Medium Term Plan

Year 2 Computing Overview

	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Strands	Computer Network & Systems	Programming	Computer Systems	Programming	Creating Media	Data Handling
Topic	What is a Computer?	Algorithms and Debugging	Word Processing	Scratch Jnr.	Stop Motion	International Space Station

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.

Computing Strand & Link to National Curriculum	Progression of Knowledge	Learning Objectives & Skills Progression	Hardware & Software	Cross Curricular Links	Key Vocabulary
What is a Computer – **Computer Network** Pupils should be taught to: • Recognise common uses of information technology beyond school • Use technology purposefully to create, organise, store, manipulate and retrieve digital content •	• To know the difference between a desktop and laptop computer. • To know that people control technology. • To know some input devices that give a computer an instruction about what to do (output) • To know that computers often work together.	• To recognise the parts of a computer • To recognise how technology is controlled	Sketch Pad Word Processor Web Browser iPads	English: Speaking and Listening Pupils should be taught to: • use relevant strategies to build their vocabulary • maintain attention and participate actively in collaborative conversations, staying on topic and initiating and responding to comments	• Computer • Desktop • Laptop • Mouse • Monitor • Buttons
Lesson		Success Criteria	Lesson Outline		Differentiation & Key Questions

Lesson 1		I can name the key parts of a computer I can explain that a keyboard contains lots of buttons I can explain the purpose of different computer parts	Ensure the children are confident with the parts of a computer that they are describing. If they need further practice, get out the children's laptops and play the 'spotting' game... the first one to point to... The keyboard The thing that shows us what the computer is doing? The thing that lets us write? The mouse? etc. Re-introduce the success criteria and explain that the children are going to demonstrate their knowledge of different parts of a computer by drawing them on a computer program. Model how to draw a computer using a program such as Microsoft Paint or 'Sketchpad' (which pupils may be familiar with from Year 1 *Getting Started*). Remind the children how to	**For pupils needing extra support:** Regularly reiterate new vocabulary and get them to repeat it back. They can use post-it notes to support their spelling. **Pupils working at greater depth:** Should annotate their drawings, describing what the mouse, keyboard and screen do and explain that an iPad doesn't need a mouse because

			change colours, paint and rub out and, depending on their previous experience, you may also want to show them the brush size tool. Slide 6: towards the end of the lesson, get the children sharing their drawing with their partner and pointing out where they drew the mouse, keyboard and screen. It is a good idea to print out these pictures so that children can refer to them as reminders throughout the topic.	it has a touch screen and keyboard built into the screen. **Key Questions** - What does the word peripheral mean? - Why are there so many? - What's the purpose of a screen? - Does a computer work without a screen?

				• Why do I have an interactive whiteboard (IWB) and a screen on my laptop? • Why does a mouse have two buttons? How do you move it around?
Lesson 2	•	• I know that people control technology • I know that technology follows instructions • I can predict what technology will do	Go through the success criteria, so that pupils can start to independently predict what they think different technology does and consider how it's controlled. Explain that learning about how technology works allows us to	**For pupils needing extra support:** If ideation is tricky, give them some limited options for what their robot

| | | | make our own inventions that do what we want them to!

So far we've looked at the technology in the room, and we've worked out what their buttons do. We've also thought about their programs, e.g. "When the button is pressed, turn on the television", this makes it easier for us to design our own technology!

Now, show children *Activity: Robot sheet* (second page) – and point out the remote control. Explain that this remote control can program children. When you press the red button, it makes the children wave their arms in the air; when you press the green button, they tap their knees; | could do. Provide a wordbank.

Pupils working at greater depth: Ask them to explain how we know whether technology is doing what you asked

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

- Can you give an example from your robot activity of an input? |

| | | | when you press the blue button, they fall asleep.

Play with the control for a few minutes. You could get children to suggest what different buttons could do.

Show and hand out the *Activity: Robot sheets*. Ask children to label the robot and explain how it works. Their robot can do anything they want (e.g. a goal scoring robot, a cupcake-making robot, a dance partner?)

The point of the activity is for children to recognise that it will need buttons to control it (inputs), and perhaps even lights/sounds (outputs) to see what it's doing! | • Can you give an example from your robot activity of an output? |
| --- | --- | --- | --- | --- |

			Give them some time to share their ideas with a partner before sharing some as a whole class. Model labelling the robot, pointing to which parts would be buttons or lights, etc. Whilst the children are labelling, get them to articulate what they're doing and how their robot works – this is more important than what it does!	
Lesson 3	•	• I can suggest what might have a computer inside • I can explain why I think this • I can suggest what the technology does	Explain to the children that they are going to go on a 'Technology Safari' around school and they'll need to keep their eyes peeled for technology that they see. You could suggest that the groups compete for the	**Pupils needing extra support:** Draw their attention to specific pieces of technology that they're likely to be familiar with.

| | | | highest number of items they see on the safari.

Organise the children into pairs and then group two pairs together. One pair in the group of four will have the clipboard with the *Activity: Safari sheet*, the other pair will have the digital camera/tablet. After each item they find, they then swap so that both pairs get a turn at each.

If it's been a while since the children used digital cameras or tablets to take photos, it may be worth a quick reminder telling them how to take a good photo.

For example:

- Hold the camera steady. | **Pupils working at greater depth:** Can suggest different ways of using or interacting with technology and predict outcomes even if they haven't used it.

- What can we see if there are computers inside technology?
- Can you see any |

			• Look through the device (not around it!). • When you're happy, take the photo. • Wait one second before moving! Set expectations for moving around school, is there anywhere they are or aren't allowed to go or look? Now take the children around the school while they spot technology and add it to their sheets. Stop in each shared area and let the children explore independently before regrouping and moving on.	technology here? • What do you think it does? • Watch carefully, can you see what it's doing? • How do we take a good photo?
Lesson 4	•	• I can create a detailed plan • I can include an input and output as	Explain to pupils that they're going to be inventors and create their own invention, using all the knowledge	**Pupils needing extra support:** Use the flying chair to help

		part of my invention • I can explain how it works, including how to control it • I can label my design clearly	they've learned about computers all around us. Their invention will have some kind of computer inside of it, but what it does is entirely up to them. Remind children of their 'technology safari' last lesson and ask them: What did you find? How did you know it was technology? How did it work? As a class, create an example invention together. Ask pupils for ideas first – what could they design? • Cupcake machine – press a button on your desk and a cake appears. • Glitter party – when you clap three times, glitter falls from the ceiling.	imagine with a real focus point. They may also need help writing key words in their design. **Pupils working at greater depth:** Should give a detailed explanation of how their invention works, including referencing inputs and outputs, with some understanding of sequencing. **Key Questions**

			• Shrink machine – spin your watch and you become the size of an insect. • Flying bike – type the secret code and the bike rises up. • Anything! Draw a sketch in the middle of the board to depict your invention. Get the children to consider the inputs and outputs of the invention and what they think they'll need. List these alongside the image. Ask: • Will I have buttons to start it? Or a microphone?	• Can you give an example of each for the invention? • What will we need? • Why do you think annotations are important?

