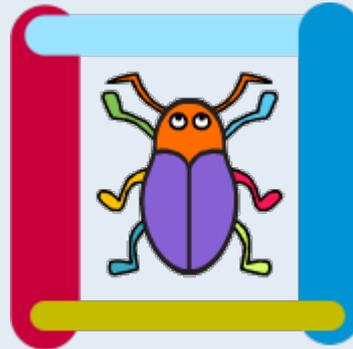
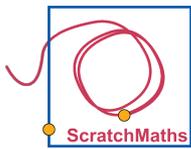


# BETLE GEOMETRY

## MODULE 2: INVESTIGATION 2

### Drawing Polygons





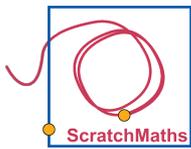
## MODULE 2: INVESTIGATION 2

### Activity 2.2.1 – Drawing Polygons



### ACTIVITY 2.2.1

# Drawing Polygons



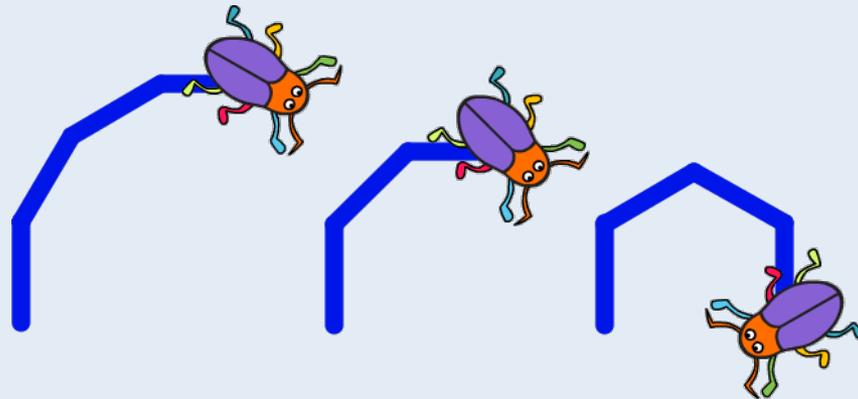
## MODULE 2: INVESTIGATION 2

### Activity 2.2.1 – Drawing Polygons



Open project **2-Drawing Polygons**, save as a copy and rename.

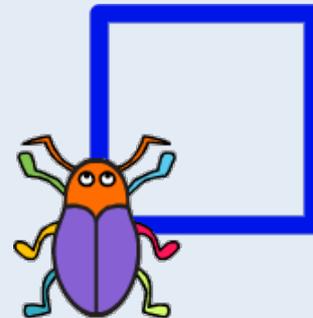
- Run the *setup script*.
- Snap together one **move** block and one **turn** block, set to any values and click the short script several times (**without** using **repeat**).



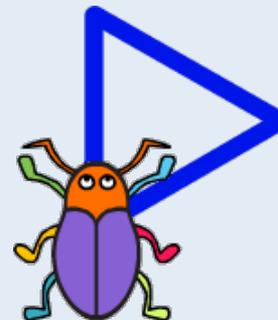


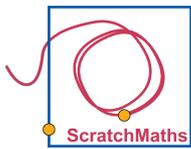
- Add the **repeat** block around your script and set it to the **smallest** number to complete your polygon in one click.

- Create a script to draw a **square**.



- Create a script to draw a **triangle**.





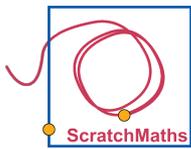
## MODULE 2: INVESTIGATION 2

### Activity 2.2.1 – Drawing Polygons



### Discussion Questions

- ◆ How did you work out how to draw your square or triangle?
- ◆ How many sides did your other polygons have? What polygons did you draw?
- ◆ How many degrees did the Beetle turn in total to make it a closed shape? How many steps did the Beetle move in total?
- ◆ What is the link between the **move** and **repeat** blocks in your polygon scripts?
- ◆ Did you manage to draw an equilateral triangle? How did you build your script to ensure it was equilateral?



