Preparing for Turtle Logo: Completing Algorithms

Aim:	**Success Criteria:**	**Resources:**
Understand what algorithms are 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. This unit prepares children for using Turtle Logo on screen, but links well to shape and direction in Maths. I can give, follow and complete an algorithm.	I can give clear accurate instructions. I can give instructions in order. I can write an algorithm. I can check an algorithm. I can give and follow instructions accurately. I can move forward and turn right 90 and left 90.	**Lesson Pack.** Hall or space large enough for children to move around freely. Cones or similar to mark points. Small whiteboards and pens.
	Key/New Words: Forward, Backward, Left, Right, Move, Turn, Right 90, Left 90.	**Preparation:** Activity Sheet - 1 per pair.

Prior Learning: Children will have created algorithms using the commands right 90 and left 90 in lesson 3.

Learning Sequence

	**Squares, Rectangles and Rectilinear Shapes:** Children work in pairs to draw rectangles, squares and other rectilinear shapes, ensuring they use the Turtle Logo language of forward, right 90 and left 90. Ensure the children walk steps the same size and make accurate 90˚ turns. They could use cones to mark the corners of the shapes.	
	**Complete This Shape:** Demonstrate how to give instructions to draw part of a rectilinear shape. Then ask the children what instructions needs to be given to get back to the start.	
	**Completing Algorithms:** Children work through the **Activity Sheet** in pairs, which gives them algorithms to follow and complete. Children record their answers. Pairs can check answers with other pairs. Remind the children to make the same size steps and make accurate quarter turns. They could use cones to mark the corners of the shapes. Children use the appropriate activity sheet to follow the algorithms and record the shape 'drawn'.  Children also write their own algorithms for their partner to complete.	
	**Using Turtle Logo Language:** Show the children the fd, lt and rt shortcuts.	
	**What shape would this be?** Ask the children what shapes would be drawn if they followed the different algorithms.	
	**A Square / A Rectangle:** Ask children to write an algorithm for a square of 4 steps on each side and a rectangle that has 6 and 3 steps.	

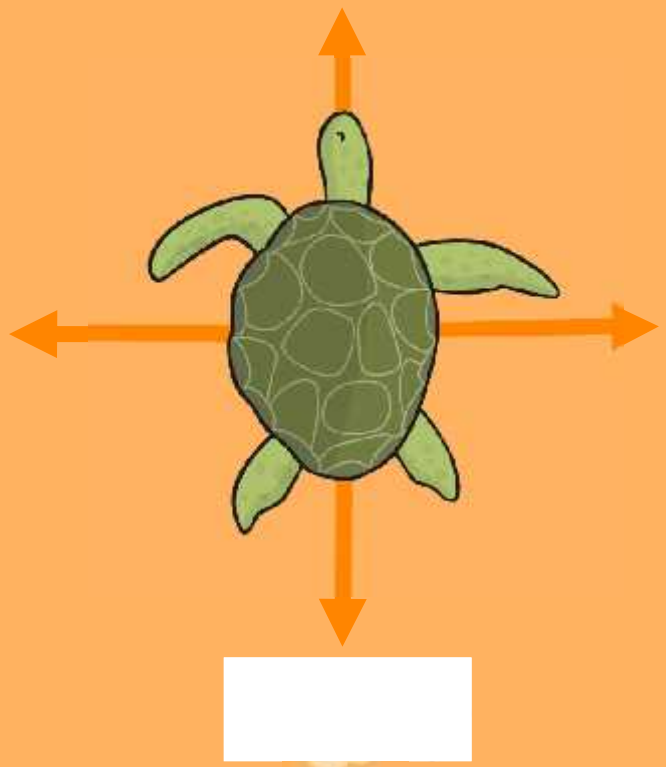
Task*it*

Complete**it:** In pairs, one child gives instructions to their partner to start a rectilinear shape. Their partner has to complete the shape.

Computing

Preparing for Turtle Logo

Completing Algorithms



Aim

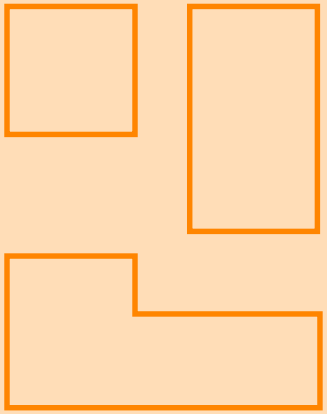
- I can give, follow and complete an algorithm.

