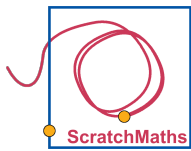


BEETLE GEOMETRY

MODULE 2: INVESTIGATION 2

Drawing Polygons





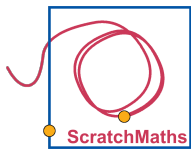
MODULE 2: INVESTIGATION 2

Activity 2.2.1 – Drawing Polygons



ACTIVITY 2.2.1

Drawing Polygons



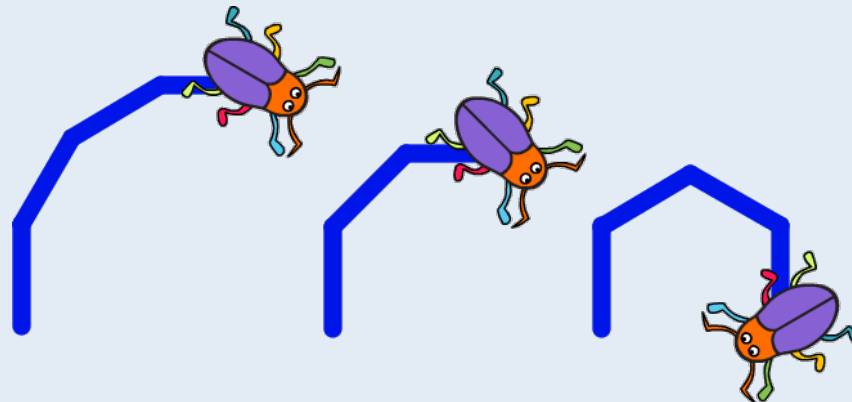
MODULE 2: INVESTIGATION 2

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**).



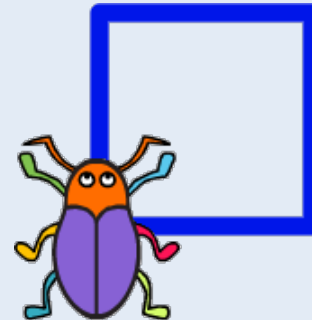
MODULE 2: INVESTIGATION 2

Activity 2.2.1 – Drawing Polygons

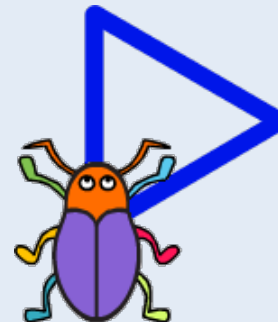


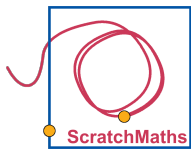
- ☐ Add the **repeat** block around your script and set it to the **smallest** number to complete your polygon in one click.

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



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





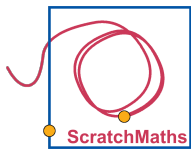
MODULE 2: INVESTIGATION 2

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 3
  move 70 steps
  turn 120 degrees
  
```

3

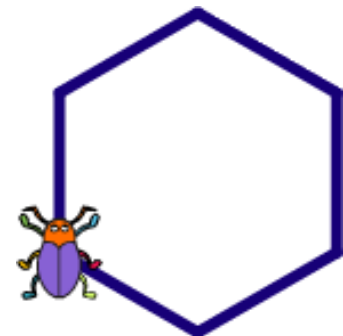
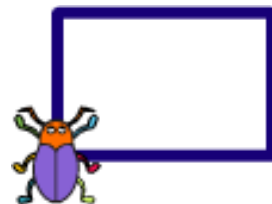
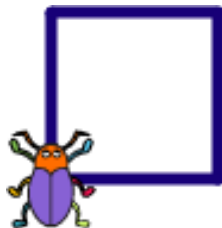
```

set pen size to 5
pen down
set pen color to blue
repeat 6
  move 70 steps
  turn 60 degrees
  
```

4

