Medium Term Plan

Year 3 Computing Overview

	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Strands	Computing Systems & Networks 1	Programming	Computing Systems and Networks 2	Computing Systems and Networks 3	Creating Media	Data Handling
Topic	Networks and the Internet	Scratch	Emailing (G/MO)	Journey Inside a Computer	Video Trailers 1/2	Comparisons cards databases (G/MO)

Key Stage 2 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.

Computing Strand & Link to National Curriculum	Progression of Knowledge	Learning Objectives & Skills Progression	Hardware & Software	Cross Curricular Links	Key Vocabulary

Computing Systems and Networks 1 - Networks and the Internet
 	
✓ 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
	▪ to understand what a network is and how a school network might be organised.
	▪ To know that a server is central to a network and responds to requests made.
	▪ To know how the internet uses networks to share files.
	▪ To know that a router connects us to the internet.
	▪ To know what a packet is and why it is important for website data transfer.
		▪ Learning about the purpose of routers.
		▪ Understanding the role of the key components of a network.
		▪ Understanding that websites and videos are files that are shared from one computer to another.
		▪ Learning about the role of packets
		▪ Understanding how networks work and their purpose.
		▪ Identifying the key components within a network, including whether they
			Cameras, Ipads, laptops,	• English
				   o Spoken Language
				• RSE
				   o Online Relationships
				• Maths
				   o Measurement, Statistics.
					•

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.		are wired or wireless. ▪ Recognising links between networks and the internet. ▪ Learning how data is transferred.		
Lesson	Success Criteria	Lesson Outline	Differentiation and Key Questions	Key Vocabulary
Lesson 1 -	• To understand what a network is and understand our school network • I can explain the purpose of a network	explain that, as a class, the children are going on a 'network safari' around the school. Put the children into groups of two or three. Ask the children if they know what a network is and what it's for? (A group of	**Pupils needing extra support:** Focus on what a network is over other success criteria. **Pupils working at greater depth:** Should explain clearly what a network is and why they are useful in their posters, as well as using appropriate images and layout.	• Network • Wired • Wireless • WiFi • Device • Internet • Component • Laptop • Tablet • Desktop • Printer • Photocopier

	• I can name the key parts of network • I can identify which components are connected • I can explain which connections are wired or wireless	connected computers that can communicate with each other and share resources.) The children should take cameras/tablets with them to take photos of devices that they think are connected to the school network, such as laptops, tablets, desktops, printers, photocopiers, server, network switch or wireless access points. They children may need some help and advice on how to locate some of the more difficult to find devices. Explain that when they return we will look at all of the devices they have found and discuss what they are and what jobs they do as part of the school network.	**Key Questions:** • Why would it be useful for laptops to be connected? • Why would it be useful if my computer were connected to that of another teacher? • Why is it useful to have these devices connected? • What would you do if they weren't connected? (If the computer wasn't connected to the printer or photocopier, it wouldn't be able to print anything.) • Why do we need to connect two computers together? • What could we do with two computers connected? • What other devices do you think are on our network?	• Server • Network switch • Wireless access points • Network map Router

Lesson	Success Criteria	Lesson Outline	Differentiation and Key Questions	Key Vocabulary
		Children will then create posters based on how connected the school is.	• Why can't you see wires connected to a laptop? • What is the device called? • What is the device for? • How does the device connect to the network? • Is the device wireless or wired? • What is a computer network? • What is it for? • What devices are connected to our network? • Why are they connected to our network? • Are they connected wirelessly or do they use wires? • What's a server for? • What's connected to the network switch? • Is that a router?	

Lesson 2	• To understand how information moves around a network and begin to recognise real world networks • I can explain what a server does • I can suggest what a server is connected to • I can discuss the journey of a file • I can recognise real world networks.	Repeat this file journey a few times from different devices using different volunteers. You could always show or hand out a printed copy of *Activity: Network map* for clarification if any children need further support. If children are confident, request that they get the headteacher's 'secret file' from the server. When the child asks the server for it, the server should ask for a password, then they must go back to the laptop to request the password, before returning with the password allowing them to get the file. Recap the previous lesson's learning on what a network is (i.e. a group of connected computers that can communicate with each other and share resources). Explain that so far we have talked about the school network, but actually, networks are all around us. On each table, put a copy of the *Activity: Network situations*. Ask the children to write their answers to the following questions around the pictures:	**For pupils needing extra support:** Could look at one of the traffic lights and scan-as-you-shop situations as these are slightly easier to understand. **Pupils working at greater depth:** Could be asked to consider how any problems that may occur are dealt with in a network, for example there is not enough money in the bank account to fulfill the withdrawal request, someone has put an item in the baggage area before scanning it, etc. **Key Questions:** • What is a [server, wireless access point, network switch] for? • What is a file? • How are the network devices connected? • Where would files be saved? • Which devices are connected wirelessly?	• Network • Server • File • Wired • Wireless • Router • Network switch • Wired • Device • Network

Lesson	Success Criteria	Lesson Outline	Differentiation and Key Questions	Key Vocabulary
		You could rotate the sheets around for other groups to look at/add to, or have each group focusing on one real-world network before sharing their ideas with the rest of the class.	- Where would your file request have to travel to reach the server? - What would happen if there was a password set on it? - What computers/devices are in this network? - How does it work? How do people use it? - What information could be being sent through the wires? - What is a network? - What devices can you see in this network? - What did the school network do? - What information do you think is being passed around? - How do people use this network? - What do you think happens next?	

