













Programming Turtle Logo and Scratch: Repeat

<p>Aim: Understand what algorithms are, how they are implemented as programs on digital devices and that programs execute by following precise and ambiguous instructions.</p> <p>Create and debug simple programs.</p> <p>Use logical reasoning to predict the behaviour of simple programs using Turtle Logo.</p> <p>I can create an algorithm using the repeat command.</p>	<p>Success Criteria: I can write commands in the correct order.</p> <p>I can write a variable value where required.</p> <p>I can correct any mistakes.</p> <p>I can use the commands fd, lt, rt to move or rotate the turtle.</p> <p>I can use repeat.</p>	<p>Resources: Lesson Pack</p> <p>Desktop Computer or Laptop</p> <p>Turtle Logo application (installed or online)</p> <p>Whiteboards and pens or books, pens and pencils for recording.</p>
	<p>Key/New Words: Algorithm, instructions, commands, forward (fd), left (lt), right (rt), move, turn, clear screen (cs), variable, repeat.</p>	<p>Preparation: Differentiated Activity Sheets as required.</p>

Prior Learning: Children will have used Turtle Logo to draw squares and rectangles in lesson 1.

Learning Sequence

	Squares and Rectangles: Ask the children to draw some rectangles and squares using Turtle Logo.	
	Turtle Logo Command /The Repeat Command: Remind the children of the commands they used last week and introduce the repeat command.	
	<p>Different Shapes: Following the differentiated Activity Sheets children use the repeat command to draw repeated squares and rectangles starting from the same place.</p> <div style="display: flex; justify-content: space-around;"> <div style="text-align: center;">  <p>Draw a range of shapes using the repeat command without support.</p> </div> <div style="text-align: center;">  <p>Draw a range of shapes using the repeat command without support and draw a regular polygon.</p> </div> </div>	
	Can You...? Ask children to come up with the algorithm to draw the shape shown on the slide.	
	What Will This Algorithm Draw? Ask children what shape they think will be drawn if they follow the algorithms shown on the Lesson Presentation . Listen to children's thoughts and ask them why.	

Taskit

Letterit: Ask children to make algorithms for rectilinear letters like T, L, E, F, H.



Computing

Programming Turtle Logo and Scratch

Repeat



forward 7
left 90



forward 7
left 90

Aim

- I can create an algorithm using the repeat command.

Success Criteria

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- I can write a variable value where required.
- I can correct any mistakes.
- I can use the commands `fd`, `lt`, `rt` to move or rotate the turtle.
- I can use `repeat`.

Squares and Rectangles

Draw some squares and rectangles using the commands:



forward <steps>.

right 90 or left 90.



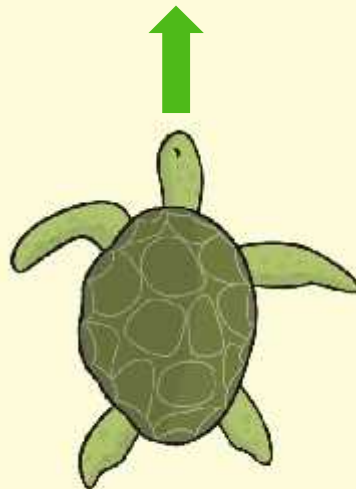
Turtle Logo Commands

Remember the commands needed for these tasks:

Moving Forward



Forward 100
or
fd 100
will move the turtle
forward 100 units.



Change the
number (variable)
to move the turtle a
different distance.

fd 4

rt 90



fd 4?
Or fd 5?

