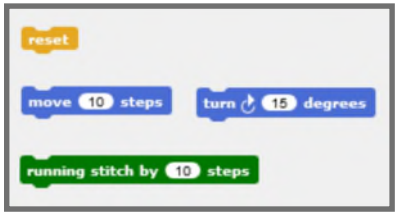
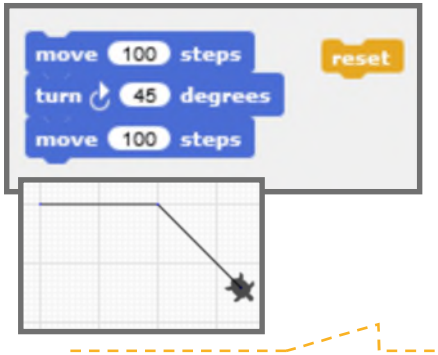
Turtlestitch Skills: Ready, Steady, Stitch

Getting started

1. You can use these blocks to stitch patterns. Change the numbers by clicking on them.

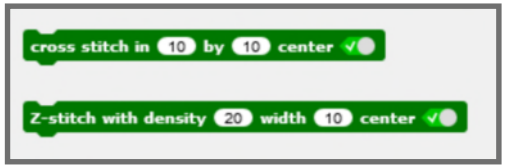


2. Join blocks together and click on them to run them.



3. Click 'reset' to move the turtle back to the start.

4. Select a stitch to make the turtle stitch its path.



Taking it further...

Explore different combinations of move and turn.
Try out different types of stitch.

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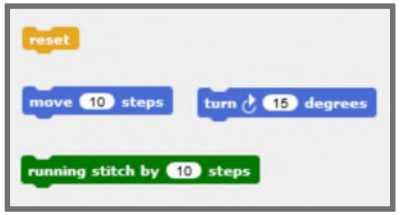

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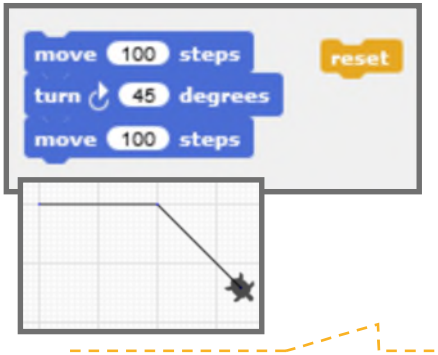

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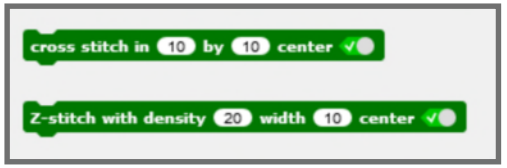


Taking it further...

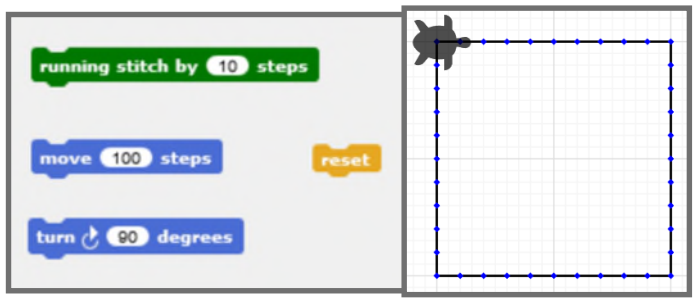
Explore different combinations of move and turn.
Try out different types of stitch.

www.warwick.ac.uk/wmgoutreach www.warwick.ac.uk/turtlestitch

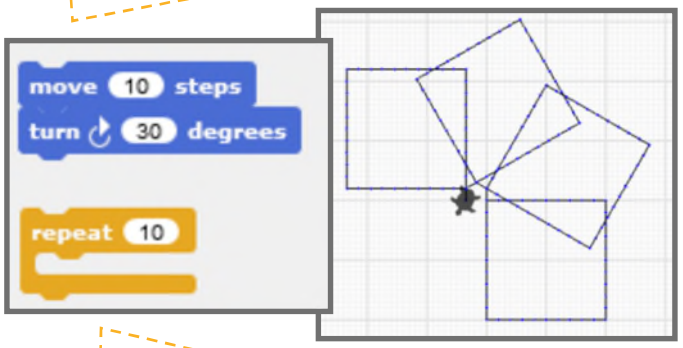
Turtlestitch Skills: Going for a Spin

Creating patterns with shapes

1. Use these blocks to stitch a square.



2. Once you have learnt to draw a square, you can create patterns by telling the turtle to make a small move and turn.



3. Use a repeat loop around the whole code—can you work out how many repetitions your pattern needs?

Taking it further...

