Curriculum Map for Computing

Early Years

To support our play based learning in Early Years, our skilled Early Years teachers will identify and plan opportunities for all children to develop key knowledge and skills which will support them in successfully accessing the National Curriculum for Computing when they enter Year One.

All planned opportunities over the year are as a result of teachers making informed decisions about what a child needs to learn and be able to do next. The evidence will come from teacher knowledge of every child and use of floor books and displays to record learning journeys.

Statutory framework for the Early Years foundation stage: The most relevant statements for Computing are taken from the following areas of learning (acknowledging the fact the we live in a digital age and all aspects of learning may have links to technology and Computing):

Communication and Language The development of children's spoken language underpins all seven areas of learning and development. Children's back-and-forth interactions from an early age form the foundations for language and cognitive development. The number and quality of the conversations they have with adults and peers throughout the day in a language-rich environment is crucial. By commenting on what children are interested in or doing, and echoing back what they say with new vocabulary added, practitioners will build children's language effectively. Reading frequently to children, and engaging them actively in stories, non-fiction, rhymes and poems, and then providing them with extensive opportunities to use and embed new words in a range of contexts, will give children the opportunity to thrive. Through conversation, storytelling and role play, where children share their ideas with support and modelling from their teacher, and sensitive questioning that invites them to elaborate, children become comfortable using a rich range of vocabulary and language structures.

Literacy It is crucial for children to develop a life-long love of reading. Reading consists of two dimensions: language comprehension and word reading. Language comprehension (necessary for both reading and writing) starts from birth. It only develops when adults talk with children about the world around them and the books (stories and non-fiction) they read with them, and enjoy rhymes, poems and songs together. Skilled word reading, taught later, involves both the speedy working out of the pronunciation of unfamiliar printed words (decoding) and the speedy recognition of familiar printed words. Writing involves transcription (spelling and handwriting) and composition (articulating ideas and structuring them in speech, before writing).

Understanding the World Understanding the world involves guiding children to make sense of their physical world and their community. The frequency and range of children's personal experiences increases their knowledge and sense of the world around them – from visiting parks, libraries and museums to meeting important members of society such as police officers, nurses and firefighters. In addition, listening to a broad selection of stories, non-fiction, rhymes and poems will foster their understanding of our culturally, socially, technologically and ecologically diverse world. As well as building important knowledge, this extends their familiarity with words that support understanding across domains. Enriching and widening children's vocabulary will support later reading comprehension.

Expressive Arts and Design The development of children's artistic and cultural awareness supports their imagination and creativity. It is important that children have regular opportunities to engage with the arts, enabling them to explore and play with a wide range of media and materials. The quality and variety of what children see, hear and participate in is crucial for developing their understanding, self-expression, vocabulary and ability to communicate through the arts. The frequency, repetition and depth of their experiences are fundamental to their progress in interpreting and appreciating what they hear, respond to and observe.

ELG: There are no ELGs that relate directly to Computing. However, the ELGs for Comprehension, Past and Present, People Culture & Communities, The Natural World, Creating with Materials, and Being Imaginative & Expressive may all be supported by the use of technology and computing skills.

The headings below refer to the areas of learning in computing which are taught in Year 1. The provision below outlines opportunities in adult directed learning and CIL which will enable the children to be ready for KS1 in this curriculum area.

