Programming Turtle Logo and Scratch: Drawing Shapes

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

Prior Learning:	It will be helpful if children can use Turtle Logo and understand the commands; forward (fd), right (rt) and left (lt) alongside a variable.

Learning Sequence

	Squares and Rectangles: Remind the children or, if there is space, practise walking a few squares and rectangles using the commands fd <steps>, rt 90 and lt 90. (*There are some examples on the **Lesson Presentation**, which could be used to start children off or to check at the end.)*	
	Turtle Logo Commands: Demonstrate the simple Turtle Logo commands, fd number, rt number (90) and lt number (90). Show children how to clear the screen (clearscreen or cs). Also show children how to use the up and down arrow to scroll through previous commands, which can then be edited and run again by pressing <enter>. (*This can save time by allowing the children to repeat previous commands without having to retype them.)*	
	Drawing Squares and Rectangles: Children draw squares and rectangles of different sizes using the differentiated **Activity Sheets**. Children may need support to draw the different shapes. Children create their own squares and rectangles and attempt to draw a triangle and other regular polygons.	
	Check: Demonstrate some of the algorithms that the children have used to draw different squares. Do the algorithms work? Are the commands written in the correct order? Have you used different algorithms for the same shape? Do you need to correct (debug) any mistakes?	

Task*it*

***Draw*it:** Children can make algorithms for squares and rectangles of different sizes to make patterns.

Computing

Programming Turtle Logo and Scratch

Drawing Shapes

Aim

- I can create an algorithm to move or rotate the turtle.

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 cs to clear the screen.

Squares and Rectangles

Give instructions to a partner to walk a square or rectangle using the commands below:

forward <steps>.

right 90 or left 90.

Walking Shapes

Can you walk a square of side 3 steps?

fd 3

rt 90

fd 3

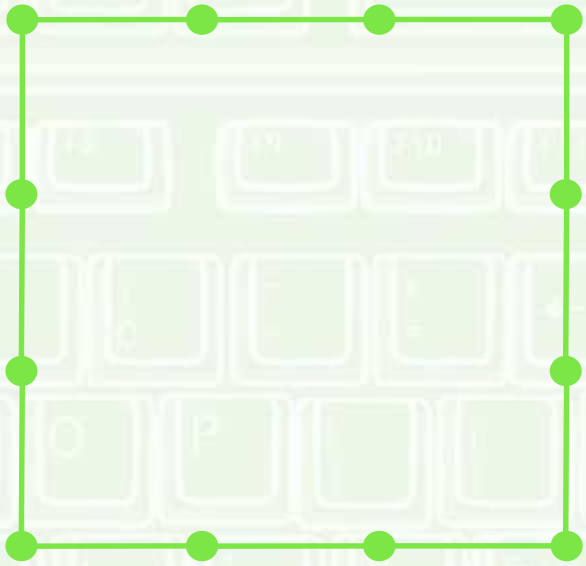
rt 90

fd 3

rt 90

fd 3

rt 90



Walking Shapes

Can you walk a rectangle of sides 4 steps and 2 steps?