Success Criteria

- I can give clear accurate instructions
- I can give instructions in order
- I can write an algorithm
- I can check an algorithm
- I can give and follow instructions accurately
- I can move forward and turn right 90 and left 90

Squares, Rectangles and Rectilinear Shapes

Walk squares, rectangles and other rectilinear shapes.



Make sure that you use the commands.

Forward

Right 90

Left 90

Take care to walk the same size steps.

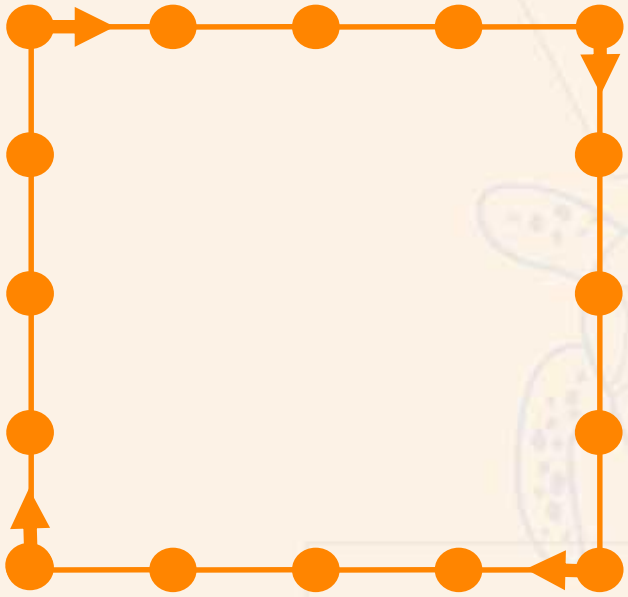
You could mark the corners with cones.

A rectilinear shape is a shape of any number of sides, but all the angles are right angles.

Complete This Shape 1

Follow this algorithm

- Forward 4
- Right 90
- Forward 4
- Right 90
- Forward 4
- Right 90
- Forward 4
- Right 90

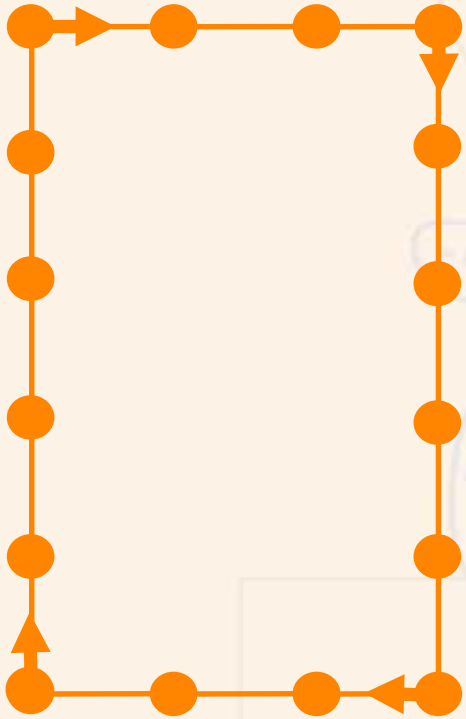


How will you finish this shape?

Complete This Shape 2

Follow this algorithm

- Forward 5
- Right 90
- Forward 3
- Right 90
- Forward 5
- Right 90
- Forward 3
- Right 90

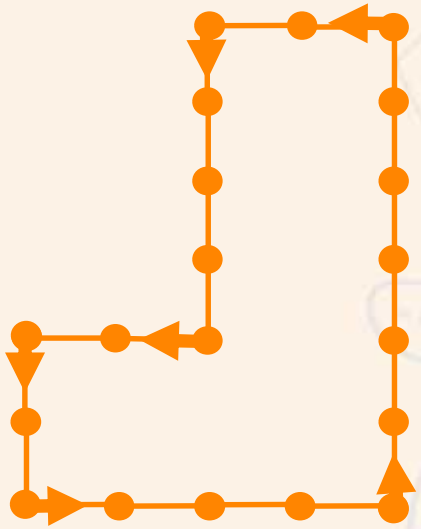


How will you finish this shape?