Lesson 3	• To understand how the Internet works and explain a website's journey • I can explain what the internet is • I understand that the computer I use is connected to the internet via a router • I know that computers have to locate websites • I recognise a website is just a file saved on a computer	Explain to the class that they are going to create a map showing how to retrieve a video from the YouTube website using the internet. They will then use this in the next lesson to retell the journey, without support, so they need to make sure that their map is clear and easy to understand. Show the children this depicting the journey of a request to the YouTube server. At each stage, stop and ask the children to draw and label the next part of their map.	**For pupils needing extra support:** reduce the number of steps in the process by just focusing on being passed from router to router. It could be more accessible to act this out in a small group. **Pupils working at greater depth:** discuss what would happen if you closed the laptop before the page had loaded or if you clicked another link. They should use logical reasoning to conclude that parts of the website would get lost trying to find a computer that was no longer there. **Key Questions:** • How the school network works. • About the key components e.g. wired and wireless access points, server and network switch. • What does the word 'internet' mean? • How does the internet work?	• Website • Computer • Connection • File • Video • YouTube • Screen • Web server • Data • Text map • Phone line • Wires • Copper • Electrical pulse • Fibre • Cables • Wireless connection • Radio waves

| | | | • Why are the wires under the sea?
 • How long have the wires been under the sea? | |

Lesson	Success Criteria	Lesson Outline	Differentiation and Key Questions	Key Vocabulary
Lesson 4	• To explore the role of routers • I understand the purpose of a router • I can explain how a website reaches my computer • I can suggest which websites will have more/less jumps	Referring back to the previous lesson, ask children to describe the journey of a website to their partners. Remind them about the maps they created showing the journey of a webpage. When they have finished, share as a class and recreate the journey that they describe on the board as this understanding sets up the lesson. Traceroute is a diagnostic tool used to track the pathway taken by a packet on an IP network from source to destination and the time taken for each jump that the packet makes. Show a visual traceroute website such as then enter a website address in the box such as and select 'Trace'. It may take a few seconds for it to reach the original server. Scroll down and you will see a	**For pupils needing extra support:** Reduce the number of websites they will explore. **For pupils working at greater depth:** Should be encouraged to make conclusions independently before the class discussion. **Key Questions:** • Why is it useful if these two schools are connected? • How could they do this if they're thousands of miles away? • How can we connect networks together? • Which was the fastest? Slowest?	• Router • Network • Internet • Server • Packet

		map and a list showing all the routers (or 'hops') that the request passed through while looking for the website. The example above shows that it took an average of 32 milliseconds (thousandths of a second) and seven hops to reach the BBC server hosted in the US by Fastly.	• Was there a difference between .co.uk and .com? • Which had the most jumps? • Did any have more jumps than others but were quicker? • Did any surprise you?	
Lesson	Success Criteria	Lesson Outline	Differentiation and Key Questions	Key Vocabulary
Lesson 5	• To understand the role of packets • I can explain that routers connect together to send information • I can understand that websites are too big to send whole	During this lesson the children are going to be acting as 'routers'. Hand out the *Activity: Packet sheets* which are messages cut up into individual packets – most children will want to write two or three.	**Pupils needing extra support:** Might need reminding of what to do when they receive a packet. **Pupils working at greater depth:** Should remind others of the importance of 'time to live'. **Key Questions:** • Why can't websites be sent as a whole? • What is a packet? • Why is it useful that packets are numbered? • What information does a packet need to have?	• Packets • Routers • Connect • Information • Websites • Route • Website • Homepage • Storage • Smart devices • Phones • Tablets

	• I can recognise that each packet will take its own route			• Can you suggest how we could make putting the puzzle back together more efficiently? • Why do packets have a 'time to live' number? • What would the internet do if a wire disconnected? • What happens if a packet never reaches its destination? • What have you found surprising or interesting during this topic?	• Corrupted • Server • World Wide Web

Computing Strand & Link to National Curriculum	Progression of Knowledge	Learning Objectives & Skills Progression	Hardware & Software	Cross Curricular Links	Key Vocabulary

| Programming - Scratch | - To know that Scratch is a programming language and some of its basic functions.
- To understand how to use loops to improve programming
- To understand how decomposition is used in programming.
- To understand that you can remix and adapt existing code. | - Using decomposition to explore the code behind an animation.
- Using repetition in programmes.
- Using logical reasoning to explain how simple algorithms work.
- Explaining the purpose of an algorithm.
- forming algorithms independently.
- Using logical thinking to explore more complex software; predicting, testing and explaining what it does. | Laptops/computer connected to the internet. | - English
  o Spoken language
  o Writing compoosition | Algorithm Animation
Application Code
Code block Coding application
Debug Decompose
Interface Game
Loop Predict
Program Remixing code
Repetition code Review
Scratch Sprite
 Tinker |