Area	Year N	Year R:
Text and Multimedia	Develop awareness that digital text and multimedia resources e.g. videos can be used to find out about things.	Develop understanding that digital text and multimedia resources, e.g. CBeebies website, can be used to find out about things. Suggest using the internet or multimedia resources to support our learning, in addition to paper-based resources.
Digital Images	Learning how to use devices e.g. i-pads to take digital photos, such as of their own learning activities.	Becoming increasingly independent in using devices, e.g. i-pads to take digital photos of their own learning.
Sound and music	Learning how to use devices e.g. i-pads to record sound bites, such as of their own learning activities.	Learning how to use devices e.g. i-pads to record sound bites, such as of their own learning activities.
Electronic Communication	Not covered in EYFS	Not covered in EYFS
Research and E Safety	See Text and Multimedia E Safety covered during Internet Safety Week and as appropriate at other times.	See Text and Multimedia E Safety covered during Internet Safety week and as appropriate at other times.
Control (algorithms)	Explore programming age-appropriate devices, e.g. beebots and everyday appliances, such as weighing scales and the classroom Smartboard.	Develop confidence in programming age-appropriate devices, e.g. beebots and everyday appliances, such as weighing scales and the classroom Smartboard.
Modelling and simulations	Not covered in EYFS	Not covered in EYFS
Understanding Technologies	Develop awareness that there are technological devices around them in everyday life, e.g. smartboard and computer in classroom, i-pads which they can use in classroom, parents' mobile phones.	Develop understanding of how these devices can be used effectively, e.g. to take a photo of their own model to record it before it needs to be dismantled.

Key Vocabulary

Internet, Video, Picture, Photo, Screen, Computer, Tablet/i-pad, website, safe (internet safety)

Key Stage One

National Curriculum:

Key stage 1 Pupils should be taught to:

- understand what algorithms are; how they are implemented as programs on digital devices; and that programs execute by following precise and unambiguous instructions
- create and debug simple programs
- use logical reasoning to predict the behaviour of simple programs
- use technology purposefully to create, organise, store, manipulate and retrieve digital content
- recognise common uses of information technology beyond school
- use technology safely and respectfully, keeping personal information private; identify where to go for help and support when they have concerns about content or contact on the internet or other online technologies.

In this way, they can build upon the skills progression during the year and over the two years in Key Stage One, preparing them for Key Stage Two.

Skills progression end points:

Area:	By the end of Key Stage One:
Digital Images	Use a range of simple tools in a paint package / image manipulation software to create / modify a picture.
	Use a range of tools in a paint package / image manipulation software to create / modify a picture to communicate an idea.
	Create a simple animation to tell a story.
Sound and music	Chose suitable sounds from a bank to express their ideas.
	Record short speech.
	Compose music from icons.
	Produce a simple presentation incorporating sounds the children have captured, or created.
Electronic Communication	Contribute ideas to class email.
	Request information from another class, person or company.
	Make their own comments on Google Classroom.
Modelling and simulations	Make simple choices to control a simple simulation program.
	Children are able to play an adventure game and use a simple simulation, making choices and observing the results.
	Their conversation shows they understand that computers are good at replicating real life events and allowing them to explore contexts that are otherwise not possible.
Understanding Technologies	show an awareness of the range of devices and tools they encounter in everyday life.
	Show an awareness that what they create on a computer or tablet device can be shown to others via another device (e.g. printer, projector, Apple TV).
	Show an awareness of a range of inputs to a computer (IWB, mouse touch screen, microphone, keyboard, etc).
	Begin to show an awareness that computers can be linked to share resources.
	Use websites and demonstrate an awareness of how to manage their journey around them (e.g. using the back/forward button, hyperlinks).

	By the end of Year 1:	By the end of Year 2:
Text and Multimedia	Work with others and with support to contribute to a digital class resource which includes text, graphic and sound.	Generate their own work, (with help where appropriate with multimedia) combining text, graphics and sound. Save and retrieve and edit their work.
Research and E Safety	As a class exercise children explore information from a variety of sources (electronic, paper based, observations of the world around them, etc.). They show an awareness of different forms of information	Children use a search engine to find specific relevant information to use in a presentation for a topic. They save and retrieve their work.
Control (algorithms)	Control simple everyday devices to make them produce different outcomes.	Control a device, on and off screen, making predictions about the effect their programming will have. Children can plan ahead.

