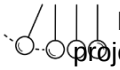
Computing Key Content MTP – Summer 2021-2022

YEAR 1	Summer 2	Key Concepts		Prior Learning		At the end of this unit children will know:		5 Key Questions	
	Unit of work **Programming B - Programming Animations**	**Programming:** (interpreting, creating and evaluating algorithms, programming to accomplish specific goals, detecting and correcting errors)		• How to identify what each floor robot command does • How to predict a floor robot's outcome of programs • How to give instructions to a robot by programming it		• On-screen programming through ScratchJr. • How to investigate sprites and backgrounds • Use programming blocks to use, modify and create programs • A basic introduction to algorithms		 What does the 'Start' block do on Scratch?  Define 'sprite'  True or false? Each sprite has its own programming area.  Why are programming blocks important?  Ben has programmed his sprite to move forwards 10 paces. Can you find his mistakes? Don't include Start block on image for this question and ensure paces number is not 10	
	Suggested lessons	Quick Quiz: What is the robot called? What does these buttons do? **Lesson 1:** During this lesson learners will become accustomed to the ScratchJr programming environment. They will	Quick Quiz: Command is another name for an… How do I get from X to Y? **Lesson 2:** During this lesson learners will discover that blocks can be joined together in ScratchJr. They will use a **Start** block to run their programs. They will also learn additional skills such as adding backgrounds and	Quick Quiz: Draw arrows to show which directions the BeeBots have travelled in. **Lesson 3:** During this lesson learners will discover that some blocks in ScratchJr have numbers underneath them. They will learn how to change these values and identify the effect on a block of changing a value.	Quick Quiz: Draw arrows to show which directions the BeeBots have travelled in. **Lesson 4:** During this lesson learners will be taught how to add and delete sprites in ScratchJr. They will discover that each sprite has its own programming area, and learn how to add programming blocks	Quick Quiz: What do these symbols/ block mean on ScratchJr? **Lesson 5:** During this lesson learners will choose appropriate backgrounds and sprites for a 'Space race' project. They will decide how each sprite will move, and create an algorithm based on the blocks available in ScratchJr that reflects this.	Quick Quiz: Match the programming block to the instruction. **Lesson 6:** During this lesson learners will use their project designs from the previous lesson to create their projects on-screen in ScratchJr. They will use their project design, including algorithms created in the previous lesson, to make programs for each of their rocket sprites. They will test whether	

		discover that they can move characters on-screen using commands, and compare ScratchJr to the Bee-Bots used in the previous unit.	deleting sprites. Learners will follow given algorithms to create simple programs.		to give instructions to each of the sprites.		their algorithms are effective when their programs are run.
	Key Content	I can choose a command for a given purpose					
		I can show that a series of commands can be joined together					
		I can identify the effective of changing a value					
		I can explain that each sprite has its own instructions					
		I can design the parts of a project					
		I can use my algorithm to create a program					
	Second order concepts	**Similarity and difference:** I can make comparisons and note differences between commands and sprites					
		Cause and consequence: I can understand the effective of programming commands					
		Written and oral expression: I can use computing terminology accurately					
YEAR 2	**Summer 2**	**Key Concepts**		**Prior Learning**	**At the end of this unit children will know:**	**5 Key Questions**	
	Unit of work **Programming A- Programming Quizzes**	**Programming:** (interpreting, creating and evaluating algorithms, programming to accomplish specific goals, detecting and correcting errors)		• How the order of commands affects outcomes • How to trace programs and predict outcomes • How to design algorithms, test them and debug them	• Sequences of commands have an outcomes • How to make predictions based on their learning • Use and modify designs to create own quiz questions in ScratchJr. • Designs are made from blocks of code • How to evaluate and make improvements to their programming projects	 What does this image mean? (pic of Scratch Green Flag).  Define ‘algorithms’  Look at the sequence of commands. What will the outcome be?  Why should you use different backgrounds?  How can we debug errors in this project? Provide examples of bugged code.	

