Frittenden

CofE

Primary School

Scheme of work:
Computing

Embedding our Intent

At Frittenden CofE Primary School, we strive to deliver a high-quality Computing curriculum which allow our pupils to recognise the significance of digital technology in their everyday lives. We explicitly teach pupils the skills and knowledge they need to become creative, digitally literate, computational thinkers.

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.

By teaching Computing, we intend to impart pupils with the knowledge, understanding, confidence, attitudes, values and skills they need in order to reach their potential as individuals in an increasingly technological society and in the digital community.

We teach the curriculum using the Teach Computing scheme which was developed by the National Centre of Computing Education. Our highly skilled subject leader has carefully worked to create a Progressive Skills Document where objectives for each year group are progressively mapped out to ensure our pupils are given the acquired skills and knowledge the further their education journey into KS3 and life beyond the classroom

Our **Christian values** underpin all aspects of our teaching and learning. The high aspirations and expectationsthe teaching team have for the children ensure that no child is given a learning limit or ceiling and that everychild is given the opportunity to flourish. The school values are integrated into every geography lesson as follows:

Respect: for the equipment that they are using; for the history of computer science and how it has evolved to give us a connected world; and for rules and procedures that keep us safe online.
Joy: Children are encouraged to find joy in the everyday; experience joy for their success and the success of others; and to share their joy. This is done through offering supportive advice and giving praise to peers for brilliant effortand achievements.
Compassion: for people such as Alan Turing, a brilliant mind who was treated unfairly.

Implementation:
Our curriculum has been carefully mapped out into a Long-Term Plan. This enables links between subjects to be identified and carefully planned for, in order to support pupils' retention of knowledge, acquisition of skills and the development of the confidence to engage with technology

Impact:
The successful approach to the teaching of Computing across the school results in

an engaging, high-quality education than enables pupils to understand the world around them and encourages them to explore digital technology further as they leave primary school.

A wide range of strategies are used to measure the impact of our Computing curriculum. End products will be used as a basis for assessment in the skills-based strands.

The impact of our curriculum is monitored at the end of each unit. Teachers use assessment to ensure our pupils have gained the intended knowledge and skills, can use these effectively and know more, remember more and are able to do more.

Computing Overview

Dahl Year A	**Technology around us.** Recognising technology in school and using it responsibly	**Digital painting** Choosing appropriate tools in a program to create art, and making comparisons with working with non-digitally.	**Moving a robot** Writing short algorithms and programs for floor robots, and predicting program outcomes.	**Grouping data** Exploring objects labels, then using them to sort and group objects by properties	**Digital writing** Using a computer to create and format text, before comparing to writing non-digitally	**Programming animations** Designing and programming the movement of a character on screen to tell stories
Dahl Year B	**Information technology around us** Identifying IT and how its responsible use improves our world in school and beyond	**Digital photography** Capturing and changing digital photographs for different purposes.	**Robot algorithms** Creating and debugging programs, and using logical reasoning to make predictions.	**Pictograms** Collecting data in tally charts and using attributes to organise and present data on a computer.	**Making Music** Using a computer as a tool to explore rhythms and melodies, before creating a musical composition.	**Programming quizzes** Designing algorithms and programs that use events to trigger sequences of code to make an interactive quiz.
Wells Year A	**Connecting computers** Identifying that digital devices have inputs, processes, and outputs, and how devices can be connected to make networked 3.1	**Branching databases** Building and using branching databases to group objects using yes/no questions. 3.4	**Stop frame animation** Capturing and editing digital still images to produce a stop-frame animation that tells a story 3.2	**Desktop publishing** Creating documents by modifying text, images and page layouts 3.5	**Sequencing sounds** Creating sequences in a block-based programming language to make music. 3.3	**Events and actions in programs** Writing algorithms and programs that use a range of events to trigger sequences of actions 3.6
Wells Year B	**The internet** Recognising the internet as a network of networks including the WWW, and why we should evaluate online content.	**Audio Production** Capturing and editing audio to produce a podcast, ensuring that copyright is considered	**Photo Editing** Manipulating digital images, and reflecting on the impact of changes and whether the required purpose is fulfilled	**Repetition in shapes** Using a text-based programming language to explore count-controlled loops when drawing shapes	**Data logging** Recognising how and why data is collected over time, before using data loggers to carry out an investigation.	**Repetition in games** Using a block-based programming language to explore count-controlled and infinite loops when creating a game.
Shakes Year A	**Systems and searching** Recognising IT systems around us and how they allow us to search the internet.	**Video production** Planning, capturing, and editing video to produce a short film.	**Selection in physical computing** Exploring conditions and selection using a programmable microcontroller.	**Flat-file databases** Using a database to order data and create charts to answer questions.	**Vector drawing** Creating images in a drawing program by using layers and groups of objects.	**Selection in quizzes** Exploring selection in programming to design and code an interactive quiz.
Shakes Year B	**Communication and collaboration** Identifying and exploring how data is transferred and information is shared online.	**Webpage creation** Designing and creating webpages, giving consideration to copyright, aesthetics, and navigation.	**Variables in games** Exploring variables when designing and coding a game.	**Introduction to spreadsheets** Answering questions by using spreadsheets to organise and calculate data.	**3D modelling** Planning, developing, and evaluating 3D computer models of physical objects.	**Sensing** Designing and coding a project that captures inputs from a physical device.

Within Computing, pupils will develop a deep understanding of key concepts and second order concepts. These key concepts have been carefully considered and identified as the core knowledge, skills and confidence to engage with technology required to successfully achieve in a digital world. The Key concepts are revisited and developed as the pupils move through the school to ensure the knowledge, skills and confidence to engage with technology are firmly embed within the long-term memory.