## MODULE 2: INVESTIGATION 2

### Activity 2.2.2 – Unplugged: Polygon Scripts



## ACTIVITY 2.2.2: UNPLUGGED

# Polygon Scripts



Match the script with the polygon that it would draw when you click on it.

1

```

set pen size to 5
pen down
set pen color to blue
repeat 4
  move 70 steps
  turn 90 degrees
  
```

2

```

set pen size to 5
pen down
set pen color to blue
repeat 4
  move 70 steps
  turn 120 degrees
  
```

3

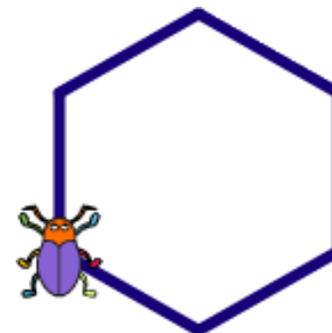
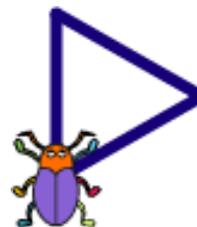
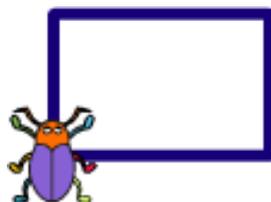
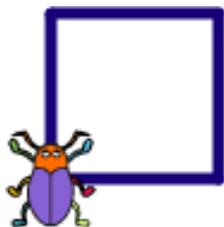
```

set pen size to 5
pen down
set pen color to blue
repeat 3
  move 70 steps
  turn 60 degrees
  
```

4

```

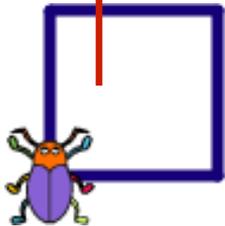
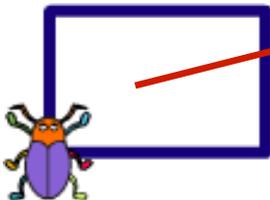
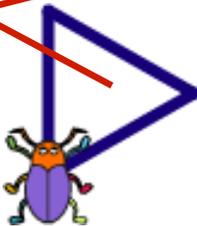
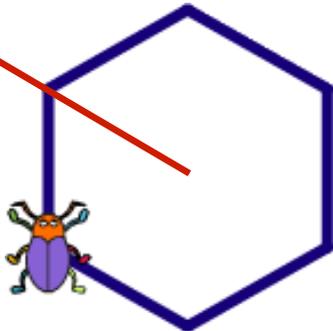
set pen size to 5
pen down
set pen color to blue
repeat 6
  move 60 steps
  turn 90 degrees
  move 90 steps
  turn 90 degrees
  
```





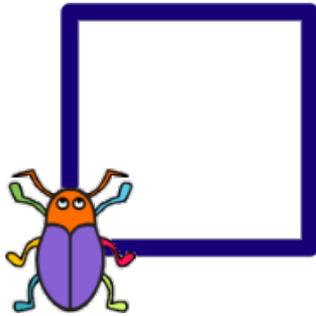
Match the script with the polygon that it would draw when you click on it.

<p>1</p> <pre>set pen size to 5 pen down set pen color to blue repeat 4   move 70 steps   turn 90 degrees</pre>	<p>2</p> <pre>set pen size to 5 pen down set pen color to blue repeat 3   move 70 steps   turn 120 degrees</pre>	<p>3</p> <pre>set pen size to 5 pen down set pen color to blue repeat 6   move 70 steps   turn 60 degrees</pre>	<p>4</p> <pre>set pen size to 5 pen down set pen color to blue repeat 2   move 60 steps   turn 90 degrees   move 90 steps   turn 90 degrees</pre>
---	--	---	---

			
---	---	---	--

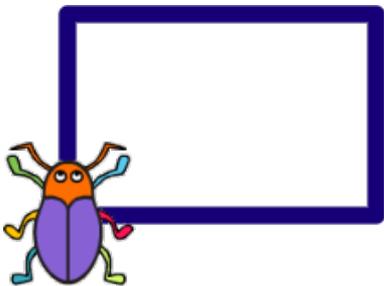


Fill in the gaps in the text below to show how you worked out the answer.