			- Should I have a touchscreen to choose what colour glitter to fall? - Will I use a lever/joystick to move where the glitter will fall from the ceiling? - How do we know it's happening? Are there lights that flash? - Is there a screen that counts down? When you decide on what you want to include, use annotations to label it with all of this information. Ask pupils why annotating is so important. Set the children to work planning their inventions. As they're doing this, question them about their inputs and	

			outputs to ensure they're considering them – this is showing their recognition of everyday technology features. Approximately 15 minutes before the end of the lesson, model how to write an explanation of their invention. It's a good idea to link this to explanation texts in English and recall the features or base their explanation on a model text. Then, give the children time to create their own.	
Lesson 5	•	• I can explain where computers are used • I can suggest what their job is	Explain that we're going to be learning what computers do. Model using the shop with some volunteers:	**Pupils needing extra support:** The order of the activities means two lots of

		• I understand that computers work together	• Get children to take the scanner photos and pick products from the shelf. When they scan it, they write what they scanned on the mini whiteboard the picture is attached to. • Those children go to the tills (where there are more children), hand over their scanner and whiteboard, and pay. • When the till people use the scanner, children at the database computer remove a picture of it from the interactive board. When the list of pictures on the board gets too low, they should phone the warehouse and ask for a new delivery (return everything to the 'shop	rehearsals before explaining the roles. **Pupils working at greater depth:** Challenged by considering what the computers do before acting them out. Can also suggest connections between the different computers.

| | | | floor' and add stock back into the database).

Split the class into approximately three groups:

- Shop Roleplayers – those who are using the 'shop'.
- Digital Recorders – using tablets/cameras they film each part of the roleplay.
- Paper Recorders – they explain what happens in each part of the supermarket and what the computers there do.

The children spend a third of the lesson on each of these activities, while you observe and ensure they are understanding it correctly. | |

Computing Strand & Link to National Curriculum	Progression of Knowledge	Learning Objectives & Skills Progression	Hardware & Software	Cross Curricular Links	Key Vocabulary
Algorithms and Debugging – **Programming** Pupils should be taught to: • nderstand what algorithms are, how they are implemented as programs on digital devices, and that	▪ To understand what machine learning is and how it enables computers to make prediction ▪ To know that loops in programming are where you set a certain instruction	▪ To decompose a game to predict the algorithms that are used ▪ To understand that computers can use algorithms to make predictions (machine learning) ▪ To plan algorithms that will solve problems	Web Browser Scratch – Online or Application	English: Speaking & Listening Pupils should be taught to: • listen and respond appropriately to adults and their peers • participate in discussions, presentations, performances, role play,	• Algorithm • Instructions • Computer • Tasks • Order • Instructions • Specific • Solution

programs execute by following precise and unambiguous instructions • Create and debug simple programs • Use logical reasoning to predict the behaviour of simple programs	(or instructions) to be repeated multiple times. ▪ To know that abstraction is the removing of unnecessary detail to help solve a problem.			improvisations and debates	
Lesson		Success Criteria	Lesson Outline	Differentiation & Key Questions
Lesson 1	•	• I understand the definitions: decompositi	*Presentation: Dinosaur algorithm* and ask the children to spread out around the room (wearing	**Pupils needing extra support:** Should have correct vocabulary modelled throughout the

		• on and algorithm • I can decompose a game to predict algorithms • I can plan algorithms for a more complex game	the dinosaur masks if you choose to use these). Explain that you're going to play a real-life version of the 'Dinosaur move' game, with the pupils being the dinosaur from the game. Wave the green flag from the *Activity:* keyboard *and green flag images* when you are ready to start the game. Display the image of a keyboard from the *Activity: Keyboard and green flag images,* and the code from the 'Dinosaur move' game and ask pupils to act it out (moving left, right or jumping and bouncing off the wall if they bump it). Display slide 6 and explain that the game is a bit boring	lesson and may benefit from working with a partner. **Pupils working at greater depth:** Should plan a game with a range of actions for the dinosaur. **Key Questions** • What does the word 'algorithm' mean? • How does 'Dinosaur move' work? • What keys cause which action to take place? • Why does the dinosaur bounce?

			at the moment as the dinosaur doesn't do much. Tell the children that you have added one more line of code: When R is pressed, the dinosaur will roar. Then test this out with your 'real-life' dinosaurs. Using the *Activity: Writing new programs sheet,* pupils work in pairs to think of other actions for the dinosaur. Encourage them to be as imaginative as they can but they must be prepared to do the action. The children then test out their new code using an image of a real keyboard.	• When does it bounce?

Lesson 2	•	• I can explain what an algorithm is • I can explain that computers use algorithms to make predictions • I can write a clear and precise algorithm	**Lego building algorithms** *Presentation: Machine learning*. Place pupils into pairs and give each pair a number of Lego blocks and explain that they have one minute to build a small model. You/they can take a photo of their model to refer back to later in the lesson. Still working in their pairs, ask the children to write a set of instructions so that someone else would be able to recreate their model if they followed the instructions. Ask the children to test out their instructions once	**Pupils needing extra support:** Should be encouraged to rebuild their lego model as they write the algoithm to make sure they don't miss out any steps. **Pupils working at greater depth:** Should write more detailed algorithms and explain the importance of them being clear and precise. **Key Questions** • Were your instructions/algorithms effective? Did

			they've written them and ask:	they include enough detail?
			• Were the instructions effective? • Did the instructions include enough detail? • Did the instructions need to be clearer?	• How could your algorithm be clearer? • How did you know what to build? • What was good about the way the algorithm was written?
			Ask the children to adapt their algorithms to be even more specific, for example, to specify brick colour and size. The children now swap their algorithms with another pair so that Pair A tries to recreate pair B's model using Pair B's instructions, and Pair B tries to recreate Pair A's model using Pair A's	

			instructions. If possible, compare the attempts with the photos taken earlier..	
			When they've finished following the algorithm ask the pairs to feedback to each other about how clear and successful their algorithms were and give them time to make any necessary changes to it to make it more precise.	
			Finally, ask each pair to swap with a new pair and repeat the process:	
			• Attempt to follow the algorithm. • Check against the original model.	

			• Give feedback – positive and next steps to work on.	
Lesson 3	•	• I can devise and create algorithms to solve problems • I can include loops in my algorithms (count controlled) • I can visualise directions from a 2D environment	*Presentation: Through the maze.* Demonstrate these concepts by playing the 'Google – Coding for carrots' game on the board: where you have to program a bunny character to navigate around a map. Show the children how to use the loop blocks, which are the orange blocks. Explain that loops allow you to repeat a part of your code rather than writing it out again. Often there is more than one solution to solve the challenge, but there can be more efficient ways	**Pupils with secure understanding indicated by:** Creating algorithms to solve problems and beginning to use loops to make their code more efficient. **Pupils working at greater depth indicated by:** Explaining their chosen algorithms clearly and using loops to make them more efficient. **Key Questions**

| | | | (algorithms) that will be quicker and use less code.

Allow pupils in pairs to log into a computing device and share the 'Google – Coding for carrots' link with them. Pupils work through the 'Google – Coding for carrots' activities at their own pace. Encourage them to support their learning by visualising the bunny character's movement by using props such as a whiteboard, cut-outs from the *Activity: Google – Coding for carrots blocks* or mini-figures.