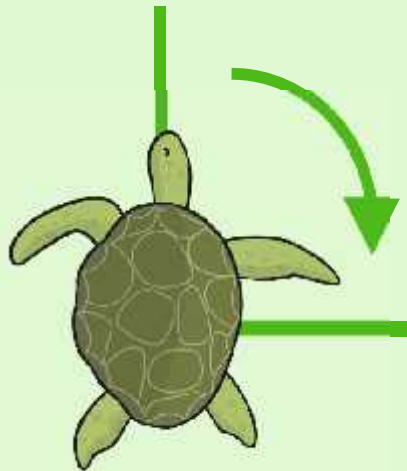
Turtle Logo Commands

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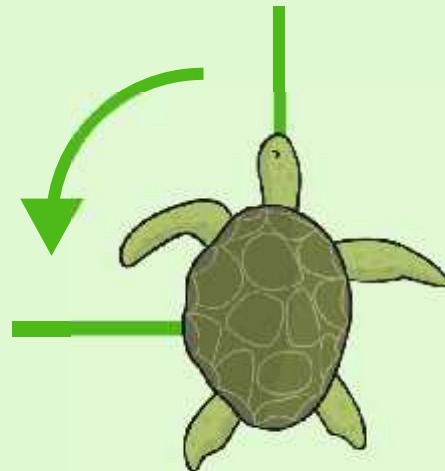
Turning left and right



Right 90 or rt 90
will turn the turtle to
the right
(quarter turn or 90°).



left 90 or lt 90
will turn the turtle to
the left
(quarter turn or 90°).



Turtle Logo Commands

Remember the commands needed for these tasks:

Clearing the Screen

'Clearscreen' or 'cs' will clear the screen and return the turtle to the starting position.



Using the Up Arrow

You can use the up arrow to scroll back through previous commands. This can save time by not having to type out commands again.



The Repeat Command

Here are suggested instructions for a square of side 100.

Basic algorithm

fd 100

rt 90

fd 100

rt 90

fd 100

rt 90

fd 100

rt 90

Combining some commands

fd 100 rt 90

fd 100 rt 90

fd 100 rt 90

fd 100 rt 90

Using the repeat command

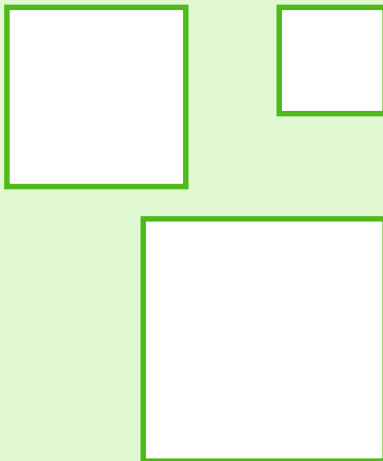
repeat 4 [fd 100 rt 90]

Different Shapes

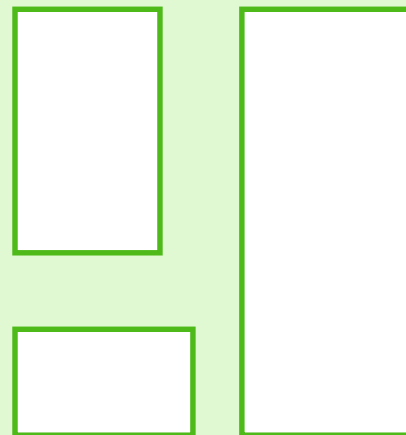


Using a Turtle Logo programme on a computer or tablet, draw some different squares and rectangles.

Can you write algorithms to draw squares of different sizes?



Can you write algorithms to draw rectangles of different sizes?



What happens if your algorithm has a mistake?

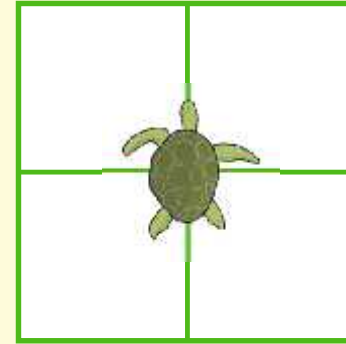


Can You...?



Can you write an algorithm for this shape?

What other solutions can you think of?



repeat 4 [fd 100 rt 90]

= draw large square.

repeat 4 [fd 50 rt 90]

= draw square half the length.

fd 50 rt 90 fd 50 lt 90

= move to the centre of large square.

repeat 4 [fd 50 rt 90]

= draw small square.

What Will This Algorithm Draw?

