

Tackling the Technology Gender Gap Together: **Ech-o Shape**

Level - Second Level

**Subject area/s – Expressive Arts – Art and
Technologies - Computing Science**



Etch-o Shape

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Subject area/s – Expressive Arts – Art - Technologies - Computing Science

Experiences and Outcomes –

Computing Science

- I understand the operation of a process and its outcome. I can structure related items of information. **TCH 2-13a**

Art

- I have the opportunity to choose and explore an extended range of media and technologies to create images and objects, comparing and combining them for specific tasks. **EXA 2-02a**
- Inspired by a range of stimuli, I can express and communicate my ideas, thoughts and feelings through activities within art and design. **EXA 2-05a**

Benchmarks – (Computing Science)

- Compares activities consisting of a single sequence of steps with those consisting of multiple parallel steps, for example, making tomato sauce and cooking pasta to be served at the same time.
- Identifies algorithms/instructions that include repeated groups of instructions a fixed number of times and/or loops until a condition is met.
- Identifies when a process is not predictable because it has a random element for example, a board game which uses dice.
- Structures related items of information for example, a family tree (MNU 2- 20b).
- Uses a recognised set of instructions/ an algorithm to sort real worlds objects for examples, books in a library or trading cards.

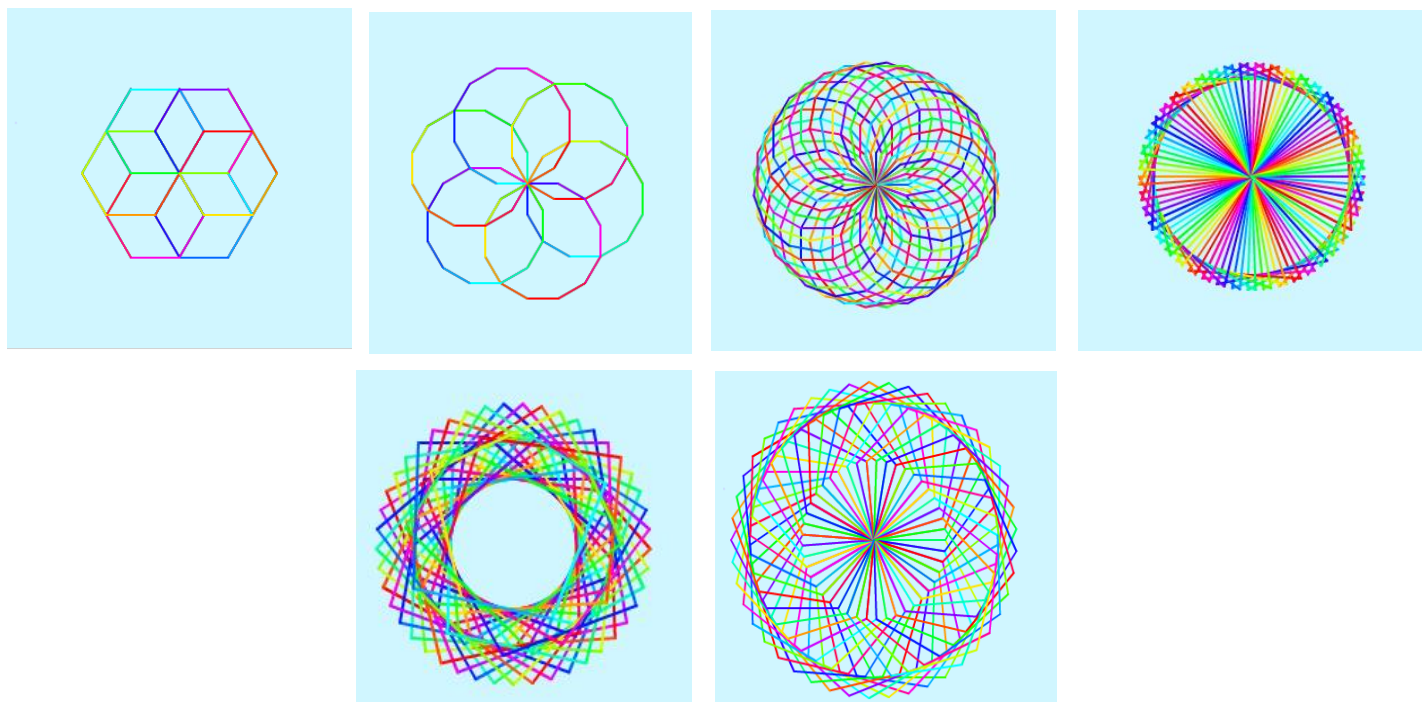
Duration of time – 4 x 1 hour lessons

Computing Science Concepts and Approaches –

- Algorithms – creating a set of instructions to plan their art piece.
- Abstraction – taking an artistic idea and reducing difficulty to code.
- Debugging – finding and fixing errors in algorithm and code throughout the tasks.
- Logical thinking – creating the code in the most logical way.
- Decomposition – breaking down the art into parts.
- Perseverance – Even when finding coding tricky, to keep going.