Try creating some other shapes and rotating them.
Create your own block to draw a square—look at the block skill card.

Turtlestitch Skills: Going for a Spin

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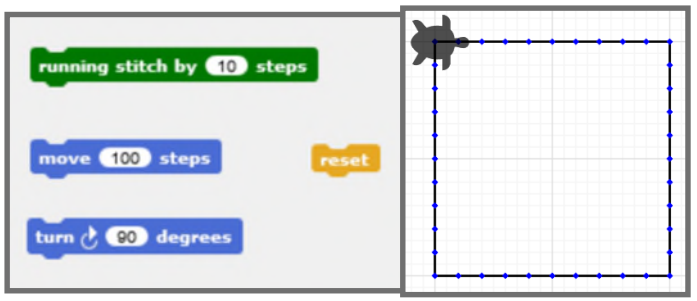

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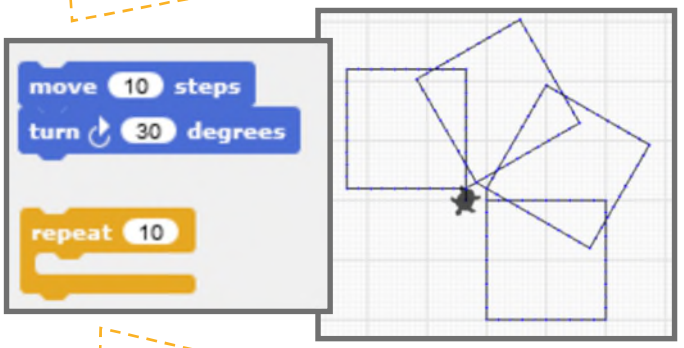

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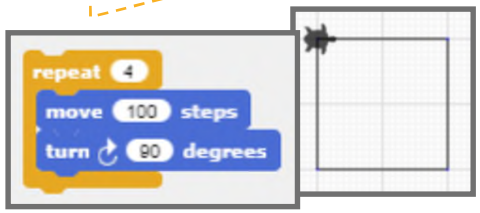
Turtlestitch Skills: Block Party

Creating your own block to save time

Making your own block can save time and keep your code neat, especially if you want to repeat a set of commands several times. In this example, we write a set of commands to draw a square. This is summarised as the block 'mysquare'. Every time we use 'mysquare' in our program, it will follow the commands for drawing a square.

1. Create instructions for the shape you want to draw. (This example makes a square).



2. Click on the variables tab.

3. Select 'Make a block'.

4. In this example, the new block will move the turtle to draw a shape, so it will be a motion block. To create your block, click on 'Motion'.

5. Type in a name for your block, e.g. 'mysquare'. Then click 'OK'.

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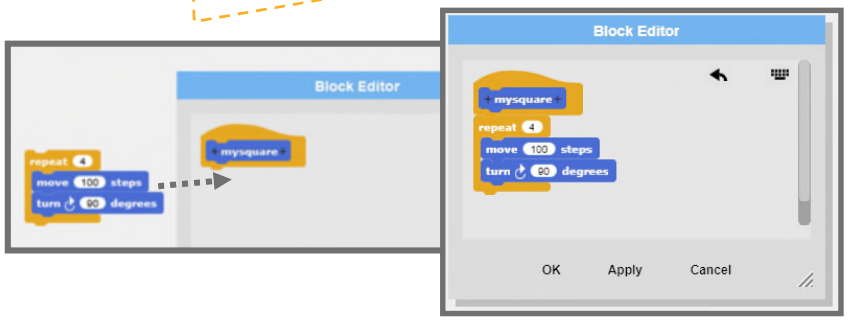
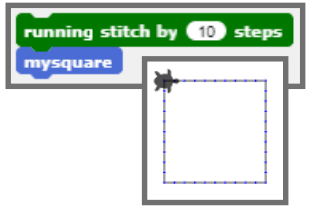