Vocabulary progression:

Area:	Key Stage One:
Digital Images	line, fill, clip-art, undo, text, save, animation, background, font, copy, paste, edit
Sound and music	Tune, note, speed, beat, volume, sound effect, repeat, music
Electronic Communication	Communicate, email, send, message, email address, attachment
Modelling and simulations	Model, design, solution, simulation, realistic, unrealistic
Understanding Technologies	Technology, Interactive whiteboard, projector, microphone, keyboard

	Year 1:	Year 2:
Text and Multimedia	Text, graphic, sound	Quiz, fact-file, presentation, save, edit
Research and E Safety	Login, password, search, button, internet	Search, filter, sharing, reply
Control (algorithms)	Instruction, algorithm, actions, debug, object	Output, test, bug, route, left, right

		Teaching Sequences:				

Continuous learning:
These areas of learning will be taught and studied continuously through KS1 through continuous provision and daily access to activities.

E-Safety – Regular review of E-Safety.

Touch typing – Children continue to practice their typing on the Chromebooks.

Presenting ideas (home learning) – Children are encouraged to use IT to support them in presenting ideas about their chosen topic, this is then delivered to their class (talk time).
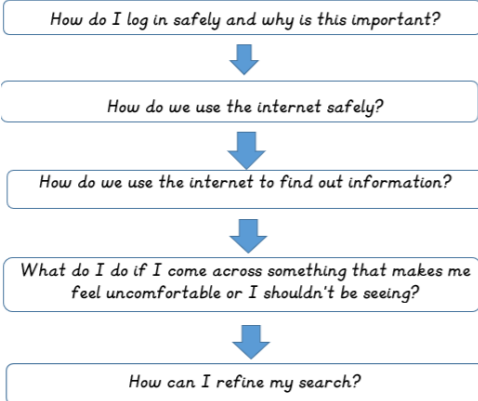
Teaching Sequences:

Key Stage One

A Year:
These units of work will be taught as a topic in the A Year to ensure curriculum coverage in our mixed age classes.

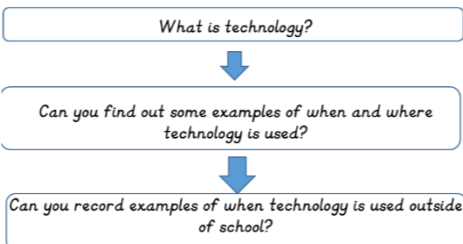**Research and E-Safety (1.1/2.2 Online Safety) Teaching Sequence:**
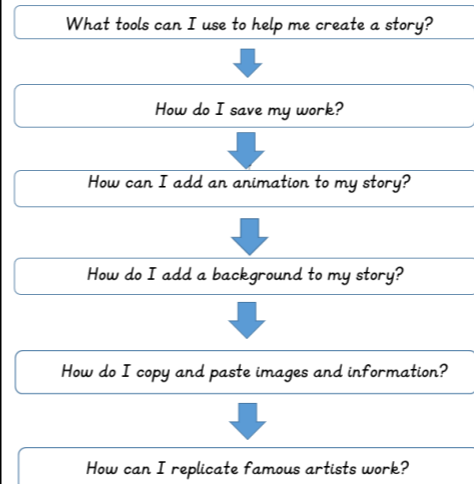
Learning Journey – Research and E-Safety
- How do I log in safely and why is this important?
- How do we use the internet safely?
- How do we use the internet to find out information?
- What do I do if I come across something that makes me feel uncomfortable or I shouldn't be seeing?
- How can I refine my search?

Understanding Technologies (1.9 Tech Outside School) Teaching Sequence:

Learning Journey – Tech Outside School
- What is technology?
- Can you find out some examples of when and where technology is used?
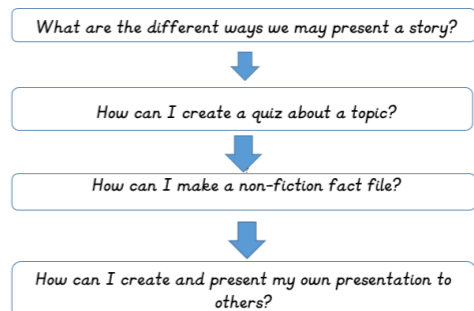- Can you record examples of when technology is used outside of school?