	Suggested lessons	Quick Quiz: Label these digital devices. **Lesson 1:** During this lesson, learners will recap what they know already about the ScratchJr app. They will begin to identify the start of sequences in real-world scenarios, and learn that sequences need to be started in ScratchJr. Learners will create programs and run them in full-screen mode using the **Green flag**.	Quick Quiz: Label the symbols from the BeeBot **Lesson 2:** During this lesson, learners will discover that a sequence of commands has an 'outcome'. They will predict the outcomes of real-life scenarios and a range of small programs in ScratchJr. Learners will then match programs that produce the same outcome when run, and use a set of blocks to create programs that produce different outcomes when run.	Quick Quiz: Match the programs to the outcomes when run. **Lesson 3:** During this lesson, learners will be taught how to use the **Start on tap** and **Go to page** (**Change background**) blocks. They will use a predefined design to create an animation based on the seasons. Learners will then be introduced to the task for the next lesson. They will predict what a given algorithm might mean.	Quick Quiz: What does the 'green flag' do on ScratchJr? What does 'Start on tap' block do? What does 'Go to page (Change background' block do? **Lesson 4:** During this lesson, learners will look at an existing quiz design and think about how this can be realised within the ScratchJr app. They will choose backgrounds and characters for their own quiz projects. Learners will modify a given design sheet and create their own quiz questions in ScratchJr.	Quick Quiz: List two ways to stay safe on the Internet. Label the desktop computer components. **Lesson 5:** During this lesson, learners will create their own quiz question designs including their own choices of question, artwork, and algorithms. They will increase the number of blocks used within their sequences to create more complex programs.	Quick Quiz: What does 'debugging' mean? Label the desktop computer components. **Lesson 6:** During this lesson, learners will compare their projects to their designs. They will think about how they could improve their designs by adding additional features. They will modify their designs and implement the changes on their devices. Learners will find and correct errors in programs (debug) and discuss whether they debugged errors in their own projects.
	Key Content	I can explain that a sequence of commands has a start					
		I can explain that sequence of commands has an outcome					
		I can create a program using a given design					
		I can change a given design					
		I can create a program using my own design					
		I can decide how my project can be improved					
	Second order concepts	**Cause and consequence:** I can identify and discuss commands and outcomes in programming					
		Written and oral expression: I can use computing terminology accurately					

YEAR 3	Summer 1	Key Concepts		Prior Learning	At the end of this unit children will know:	5 Key Questions
	Unit of work **Creating Media – Desktop Publishing**	**Creating media:** (design and development, communicating and collaborating online, evaluating online content, respectful and responsible communication, presenting, creating content)		• Using digital devices to combine texts and images e.g. digital writing, digital painting and digital photography	• The terms 'text' and 'images' and how they can communicate messages • How to use desktop publishing software and consider careful choices of font size, colour and type to edit and improve premade documents • Terms 'templates', 'orientation' and 'placeholders' • Purpose of layouts and how and why desktop publishing is used in the real world	 How can we communicate messages digitally?  Define 'page orientation'  What are the advantages of using texts, images or both to communicate messages effectively?  What are the benefits of using desktop publish application for use in the wider world?  How has technology changed over time for publishing?
	Suggested lessons	Quick Quiz: What is an 'input'? What is an 'output'? **Lesson 1:** In this lesson, learners will become familiar with the terms 'text' and 'images' and understand that text and images need to be used carefully to communicate messages clearly. Learners will be able to give advantages and disadvantages of	Quick Quiz: List two inputs for a digital device. List two outputs for a digital device. **Lesson 2:** This lesson will build on last week's lesson, in which we looked at using images and text to communicate a message effectively. In this lesson we will look at desktop publishing. Learners will think about how to make careful choices regarding font size, colour, and type in an invitation. The use of	Quick Quiz: Provide pictures of inputs and outputs. Children to identify whether inputs or outputs. **Lesson 3:** Learners will be introduced to the terms 'templates', 'orientation', and 'placeholders' within desktop publishing software. The learners will create their own magazine template, which they will add content to during the next lesson.	Quick Quiz: What is an 'attribute'? What does 'orientation' mean? **Lesson 4:** In this lesson, learners will add their own content (text and images) to the magazine templates they created in lesson 3. They will copy the information for the front of their magazine from a prewritten document and paste it into the chosen place on their magazine cover. Images will be added from within the search facility in Adobe Spark. Teachers could ask learners to gather	Quick Quiz: List some advantages of using text, images or both to communicate messages effectively. **Lesson 5:** In this lesson, learners will think about the different ways information can be laid out on a page. They will look at a range of page layouts such as letters and newspapers, and begin to think about the purpose of each of these. They will then consider the benefits of using desktop publishing applications.