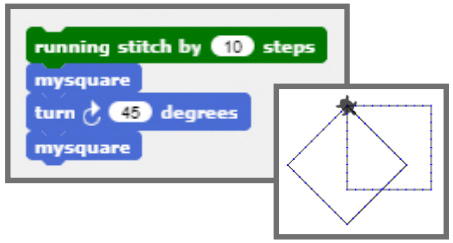
7. The result should look like this. This window shows us that from now on, when we use the block 'mysquare', the turtle will be commanded 4 times to move 100 steps and turn 90 degrees.

8. Click OK in the block editor. Then the new block will appear at the bottom of the block palette on the left-hand side of the screen, where you can drag it from.

9. Now you can stitch a square this way,...



... use the block more than once,...



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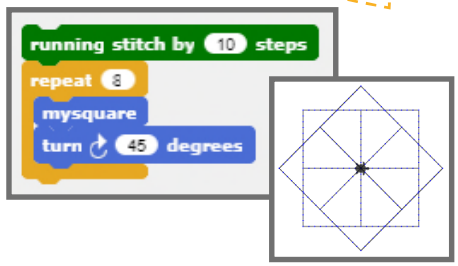

Taking it further...

Try making different motion blocks to create other shapes, for example a triangle or star.

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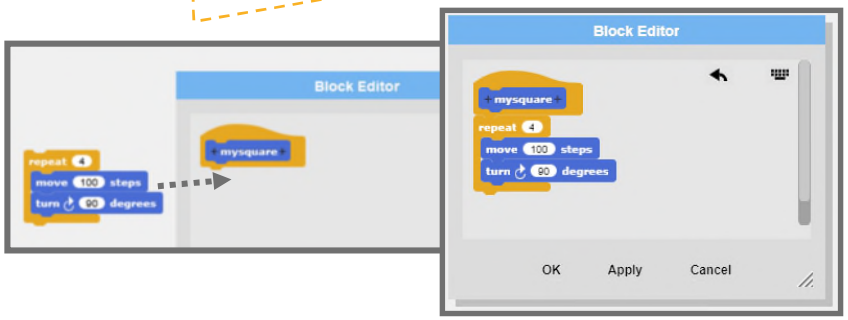

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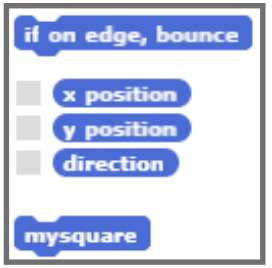

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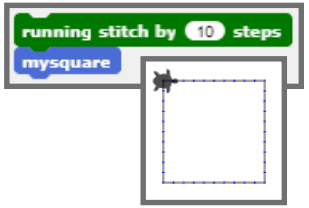

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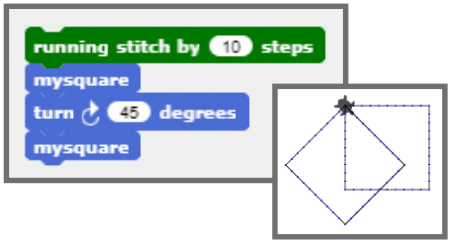

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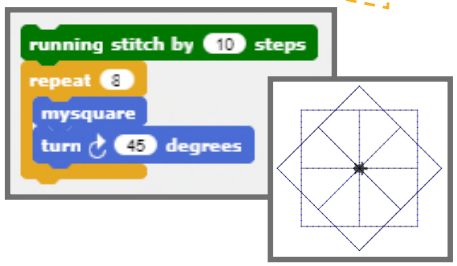


Taking it further...

Try making different motion blocks to create other shapes, for example a triangle or star.