		- Incorporaing loops to make code more efficient. - Continuing existing code. - Making reasonable suggestions for how to debug their own and others' code.			
Lesson	Success Criteria	Lesson Outline		Differentiation and Key Questions	Key Vocabulary
Lesson 1	• To explore a programming application • I know that Scratch is a coding application • I can predict what I think differe	Children familiarise themselves with 'Scratch': predicting, exploring and explaining as they go, then learn how to create 'sprites' and 'tinker' to explore the functionality of the different blocks avail		**Pupils needing extra support:** This lesson is about exploration at whatever level they can access. Teachers/TAs supporting the pupil could vocalise the actions the child is doing/did to reinforce concepts of cause and effect, eg: "You used this change colour block and it made x happen".	• Tinkering • Programming application • Coding application • Code • Application • Interface • Sprite • Review • Predict

	nt codes will do • I can explore an application independently • I can explain what I found		**Pupils working at greater depth:** Should be encouraged to use blocks from three different colour groups. **Key Questions:** • What happens when you add block x? • How did you make that happen? • Can you change what happens when you use that block? • Which block matched which action? • Do any of the blocks work together?	

Lesson	Success Criteria	Lesson Outline	Differentiation and Key Questions	Key Vocabulary
Lesson 2	• To use repetition (a loop) in a program • I can understand and explain	Using Scratch, children create musical instruments using either the 'sound' blocks, real musical notes or by selecting sounds from the library, using	**Pupils needing extra support:** Reduce the number of sprites they're working with. Focus on one loop such as 'repeat forever'. **Pupils working at greater depth:** Add	• Repetition • Loop • Programme • Code

		what a loop is	'loops' to create the repetition found in most music pieces	visual effects to how a sprite looks when it's playing, so we know which have and haven't been clicked.	
		• I can recognise when a loop is used		**Key Questions:**	
		• I can choose an appropriate loop		• How do you start the program?	
				• What will happen when you press x? etc.	
				• What is a loop? What does it do? (A loop is a part of a program that repeats a section of code.)	
				• What do you think will be different about the piece of code which runs when you press the 'down arrow'? When will this stop?	
				• What about the final script, which begins when you press the 'up arrow'? When will this stop?	

			- Why are loops useful in music? - Why would we want to use a loop? (We use loops to stop us wasting time writing the same thing lots of times.) - Why did you use loop x instead of loop y? (For example: I use 'repeat until' when brushing my teeth because I wanted to brush them until they were clean. I use repeat 15 times for climbing stairs in my house because I know I have 15 stairs.) - How does using a loop improve your programming? (You're less likely to make mistakes if you write less. You also save time.)	

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Lesson	Success Criteria	Lesson Outline	Differentiation and Key Questions	Key Vocabulary
Lesson 3	• To program an animation • I can decompose a project • I can plan what I want to happen • I can select the blocks to make that happen	Children 'remix' an animation and make it their own by altering the program's code, following a set of challenges or suggested alterations to the animations	**Pupils needing extra support:** If children struggle to know how to make the three changes to the animation you suggested, use the *Activity: Challenge answers* for reference so that you can guide them towards the blocks they need to make these changes. **Pupils working at greater depth:** Choose more complex suggestions, e.g. rock bouncing off the monkey, for these children to focus on. Encourage children to use block 'tips' independently. **Key Questions:** • What is an animation? • What blocks do you think are being used?	• Animation • Program • Decompose • Plan • Coding blocks • Remixing code

			• Where do you think that's being used? • Why have you chosen to use that block? • What are you trying to add? How are you going to do that? • Is copying someone else's work from the internet a good thing to do? • What changes could you make to the animation that's there? • Who would like to share their project? • Can you match the changes to the code? • What's different? • How has that person made the animation different?	

Lesson	Success Criteria	Lesson Outline	Differentiation and Key Questions	Key Vocabulary
Lesson 4	• To program a story • I can choose appropriate blocks • I can continue someone else's program • I can debug my own program	After practicing how to debug code independently, pupils consider the plot in the animation 'Storytelling', then remix it to complete the story by creating a middle and an end and adding speech	**Pupils needing extra support:** Work with an adult to first articulate first what they want to happen next. Then break down a small change to make together. Independently, pick the blocks to make this small change and then repeat. **Pupils working at greater depth:** Increase the complexity of the program by making other characters appear/disappear and adding sound effects. **Key Questions:** • How has this project been made? • What sprites will there be? • How many backdrops were there? • What do you expect to find	• Storytelling • Program • Debug • Animation • Remixing code • Sprite

Lesson	Success Criteria	Lesson Outline	Differentiation and Key Questions	Key Vocabulary
			when you look at the code?	
			• What has changed in the program?	
			• Where does something not make sense? Where is that in the code?	
			• What does block x do in your program?	
			• What would you do if you wanted to add a new character?	
			• What is it doing?	
			• Where is the code that makes it do that?	
			• What happens if you change one of the blocks?	
			• Does it do the same thing every time?	
			• What haven't you tried yet?	
			•	

Lesson	Success Criteria	Lesson Outline	Differentiation and Key Questions	Key Vocabulary

Lesson 5	• To program a game	After playing the game 'Robot Bop' children explain the action and algorithm behind it, then represent the code on paper before programming it into Scratch to replicate the original	**Pupils needing extra support:** Provide some of the code completed next to the algorithm to reinforce the link. This also provides a reduced number of blocks when matching the code to the second part of the algorithm.	• Program
	• I can explain the purpose of an algorithm		**Pupils working at greater depth:** Independently complete the challenges.	• Game
	• I can decompose a problem			• Algorithm
	• I can use an algorithm to code a program		**Key Questions:**	• Decompose
			• How does the game work?	• Code
			• What happens when I do x?	• Decompose
			• How long do the characters appear and disappear for?	• Coding blocks
			• Which blocks make that happen?	
			• What happened in the 'Robot Bop' game?	