Concepts:

- **Computing systems and networks**: (systems, networks and how they are used, the internet, hardware and software)
- **Programming**: (interpreting, creating and evaluating algorithms, programming to accomplish specific goals, detecting and correcting errors)
- **Data and information**: (collecting, analysing, evaluating, presenting data and information)
- **Creating media**: (design and development, communicating and collaborating online, evaluating online content, respectful and responsible communication, presenting, creating content)

As part of the work on each key concept, children also explore and learn about:
- The effective use of tools
- The impact of technology
- Safety and security

Concept	Dahl A	Dahl B	Wells A	Wells B	Shakes A	Shakes B
Computing systems and networks						
Programming						
Data and information						
Creating media						

Domains of knowledge:

The computing curriculum provides pupils with an understanding of the following domains of knowledge.

- **NW** Networks: (How networks can be used to retrieve and share information) CM Creating Media: (Selecting and creating a range of media including text, images, sounds and video)
- **DI** Data and Information: (How data is stored, organised and used to represent real world artefacts and scenarios)
- **DD** Design and Development: (The activities involved in planning, creating and evaluating computing artefacts)
- **CS** Computing Systems: (What a computer is and how its constituent parts function as a whole) IT Impact of Technology: (How individuals, systems

and society as a whole interact with computer systems)

- **AL** Algorithms: (Comprehending, designing, creating and evaluating algorithms)
- **PG** Programming: (Creating software to allow computers to solve problems)
- **ET** Effective Use of Tools: (Using software tools to support computing work)
- **SS** Safety and Security: (Understanding risks when using technology and how to protect individuals and systems)

Our scheme of work has been colour coded in to: Computer Science, Information Technology and Digital Literacy.

Computing Scheme software and hardware requirements

	COMPUTING SYSTEMS AND NETWORKS	CREATING MEDIA	CREATING MEDIA	DATA AND INFORMATION	PROGRAMMING A	PROGRAMMING B
Dahl Year 1	Technology around us	Digital Painting	Digital writing	Grouping data	Moving a robot	Introduction to animation
	Paintz app	MS Paint, Paintz app	Word, Google Docs 2Publish, Clicker	Practical objects, Google slides	BeeBots	Scratch Jr
Dahl Year B	Information technology around us	Digital photography	Making music	Pictograms	Robot algorithms	Introduction to quizzes
	Unplugged / Google Slide sorting activity	Tablet device and / or digital camera. Pixlr	Chrome Music Lab	J2Data 2graph	BeeBots	Scratch Jr
Wells Year A	Connecting Computers	Stop frame animation	Desktop publishing	Branching databases	Sequence in music	Events and actions
	Mainly unplugged / worksheets Graphics software e.g. Paint	Tablets, iMotion Stop motion studio, 2animate, animation in PPT	Adobe Spark Canva, MS Publisher, 2Publish	J2EBranch Textease Branch, 2question	Scratch	Scratch
Wells Year B	The internet	Photo editing	Audio editing	Data logging	Repetition in shapes	Repetition in games
	Internet browser, G Suite traceroute, Chrome music lab	paint.net, pixabay befunky, lunapic,	Audacity on laptop voice memo recorder on tablet	Data loggers or apps, Google Science journal	Turtle academy playground Scratch, Logo	Scratch
Shakespeare Year A	Sharing information	Vector drawing	Video editing	Flat-file databases	Selection in physical computing	Selection in quizzes
	Google slides, Scratch	Google drawings Aspex draw, drawing tools in Word and PPT	Video devices e.g. tablets, iPads, video camera, Video Editor (Win 10 app) / iMovie	j2data Information Magic, Softease Database	Crumble	Scratch
Shakespeare Year B	Communication	3D modelling	Web page creation	Spreadsheets	Variables in games	Sensing
	Web browsers, 'unplugged'	TinkerCAD (need accounts)	Google sites	Google sheets or Excel	Scratch	MicroBit (or emulator)

EYFS	
Three- and Four-Year Olds	**Communication and Language** Pay attention to more than one thing at a time.Use a wider range of vocabulary. Understand a question or instruction that has two parts. **Personal, Social and Emotional Development** Increasingly follow rules and understand why they are important. Talk about feelings using works like 'happy', 'sad' or 'worried'. **Physical Development** Use one handed tools and equipment. **Literacy** Understand that print can have a different purpose. We read English from left to right and from top to bottom.Write some or all of their name. **Mathematics** Link numerals and amounts Notice and correct an error in a repeating pattern Begin to describe a sequence, using words such as 'first', 'then'. **Understanding the World**Explore how things work.
Children in Reception	**Communication and Language**Learn new vocabulary. Use talk to help work out problems and organise thinking and activities. **Personal, Social and Emotional Development** Show perseverance and resilience in the face of challenge. **Physical Development** Develop small motor skills so that they can use a range of tools effectively.Use their core muscles to achieve a good posture when sitting at a table. **Mathematics** Continue, copy and create repeating patterns
Early LearningGoals	**Communication and Language** Offer explanations for why things might happen using recently introduced vocabulary. **Personal, Social and Emotional Development** Explain the reasons for rules and know right from wrong. **Physical Development** Use a range of small tools, including, scissors, paintbrushes and cutlery. **Mathematics** Have a deep understanding of numbers to 10. **Understanding the World** Know some similarities and differences between the natural world and the world around them and contrasting environments.
Compassion. Respect. Joy	