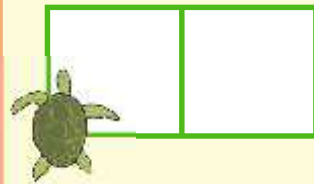


```
repeat 2[fd 50 rt 90 fd 100 rt 90]  
repeat 4[fd 50 rt 90 fd 50 rt 90]
```

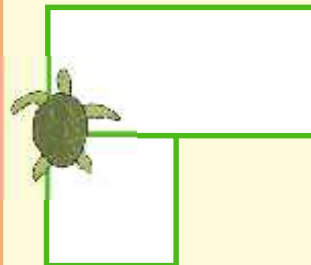
A



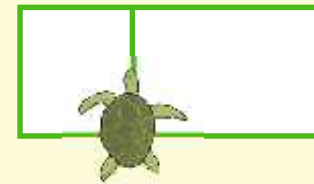
B



C



D



Incorrect:

Only drawn the rectangle (first line of algorithm).

Click on the shape that you think is correct.

Correct

Well done!

Incorrect:

Square would have bk 100 instead of fd 100.

Incorrect:

Square would have lt 90 instead of rt 90.

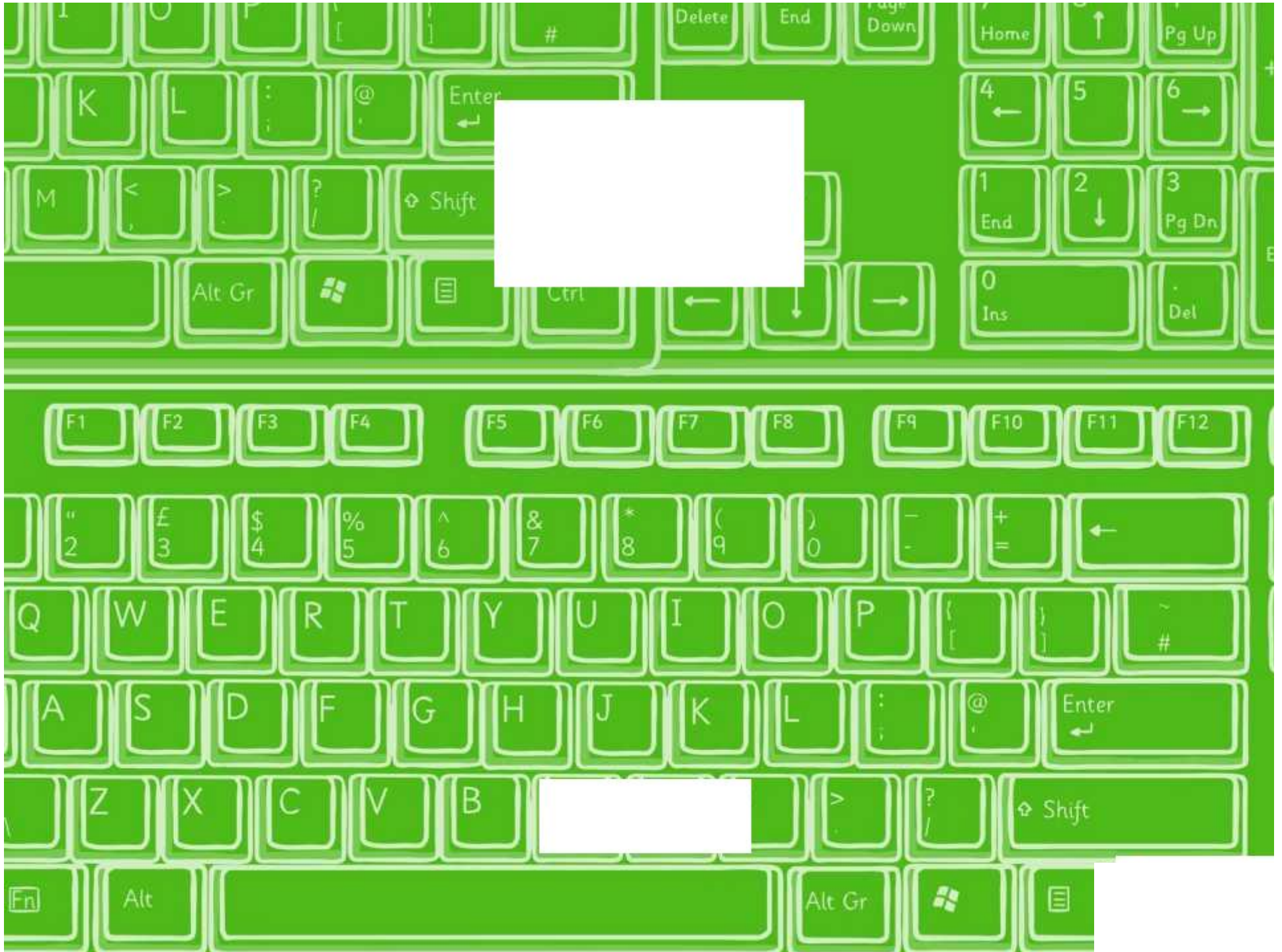
Aim



- I can create an algorithm using the repeat command.

Success Criteria

- I can write commands in the correct order.
- I can write a variable value where required.
- I can correct any mistakes.
- I can use the commands `fd`, `lt`, `rt` to move or rotate the turtle.