				What happened when you clicked the green flag?	
				Where did the move to? Could you tell where they'd go next?	
				How many times did they keep appearing and disappearing?	
				What happened next in the game? What did you do to play it?	
				•	

Computing Strand & Link to National Curriculum	Progression of Knowledge	Learning Objectives & Skills Progression	Hardware & Software	Cross Curricular Links	Key Vocabulary

Lesson	Success Criteria	Lesson Outline		Differentiation and Key Questions	Key Vocabulary

Computing Systems and Networks 2 - Emailing	- To understand that email stands for "electronic mail".
	- To know that an attachment is an extra file added to an email.
	- To understand that emails should contain appropriate and respectful content.
	- To know that cyberbullying is bullying using electronics such as a computer or a phone.
		- Learning to log in and out of an email account
		- Writing an email including a subject, "to" and "from".
		- Sending an email with an attachment.
		- Replying to an email
		- Understanding the purpose of emails.
		- Learning about cyberbullying.
		- Learning that not all emails are genuine, recognising when an email might be fake and what to do about it.
				- English
				  o Writing - composition
				- RSE
				  o Online relationship.
					Attachment Bcc (Blind carbon copy)
					Cc (Carbon copy) Compose
					Content Cyberbullying
					Document Domain
					Download Email
					Email account Email address
					Emoji Emotions
					Fake Font
					Genuine Hacker
					Icons Inbox
					Information Link
					Log in Log out
					Negative language Password
					Personal information Positive language
					Reply Responsible digital citizen
					Scammer Settings
					Send Sign in
					Spam email Subject bar
					Theme Tone
					Username Virus
					   WiFi

Lesson	Success Criteria	Lesson Outline		Differentiation and Key Questions	Key Vocabulary

| Lesson 1 | • To understand what email is used for and to send an email

• I can log in and log out of my email account
• I can write an email to my teacher
• understand that emails can be used to send information around the world | Learning about what an email can be used for, practising logging in and logging out of an email account, writing and sending an email for the first time | **Pupils needing extra support:** Support pupils with typing their email address to log in. Make sure they have a printed copy of your email address.

Pupils working at greater depth: Encourage pupils to think about the questions they will ask the recipient of their email. Make sure they write more than one question

<u>**Key Questions:**</u>

• What is an email?
• Why do we use emails?
• What does being a responsible citizen mean?
• What is good about email as a form of communication?
• When do you think this form of communication was first used? | • Email
• Log in
• Log out
• Information
• Responsible digital citizen
• WiFi
• Image
• Video
• Sign in
• Username
• Domain
• Computer
• Email address
• Password
• Settings
• Theme
• Email account
• Composing an email
• Sending an email
• Subject bar |

Lesson	Success Criteria	Lesson Outline	Differentiation and Key Questions	Key Vocabulary
			• What are the pros and cons of each communication shown in the *Activity: Forms of communication*? • Why do you think it is important to keep your password a secret? • How do you send an email? • What is an email address made up of? • What should you do if your recipient does not receive your email?	
Lesson	Success Criteria	Lesson Outline	Differentiation and Key Questions	Key Vocabulary
Lesson 2	• To edit email content and add an attachment	Learning how to send an email and how to make them more interesting by using editing features and adding attachments	**Pupils needing extra support:** Can be supported with navigating two tabs at once for email and image searching. Encourage children to keep their email short so	• Email • Content • Attachment • Email account • Reply • Log in • Inbox • Link

	- I can log in to my email account - I can send an email with an attachment - I can reply to an existing email		that they can focus on editing the content. **Pupils working at greater depth:** Ask pupils to use the hyperlink button to create a link to a website. **Key Questions:** - What is an 'icon'? - What is an email 'attachment'? - Why do we use an email 'attachment'? - What types of things can you attach to an email? - How would the tone of your email change depending on who you send it to? - What else did you do to your emails? - Did you change the colour of	- Content - Information - Document - Adding an attachment - Icons - Font - Emoji - Spam email - Copyright

			writing? The size or font? - Did anyone use lots of emojis? - What are 'spam' emails?	
Lesson	Success Criteria	Lesson Outline	Differentiation and Key Questions	Key Vocabulary
Lesson 3	- To understand the importance of being kind online and what this looks like - I understand how to use positive language within an email - I am able to recognise when digital behaviour is unkind - I know how to be a	Learn the art of using positive language within an email and how to recognise when digital behaviour is unkind	**Pupils needing extra support:** Provide pupils with the *Activity: Positive phrases* or have the Classroom resources from the to hand. You should also support pupils with copying the teacher into their email. **Pupils working at greater depth:** Encourage pupils to use a range of skills that were introduced during the previous lesson, for example, editing the text, adding images and putting in hyperlinks. **Key Questions:** What do they notice about how you are speaking?	- Tone of voice - Body language - Positive language - Negative language - Emotions - CC - BCC