Complete This Shape 3

Follow this algorithm

- Forward 6
- Left 90
- Forward 2
- Left 90
- Forward 4
- Right 90
- Forward 2
- Left 90
- Forward 2

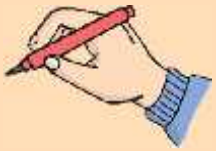


How will you finish this shape?

- Left 90
- Forward 4
- Left 90

Completing Algorithms

Work through the different activities. Record your findings as you go.



You may wish to mark your starting position in some way.

These instructions are written in "Turtle Logo" format.

Forward 4

Right 90

Try to make your steps the same size every time.

Try to make your 90 degree turns accurate.

You will need to record how you can get back to your starting point.

Using Turtle Logo Language

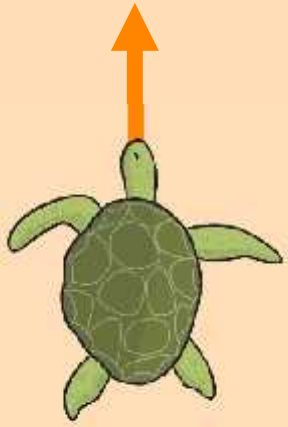
It is important that we use language that is understood by whoever or whatever is following the instructions.

Sometimes commands can be abbreviated.

Moving Forward

We can shorten forward to fd

Forward becomes fd 5



Using Turtle Logo Language

It is important that we use language that is understood by whoever or whatever is following the instructions.

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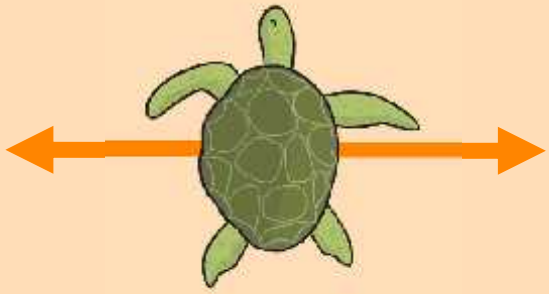
Turning

We can shorten left or right to lt or rt

Left can be written as lt 90
Right can be written as rt 90



What shape would this be?

fd10

rt 90

fd 5

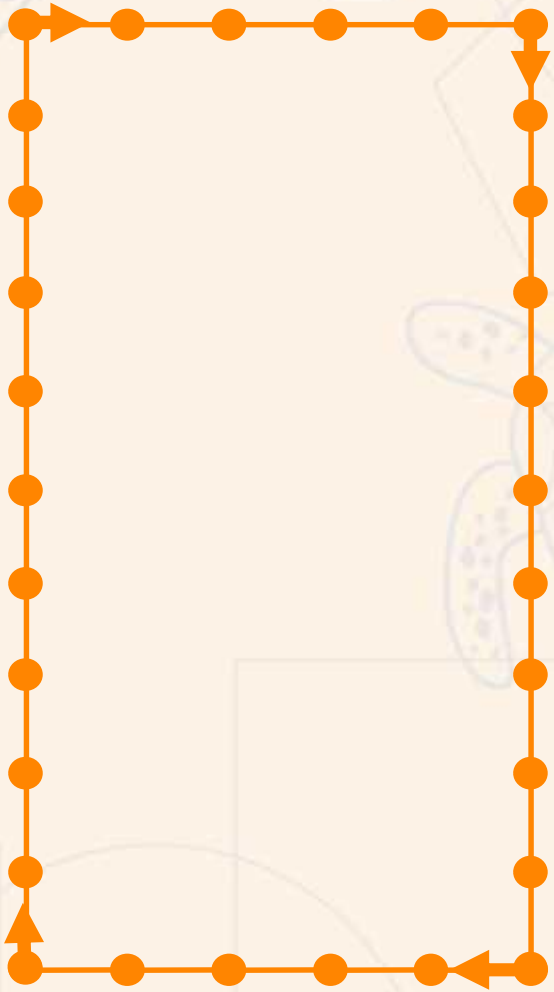
rt 90

fd 10

rt 90

fd 5

rt 90



What shape would this be?