Digital Images (1.6/2.6 Animated stories and Creating Pictures) Teaching Sequence:
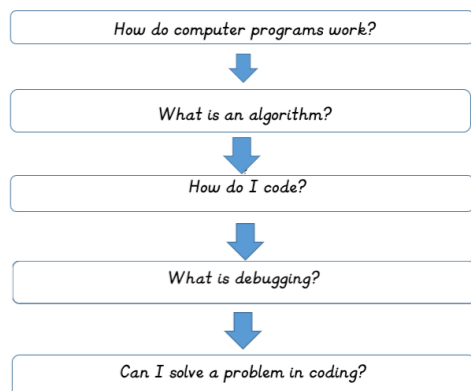
Learning Journey – Digital Images
- What tools can I use to help me create a story?
- How do I save my work?
- How can I add an animation to my story?
- How do I add a background to my story?
- How do I copy and paste images and information?
- How can I replicate famous artists work?

Text and multimedia (2.8 Presenting ideas) Teaching Sequence:

Learning Journey – Text and Multimedia
- What are the different ways we may present a story?
- How can I create a quiz about a topic?
- How can I make a non-fiction fact file?
- How can I create and present my own presentation to others?

Coding/algorithms (1.7/2.1 Coding) Teaching Sequence:

Learning Journey – Coding
- How do computer programs work?
- What is an algorithm?
- How do I code?
- What is debugging?
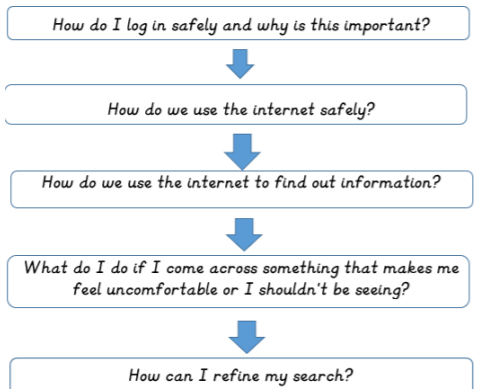- Can I solve a problem in coding?

B Year:
These units of work will be taught as a topic in the B Year to ensure curriculum coverage in our mixed age classes.

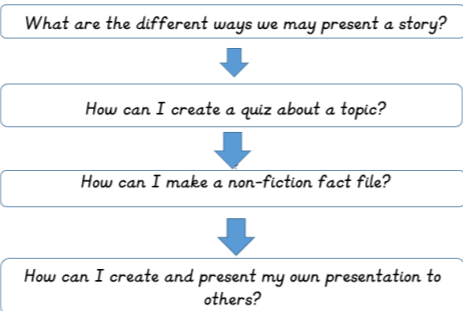**Research and E-Safety (1.1/2.2 Online Safety) Teaching Sequence:**

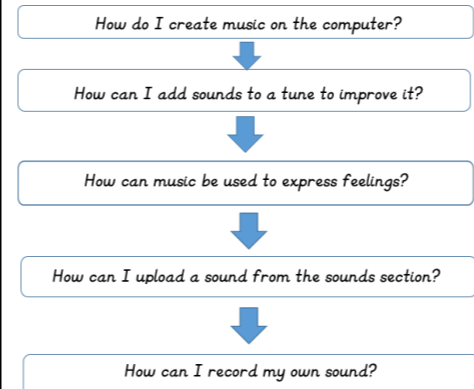Learning Journey – Research and E-Safety
- How do I log in safely and why is this important?
- How do we use the internet safely?
- How do we use the internet to find out information?
- What do I do if I come across something that makes me feel uncomfortable or I shouldn't be seeing?
- How can I refine my search?

Text and multimedia (2.8 Presenting ideas) Teaching Sequence:

Learning Journey – Text and Multimedia
- What are the different ways we may present a story?
- How can I create a quiz about a topic?
- How can I make a non-fiction fact file?
- How can I create and present my own presentation to others?

Sound and music (2.7 - Making Music) Teaching Sequence:

Learning Journey – Sound and Music
- How do I create music on the computer?
- How can I add sounds to a tune to improve it?
- How can music be used to express feelings?
- How can I upload a sound from the sounds section?
- How can I record my own sound?