Lesson	Success Criteria	Lesson Outline	Differentiation and Key Questions	Key Vocabulary
	responsible digital citizen when I encounter others online		• How can you tell which emotion your partner is expressing? • What did the Tiger do that was wrong? • Why do you think the Tiger said mean things? (Because he felt that he could get away with it because no one knew who he really was.) • What do you think you should do if someone is unkind to you online? (Tell an adult that you trust about it.) • What does 'cc' and 'bcc' mean? • Why might you want to 'blind copy' someone into an email?	
Lesson	Success Criteria	Lesson Outline	Differentiation and Key Questions	Key Vocabulary

| Lesson 4 | • To understand that cyberbullying involves being unkind online

• I can recognise unkind behaviour and know how to report it
• I can be a responsible digital citizen
• I can offer advice to support other people who are victims of cyberbullying | Learn to use positive language within an email and how to recognise when digital behaviour is unkind. | **Pupils needing extra support:** Consider pairing pupils of mixed ability to support pupils of lower ability.

Pupils working at greater depth: Encourage to think carefully about what we mean by cyberbullying and how to avoid doing it themselves.

Key Questions:
• How do you think this person felt when this was said to them?
• Do you think the person who said this intended to upset their friend?
• What types of things does he do to try and persuade Alfie to play with him? (He starts by offering Alfie 'gamer points' then threatens | • Cyberbullying
• Online
• Responsible
• Digital citizen
• Advice
• Email account
• Email
• Reply
• Username
• Decision tree
• Flowchart |

			Alfie with embarrassment) • Why doesn't Alfie like Sam at the beginning of the video? (Because Sam had 'liked' a mean post about Alfie on his gamer videos) • What should you do if someone is unkind online? (Discuss different ideas for who to speak to and what to do) • What does Alfie do in the video? (He speaks to his mum, who recommends that he blocks the gamer and notifies an administrator [admin user])	
Lesson	Success Criteria	Lesson Outline	Differentiation and Key Questions	Key Vocabulary
Lesson 5	• To understand	Investigate and explore 'spam', 'junk' and	**Pupils needing extra support:** Keep the *Presentation: Fake*	• Email • Genuine

	that not all emails are genuine • I can recognise when an email might be fake • I understand that I shouldn't click on links in an email unless I know what it is • I know what to do if I suspect an email is fake	'phishing' emails and how to avoid being tricked by fake emails as not all emails are honest and trustworthy	*emails* visible on the board or print out slides for them to refer to during the lesson. **Pupils working at greater depth:** Encourage pupils to think carefully about different ways that fake emails can be introduced. **Key Questions:** • How can you tell whether something is real or fake? • Were there any clues? •	• Fake • Link • Email account • Information • Personal information • Email address • Install • Virus • Computer • Attachements • Scammer • Hacker • Download • Mark it as spam • Spam email

Computing Strand & Link to National Curriculum	Progression of Knowledge	Learning Objectives & Skills Progression	Hardware & Software	Cross Curricular Links	Key Vocabulary	
Computing Systems and Networks 3 - Journey Inside a Computer	- To know the roles that inputs and outputs play on computers. - To know what some of the different components inside a computer are, eg, RAM, CPU, hard drive, and how they work together. - To know what a	- understanding what the different components of a computer do and how they work together. - Drawing comparisons across different types of computers. - Using decomposition to explain the parts of a		- English ○ Spoken language - D&T	Algorithm CPU (central processing unit) Decompose Disassemble Hard drive Infinite loop Keyboard Memory Monitor Output Program RAM (random access memory) Storage Technology	Assemble Data Desktop GPU (graphics processing unit) HDD (hard disk drive) Input Laptop Microphone Mouse Photocopier QR Code ROM (read only memory) Tablet device Touchscreen Touchpad

		tablet is and how it is different from a laptop/deskt op computer.	laptop computer. - Explaining the purpose of an aogorithim.		

Lesson	Success Criteria	Lesson Outline	Differentiation and Key Questions	Key Vocabulary
Lesson 1	• To recognise basic inputs and outputs • I recognise some inputs and outputs • I understand that a computer	Learning about the different forms of inputs and outputs and their functions, pupils develop their understanding that computers follows instructions	**Pupils needing extra support:** Try using a desktop computer where they can experience plugging/unplugging the different peripherals. **Pupils working at greater depth:** Should include more detail on their posters about what happens when a key is pressed/mouse is clicked. What information is sent? Where is it received? They	• Input • Output • Computer • Monitor • Keyboard • Mouse • Computer • Data • Program

	follows instructions • I can suggest what the computer is doing		should also consider other forms of input and output **<u>Key Questions:</u>** • What does a keyboard/mouse/scr een look like? • Why have some people drawn different types? • Are both types of mouse the same? Do they do the same thing? • What does a keyboard/mouse/scr een do? What's it for? • What's an input? • What's an output? • Why does a computer need inputs and outputs? • What happens inside the computer when you move the mouse? • What happens inside the computer when you click on something?	

