The Valley Primary School

Class 1 Computing MTP Spring 1 2023-2024.

Programming with Scratch Jr

Unit Overview:

This unit introduces children at Key Stage 1 to the principles of coding, using the age-appropriate ScratchJr software. A more accessible version of the popular Scratch Programming and aimed at age 5-7, ScratchJr is available as a free app for Apple, Amazon and Android tablets. The platform encourages basic understanding of algorithms and how to create precise instructions for visual working programs. It begins to develop a sense of creating, debugging and logical reasoning, which are required for further programming at KS2.

Assessment:

...all children should be able to:

• open the ScratchJr app and start a new project;

• add new characters and backgrounds;

• use blocks for movement in different directions;

• create short sets of sequenced instructions.

...most children will be able to:

• use different end blocks, including repeat forever;

• change the size of characters to grow or shrink;

• hide and show characters with an instruction block;

• program two or more characters with instructions at the same time.

...some children will be able to:

• use a repeat block for a section of instructions and specified number of times;

• predict the behaviour of a character, based on a sequence of instructions;

• edit the colours and other features of characters or sprites;

• create longer sequences of more complex instructions.

Learning Sequence & Objectives	Activities
To describe and use instructions to program a character.	**Learning Sequence** **Introduction to ScratchJr:** What is it? ScratchJr is an app available for tablets (such as Apple, Amazon and Android tablets) that allows you to create your own stories and games. It is aimed at children age 5-7 and is free to download, with an adult's permission. **Watching the Demo (Pause to Predict):** Encourage children to watch the demo on their own (or shared) tablet device, guided by an adult. Pause to predict what blocks might do. Ask what children think the blue arrow blocks do? What will an arrow followed by the invisible block do? Tell children there are many more blocks we can learn about in future lessons to create more complex programs! Use the Watch Demo Activity Sheet as a guide. **Starting a New Project:** Demonstrate starting a new project. Focus on how to add new characters and backgrounds, matching them to each other for suitability. **Cool Characters and Brilliant Backgrounds:** Children use the differentiated Cool Characters Activity Sheets to help them open the app and start working on a new project. Can children use software to create new projects, including adding a suitable character and background? ★ Children open the app and start a new project. They add and remove characters and backgrounds, matching appropriately. ★★ Children begin by following the LA guidance. They then move on to the MA sheet, experimenting with dragging and executing blocks. They describe what effect individual instruction blocks will have. ★★★ Children begin by following the LA guidance, if necessary. They then move on to the MA activity. As an extra challenge, children use the HA sheet to paint backgrounds/draw blocks to match a given sequence of written instructions. **Instruction Blocks for Characters:** Using the Lesson Presentation, show an example charcter on the screen and ask what the effect would be of a range of different blocks. Can children describe the instructions that the blocks have upon the character?

To program a character to grow and shrink.

Learning Sequence

Whole Class	**Recap Instruction Blocks:** Show a selection of instruction blocks from ScratchJr and ask children to remember or suggest what effect each one will have. Can children describe the effects that the blocks have upon the character?	◐
	Grow and Shrink: Focus on the blocks for grow and shrink and discuss their effect. Note the value with the block and how this can be altered to make the sprite grow or shrink at a different rate.	◐
	Incredible Inflating Chicken! Showing a screenshot of the farm background with a chicken and prickly plant added, ask what would happen if we tap on the 'grow' and 'shrink' blocks when selecting the chicken. Establish that we can use the blocks to change the size of the chicken.	◐
	Connecting Blocks: Now show the screenshot with blocks connected and discuss the purpose of the 'START ON TAP' or 'START ON BUMP' blocks. How is the chicken made to grow? What makes it shrink again? Can children understand the effect of the connected blocks?	◐
	Grow Your Own Chicken! Children use the differentiated **Grow and Shrink Activity Sheets** to help them add characters ad use the grow and shrink blocks. Can children add the correct blocks to make a sprite grow or shrink?	◑

★ Most children will begin with the LA sheet. They use skills to add specific characters and background, then blocks for grow and shrink effect.	★★ Children begin by following the LA sheet. They then move on to the MA sheet, connect blocks to make sequential programs. They add or edit further objects as an extension.	★★★ Children begin by following the LA and MA guidance, as necessary. They then move on to the HA sheet, applying skills in a new context. They explore different start trigger instruction.

	Starting Blocks Display examples of sequences with different starting instructions, e.g. START ON TAP, START ON BUMP, START ON GREEN FLAG. Can children describe what would make each sequence begin?	◐

To use instructions to make characters move at different speeds and distance.

Learning Sequence

(Whole Class)	**Starting and Ending:** Recap the different ways of starting a sequence of instruction blocks. Can children remember what each block does and how it works? Display some end blocks to demonstrate that good code should have a start and an end. We can choose to either run a sequence of blocks once or use the 'REPEAT FOREVER' block to keep running the sequence.	◓
(Whole Class)	**Moving Along:** Show the screenshot of the car on the road. Can children identify the correct block to make it move in the right direction along the road? How do we make it go further? What do children predict will happen when it reaches the end of the screen? Note: the sprite automatically reappears back on the other side of the screen, continuing its instructions sequentially.	◓
(faces)	**Changing Size and Speed:** Show a selection of blocks. Can children identify which block would be used to make the car smaller, to fit the size of the road? Which block would be used to make the car travel faster? Note: the latter is a new block to be introduced so children won't be familiar with it.	◓
(faces)	**Let's Drive!** Children use the differentiated **Moving Cars Activity Sheets** to create and edit simple programs, designed to make one or more cars travel along the road on the background. Can children use the correct sequence of instructions to program the cars to move at different speeds?	●

★	Children use the LA sheet as a guide. They add a car to the city background and program it to travel along using repetition, either a given number of time or forever.	★★	Children use the MA sheet as a guide. They add a second car to the background, changing the size and programming it to travel at a different speed.	★★★	As an extra challenge, children use the HA sheet as a guide to apply skills, using their own choice of background and chracter from given suggestions: cyclists in the suburb background, or sea creatures in the underwater one.