This is the correct polygon because:

- it has \_\_\_\_ equal sides and \_\_\_\_ right angles
- the blocks in the **repeat** are run \_\_\_\_ times
- the **move** block is \_\_\_\_ steps
- the Beetle always turns right by \_\_\_\_ degrees

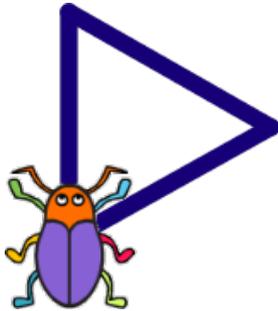


This is correct polygon because:

- it has \_\_\_\_ pairs of equal sides opposite each other, a shorter pair and a longer pair
- it has \_\_\_\_ right angles
- the blocks in the **repeat** are run \_\_\_\_ times
- there are \_\_\_\_ **move** blocks in the **repeat**
- there are \_\_\_\_ **turn** blocks in the **repeat** and the Beetle always turns right by \_\_\_\_ degrees

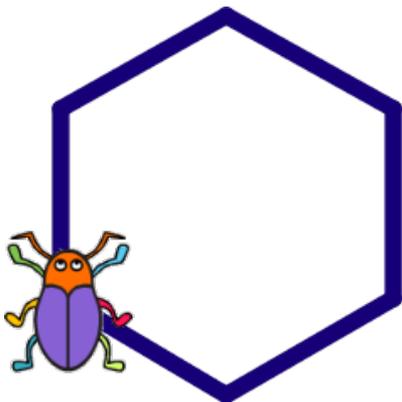


Fill in the gaps in the text below to show how you worked out the answer.



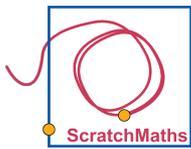
This is correct polygon because:

- it has \_\_\_\_\_ equal sides and \_\_\_\_\_ equal angles
- the blocks in the **repeat** are run \_\_\_\_\_ times
- the **move** block is \_\_\_\_\_ steps
- the Beetle always turns right by \_\_\_\_\_ degrees



This is correct polygon because:

- it has \_\_\_\_\_ equal sides and \_\_\_\_\_ equal angles
- the blocks in the **repeat** are run \_\_\_\_\_ times
- the **move** block is \_\_\_\_\_ steps
- the Beetle always turns right by \_\_\_\_\_ degrees



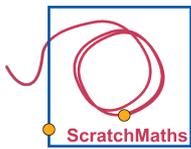
## MODULE 2: INVESTIGATION 2

### Activity 2.2.3 – Using and Defining More Blocks



### ACTIVITY 2.2.3

# Using and Defining More Blocks



## MODULE 2: INVESTIGATION 2

### Activity 2.2.3 – Using and Defining More Blocks



Continue in **2-Drawing Polygons**, save as a copy and rename.

- Go to the **More Blocks** group and find the new blocks that are there.