		using text, images, or both text and images to communicate messages effectively.	the Return, Backspace, and Shift keys will be explored and learners will be taught how to type age-appropriate punctuation marks. This will build on the typing skills learned in the Year 1 'Digital painting' unit. Learners will understand that once content has been added, it can be rearranged on the page.	This lesson has been designed on a laptop using Adobe Spark and this is reflected in the screenshots and videos. Teachers may decide to use the Adobe Spark app, or other software such as Canva or Microsoft Publisher.	copyright-free images from http://www.pixabay.com if using a different application.	
	Key Content	I can recognise how text and images convey information				
		I can recognise that text and layout can be edited				
		I can choose appropriate page settings				
		I can add content to a desktop publishing publication				
		I can consider how different layouts can suit different purposes				
	Second order concepts	**Chronology:** I have an understanding of how publishing has changed over time				
		Significance: I understand the significance of desktop publishing in the wider world				
		Written and Oral Communication: I can use computing terminology I can use written and oral communication within digital media I can use technology to support and improve communication				
	Summer 2	**Key Concepts**		**Prior Learning**	**At the end of this unit children will know:**	**5 Key Questions**

	Unit of work **Programming B – Events and Actions in Programs**	**Programming:** (interpreting, creating and evaluating algorithms, programming to accomplish specific goals, detecting and correcting errors		• Use of floor robots and ScratchJr. • Sequencing	• The links between events and actions • Explore movement • Programming extensions • Draw lines with sprites and modify	 What does an 'event' do?  Give me a definition for 'sprite'  What is going wrong in this program? Give children an example of code that needs debugging on Scratch  What is the importance of the **Pen** extension?  Select the correct set up blocks to position the sprite at the start of the maze.	
	Suggested lessons	Quick Quiz: List some attributes for these groups. **Lesson 1:** In this lesson, learners will investigate how characters can be moved using 'events'. They will analyse and improve an existing project, and then apply what they have learned to their own projects. They will then extend their learning to control multiple sprites in the same project.	Quick Quiz: What database have we been looking at last term? Why are databases useful? **Lesson 2:** In this lesson, learners will program a sprite to move in four directions: up, down, left, and right. They will begin by choosing a sprite and sizing it to fit in with a given background. Learners will then create the code to move the sprite in one direction before duplicating and modifying it to move in all four directions. Finally, they will consider how their project could be	Quick Quiz: How can characters be moved on Scratch? What directions do sprites move in? **Lesson 3:** This lesson will introduce learners to extension blocks in Scratch using the **Pen** extension. Learners will use the pen down block to draw lines, building on the movement they created for their sprite in Lesson 2. Learners will then decide how to set up their project every time it is run.	Quick Quiz: What does the Pen extension do? What are stop-frame animations made from? **Lesson 4:** In this lesson, learners will be given the opportunity to use additional **Pen** blocks. They will predict the functions of new blocks and experiment with them, before designing features to add to their own projects. Finally, they will add these features to their projects and test their effectiveness.	Quick Quiz: What are the functions of these blocks? **Lesson 5:** This lesson explores the process of debugging, specifically looking at how to identify and fix errors in a program. Learners will review an existing project against a given design and identify bugs within it. They will then correct the errors, gaining independence as they do so. Learners will also develop their	Quick Quiz: Identify and fix the errors in the program below **Lesson 6:** In this lesson, learners will design and create their own projects. Using a template (which can be blank or partially completed), learners will complete projects to move a sprite around a maze, with the option to leave a pen trail showing where the sprite has moved. Ideally, projects will include setup blocks to position the sprite at the start of the maze and clear any lines already on the screen.