fd 8

lt 90

fd 8

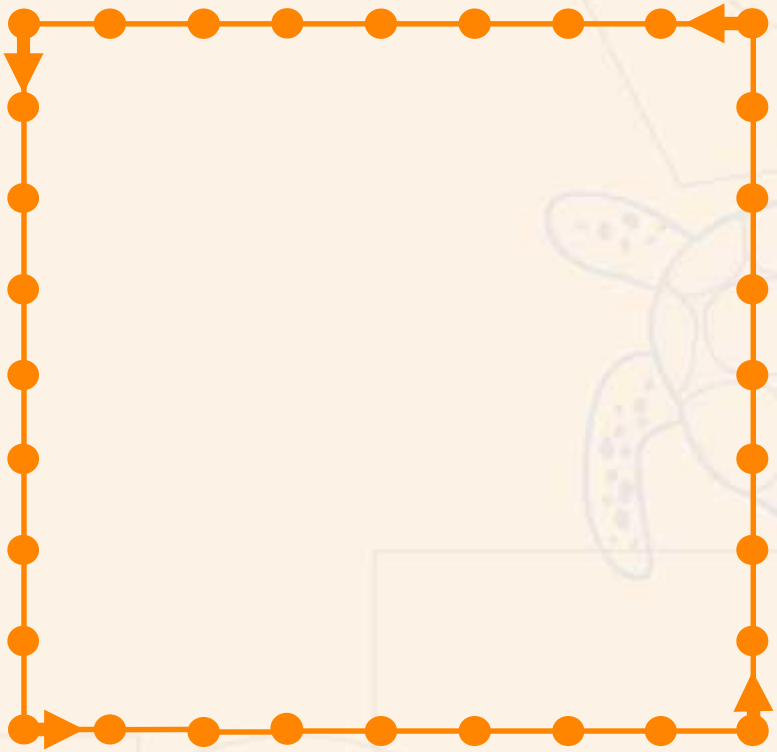
lt 90

fd 8

lt 90

fd 8

lt 90



A Square

Can you write an algorithm for a square 5 steps in size?

fd 5

rt 90

fd 5

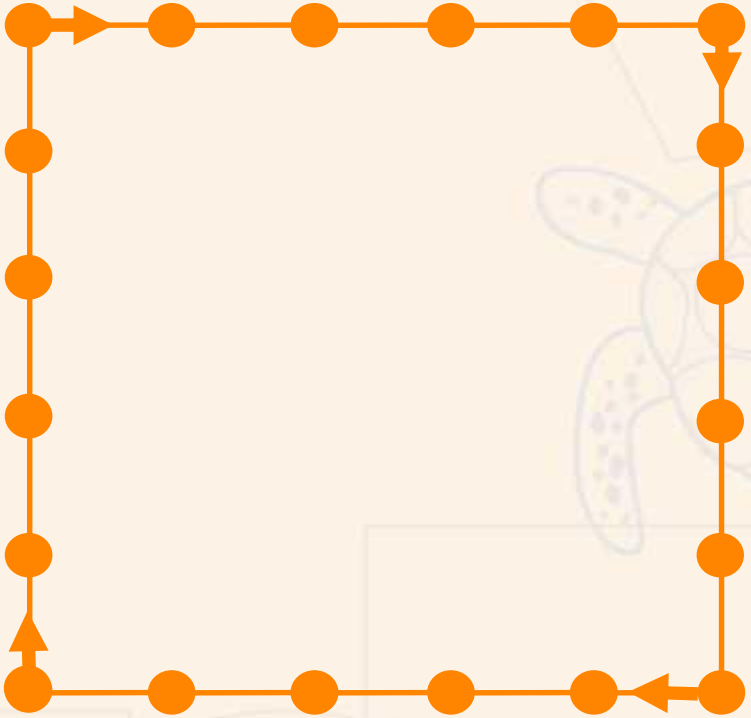
rt 90

fd 5

rt 90

fd 5

rt 90



A Rectangle

Can you write an algorithm for a rectangle 6 steps and 3 steps in size?