set random pen size

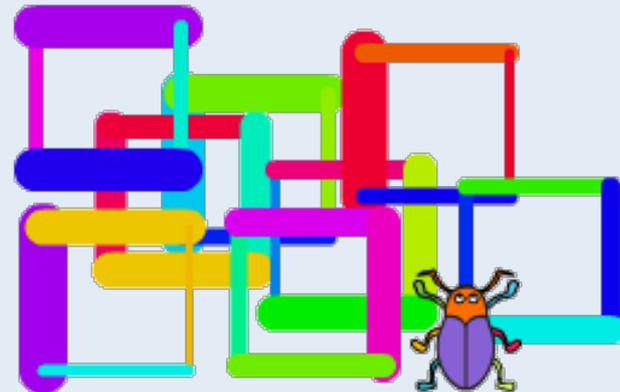
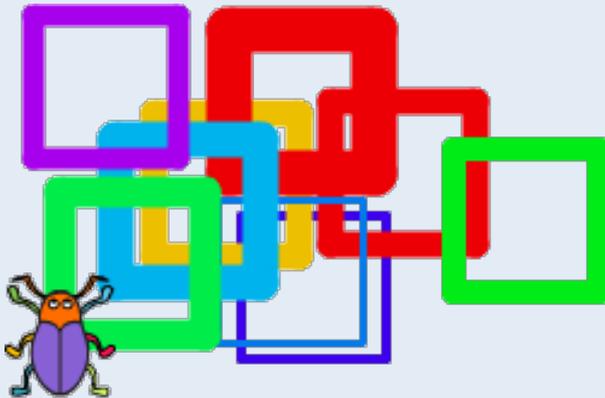
set random pen colour

set random pen shade

- Experiment with these new blocks by adding them to the top of your *square script* or inside the script.

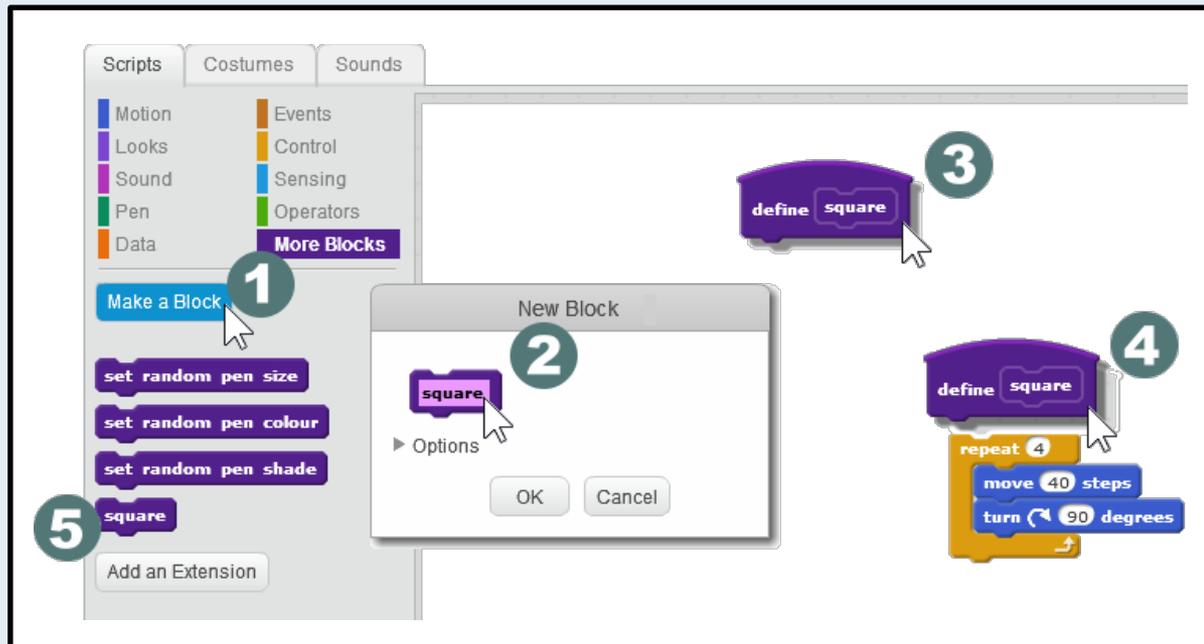


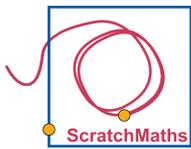
- Drag the Beetle around the stage to draw squares with different coloured and sized lines.





- Make a new block (1) and give your block a meaningful name e.g. *square* (2).
- Drag the hat block (3) and put it as a hat on top of the script for drawing a square (4).