fd 4

rt 90

fd 2

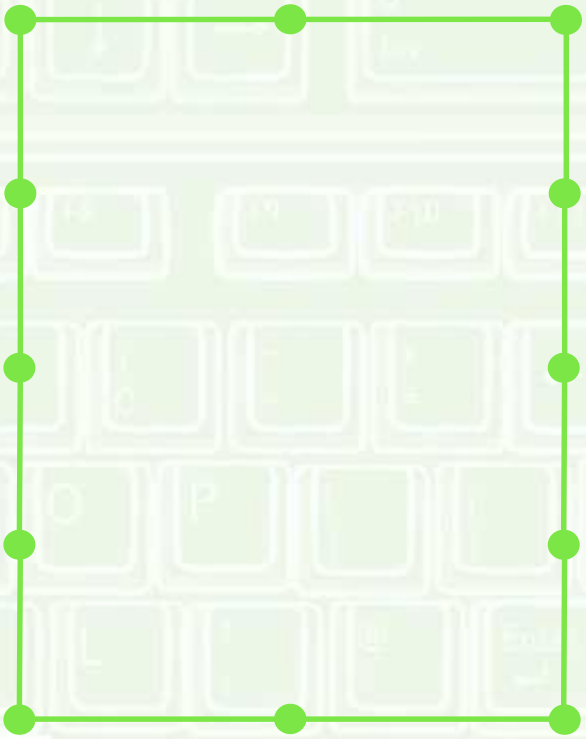
rt 90

fd 4

rt 90

fd 2

rt 90

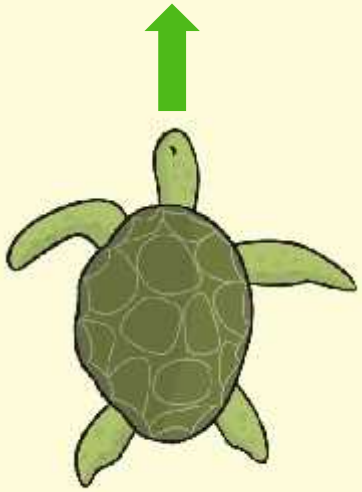


Turtle Logo Commands

Here are some of the main 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

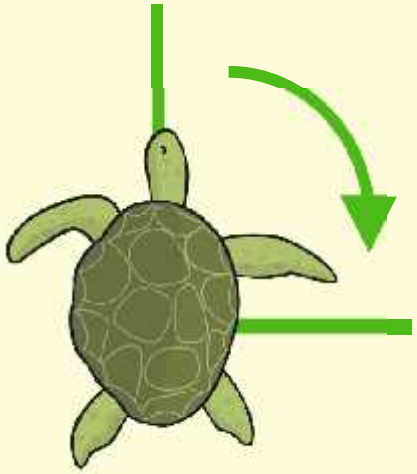
rt 90

Turtle Logo Commands

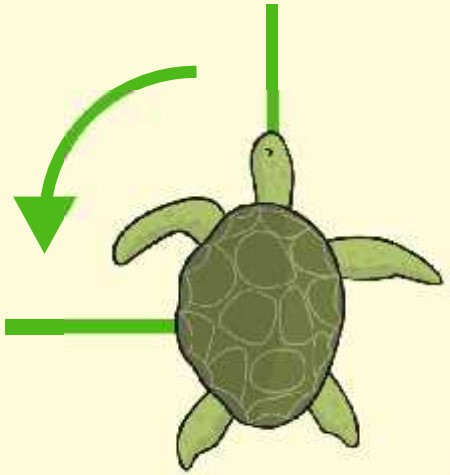
Here are some of the main commands needed for these tasks:

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

Here are some of the main commands needed for these tasks:

Clearing the Screen

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

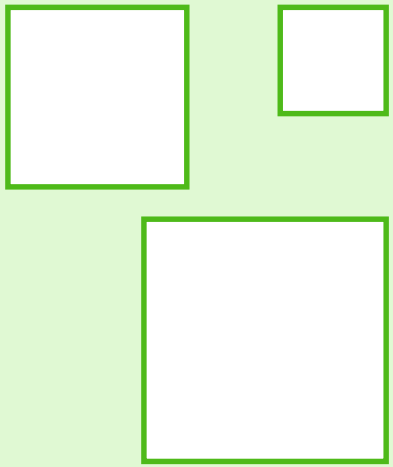
Using the Up Arrow

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

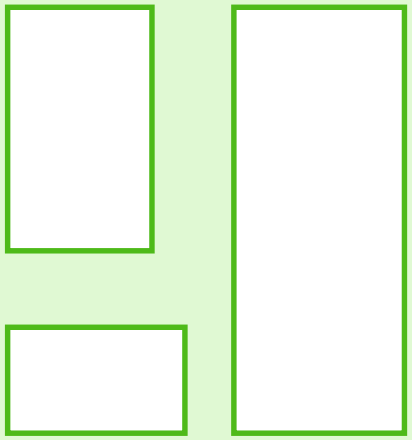
Drawing Squares and Rectangles

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?

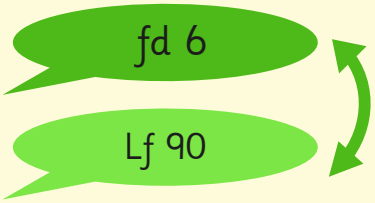


What happens if your algorithm has a mistake?

Check

Let's look at some of the algorithms you have used:

Are the commands in the correct order?



Are the commands used correctly?

Have we used different algorithms that draw the same shape?