			extended to prove that their sprite has successfully navigated a maze.			projects by considering which new setup blocks to use.	
	Key Content	I can explain how a sprite moves an existing project					
		I can create a program to move a sprite in four directions					
		I can adapt a program to a new context					
		I can develop my program by adding features					
		I can identify and fix bugs in a program					
		I can design and create a maze-based challenge					
	Second order concepts	**Cause and Consequence:** I understand how programming affects outcomes					
		Written and Oral Expression: I can use computing terminology accurately					
Y4	**Summer 1**	**Key Concepts**		**Prior Learning**	**At the end of this unit children will know:**	**5 Key Questions**	
	Unit of work **Creating Media – Photo Editing**	**Creating media:** (design and development, communicating and collaborating online, evaluating online content, respectful and responsible communication, presenting, creating content)		• Making choices on a tablet/ computer • Navigation within applications	• How to edit digital images • The impact that editing can have on an image • How editing can be used appropriately for different scenarios • How to create and evaluate 'fake' images	What does the 'crop' tool do? Define 'retouch' Identify the changes made to the given edited images. Why do people choose to retouch images? What are the positive and negative effects that retouching can have on those images?	
	Suggested lessons	What is the World Wide Web made up of? List some digital devices. **Lesson 1:** In this lesson, learners will be introduced to the online editor, and changes that can be made to images	Quick Quiz: What is decomposition? List technological devices we have in the classroom. List technological devices we have at home. **Lesson 2:** In this lesson, learners will identify	Quick Quiz: Tick whether the images are real or not. How can we stay safe online? **Lesson 3:** In this lesson, learners will look at the effect that different colours and filters can have on an image. They will choose appropriate effects to fit	Quick Quiz: Identify devices' inputs and outputs. What is a podcast? **Lesson 4:** This lesson is based on editing images by using retouching tools. Learners will consider why people may choose to retouch images, and the positive and negative effects that	Quick Quiz: What do people retouch images? What is 'debugging'? **Lesson 5:** This lesson is based on the concept of 'fake' images. Learners will sort images into 'fake' and 'real' and give reasons for their decisions. They will create their own fake images and reflect on how easy it is to digitally alter images and what this might means for the images that they see around them.	

		using a range of tools. They will look at changing the composition of images using the 'crop' tool, and evaluate the effect that this can have on an image.	changes that have been made to edited images. They will search for and save images from a copyright-free website. Learners will then use an image editor to make a new image composition linked to a cross-curricular theme.	a scenario, and explain how they made their choices. They will then edit the same original image using different effects to suit two different scenarios, and compare the two versions.	retouching can have on images. They will use retouching tools to improve images, and consider which tools are appropriate for retouching.	
	Key Content	I can explain that digital images can be changed				
		I can change the composition of an image				
		I can describe how images can be changed for different uses				
		I can make good choices when selecting different tools				
		I can recognise that not all images are real				
	Second order concepts	**Responsibility:** I understand that not all online content is real				
		Written and Oral Expression: I can create digital media				
		Similarity and Difference: I can make comparisons and note differences				
	Summer 2	**Key Concepts**		**Prior Learning**	**At the end of this unit children will know:**	**5 Key Questions**
	Unit of work **Programming B – Repetition in Games**	**Programming:** (interpreting, creating and evaluating algorithms, programming to accomplish specific goals, detecting and correcting errors)		• Use of floor robots, ScratchJr. and Scratch	• Differences between count-controlled and infinite loops • Modify existing animations and games using repetition	 Which parts of the instructions are repeated?  Give me definitions for 'infinite loops' and 'count-controlled loops'  When are infinite loops suitable?  How is repetition used in this model project? Provide an example model project similar to that in L5  How effectively has repetition been used in this code? Provide an example similar to that in L3
	Suggested lessons	Quick Quiz:	Quick Quiz: What is an algorithm?	Quick Quiz: What are 'infinite' loops?	Quick Quiz:	Quick Quiz: Quick Quiz:

		List three ways to be safe on online devices. Tick the apps you are allowed to have accounts on at the ages of 8/9. **Lesson 1:** In the first lesson, learners look at real-life examples of repetition, and identify which parts of instructions are repeated. Learners then use Scratch, a block-based programming environment, to create shapes using count-controlled loops. They consider what the different values in each loop signify, then use existing code to modify and create new code, and work on reading code and predicting what the output will be once the code is run.	What are they used for? Predict the outcome of this code. **Lesson 2:** In this lesson, learners look at different types of loops: infinite loops and count-controlled loops. They practise using these within Scratch and think about which might be more suitable for different purposes.	What are 'count-controlled' loops? **Lesson 3:** In this lesson, learners create designs for an animation of the letters in their names. The animation uses repetition to change the costume (appearance) of the sprite. The letter sprites will all animate together when the **event** block (**green flag**) is clicked. When they have designed their animations, the learners will program them in Scratch. After programming, learners then evaluate their work, considering how effectively they used repetition in their code.	What happens when the green flag is clicked? Give me an example of an input device. **Lesson 4:** In this lesson, learners look at an existing game and match parts of the game with the design. They make changes to a sprite in the existing game to match the design. They then look at a completed design, and implement the remaining changes in the Scratch game. They add a sprite, re-use and modify code blocks within loops, and explain the changes made.	Input or output? (Provide a variety of different picture prompts) **Lesson 5:** In this lesson, learners look at a model project that uses repetition. They then design their own games based on the model project, producing designs and algorithms for sprites in the game. They share these designs with a partner and have time to make any changes to their design as required.	Why are. some images 'retouched'? **Lesson 6:** In this lesson, learners build their games, using the designs they created in Lesson 5. They follow their algorithms, fix mistakes, and refine designs in their work as they build. They evaluate their work once it is completed, and showcase their games at the end.
	Key Content	I can develop the use of count-controlled loops in a different programming environment					
		I can explain that in programming there are infinite loops and count-controlled loops					
		I can develop a design that includes two or more loops which run at the same time					
		I can modify an infinite loop in a given program					
		I can design a project that includes repetition					
		I can create a project that includes repetition					
		Cause and Consequence: I can discuss loops in programming					
		Similarity and Difference: I can make comparison, find patterns, note differences and draw conclusions					

	Second order concepts	**Written and Oral Expression:** I can use computing terminology				
YEAR 5	**Summer 1**	**Key Concepts**		**Prior Learning**	**At the end of this unit children will know:**	**5 Key Questions**
	Unit of work – Vector Drawing	**Creating media:** (design and development, communicating and collaborating online, evaluating online content, respectful and responsible communication, presenting, creating content)		• Digital painting • Use of digital images	• Vector images are made up of shapes • How to use different tools and how images are created in layers • How images can be grouped and duplicated to create complex pieces of work	 What are vectors made up of?  Define 'objects' in terms of vectors  How does 'duplicating' save time?  Discuss and describe how digital images are created.  Suggest improvements to these vector drawings.
	Suggested lessons	Quick Quiz: How are computers connected together to form systems? Provide some programming devices/ programs. Children to name them. **Lesson 1:** In this lesson learners will be introduced to vector drawings and begin to have an understanding that they are made up of simple shapes and lines. Learners will use	Quick Quiz: What are vector made up of? What components made up a Crumble circuit? **Lesson 2:** During this lesson learners will begin to identify the shapes that are used to make vector drawings. They will be able to explain that each element of a vector drawing is called an **object**. Learners will create their own vector drawing by moving, resizing, rotating, and changing the colours of a selection of	Quick Quiz: What is each element of a vector drawing called? Why is 'duplicating' useful? **Lesson 3:** During this lesson learners will continue to increase the complexity of their vector drawings by using the zoom tool to help them add detail. They will begin to understand how grids and resize handles can be used to improve consistency in their drawings and use tools to modify objects, creating different effects.	Quick Quiz: How can we stay safe online? List some different forms of media we can send electronically. **Lesson 4:** During this lesson learners will gain an understanding of layers and how they are used in vector drawings. They will learn that each object is built on a new layer and that these layers can be moved forward and backward to create effective vector drawings.	Quick Quiz: How can we increase the complexity of vector drawings? How can we create effective vector drawings? **Lesson 5 & 6:** During this lesson, learners will be taught how to duplicate multiple objects. They will learn how to group objects to make them easier to work with, how to copy and paste these images, and then make simple alterations. During this lesson learners will also understand how digital images can be made from shapes or pixels