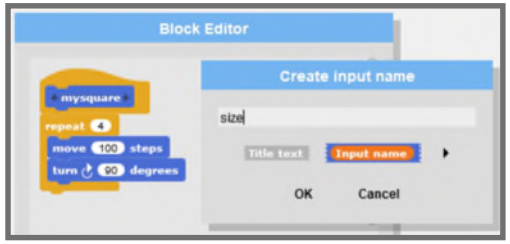
Turtlestitch Skills: Little and Large

Stitching a shape in different sizes

In this example, we use a motion block to draw the same shape in different sizes. To change the size of our square, we will make size a parameter to the function ‘mysquare’. Setting parameters is useful because it helps condense your program.

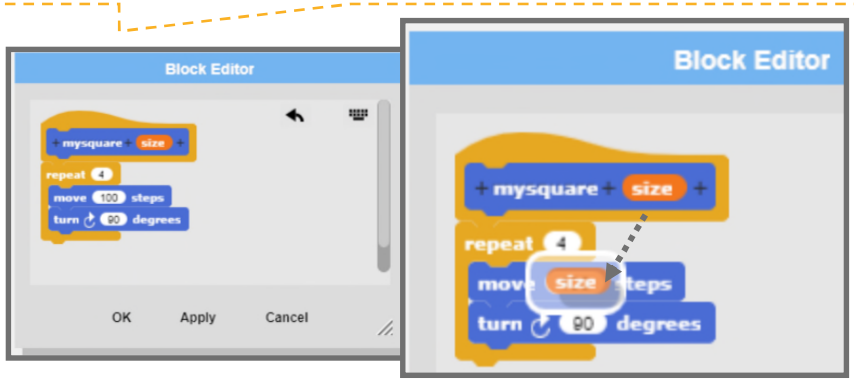
1. Begin to create a block to draw a shape —learn how using the Block Party card. If you have already made one, right-click on it and select ‘edit….’

2. Click ‘+’ next to the block name.



3. Name the input ‘size’, because that is the variable you will change. Click OK.

4. In the block editor, drag and drop the orange ‘size’ input into the blue ‘move…’ block, replacing the pre-set value (100 in this example).



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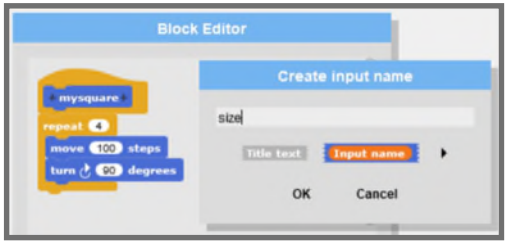

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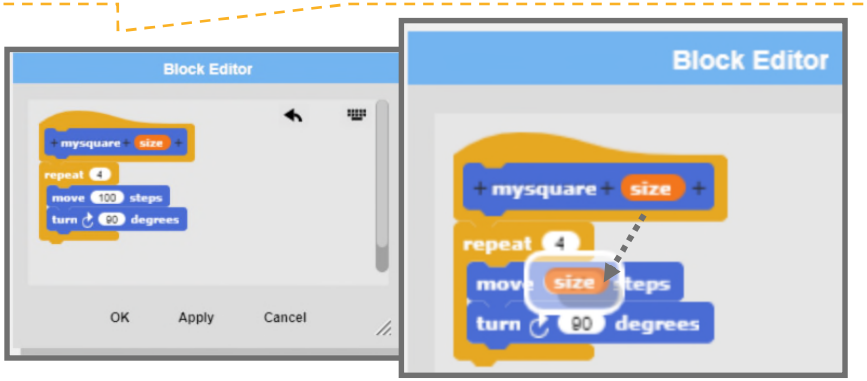


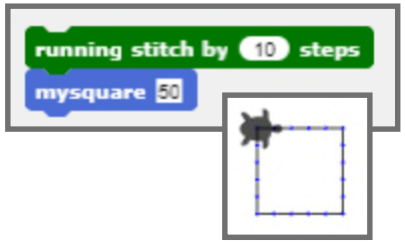
5. The result should look like this. Now, instead of moving 100 steps for each side of the square, the turtle is ready to move any specified number of steps. Let's learn to set this value.