After 15 minutes, go through the *Presentation: Coding for carrots answers* with the children, which showcases the | • Is there a faster way of getting through the map?
• Is your way the most efficient? |

			answers for Levels one to six.	
Lesson 4	•	• can explain what abstraction is • I can give an example of when abstraction might be useful	*Presentation: Making maps.* Put the children into small groups and give each group photographs of classrooms and key places around your school that you have photographed (hall, playground, field, different classrooms). Explain that they are going to use abstraction to make a plan view of each location to create a collaborative map of the school. Model this activity by drawing a plan of your classroom using simple shapes and limited detail. Discuss what key features	**Pupils needing extra support:** Should work as part of a guided group and discuss the key features that they should include in their plan – and whether their plan has too much or too little detail. **Pupils working at greater depth:** Should discuss whether the level of abstraction they have used is too much, too little or just right. **Key Questions**

			should be included so that it's still recognisable. Ask them: - What isn't needed to recognise the room from the plan? (abstraction) - Would colour-coding make it clearer to identify the location? - Are tables, doors, whiteboards identified in their plans? - What are unnecessary features? - What is too much detail? Too little detail?	- What are unnecessary features? - What is too much detail? - What is too little detail? - Was their level of abstraction appropriate or do they need more/less detail? - What isn't needed to recognise the room from the plan? (Abstraction) - Would colour-coding make it clearer to identify the location? - Are tables, doors, whiteboards

				identified in their plans?
Lesson 5	•	• I understand the meaning of the word 'debugging' • I can listen to my peer's verbal instructions • I can perform a task by following step-by-step instructions	*Presentation: Unplugged debugging.* Tell the children that we are going to be debugging (finding and correcting errors in instructional steps). Ask pupils what they think are the most important aspects when playing games? (Teamwork, following instructions, thinking about the steps (algorithms) etc.) **Demonstration** Give yourself and the pupils five or six lego bricks of the same size and type. Explain that you are going to make	**Pupils needing extra support:** Should be keep their figure simple. **Pupils working at greater depth:** Get those who have successfully completed their task to go around to other pairs that are struggling and get them to talk through steps that helped them be successful. **Key Questions** What did you find tricky about copying my lego model object? (No instructions)

			an object out of the pieces and they have to copy it exactly. In silence and with no instructions, model creating the object in front of the children and get them to copy it. When they have finished, ask the children what they found tricky about copying it so that it looked exactly the same. They're likely to say that having no instructional help made it tricky, so draw out that having no instructions is a part of the process of debugging. **Activity** The children are going to follow their partner's verbal	

			instructions to build a lego figure (robot). The children will need: - Lego bricks or building bricks - Partition wall – a piece of cardboard should be suffice - Flat surface – desk or floor Task: Build a Lego figure using the lego bricks: **Step 1: Two children sit opposite each other on two ends of a desk/floor.** **Step 2: Place a partition wall or in the middle of the desk/floor.** **Step 3: Child A (Programmer) constructs**	

			a Lego figure out of the bricks they have (not using more than 6 pieces). Child B (Computer) mustn't see it.

Step 4: Make sure the same pieces of Lego are given to Child B (Computer)

Step 5: Child A (Programmer) gives one instruction at a time to Child B (Computer) to build their robot.

Step 6: Remove the partition wall and compare the Lego figures.

The job of Child B (Computer) is to build their robot without seeing the model and only listening to | |

			Child A's (Programmer) instructions. If they're unable to recreate the Lego figure with the instructions given, then either the instructions were unclear or they weren't followed exactly. They will need to go back and check them – this is called 'Debugging'. **Extension:** The difficulty level can be increased by giving the 'Computer' more lego pieces.	

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Word Processing – **Computer Systems** Pupils should be taught to: • Use technology purposefully to create, organise, store, manipulate and retrieve digital content • Use technology safely and respectfully, keeping personal information private	▪ To know that touch typing is the fastest way to type. ▪ To know that you can make a text a different style, size and colour. ▪ To know that "copy and paste" is a quick way of duplicating text.	▪ To begin to learn to touch type ▪ To understand how to add images to a text document	Web Browser Word Processor Touch Typing	English: Writing – transcription Pupils should be taught to: • name the letters of the alphabet	• Keyboard • Space bar • Word processing software • Touch typing • Delete • Backspace

Lesson		Success Criteria	Lesson Outline	Differentiation & Key Questions
Lesson 1	•	• I can find keys on a computer keyboard • I can identify the home keys on a computer • I understand how to type capital letters using 'shift'	Once the children have finished the quiz, bring them together to discuss what they have discovered. Allow pupils to explain their answers and reasoning. Now that we've taken a look at the keyboard we're going to learn how to type a little more quickly on it! Show slide 9. People who type really quickly learn something called 'touch typing', which means they know how to find the letters without looking at the keys. The best way to learn is to practise a little bit every day to become quicker and start to recognise where the letters are. Show slide 10 and display Link: 'TypingClub', which is a website that introduces touch typing skills,	**Pupils needing extra support:** May find it useful to work on Link: 'TypingClub Jungle Junior', which shows you which fingers to use. **Pupils working at greater depth:** Complete a 'placement test' before starting. **Key Questions** • How many letters can you type? • Can anyone figure out why the sentence, 'The quick brown fox jumps over the lazy

| | | | building right up to type special characters and even Shakespeare!

If you have any children already familiar with the keyboard layout, you may want to encourage them to take a placement test to start, but for the majority of your class, you'll want to start at the beginning!

Show slide 11. Explain to your class that the aim is to type the letters without looking at the keys but that they are allowed to look at the beginning. It's ok if they make mistakes. It's better to get things wrong and learn to correct them! | dog' is special? (It has every letter in the English language in it.)
• Were the children able to find all the letters? Which letter was hard to find?
• Did anyone figure out how to delete a letter that they typed by mistake? (Look at the 'Backspace' key, which allows you to delete the previous letter!) |

			Pupils work at their own pace to get as far as they can working through the TypingClub lessons.	
Lesson 2	•	• I can type a sentence into a word processor • I can select all the text and make it bold or in italics • I can explain how to make other changes using a word processor	*Presentation: Getting started with word processing*. In this lesson, we are going to look at some basic word processing skills. The focus is still on increasing typing speed as well as exploring the word processing software. Pupils are going to type up the first page of the book that they have chosen. Before they start, ask if the children know how to type a capital letter. Discourage them from using the caps lock key. Instead, explain that it is easier to hold down the Shift key and tap the letter. Display slide 6 and introduce some keyboard shortcuts. First, demonstrate that:	**Pupils needing extra support:** Make sure children choose a simple book to type and expect them to only type the first sentence or two rather than the whole page. **Pupils working at greater depth:** Look for a book with 'special' characters on the first page or more advanced keyboard features such as speech or question marks. **Key Questions**

			• Ctrl/cmd + A highlights all of the text that you have typed. What happens if you hit backspace Everything has been deleted. Fortunately, we do not need to panic because if we use: • Ctrl/cmd + Z we can 'undo' whatever we just typed, and • Ctrl/cmd + Y to redo. Remember: on a Mac, you use Command (cmd) for shortcuts, but on a PC, you will need to use Control (Ctrl). We are just exploring a few shortcuts in this lesson, but a full list can be found in the *Activity:* keyboard *shortcuts*. Make sure children understand how to use these three key keyboard shortcuts: • Ctrl/cmd + A • Ctrl/cmd + Z	What keyboard shortcuts will you remember for next time?

			• Ctrl/cmd + Y Once the children have typed the first paragraph, page or sentence of their book (depending on their typing speed), it's time for them to explore what they can do within a word processor. Demonstrate using Ctrl/cmd + A to select all of the text and click on the bold button (usually represented by a capital B). Demonstrate that it can be toggled on or off by clicking on it again. Discuss what the button does to the text. Ask children what they think the other buttons in this section do? Remember to model clicking away from text to 'deselect' everything and view your changes.	

|			**B** *I* U	
			The children then tinker with the tools available. By using the shortcut keys, they can make changes to all of the text and then use 'undo' to try a different tool. Challenge children to find out what the different buttons on their word processor do.	
Lesson 3	•	• I can use keyboard shortcuts to alter text • I know how to search for and find an	*Presentation: Newspaper writer.* The children's goal is to create a newspaper page based on a well-known story. The key skills we are focusing on are image imports and building keyboard shortcuts. Share the newspaper website link of either 'First News Live' or 'CBBC	**Pupils needing extra support:** Add your own pre-typed text of The Gingerbread Man article on their computers to allow them to modify and insert images to

		appropriate image • I can import and alter an image in a document	Newsround' with the children. Discuss and demonstrate the aspects of the website which allow us to move around or 'navigate' the site, such as the forward and back buttons. Show how to select the links and move between sections of the site to discover different information. Give the children five minutes to explore any features news sites/papers have. Explain that the children will be reporting on the story you read at the start of the lesson ('The Gingerbread Man', or whatever you chose). On a document on your interactive whiteboard, type a title for your newspaper and make a few changes like altering the font's size and colour. Ask the children if they can	personalise it, rather than create it from scratch. **Pupils working at greater depth:** Encourage pupils to create a second page for their newspaper. **Key Questions** • What can you spot that makes these news articles or websites interesting? (Different colours, images and font sizes etc.) • What keyboard shortcuts do you remember?

| | | | remember any of the keyboard shortcuts:

• How do we undo or redo something we've typed or altered? Cmd/ctrl + Z and Y.
• Can anyone remember how to make text bold or italic using a keyboard shortcut? Cmd/ctrl + B and I.

