ST LAWRENCE C.E. PRIMARY SCHOOL LEARNING JOURNEY

SUBJECT: COMPUTING UNIT: GAME TERM: SPRING 1 YEAR GROUP: 4

THE BIG QUESTION			
How can I make a game with continuous loops?			
END OF UNIT OUTCOME	Design and code your own game that uses loops.		
OBJECTIVES	• Design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems • Solve problems by decomposing them into smaller parts • Use sequence, selection, and repetition in programs • Work with variables and various forms of input and output • Use logical reasoning to explain how some simple algorithms work and to detect and correct errors in algorithms and programs		
CONCEPT: Achievement	Creating their own game.		
LESSON 1 QUESTION	**What does it mean if something is continuous?**		
KEY KNOWLEDGE	Continuous means something keeps happening without stopping. Loops allow codes to repeat. A forever loop makes actions continuous in Scratch.		
RICH TASK	Introduce The Big Question – what do they already know? Start with an everyday computing concept- Everyday repetition Roleplay and write own simple continuous loops on paper. Make the point that you are using loop always but the Scratch code will use forever.		
SUPPORT AND CHALLENGE	S: Use visual roleplay and simple loop examples. C: Pupils explain why games need continuous actions.		
KEY VOCABULARY	Loop Sequence Continuous	**RESOURCES**	https://scratch.mit.edu/projects/316961043
LESSON 2 QUESTION	**How do continuous loops work in Scratch?**		
KEY KNOWLEDGE	A forever loop repeats code until the program stops		

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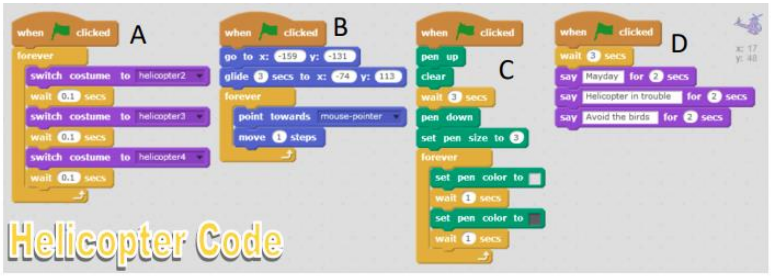
<table>
<tr><td></td><td>Code can include more than one continuous loop.

Predictions can be made by reading code.</td></tr>
<tr><td>RICH TASK</td><td>Retrieval practice activity
Revise KO


Show children the Helicopter Code.

Reading the code- with a partner.
1, How many different costumes will code block A show once the green flag has been clicked?
2, What code blocks are inside the continuous loop in code block B?
3, How many continuous loops are in all the helicopter code above?
4, How many seconds will code block D run for once the green flag is clicked?
5, How long does it stay light grey for before changing to dark grey in code block C?

Match the code block to the correct prediction. The first one has been done for them.
Read the main program code sections A to D slowly from top to bottom. Beware there are two false predictions which don't match any code above!

<table>
<tr><td>D</td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>Say what has happened to the helicopter and what the user should do in the game.</td><td>Leave a light and dark grey trail behind the helicopter after 3 seconds.</td><td>Stop the game if the helicopter touches a parrot.</td><td>Move the helicopter to a start location. Then make it move by following the mouse.</td><td>Make the parrot flap its wings by changing costumes.</td><td>Change the costumes of the helicopter to make it look like it is flying.</td></tr>
</table>
</td></tr>
<tr><td>SUPPORT AND CHALLENGE</td><td>S: Read code aloud together. Work in a small group.