		the main drawing tools within a software package. This unit is written assuming the use of Google Drawings (docs.google.com/drawings/) but other packages such as Microsoft Publisher, or Microsoft PowerPoint can be used if preferred. Learners will discuss how vector drawings differ from paper-based drawings	objects. They will also learn how to duplicate the objects to save time.			
	Key Content	I can identify that drawing tools can be used to produce different outcomes				
		I can create a vector drawing by combining shapes				
		I can use tools to achieve a desired effect				
		I can recognise that vector drawings consist of layers				
		I can group objects to make them easier to work with				
	Second order concepts	**Similarity and Difference:** I can make comparisons, find patterns, note differences and draw conclusions				
		Written and Oral Expression: I can use computing terminology within digital media				
	Summer 2	**Key Concepts**		**Prior Learning**	**At the end of this unit children will know:**	**5 Key Questions**

	Unit of work **Programming B – Selection in Quizzes**	**Programming:** (interpreting, creating and evaluating algorithms, programming to accomplish specific goals, detecting and correcting errors)		• How 'conditions' can be used in programming	• How to write programs that ask questions • How select controls the outcomes based on the answers given • How to design a quiz in response to a given task and implement it as a program	 Select the programs that contain an example of selection.  What is a 'binary question'?  Why do you use selection in programming?  Discuss what will happen if the green flag is clicked to run the program below? (have image of Scratch code)  Identify the outcomes in the given programs and how the condition informs which outcomes is selected.	
	Suggested lessons	Quick Quiz: Computers can be connected to form… How is information transferred over the Internet --? **Lesson 1:** In this lesson, learners revisit previous learning on 'selection' and identify how 'conditions' are used to control the flow of actions in a program. They are introduced to the blocks for using conditions in programs using the Scratch programming	Quick Quiz: Match the term to the definition: selection condition programming **Lesson 2:** In this lesson, learners will develop their understanding of selection by using the 'if… then… else...' structure in algorithms and programs. They will revisit the need to use repetition in selection to ensure that conditions are repeatedly checked. They identify the two outcomes in given programs and how the condition informs	Quick Quiz: Identify the outcomes of the programs. What does a condition control? **Lesson 3:** In this lesson, learners consider how the 'if… then... else…' structure can be used to identify two responses to a binary question (one with a 'yes or no' answer). They identify that the answer to the question is the 'condition', and use algorithms with a branching structure to represent the actions that will be carried out if the condition is true or false. They learn how	Quick Quiz: What benefits does sharing information online have? What programming device did we use last term? **Lesson 4:** In this lesson, learners will be provided with a task: to use selection to control the outcomes in an interactive quiz. They will outline the requirements of the task and use an algorithm to show how they will use selection in the quiz to control the outcomes based on the answer given. Learners will complete their designs by using storyboards to identify the questions that will be asked, and the outcomes for both correct and	Quick Quiz: What makes a useful chart? What does 'unplugged' mean in computing? **Lesson 5:** In this lesson, learners will use the Scratch programming environment to implement the first section of their algorithm as a program. They will run the first section of their program to test whether they have correctly used selection to control the	Quick Quiz: Identify the error in the program below **Lesson 6:** In this lesson, learners will return to their completed programs and identify ways in which the program can be improved. They will focus on issues where answers similar to those in the condition are given as inputs, and identify ways to avoid such problems. Learners will also consider how the outcomes may change the program for subsequent users, and identify how they can make use of setup to