Lesson	Success Criteria	Lesson Outline	Differentiation and Key Questions	Key Vocabulary
Lesson 2	• To decompose a laptop • I can suggest a laptop's inputs and outputs • I recognise a laptop is made up of many parts • I can use logic to explain the purpose of some parts	To consolidate their understanding of the different components of a computer, children build a paper version of a laptop, describing the purpose of the various parts	**Pupils needing extra support:** Should focus on the definitions of the CPU and hard drive as these are most straightforward. **Pupils working at greater depth:** Should concentrate on the interactions between the parts through questioning and discussion. <u>**Key Questions:**</u> • What is an input? • What is an output? • Can you explain what they do? • Can you give examples? • What is inside a laptop? • Are there any inputs and outputs on the laptop that weren't on the desktop computer? • What else is inside a laptop? • How are all of those things connected?	• Input • Output • Desktop computer • Laptop • Mouse • Monitor • Keyboard • Microphone **CPU** – is the processor. It's very smart and fast at calculating things and bossy, telling the other components what to do. **Hard Drive** – is slow, but keeps good care of your pictures and games. **RAM –** remembers all immediate things and runs between the CPU and the hard drive but it forgets everything once the computer is shut down. **ROM** – remembers all the important things and stuff that you don't want to accidentally remove or have disappear when the computer is shut down. **GPU** – shows things on the computer screen, but has a bad memory and needs help from ROM and RAM.

Lesson	Success Criteria	Lesson Outline	Differentiation and Key Questions	Key Vocabulary
Lesson 3	• To understand the purpose of computer parts • I can explain that a computer is made up of many parts • I can suggest the purpose of each part • I can follow an algorithm	Mimicking the CPU and GPU, children work in groups to create a giant piece of artwork by closely following an algorithm	**For pupils needing extra support:** Use pictures such as those in the 'Hello Ruby' book to allow simpler identification of the parts of a computer. **Pupils working at greater depth:** Should be encouraged to make links with the unplugged activity and the 'real' transition that takes place. **Key Questions:** • What do CPU and GPU do? (CPU gives instructions and GPU displays the instructions on the screen.) • Why were they following an algorithm? • What is it? • What did this have to do with computer parts?	• Algorithm • CPU • GPU • Infinite loop

Lesson	Success Criteria	Lesson Outline	Differentiation and Key Questions	Key Vocabulary
Lesson 4	• To understand the purpose of computer parts • I can explain that a computer is made up of many parts • I can suggest the purpose of each part • I can use a QR code	Pupils take part in a number of different games to develop their understanding of the purpose of the various parts of a computer, including the ROM, RAM and hard drives	**For pupils needing extra support:** You may need to reduce the number of pairs of cards and they might need answers to the scavenger hunt so that they can match the answers to each clue. **Pupils working at greater depth:** Should explain connections between the different parts of the computer. **Key Questions:** • What parts do you recognise in the video? • What is memory for? • Why do computers have memory? • Where was that card before? • Why does CPU need memory?	• QR code • Components • Assemble • Disassemble • Memory • Hard drive • ROM • RAM
Lesson	Success Criteria	Lesson Outline	Differentiation and Key Questions	Key Vocabulary

| Lesson 5 | • To decompose a tablet computer

• I recognise a tablet is a computer
• I can compare similarities and differences across different types of computer
• I can use logic to suggest what's inside a computer | Building on their understanding of computer parts from Lesson 2, children compare the similarities and differences between different types of computers before drawing a diagram of a tablet with all of its components | **Pupils needing extra support:** May benefit from a word bank of key terms for easier recognition.

Pupils working at greater depth: Should explain what the parts do and why they are important.

Key Questions:

• What does a tablet do?
• What is a tablet?
• What's the difference between a tablet and a laptop?
• What inputs can you recognise?
• Are there any outputs?
• What's inside a tablet? What's it for?
• Why does a tablet need that component?
• Can you remember the parts of a computer explored thus far?
• Which of these components do you | • Tablet
• Computer
• Laptop
• Desktop
• Decompose
• Disassemble
• Batteries
• Camera
• Microphone
• Speaker
• Touchscreen
• Input
• Output
• CPU
• GPU
• RAM
• ROM
• Hard drive
• Storage
• Technology |

			think are inside a tablet? • Does a tablet need a CPU?	

Computing Strand & Link to National Curriculum	Progression of Knowledge	Learning Objectives & Skills Progression	Hardware & Software	Cross Curricular Links	Key Vocabulary

Creating Media - Video Trailers	- To know that different types of camera shots can make my photos or videos look more effective. - To know that I can edit photos and videos using film editing software. - To understand that I can add transitions and text to my video.	- using logical thinking to explore more complex software; predicting, testing and explaining what it does. - Taking photographs and recording video to tell a story. - Using software to edit and enhance their video adding music, sounds and text on screen with transitions.		English - Reading - Writing - composition.	Application Camera angle Clip Cross blur Cross fade Cross zoom Desktop Digital device Dip to black Directional wipe Edit Film Film editing software Graphics Import Key events Laptop Music Photo Plan Recording Sound effects Storyboard Time code Trailer Transition Video Voiceover
Lesson	Success Criteria	Lesson Outline		Differentiation and Key Questions	Key Vocabulary
Lesson 1	• To plan a book trailer • I can describe the purpose of a book trailer	Pupils create a storyboard to plan their book trailers, identifying the key events in their chosen story.		**Pupils needing extra support:** Should use *Activity: Storyboard template A*, which contains question prompts.	• Plan • Trailer • Key events • Sound effects • Video • Film • Photos