Model typing a sentence about the story they looked at in the 'Attention grabber', encouraging them to consider:

• What happened?
• Who was involved?
• Where did it happen?
• When did it happen?
• Why did it happen? What caused it?

. Let pupils know that you are not expecting pages of text and that they | • How do we undo or redo something we've typed or altered? (Cmd/ctrl + Z and Y) |

			should instead focus on experimenting with images, layout and text effects. An important part of their work will be importing a relevant image into the document. Demonstrate how to do this by going to 'Google Image Search' (go to Google.com and look in the top right-hand corner to select 'Images'). Look for 'Gingerbread man' (or something relevant to the book you have chosen). For ease, demonstrate choosing the image you want and dragging it to your desktop so that you can then drag the picture into your document. Show children that they can alter the positioning of a picture by choosing whether to make it 'in line' 'wrap text' or 'break text'. You will need to click on the image to alter this.	

| | | | In **Microsoft Word**, a menu will open when you right click the image to then look for 'Wrap Text' and a drop down will appear to select the text wrapping you want.
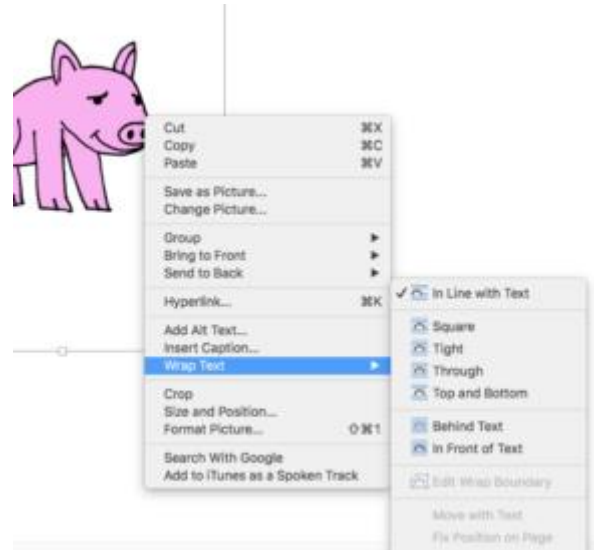
Ask children to use images and text editing to create a newspaper article about 'The Gingerbread Man', reminding them that they should show off all of their skills learned in the topic so far rather than spending | |

			too much time finding an image or typing the story. Emphasise the importance of using keyboard shortcuts to make the text more interesting; for example: **bold** and *italics*.	
Lesson 4	•	• I understand how to use text styles to create headings and subtitles • I can copy and paste text into a document • I understand the importance	*Presentation: Poetry book.* Review the keyboard shortcuts you have looked at so far: undo, redo, bold, italic, underline. Explain that the children are now going to learn one of the most useful keyboard shortcuts: copy and paste. Explain that sometimes we find information on the internet or in another document that we want to copy. We can do this by highlighting the text we want and then typing Ctrl/cmd + C to copy, and Ctrl/cmd + V to paste the text into a new	**Pupils needing extra support:** Encourage pupils to select short, simple poems and provide a print out of the *activity* **Pupils working at greater depth:** Ask pupils if they can figure out how to centre text, add bullet points, change font, etc.

| | | | of crediting source materials | document. You can also use Ctrl/cmd + X to 'cut' text if you want to move it to a different place in a document.

Discuss the importance of citing sources when you copy something from the internet. Explain that when someone puts something online, it still belongs to them. We can often use their text or images, but we must say where we got the image from.

Explain to the class that they are going to use copy and paste to create a poetry book of poems from the internet. You may want to look at Link: 'Ken Nesbitt's Poetry4Kids', or find an alternative.

If you have opted to find an alternative poetry website, get the children to work in pairs to use an appropriate search engine, such as | **Key Questions**

- What poem will you choose?
- Where did you find the poem?
- Who wrote the poem?
- Why is important to cite the author and the source? |

			Kiddle, and experiment with typing in suitable keywords such as:	
			• poetry for children • poems for children • poetry for kids • poems for kids	
			Ask the class to share any suitable websites. Explain that the keywords we use when we search help us to find the most useful websites for what we need. Give the children some time to find some of their favourite poems they have come across. They will then copy and paste a poem they like, add a relevant picture and alter the formatting, text and layout to make it look more attractive. They can then repeat this process for a second and third poem, but they should only copy one poem per page.	

			Remind children that they must include the name of the person who wrote the poem and which website they copied it from. You may need to show the children how to select the URL of a website by clicking on it, using Ctrl/cmd + A and then Ctrl/cmd + C to copy.	
Lesson 5				

Computing Strand & Link to National Curriculum	Progression of Knowledge	Learning Objectives & Skills Progression	Hardware & Software	Cross Curricular Links	Key Vocabulary
Scratch Jr – **Programming**	▪ To know that coding is writing in a special	▪ To explore a new application ▪ To create an animation	Web Browser BeeBots Scratch Jrn	<u>English</u> **Speaking and listening**	• Bee-Bot • Algorithm • Code • Instruction

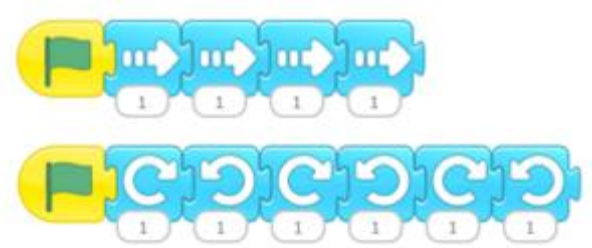|					
Pupils should be taught to: • Use logical reasoning to predict the behaviour of simple programs • Understand what algorithms are, how they are implemented as programs on digital devices and that programs execute by following precise	language so that the computer understands what to do. ▪ To understand that the characters in ScratchJR are controlled by programming blocks. ▪ To know that you can write a programme to create a musical instrument			• use spoken language to develop understanding through speculating, hypothesising, imagining and exploring ideas	

and unambiguous instructions • Create and debug simple programs	or to tell a joke.			
Lesson		Success Criteria	Lesson Outline	Differentiation & Key Questions
Lesson 1	•	• I know that ScratchJr is a coding application • I can predict what I think something new will do • I can explore	*Presentation: Using ScratchJr*. Introduce the learning objectives' to the children. Draw attention to the fact that the aim of this lesson is not to put all the blocks on at once and press 'go', but instead to carry out an informative cycle: predict > test > review Children do not need to identify this formally but the process is described in the success criteria (predict, explore,	**Pupils needing extra support:** This lesson is about exploration at whatever level the children can access, but a teacher or TA can support children exploring only the one and two-

| | | something independently

 • I can explain what I found using ScratchJr | explain), so if they follow that they should be doing it anyway.

 To encourage the children to explore beyond their comfort zone, introduce a points system for when they use certain blocks.

 Give each child a score sheet from the *Activity: Tinkering score sheet* (there are two sheets per page). Every time the children use one of the blocks in their program, they can circle it on their printout. To get the points, however, the children need to be able to explain both what the block did and how it worked. It is not enough to just add the block to their program at random and without purpose. The higher the number of points for a block, the harder it is for the children to recognise what the block is doing.