		environment. They modify the conditions in an existing program and identify the impact this has	which outcome will be selected. Learners use this knowledge to write their own programs that use selection with two outcomes.	questions can be asked in Scratch, and how the answer, supplied by the user, is used in the condition to control the outcomes. They use an algorithm to design a program that uses selection to direct the flow of the program based on the answer provided. They implement their algorithm as a program and test whether both outcomes can be achieved.	incorrect answers. To demonstrate their understanding of how they are using selection to control the flow of the program, learners will identify which outcomes will be selected based on given responses.	outcomes, and debug their program if required. They will then continue implementing their algorithm as a program. Once completed, they will consider the value of sharing their program with others so that they can receive feedback. Learners conclude the lesson by using another learner's quiz and providing feedback on it.	provide all users with the same experience. They will implement their identified improvements by returning to the Scratch programming environment and adding to their programs. They conclude the unit by identifying how they met the requirements of the given task, and identifying the aspects of the program that worked well, those they improved, and areas that could improve further.
	Key Content	I can explain how selection is used in computer programs					
		I can relate that a conditional statement connects a condition to an outcome					
		I can explain how selection directs the flow of a program					
		I can design a program which uses selection					
		I can create a program which uses selection					
		I can evaluate my program					
	Second Order Concepts	**Cause and Consequence:** I can discuss selection in programming					
		Similarity and Difference: I can make comparison, find patterns, note differences and draw conclusions					
		Written and Oral Expression: I can use computing terminology					
	Summer 1	**Key Concepts**		**Prior Learning**	**At the end of this unit children will know:**	**5 Key Questions**	

YEAR 6	**Unit of work** **Creating Media – 3D Modelling**	**Creating media:** (design and development, communicating and collaborating online, evaluating online content, respectful and responsible communication, presenting, creating content)		• Working with 2D graphics applications	• Using a computer to produce 3D models • How to work in 3D space, including combining 3D objects to make a house and examining the differences between working digitally with 2D and 3D graphics • How to make accurate 3D models of physical objects	What are the similarities and differences between working digitally with 3D and 3D graphics? 2D/ 3D Explain what the following symbols do on TinkerCad. How could you develop your skills further on TinkerCad? Discuss the similarities and differences of working digitally with 2D and 3D graphics	
	Suggested lessons	Quick Quiz: Websites are made up of lots of…. Webpages combined together make a… List three features a website should include. **Lesson 1:** This lesson introduces learners to the concept of 3D modelling by creating a range of 3D shapes that they select and move. They also examine the shapes from a variety of views within the 3D space.	Quick Quiz: 1:1 or one-to-many? **Lesson 2:** This lesson examines the similarities and differences between working digitally with 2D and 3D graphics. Learners initially discuss the similarities and differences they have identified so far, then move on to combine 3D shapes, including lifting the 3D object, to produce a house. Learners then colour their 3D shapes, followed by adding further shapes and undertaking further reflection on the similarities and differences between working digitally with 2D and 3D graphics.	Quick Quiz: Web crawlers help search engines by… List three search engines. **Lesson 3:** During this lesson, learners will produce a 3D model of a physical object, which will contain a number of different 3D objects. 3D objects will need to be rotated and placed into position in relation to other 3D objects.	Quick Quiz: What are variables? Identify the variables below. **Lesson 4:** During this lesson, learners will produce a 3D model of a pencil holder desk tidy. The 3D model will contain a number of 3D objects that are of specific dimensions and use other 3D objects as placeholders to create holes with them.	Quick Quiz: How can we ensure we are safe online? What are the different types of media used on web pages? **Lesson 5:** During this lesson, learners will resize and enhance their 3D model of a pencil holder desk tidy. Learners will also plan their own 3D model of a photo frame, which will be developed during the next lesson.	Quick Quiz: What do the following symbols on TinkerCad mean? **Lesson 6:** During this lesson, learners will produce their own 3D model based on their planning during the previous lesson. They will evaluate their work and make improvements based on feedback from their peers.