- I can use `repeat`.





Programming Turtle Logo

I can create an algorithm and use the repeat command.

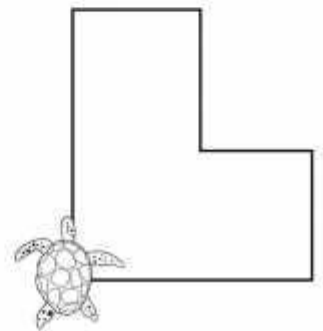
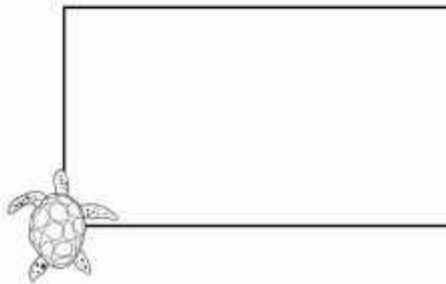
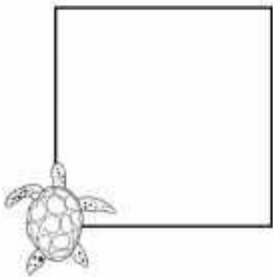


1. Try typing the commands for a square all on the same line. What happens?

2. Type the following algorithm. `fd 60 rt 90 fd 120 fd 90 fd 90 rt 90 fd 120 fd 90`

What will this algorithm draw? _____

3. Now try drawing some other rectilinear shapes.



4. Type the following command: `repeat 2 [fd 60 rt 90 fd 120 rt 90]`

What shape have you drawn? _____

5. Now try to draw a square using repeat.

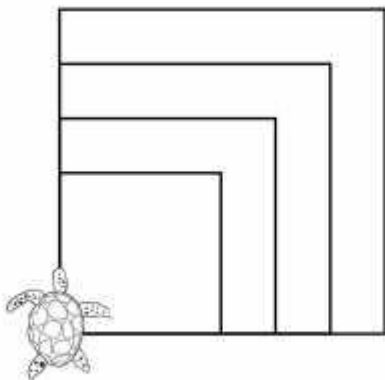


Programming Turtle Logo

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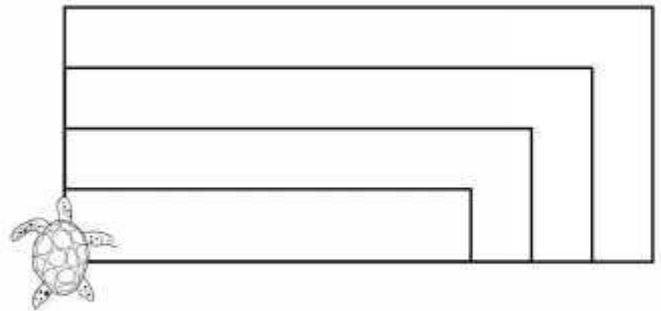