Dahl Year A
MY LEARNING JOURNEY: Computing

'I CAN' *The skills I have learnt...*	'I KNOW' *The knowledge I have...*
Technology around us. I can identify technology I can identify the toolbar and use bold and change font and size I can type capital letters I can use the space bar I can find letters on a keyboard to type words I can insert a picture from a picture box I can follow rules for using technology responsibly More able: Pupils demonstrate their depth of understanding by creating their own criteria for items against which they can physically sort, collate, edit, present, search through, re-order andre-structure and explain their reasoning.	I know what a computer is and what its main parts are called. I know how to use a keyboard and how to edit using the delete key I know how to use technology purposefully. I know I can change the keyboard output to upperand lowercase letters. I know using different fonts and sizes changes the appearance of my work. **Key vocabulary:** Computer mouse/trackpad, draw, click, double-click, click and drag Input device, computer, keyboard, mouse Shift, space bar, capital letter, full stop Safely, responsibly, computer, technology
Digital painting I can draw lines and make marks on a screen andexplain which tools I used I can make marks with the square and line tools I can use the shape and line tools effectively I can use the shape and line tools to recreate thework of an artist I can explain why I have chosen specific tools More able: Pupils demonstrate their depth of understanding by creating their own criteria for items against which they can physically sort, collate, edit, present, search through, re-order andre-structure and explain their reasoning.	I know how to create an image using a programme. I know how to select different tools to create different effects. **Vocabulary:** sort, font, size, toolbar, shift, bold, italic, shape, line, tools, space bar, insert
Moving a Robot I can use a start block in a program I can use more than one block by joining them together I can compare left and right turns I can experiment with turn and move commands to move a physical computer I can use event, action and object code blocks I can select appropriate background artwork for aproject More able: Pupils can explain the possible actions of objects including moving, responding tobeing clicked on and collision with other objects. They can also use their prior coding experience to recognise whole blocks of familiar code.	I know that an algorithm is a set of instructions used tosolve a problem or achieve an objective. I know that an algorithm written for a computer is called a program. I know finding errors in an algorithm is called debugging. I know different code blocks have different purposes. **Vocabulary:** sequence, program, debug, challenge, instructions, event, action, object, block, command

Grouping Data	I can describe objects using labels and match objects to a group. I can count groups of objects and describe their properties. I can count and group objects with the same properties I can compare groups of objects and answer questions about them. More able:	I know how to group objects by their properties. **Key vocabulary:** Group, object, property, value, label, colour, data set, more, less, most, least, fewest, the same	
Digital Writing	I can find and identify keys on a key pad. I can use a computer to write I can add and remove text on a computer using the backspace key. I can change the look of the text by using bold, italic and underlining. I can make careful choices when changing text, for example, changing the font, selecting a word by double clicking or clicking and dragging. To explain why I used the tools that I chose. To compare writing on a computer with writing on paper More able: Pupils demonstrate their depth of understanding by creating their own criteria for items against which they can physically sort, collate, edit, present, search through, re-order andre-structure and explain their reasoning.	I know how to use Microsoft Word. I know how to change the font and use bold, italic and underline. **Key vocabulary:** Word processor, keyboard, mouse, cursor, select, font, toolbar, bold, italic, underline, Microsoft Word, Google Docs	
Programming animations	I can compare different programming tools and find and use commands to move a sprite. I can use a start block in a program and I can join blocks together. I can explain what happens when I change a value. I can add blocks to my sprite and delete a sprite. I can create an algorithm for each sprite to control movement. I can test the programs I have created and alter my designs. More able: Pupils can explain the possible actions of objects including moving, responding tobeing clicked on and collision with other objects. They can also use their prior coding experience to recognise whole blocks of familiar code.	I know that an algorithm is a set of instructions used to achieve an objective. I know that an algorithm written for a computer is called a program and finding errors in an algorithm is calleddebugging. **Key Vocabulary:** ScratchJr, Bee-Bot, command, sprite, compare, programming, programming area, block, joining, start block, run, background, delete, reset, algorithm, predict, effect, change, value, Instructions, delete, algorithm, appropriate,	
Digital Literacy	I can speak to a trusted adult if I feel scared, frightened or embarrassed about something I seewhile using technology.	I know I need to use technology safely and respectfully, keeping personal information private. I know where to go for help and support when I	

	haveconcerns about what I have seen on the internet, or another digital device. I understand the importance of keeping information,such as my usernames and passwords private. **Vocabulary:** technology, notification, tools, username, password, open, save, retrieve, report, concern, safety, personal information

<div align="center">Compassion. Respect. Joy</div>

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Dahl Year B
MY LEARNING JOURNEY: Computing

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	'I CAN' *The skills I have learnt...*	**'I KNOW'** *The knowledge I have...*
Information Technology around us.	I can recognise the uses and features of information technology: describing some uses of computers and examples of computers. To can identify information technology in school and at home and say what it is used for. I can explain the benefits of IT and how devices work together. I can recognise how to use IT responsibly and that rules are in place to keep me safe and help me. More able:	I know what information technology is and how it helps people at home, in school and in the wider world. I know that devices are often linked and work together. I know that networks are connected systems I know rules that help keep us safe and healthy in and beyond the home when using technology
Digital Photography	I can capture a digital photograph and talk about how to take a photograph. I can take a photograph in landscape or portrait and explain why one or other might look better. I can identify what is wrong with a photograph and reframe it. To decide how photographs can be improved by using light. I can use editing to change my photograph, experimenting with colour and filters. I can identify if an image is real or if it has been changed. More able:	I know how to take a photograph, thinking about light and composition, I know how to edit my photograph **Key vocabulary:** device, camera, photograph, capture, image, digital, landscape, portrait, horizontal, vertical, field of view, narrow, wide, format, Framing, focal point, subject matter, field of view, format, compose, natural lighting, artificial lighting, flash, focus, background, foreground Editing, tools, colour, filter, images, Pixlr, lighting, focus, filter, changed, real

