Scratch animation – use pen to draw a polygonal flower

Drawing shapes

- Select a sprite.
- Click on the pen palette.
- 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 motion block.

- Add a turn 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
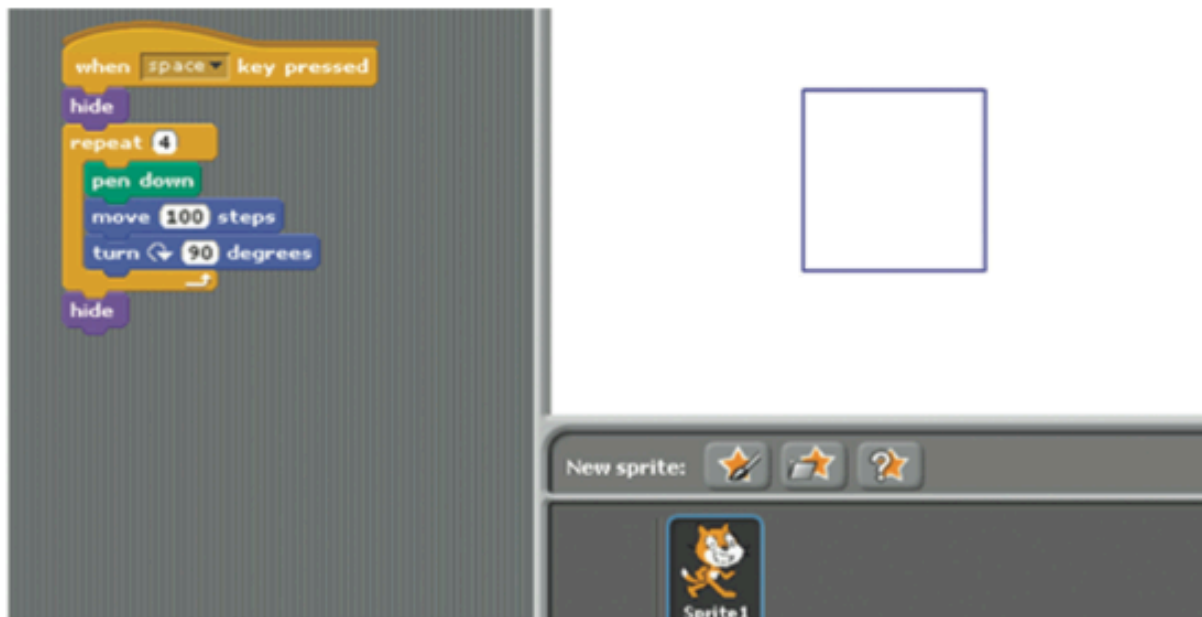Pentagon = 5 x 72   Hexagon = 6 x 60

Challenge Time 1!

1. Draw a square.
2. Use the hide block (looks palette) to hide the sprite and better see the shape.
3. Experiment with pen colour and pen size.
4. Add waits to slow the sprite down. This will allow you to see the sprites moving.
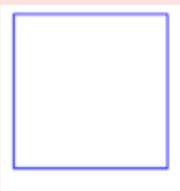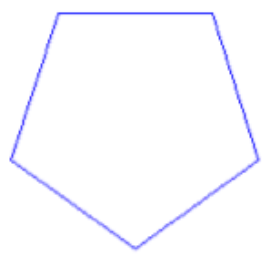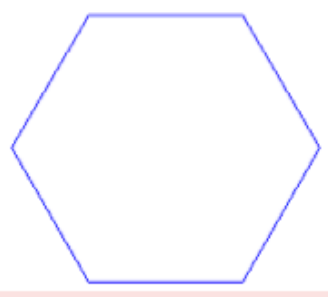5. Try some other shapes such as triangles, pentagons and hexagons.

Repeats

- Repeats allow you to draw shapes more quickly. 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.

Polygons

- Here are the scripts which draw the polygons:

pen down / repeat 4 / move 100 steps / turn 90 degrees	**4x90 = 360**	(square)
pen down / repeat 5 / move 100 steps / turn 72 degrees	**5x72 = 360**	(pentagon)
pen down / repeat 6 / move 100 steps / turn 60 degrees	**6x60 = 360**	(hexagon)

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Make a Flower

- Start out with a square:

```
pen down
repeat 4
    move 100 steps
    turn ↻ 90 degrees
```

- Put the square inside another repeat block.
  Remember that repeat x degrees must equal 360:

```
pen down
repeat 40
    repeat 4
        move 100 steps
        turn ↻ 90 degrees
    turn ↺ 9 degrees
```

40 x 9 degrees = 360 degrees

Make a Flower

- Try making squares of different sizes:

- Change the pen color each time in the loop to create a rainbow effect:


```
pen down
repeat 40
    repeat 4
        move 75 steps
        turn ↻ 90 degrees
        change pen color by 10
    turn ↻ 9 degrees
```

- Make flowers all over the stage. Start the loops from these locations:

```
go to x: -100 y: 100      go to x: 100 y: 100
go to x: -100 y: -100     go to x: 100 y: -100
```