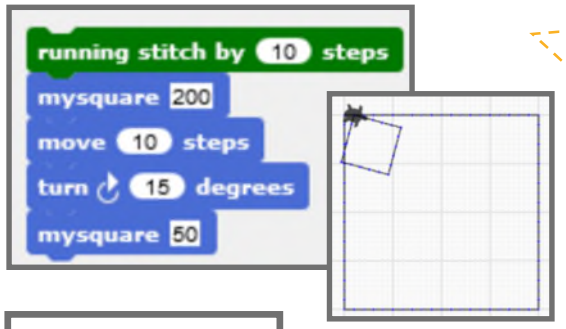
6. Click OK in the block editor.

7. Find your new block at the bottom of the motion block palette on the left-hand side of the screen.

8. The value you enter in the white space will set the number of steps the turtle moves for each side.

Here, we have set each side of the square to 50 steps long.





Here, we have added a move and turn between squares of different sizes.

Taking it further...

Here we used the variable size as a parameter to the function 'mysquare'. Can you use other variables to set parameters?

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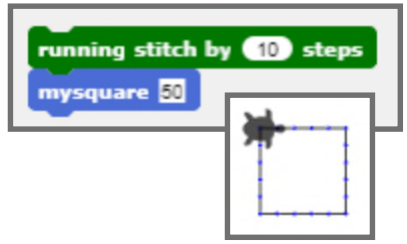

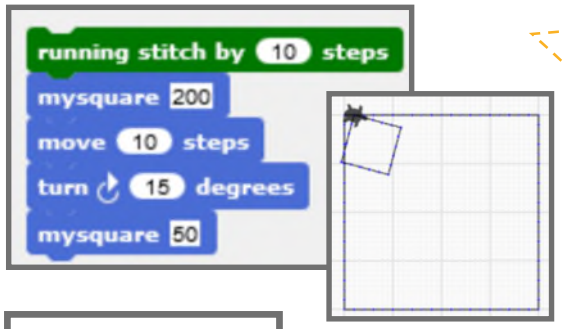

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Here we used the variable size as a parameter to the function 'mysquare'. Can you use other variables to set parameters?

CATAPULT High Value Manufacturing

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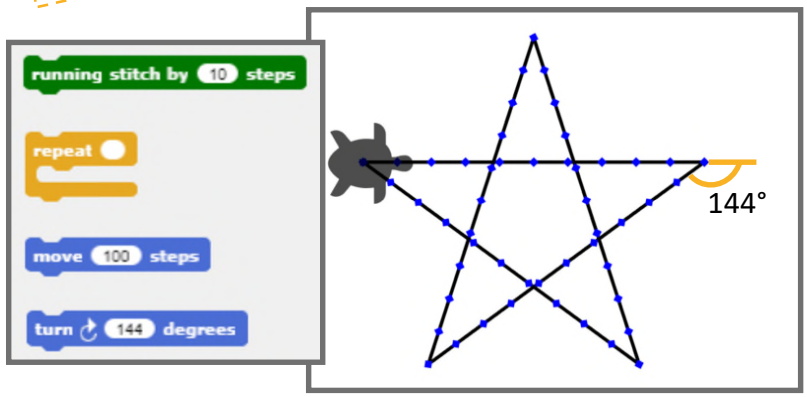
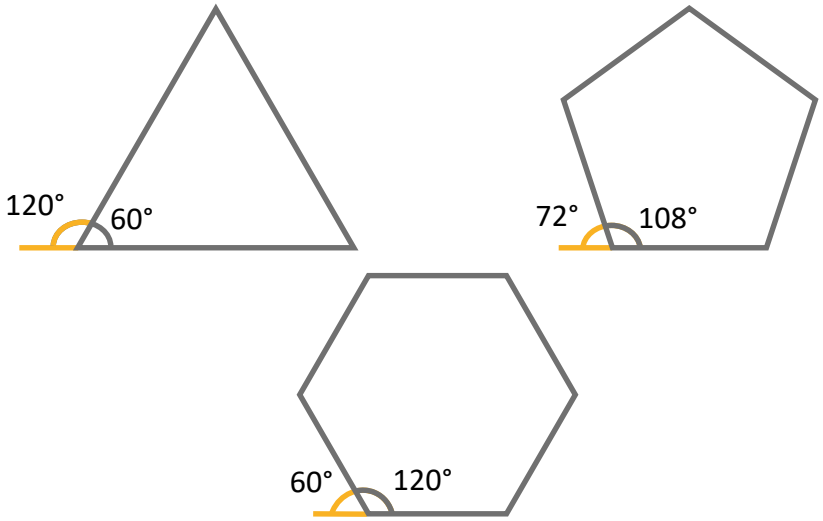
Turtlestitch Skills: Seeing Stars