1. Program the turtle to draw 4 squares that grow in a sequence. Write the algorithm below.



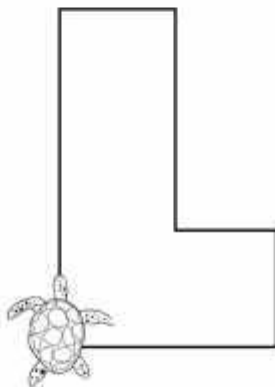
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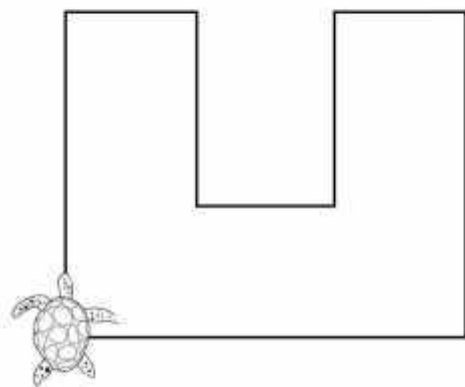
Algorithm: _____

3. Program the turtle to draw an L shape. Write the algorithm below.



Algorithm: _____

4. Program the turtle to draw a rectilinear U shape. Write the algorithm below.



Algorithm: _____

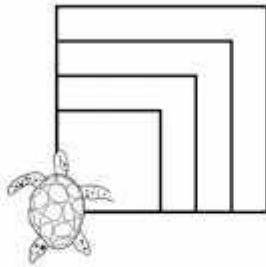


Programming Turtle Logo

I can create an algorithm and use the repeat command.

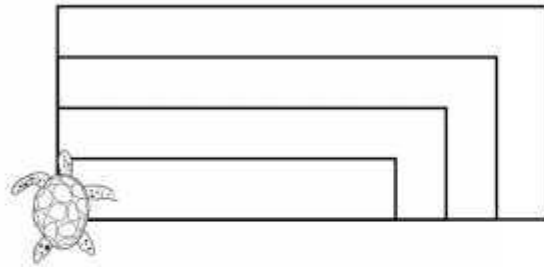


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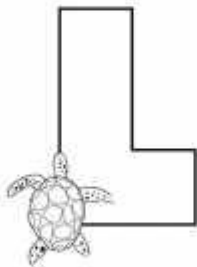
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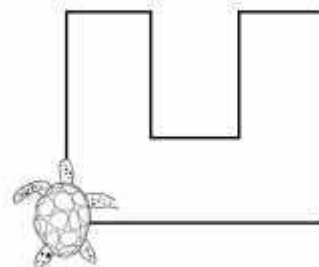
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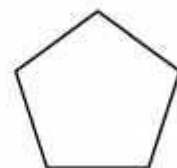
Algorithm: _____

4. Program the turtle to draw a rectilinear U shape. Write the algorithm below.



Algorithm: _____

5. Use the repeat command to help you try to draw any regular polygon.



Answers

Note that it is possible to turn first, either right or left, to complete the shape backwards instead of forwards.

No.	Algorithm (the numbers in italics can vary)
1	repeat 4[fd 75 rt 90] repeat 4[fd 100 rt 90] repeat 4[fd 125 rt 90] repeat 4[fd 150 rt 90]
2	repeat 2[fd 50 rt 90 fd 75 rt 90] repeat 2[fd 75 rt 90 fd 100 rt 90] repeat 2[fd 100 rt 90 fd 125 rt 90] repeat 2[fd 125 rt 90 fd 150 rt 90]
3	fd 100 rt 90 fd 25 rt 90 fd 75 lt 90 fd 50 rt 90 fd 25 rt 90 fd 75 rt 90
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Programming Turtle Logo

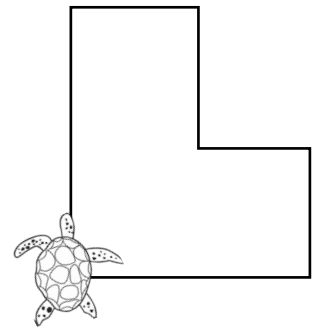
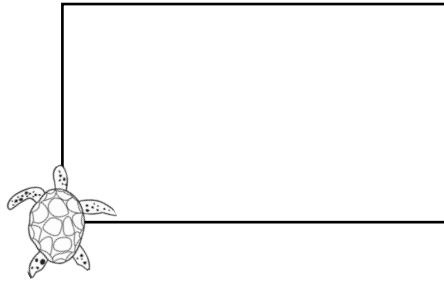
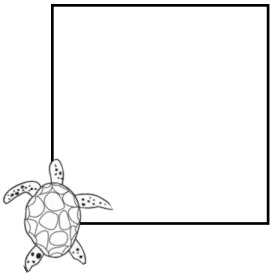


