

Medium Term Plan – Computing – Year 3 Autumn 1: **COMPUTING SYSTEMS AND NETWORKS – Connecting computers**

Length of unit - 6 Sessions (2 sessions taught per week)

	Disciplinary and Substantive Knowledge	Vocabulary	Learning Sequence
Pre-learning	• What technology they see in their lives (bar code readers, televisions, bank cards, traffic lights) • That the school has rules about using technology in school • Understand some of the rules about using technology in school	• Digital device • Input • Output • Process • Digital device	Session 1 - How does a digital device work? This lesson introduces the concepts of input, process, and output. These concepts are fundamental to all digital devices. Learners apply their knowledge in a range of contexts and create their own input, process, output systems.
Learning in this unit	• To explain how digital devices function • To identify input and output devices • To recognise how digital devices can change the way we work • To explain how a computer network can be used to share information • To explore how digital devices can be connected • To recognise the physical components of a network	• Program • Connection • Network • Network switch • Server • Wireless access point (WAP)	Session 2 - What parts make up a digital device? Learners will develop their knowledge of the relationship between inputs, processes, and outputs and apply it to devices and parts of devices that they will be familiar with from their everyday surroundings.
Resources Paintz App			Session 3 - How do digital devices help us? Learners will apply their learning from Lessons 1 and 2 by using programs in conjunction with inputs and outputs on a digital device. They will create two pieces of work with the same focus, using digital devices to create one piece of work, and non-digital tools to create the other. Learners will then compare and contrast the two approaches.
			Session 4 - How am I connected? Many digital devices are now connected to other digital devices, e.g., computers through wires, tablets through Wi-Fi, and smartphones through mobile phone networks. This lesson explains that the benefit of connecting digital devices is that it allows information to be shared between users and systems.
			Session 5 - How are computers connected? This lesson introduces key network components, including a server and wireless access points. Learners will examine each device's functionality and look at the benefits of networking computers.
			Session 6 - What does our school network look like? Learners will further develop their understanding of computer networks. They will see examples of network infrastructure in a real-world setting and relate them to the activities in Lesson 5. .

Medium Term Plan – Computing – Year 3 Autumn 2: **CREATING MEDIA – Stop-frame animation**

Length of unit - 5 Sessions (2 sessions taught per week)

	Disciplinary and Substantive Knowledge	Vocabulary	Learning Sequence
Pre-learning	• How apps and software can be used to adapt and alter images • A range of digital devices and how they are used	• Animation • Flip book • Stop frame animation	Session 1 - Can a picture move? Learners will discuss whether they think a picture can move. They will learn about simple animation techniques and create their own animations in the style of flip books (flick books) using sticky notes.
Learning in this unit Resources Stop Motion Animator	• To explain that animation is a sequence of drawings or photographs • To relate animated movement with a sequence of images • To plan an animation • To identify the need to work consistently and carefully • To review and improve an animation	• Frame • Sequence • Image • Photograph • Setting • Character • Events • Consistency • Evaluation • Onion skinning	Session 2 - Frame by frame In the previous lesson, learners created their own flip book–style animations. In this lesson, they will develop this knowledge and apply it to make a stop-frame animation using a tablet.
			Session 3 - What's the story? Remind the learners of the animations that we created last lesson and tell them that next lesson we will use tablets to animate some of our own stories. Tell the learners that during this lesson they will create a storyboard showing the characters, settings and events that they would like to include in their own stop-frame animation next week.
			Session 4 - Picture perfect In the previous lesson, learners planned out their own stop-frame animations in a storyboard. This lesson, they will use tablets to carefully create stop-frame animations, paying attention to consistency.
			Session 5 - Evaluate and make it great! Last lesson, learners created their own stop-frame animations. This lesson, they will evaluate their animations and try to improve them by creating a brand-new animation based on their feedback. They will add other media and effects into their animations, such as music and text.

Medium Term Plan – Computing – Year 3 Spring 1: **PROGRAMMING A – Sequencing sounds**

Length of unit - 6 Sessions (2 sessions taught per week)

	Disciplinary and Substantive Knowledge	Vocabulary	Learning Sequence
Pre-learning	• That algorithms are a series of instructions • How to program floor robots • How to use block coding in Scratch Jnr • How to debug a program • How to design an algorithm to achieve a goal	• Scratch • Programming • Blocks • Commands • Code • Sprite • Costume • Stage • Backdrop • Sprites • Motion • Turn • Go to • Glide	Introduction to Scratch This lesson introduces learners to a new programming environment: Scratch. Learners will begin by comparing Scratch to other programming environments they may have experienced, before familiarising themselves with the basic layout of the screen.
			Programming sprites In this lesson, learners will create movement for more than one sprite. In doing this, they will design and implement their code, and then will create code to replicate a given outcome. Finally, they will experiment with new motion blocks.
			Sequences In this lesson, learners will be introduced to the concept of sequences by joining blocks of code together. They will also learn how event blocks can be used to start a project in a variety of different ways. In doing this, they will apply principles of design to plan and create a project.
Learning in this unit Resources Scratch	• To explore a new programming environment • I can identify that each sprite is controlled by the commands I choose • To explain that a program has a start • To recognise that a sequence of commands can have an order • To change the appearance of my project • To create a project from a task description	• Sequence • Event • Task • Design • Order • Note • Chord • Algorithm • Bug • Debug	Ordering commands This lesson explores sequences, and how they are implemented in a simple program. Learners have the opportunity to experiment with sequences where order is and is not important. They will create their own sequences from given designs.
			Looking good This lesson develops learners' understanding of sequences by giving them the opportunity to combine motion and sounds in one sequence. They will also learn how to use costumes to change the appearance of a sprite, and backdrops to change the appearance of the stage. They will apply the skills in Activity 1 and 2 to design and create their own project, including sequences, sprites with costumes, and multiple backdrops.
			Making an instrument In this lesson, learners will create a musical instrument in Scratch. They will apply the concept of design to help develop programs and use programming blocks — which they have been introduced to throughout the unit. They will learn that code can be copied from one sprite to another, and that projects should be tested to see if they perform as expected.