Creating a star and other shapes

1. Use these blocks to stitch a star.



2. Can you work out how to use these angles to stitch other shapes?



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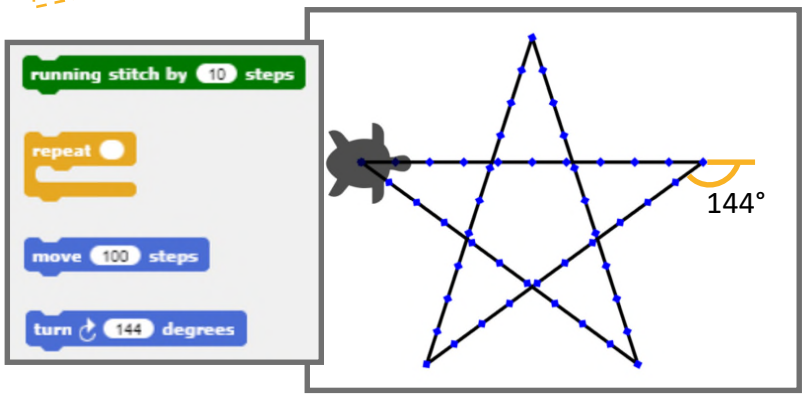

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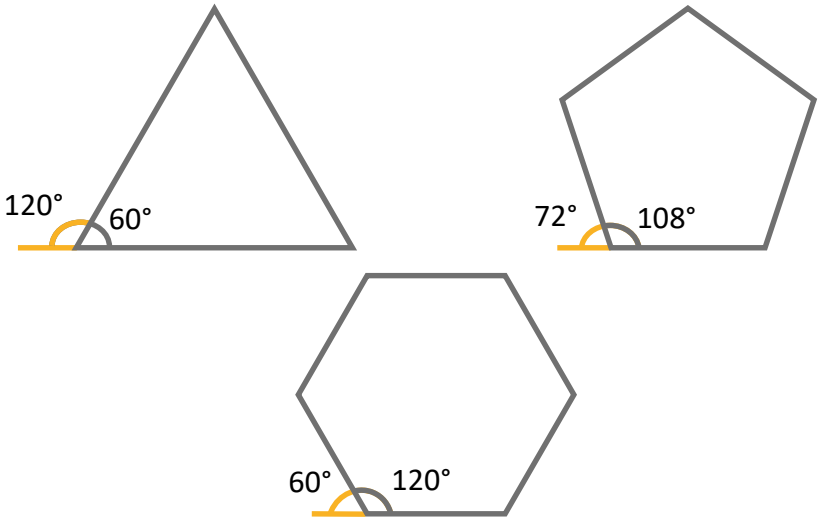
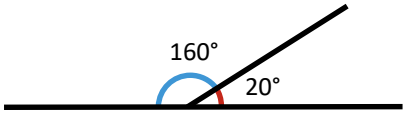
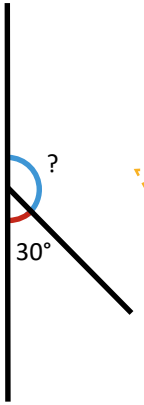


A key element of stitching shapes is working out how many degrees the turtle needs to turn. Here are some clues.

The angle on a straight line is 180°.



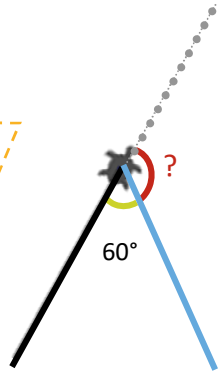
These angles add up to 180° because they join the straight line at the same point.



To work out the value of the red angle, we subtract 30 from 180. This tells us that missing angle is 150°.