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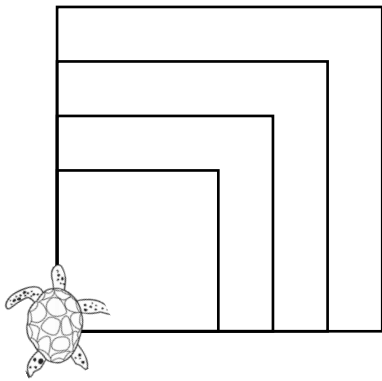
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Programming Turtle Logo

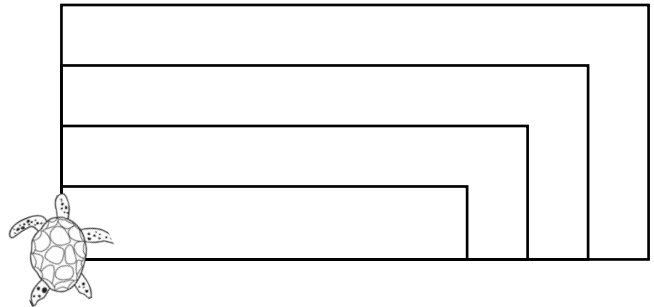


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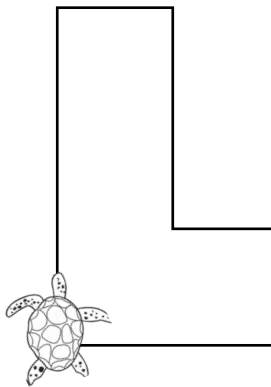
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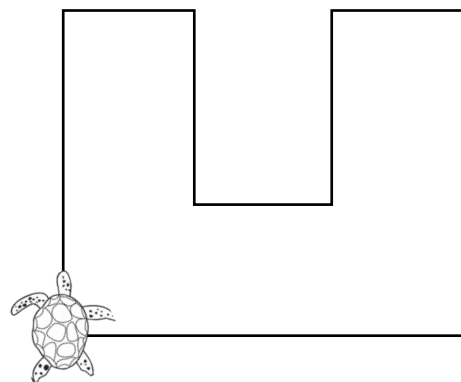
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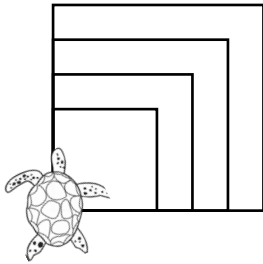
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Programming Turtle Logo

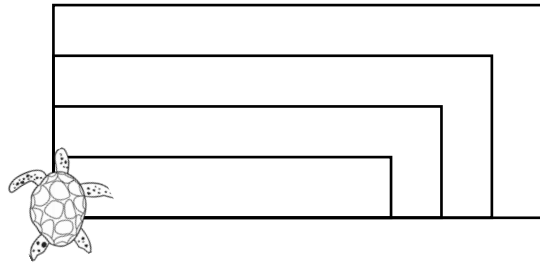


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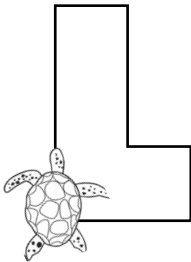
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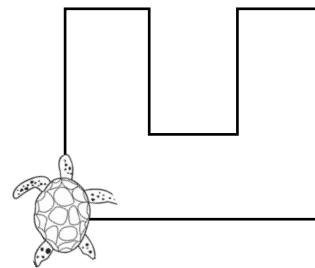
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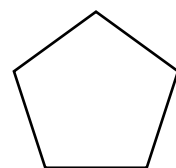
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Programming Turtle Logo and Scratch | Repeat

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