Modelling and simulations Teaching Sequence:

Learning Journey – Modelling and simulations
- How can I control the outcome of a game?
- What happens if I try playing the game in a different way?
- How can I create my own model of an object?
- How can I create my own game?

Coding/algorithms (1.7/2.1 Coding) Teaching Sequence:
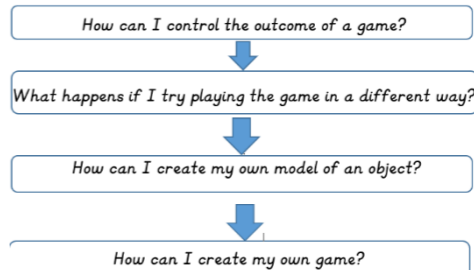
Learning Journey – Coding
- How do computer programs work?
- What is an algorithm?
- How do I code?
- What is debugging?
- Can I solve a problem in coding?
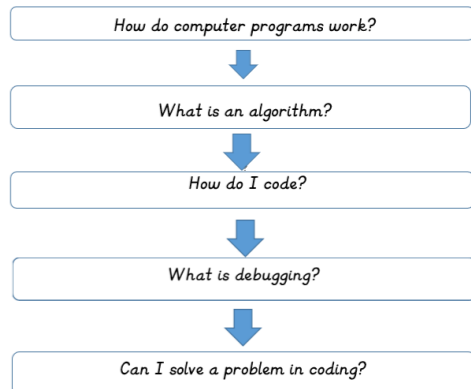
Key Stage Two

National Curriculum:
Pupils should be taught to:

- design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems; solve problems by decomposing them into smaller parts ⬚ use sequence, selection, and repetition in programs; work with variables and various forms of input and output
- use logical reasoning to explain how some simple algorithms work and to detect and correct errors in algorithms and programs
- understand computer networks including the internet; how they can provide multiple services, such as the world wide web; and the opportunities they offer for communication and collaboration ⬚ use search technologies effectively, appreciate how results are selected and ranked, and be discerning in evaluating digital content
- select, use and combine a variety of software (including internet services) on a range of digital devices to design and create a range of programs, systems and content that accomplish given goals, including collecting, analysing, evaluating and presenting data and information
- use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact.

As we are a First School, our pupils complete Key Stage 2 at another setting. Where we cannot guarantee units will not be covered more than once as children move to other settings in Year 5, we have aligned our curriculum as best we can to see the recommended parts of the curriculum for upper KS2 be taught in Years 5 and 6 following our scheme Purple Mash. Our skills based curriculum means that skills are built upon in every unit.

Skills progression end points:

Area	By the end of Year 4
Text and Multimedia	Record and present information integrating a range of appropriate media combining text and graphics in printable form and sound and video for on-screen presentations which include hyperlinks. Begin to show an awareness of the intended audience and seek feed-back.
Digital Images	Manipulate digital images using a range of tools in appropriate software to convey a specific mood or idea.
Sound and music	Create a simple podcast, selecting and importing already existing music and sound effects as well as recording their own.
Electronic Communication	Begin to understand the need to abide by school e-safety rules.
Research and E Safety	Using another curriculum area as a starting point, children ask their own questions then use ICT sources to find answers, making use of search engines, an index, menu, hyperlinks as appropriate. Children use the information or resources they have found. Children talk about using ICT to find information / resources noting any frustrations and showing an emerging understanding of internet safety.
Control (algorithms)	Children are able to type a short sequence of instructions and to plan ahead when programming devices on and off screen.
Handling information (databases and graphs)	Children use a simple database (the structure of which has been set up for them) to enter and save and save information on a given subject. ⬚ They follow straight forward lines of inquiry to search their data for their own purposes. ⬚ They talk about their experiences of using ICT to process data compared with other methods.
Modelling and simulations	Use models and simulations to find things out and solve problems. Recognise that simulations are useful in widening experience beyond the classroom. ⬚ Make simple use of a spreadsheet to store data and produce graphs.
Understanding Technologies	**Individual** - Begin to show discernment in their use of computing devices and tools for a particular purpose and explain why their choice was made. **Networks** - Show an understanding that their password is the key to accessing a personalised set of resources and files (e.g. My Documents). ⬚ Show an awareness of where passwords are critical in everyday use (e.g. parents accessing bank details) **The internet** - Show an awareness that not all the resources/tools they use are resident on the device they are using. ⬚ Begin to show an understanding of URLs.
Data logging	Begin to use a data logger to sense physical data (sound, light, temperature).