Robot Algorithms	I can choose a series of words that can be enacted as a sequence. I can create different algorithms for a range of sequences using the same commands and show the difference in outcomes between two sequences that have the same command. I can predict the outcome of my algorithm and compare this with what did happen. I can explain that programming projects can have code and artwork. I can design a specific algorithm to meet my goal and explain what it should achieve. I can create and debug a program that I have written More able: an exceeding pupil will be able to apply their knowledge as a transferable skill across a range of debugging scenarios. They will also be able to predict outcomes in more complex code.	I know computers require simple, precise instructionsto perform. I know how to identify and correct some simple errors (debugging). I am beginning to understand that computer networks provide access to the internet etc. **Key vocabulary:** instruction, sequence, clear, unambiguous, algorithm, program, sequence, order, algorithm, commands, prediction, artwork, design, route, mat, debugging
Pictograms	I can count and compare objects (data) using tally charts, comparing totals. I can enter data on a computer and view that data in a different format: I can use a pictogram to answer simple questions about the data. I can use a tally chart to create a pictogram. I can answer 'more than'/'less than' and 'most/least' questions about an attribute. I can create a pictogram to arrange objects by attributes. I can create a pictogram to compare people by a common attribute. I can explain that we can present information using a computer and that sometimes it is this data should not be shared. More able:	I know how to create a pictogram from collected data in a tally chart. I know how to search for specific information or data. I know that I shouldn't share personal information online. Key vocabulary: More than, less than, most, least, organise, data, object, tally chart, votes, total Pictogram, enter, compare, objects, count, explain, more, less, more common, least common Attribute, group, same, different, more than/less than, most/least, sharing, data
Making Music	I can listen to music, for longer periods of time, identifying differences in pieces and say how it makes me feel. I can create a rhythm pattern and follow a rhythm pattern on a percussion instrument. I can use a computer to experiment with pitch and duration.: I can use a computer to create a musical pattern using three notes, refining my pattern I can create and save a musical pattern to describe an animal. I can evaluate my work stating how I could improve it. I can reopen it. More able: Exceeding pupils can import theirown images and drumbeats, seamlessly using different aspects of 2Beat, 2Sequence, 2Paint or Music Lab.	I know how to edit more complex digital data such as music compositions. I know how to use a range of media in their digital content including photos, text and sound and present ideas. I know notes in music are arranged in a sequence. Changing the order changes the sound. **Key vocabulary:** music, planets, Mars, Venus, war, peace, quiet, loud, feelings, emotions, pattern, rhythm, pulse, Neptune, pitch, tempo, rhythm, notes, instrument, create, emotion, pitch, pulse/beat, open, edit

Introduction to Quizzes	I can identify that a program needs to be started and I can identify the start of a sequence. I can change the outcome of a sequence of commands; can match two sequences with the same outcome and predict an outcome. I can create a design and decide which blocks I need, which background I will use and choose characters. I can create an algorithm, debug and improve by adding features. More able:	I know how write and algorithm to my design. I know how to debug and improve my desigsn. **Key Vocabulary:** Sequence, command, program, run, program, start, outcome, predict, blocks, sprite, algorithm, design, actions, project, blocks, design, modify, change, design, build, match, compare, debug, features, evaluate
Digital Literacy	I can identify a range of ways to report concern about content (trusted adult, report functions)	I know how to report inappropriate behaviours and content to a trusted adult.
Compassion, Respect. Joy.		

Wells Year A	
MY LEARNING JOURNEY: Computing	
'I CAN' *The skills I have learnt...*	**'I KNOW'** *The knowledge I have...*
Connecting Computers I can classify input and output devices; design a digital device and model a simple process. I can recognise similarities and differences between using digital devices and non-digital tools. I can explain how a computer network can be used to share information and that messages pass through multiple connections. I can explain how digital devices can be connected and what the role of a switch, server and wireless access point is. I can recognise the physical components of a network and how they are connected. More able:	I know digital devices and change the way we work I know what a computer network is and how it works in the school setting. I know what a switch, server and wireless access point are. **Key Vocabulary:** Digital device, input, output, process, program, connection, network, network switch, network switch, server, wireless access point (WAP)
Stop Frame Animations I can explain that animation is a sequence of drawings or photographs I can create a stop frame animation and predict what it will look like. I can break down a story into setting, characters and events to create a storyboard. I can evaluate the quality of my animation and review a series of frames to check my work. To review and improve an animation explaining how I will improve it. I can evaluate the impact of adding other media to my animation More able:	I know how to create a stop frame animation. I know how to add media to my animation. I know how to use 'onion skinning.' **Key Vocabulary** ;Animation, flip book, stop frame animation, frame, sequence, image, photograph, setting, character, events, onion skinning, consistency evaluation, animation, delete, frame, media, import, transition
Sequence in music I can explore a new programming environment, including attributes, projects, blocks, commands, codes, staging and backdrops. I can identify that each sprite is controlled by the commands I choose I can create a sequence of connected commands and decide where and how my program will start. I can combine sound commands and order notes into a sequence to create a musical instrument. To change the appearance of my project	I know how to write a program, run and debug it. I know how to create a sequence of music within my program. **Key vocabulary:** Scratch, programming, blocks, commands, code, sprite, costume, stage, backdrop, motion, turn, point in direction, go to, glide, Sequence, event, task, design, run the code, order, note, chord, stage, costume, backdrop, design, algorithm, bug, debug

	To create a project from a task description More able:	
Branching Databases	I can create a branching database by grouping groups of objects separated by one attribute. I can make up yes/no questions about these groups. To identify the object attributes needed to collect relevant data I can explain why it is helpful for a database to be well structured I can compare the information shown in a pictogram with a branching database More able:	I know how to carefully structure a branching database, identifying attributes for grouping and yes/no questions. **Key vocabulary:** Attribute, value, questions, table, objects, branching database, database, , equal, even, separate, order, organise, value, question, j2data, selecting, pictogram, compare, information, decision tree
Desktop Publishing	I can recognise how text and images convey information clearly and that there are some advantages and disadvantages to using them. I can change the text layout, including font style, size and colour. I can choose appropriate page settings: generating a template to meet my needs with placeholders. I can add content to a desktop publishing publication, including adding text and pasting pictures. I can change the layout to suit different purposes. To consider the benefits of desktop publishing and identify its use in the real world. More able:	I know how to create a template, add text and images. I Know how to change text layout, including font size and colour. I know how to alter the layout to suit my purpose. **Key vocabulary:** Text, images, advantages, disadvantages, communicate, font, font style, template, landscape, portrait, orientation, placeholder, desktop publishing, copy, paste, layout, purpose, benefits
Events and Actions	I can explain how a sprite moves in an existing project I can create a program to move a sprite in four directions I can adapt a program to a new context I can develop my program by adding features I can identify and fix bugs in a program I can design and create a maze-based challenge	I know how to make my sprite move and I can select keys to do this (up, down, left, right) I know how to add blocks and use function such as pen down. **Key vocabulary:** Motion, event, sprite, algorithm, logic, move, resize, algorithm Extension block, pen up, set up, pen, design, actions, debugging, errors, setup