	• I can pick out the key events in a story • I can plan a book trailer		**Pupils working at greater depth:** Should write the storyboard from the main character's perspective, rather than a third-party narrator. **Key Questions:** • What is the purpose of a book trailer? • Whose point of view is the trailer from? • How much of the story should you share in the trailer • What will make other children want to read that book? • What did you notice?	• Key Scenes • Storyline • Storyboard • Text • Voiceover • Music • Technology

			• How do sound effects and music change the overall effect of the video?	
Lesson	Success Criteria	Lesson Outline	Differentiation and Key Questions	Key Vocabulary
Lesson 2	• To take photos or videos to tell a story • I can frame shots differently to create the effect I want • I can use digital devices to record video or take photos	Using digital devices, pupils take photos and videos, framing their shots to achieve desired effects	**Pupils needing extra support:** would benefit from taking photos rather than filming so they can spend time carefully framing their shots. **Pupils working at greater depth:** should incorporate sound effects, voiceovers and music, considering how they will fit together and filming shots from different angles and distances. **Key Questions:**	• Filming • Photos • Digital devices • Video • Storyboard • Trailer • Voiceovers • Text • Sound effects • Music

			- What's the effect of each technique? - How does it make the audience feel? - What impressions does it give about characters, setting or story? - How do you think that person is feeling? - What mood is created with this shot? - What does it make you think? - How are you going to frame your shots? - Have you filmed or	

Lesson	Success Criteria	Lesson Outline	Differentiation and Key Questions	Key Vocabulary
			taken photos for every part of your storyboard?	
Lesson 3	• To edit a video • I can import videos and photos into film editing software • I can record sounds using digital devices • I can add sound effects and music to a video	Pupils import their footage from the previous lesson into film editing software and record and add sounds, music and voiceover to their video	**Pupils needing extra support:** should be encouraged to focus on importing their photos and getting them in the correct order. If it features in their plan, they can add a simple voiceover. **Pupils working at greater depth:** should incorporate music and sound effects into their video. **Key Questions:** • How is this book trailer effective? • What makes a successful	• Edit • Import • Video • Photo • Film editing software • Record • Sound • Digital device • Sound effects • Music • App • Tablet • Laptop • Desktop • Graphics • Time code

			book trailer? • What different effects can you create using WeVideo? •	
Lesson	Success Criteria	Lesson Outline	Differentiation and Key Questions	Key Vocabulary
Lesson 4	• To add text and transitions to a video • I can add text to my video • I understand what transitions are in film • I can incorporate different transitions in my video	Learning about different transition styles, pupils add transitions between the different shots in their videos as well as text on screen.	**For pupils needing extra support:** limit the number of transitions, sounds and images added to enable them to still achieve a finished piece **Pupils working at greater depth:** should include lots of transitions and text on screen. **Key Questions:** • What is a transition? • What do you understand	• Transition • Text • Crossfade • Cross blur • Cross zoom • Dip to black • Directional wipe • Storyboard

			by this word? • What does this transition make you think of? •	
Lesson	Success Criteria	Lesson Outline	Differentiation and Key Questions	Key Vocabulary
Lesson 5	• To evaluate video editing • I can explain what makes a successful video • I can explain what makes a successful book trailer • I can think about how I share book recommendations	Children evaluate their trailers against agreed class success criteria, articulating what makes a successful book trailer and discussing ideas for sharing book recommendations	**Pupils needing extra support:** should be encouraged to refer to the class success criteria when making discussion points. **Pupils working at greater depth:** should be encouraged to share ideas for the success criteria based on book trailers they have seen. If creating a Google Slide page, they can be challenged to include hyperlinks to the author's	• Evaluate • Video • Video editing • Transition • Sound effect

			page or other relevant websites. **Key Questions:** • Does the video give enough information without giving it away? • Does it include at least one transition, sound effect etc.? • Does it seem as though the sequence of scenes is in the right order? • Am I left wanting to read the book? • What makes a good video?	

			• What makes a successful book trailer? • What did you enjoy about this book trailer? • What do you think would make it better?	

Computing Strand & Link to National Curriculum	Progression of Knowledge	Learning Objectives & Skills Progression	Hardware & Software	Cross Curricular Links	Key Vocabulary
<u>Data Handling - Comparisons Cards Databases</u>	- To know that a database is a collection of data stored in a logical and structured and orderly manner. - To know that computer databases can	- Explain what is meant by "field", "record", and "data". - Compare paper and computerised databases.		Maths - Number and place value; statistics.	Categorise Category Chart Data Database Excel Fields Filter Graph Information Interpret PDF Questionnaire Record Representation Sort Spreadsheets

		be useful for sorting and filtering data. - To know that different visual representations of data can be made on a computer.	- Put values into a spreadsheet. - Sort, filter and interpret data in a spreadsheet. - Create a graph on Microsoft Excel. - Explain the purpose of visual representations of data. - Using logical thinking to explore more complex software; predicting, testing and explaining what it does. - Understanding the vocabulary associated with datbases: field, record, data. - Learning about the pros and cons of digital versus paper databases.			