Key Content	I can use a computer to create and manipulate 3D digital objects
	I can compare working digitally with 2D and 3D graphics
	I can construct a digital 3D model of a physical object
	I can identify that physical objects can be broke down into a collection of 3D shapes
	I can design a digital model by combining 3D objects
	I can develop and improve a digital 3D model
Second order concepts	**Similarity and Difference:** I can make comparisons, find patterns, note differences and draw conclusions
	Written and Oral Expression: I can use computing terminology within digital media

Summer 2	**Key Concepts**	**Prior Learning**	**At the end of this unit children will know:**	**5 Key Question**
Unit of work **Programming B – Sensing**	**Programming:** (interpreting, creating and evaluating algorithms, programming to accomplish specific goals, detecting and correcting errors)	• Sequence – Y3 • Repetition – Y4 • Selection – Y5	• How to use sequence, repetition and selection in a different environment with a micro:bit • How to create code from a given design	 True or false? The micro:bit is an input process, output device that can be programmed.  Define 'conditions'  How can a micro:bit count your steps?  What code could you write if you wanted to make X using a micro:bit?  Identify the four programming constructions needed to be included in your projects.

Suggested lessons	Quick Quiz: CopyRIGHT or copyWRONG? **Lesson 1:** In this lesson, learners will be introduced to the micro:bit as an input, process, output device that can be programmed. Learners will	Quick Quiz: What is a micro:bit? What information should you not share online? **Lesson 2:** In this lesson, learners will explore how if, then, else statements are used to direct the flow of a program. They will initially relate if, then,	Quick Quiz: What are the different types of media used on web pages? **Lesson 3:** In this lesson, learners will initially use the buttons to change the value of a variable using selection. They will then develop their programs to update the variable by moving their micro:bit	Quick Quiz: How can a variable be displayed? **Lesson 4:** In this lesson, learners will initially work at code level by applying their knowledge from the previous lesson to make their micro:bit perform the function of a compass. They will then design a program which will enable the micro:bit to be	Quick Quiz: Which communication method suits the purpose? **Lesson 5:** In this lesson, learners will be working at the design level. They will pick out features of a step counter, a piece	Quick Quiz: True or false questions related to spreadsheet. **Lesson 6:** In this lesson, learners will use the design that they have created in Lesson 5 to make a micro:bit-based step counter. First they will review their plans, followed by creating their code. Depending

		familiarise themselves with the device itself and the programming environment, before creating their own programs. They will then flash their programs to the device.	else statements to real-world situations, before creating programs in MakeCode. They will apply their knowledge of if, then, else statements to create a program that features selection influenced by a random number to create a micro:bit fortune teller project.	using the accelerometer to sense motion. Finally, they will learn that a variable can be displayed after it is updated or in response to an input.	used as a navigational device. To code this, they will adapt the code they completed to make the compass.	of technology with which they are likely to be familiar. They will then relate those features to the sensors on a micro:bit. Having seen a simulated example of a micro:bit step counter, learners will pick out features which they will be able to include in their design. In the main activity, learners will design the algorithm for their step counter project. Finally, they will connect the battery pack to their micro:bit to set it up as a portable device.	on their level of confidence, they can use a scaffolded or part-complete project, otherwise they can start a new project. Learners will test and debug their code, using the emulator and then the physical device. To successfully complete this project, learners will need to use all four programming constructs: sequence, repetition, selection, and variables
	Key Content	I can create a program to run on a controllable device					
		I can explain that selection can control the flow of a program					
		I can update a variable with a user input					
		I can use a conditional statement to compare a variable to a value					
		I can design a project that uses inputs and outputs on a controllable device					
		I can develop a program to use inputs and outputs on a controllable device					
	Second order concepts	**Cause and Consequence:** I can discuss selection, inputs and outputs in programming					
		Similarity and Difference: I can make comparison, find patterns, note differences and draw conclusions					
		Written and Oral Expression: I can use computing terminology accurately					