Year 5 Programming 5 Scratch Maths: My Animated Sprites

Timing	
The pace of the investigations can vary according to the group of learners so plan for 4 sessions of approximately 1 hour **OR** 8 sessions of 45 minutes	**This block is based on the <u>materials produced by Institute of Education, UCL</u>. A group of Somerset schools were part of this project and identified benefits to learners in terms of computational and mathematical understanding and confidence** **The block is based on module 3 of the materials. Module 1 has been incorporated into planning for year 4. Module 2 is available as a stand-alone module if you would like to use Scratch explore different drawing algorithms.** **Children will** • Explore projects with multiple sprites and define scripts to run their individual behaviours (Investigation 1) • Use multiple costumes to animate a sprite (Investigation 1) • Explore conditions to control the flow of a sprite's behaviour (Investigation 2) • Discover how to sense the current situation of a particular sprite (Investigation 2) • Explore the concept of broadcasting messages between sprites (Investigation 3) • Plan out and implement a story using all their knowledge gained in Module 3 (Investigation 4)
e-safety links I can talk about the dangers of spending too long online or playing a game	**Objectives** **Programming** • I can use a variable to increase programming possibilities. • I can use 'if' and 'then' commands to select an action. • I can decompose a problem into smaller parts to design an algorithm for a specific outcome and use this to write a program. • I can use logical reasoning to detect and debug mistakes in a program. • I can change an input to a program to achieve a different output.

Links to other learning
Maths: Geometry – position and direction, factors of numbers, negative numbers in context   **English**: Poetry and storytelling   **Art and Design**: Animation

Resources	Preparation

All resources for this block come from:
 	
 ScratchMaths Module 3
 	
 Download materials here
	• Download materials for ScratchMaths Module 3 – Interacting sprites *(All resources for this block are contained within this download).*
	    ○ Teacher notes
	    ○ Classroom presentations
	    ○ Starter project (save as read only file and guide children to rename when they open them to use)
	    ○ (You may also find the printable posters useful)
	 • The starter project 3-Multiple Sprites is used throughout the module. Each investigation starts with a starter project that includes all the scripts from the previous investigation(s).
	 • For confident programmers, you may want to copy pages of the teacher script to enable them to work at a faster pace.
	 • Print Activity 3.2.4 Unplugged True or False page 28 of teacher notes.
	 • Print and cut up one copy of the cards on pages 31 – 33 of teacher notes.
	 • Print out unplugged handout Reading scripts activity 3.4.1 pages 42 - 44

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	Expectations	Activity	Success Criteria
1	**Programming** I can use logical reasoning to detect and debug mistakes in a program. I can change an input to a program to achieve a different output.	**Module 3: Investigation 1 Animating Sprites** • Use Scratch starter project **3-Multiple Sprites** • Work through investigation 1 as per the teacher notes (pages 5 – 16) using **Investigation 1 presentation.** • Encourage children to explore blocks individually before using them in a script (direct drive) • Take time to discuss alternative solutions to problems	Gold: Can I create and explain different behaviours for different sprites? Silver: Can I control different sprites to show different behaviours at the same time? Bronze: Can make different sprites do different things?
2	**Programming** I can use 'if' and 'then' commands to select an action. I can change an input to a program to achieve a different output.	**Module 3: Investigation 2 Encountering Conditions** • Use Scratch starter project **3-Multiple Sprites2** • Work through investigation 2 as per the teacher notes (pages 17 – 28) using **Investigation 2 presentation.** • Make sure children recognise the similarities and differences between repeat, forever and repeat until blocks. • Continue to encourage children to explore new blocks individually. • Encourage children to 'test' whether something is touching another object. • Support children to explain how a script runs if a certain condition is true. Test understanding with True or False handout on page 28 of teacher notes. • Discuss the term random with the children for activity 3.2.2 • Check children's understanding of a specified x or y value and whether something is more than a specified value.	Gold: Can I use conditions to control the behaviour of sprites and explain how to sense the current situation of a particular sprite? Silver: Can I make a sprite react to a certain condition? Bronze: Can I chance the value of a variable?

	Programming I can change an input to a program to achieve a different output. I can use logical reasoning to detect and debug mistakes in a program.	**Module 3: Investigation 3 Broadcasting Messages** • Use Scratch starter project **3-Multiple Sprites3** • Work through investigation 3 as per the teacher notes (pages 29 – 39) using **Investigation 3 presentation.** • Use unplugged activity 3.3.1 to build understanding of the broadcast command – copies of the cards distributed around the class. • Remind children of how to define blocks to increase the efficiency of their program. • Make sure children recognise the difference between saying a message and broadcasting a message. • Encourage children to use logical reasons to spot and debug mistakes.	Gold: Can I design a script for different sprites to react to the same message in parallel? Silver: Can I explain how I can use the broadcast command to make something happen? Bronze: Can use the broadcast command to make something happen?
3			
4	**Programming** I can decompose a problem into smaller parts to design an algorithm for a specific outcome and use this to write a program.	**Module 3: Investigation 4 Interactive Stories** • Use Scratch starter project **3-Multiple Sprites4** • Work through investigation 4 as per the teacher notes (pages 40 – 28) using **Investigation 4 presentation.** • Use unplugged handout Reading scripts activity 3.4.1 pages 42 – 44 to assess children's knowledge. • Split children into small groups to plan their story and the algorithm for their story. • Support children to build the interactions required for the different parts of their story.	Gold: Can I plan and build a story by breaking it up into the different interactions required? Silver: Can I plan a story and help to build the different interactions required? Bronze: Can I tell you about the different parts of the story I have helped to build?