

Unplugged Activity 3: Thomas' Tangles

Overview

In this activity children will explore abstract patterns using randomness within an algorithm.

Using crayons, pencils or pens, children will follow an algorithm to create a random drawing. This could be done in pairs using squared paper.

Person A: Rolls the dice and reads out the instructions.

Person B: Is the robot carrying out the instructions.

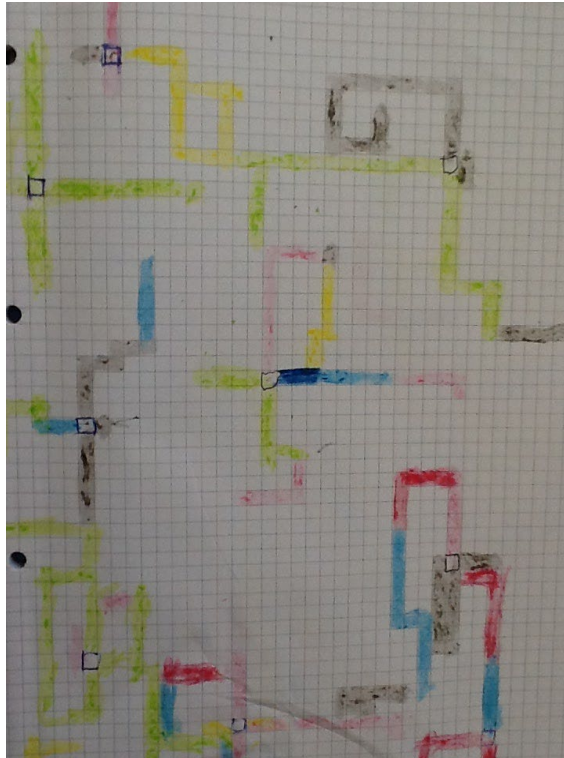


Figure 9: Example drawing

When the starting or central square is blocked and a new central square is needed the roles of A and B swap (so A is the 'robot' and B rolls the dice and reads out the instruction). The roles keep swapping.

Here is the algorithm:

Start from a random square - call it the centre square

Repeat until end of game

 If die roll = 1

 Roll die for number of moves

 Check for blocks

 If not blocked then

 move die roll number of steps up the page

 If die roll = 2

 Roll die for number of moves

 Check for blocks

 If not blocked then

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        move die roll number of steps down the page
If die roll = 3
    Roll die for number of moves
    Check for blocks
    If not blocked then
        move die roll number of steps to the left
If die roll = 4
    Roll die for number of moves
    Check for blocks
    If not blocked then
        move die roll number of steps to the right
If die roll = 5
    Roll die
    If die = 1 change colour to Red
    If die = 2 change colour to Blue
    If die = 3 change colour to Black
    If die = 4 change colour to Red
    If die = 5 change colour to Orange
    If die = 6 change colour to Yellow
If die roll = 6
    Return to current centre square

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Check for blocks:

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    If pathway blocked do not move then
        reroll die
    If number of spaces in the direction > die roll then
        move until blocked
    If all pathways blocked then
        choose a new centre square

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Computational thinking features developed

Using an **algorithm** to produce a randomised picture.

Refining the algorithm.

Identifying computing constructs such as **sequences**, **selection**, and **loops**.

Cross curricular links

Art and Design: children will learn about generative art by using art materials to create the finished piece based on an algorithm. They could go on to explore examples of generative art in Scratch.