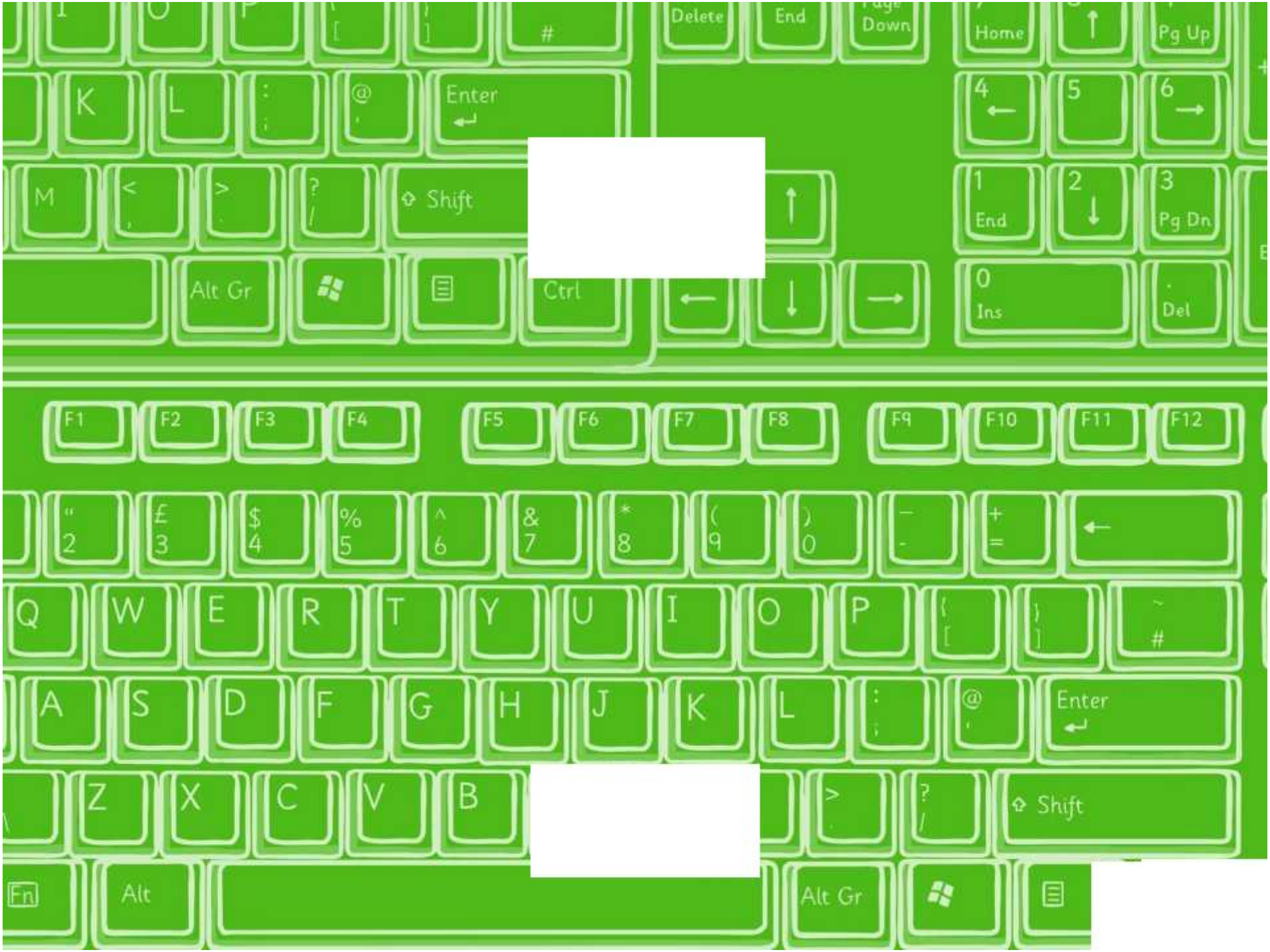
Can we debug any that don't work?

Aim

- I can create an algorithm to move or rotate the turtle.

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 cs to clear the screen.


Delete
End
Home
Pg Up
Enter
Shift
Alt Gr
Ctrl
End
Pg Dn
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F1
F2
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F4
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F6
F7
F8
F9
F10
F11
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H
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K
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Enter
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X
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V
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Shift
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Alt
Alt Gr

Programming Turtle Logo

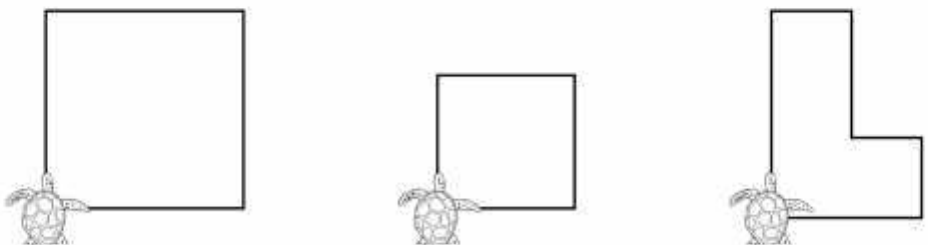
I can create an algorithm to move or rotate the turtle.

