Year 4 Computing: Programming and debugging

Learning Objective	Core Knowledge	Activities for Learning	Key/related Vocabulary	Assessment Focus/Questions
Lesson 1	See knowledge organiser.	Use this lesson to a) Allow pupils to login to the pupil Chromebooks for the first time or to practise this skill. b) Read through the knowledge organiser together as a class. c) Practise loading the scratch website and read the related section of the knowledge organiser. d) Complete the start of unit assessment quiz. Remember to make a copy of this quiz so that your results are separate from the other schools in the trust. You may want to post the quiz, which is a google form, onto Google Classroom to give children easy access.	See knowledge organiser.	See assessment quiz.
Lesson 2: **WALT: explain what variables are and how they are used in programs.** **WALT: write a SCRATCH program that uses a variable.**	*Variables* are like boxes They are used by computer programs to *store* all kinds of information	Introduce WALTS & the new topic. Watch the video **'how computer games use variables'**. Discuss the question posed at the end of the clip. Explain what variables are. (see core knowledge) Load the scratch website and talk pupils through the process. The website is scratch.mit.edu but they can just google 'Scratch' and click on the first search result. Once you have loaded Scratch you will need to click on **'create'.** Go to **'File'** and then **'Load'** to open up the lesson one	Variables Scratch Debugging Stage Script Sprite	A variable is like a _____. Computers use variables to _____ information.

		Scratch File. (**lesson scratch file.sb3**) Hit the green flag to use this program and explain how it stores and then uses the variable. Show the children the ppt slide with the challenges and let them independently create a program that uses a variable to store information. Complete the exit quiz. The children won't need to save the work from this lesson but there is a slide that details how to do so should you wish.		
Lesson 3: **WALT : explain what repetition is and why it's used in programs.** **WALT : write a SCRATCH program that uses repetition.**	You can use repetition when you want the computer to do the same thing several times There are 3 types of repetition commands in Scratch Repetition makes a program shorter as you don't have to repeat code over and over.	Start with the quiz. Introduce WALTS. Ask the question 'What shape will the cat move in when you press the green flag?' 'Can you notice an instruction?' Explain what repetition is and how in scratch there are three different 'control blocks' that we can use for this. Discuss the difference between repeating something a number of times, repeating something forever and repeating something until a condition is met. Show the ppt slide that contains the challenges. The pupils should attempt these challenges in order. The commands are given but children will have to order correctly and then debug and test themselves. They can test by pressing the green flag. Complete the short exit quiz.	Repetition Debugging Scratch Stage Script Sprite	Why do computers use repetition? Which instruction shown is an example of repetition?

Lesson 4 **WALT : explain what repetition is and why it's used in programs.** **WALT : write a SCRATCH program that uses repetition.**	As previous lesson.	Lesson starter – quiz Introduce WALTS. Recap the three different types of repeat commands. Talk through the blocks that would be used to draw a square. Why do you think the command erase all has been placed at the start? Talk through the slide that shows drawing a pattern. There is a scratch file that you can load for this called **'Lesson 4 Drawing Example'.** Key Question - How much shorter is this program as a result of using repetition? Hand out the three challenge cards (print the last three slides). Differentiate by starting the AARL children on challenge 2. Challenge Card 1 has a scratch file that you could load called **'lesson4challengecard1'.**	Repetition Scratch Debugging Stage Script Sprite	
Lesson 5: **WALT: write a SCRATCH program that uses variables and repetition.**	Variables and repetition are often used in conjunction with each other.	Starter – How would you change the set of instructions to make it simpler and shorter? Answer – use repetition and the repeat x10 block. Recap the three different repetition block. Chn should now be very familiar with these. Introduce the concept of this lesson and WALT. Load lesson **5 example scratch file** which shows a counter that counts up to 100 when the space bar is pressed. Show the children the blocks that were made to use this program. Explain that the variable 'num' was	Variables Scratch Debugging Stage Script Sprite Repetition	How can we get the counter to count backwards?

		created before sequencing the blocks. The children learnt how to make these variables in lesson 2. Print off the 'Make a counter challenges' (2 pages of the ppt) and get children to attempt. Make a counter challenge 1 gets the chn to use the same blocks as the scratch file that you shared. They have to make small subtle changes to meet each step of the challenge. The children may wonder how to get the counter to go down. We use negative numbers for this! Make a counter challenge 2 requires children to use a new set of blocks and to order these themselves. There is much less scaffolding for this challenge.		