Medium Term Plan – Computing – Year 3 Spring 2: **DATA AND INFORMATION – Branching databases**

Length of unit - 6 Sessions (2 sessions taught per week)

	Disciplinary and Substantive Knowledge	Vocabulary	Learning Sequence
Pre-learning	• Grouping data. • Labelling objects. • Grouping objects based on different properties • Pictograms and how they can be used to sort information	• Attribute • Value • Questions • Table • Objects • Branching database, • Equal • Even • Separate • Structure • Compare • Order • Organise • Selecting • Pictogram • Information • Decision tree	Yes or no questions During this lesson, learners will start to explore questions with yes or no answers, and how these can be used to identify and compare objects. They will create their own yes or no questions before using these to split a collection of objects into groups.
			Making groups During this lesson, learners will continue to develop their understanding of using questions with yes or no answers to group collections of objects. They will learn how to arrange objects in a tree structure and will continue to think about which attributes the questions are related to.
			Creating a branching database During this lesson, learners will continue to develop their understanding of ordering objects/images in a branching database structure. They will learn how to use an online database tool to arrange objects into a branching database and will create their own questions with yes or no answers. The learners will show that their branching database works through testing.
Learning in this unit Resources j2data Branch and Pictogram	• To create questions with yes/no answers • To identify the object attributes needed to collect relevant data • To create a branching database • To identify objects using a branching database • To explain why it is helpful for a database to be well structured • To compare the information shown in a pictogram with a branching database		Structuring a branching database During this lesson, learners will continue to develop their understanding of how to create a well-structured database. They will use attributes to create questions with yes or no answers and apply these to given objects. The learners will be able to explain why questions need to be in a specific order and will compare the efficiency of different branching databases.
			Using a branching database During this lesson, learners will independently create a branching database that will identify a given object. They will continue to think about the attributes of objects to write questions with a yes or no answer, which will enable them to separate a group of objects effectively. The learners will then arrange the questions and objects into a tree structure, before using their branching database to answer questions.
			Two ways of presenting information During this lesson, the learners will compare two ways of presenting information. They will demonstrate their ability to explain what information is shown in a pictogram and a branching database. The learners will begin to compare the two ways of presenting information.

Medium Term Plan – Computing – Year 3 Summer 1: **CREATING MEDIA – Desktop publishing**

Length of unit - 6 Sessions (2 sessions taught per week)

	Disciplinary and Substantive Knowledge	Vocabulary	Learning Sequence
Pre-learning	- Understand that technology can be used to change digital files (paintings, images, text) - Understand that apps and software have tools that can be used to change files	- Text - Images - Advantages - Disadvantages - Communicate - Font - Template - Landscape - Portrait - Orientation - Placeholder - Template - Desktop publishing - Copy - Paste - Layout - Purpose - Benefits	Words and pictures 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 using text, images, or both text and images to communicate messages effectively.
			Can you edit it? 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 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.
			Great template! Learners will be introduced to the terms 'templates', 'orientation', and 'placeholders' within desk-top publishing software. The learners will create their own magazine template, which they will add content to during the next lesson.
Learning in this unit Resources Adobe Spark	- To recognise how text and images convey information - To recognise that text and layout can be edited - To choose appropriate page settings - To add content to a desktop publishing publication - To consider how different layouts can suit different purposes - To consider the benefits of desktop publishing		Can you add content? 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.
			Lay it out 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.
			Why desktop publishing? In this lesson, learners will explain what desktop publishing means in their own words. They will think about how desktop publishing is used in the wider world and consider the benefits of using desktop publishing applications.

Medium Term Plan – Computing – Year 3 Summer 2: **PROGRAMMING B – Events and actions in programming**

Length of unit - 6 Sessions (2 sessions taught per week)

	Disciplinary and Substantive Knowledge	Vocabulary	Learning Sequence
Pre-learning	• Block coding • The Scratch block coding environment • How to use events and motion in Scratch • Debugging and how it is important in writing a program	• Motion • Event • Sprite • Algorithm • Logic • Move • Resize • Extension block • Pen • Design • Action • Debugging • Errors • Setup • Code • Test	Moving a sprite 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. Maze movement 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 back-ground. 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 extended to prove that their sprite has successfully navigated a maze. Drawing lines 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.
Learning in this unit Resources Scratch	• To explain how a sprite moves in an existing project • To create a program to move a sprite in four directions • To adapt a program to a new context • To develop my program by adding features • To identify and fix bugs in a program • To design and create a maze-based challenge		Adding features 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 pro-jects and test their effectiveness. Debugging movement 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 de-sign and identify bugs within it. They will then correct the errors, gaining independence as they do so. Learners will also develop their projects by considering which new setup blocks to use. Making a project 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.