fd 6

rt 90

fd 3

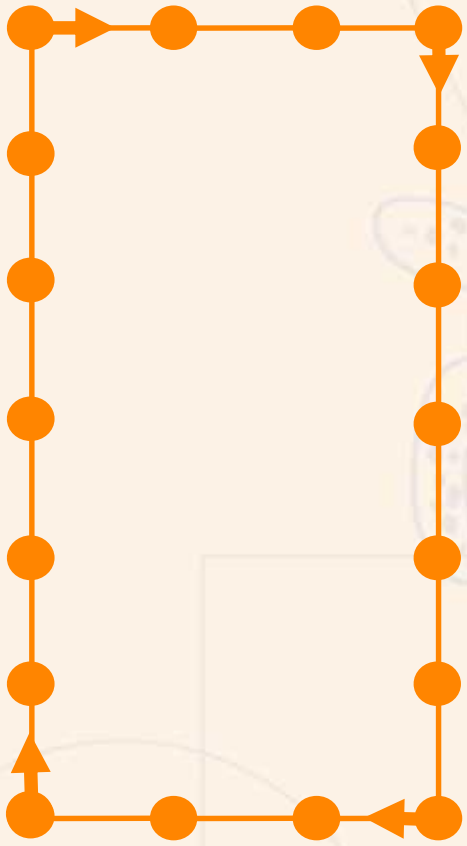
rt 90

fd 6

rt 90

fd 3

rt 90



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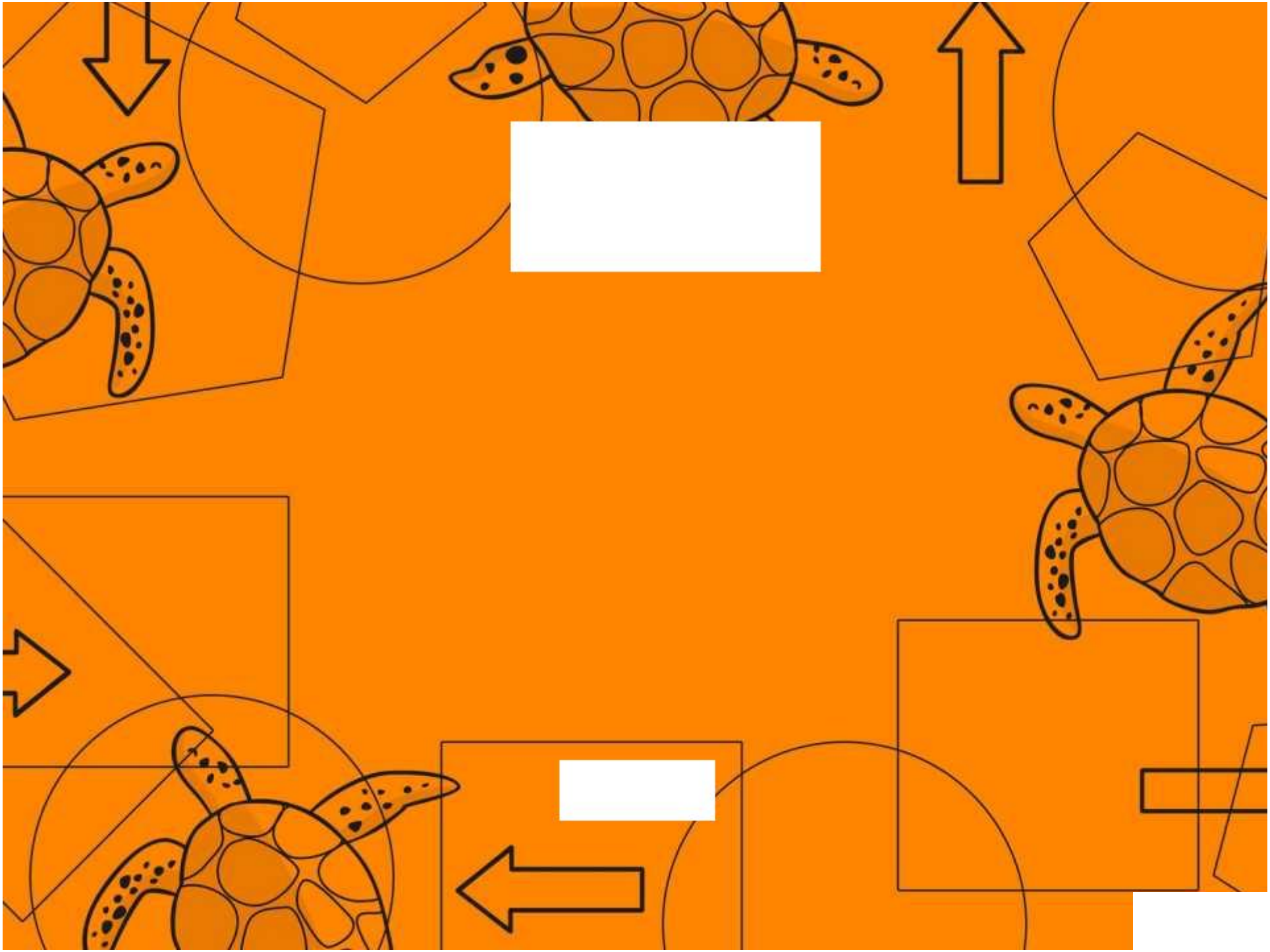

