Tier 3
Basic vocabulary *To be used but require little or no explicit instruction.*	***Academic vocabulary*** *To be taught and assessed. Words that could be used across disciplines.*	**Context Specific** *Specific vocab that will normally relate to one subject – to be taught and assessed*

Computing – KS2	**Year 5**		
Key Knowledge	**Key Vocabulary**		
Topic: Systems & Searching	**Tier 1**	**Tier 2**	**Tier 3**
Key Primary Theme: Computing Systems and Networks Systems, networks and how they are used, the internet, hardware and software)	ordering storage connection links	content creator selection ranking index refine system search	algorithm search engine optimisation (SEO) web crawler
Initial knowledge ❑ Computers can be connected together to form systems ❑ Systems are built using a number of parts ❑ Computer systems are designed to help us			
Sticky knowledge: taught & assessed for end goal. ❑ Parts of a computer system are not always in the same country. Information can be transferred using the internet ❑ Every computer has a unique address called an IP address ❑ Rules that computers have for communicating with one another are called protocols			

Topic: Audio & Video Production/Vector Graphics	**Tier 1**	**Tier 2**	**Tier 3**
Key Primary Theme: Creating Media Design and development, communicating and collaborating online, evaluating online content, respectful and responsible communication, presenting, creating content	group/ungroup pan reflection resize reuse rotate static tilt zoom	lens long shot mid-range panning reorder reshoot side-by-side split vector	
Initial knowledge ❑ Video is defined as moving pictures which can include audio			
Sticky knowledge: taught & assessed for end goal. ❑ AV devices are those which fully integrate audio and visual ❑ Vector images are made up of shapes ❑ Google Drawings is software that can be used for vector drawing ❑ Digital images can be made using either shapes or pixels			

Topic: Selection including quizzes	**Tier 1**	**Tier 2**	**Tier 3**
Key Primary Theme: Programming Interpreting, creating and evaluating algorithms, programming to accomplish specific goals, detecting and correcting errors	loop repetition	cell circuit components conditional statement connection led output component	microcontroller
Initial knowledge ❑ Crumble is programming software that uses the same drag-and-drop style as Scratch. ❑ Repetition is used in programming to give the same instruction or set of instructions several times.			
Sticky knowledge: taught & assessed for end goal. ❑ Crumble allows you to write programs that turn LEDs (Sparkles) on and off, change LED colours, spin motors, use push switches as inputs, and combine a number of these peripherals. ❑ Repetition uses loops as the means to give these instructions. ❑ An infinite loop: a loop that commands the instruction/set of instructions to repeat forever. ❑ A count-controlled loop: a form of repetition in which a set of commands are carried out a specific number of times. ❑ A condition-controlled loop is a form of repetition in which a set of commands stop being carried out when a condition is met. ❑ Conditions are statements that need to be met for a set of actions to be carried out. They can be used in algorithms and programs to control the flow of actions. ❑ Selection is a decision within a computer program when the program decides to move on based on the results of an event			

Topic: Flat-file Databases	Tier 1	Tier 2	Tier 3
Key Primary Theme: Data and Information Interpreting, creating and evaluating algorithms, programming to accomplish specific goals, detecting and correcting errors	graph chart sort order group	database data information field value criteria axis compare filter	
Initial knowledge ❑ Databases allow people to search and sort large quantities of data to find information ❑ A database is composed of 'records' which are sets of data on a particular object ❑ Records are formed from one or more 'fields' of data.			
Sticky knowledge: taught & assessed for end goal. ❑ A flat-file database is a collection of data organised in a single table ❑ The term database means a collection of organised data that is stored on a computer ❑ Data records can be 'grouped' or 'sorted' based on different fields ❑ A field is one specific piece of data in a database record ❑ The value within the record is the 'answer' to each field ❑ All objects have attributes. An attribute includes its name and a value			

Topic: Project Evolve	Tier 1	Tier 2	Tier 3
Strand: Online Safety (see detailed overview in ProjectEvolve – Strands section) Introducing to basic concepts to help them understand how to use the internet and digital devices safely.	emojis gifs memes	modified stereotypes targeted adverts voice activation	
Initial knowledge ❑ Know what is meant by the term 'stereotype', how 'stereotypes' are amplified and reinforced online, and why accepting 'stereotypes' may influence how people think about others. ❑ Help is available if some is being bullied online			
Sticky knowledge: taught & assessed for end goal. ❑ Know what a strong password is and demonstrate how to create one. ❑ Understand that many free apps or services may read and share private information with others. ❑ Some apps and games may request or take payment for additional content and explain the importance of seeking permission from a trusted adult before purchasing ❑ A hoax is a false warning about something. A virus hoax is a warning about a computer virus - typically, the warning arrives in an email note or is distributed through a note in a company's internal network. ❑ Abusive users can be blocked			