		- Sorting and filtering databases to easily retrieve information. - Creating and interpreting charts and graphs to understand data.		
Lesson	Success Criteria	Lesson Outline	Differentiation and Key Questions	Key Vocabulary
Lesson 1	• To understand the terminology around databases • I know what field, record and data mean • I can compare numbers • I can scan a record for relevant information	Use 'Comparison cards' to understand and learn about the meanings of records, fields and data when working with databases	**Differentiation:** **Pupils needing extra support:** Give them values that they can put into their own Comparison card instead of calculating this themselves. Show *Activity: Labelled Comparison card* as a visual reminder of the terms used in the lesson. **Pupils working at greater depth:** Should consider a fair way of choosing a winner when there is no numerical data, e.g. compare the position in the alphabet of the starting letter,	• Records • Fields • Data • Information • Spreadsheet • Database • Catergory

compare the number of letters etc.

Key Questions:
- What is a Comparison card?
- How can you compare two different values?
- Why are the fields the same across all of the Comparison cards in the set?
-

Lesson	Success Criteria	Lesson Outline	Differentiation and Key Questions	Key Vocabulary
Lesson 2	- To compare paper and computerised databases - I understand what a paper database is and can name examples - I understand what a computerised database is	Building upon the last lesson, learn about there being digital and non-digital databases and compare the advantages and disadvantages of both	<u>**Differentiation:**</u> **Pupils needing extra support:** could be given the *Activity: Labelled comparison card* as a visual recap of key vocabulary. **Pupils working at greater depth:** should be encouraged to create their own lists showing the advantages and disadvantages of paper vs.	- Computer - Databases - PDF - Excel - Spreadsheet - Data - Pros - Cons

	• I can compare the advantages and disadvantages of paper and computerised databases		computerised databases. **<u>Key Questions:</u>** • What is a database? (It is a data collection stored in a logical, structured and orderly manner – it doesn't have to be computerised.) • What is a paper database? • Can you think of any examples of paper databases? • Is a stack of Comparison cards a database? Why or why not? • What is a computerised database?	

			- Can you visualise what a computerised version of a Comparison cards database would look like? - Do they look similar or different to how you pictured them? - Why might it be useful to have this data on a computer? - What are the advantages and disadvantages of a computerised database? - Why do you think I was quicker at finding out the answer?	
Lesson	Success Criteria	Lesson Outline	Differentiation and Key Questions	Key Vocabulary

| Lesson 3 | • To sort, filter and interpret data

• I can input data into a database
• I know how to sort data
• I can filter data by a particular value
• I can create questions that can be answered using information from a database
• I can interpret information | Inputting data into a database, pupils then sort and filter the data by different values and create questions that can be answered using information from their database | **Differentiation:**
Pupils needing extra support: May benefit from creating a paper-based series of questions and keep it to a simple 'highest, lowest, fastest, slowest' style of question.

Pupils working at greater depth: Should be encouraged to type up their questions and explain why sorting and filtering are useful.

Key Questions:
• How can you sort the data to find the [e.g. fastest alien] quickly?
• How can we store this type of information on a computer to allow us to sort it out in a convenient way?
• Why would it be useful to | • Sort
• Filter
• Interpret
• Data
• Database
• Spreadsheet
• Questionnaire |

			sort data in this way?	
			• Why might you need to filter results?	
			• What information can we retrieve from seeing the results in this order?	
			• Can you suggest questions to add to the form?	
Lesson	Success Criteria	Lesson Outline	Differentiation and Key Questions	Key Vocabulary
Lesson 4	• To represent data in different ways • I can create a graph and chart in Microsoft Excel • I can name different types of charts • I understand the purpose of visual	Learn the art of representing data from a database in unique and visual ways, creating graphs and charts that can be used for data analysis	**Differentiation:** **Pupils needing extra support:** could create a simple chart for the whole data set and just experiment with changing the chart type, explaining which ones make the information easier to understand. **Pupils working at greater depth:** should	• Data • Representation • Charts • Graphs • Databases • Spreadsheet

| | | representations of data | | be creating charts for different sections of data and explain what this tells them. Encourage them to put the data into a real-world context.

Key Questions:
• What are graphs and charts for?
• Why might we show visual representations of data?
• What can you see from looking at the data in these forms?
• Do you think the graph or chart is useful or not? Why do you think this?
• Why might the different columns or sections display in different colours? | |

			• How does this help us to interpret it? • Why are all of the blocks or bars the same width? • What would happen if they weren't? • What would this tell us about the data? • Why do we have to be mindful of this when creating paper graphs and charts? •	
Lesson	Success Criteria	Lesson Outline	Differentiation and Key Questions	Key Vocabulary
Lesson 5	• To sort data for a purpose • I understand that databases are used for different purposes	Children put into practice the skills that they have learnt and sort and filter data to plan a holiday	<u>**Differentiation:**</u> **Pupils needing extra support:** Can be directed to a certain website and given a destination. Show them how to sort and filter the information by different fields.	• Plan • Sort • Database • Filter • Information • Online

	- I know how to sort and filter data - I can explain what information is useful in an online database		**Pupils working at greater depth:** Should conduct their own searches in order to find the best possible offers. **Key Questions:** - What is a database? - What are they used for? - Which online databases do you know about? - Why are online databases useful? - Why do they often look different to the spreadsheets we have been using? - What criteria must the holiday include?	