Vocabulary progression:

	Year 3 and 4
Text and Multimedia	Media, hyperlink, timings, animation, text box, slideshow, border, font, audience
Digital Images	Manipulation, tools, scan, digital images, software, mood, idea
Sound and music	Podcast, soundtrack, compose, tempo, bars
Electronic Communication	SMART rules, Appropriate / inappropriate, personal information, internet, permission, reputable / reliable source, permission, password, spoof, cookies, copyright, plagiarism, spam, virus, phishing, malware, digital footprint
Research and E Safety	Search engine, results page, reliability, keywords, internet, balanced view
Control (algorithms)	Algorithm, alert, button, background, command, sequence, programming, Logo, procedure, pen down, pen up, prediction, grid, multi-line mode
Handling information (databases and graphs)	Debugging, data, database, binary tree, graph, axis, chart, row, column, sorting, tally chart
Modelling and simulations	Analysis, modelling, simulation, evaluation, decision
Understanding Technologies	Website, forward/backward button, hyperlinks, resources, device, URL
Data logging	Data, sound, temperature, light, record

	Continuous learning: These areas of learning will be taught and studied continuously through KS2 through continuous provision and daily access to resources and activities.	**Research and E-safety** – to look for information online safely – linked to research in other subjects. **Understanding technologies – to show a growing understanding of their individual use of networks and the internet** – to be taught through the use of IT across the curriculum				

Teaching Sequences:

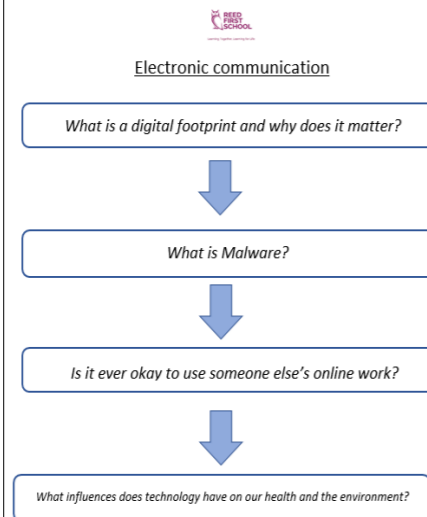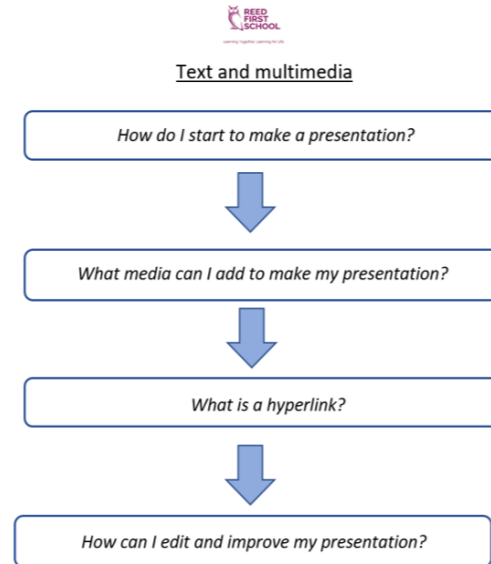|	**A Year:** These units of work will be taught as a topic in the A Year to ensure curriculum coverage in our mixed age classes.	**Unit: Unit: Electronic communication (3.2 online safety) Teaching Sequence:**	**Unit: Modelling and simulations (3.7 simulations) Teaching Sequence:**	**Unit: Digital images – to manipulate images to convey a mood or idea Teaching Sequence:**	**Unit: Control (algorithms) (3.1 coding) Teaching Sequence:**	**Unit: Control algorithms) (4.5 Logo) Teaching Sequence:**
Lower Key Stage Two		Electronic communication How do I make a safe password? ↓ Can I believe everything on the internet? ↓ What is an age restriction and why are they important?	Modelling and simulations What are simulations? ↓ How are simulations useful in real situations? ↓ What should I consider when evaluating a simulation?	Digital images How can I manipulate a digital image? ↓ What makes a good animated film? ↓ How are animations created by hand? ↓ How can I use 2Animate to create my own animation? ↓ What is onion skinning in animation? ↓ How do I add sounds and backgrounds? ↓ What is stop motion animation?	Control (algorithms) What is a flowchart and how is it used? ↓ Why are there different types of timers? ↓ How do I use the repeat command? ↓ How do I debug my program? ↓ Can I use my knowledge to create an interactive scene?	Control (algorithms) part 2 What are the common instructions in 2Logo? ↓ How do I create shapes? ↓ What can I use the repeat command for? ↓ What does it mean to build a procedure?