 Give the children the main bulk of this time to explore, tinker and challenge | point blocks as what these blocks do is more obvious.

 Pupils working at greater depth: Challenge them to use the higher point-scoring blocks with less visible applications.

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

 • What blocks did you use?
 • What did they do?
 • Did the blocks do |

			themselves to use blocks and work out what they do using the predict > test > review cycle. You could record (with a camera or tablet) some of what the children do, to share at the end of the lesson. This reminds them what they achieved and allows for discussion so that those who didn't use that combination of blocks can learn about them.	as you predicted?
Lesson 2	•	• I can use the programming blocks I've learned about for a purpose • I can recognise a	*Presentation: Creating an animation.* Show the children that you get a more fluid movement when you give the computer two (or more!) instructions to do at the same time. To illustrate this, start a new ScratchJr project, adding in the fly character once more. This time, use two green flag blocks to tell the computer that the	**Pupils needing extra support:** It may benefit some children to view videos or real life examples of the animals moving around before they try and recreate them.

		loop in programming • I can think about how animals move • I can use my programming skills creatively to use code to represent an animal moving	actions are carried out at the same time. The code will look something like this: Run the program and compare this with the program the children devised for the first fly project. The first project will appear more disjointed as each block runs one after the other. Which do they think looks better? Why? Look at the code for the second fly. Is there anything we could do to make this even better? Guide children to the idea that they don't need to use lots of straight arrows when they could change the number on the first one to four instead of one.	Can they articulate what that want to happen? For example, to go across AND up and down, you can do with two programs. **Pupils working at greater depth:** Need to be making good use of the predict > test > review cycle to ensure that they are always trying to improve what their characters are doing. They may add some

| | | | | Show slide 8. Look at the second row of code, can they spot a pattern? Change the numbers to three – does it work? No, because then it tips forward three times and then backward three times instead of rotating forwards, backwards and then forwards again, etc.

Show slides 9 and 10. Two other blocks you might want to demonstrate to the pupils are the:

• Orange loop block – Loops are used in all programming languages and allow programmers to tell the computer to repeat an instruction more than once. This block is currently telling it to repeat four times. | differences so it is not repeating the same thing all the way across the screen, for example, the bird only swoops down every other time.

Key Questions

• Which fly project looks better and why?
• How do animals, birds, fish and other creatures move? |

- Red repeat 'forever' block – This makes the code continue/repeat forever. The children will need to use these today.

Explain that when animators make films with CGI animals, they spend a lot of time watching real life animals to make sure the CGI animals move in a realistic way. This is the children's challenge for today. Introduce the 'Learning Objectives' and 'Success Criteria'.

			Children will use the pre-drawn characters in ScratchJR and aim to make them move in a realistic way. Recap how some animals move: snakes slither; birds swoop;, butterflies flutter, etc. This will influence the children's understanding of how to create movement in ScratchJR as well as the process of predict > test > review. The children can choose their own animals, but the following are the easiest: Field scene: - Fly. - Butterfly. - Bird (swooping – wings won't flap). - Snake. - Rabbit.	

|			
			Underwater scene (slightly harder as children are less likely to know how these creatures move): • Fish (there are two types of fish). • Crab. • Seahorse. • Sstarfish. • Whale. Children add one animal at a time to their scene trying to get the movement as realistic as possible. They should be using forever loops in their code so that the movement will never end.	
Lesson 3	•	• I can design a musical instrument	*Presentation: Making a musical instrument.* Introduce the learning objectives and success criteria and discuss: Why would we use the characters as buttons? What would we	**Pupils needing extra support:** Start with one button at a time or use

			want to happen when we pressed our 'button'?	the existing characters if it's too abstract.
		• I can program code to run 'on tap' • I can select appropriat e blocks for my purpose	Show slide 6. Avoid using animals as characters, as this will reduce the children's creativity. They will find it hard to imagine pressing the cat and it saying anything other than 'meow'. You may want to print out and look at for reference the *Teacher support: Code example*, which is a larger version of what is shown on slide 6. As you've just done the 'unplugged' example, pupils should be making the connection that when the button is pressed, you want the instrument to make a sound – just as what happened when the volunteers held out their hands to be 'played' in the Attention grabber. We could use an existing character, or we could design our own button. What could our button look like? Spend some time brainstorming ideas – there is no	Could be adapted so that children record an animal sound for each animal character instead of an instrument. **Pupils working at greater depth:** Should be encouraged to add other visual clues to their musical instrument to show what it is doing. They can come up with ideas

			right answer, it's just about the children recognising that coding can be creative. Show the children an example musical instrument you have made in ScratchJR by pre-recording your own sound using the dotted microphone icon. This can be a simple shape background with some different coloured button characters on top (it won't look like a guitar, but a musical instrument is anything that you can use to make music!) – see the *Teacher video: Making a musical instrument* for more information. Ask children to predict what they think will happen when you tap a button. Then show them. Each of the buttons is a 'character' in the ScratchJr sense but is really just a shape (children mostly imagine buttons as circles!). If the code is correct, when the button is pressed, it will play a recorded	independently to improve this or work out how to implement a button movement to show music is playing. **Key Questions** • Why would we use the characters as buttons? • What would we want to happen when we pressed our 'button'?

				sound so that you can play your creation like a musical instrument.	• What could our button look like?
					• What do you predict will happen when a button is tapped?
				Draw the children's attention to the green sound blocks. Explain that the children can record their own sounds using the dotted microphone icon (this will open the blue recording option – press 'red' to record).	
				If a tablet doesn't seem to have a microphone block to click, the microphone setting may have been turned off. You will need to 'allow' in the privacy settings on the device.	
				Each sound recorded will be numbered and stored within the sound icons. Children will be recording the sound of their own voice, which they explored in the Attention grabber.	
				The children could make the sounds of familiar instruments using their voice, the strum of a guitar, the toot of a	

trumpet, or they could tap on different surfaces or use pencils on pots, etc.

A sound can be deleted by holding a finger on it. However, as with previous projects, it's not recommended to demonstrate this to your pupils as they may accidentally delete each other's work.
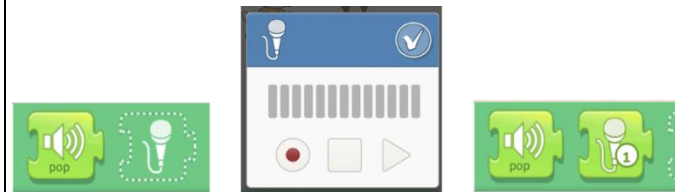
Deomstrate to the children the new block 'START ON TAP' (below) which means our program doesn't wait for the green flag anymore.