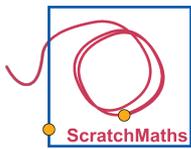
## MODULE 2: INVESTIGATION 2

### Activity 2.2.3 – Using and Defining More Blocks



## Discussion Questions

- ◆ What is the difference between *pen colour* and *pen shade*?
- ◆ Where did you try placing the **set random pen** blocks in your script – how did this change your drawing?
- ◆ Why would it be a good idea to define a new block for a script you use many times in your project (e.g. drawing a square)?
- ◆ Why is it important to give a new block a meaningful name?



## MODULE 2: INVESTIGATION 2

### Activity 2.2.4 – Combining New Blocks



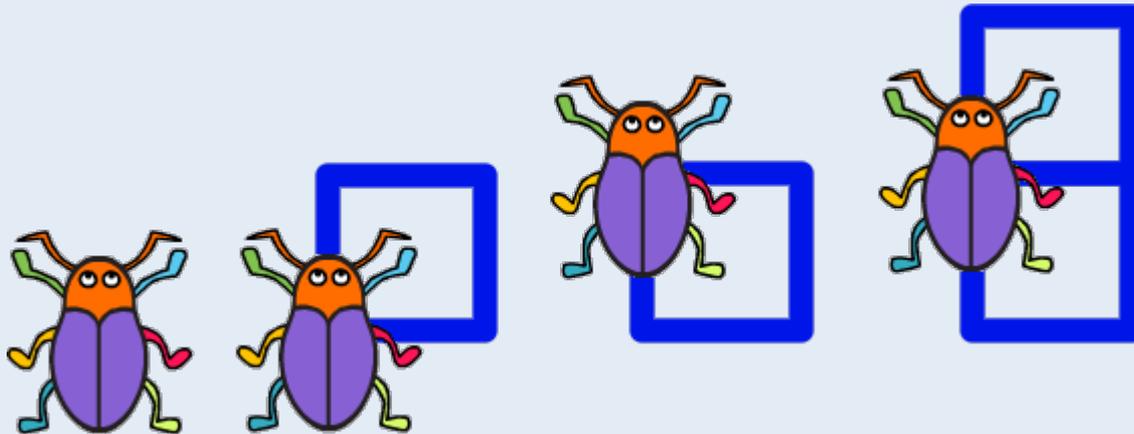
### ACTIVITY 2.2.4

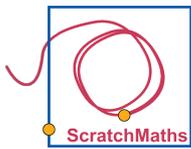
# Combining New Blocks



Continue in **2-Drawing Polygons**,  
save as a copy and rename.

- Build a script, using your **square** block, to **draw a tower of two squares**.