Use the commands that you have learnt to move and turn the turtle. For each shape write down the algorithm you have used.

1. A square.

2. A square of a different size.

3. The letter L.



Programming Turtle Logo

I can create an algorithm to move or rotate the turtle.

Use Turtle Logo to draw each shape and record your algorithms below:

1. A square of side 100.

Algorithm: _____

2. A rectangle of sides 50 and 100.

Algorithm: _____

3. A rectangle of sides 60 and 80.

Algorithm: _____

4. A square of sides 80.

Algorithm: _____

5. A rectangle of sides 40 and 120.

Algorithm: _____

6. A rectangle of sides 30 and 90.

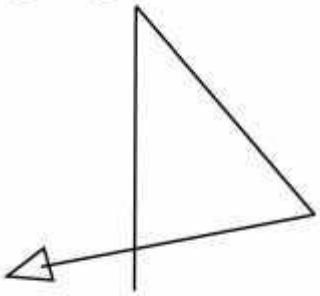
Algorithm: _____

Programming Turtle Logo

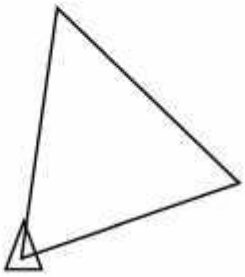
I can create an algorithm to move or rotate the turtle.

1. Draw several different squares and rectangles. Record one of your algorithms below:

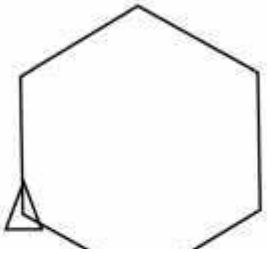
2. Draw a triangle. Don't worry about getting the turtle back to the start on your first attempt.



3. Now try different angles to get the turtle back to the start.



4. Think about the angle you need to turn and how many sides there are for this triangle and the square. Draw other regular shapes like a pentagon, hexagon or octagon.



Answers

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

No.	Basic Algorithm	Algorithm with repeat
1	fd 100 rt 90 fd 100 rt 90 fd 100 rt 90 fd 100 rt 90	repeat 4 [fd 100 rt 90]
2	fd 50 rt 90 fd 100 rt 90 fd 50 rt 90 fd 100 rt 90.	repeat 2 [fd 100 rt 90 fd 50 rt 90]
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5	fd 40 rt 90 fd 120 rt 90 fd 40 rt 90 fd 120 rt 90.	repeat 2 [fd 40 rt 90 fd 120 rt 90]
6	fd 30 rt 90 fd 90 rt 90 fd 30 rt 90 fd 90 rt 90.	repeat 2 [fd 30 rt 90 df 90 rt 90]

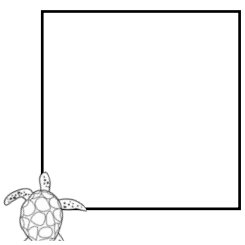
Programming Turtle Logo

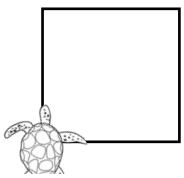
Use the commands that you have learnt to move and turn the turtle. For each shape write down the algorithm you have used.

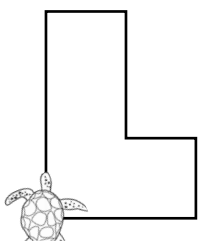
1. A square.

2. A square of a different size.

3. The letter L.







Programming Turtle Logo

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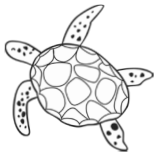

1. A square of side 100.

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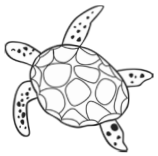

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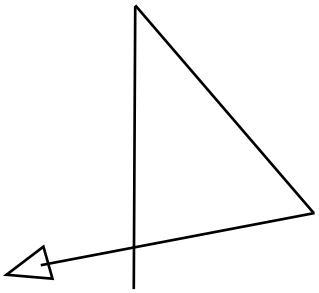

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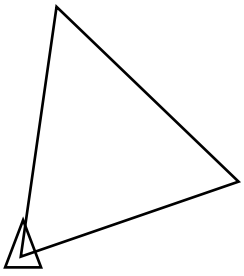

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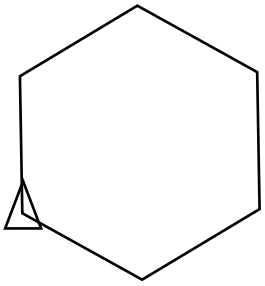

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Programming Turtle Logo and Scratch | Drawing Shapes

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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.		
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