Instead, each of the sounds you have created and attached to any single

			character, will play when you press the character to which you have	
			Children design their instrument outline for their background, using the background editing tool. The button they have created (which is a character) then goes on top.	
			Remember, you will need to draw your characters and backgrounds before you start programming, but in the lesson we want to talk about how the code works before you show them how to draw a background.	
			To draw a background, the children select the background tool from the top middle of the project, select a blank background, then tap the paintbrush in the top right to enter the editing tools.	
			Next, they will need to decide how many buttons ('characters') they want and create them by using the 'draw new	

			character' tool and designing some simple shapes, before choosing and recording a sound for each of them. When they are finished, the children should have their own musical instrument.	
Lesson 4	•	• I can use an algorithm to help me with my programming • I can sequence the blocks appropriately • I can explain what each block in	*Presentation: Programming a joke.* Explain that an 'algorithm' is a set of instructions that allow you to make a computer do something. Tell the children that in this lesson they need to take these instructions and turn them into 'code' so that the computer can understand them. Display slide 6, which shows the step by step instructions that the class will follow. The children could create their own joke if they have ideas, or use one of your examples if they're not sure. As it is the first time that the children have worked from an algorithm you might	**Pupils needing extra support:** Give a copy of all the blocks they will be using to create their program. They have to find them in the app and choose the correct order. They could be provided as either paper printouts of the

		the program does	want them to have their tablets or Chromebooks in front of them and take the class through the steps as they carry out the action:	blocks, or the teacher/TA pulling the appropriate blocks into the programming area for the child to them connect and sort as they think is appropriate. The idea is to reduce the wealth of options to make decisions more manageable, rather than being able to pick from all the blocks.
			Show the children how to delete the cat (hold your finger on him until an 'x' appears)	
			Then, add one or two new characters that are relevant to the joke that the children have chosen, for example, a star fish and seaweed. If the children can't find the character they want, they can draw their own by pressing the paint brush at the top of the character selection screen.	
			Now, begin coding – remind the children that to give instructions to their character, they need to drag the blocks down into the coding area.	
			After adding the green flag, the children are going to record their voices speaking	**Pupils working at greater depth:** Make

				the first part of the joke. Try and get the children to suggest where they might find these blocks? Ask them to think back to *Lesson 3: Making a musical instrument.* (The blocks children need are sound blocks – the green blocks are to do with sound.)	connections such as the numbers under the movement blocks to increase distance (not using the same arrow multiple times) and using repetition such as the orange or red repeat blocks to control their character's movement.
				Model recording the sound, using the record button as you did in *Lesson 3: Making a musical instrument*. If a tablet doesn't seem to have a microphone block to click, the microphone setting may have been turned off, so you will need to 'allow' this in the privacy setting on the device.	**Key Questions**
				Once you have shown the children how to record the question, they should be able to record the answer as well. If you have any children that cannot record their voice for any reason, they could use the 'say' block, which shows writing on the screen in a speech bubble. However,	• Who would like to share their jokes with the class? • Which blocks did

			it does mean children have to type the joke out. To finish the program, the children can add some movement appropriate to their characters, for example, a fish bobbing in the water or the giraffe walking across the screen.	you use? And why? • What happens if we swap the sequence? • Did anyone use a 'loop' block? • Which blocks are being repeated by the addition of the loop?
Lesson 5	•	• I can explain what an algorithm is	*Presentation: 'The Three Little Pigs' algorithms.* Ask the children about the term 'algorithm' that was introduced last week. Can they remember what it meant or how we used it? Remind the children that it is a set of clear instructions that	**Pupils needing extra support:** During the AfL (Assessment for Learning) activity,

		• I can choose the code to match my algorithm • I can use an algorithm to write a computer program	we turn into code and give to the computer as a program. Explain that today the algorithm is more complicated because we have four characters in our program. To begin, they are going to complete a paper-based 'cut and paste' algorithm using the *Activity: 'The Three Little Pigs' algorithms,* then the code will be there for us to use within ScratchJr. Show the children the four blocks they will be using (and the green flag with which we start all of our programs). Do they know what each block does? They should recognise them from the pictures, but you can tap on each one to find out. The blocks above work as: 1. Start the program	reduce the number of block possibilities. Focus on one character at a time, sit with an adult who can replay the original each time for them to focus on just that one character. **Pupils working at greater depth:** Encourage them to take the algorithm and structure of the first little pig and apply it more independently to

			2. Record your voice 3. Wait seconds 4. Hide 5. Show Hand out a copy of the *Activity: 'The Three Little Pigs' algorithms* to each child and read through together. Can the children work out which of the blocks need to go into each character's program? Give them five minutes to cut and stick the blocks into place. The answer to the *'The Three Little Pigs' algorithms* can be found on page three of the Activity. Children now use the algorithm and code blocks to create their own version of the story, 'The Three Little Pigs'. The paper-based 'cut and paste' algorithm shows the blocks they need:	the second pig (sticks house). **Key Questions** • What's an algorithm? (Clear instructions that humans use to decide what they want the computer to do.) • How can algorithms help us when we're programming? (They allow us to get all the

				tricky thinking parts out of the way, so we can add the code and make our programs work.) • How do you know this block matches that part of the algorithm? (The algorithm and the code blocks work together. If there are words in

				the algorithm, we record ourselves saying them.) • What blocks will I need to …?

Computing Strand & Link to National Curriculum	Progression of Knowledge	Learning Objectives & Skills Progression	Hardware & Software	Cross Curricular Links	Key Vocabulary
Digital Imagery – **Creating Media** Pupils should be taught to:	▪ To understand that an animation is made up of a	▪ To understand and create a sequence of pictures ▪ To take clear photos ▪ To edit photos	Web Browser BeeBots iPads Excel	**English** <u>Reading</u> • making inferences on the basis	• Pictorial story • Image • Sequence • Plan • Photo

• 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	sequence of photographs. ▪ To know that small changes in frames will create a smoother looking animation. ▪ To understand what software creates simple animations and some of its own features.	▪ To search for and import images		of what is being said and done • predicting what might happen on the basis of what has been read so far • participate in discussion about books, poems and other works that are read to them and those that they can read for themselves, taking turns and listening	• Pictures

		to what others say	

Lesson		Success Criteria	Lesson Outline	Differentiation & Key Questions
Lesson 1	•	• I can explain what is happening in a pictorial story • I can recognise the importance of sequencing • I know that sequencing is important in Computing • I can plan my own pictorial story	The children will learn about pictorial stories. The objective is that the children will make their own. The children should be confident that stories can be made from pictures alone. The children also need to understand how pictorial stories work. Ask the children: • What sort of pictures need to be at the start? (Make cross-curricular links to story structures like characters and settings). • What needs to happen in the middle? (something exciting).	**Pupils with secure understanding indicated by:** Explaining what is happening in a photo story. Planning three distinct parts of a photo story. **Pupils working at greater depth indicated by:** Explaining how their photos will show their story. Discussing where

			• What needs to happen in the end? • What do the characters do next? Show the children the *Which comes first?* images. Several picture stories are muddled. The children work out the correct sequence. Ask the children how they did it. The children have understood stories, introduce them to the characters. These characters can be whatever you have in school (you may need to ask EYFS if your Year 1 don't have access to small world resources). Lego or Playmobil people work well. An animal/dinosaur could play the 'baddie' in the story. Show the children the *Activity: 3 box planning sheet*. The children	characters will be placed. **Key Questions** • Who are the characters? • What is the exciting middle scene? • How have they shown the ending?

			draw what they intend to photograph in next week's lesson. There are three boxes in the main planning sheet. Three is a realistic amount of photos for each child to take in Lesson 2. There is also an *Activity: 5 box planning sheet* for pupils working at greater depth, who may require more challenges. There are lines underneath for the children to write what is happening in each picture – this could be just words or full sentences. This will not be included in their photographs, but it does make remembering their plans easier for next week. The children complete the *Activity: 3 box planning sheet or Activity: 5 box planning sheet.*	

Lesson 2	•	• I can get down to the level of my character • I can look at the screen and check what is in frame • I can press the button carefully to ensure nothing changes • I understand that moving can create a blurred image • I can ensure that my surroundings	Introduce the children to the device that they are going to be using. Show the children how to turn it on, use the screen to focus on what they are capturing and take the photo. Divide the children into their groups. It is possible for all the children in the group to take (at least) the three photos that they need within the time. Although they are helping each other out, the children should create their own story. Go over the rules for working in these groups: • Take one photo – pass it on	**Pupils needing extra support:** May need support working in a group. Making the roles, rules and expectations explicit gives these children structure. **Pupils working at greater depth:** You could group these children together to give them more opportunity to work on their longer stories. You

| | | | are bright enough | • No more than one retake per go (wait until your next turn)
• No deleting – even if you have not shown the children how to use this, they may work it out. The children might accidentally lose other photos as well.
• To stop things getting lost, each child is responsible for looking after something.