(faces)	**Moving in Different Directions:** Some pupils may have attempted the challenge of the sea creatures underwater. Show an example screenshot and ask children to describe to a partner, then feedback, what each set of instructions would make the associated character do. This task could also be provided as a written extension using the **Moving Underwater Activity Sheet**.	◓

To use a repeat instruction to make a sequence of instructions run more than once and predict the behaviour.

Prior Learning: Children will have begun to create simple programs using the ScratchJr app in Lessons 1-3.

Learning Sequence

	Moving Around: Can children suggest any blocks which make a sprite move? Where would those blocks be? Show screenshot with movement blocks visible and establish the purpose of each. Remind children that the last lesson focused mainly on moving in one direction (to the right) but with the Underwater sea creatures, various different directions were used.	
	Spaceman Travelling: Show the screenshot of the spaceman sprite, matched to a suitable background. Which direction might he move in, if he was floating in space? Establish that he may move in many different directions, so we are going to build a sequence of blocks to create this movement.	
	Repeat or Repeat Forever: Show the sequence with the REPEAT FOREVER block at the end. Can children describe what effect this block has? Tell children that we don't want the spaceman to keep repeating the sequence forever, just to do it a certain number of times. To do this, we use a REPEAT BLOCK, placed around the blocks we want to be repeated – and say how many times to do it. (*It may be helpful to demonstrate this on a tablet at this point.*)	
	Program Your Spaceman: Children use the differentiated Spaceman Activity Sheets to program the astronaut to move. Can children use the REPEAT FOREVER and REPEAT blocks, describing the different effects of each? In each case, children should be encouraged to predict what the spaceman will do, based on their precise instructions, before testing the program to see if it behaves as expected. If not, children change the blocks or value to 'debug' the program.	
	★ Children select a sequence of move blocks with an END block, and then replace with REPEAT FOREVER. As an extension, children could move on to the MA and HA sheets if appropriate. ★★ Children begin by following the LA sheet, then progress to the MA sheet. They replace the REPEAT FOREVER block with REPEAT for a given number of times. They add a GO HOME button. ★★★ After following the LA and MA sheets, children follow additional challenges on the HA sheet, exploring making the spaceman shrink or become invisible, as well as changing their background and sequence. Children can also use the Using Repeat Activity Sheet as an extension or group work.	
	Predicting Behaviour: Using the Lesson Presentation, display the sequence of code that some children may have managed to get to using the HA Activity Sheet. Can children predict and describe what each block does in turn? What appears to happen to the astronaut? If children have different code, compare examples / ask others to predict the character's behaviour based on this code.	

To create programs that play a recorded sound.

Learning Sequence

	Identifying Blocks: Begin by providing children with a range of images for ScratchJr blocks, using the Scratch Junior Blocks Sheet and allow them to identify together which blocks they recognise and can describe the effects for. Can children predict what any of the other blocks do?	
	Sounds and Speech: Use the Lesson Presentation to show the blocks for recording and playing sounds and for adding speech bubbles. Ask what children think they are for and then describe their purpose.	
	Animal Sounds: Using the Lesson Presentation, display some of the animal sprites available on ScratchJr, along with speech bubbles. Allow children to have fun demonstrating animal sounds, while clicking to display a text version of the sound inside the speech bubbles.	
	Code for Sounds: Show an example of a sequence of blocks, involving sound and speech bubbles. Children use the blocks from the Scratch Junior Blocks Sheet (either by cutting out or using pre-cut version), like jigsaw pieces to make a sequence similar to the example on the board.	
	Record Your Sounds: Children use the differentiated Animal Sounds Activity Sheets to create code to use sounds. Can children create code to play recorded sounds? ⭐ Children copy code for 3 animals. ⭐⭐ Children copy code for animals, and then create their own code for 2 more. ⭐⭐⭐ Children copy code for 1 animal and then create their own code for at least 3 more.	
	Describe a Sequence: Show the image of four animals on a River background. Ask children to describe, draw or make a sequence of blocks (could include a sound, speech bubble or movement) and say what it would program the animal to do.	

To create programs with a sequence of linked instructions.

Learning Sequence

	Penguins: Show the 'Arctic' background from ScratchJr, with a penguin character. Ask children what the penguin could be programmed to do. Encourage suggestions such as run, jump, spin, somersault, dive into the water etc.	
	Instruction Sequence: Show examples of some simple instruction sequences and see if children can predict what they will program the penguin to do.	
	Wait: Introduce the block for WAIT and how it is used. Demonstrate as part of a sequence and ask children to describe how it would work and what it would look like in action.	
	Programming Penguins: Begin by verbally introducing the task of programming the penguin(s) to move and hop into the water, then turn invisible or somersault into the water. Allow children to attempt to create a working sequence first, before providing the **Penguins Activity Sheet** with examples. Children can then edit or change their sequence as necessary. Can children create increasingly complex sequences of instructions to program a character?	
	★ Children use basic instruction sequences to move the penguin character. ★★ Children use instruction sequences with increasing complexity and additional blocks (including WAIT) and include a second penguin. ★★★ After creating the first set of complex instructions using a WAIT block, children use multiple further penguin characters. They distinguish them by renaming and recolouring.	
	Describing Instructions: Ask children to describe what actions they were able to program the penguin to do, describing the blocks used. In addition, or as alternative, use some example blocks to ask children if they can describe how to sequence some given instructions, such as jumping into the water and doing a somersault.	