Overview of learning

Shape, line and colour are three of the seven elements of art. This series of lessons aims to create a piece of art from repetitive shape using the program Scratch. It is a hybrid somewhere between etcho-sketch and spirograph!



Prior Knowledge

- Knowledge of angles and 2D shape
- Learners should be familiar with program Scratch. If not, see: https://cdn.scratch.mit.edu/scratchr2/static/_a1d7466d7c597881e31fc0bbf25e80d3_/pdfs/help/Getting-Started-Guide-Scratch2.pdf
- Computational concepts

Pupil Objectives

- I can design a piece of art
- I can create and use an algorithm to produce a piece of art
- I can debug an algorithm
- I can decompose a problem into manageable parts

Differentiation

Based on children's ability levels, expectation and support is differentiated.

Each task on Scratch varies in difficulty, it is at the teacher's discretion who may need additional challenge or support.

Assessment Opportunities

- Photographs,
- Screen shots of code,
- Samples of algorithms,
- Peer/self-assessment throughout,
- Final Showcase.

Logins for Scratch are recommended. Learners can save work and it can be stored on the Scratch website. If you are using a teaching account, as shown in the help sheet, you can manage each account and see the progress of each pupil.

Curriculum Links

Literacy:

Instructional Writing

Maths

Shape/Angles

Resources required

Paper, pens & 1.1.1 Access to online Scratch (scratch.mit.edu)

[You Tube Video – Sliders](#)

[You Tube Video – Shape Repeat Backdrop](#)

[You Tube Video – Shape Repeat](#)