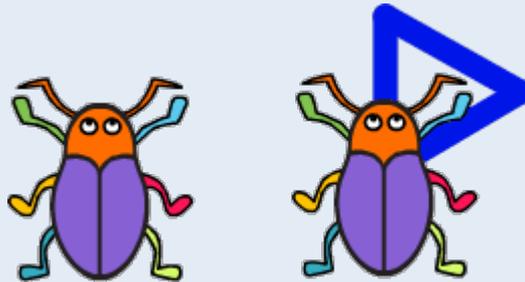


## MODULE 2: INVESTIGATION 2

### Activity 2.2.4 – Combining New Blocks

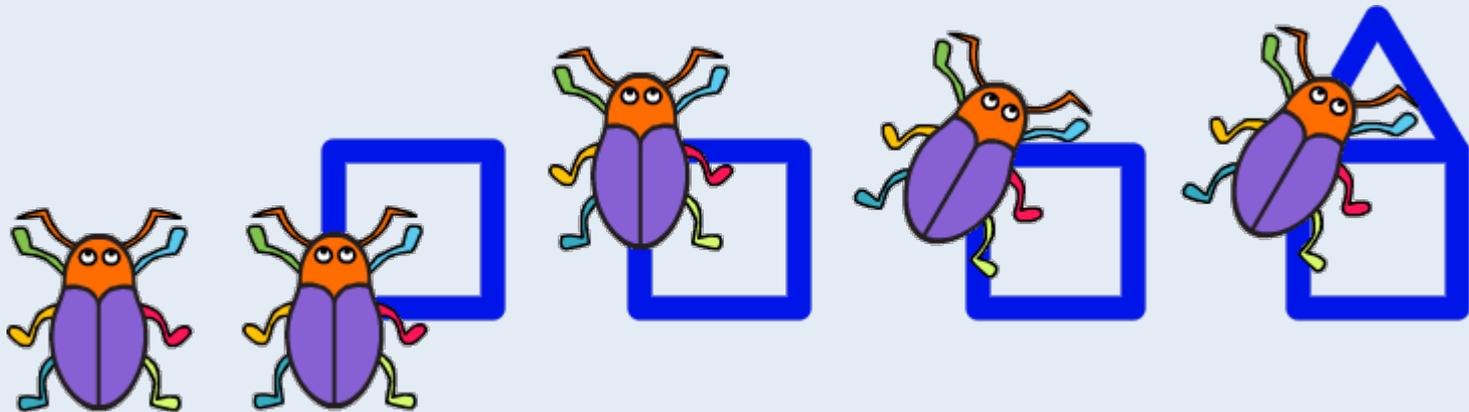


- Make another new block **triangle** with sides that are the same length as your square.



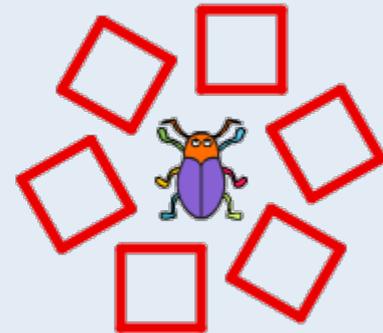
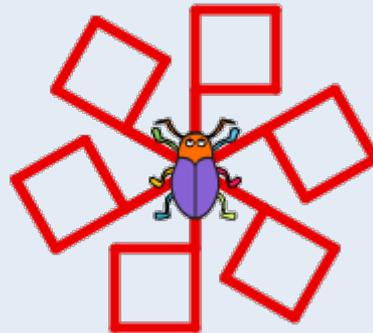
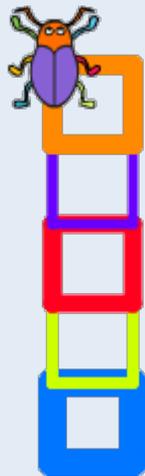
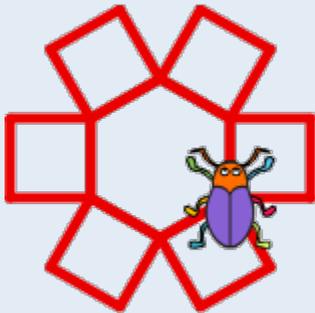


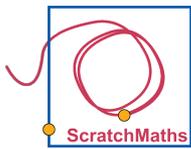
- Combine your **square** and **triangle** blocks in one script to draw a house.





- [Extension] Try building scripts to draw some of the example pictures below using just the **square** block.





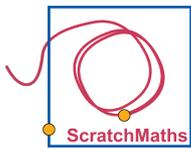
## MODULE 2: INVESTIGATION 2

### Activity 2.2.4 – Combining New Blocks



## Discussion Questions

- ◆ What problems did you encounter when building a script for drawing a tower of two squares and how did you solve these?
- ◆ How did you use your new blocks to create a house?
- ◆ Did defining a new block for **square** and **triangle** make it easier to draw the house? How?
- ◆ What problems did you encounter when drawing your house?
- ◆ How did you discover the angle that you need to turn by in order to draw the roof on your house correctly?



# MODULE 2: INVESTIGATION 2



## My **Investigation 2** check list:

- I built a script to draw a square.
- I built a script to draw an equilateral triangle.
- I envisaged what polygons different scripts would draw.
- I used pre-defined blocks within my square script to draw squares with sides of random widths and colours.
- I defined my own **square** and **triangle** blocks.
- I used my **square** block to draw a tower.
- I used my **square** and **triangle** blocks to draw a house.