The turtle has already walked along the black line. The grey line shows where the turtle will go if it doesn't turn.

For the turtle to walk along the blue line, it needs to turn 120°, because 180 - 60 = 120.



Taking it further...

Can you make stars with more points?

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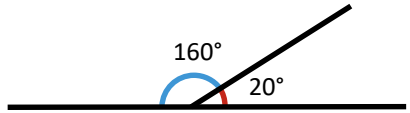

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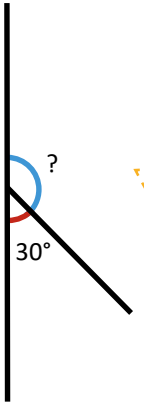

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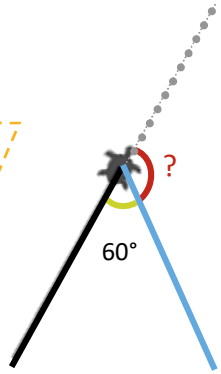

Taking it further...

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www.warwick.ac.uk/wmgoutreach www.warwick.ac.uk/turtlestitch

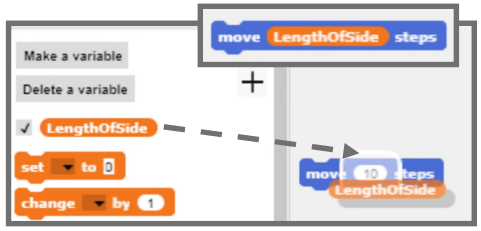
Turtlestitch Skills: Variables

Creating your own variable

A variable is like a labelled box that you can store a value in. (A value could be a number, a letter, a symbol or a string of these.) You can use this value in your instructions. You can also change the value that is in the box. In this example, we will stitch a spiral with a variable that sets how far the turtle moves.

1. Click on the variables tab, then select 'Make a variable'.

2. The variable's name is like a label on a box. Give your variable a meaningful name describing what you will use it for, e.g. 'LengthOfSide' or 'AngleOfTurn'. Click OK.



3. In these blocks, you can click on the black arrow to select the variable whose value you want to set or change.

4. You can drag and drop your variable into blue motion blocks.

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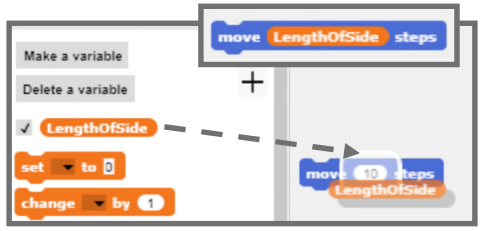

3. In these blocks, you can click on the black arrow to select the variable whose value you want to set or change.

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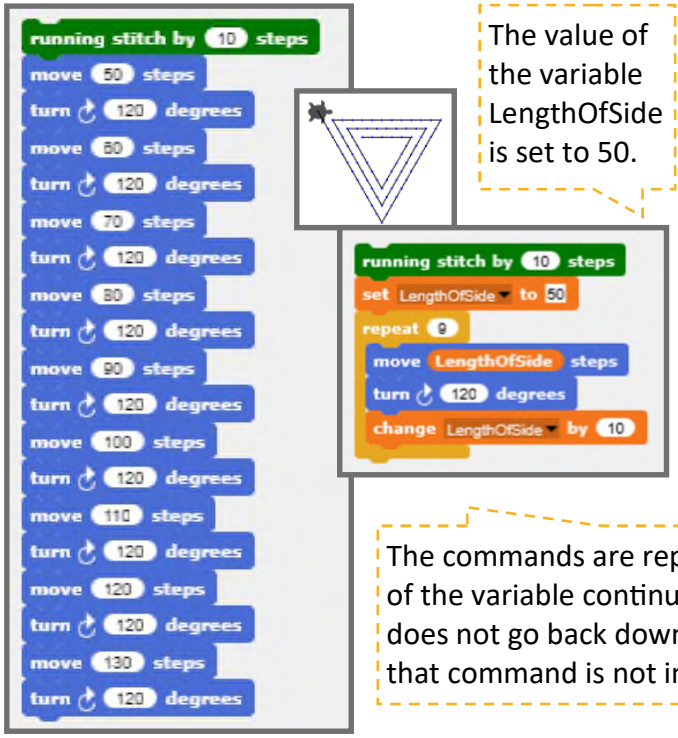
Both of these programs produce the same spiral, but with variables, we can use fewer blocks to get the same result.