```

set pen size to 5
pen down
set pen color to blue
repeat 4
  move 60 steps
  turn 90 degrees
  move 90 steps
  turn 90 degrees
  
```







MODULE 2: INVESTIGATION 2

Activity 2.2.2 – Unplugged: Polygon Scripts



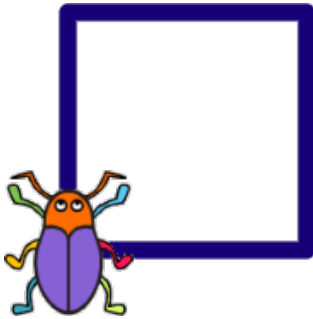
☐ Match the script with the polygon that it would draw when you click on it.

<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>
			

Red lines connect the scripts to the polygons: Script 1 to the square, Script 2 to the rectangle, Script 3 to the triangle, and Script 4 to the hexagon.

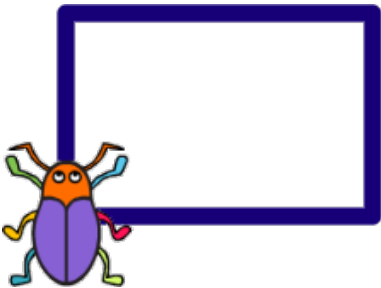


☐ Fill in the gaps in the text below to show how you worked out the answer.



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:

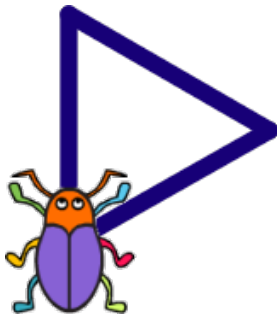
- it has ____ pairs of equal sides opposite each other, a shorter pair and a longer pair
- it has ____ right angles
- the blocks in the **repeat** are run ____ times
- there are ____ **move** blocks in the **repeat**