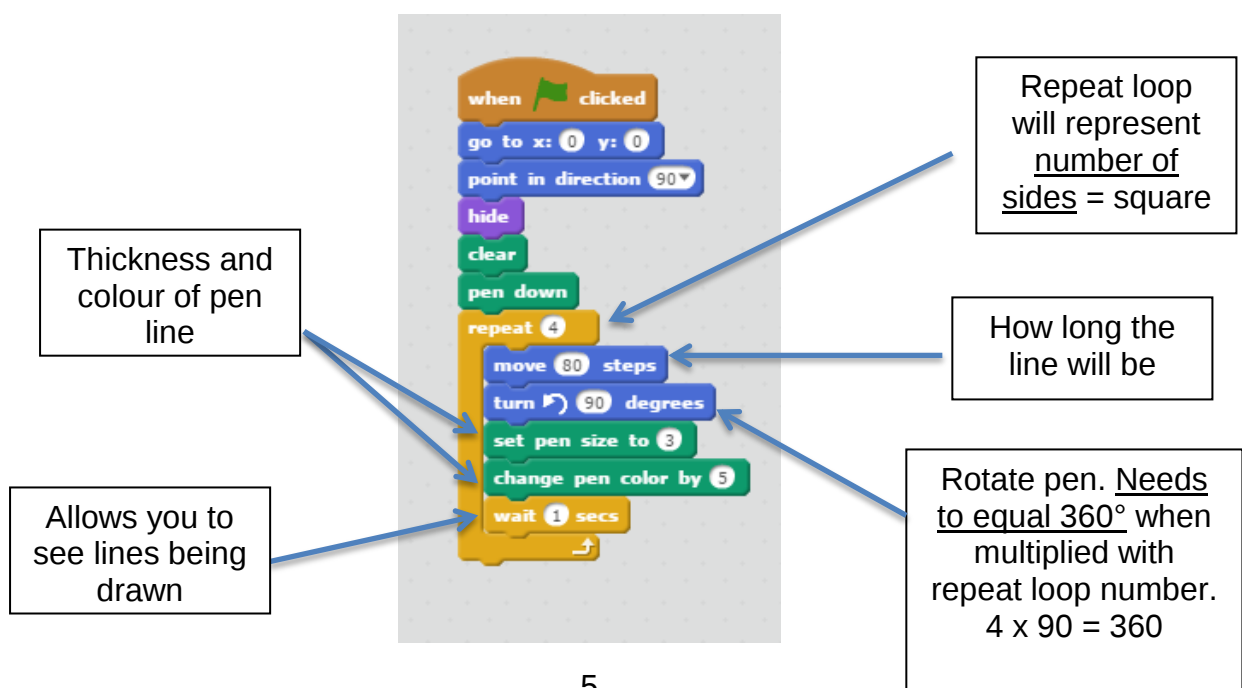
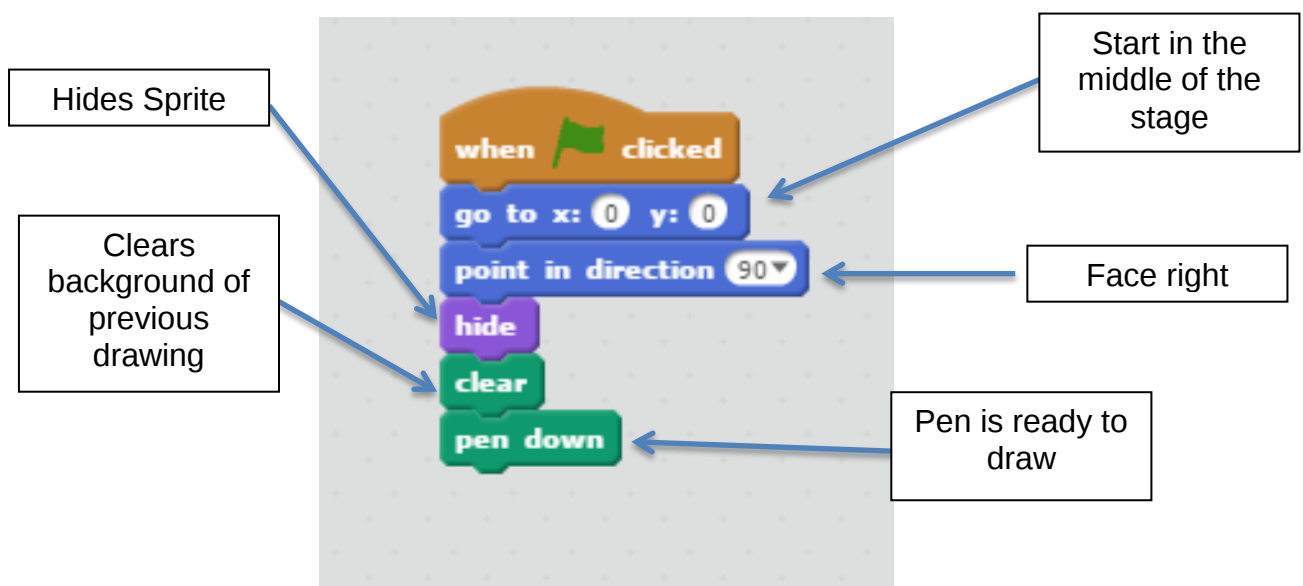
[You Tube Video – Broadcast Shape Repeat](#)

Introduction

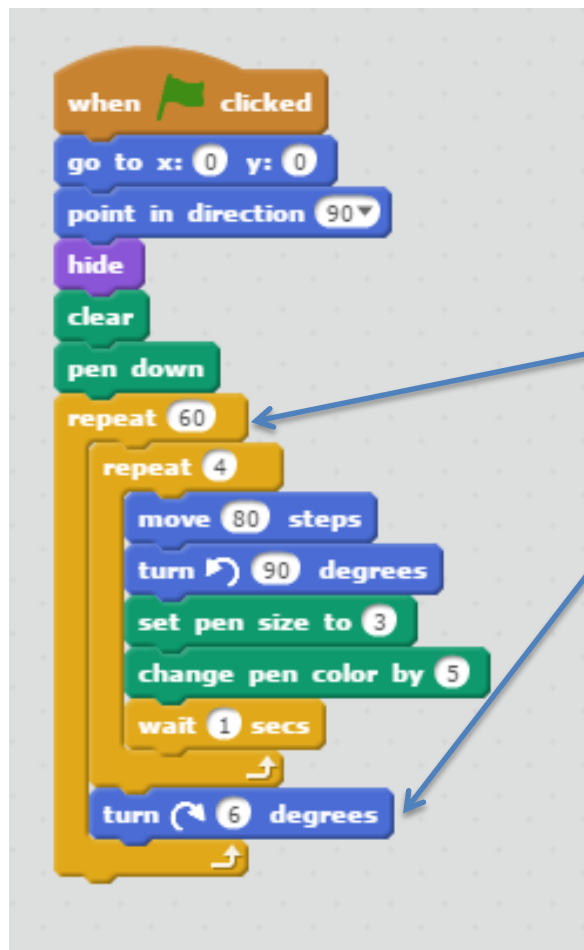
1. Show learners automated PowerPoint to provide a stimulus for what could be created over the next block of learning.
2. Provide explanation of what they will be covering. Review 2D shapes and number of sides.