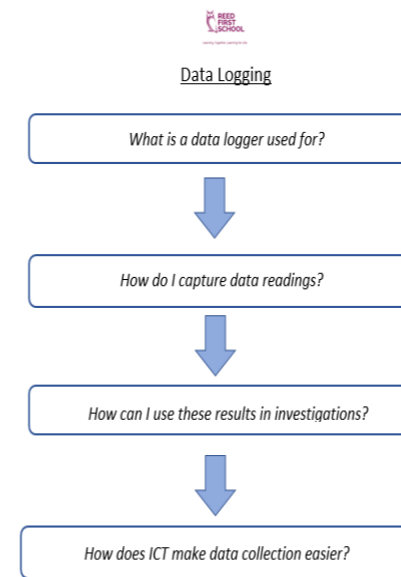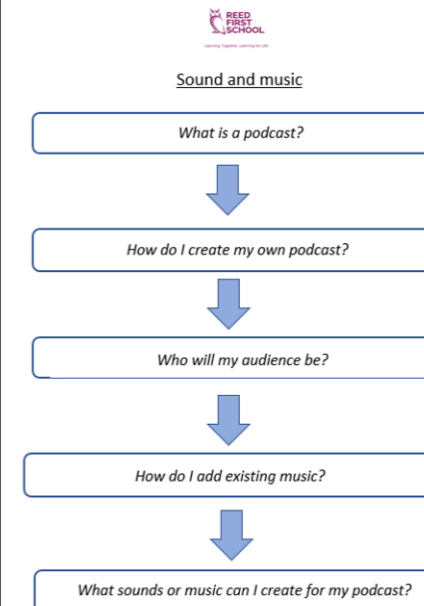| **B Year:** These units of work will be taught as a topic in the A Year to ensure curriculum coverage in our mixed age classes.	**Unit: Electronic communication (4.2 online safety) Teaching Sequence:**	**Unit: Text and multimedia (3.9 presenting with ppt/Google Slides) Teaching Sequence:**	**Unit: Data Logging – to log physical data Teaching Sequence:**	**Unit: Sound and music Teaching Sequence:**	**Unit: Handling information (databases and graphs) (3.6 branching databases & 3.8 graphs) Teaching Sequence:**
	Electronic communication	Text and multimedia	Data Logging	Sound and music	Handling information (databases and graphs)
	What is a digital footprint and why does it matter?	How do I start to make a presentation?	What is a data logger used for?	What is a podcast?	Why are yes/no questions helpful?
	What is Malware?	What media can I add to make my presentation?	How do I capture data readings?	How do I create my own podcast?	What is a branching database?
	Is it ever okay to use someone else's online work?	What is a hyperlink?	How can I use these results in investigations?	Who will my audience be?	How do I debug my database?
	What influences does technology have on our health and the environment?	How can I edit and improve my presentation?	How does ICT make data collection easier?	How do I add existing music?	How is data added to a graph?
				What sounds or music can I create for my podcast?	Which is the most appropriate style of graph for my data?