Digital Literacy	I can recognise what a good password is and why I should keep passwords safe.	I know the importance of having a secure password and not sharing this with anyone else.
	I can explain what is meant by the term 'online identity'.	I know that not all information on the internet is correct.
	I can identify the age restrictions on games and apps to work out whether they are suitable for me.	I understand that there is more than one way to report unacceptable content and contact.
		I know that being on the internet or playing games can alter my emotions.
	More able: Pupils will be able to appraise the accuracy of information shared on a website and a provide suitable evidence to support their decisions on whether it is trustworthy or not.	Vocabulary: internet, age range, identity, privacy

Compassion. Respect. Joy

Wells Year B	
MY LEARNING JOURNEY: Computing	
'I CAN' *The skills I have learnt...*	**'I KNOW'** *The knowledge I have...*
The Internet I can explain how the internet is made up of connected networks. I can explain how websites are stored on the www, what types of media can be shared and how to access websites on the WWW. I can explain that that content of the www is created by people. I can evaluate the consequences of unreliable content. I can name the different parts of a desktop computer and know what the function of the different parts of a computer is. E.g. Make a leaflet labelling a computer. More able:	I know computers are made from hardware, software and components. I know that websites and their contents are created by people and that some information that I find online may not be honest, accurate or legal. **Key Vocabulary:** internet, network, router, network, security, switch, server, wireless, access point (WAP), web page, web address, links, files, content, download, sharing, ownership, permission, information, accurate, honest, adverts, legal.
Audio Production I can identify digital devices that can record sound and play it back and that a range of sounds can be recorded. I can plan and record a podcast, saving it as a file. I can discuss how to improve my podcast and edit sections of an audio recording. I can reopen my recording and add sound, using editing tools to rearrange sections of audio. More able:	I know what a podcast is. I can record a podcast, editing to make improvements and add sound. **Key vocabulary:** audio, record, playback, microphone, speaker, headphones, input, output, sound, start, stop, pause, save, file, edit, section, mixing, time shift.
Photo Editing I can explain the effect that editing can have on an image. I can change the composition of an image by selecting parts of it. I can use editing tools on a photograph and can explain the effect these have. I can evaluate how changing can improve an image. I can save and retrieve an image. More able:	I know how to edited an image. I know how to adjust, sharpen, brighten, alter and image. I know how to change hue, saturation, change colour or use settings such as sepia. **Key vocabulary:** image, edit, arrange, select, crop, undo, save, copyright, pixels, rotate, flip, adjustment, effects, colours, hue/ saturation, sepia, save, version, illustrator, vignette, retouch, edit, clone, recolour, image, fake, real, composite, cut, copy, paste, background, foreground.
Repition in Shape I can create a code snippet for a given purpose, for example controlling a turtle. I can write an algorithm for a given outcome, including repetition. I can design a program that has a count-controlled loop. I can debug my program.	I know how to create a program with an object that repeats actions. **Key vocabulary:** program, turtle, commands, code, snippet, algorithm, design, debug, logo, command, pattern, repeat, repetition, count controlled loop, value, count-controlled, loop, trace, decompose, procedure, debug, program

	More able: Pupils' designs for their programs, show that they are absorbing new knowledge of coding structures such as 'if' statements, repetition and variables to think of their programs in logical, achievable steps.	
Data logging	I can explain that data gathered can be used to answer a given question and I can suggest questions to be asked of the data. I can use a data logger to collect data and that the data logger collects 'data points' from sensors over a given time. I can use collected data to answer questions and draw conclusions. More able:	I know how to use a data logger to collect data. I know that sensors are the input devices and that the data is recorded. **Key vocabulary:** data, table, input device, sensor, data logger, data point, interval, analyse, data set, import, export, logged, collection, review, conclusion.
Repition in Games	I develop the use of count-controlled loops in a different programming environment, for example scratch. I can explain that in programming there are infinite loops and count controlled loops. I can develop a program which includes two or more loops which run at the same time. I can modify an infinite loop. More able: Pupils' designs for their programs, show that they are absorbing new knowledge of coding structures such as 'if' statements, repetition and variables to think of their programs in logical, achievable steps.	I know how to add loops to a program. **Key vocabulary:** scratch, programming, sprite, blocks, code, loop, repeat, value, forever, count controlled loop, costume, animate,
Digital Literacy	I can identify possible risks of installing free and paid for software. I can identify signs of a computer virus. I can identify security symbols such as padlocks can help keep me safe online. I can identify and am aware of the existence of scam websites. I can explain what a digital footprint is and how it relates to identity theft. I can give examples of things that they would not want to be in their digital footprint. More able: More able pupils can search for specific content and rephrase key words to alter outcomes. They can demonstrate that they are making connections between the positive possibilities that technology provides e.g. collaboration and sharing and the possible downsides of this such as malware and phishing.	I know I should report inappropriate content found online to a trusted adult. I understand that not all information I find online has been fact checked. I know that malware is software that is specifically designed to disrupt, damage, or gain access to a computer. I know what a computer virus is. I know it is healthy to limit screen time and have screen free activities, **Key vocabulary:** internet browser, spoof website, malware, copyright, phishing, online identity, digital footprint
	Compassion. Respect. Joy	