- there are ____ **turn** blocks in the **repeat** and the Beetle always turns right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

MODULE 2: INVESTIGATION 2

Activity 2.2.2 – Unplugged: Polygon Scripts

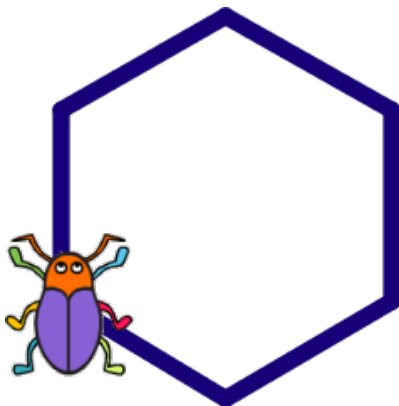


☐ Fill in the gaps in the text below to show how you worked out the answer.



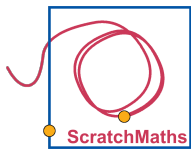
This is correct polygon because:

- 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



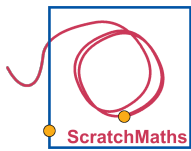
MODULE 2: INVESTIGATION 2

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

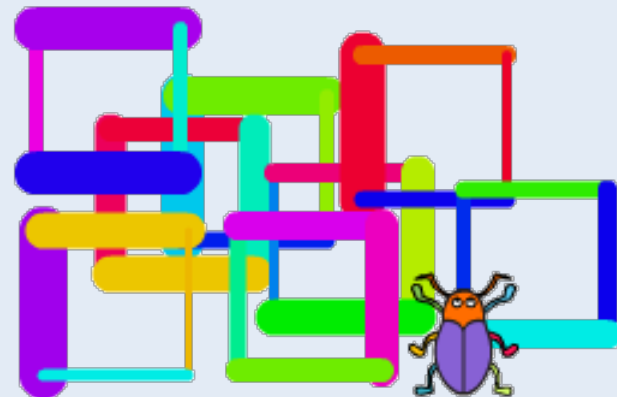
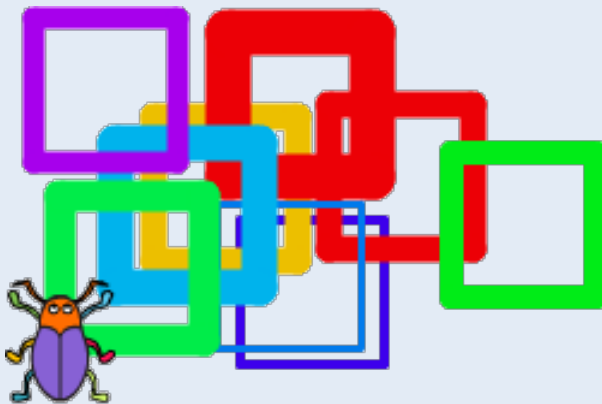
- ☐ Experiment with these new blocks by adding them to the top of your *square script* or inside the script.

MODULE 2: INVESTIGATION 2

Activity 2.2.3 – Using and Defining More Blocks



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

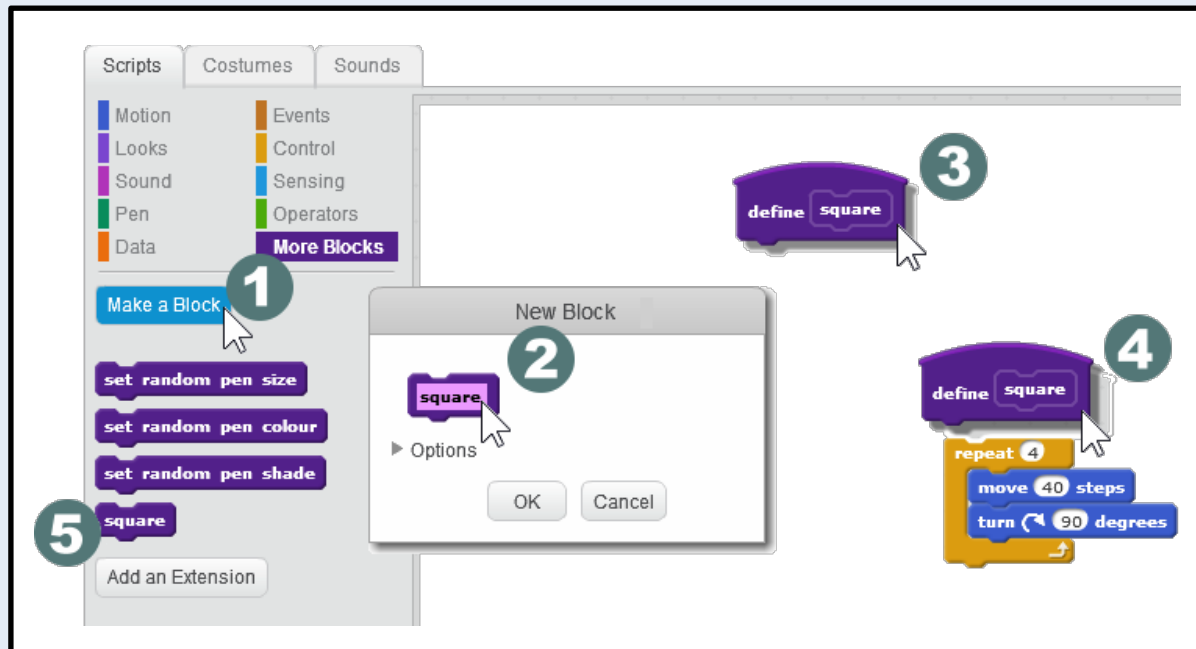


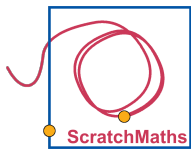
MODULE 2: INVESTIGATION 2

Activity 2.2.3 – Using and Defining More Blocks