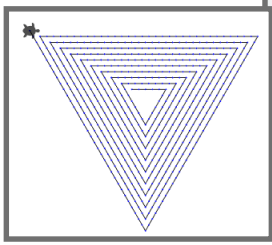
The value of the variable LengthOfSide is set to 50.

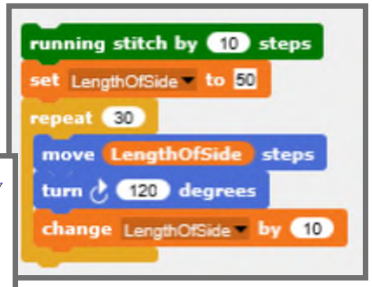
At first, the turtle moves 50 steps.

The value of LengthofSide is increased by 10, so the turtle moves further.

The commands are repeated; the value of the variable continues to increase. It does not go back down to 50 because that command is not in the repeat loop.

It is easy to make a bigger spiral by changing the number of repetitions.

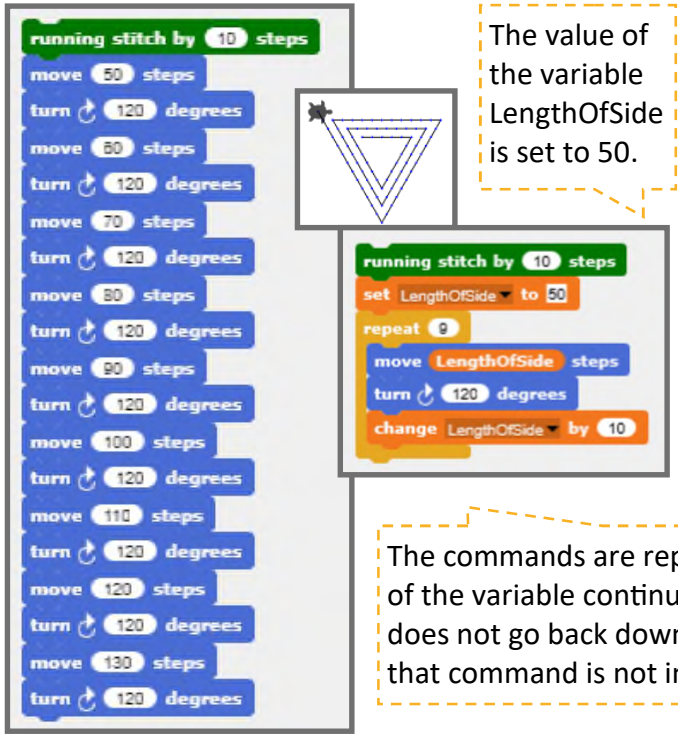




Taking it further...

Think about how using variables can make your code simpler.

Both of these programs produce the same spiral, but with variables, we can use fewer blocks to get the same result.



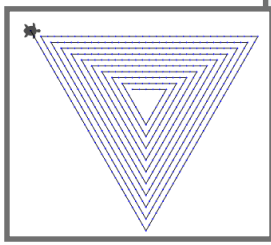
The value of the variable LengthOfSide is set to 50.

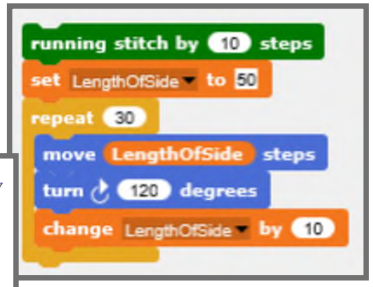
At first, the turtle moves 50 steps.

The value of LengthofSide is increased by 10, so the turtle moves further.

The commands are repeated; the value of the variable continues to increase. It does not go back down to 50 because that command is not in the repeat loop.

It is easy to make a bigger spiral by changing the number of repetitions.





Taking it further...

Think about how using variables can make your code simpler.