Shakespeare Year A MY LEARNING JOURNEY: Computing	
'I CAN' *The skills I have learnt…*	**'I KNOW'** *The knowledge I have…*
Sharing information I can explain how computers are connected together to form systems. I can explain the role that computers have in our lives and how information is transferred over the internet. I can work collectively on a shared project online. I can evaluate different ways of working together online. More able:	I know that connect devices can allow is to access shared files stored online. I know that sharing information online lets people in different places work together. **Key vocabulary:** system, connection, digital, input, process, output, protocol, address, packet, chat, explore, slide deck, reuse, remix, collaboration
Video editing I can explain that a video can hold visual and audio media. I can plan a video using a storyboard. I can make a recording taking into account light and angles. I can reshot, edit and improve my video and include special effects, title screen and end credits More able:	I know how to use Windows Movie Maker and I can edit my video to improve it. I know how to add audio, set my video to music, add a title and credits and change the transition method and length between sections or stills. **Key vocabulary:** Video, audio, AV, recording, capture, zoom, storage, digital, tape, save, videographer, technique, pan, tilt, content, light, camera, angles, export, lighting, setting, computer, split, edit, timeline, transition, special effects, title screen, end credits, export, constructive, feedback.
Selection in physical computing I can control a simple circuit connected to a computer; including a microcontroller (crumble), an infinity loop and an LED light. I can connect more than one output device to a microcontroller, deciding which output device I control with a count-controlled loop. I can experiment with a 'do until' loop. I can use selection (an 'if …then' statement) to direct the flow of a program. I can make a physical drawing/model of a physical computing project. I can create an algorithm to control my robot/simulation using repetition, sequencing, co-ordinates and text inputs. Using crumble or 2code a game linked to our topics. More able: Pupil's test and debug their program as they go and can use logical methods to identify the approximate cause of any bugs then test systematically to identify the specific line of code that is causing the problem.	I know how to create algorithms for physical computing using loops and sequences. I know the importance of planning and designing aproject in order to follow a plan and make adjustments where necessary. **Key Vocabulary:** Microcontroller, Crumble controller, components, switch, motor, LED, Sparkle, crocodile clips, connect, battery box, program, condition, true, false, input, output devices, selection, condition, action, task, design, selection, repetition, condition, action, microcontroller, Crumble controller, switch, crocodile clips, battery box Task, design, selection, repetition, algorithm, debug, evaluate

Flat file databases	I can create a database, using fields which hold and record the data. I can search a database using 'and' and 'or.' I can apply filters and select an appropriate chart or graph to visually compare data. I can apply my knowledge of a database to ask questions that will need more than one field to answer. More able:	I know how to create a database. I know that a databases is a program that is used to store information (attributes) and that you can ask questions (search) a database for answers. I know that you can create graphs and charts to represent your answers. **Key Vocabulary:** Database, data, information, record, field, sort, order, group, search, criteria, graph, chart, axis, compare, filter, presentation.
Vector drawing	I can use drawing tools to produce different outcomes and for different purposes. I can create a vector drawing by combining shapes and I can move, resize, rotate and duplicate them. I can use tools to achieve a desired effect, for example using the zoom tool to add detail to my drawing. I can create layers bring objects to the front or the back. I can evaluate my vector drawing and say how I might improve it. More able:	I know how to create an image using vector drawing. I know how to use a range of tools with in the program. **Key vocabulary:** vector, drawing tool, shapes, object, icon, toolbar, move, resize, colour, rotate, duplicate/ copy, organise, zoom, select, alignment grid, handles, consistency, modify, layers, front, back, order, copy, paste, group, ungroup, improvement, evaluate, alternatives, vector drawing.
Selection in quizzes	I can explain how selection is used in a program and identify conditions and how to modify them. I can create a program with different outcomes using selection and identify the condition and outcome is an if… then… else statement. I can explain how selection directs the flow of a program I can design and create a program which uses selection: creating the algorithms, running the program and debugging.	I know how to use scratch to create a quiz. I know how to add a loop. Key vocabulary: Selection, condition, true, false, outcomes, conditional statement - the linking together of a condition and outcomes-algorithm, program, debug, Task, design, algorithm, input, program, selection, condition, outcomes, test, run, implement, share, evaluate, constuctive
digital Literacy	I can explain how identity online can be copied, modified or altered. I can demonstrate responsible choices about my online identity, depending on context. I can refer to SMART choices. I can think critically about what I share online and the digital footprint I create. I can explain how I would report online bullying onthe apps and platforms that I use and know how toblock abusive users I can describe the helpline services who can support me and what I would say and do if I needed their help (e.g., Childline) I can explain how and why some people may	I understand the difference between online mis-information (inaccurate information distributed by accident) and dis-information (inaccurate informationdeliberately distributed and intended to mislead). I have a secure knowledge of common online safetyrules and can apply this by demonstrating the safe and respectful use of a few different technologies and online services. I know how to relate appropriate online behaviour totheir right to personal privacy and mental wellbeing of themselves and others. **Key vocabulary:** online identity block, mis-information, dis-information, skeptical, SMART, ad-targeting, cite,opinions, facts, influence, manipulation, persuasion,false, valid, reliable

present 'opinions' as 'facts'. I can define the terms'influence', 'manipulation' and 'persuasion' and explain how I might encounter these online (e.g. advertising and 'ad targeting').

I can explain key concepts including: fact, opinionbelief, true, false, valid, reliable.

More able: Pupils demonstrating More ablehave a detailed knowledge of what the SMART rules are and understand how these are applied to using technology safely and respectfully. Furthermore, they understand the implications of improper use of technology and the internet.

Compassion. Respect. Joy

Shakespeare Year B MY LEARNING JOURNEY: Computing	
'I CAN' *The skills I have learnt…*	'I KNOW' *The knowledge I have…*
Communication I can search the web for specific information and identify and compare results from different search engines. I can explain that web crawlers are the digital bots that search the internet for index pages for web address. I can explain web pages are ranked and how search engines make money. I can identify that there are different ways to communicate over the internet More able:	I know how to search the internet and that I will get different results from different search engines. I know that web crawlers are digital bots that find what I am looking for. I know how to keep myself safe online and that I should not be sharing personal information. I know that if I am communicating online, that my conversations may not be private. Key vocabulary: Search, search engine, Google, Bing, Yahoo!, Swisscows, DuckDuckGo, refine Index, crawler, bot, search engine, ranking, search engine, search engine optimisation, links, web crawlers, selection, ranking, communication, internet, public, private, one-way, two-way, one to one, one to many, SMS, email, WhatsApp, blog, YouTube, Twitter, BBC Newsround
Web page creation I can explore a webpage and identify the different types of media that are used in its construction and its common features. I can plan a design for a webpage that suits my purpose. I can find suitable images and consider the ownership of these images. I can add content to my page, make edits and preview it on a different device. I can make multiple pages and link them using hyperlinks. I can evaluate my the users experience of a website.	I know how to plan and create a web page, adding content and hyperlinks. I know that some images have copyright. Key vocabulary: Website, web page, browser, media, Hypertext Markup Language (HTML), Website, web page, breadcrumb trail, navigation, hyperlink, subpage, evaluate, implications, external link, embed, copyright, fair use.

