

Medium Term Plan – Computing – Year 2 Autumn 1: **COMPUTING SYSTEMS AND NETWORKS – IT around us**

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) • The school has rules about using technology in school • Understand some of the rules about using technology in school	• Information technology (IT) • Computer • Barcode • Scanner/scan	What is IT? This lesson develops learners' understanding of what information technology (IT) is. They will identify devices which are computers and consider how IT can help us both at school and at home.
Learning in this unit Resources Google Slides	• To recognise the uses and features of information technology • To identify the uses of information technology in the school • To identify information technology beyond school • To explain how information technology helps us • To explain how to use information technology safely • To recognise that choices are made when using information technology		IT in school This lesson encourages learners to consider common uses of information technology in a context that they are familiar with beyond school. IT in the world Having considered the use of information technology in the familiar context of the home, learners will explore IT in other environments that they may have experienced. The benefits of IT This lesson focuses on the specific use of IT in a shop. Using IT safely In this lesson, learners will consider how they use different forms of information technology safely, in a range of different environments. Using IT in different ways In this lesson, learners will think about the choices that are made when using information technology, and the responsibility associated with those choices.

Medium Term Plan – Computing – Year 2 Autumn 2: **CREATING MEDIA – Digital photography**

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

	Disciplinary and Substantive Knowledge	Vocabulary	Learning Sequence
Pre-learning	• Know a range of digital technology is all around us • Know that computers can be used to create and change images (based on Year 1 unit—digital painting) • Understand how to be responsible when using technology	• Device • Camera • Photograph • Capture	Taking Photographs This lesson introduces the concept that many devices can be used to take photographs. In the lesson, learners begin to capture their own photographs.
Learning in this unit Resources iPads to take photos	• To use a digital device to take a photograph • To make choices when taking a photograph • To describe what makes a good photograph • To decide how photographs can be improved • To use tools to change an image • To recognise that photos can be changed	• Image • Digital • Landscape • Horizontal • Portrait • Vertical • Field of view • Narrow • Wide • Format • Framing • Focal point • Lighting • Flash • Focus • Background • Foreground • Editing • Filter	Landscape or portrait? In this lesson, learners explore taking photographs in both portrait and landscape formats and explore the reasons why a photographer may favour one over the other.
			What makes a good photograph? In this lesson, learners discover what constitutes good photography composition and put this into practice by composing and capturing photos of their own.
			Lighting This lesson introduces the concepts of light and focus as further important aspects of good photography composition. In this lesson, learners investigate the effect that good lighting has on the quality of the photos they take, and explore what effect using the camera flash and adding an artificial light source have on their photos. They also learn how the camera autofocus tool can be used to make an object in an image stand out.
			Effects This lesson introduces the concept of simple image editing. Learners are introduced to the Pixlr image editing software and use the 'Adjust' tool to change the colour effect of an image.
			Is it real? This lesson introduces the concept that images can be changed for a purpose. Learners are introduced to a range of images that have been changed in different ways and through this, develop an awareness that not all images they see are real. To start the lesson, learners are first challenged to take their best photograph by applying the photography composition skills that they have developed during the unit.

Medium Term Plan – Computing – Year 2 Spring 1: **PROGRAMMING A – Robot algorithms**

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

	Disciplinary and Substantive Knowledge	Vocabulary	Learning Sequence
Pre-learning	• Commands and how algorithms are a sequence of commands • How floor robots are programmed • How to use prediction in programs	• Instruction • Sequence • Clear • Algorithm • Program • Sequence • Order • Commands • Prediction • Route • Debugging	Giving instructions
			In this lesson, pupils will follow instructions given to them and give instructions to others. Pupils will consider the language used to give instructions and how that language needs to be clear and precise. Pupils will combine several instructions into a sequence that can then be issued to another pupil to complete. Pupils will then consider this clear and precise set of instructions in relation to an algorithm, and they will think about how computers can only follow clear and unambiguous instructions
			Same but different This lesson focuses on sequences, and guides pupils to consider the importance of the order of instructions within a sequence. Pupils will create several short sequences using the same commands in different orders. They will then test these sequences to see how the different orders affect the outcome.
			Making predictions In this lesson, pupils will use logical reasoning to make predictions. They will follow a program step by step and identify what the outcome will be.
Learning in this unit	• To describe a series of instructions as a sequence • To explain what happens when we change the order of instructions • To use logical reasoning to predict the outcome of a program (series of commands) • To explain that programming projects can have code and artwork • To design an algorithm • To create and debug a program that I have written		Mats and routes
Resources BeeBot			In this lesson, pupils will design, create, and test a mat for a floor robot. This will introduce the idea that design in programming not only includes code and algorithms, but also artefacts related to the project, such as artwork and audio.
			Algorithm design In this lesson, pupils will design algorithms to move their robot around the mats that they designed in Lesson 4. As part of the design process, pupils will outline what their task is by identifying the starting and finishing points of a route. This outlining will ensure that pupils clearly understand what they want their program to achieve
			Debugging In this lesson, pupils will take on a larger programming task. They will break the task into chunks and create algorithms for each chunk. This process is known as 'decomposition' and is covered further in key stage 2. Pupils will also find and fix errors in their algorithms and programs. This is known as 'debugging'.

