When coding and art collide

In this interactive art project, young people will use the Scratch 3 Pen extension to draw colourful patterns by writing code and then entering numbers to produce different results

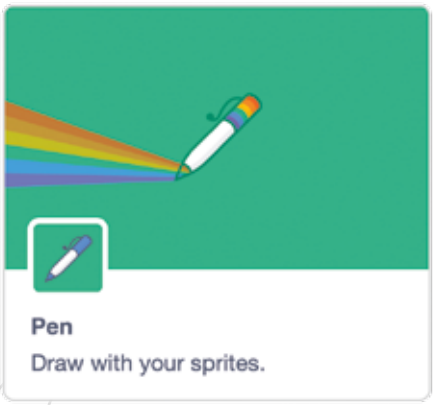
Suitable for Scouts

Instructions

1 Go to **rpf.io/scratch-new** in a web browser to create a new Scratch 3 project.

2 To use the Pen blocks in Scratch 3 you need to add the Pen extension. Click on the 'Add Extension' icon in the bottom left of the screen:

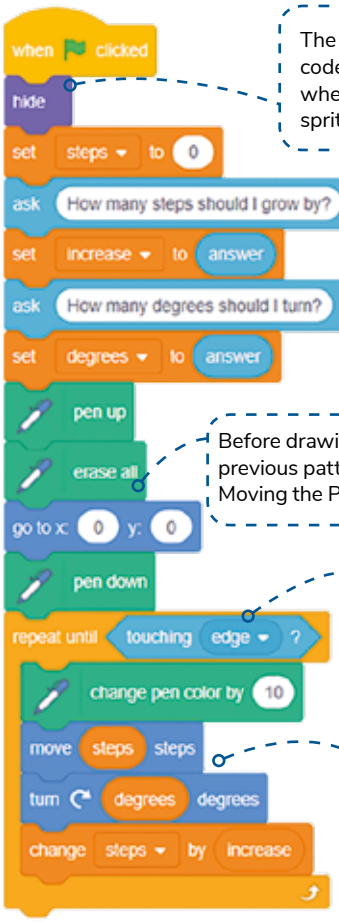
Click on the Pen Extension:



You will see a new set of blocks for drawing with the Pen:

3 Open up the Variables section and click 'Make a Variable' to create new variables that are called: 'steps', 'increase' and 'degrees':

4 Add the following code to the cat sprite and check that you understand what it does:



The sprite won't be visible in this project so you can add your code to the cat sprite and hide it. The Pen will stop drawing when the sprite touches the edge of the screen; making the sprite small means it will keep drawing right to the edge.

The pattern will spiral out from the centre. The 'increase' variable tells the Pen how much to grow the spiral each time.

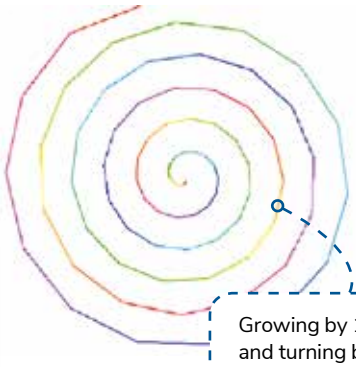
The Pen will turn (rotate) before it draws a new line. The 'degrees' variable tells the Pen how much to turn.

Before drawing a new pattern you need to clear the previous pattern and move the Pen back to the middle. Moving the Pen up stops it drawing while it moves.

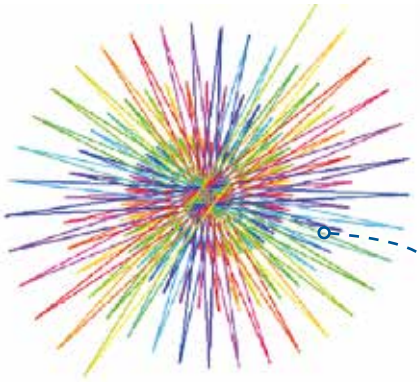
The Pen will keep drawing until it hits the edge of the stage.

Each time round the loop, the Pen colour will change slightly and the Pen will move, drawing as it goes, and then turn. Then the number of steps is increased so that the Pen draws a slightly longer line the next time round the loop.

5 Now click the green flag and try out your project. For the best results, choose a number below 10 for the steps to grow by, and a number below 180 for the number of degrees to turn by.



Growing by 1 step and turning by 25 degrees gives this pattern.



Growing by 3 steps and turning by 175 degrees gives this pattern.

The Pattern Pen is a Raspberry Pi Foundation project that's available for everyone. You can find detailed step-by-step instructions with more information at **rpf.io/pattern-pen-project**. See the completed project at **rpf.io/pattern-pen-soln**.

Time needed
60 minutes

Badge

Raspberry Pi partners the Digital Maker Staged Activity Badge

Partner

Raspberry Pi

Outcomes

This project meets Digital Maker Staged Activity Badge Stage 2 requirement: create a piece of interactive or animated digital art using software.

More information

Scouts has partnered with the Raspberry Pi Foundation to produce resources for this badge. For more information visit **scouts.org.uk/supporters/raspberrypi**.