	More able:	
Variables in games	I can define a 'variable' as something that is changeable, variables can hold numbers or letters.

I can explain why a variable is used in a program; it is a place holder in memory for a single value.

I can choose how to improve a game by using variables.

I can design a project that builds on a given example: choosing artwork and creating the algorithm.

To use my design to create a project, testing the code that I have written.

To evaluate my project

Exceeding pupils begin to translate coding knowledge to Python and create more complex scenarios. | I know how to design my game, write the algorithms, create the artwork, test and debug.

Key vocabulary: variable, change, name, value, set, change, event, design, algorithm, code, task, artwork, program, debug, improve, evaluate, share. |
| **Introduction to Spreadsheet** | I can create a formula in a spreadsheet for simple conversions e.g. cm to m and use formulas to calculate the perimeter of a rectangle.

I can work collaboratively to solve a problem using spreadsheets.

I can use simple formulae to solve calculations including =sum and other statistical functions.

I can present data visually using graphs in2calculate and/or Excel.

I can decide which keys are more suitable to perform a task. E.g. Numerical keys when typing long numbers.

More able: Pupils can create a database with a greater number of fields and create complex search questions about their database for their classmates to answer (Questions using and/or statements). | I know how to format cells to perform a function and that spreadsheets can be used to present data visually.

I know to credit sources when inserting media from websites and to check their validity.

I know data can be presented numerically or visually, each for different purposes.

Key vocabulary: Spreadsheet, data, data heading, data set, cells, columns and rows, object, spreadsheet application, format, common attribute, formula, calculation, cell reference, operation, range, duplicate, sigma Propose, question, organised, graph, chart, evaluate, results, comparison, questions, software, tools, data |

3D Modelling	I can use a computer to create and manipulate three-dimensional (3D) digital objects I can compare working digitally with 2D and 3D graphics I can construct a digital 3D model of a physical object I can identify that physical objects can be broken down into a collection of 3D shapes I can design a digital model by combining 3D objects I can develop and improve a digital 3D model More able: Pupils can manipulate mthe program to create more complex 3D objects.	I know how to create a 3D object using a computer program. **Key vocabulary:** 2D, 3D, 3D object, 3D space, view, resize, colour, lift, rotate, position, select, duplicate, dimension, placeholder, hole, group, ungroup, design, modify, evaluate, improve.
Sensing	I can create a program to run on a controllable device I can explain that selection can control the flow of a program I can update a variable with a user input I can use a conditional statement to compare a variable to a value I can design a project that uses inputs and outputs on a controllable device I can develop a program to use inputs and outputs on a controllable device More able: Exceeding pupils begin to translate coding knowledge to Python and create more complex scenarios.	I know how to control multiple variables on a physicalcomputing device. **Key vocabulary:** micro:bit, makecode, input, process, output, flashing, USB, selection, condition, if… then…. Else, variable, random, sensing, accelerometer, compass, direction, design, task, algorithm, step counter, plan, code, test, debug.
Digital Literacy	I can identify the risks and the benefits of apps andsoftware that broadcast location and can turn this function on/off as required. I can clearly explain appropriate behaviour online and report any behaviours than make me feel uncomfortable. I can explain how and why some people may explain opinions as facts and how I may encounterthese online through advertising and ad-targeting. More able: Children can confidently managetheir online presence and explain how they maydeal with future problems.	I am aware that some games, apps and websites etc.have age restrictions and this is for my safety and thesafety of others. I know that too much 'screen time' can be detrimental to my health and know ways in which toaccess devices safely. I understand the value in preserving privacy when online for my own and other people's safety. **Vocabulary:** gender, bullying, age related content,impact, app permissions, reporting content, alert

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	COMPUTING SYSTEMS & NETWORKS	CREATING MEDIA	DATA & INFORMATION	PROGRAMMING
YEAR 1	Technology around us To identify technology To identify a computer and its main parts To use a mouse in different ways To use a keyboard to type To use the keyboard to edit text To create rules for using technology responsibly	Digital painting To describe what different freehand tools do To use the shape tool and the line tools To make careful choices when painting a digital picture To explain why I chose the tools I used To use a computer on my own to paint a picture To compare painting a picture on a computer and on paper Digital writing To use a computer to write To add and remove text on a computer To identify that the look of text can be changed on a computer To make careful choices when changing text To explain why I used the tools that I chose To compare writing on a computer with writing on paper	Grouping data To label objects To identify that objects can be counted To describe objects in different ways To count objects with the same properties To compare groups of objects To answer questions about groups of objects	Moving a robot To explain what a given command will do To act out a given word To combine forwards and backwards commands to make a sequence To combine four direction commands to make sequences To plan a simple program To find more than one solution to a problem Introduction to animation To choose a command for a given purpose To show that a series of commands can be joined together To identify the effect of changing a value To explain that each sprite has its own instructions To design the parts of a project To use my algorithm to create a program