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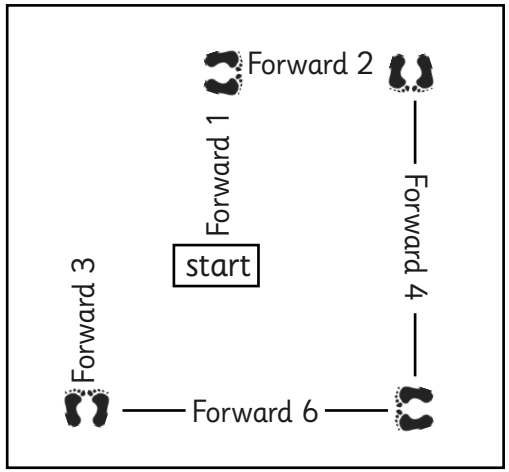
Completing Algorithms

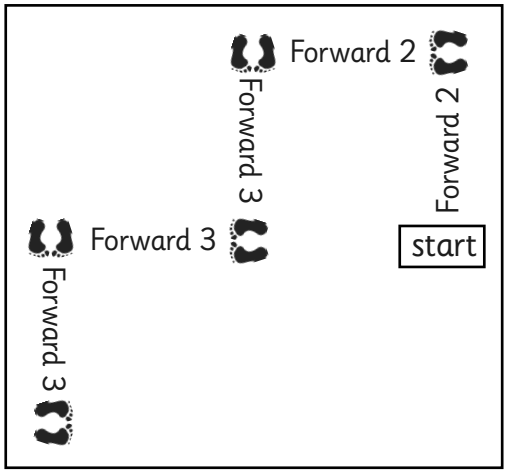
1: How would you complete the algorithm?

Forward 1 (steps)
Right 90 (degrees)
Forward 2
Right 90
Forward 4
Right 90
Forward 6
Right 90
Forward 3



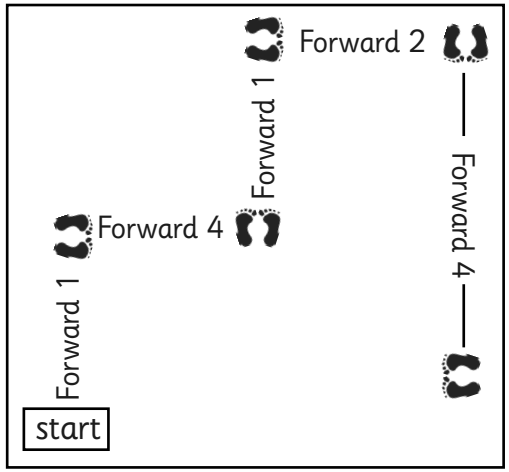
2: How would you complete the algorithm?

Forward 2 (steps)
Left 90 (degrees)
Forward 2
Left 90
Forward 3
Right 90
Forward 3
Left 90
Forward 3
Left 90



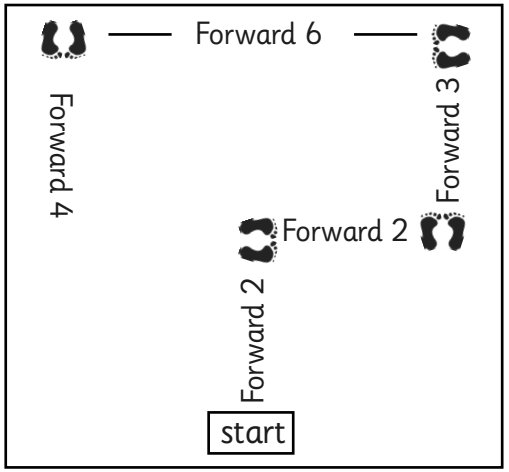
3: How would you complete the algorithm?

Forward 1 (steps)
Right 90 (degrees)
Forward 4
Left 90
Forward 1
Right 90
Forward 2
Right 90
Forward 4
Right 90



4: How would you complete the algorithm?

Forward 2 (steps)
Right 90 (degrees)
Forward 2
Left 90
Forward 3
Left 90
Forward 6
Left 90
Forward 5



Completing Algorithms

1: How would you complete the algorithm?

