How to write games, animations and stories using SCRATCH for primary schools

Lesson Plan 5
In the Garden

Mathematical Skills / Concepts
Scratch Features
Curricular Links
Problem Solving, Sequencing, Time
Using Pen Function / Repeated Drawing
Mathematics, Art

lero THE IRISH SOFTWARE ENGINEERING RESEARCH CENTRE

ICS SKILLS CERTIFICATION BODY OF THE IRISH COMPUTER SOCIETY

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Learning Objectives

The child will:

- Use the Pen blocks to create 2D shapes.
- Use lines and angles to create images.
- Use repeats to draw an image.

> **Teacher Tip**
>
> Allow the children to explore the http://scratch.mit.edu website for inspiration for their projects. Remind them that Scratch is about sharing and building on other people's work.

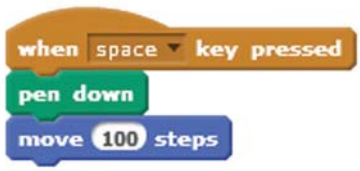
Introduction

The Pen blocks allow you to draw images in Scratch. This should be familiar to anyone who has used Logo.

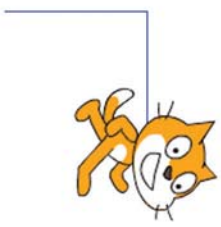
- When drawing in Scratch, imagine that the sprite is "carrying" a pen. Everywhere the sprite moves, it leaves a line behind. For example, if you wish to draw a square, move the sprite in the shape of a square and the line will appear.
- A fun way to introduce this concept is to ask one of the children to become a sprite. They stand in free space and other children direct them around the classroom. In this way the children are giving and following specific instructions such as "Walk five steps forward. Turn 90 degrees to the left."

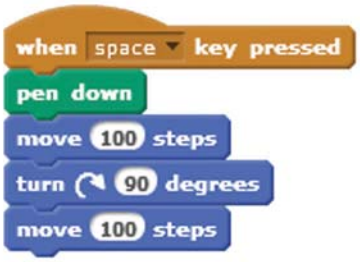
Drawing shapes

- Select a sprite.
- Click on Pen.
- The "pen down" block puts the pen down on the screen to write.
- "Pen up" lifts the pen off the page so the sprite can move without drawing.
- "Clear" removes all drawing from the stage.
- "Stamp" prints a replica of the sprite onto the stage.
- To draw a line use the pen down block and add a move block.



- Add a turn block to draw shapes. Turns are based on the degrees of a full rotation.





Angles

The angles for a full rotation must add up to 360 degrees. These degrees are divided between the number of corners a shape has. Therefore

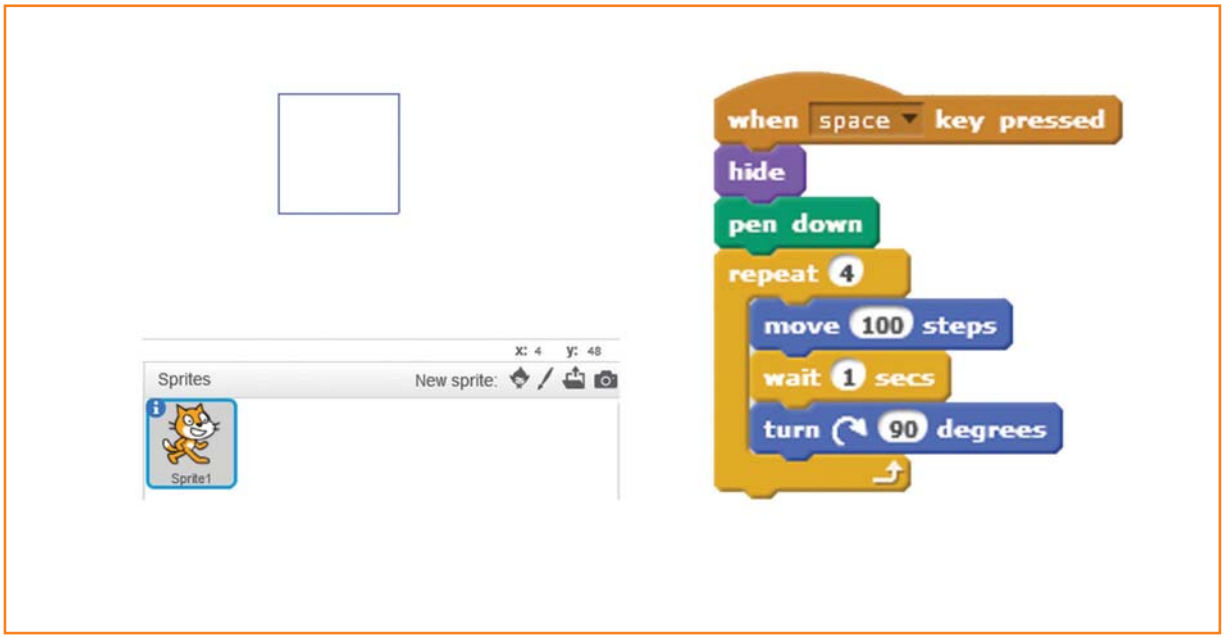
Square /rectangle = 4 x 90
Triangle = 3 x 120
Pentagon = 5 x 72
Hexagon = 6 x 60

Challenge Time 1!