This activity works best outside. Putting small characters on a playground/field immediately creates the setting of wilderness, as the grass and flowers etc are so tall compared to the character. If this is not possible, you could source some props to give an idea of scale. | could also model how to discuss improving photos as they're taking them, asking:

• Would it be better if..?
• Could we put the character..?
• How can I do..?

Key Questions

• Is the character full height?
• What's in the background? |

| | | | Discuss the Success Criteria and look at last week's plans. Children often take lots of photos rather than a few good quality photos. Encourage the children to arrange the position of objects before they take the photo. This reduces time wasted taking photos and saves storage space on devices.

When outside, go through the Success Criteria again, modelling the following:

- Placing the character on the floor and getting the camera really close. (Even if your camera/tablet has a zoom option, it is best not to use it if you don't need to. The more you zoom, the less quality your photo has.) | • Can you see any children?
• Would the photo look better if you moved so the sun wasn't so bright? |
|---|---|---|---|---|

			• Explain what you're looking at on the screen. Is the character full height? If not, get closer. What's in the background? Can you see any children? If so, politely ask them to move to one side. Would the photo look better if you moved so the sun wasn't so bright? etc. • Explain the importance of keeping the camera still. If you're using tablets that are quite heavy, suggest that they keep both hands holding the tablet, whilst someone from their group presses the 'capture' button. Give the children 10 to 15 minutes to take their photos.	

Lesson 3	•	• I can explain that photos can be changed after they have been taken • I can identify ways to improve my photo • I can crop, resize and add a colour filter to my photo	Explain to the children that they will explore editing the photos they took in the last lesson. In groups or pairs, children edit one photo together depending on the number of devices available. The point is to understand the different changes they can make to images. They should focus mainly on: • Cropping – considering which parts of the image are most important. • Changing colour-effects – discussing how this affects the mood of the picture. While the children work, note any exciting effects that you see	**Pupils needing extra support:** May need adult help with loading the images onto the app or computer. Model the process of editing an image and repeat key vocabulary such as uploading, importing, cropping, settings, etc. **Pupils working at greater depth:** Should discuss why they

| | | | them use. Refer back to the best effects at the end of the lesson. | would make changes to a photo and the impact this has and be able to apply a wider range of effects to their photo, experimenting with new editing tools. They should then create a guide called 'How to edit an image' in a document of their choosing.

Key Questions

- When would it be a good time to use that effect, and why? |

Lesson 4	-	- I know images can be found online - I can think of a keyword to search with - I know what to do if I find something uncomfortable	Give children their completed *Activity: Planning sheets* (from *'Lesson 1: Planning a photo story'*) to talk through and remind them what they have been working towards. Explain that today they will add props to the photos they took in *'Lesson 2: taking photos'*. We can add photos to our computers ourselves in many ways, either by downloading	**Pupils needing extra support:** May need an alphabet sheet to match upper and lowercase letters to help them use the keyboard more easily.

			them from an email, importing them from a USB device or locating them on personal cloud storage programs such as Microsoft OneDrive. Ask the children if they know of any other ways to access images on a computer. Explain that online stock photography providers have thousands of images sent in by lots of different people. Usually, you will need to pay the website to access their images, and in most cases, these images are 'copyrighted', meaning you have to credit or ask permission from whoever took the photo to use it. Discuss the question: What does the word 'copyright' mean? (Is the legal way of protecting a creator's piece of work). Remind children how to search for copyright-free images via sites	**Pupils working at greater depth:** Can manipulate the image to suit a purpose and explain why the size is important. Should find and use png images to avoid a white box blocking their original image. **Key Questions** - Have you been able to edit your photo effectively? - What else could you

			such as Pixabay.com or using the appropriate filtering on search engines such as Microsoft Bing and Google. Show children how to search for images and save them using an internet browser	add in if you had more time?
Lesson 5	•	• I can download the photos I want • I can organise them on to the page • I can resize and change the orientation of my images • I can add numbers to	Explain to the children that they will choose a minimum of three photos for their collage story. Do not worry about which child took the photo – they can choose whichever they think will work. Children should start by opening up a blank presentation in Microsoft PowerPoint. They should then go to 'Insert', 'Pictures' and select to insert picture 'from this device'. In the image downloads menu, the	**Pupils needing extra support:** May need help navigating to the right page and downloading the files so they can then work independently on their collage. **Pupils working at greater**

		show their order	children can select 'OneDrive', where they can find the images they have taken and created over the course of this unit. They should add these images one at a time by clicking on an individual image and clicking 'Insert'. Pupils should repeat this process until all images they want are inserted into their Microsoft PowerPoint presentation. If you used tablets to save the edited photos, make sure each group has the same device to access their images. They can then use 'Microsoft PowerPoint', 'LunaPic', 'Pixlr', 'BeFunky' or any other relevant app to insert and manipulate images from the device's gallery. Once all children have at least three photos dragged onto their	**depth:** Could add in further decoration such as shapes and use 'fill' to add colour to the **Key Questions** - Can you remember how to resize the pictures so they are not all on top of each other? - How could we make the order of the pictures clearer? - What could we use?

			page, bring the class back together. Ask if they can remember how to resize the pictures so that they are not all on top of each other—model how to do this. Ask how we could make the order of the pictures clearer – what could we use? Show the children how to add a text box to type a number. Drag it next to the picture. Show the children how to add a final box with their name in it. Give the children the rest of the lesson to arrange their pictures. If they finish, they can add shapes and colours.	

Computing Strand & Link to National Curriculum	Progression of Knowledge	Learning Objectives & Skills Progression	Hardware & Software	Cross Curricular Links	Key Vocabulary
Introduction to Data – **Data Handling** Pupils should be taught to: • Use technology purposefully to create, organise, store, manipulate and retrieve digital content	▪ To understand that you can enter simple data into a spreadsheet. ▪ To understand what steps you need to take to create an algorithm. ▪ To know what data to use to answer certain questions. ▪ To know that computers can be used to monitor supplies.	▪ To represent data in different ways ▪ To use technology to represent data in different ways ▪ To collect and record data	Web Browser iPads	<u>Mathematics</u> Pupils should be taught to: • Identify and represent numbers using objects and pictorial representations including the number line, and use the language of: equal to, more than, less than (fewer), most, least • Read and write numbers from 1 to 20 in numerals and words • interpret and construct simple pictograms, tally charts, block diagrams and simple tables • ask and answer simple questions by counting the number of objects in	• Data • Representation • Map • Information • Objects

			each category and sorting the categories by quantity	
Lesson		Success Criteria	Lesson Outline	Differentiation & Key Questions
Lesson 1	•	• I know that data can be shown in different ways • I can represent data in different ways • I can answer questions about the data using my representation	Show children the *Zoo map,* showing different numbers of animals in each enclosure. Explain that you want to remember how many of each animal there are so that you could tell someone at home. You are not allowed to take the *Zoo map* with you. Tell children to use lolly sticks, cubes, paper, colouring pencils or other objects they find, to represent the animals and show how many of each animal there are at the zoo. Encourage the children to find easy ways of showing which animals there are more, or fewer of. Rather than having a pile of lolly sticks or cubes, they may prefer to line them up or put them in piles. Halfway through, ask the children to try representing the information in a different way. If the children have used objects, then encourage them to use drawings (either pictures of the animals or something more abstract, e.g. lines, circles, dots, tally chart).	**Pupils needing extra support:** May benefit from working as part of a pair to share ideas with and get reassurance. They may need reminding that there is no right or wrong way to show the information. **Pupils working at greater depth:** Should be encouraged to explore a variety of different ways, including incorporating numerals. **Key Questions** • What do you think about this? • Is it easy to quickly compare the number of each animal?