C: Pupils justify their predictions</td></tr>
<tr><td>KEY VOCABULARY</td><td>Prediction
Continuous
Code</td><td>RESOURCES</td><td>Helicopter Scratch project</td></tr>
</table>

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LESSON 3 QUESTION	**How can we investigate what code does without changing it?**		
KEY KNOWLEDGE	Programs can be tested multiple times. Observations help confirm or correct predictions. Different sprites can have different loops.		
RICH TASK	Retrieval practice activity Revise KO Start Scratch and load helicopter game. Run the code and play the helicopter game a few times. Did you predict the outcome? **Investigate** (Run the programs lots of times but don't change the code) Look at the code inside the helicopter Helicopter Sprite Questions 1, What x and y position does the helicopter start at? 2, What x and y position does the helicopter glide to 3 seconds after the game has started? 3, How long does it take before the light and dark grey trail starts to show in the game? 4, Which helicopter costume is not used? Why is it not used? (HINT Look in costumes) Look at the code inside Parrot 1 Parrot 1 Sprite Questions 1, How long is parrot 1 hidden for once the game starts? 2, Which two backdrops are only run once the parrot touches a helicopter? 3, How long is there between each beat of the parrots wings? 4, What does the parrot do once it touches the edge of the screen? What code block instructs it to do that?		
SUPPORT AND CHALLENGE	S: Teacher-guided questioning. Record answers as a group. C: Pupils explain how loops control behaviour.		
KEY VOCABULARY	Sprite Investigate Loop	**RESOURCES**	Helicopter Scratch project
LESSON 4 QUESTION	**How can changing loops change how a game works?**		
KEY KNOWLEDGE	Changing values inside loops affects speed and timing. Initialisation blocks reset sprites at the start.		
RICH TASK	Retrieval practice activity Revise KO		

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<table>
<tr><td></td><td colspan="3"><u>Modify (Run the code and make small changes)</u>

<u>Helicopter Sprite Questions</u>
1, Can you make the rotor on the helicopter run slower? What did you change?
2, Can you make the helicopter move faster? What did you change?
3, Can you make the smoke trail change colour quicker? What did you change?
4, Can you make the smoke trail wider? What did you change?
5, Can you make the smoke trail start earlier? What did you change?
Parrot 1 Sprite Questions
1, Can you make the parrot move faster? What did you change?
2, Can you make the wings flap faster? What did you change?
4, Which three blocks are initialisation? Return the sprite and background back to their starting positions?

<u>Modify More (Make larger changes such as adding blocks)</u>

<u>Any Sprite Questions</u>
1, Modify the code in helicopter so that it goes to the mouse-pointer rather than just moving slowly towards it. (HINT You will need to replace a block)
2, Add another faster parrot that arrives after 35 seconds from the bottom right. You can duplicate Parrot 4 as a starting point.</td></tr>
<tr><td>SUPPORT AND CHALLENGE</td><td colspan="3">S: Step-by-step guidance in a small group.

C: Independent modification and own independent explanation</td></tr>
<tr><td>KEY VOCABULARY</td><td>Modify
Initialisation
Debug</td><td>RESOURCES</td><td>Helicopter Scratch project</td></tr>
<tr><td colspan="4"></td></tr>
<tr><td>LESSON 5 QUESTION</td><td colspan="3">How can I use continuous loops to create my own game?</td></tr>
<tr><td>KEY KNOWLEDGE</td><td colspan="3">Loops make games interactive and continuous

Planning helps create effective algorithms.

Algorithm is a</td></tr>
</table>

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<td>END OF UNIT OUTCOME</td>
<td colspan="3">Revision of key knowledge
Outcome linked to The Big Question
What links to our concept have you found?

Design and code your own game that uses loops. You can adapt any ideas from the
helicopter game. You can share design ideas but must plan and code separately.

Idea Level My game will...

Design Level (Draw your game simply)

Write loop algorithms that you might need (you can write one then code it)

Initialisation Jot down how your game will always start in the same place</td>
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<tr>
<td>SUPPORT AND CHALLENGE</td>
<td colspan="3">Support: Planning templates and example scripts.

Challenge: Add variables, scoring, or extra sprites.</td>
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<tr>
<td>KEY VOCABULARY</td>
<td>Algorithms
Prediction
Continuous
Code</td>
<td>RESOURCES</td>
<td>Scratch
Planning templates</td>
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