Medium Term Plan – Computing – Year 2 Spring 2: **DATA AND INFORMATION - Pictograms**

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

	Disciplinary and Substantive Knowledge	Vocabulary	Learning Sequence
Pre-learning	This unit progresses students' knowledge and understanding of grouping data. It builds on the Year 1 Data and Information unit where learners labelled objects and grouped them based on different properties.	• More/less than • Most/Least • Organise • Data • Object • Tally chart • Votes • Total • Attribute • Pictogram • Compare • Count • Explain • Group • Same/different • Popular • Conclusion • Block diagram	Counting and comparing
			During this lesson learners will begin to understand the importance of organising data effectively for counting and comparing. They will create their own tally charts to organise data, and represent the tally count as a total. Finally, they will answer questions comparing totals in tally charts using vocabulary such as 'more than' and 'less than'.
			Enter the data
			During this lesson learners will become familiar with the term 'pictogram'. They will create pictograms manually and then progress to creating them using a computer. Learners will begin to understand the advantages of using computers rather than manual methods to create pictograms, and use this to answer simple questions.
Learning in this unit	• To recognise that we can count and compare objects using tally charts • To recognise that objects can be represented as pictures • To create a pictogram • To select objects by attribute and make comparisons • To recognise that people can be described by attributes • To explain that we can present information using a computer		Creating pictograms
			During this lesson learners will think about the importance of effective data collection and will consider the benefits of different data collection methods: why, for example, we would use a pictogram to display the data collected. They will collect data to create a tally chart and use this to make a pictogram on a computer. Learners will explain what their finished pictogram shows by writing a range of statements to describe this.
			What is an attribute?
			During this lesson learners will think about ways in which objects can be grouped by attribute. They will then tally objects using a common attribute and present the data in the form of a pictogram. Learners will answer questions based on their pictograms using mathematical vocabulary such as 'more than'/'less than' and 'most'/'least'.
Resources j2data pictogram			Comparing people
			During this lesson learners will understand that people can be described by attributes. They will practise using attributes to describe images of people and the other learners in the class. The learners will collect data needed to organise people using attributes and create a pictogram to show this pictorially. Finally, learners will draw conclusions from their pictograms and share their findings.
			Presenting information
			During this lesson learners will understand that there are other ways to present data than using tally charts and pictograms. They will use a pre-made tally chart to create a block diagram on their device. Learners will then share their data with a partner and discuss their findings. They will consider whether it is always OK to share data and when it is not OK. They will know that it is alright to say no if someone asks for their data, and how to report their concerns.

Medium Term Plan – Computing – Year 2 Summer 1: **CREATING MEDIA – Digital music**

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	• Music • Quiet • Loud • Feelings • Emotions • Pattern • Rhythm • Pulse • Pitch • Tempo • Notes • Instrument • Create • Pulse/beat • Open • Edit	How music makes us feel
			The learners will listen to and compare two pieces of music from The Planets by Gustav Holst. They will then use a musical description word bank to describe how this music generates emotions, i.e. how it makes them feel. Rhythms and patterns
			In this lesson, learners will explore rhythm. They will create patterns and use those patterns as rhythms. They will use untuned percussion instruments and computers to hear the different rhythm patterns that they create. How music can be used
			In this lesson, learners will explore how music can be used in different ways to express emotions and to trigger their imaginations. They will experiment with the pitch and duration of notes to create their own piece of music, which they will then associate with a physical object — in this case, an animal.
Learning in this unit	• To say how music can make us feel • To identify that there are patterns in music • To show how music is made from a series of notes • To show how music is made from a series of notes • To create music for a purpose • To review and refine our computer work		Notes and tempo
			In this lesson, learners will develop their understanding of music. They will use a computer to create and refine musical patterns.
			Creating digital music
			In this lesson, learners will choose an animal and create a piece of music using the animal as inspiration. They will think about their animal moving and create a rhythm pattern from that. Once they have defined a rhythm, they will create a musical pattern (melody) to go with it.
			Reviewing and editing music
			In this lesson, learners will retrieve and review their work. They will spend time making improvements and then share their work with the class.

Medium Term Plan – Computing – Year 2 Summer 2: **PROGRAMMING B – Programming quizzes**

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

	Disciplinary and Substantive Knowledge	Vocabulary	Learning Sequence
Pre-learning	- Algorithms - Commands and how algorithms are a sequence of commands - How ScratchJnr uses block programming(after Year 1 unit Programming Animations)	- Sequence - Command - Program - Run - Start - Outcome - Predict - Blocks - Sprite - Algorithm - Design - Actions - Project - Build - Debug - Evaluate	ScratchJr recap
			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.
			Outcomes 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.
			Using a design 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.
Learning in this unit	- To explain that a sequence of commands has a start - To explain that a sequence of commands has an outcome - To create a program using a given design - To change a given design - To create a program using my own design - To decide how my project can be improved		Changing a design
			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.
			Designing and creating a program
			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.
Resources Scratch JR			Evaluating
			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.