Main

3. Allow learners to open Scratch and draw a shape of their choice.



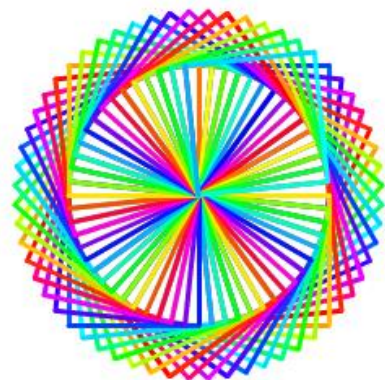
4. When learners have mastered drawing a shape, allow experimentation with a different shape. The relationship between repeat and turns should be noticed. It always adds up to 360°. This highlights the sum of exterior angles.
5. The next step is to repeat the shape enough times that it will create a pattern. Each shape will create a different pattern.

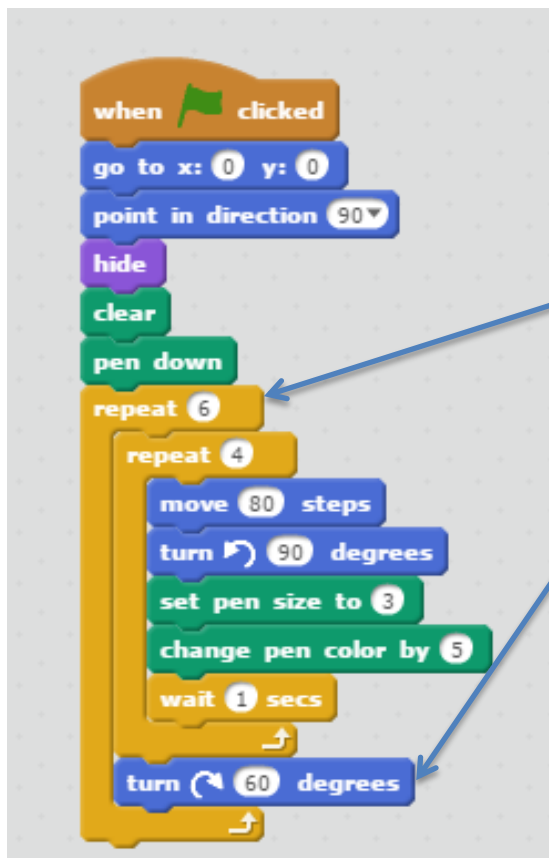


Adding another repeat loop and turn block will create a pattern.

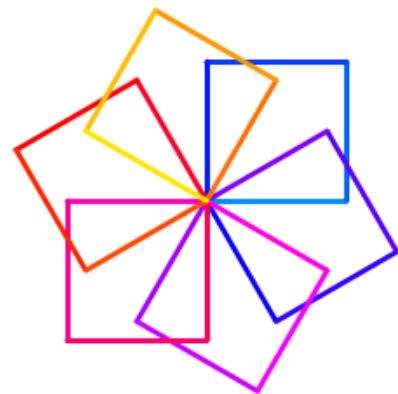
Ensuring the outer repeat and turn multiply to equal 360 will create a circular pattern.
 $60 \times 6 = 360$

The more repeats and less degrees the shape turns by, the tighter the pattern.