- ☐ 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).





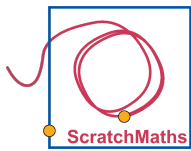
MODULE 2: INVESTIGATION 2

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

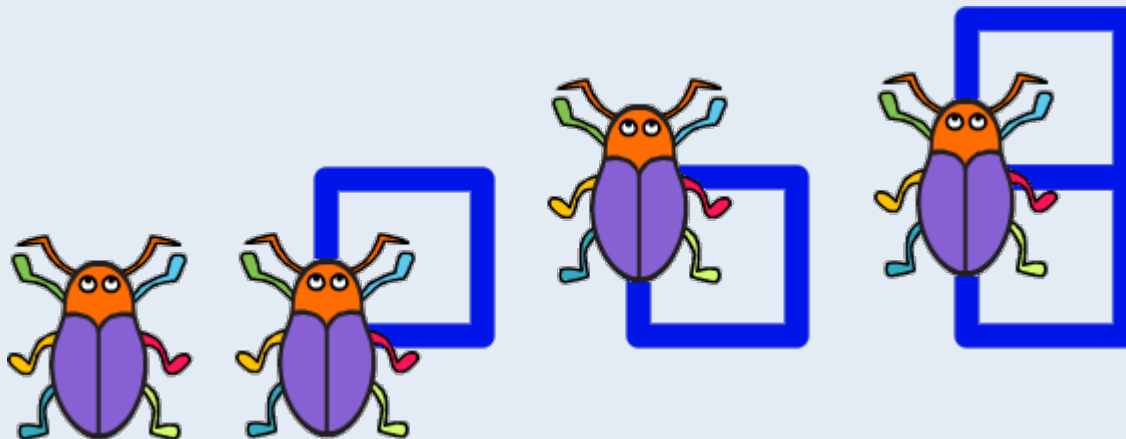
MODULE 2: INVESTIGATION 2

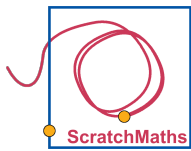
Activity 2.2.4 – Combining New Blocks



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**.



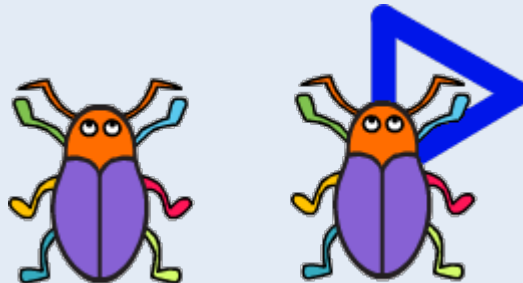


MODULE 2: INVESTIGATION 2

Activity 2.2.4 – Combining New Blocks



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

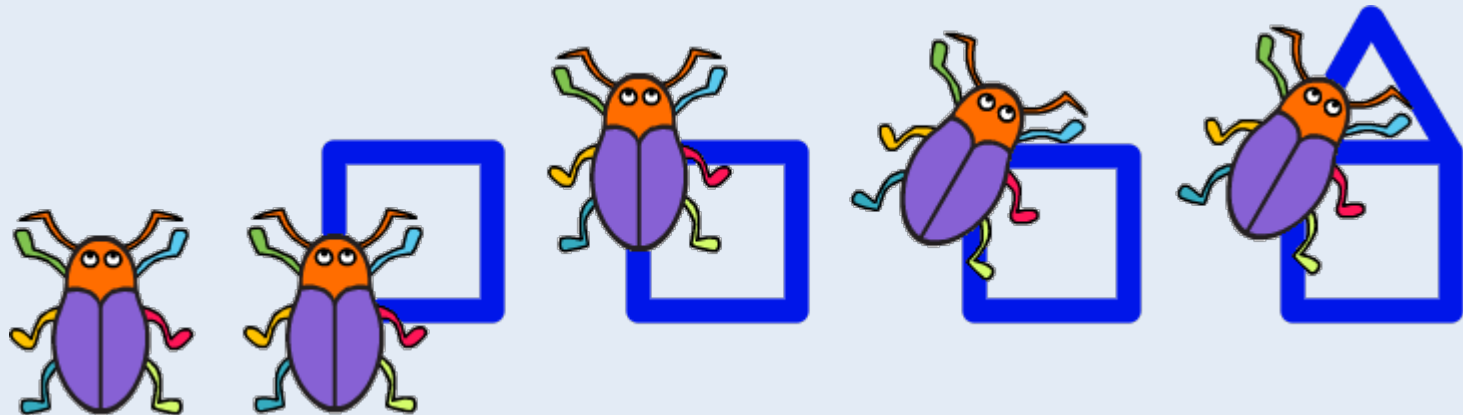


MODULE 2: INVESTIGATION 2

Activity 2.2.4 – Combining New Blocks



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

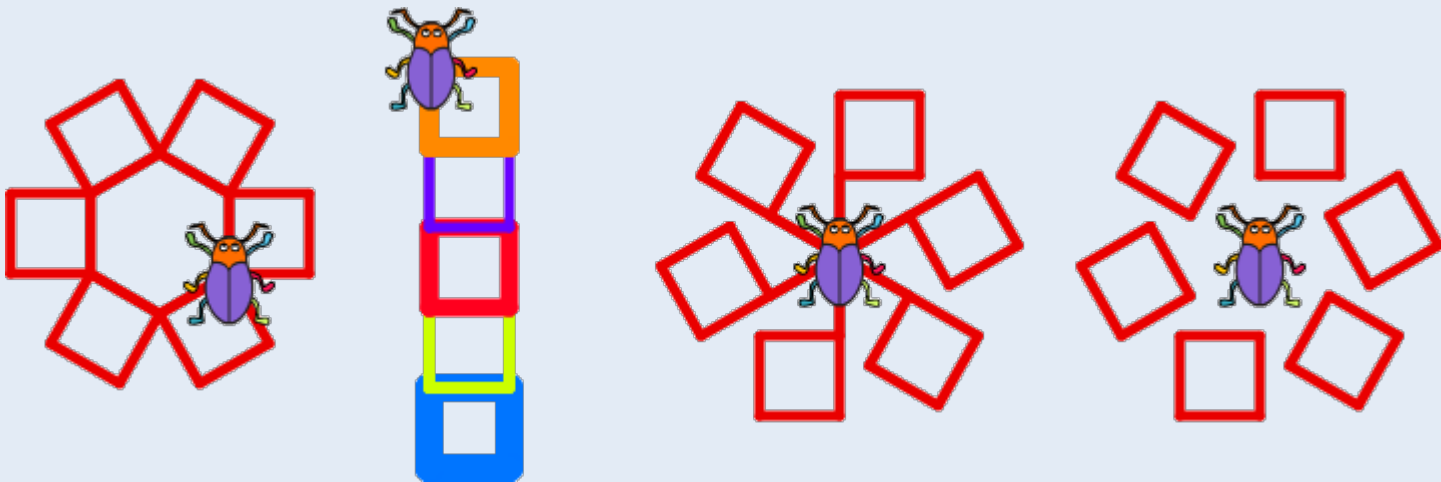


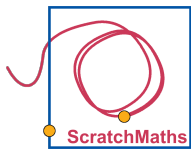
MODULE 2: INVESTIGATION 2

Activity 2.2.4 – [Extension] Combining New Blocks



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





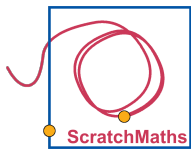
MODULE 2: INVESTIGATION 2

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.