Year 2 Spring 1 Medium Term Plan - Algorithms and Programs

Unit Rationale

Children move away from algorithms as sets of instructions towards writing their own programs (set of instructions in computer language). The programs they create become more complex over the unit and the process of debugging is introduced and built upon. The unit is a key introduction to Scratch.

National Curriculum Objectives:	Cross Curricular/E-safety Links:
-algorithms are 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 (loading Scratch files) - using a browser to load Scratch. We use Google Chrome as we have Chromebooks but others are available. e.g Apple - Safari. Microsoft - Internet Explorer - logging into Chromebooks (keeping passwords secure and typing skills.
Trips/Visits:	**Modern Day Links:**
Prior Learning:	**Substantive Knowledge:**
Understanding what algorithms are.	An algorithm is a precise set of instructions. A program is a set of instructions in computer language. A computer will only do what you tell it and that the computer only understands certain instructions. Debugging is finding and fixing errors in a program.
Big ideas/Disciplinary Knowledge	**What next?**
Thinking like a computer to debug. (the computer is following the instructions precisely and only understands certain instructions) Predicting what a program will do. Finding and fixing errors in code and the process of doing this as they go. Just as a writer would edit as they write and not just at the end of a piece of work.	Children create animations in Year 3 which begin to use repetition. Year 4, 5 & 6 all have units which build on selection, variables and decomposing programs into smaller parts to debug.

Lesson	WALT	What should the children remember?	Lesson plan and outcome	Key Vocabulary	Key Questions
1	**Lesson 1 E-safety - please see separate folder**				
Lesson 2	**Lesson 2:** WALT: write a basic algorithm	prior knowledge on what an algorithm is - (a specific and precise set of instructions)	Quiz: Re-cap prior learning using - instructions to help a blindfolded person open a door. Discuss what we did and what we needed to do (use precise instructions) Input: Use maps on slides to describe directions from one place to another in pairs. Focus on precise instructions and attention to detail. Activity: Write instructions for the challenges set and then ask a partner to follow them and see if they are correct. **Template for recording is in the drive** Plenary: Re-cap what an algorithm is and how we use it.	algorithm instructions precise order	What is an algorithm? What are the essential things when writing an algorithm?
Lesson 3	**Lesson 3:** WALT: write a simple computer program in Scratch.	Use of precise and specific instructions to create an algorithm A program is a set of instructions in	Quiz: Re-cap prior learning using - what is an algorithm? What are the important things to remember in an algorithm? (clear and precise instructions) Input: Introduce the concept of programming. What can we use this for? Introduce Scratch and model how to load the website on Chrome. Chn to complete then come back to carpet.	program instructions computer language Scratch stage sprite colour coded blocks	What is a program? What is an algorithm?

		computer language.	Model how to open the Scratch file needed for the lesson. (lesson3.sb3) Children to complete then come back to carpet. Model how to use the code to get the car to the town hall. (video file from 1:30 shows teachers how to do this - please do not show this clip to the children) Activity: Children to complete the programming challenges on Scratch. Mini-plenary: Predict where the code will take the car to. Plenary: Re-cap what we have learnt in the quiz		
Lesson 4	**Lesson 4:** WALT: write a computer program in Scratch.	Use of precise and specific instructions to create an algorithm A program is a set of instructions in computer language. Children are writing a slightly more complicated program today that uses the control block 'wait'.	Share WALT and what an algorithm and program is. Chn to load scratch website and load the scratch file. (same file as previous lesson) Today pupils are adding the wait command so that the car waits before moving onto another location. Explain how the wait command works and predict where the car will visit on the journey. Activity: Children to complete the programming challenges on Scratch. Plenary - complete the sentences about algorithms and programs.	program instructions computer language Scratch stage sprite colour coded blocks wait block	What is a program? What is an algorithm?

Lesson 5	**Lesson 5:** WALT: debug simple computing programs by predicting what they will do.	to know what a program and an algorithm are debugging is fixing errors in program. Some chn will have been doing this naturally in previous lessons.	Quiz: Re-cap prior learning e-safety learning and then What is an algorithm? What is a program? What is the difference? Re-explain to children that a computer will only do what you tell it and that the computer only understands certain instructions. Input: Share WALT and definition of debugging. Go through examples. Can children use knowledge of scratch blocks to predict what is wrong? How would they change it? Children to load the lesson five scratch file. Display to children the page on google slides that shows which number should take the car to which destination! There is a problem with our programs. They need to be debugged! Answers and available as is a print out of the programs so that children can annotate the changes they have made. There is a challenge available where the car should visit two different locations.	algorithm program instructions computer language Scratch wait directional language debugging	What is the difference between and algorithm and a program? What computer language do we use when programming? Can you predict what will happen to the car if the computer follows these instructions? What scratch block would you change? Why?

Lesson 6	**Lesson 6:** WALT: debug a program I have written myself.	This lessons tests children's knowledge of all of the skills covered in the unit so far. Teaching is around getting children to predict and identify errors in the programs that they make themselves	Quiz: Re-cap prior learning using - what is an algorithm? What is a program? What is the difference? computer? Recap debugging and look at the new program children will use today - directing a bus to London landmarks. Input: Look at the Scratch program and discuss how we would test this for errors. Do children talk about predicting? Do they talk about testing by clicking the green flag and watching the bus? Explain that children need to test their program for errors as they go. Finding an error in a large program is going to be tricky. Activity: Children to complete the programming challenges on Scratch - choose level according to their confidence and understanding. All challenges are on a google doc so they can be printed and handed out.	algorithm program instructions computer language Scratch wait directional language error debugging	Can children identify the errors in a program? Can children reprogram to correct the errors?