

# Year 4 Computing – Repetition in Games

## What I should already know

- Programming is when we make a set of instructions for computers to follow.
- Scratch is a program that we can use in order to code our own stories and animations.
- We can use event and action command blocks in order to make sprites carry out acts when certain prompts take place.

## What I will learn by the end of this unit

- We use programs such as Scratch to code our own games
- We can use repeat and loop operator blocks in Scratch to make our programs more logical and efficient. These help us to run code continuously or for a set number of times.
- We use algorithms (a set of instructions to perform a task) to sequence movements, actions and sounds to program effective animations.

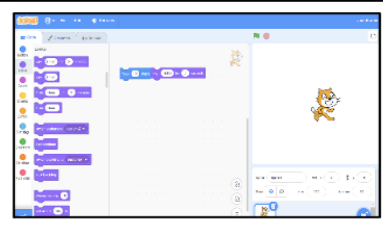
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### The Basics of Scratch

**-What is Scratch?** Scratch is a website/ app that lets us code our own stories, games and animations.

-Scratch helps us to learn how to use programming language, whilst also being creative and using problem-solving skills.

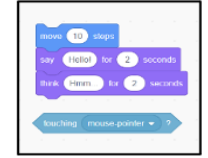


#### There are three main areas in Scratch:

**-The Blocks Palette** (on the left) contain all of the different blocks: puzzle piece commands which control the animation.



**-Code Area** (in the middle) is where the blocks are placed to create a program.

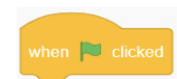


**-Stage with Sprite** (right) is where the output of the program is presented. The sprite is the character.



**Attributes:** There are three attributes of the sprite which we can change to make our animation: Code, Costumes, Sounds.

**-Event Blocks:** Event blocks are coloured yellow and are used to sense different events that happen e.g., the green flag being clicked.

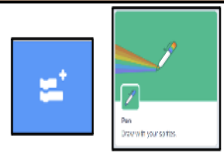


**-Action Blocks:** Action blocks include 'Motion' blocks, 'Sound' blocks and 'Looks' blocks. They make the sprite move, make sounds and change appearance.

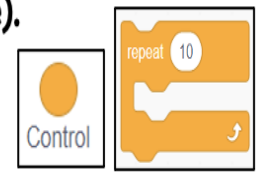


### Loops and Repetition

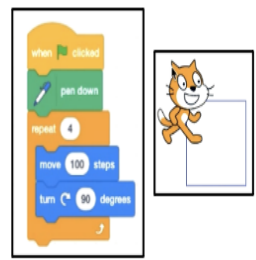
**-Pen Drawing in Scratch:** Select the 'add extension' icon in the bottom left corner. Then select 'pen.' This allows you to draw with your sprites.



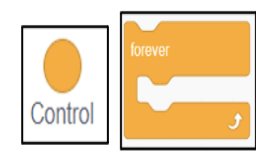
**-The Repeat Block:** Select 'code' and then the 'control' blocks (orange). Here you will find the repeat block. It should be placed around the command blocks that you want to repeat. The number of times something is repeated can be typed into the white area.



**-Creating Shapes:** Selecting 'pen down' (in the 'operators' blocks) can be followed by use of the motion blocks to determine the line that will be drawn (e.g. 'move 10 steps'). Turning a number of degrees changes the direction of the pen. Placing the repeat block around this motion code can allow more complex shapes to be drawn.



**-Count-Controlled/Infinite Loops:** We can control the number of 'loops' of a command with the number typed into the 'repeat' block. The 'forever' block makes a command continue infinitely (forever).



### Event Managing and Efficiency

-We should ensure that programs are coded and labelled in easy-to-understand, user-friendly ways.

-Using the 'events' blocks logically can help to make your programming easy to use. For example, when 's' key pressed a square is drawn, when 'h' key is pressed a hexagon is drawn.



-Efficiency is about getting the right result in the easiest way possible, wasting little time or effort. Our use of the repeat and loop tools should help to create efficient programs.

### Algorithms, Trialling, Debugging

-Designing an **algorithm** (set of instructions for performing a task) will help you to program the sequence that you require.

-Programmers do not put their computer programs straight to work. They **trial** them first to find any errors:

**-Sequence errors:** An instruction in the sequence is wrong or in the wrong place.

**-Keying errors:** Typing in the wrong code.

**-Logical errors:** Mistakes in plan/thinking.

-If your algorithm does not work correctly the first time, remember to **debug** it.



### Disciplinary Skills

- Design, write and debug programs that accomplish specific goals.
- Solve problems by decomposing them into smaller parts.
- Use sequence, selection and repetition in programs.
- Understand computer networks, including the internet; how they can provide multiple services, such as the World Wide Web, and the opportunities they offer for communication and collaboration.

### Key Vocabulary

loop	repeat	value	forever	sequence
loop	animate	attribute	repeat	event block
duplicate	modify	trial	refine	logical