Tier 1	Tier 2	Tier 3
Basic vocabulary *To be used but require little or no explicit instruction.*	***Academic vocabulary*** *To be taught and assessed. Words that could be used across disciplines.*	**Context Specific** *Specific vocab that will normally relate to one subject – to be taught and assessed*

Computing – KS2	**Year 6**		
Key Knowledge	**Key Vocabulary**		
Topic: Communication & Collaboration	**Tier 1**	**Tier 2**	**Tier 3**
Key Primary Theme: Computing Systems and Networks Systems, networks and how they are used, the internet, hardware and software)		protocol	Internet Protocol (IP) data payload packet header Domain Name Server (DNS) Slide deck
Initial knowledge ❑ Search engines are necessary to help us find things on the World Wide Web ❑ Search engines return different amounts of results			
Sticky knowledge: taught & assessed for end goal. ❑ The 2 most common methods of searching are by using a search engine and the address bar ❑ Search engines select and rank results on specific criteria ❑ Search engines can have limitations and somethings cannot be searched for			

Topic: Web Page Creation / 3D Modelling	**Tier 1**	**Tier 2**	**Tier 3**
Key Primary Theme: Creating Media Design and development, communicating and collaborating online, evaluating online content, respectful and responsible communication, presenting, creating content	hollow preview	copyright embed external link home page implication perspective	hyperlink Hypertext Markup Language (HTML) subpage
Initial knowledge ❑ Websites are created for a chosen purpose ❑ Websites can contain different types of media			
Sticky knowledge: taught & assessed for end goal. ❑ Websites are written in HTML code ❑ Copyright-free images can be searched for and should only be used on websites ❑ Hyperlinks send you to someone else's work instantly after clicking a word, symbol or image ❑ Tinkercad is a website which allows you to create, select and move 3D objects ❑ Objects in Tinkercad can be viewed from different angles, resized, relifted and altered, rotated and positioned			

Topic: Variables in Games/Sensing Movement	**Tier 1**	**Tier 2**	**Tier 3**
Key Primary Theme: Programming Interpreting, creating and evaluating algorithms, programming to accomplish specific goals, detecting and correcting errors		condition If then else navigation selection sensing variable	accelerometer
Initial knowledge ❑ Variables can be used, set and changed through the running of a program			
Sticky knowledge: taught & assessed for end goal. ❑ Variables can hold a single value at a time ❑ When programming there are 4 levels which can help describe a project – these are known as levels of abstraction. ➢ Task – what is needed ➢ Design – what it should do ➢ Code – how it is done ➢ Running the code – what it does ❑ The micro:bit is an input, process, output device that can be programmed			

Topic: Introduction to Spreadsheets	Tier 1	Tier 2	Tier 3
Key Primary Theme: Data and Information Interpreting, creating and evaluating algorithms, programming to accomplish specific goals, detecting and correcting errors	results sum	cell cell reference data set format formula range sigma spreadsheet	
Initial knowledge ❑ Data can be words, numbers, dates, images, sounds, etc. without context is important. ❑ A data set is a collection of related data that can be modified using a computer			
Sticky knowledge: taught & assessed for end goal. ❑ Organising data is an important aspect of data and information. ❑ Data supports the use of calculations and provides the opportunity to use sorting and filtering, which enables ease of use and reduces human error. ❑ Formatting by applying number formats to alter cells changes how a spreadsheet interacts with the data and is different to applying style formatting, which only changes the appearance of data.			

Topic: Project Evolve	Tier 1	Tier 2	Tier 3
Strand: Online Safety (see detailed overview in ProjectEvolve – Strands section) Introducing to basic concepts to help them understand how to use the internet and digital devices safely.		age-related auto-updates inappropriate online content online reputation screen-grabs	
Initial knowledge ❑ Online services have terms and conditions that govern their use. ❑ It its important to report online bullying to a trusted adult ❑ It is important to develop a positive online reputation			
Sticky knowledge: taught & assessed for end goal. ❑ Know what to do if a password is shared, lost or stolen. ❑ Some people may present 'opinions' as 'facts'; why the popularity of an opinion or the personalities of those promoting it does not necessarily make it true, fair or perhaps even legal. ❑ Companies and news providers target people with online news stories they are more likely to engage with and how to recognise this. ❑ Protect your 'digital personality' and online reputation, including degrees of anonymity. ❑ Taking or sharing inappropriate images of someone, even if they say it is okay, may have an impact for the sharer and others; and who can help if someone is worried about this.			