			And vice versa, if the children have used drawings, then encourage them to use objects. If someone needs a challenge, task them with representing the information using numbers. Take photos of all the different ways the children find to show the data, getting them to describe what they've done and why it works well.	
Lesson 2	•	• I can navigate a computer using a mouse • I can type using a keyboard • I understand that data can be shown in different ways • I can represent data in different ways	**Pictograms** Show children how to navigate to 'J2E's JIT5' by: setting up a desktop shortcut, adding it as a favourite in their web browsers or finding it by searching for JIT5. write paint turtle chart pictogram animate branch mi Then, demonstrate clicking on the red tab in the top right called 'pictogram'. At each stage of the lesson, get children to predict what will happen if they click a certain button, encouraging them to be brave and have a go. They can then share what they have learned with the rest of the class. Once everyone is on the pictogram page, they click on the arrow buttons next to the picture of a lion to scroll through the different animal pictures available.	**Pupils needing extra support:** Should be positioned with a good view of the board so that they can quickly and easily refer to the table of results. May benefit from working with a partner. **Pupils working at greater depth:** Should add appropriate labels to column headings and group titles, e.g. lions. They should also try changing the colour of each animal by clicking the square to the right of the number. **Key Questions** • Why did adding lots of one animal made the size of the pictures change?

			When they find an animal that was seen at the zoo (lion, zebra, elephant, flamingo, monkey) they either click and drag it to one of the rectangular boxes at the bottom, or click the animal and then click the box they want it to go to. They should give each animal a label by typing this in at the bottom. Encourage children to have a go at spelling the words themselves. Once they have added all of the animals to the label boxes, they can then click the + to add these to the pictogram. For example, if there are three lions, they should click the + sign three times. They continue this process for all of the animals. Ask pupils the following questions to assess their understanding. • Why did adding lots of one animal made the size of the pictures change? So that all of the images would fit in a straight line on the page. • Why did this resize all of the other animal images in their pictogram? To	• Why did this resize all of the other animal images in their pictogram?

			ensure that they all lined up so that they could easily see which animals there are more of/fewer of. Show how all the images are the same height to make it easier to compare the number of them.	
Lesson 3	•	• I can identify different minibeasts • I can record the number of different minibeasts I see • I can represent this data digitally	You can share the minibeasts depicted on 'J2E's JIT5' if pupils want to show their data in a pictogram. There is the option of drawing their own on the website if the creature they want is not included, but for ease, the predrawn images are: • Minibeasts > bee, butterfly, caterpillar, dragonfly, fly, grasshopper, ladybird, slug, snail, spider, stick insect, woodlouse, ant • Animals section > millipede and worm **Collect data (10 minutes)** Go outside on your minibeast hunt, with children taking photos where necessary and making a note on their sheets of how many of each creature they spot. Make sure that groups focus on different areas so that they can cover as much of the outdoor	**Pupils needing extra support:** Might need to stick to creating a pictogram and would benefit from working with more confident pupils. **Pupils working at greater depth:** Should represent their data in multiple ways, adapting the colours to suit their preferences, and selecting a preferred graphic representation of data, explaining their choice. **Key Questions** • Why do you think it's good way to carry out **data collection**?

| | | | space as possible in the shortest amount of time. It also avoids them counting the same minibeasts twice, which would give inaccurate results.

When finished, they come back to the classroom to represent the data they have collected.

Represent Data (20 minutes)

Get children onto the 'J2E's JIT5' in the same way as the previous lesson, explaining that they are going to use their skills from Lesson 2 to represent the data they have just collected. If they worked in groups of three, they should all work together to do this, but if they worked in a group of four, they should split into two pairs to make sure they are involved in the process.

Explain that they're going to select the five minibeasts they found the most of and represent the data in different ways.

This is a great opportunity to give pupils some autonomy over how they show the information they have collected, encouraging them to consider which way would be best suited to this data.

If they choose the 'chart' tab, they can put the information in a table – naming each of the | • What is the best way to approach **representing** the **data**?
• Which are the five most common minibeast you have found?
• How many were there of each? |

			minibeasts they encountered – but then show the data in multiple different ways. If they select the 'pictogram' tab, they will need to find and select appropriate images or draw those that are not available. As mentioned earlier, most of the relevant images are in the minibeasts category, but two are found in the animals category. Explain to any pupils that ask that all of these creatures could be in both the minibeasts and animals categories, which could lead to a discussion about groups within the umbrella term of animals.	
Lesson 4	•	• I can identify and categorise different animals • I can click and drag objects • I can identify questions to sort data in the most efficient way	As a class discuss the most effective questions from the Attention Grabber, i.e. which ones narrowed down the selection of data the most. Explain that they are going to make their own version of the 'Guess Who®' game, using JIT5's branching database. Show children the 'sort' button at the bottom right: 	**Pupils needing extra support:** Could use just four animals in their branching database to minimise the amount of typing, clicking and dragging. **Pupils working at greater depth:** Should be encouraged to use many animals in their database, sorting the data in the most efficient way possible (i.e. using the fewest number of questions).

		• I can create a branching database	It will ask you to type a question which will split this group of animals (get them to consider the questions from the 'Attention Grabber'). Encourage them to use words like mammal, fish, herbivore, carnivore, etc. If any pupils struggle with typing, they could limit their question to one or two words with a question mark; e.g. Carnivore? Four legs? Or ask simple questions, such as: Does it have a beak? Has it got a black stripe on it? Once you have typed your question, click and drag the animals into either the 'thumbs up for yes', or 'thumbs down for no' groups then click 'done'. sort Explain that they will repeat this process until all of their animals are sorted. Set pupils off on this task, recommending that they start with a maximum of six animals. They should work in pairs to create questions to sort the animals then practise their mouse skills to click and drag the correct animals into either the yes or no boxes. Once they've finished, the program asks if they want to play. They can test their game by clicking 'play' and choosing one of the animals	**Key Questions** • Can you sort the data using the fewest number of questions? • Carnivore? • Four legs? • Does it have a beak? Has it got a black stripe on it?

			from the left hand side and remembering that animal. They then need to test if their branching database can accurately figure out the animal they chose by answering the questions. If they notice a question isn't right, they can click on the edit pencil icon in the left of each box to change it.	
Lesson 5	•	• I understand that computers understand different types of input • I can design a computerised invention to gather data • I can explain how my invention works	Explain to pupils that they are going to be inventors! They can be very creative with their design (i.e. it doesn't have to be something that they could actually make); however, it does have to behave like a computer. In pairs, pupils come up with ideas for an invention, which would collect data in order to help them to answer a question of their choosing, e.g. • When is the most popular time to visit the park? • What is the most popular toy in the shop? • What is the loudest part of the school? • What time of the day is the school hall the warmest?	**Pupils needing extra support:** May need to talk through their ideas more at the beginning to help clarify what they need their computerised invention to do. They could always describe and explain its function or write one word labels. **Pupils working at greater depth:** Should add detailed labels to their design, experimenting with different colours, sizes and fonts. **Key Questions** • When is the most popular time to visit the park?

			Once they have come up with their idea, they go to 'Sketchpad' (which they should be familiar with from the Year 1 topic, *Getting started*. Tell them that you want them to draw their inventions, adding labels and information to explain:	• What is the most popular toy in the shop? • What is the loudest part of the school? • What time of the day is the school hall the warmest?
			• What their computerised machine would need to count or measure • Roughly how long it would need to gather data • What type of input it would need (movement, pressure, level of sound, level of light, image recognition) Demonstrate how to click the 'Text' button to type labels for their computerised invention and challenge them to experiment with changing the colour, size and font of the text.	