1. Draw a square.
2. Use the hide block (Click on Looks) to hide the sprite and see the shape more clearly.
3. Experiment with pen colour and pen size.
4. Add wait blocks to slow the sprite down. This will allow you to see the sprite moving.
5. Try some other shapes such as triangles, pentagons and hexagons.

Repeats

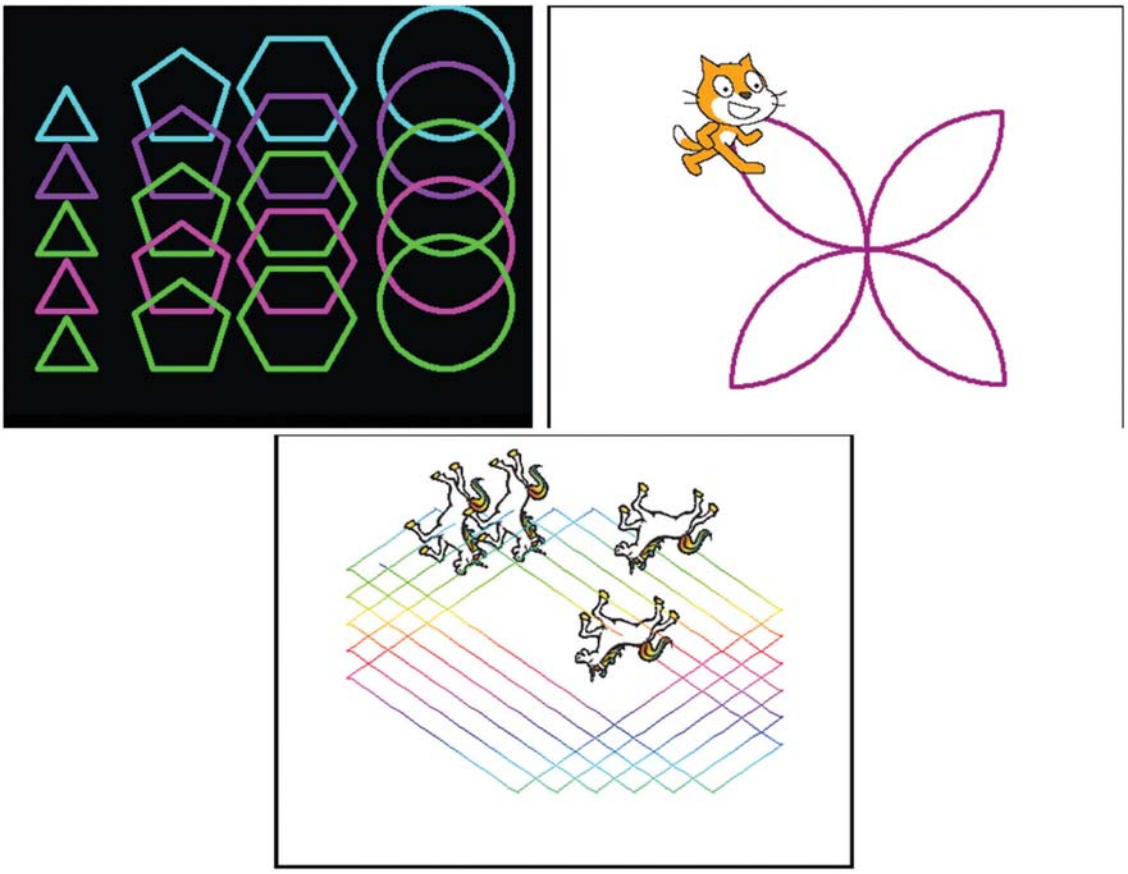
- Repeats allow you to draw shapes more efficiently. They also enable you to create interesting patterns.
- To draw a square you can just draw one side, turn, and repeat it 4 times.



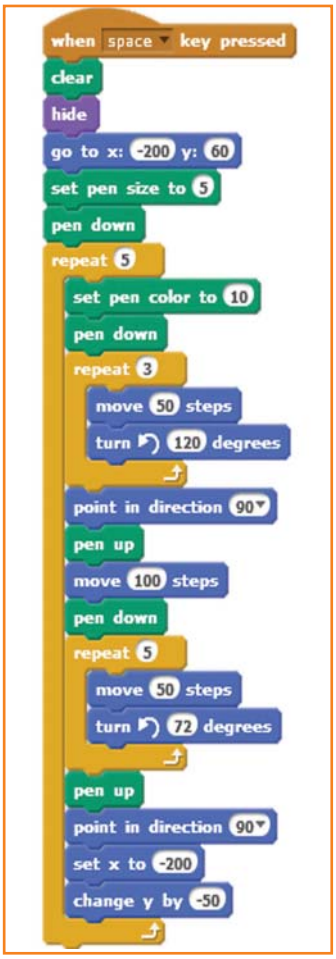
- The number of repeats will obviously depend on the number of sides a shape has.

Patterns

Repeated drawing can also be used to create unusual patterns.



Code A



Challenge Time 2!

1. Enter Code A into Scratch and see what happens.
2. Alter the code to change the colours and shapes used.

Ultimate Challenge!

1. Using the pen draw a garden (imagine hexagon flowers with square leaves).
2. Be as creative as you can.
3. Have a look at other people's projects. Tell them what you like and suggest ideas to make their project even better!