Forward 1 (steps)
Right 90 (degrees)
Forward 2
Right 90
Forward 4
Right 90
Forward 6
Right 90
Forward 3

2: How would you complete the algorithm?

Forward 2 (steps)
Left 90 (degrees)
Forward 2
Left 90
Forward 3
Right 90
Forward 3
Left 90
Forward 3
Left 90

3: How would you complete the algorithm?

Forward 1 (steps)
Right 90 (degrees)
Forward 4
Left 90
Forward 1
Right 90
Forward 2
Right 90
Forward 4
Right 90

4: How would you complete the algorithm?

Forward 2 (steps)
Right 90 (degrees)
Forward 2
Left 90
Forward 3
Left 90
Forward 6
Left 90
Forward 5

5: How would you complete the algorithm?

Forward 6 (steps)
Right 90 (degrees)
Forward 3
Right 90
Forward 3
Right 90
Forward 5
Left 90
Forward 3

6: How would you complete the algorithm?

Forward 3 (steps)
Left 90 (degrees)
Forward 3
Left 90
Forward 1
Left 90
Forward 5
Left 90
Forward 3
Left 90
Forward 2

Completing Algorithms

1: How would you complete the algorithm?

Forward 1 (steps)
Right 90 (degrees)
Forward 2
Right 90
Forward 4
Right 90
Forward 6
Right 90
Forward 3

2: How would you complete the algorithm?

Forward 2 (steps)
Left 90 (degrees)
Forward 2
Left 90
Forward 3
Right 90
Forward 3
Left 90
Forward 3
Left 90

3: How would you complete the algorithm?

Forward 1 (steps)
Right 90 (degrees)
Forward 4
Left 90
Forward 1
Right 90
Forward 2
Right 90
Forward 4
Right 90

4: How would you complete the algorithm?

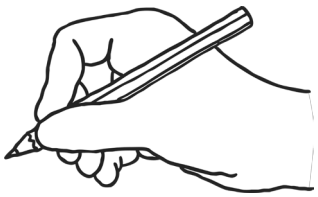
Forward 2 (steps)
Right 90 (degrees)
Forward 2
Left 90
Forward 3
Left 90
Forward 6
Left 90
Forward 5

5: How would you complete the algorithm?

Forward 6 (steps)
Right 90 (degrees)
Forward 3
Right 90
Forward 3
Right 90
Forward 5
Left 90
Forward 3

6: Challenge

Give your partner an algorithm of your own to follow. Record your algorithm and the shape drawn.



Completing Algorithms Answers

1: How would you complete the algorithm?

Forward 1 (steps)
Right 90 (degrees)
Forward 2
Right 90
Forward 4
Right 90
Forward 6
Right 90
Forward 3

Right 90
Forward 4

2: How would you complete the algorithm?

Forward 2 (steps)
Left 90 (degrees)
Forward 2
Left 90
Forward 3
Right 90
Forward 3
Left 90
Forward 3
Left 90

Left 90
Forward 4

3: How would you complete the algorithm?

Forward 1 (steps)
Right 90 (degrees)
Forward 4
Left 90
Forward 1
Right 90
Forward 2
Right 90
Forward 4
Right 90

Right 90
Forward 2

4: How would you complete the algorithm?

Forward 2 (steps)
Right 90 (degrees)
Forward 2
Left 90
Forward 3
Left 90
Forward 6
Left 90
Forward 5

Left 90
Forward 4

5: How would you complete the algorithm?

Forward 6 (steps)
Right 90 (degrees)
Forward 3
Right 90
Forward 3
Right 90
Forward 5
Left 90
Forward 3

Left 90
Forward 2

6: How would you complete the algorithm?

Forward 3 (steps)
Left 90 (degrees)
Forward 3
Left 90
Forward 1
Left 90
Forward 5
Left 90
Forward 3
Left 90
Forward 2

Left 90
Forward 5

Preparing for Turtle Logo

I can move forward a number of steps.

Preparing for Turtle Logo

I can turn
right 90 and left 90.

Preparing for Turtle Logo

I can move forward a number of steps.

Preparing for Turtle Logo

I can turn
right 90 and left 90.

Preparing for Turtle Logo

I can turn
right 90 and left 90.

Preparing for Turtle Logo

I can move forward a number of steps.