

# Steps through Learning Computing : Programming Adventures (Repetition in games)

## Vocabulary that I will learn and use during this unit of work

Scratch, programming, sprite, blocks, code, loop, repeat, value, infinite loop, count-controlled loop, costume, repetition, forever, animate, event block, duplicate, modify, design, algorithm, debug, refine, evaluate.

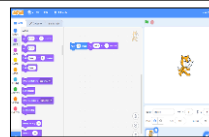
## Sticky knowledge about

- Repetition is used in programming to give the same instruction several times
- Repetition can be infinite or count-controlled
- An algorithm is a set of instructions written to perform a specific task
- Debugging means to edit and fix problems in an algorithm

### 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.

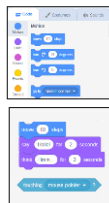


#### There are three main areas in Scratch:

**-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.



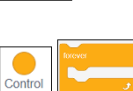
### Loops and Repetition

**-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).



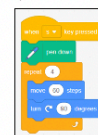
- **Stay Safe Online:** Don't share personal info like your full name, address, or phone number. Also, don't share details about where you go to school or your social media accounts.
- **Be Kind and Helpful:** When you comment on someone's project, say something nice about it and offer suggestions in a friendly way. Don't be mean or spammy.
- **Share and Collaborate:** You can use other people's stuff on Scratch to make your own cool projects but remember to give credit. And when you share your work, others can use it too, as long as they give credit and make changes.
- **Be Honest:** Always tell the truth and be yourself when you're on Scratch. Don't pretend to be someone else.
- **Keep Scratch Friendly:** Make sure your creations and chats are friendly for everyone. If you see something mean or inappropriate, you can click the link that says "report" on any project, comment, discussion post, studio, or profile page. If you're unsure or it's a bit complicated, you can ask your teacher or a trusted adult to get in touch with us. The Scratch team will take care of it.

### 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. E.g. 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.