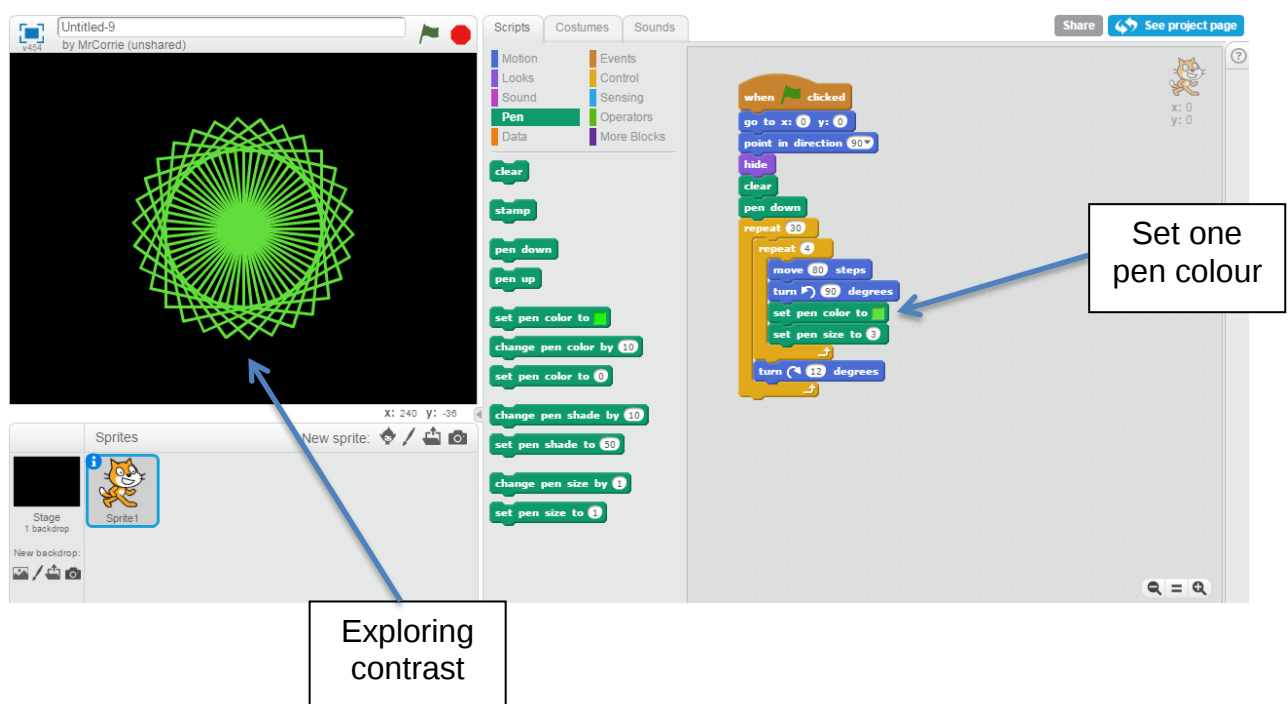




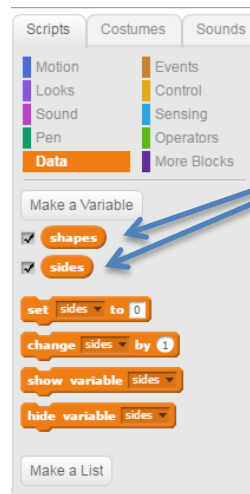
Vice versa!



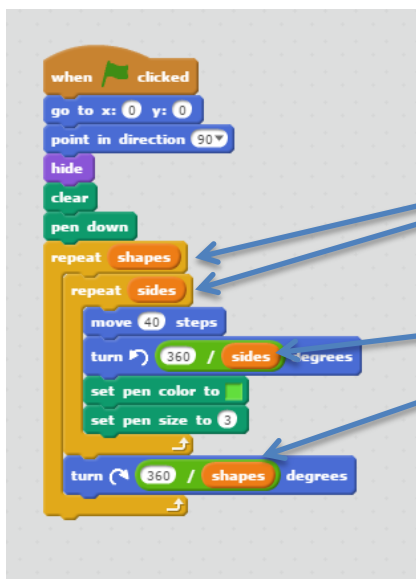
6. Learners should experiment with colour, background and shape to get the desired effect.



7. The next step is to use sliders. Sliders will allow learners to change their shape art without adapting their code.



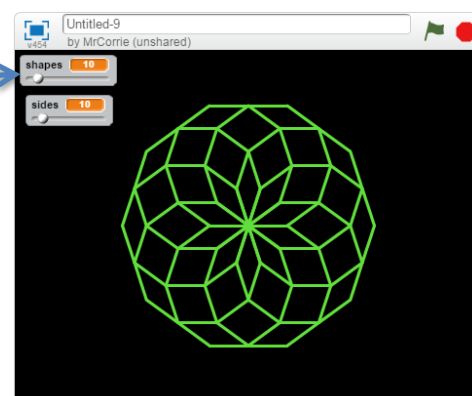
Add two new variables: shapes and sides.