YEAR 2	Information technology around us	Digital photography	Pictograms	Robot algorithms
	To recognise the uses and features of information technology To identify information technology in the home To identify information technology beyond school To explain how information technology benefits us To show how to use information technology safely To recognise that choices are made when using information technology	To know what devices can be used to take photographs To use a digital device to take a photograph To describe what makes a good photograph To decide how photographs can be improved To use tools to change an image To recognise that images can be changed **Making music** To say how music can make us feel To identify that there are patterns in music To describe how music can be used in different ways To show how music is made from a series of notes To create music for a purpose To review and refine our computer work	To recognise that we can count and compare objects using tally charts To recognise that objects can be represented as pictures To create a pictogram To select objects by attribute and make comparisons To recognise that people can be described by attributes To explain that we can present information using a computer	To describe a series of instructions as a sequence To explain what happens when we change the order of instructions To use logical reasoning to predict the outcome of a program (series of commands) To explain that programming projects can have code and artwork To design an algorithm To create and debug a program that I have written **Introduction to quizzes** To explain that a sequence of commands has a start To explain that a sequence of commands has an outcome To create a program using a given design To change a given design To create a program using my own design To decide how my project can be improved
YEAR 3	Connecting computers	Stop-frame animation	Branching databases	Sequence in music
	To explain how digital devices function To identify input and output devices To recognise how digital devices can change the way we work To explain how a computer network can be used to share information To explore how digital devices can be connected To recognise the physical components of a network	To explain that animation is a sequence of drawings or photographs To relate animated movement with a sequence of images To plan an animation To identify the need to work consistently and carefully To review and improve an animation To evaluate the impact of adding other media to an animation **Desktop publishing** To recognise how text and images convey information To recognise that text and layout can be edited To choose appropriate page settings To add content to a desktop publishing publication To consider how different layouts can suit different purposes To consider the benefits of desktop publishing	To create questions with yes/no answers To identify the object attributes needed to collect relevant data To create a branching database To identify objects using a branching database To explain why it is helpful for a database to be well structured To compare the information shown in a pictogram with a branching database	To explore a new programming environment I can identify that each sprite is controlled by the commands I choose To explain that a program has a start To recognise that a sequence of commands can have an order To change the appearance of my project To create a project from a task description **Events and actions** To explain how a sprite moves in an existing project To create a program to move a sprite in four directions To adapt a program to a new context To develop my program by adding features To identify and fix bugs in a program To design and create a maze-based challenge

YEAR 4	The internet	Audio editing	Data logging	Repetition in shapes
	To describe how networks physically connect to other networks To recognise how networked devices make up the internet To outline how websites can be shared via the World Wide Web To describe how content can be added and accessed on the World Wide Web To recognise how the content of the WWW is created by people To evaluate the consequences of unreliable content	To identify that sound can be digitally recorded To use a digital device to record sound To explain that a digital recording is stored as a file To explain that audio can be changed through editing To show that different types of audio can be combined and played together To evaluate editing choices made **Photo editing** To explain that digital images can be changed To change the composition of an image To describe how images can be changed for different uses To make good choices when selecting different tools To recognise that not all images are real To evaluate how changes can improve an image	To explain that data gathered over time can be used to answer questions To use a digital device to collect data automatically To explain that a data logger collects 'data points' from sensors over time To use data collected over a long duration to find information To identify the data needed to answer questions To use collected data to answer questions	To identify that accuracy in programming is important To create a program in a text-based language To explain what 'repeat' means To modify a count-controlled loop to produce a given outcome To decompose a program into parts To create a program that uses count-controlled loops to produce a given outcome **Repetition in games** To develop the use of count-controlled loops in a different programming environment To explain that in programming there are infinite loops and count controlled loops To develop a design which includes two or more loops which run at the same time To modify an infinite loop in a given program To design a project that includes repetition To create a project that includes repetition
YEAR 5	Sharing information	Video editing	Flat-file databases	Selection in physical computing
	To explain that computers can be connected together to form systems To recognise the role of computer systems in our lives To recognise how information is transferred over the internet To explain how sharing information online lets people in different places work together To contribute to a shared project online To evaluate different ways of working together online	To recognise video as moving pictures, which can include audio To identify digital devices that can record video To capture video using a digital device To recognise the features of an effective video To identify that video can be improved through reshooting and editing To consider the impact of the choices made when making and sharing a video **Vector drawing** To identify that drawing tools can be used to produce different outcomes To create a vector drawing by combining shapes To use tools to achieve a desired effect To recognise that vector drawings consist of layers To group objects to make them easier to work with To evaluate my vector drawing	To use a form to record information To compare paper and computer-based databases To outline how grouping and then sorting data allows us to answer questions To explain that tools can be used to select specific data To explain that computer programs can be used to compare data visually To apply my knowledge of a database to ask and answer real-world questions	To control a simple circuit connected to a computer To write a program that includes count-controlled loops To explain that a loop can stop when a condition is met, eg number of times To conclude that a loop can be used to repeatedly check whether a condition has been met To design a physical project that includes selection To create a controllable system that includes selection **Selection in games** To explain how selection is used in computer programs To relate that a conditional statement connects a condition to an outcome To explain how selection directs the flow of a program To design a program which uses selection To create a program which uses selection To evaluate my program

YEAR 6	Communication	Web page creation	Spreadsheets	Variables in games
	To identify how to use a search engine	To review an existing website and consider its structure	To identify questions which can be answered using data	To define a 'variable' as something that is changeable
	To describe how search engines select results	To plan the features of a web page	To explain that objects can be described using data	To explain why a variable is used in a program
	To describe how search engines select results	To consider the ownership and use of images (copyright)	To explain that formula can be used to produce calculated data	To choose how to improve a game by using variables
	To explain how search results are ranked	To recognise the need to preview pages	To apply formulas to data, including duplicating	To design a project that builds on a given example
	To recognise why the order of results is important, and to whom	To outline the need for a navigation path	To create a spreadsheet to plan an event	To use my design to create a project
	To recognise how we communicate using technology	To recognise the implications of linking to content owned by other people	To choose suitable ways to present data	To evaluate my project
	To evaluate different methods of online communication			**Sensing**
		3D modelling		To create a program to run on a controllable device
		To use a computer to create and manipulate three-dimensional (3D) digital objects		To explain that selection can control the flow of a program
		To compare working digitally with 2D and 3D graphics		To update a variable with a user input
		To construct a digital 3D model of a physical object		To use an conditional statement to compare a variable to a value
		To identify that physical objects can be broken down into a collection of 3D shapes		To design a project that uses inputs and outputs on a controllable device
		To design a digital model by combining 3D objects		To develop a program to use inputs and outputs on a controllable device
		To develop and improve a digital 3D model		