Outer repeat = shapes
Inner repeat = sides

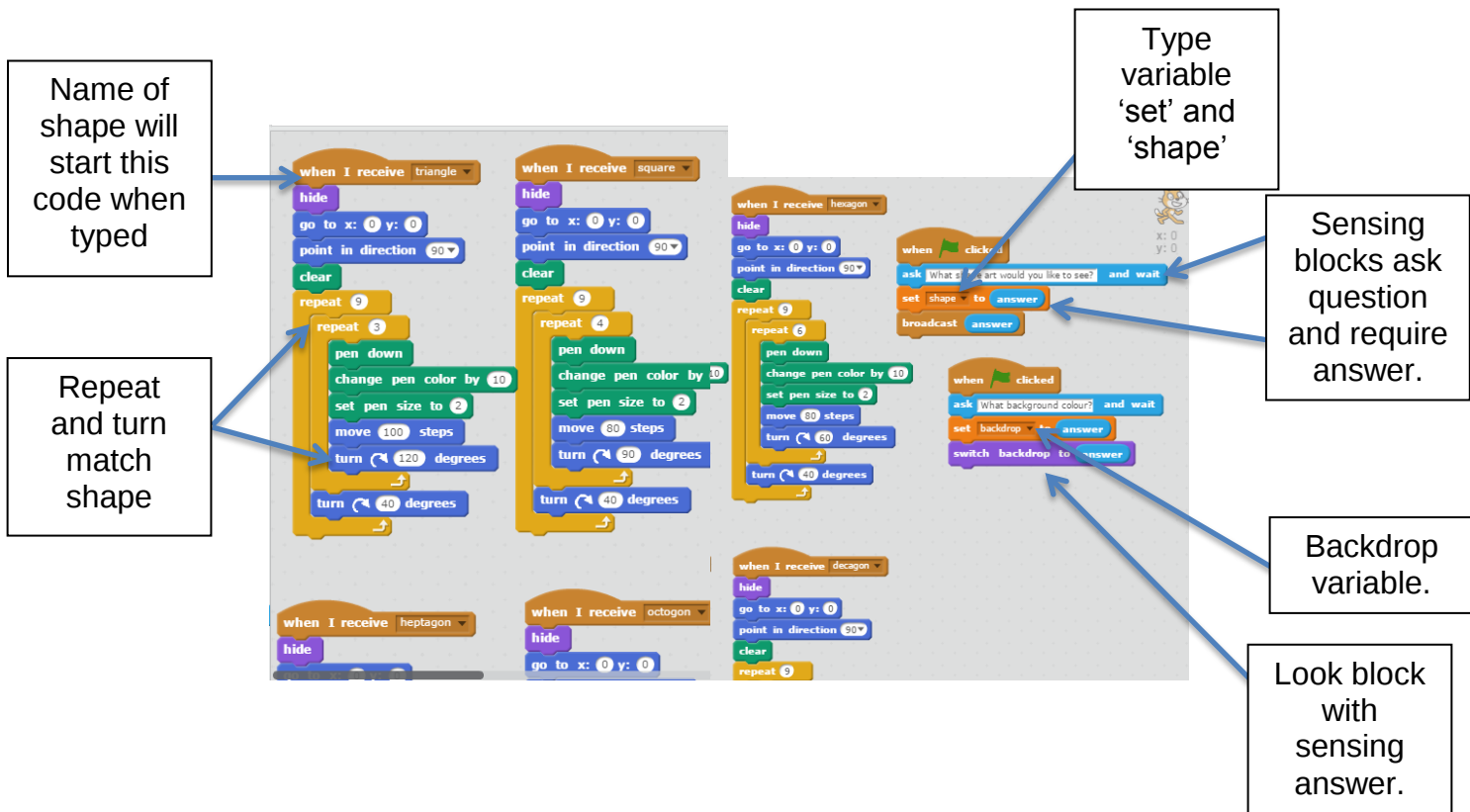
Using dividing operation, divide sides and shape by 360

Right click on variables on the stage, switch to slider



Adjust size of lines if shape is too big.

8. As an alternative, learners could introduce type-commands to draw certain patterns. Type name of shape and then type colour of backdrop.



Plenary

9. Once learners have had opportunity to explore shape, colour, line and size, ask children to select their favourite design. This could be printed and backed for be part of a display, or save via a screen shot for a presentation.
10. Learners can reflect on their experience – have they met the criteria? What would they improve? Would they do anything differently? What are the next steps?