Programming Turtle Logo and Scratch: Drawing

Aim:	Success Criteria:	Resources:
Design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems; solve problems by decomposing them into smaller parts. Use sequence, selection, and repetition in programs; work with variables and various forms of input and output. Use logical reasoning to explain how some simple algorithms work and to detect and correct errors in algorithms and programs. This unit continues the learning from the Year 2 Turtle Logo units and links well to shape and direction in Maths. I can create and debug algorithms to draw shapes.	I can use commands in the correct order. I can use a variable value where required. I can correct any mistakes. I can use the pen block to draw.	Lesson Pack. Desktop computer /laptops Scratch v2 installed or use online application. Alternatively, use Pyonkee on iPads.
	Key/New Words: Sprite, block, command, background or backdrop, algorithm, move, turn, green flag, key press, pen.	Preparation: Ensure application is installed on the computers, or available online. It will help if teachers work through the unit prior to teaching the children to ensure familiarity.

Prior Learning: Children will have created an algorithm to draw a regular polygon in lesson 3.

Learning Sequence

Can You Remember? Ask the children to create an algorithm that will do the following:
- Move forward 50 and change colour
- Move back 100 and say "Forward again!"
- Move back to the start and make a sound

Children repeat this algorithm 8 times and program the algorithm to start when the Green flag is pressed. They then change the backdrop, add a different sprite that follows their own algorithm and start when the space bar is pressed.

Algorithms: Look at the answers to the first two parts above. Click on the algorithms to see them run in v2 online. The third has many possibilities. *(These initial activities will demonstrate how well the children can remember the commands they have learnt. Make note of the skills children are less confident with.)*

Remember the Blocks: Demonstrate, or get a child to demonstrate, the skills that need reinforcing *(from your observations in the initial activity)*.
Drawing: Show the children how to use the pen block to draw as the sprite moves.
Turning: Show how to turn the cat (as in Turtle Logo).
Duplicate: (Copy) Demonstrate how to copy blocks using the stamp or right click, duplicate.
Clear Screen: Show how to use the blocks to clear and centre the sprite.
Saving Projects: Show children how to save their projects. *(If using the standalone applications children can save their projects into their folder. If using the online version, they will need to register or download to a computer each time they save.)*

Drawing Shapes: Children use the pen, forward and turn blocks to draw different size squares and rectangles. They can then add the key press block to each algorithm. Children save their projects if possible.

★ The algorithm is provided to copy.

★★ The algorithm is given in part to complete.

★★★ The blocks needed are listed.

Share: Children compare their algorithms, test and debug, with a partner.

What Will Happen? Show the example algorithms on the **Lesson Presentation** and ask if they will work. Click to load the algorithms in Scratch to test.

Task*it*

Scratch*it:* If the children have access to computers, laptops or tablets, the children could continue to work through the **Challenge Cards** or create their own algorithms.

Computing

Programming Turtle Logo and Scratch
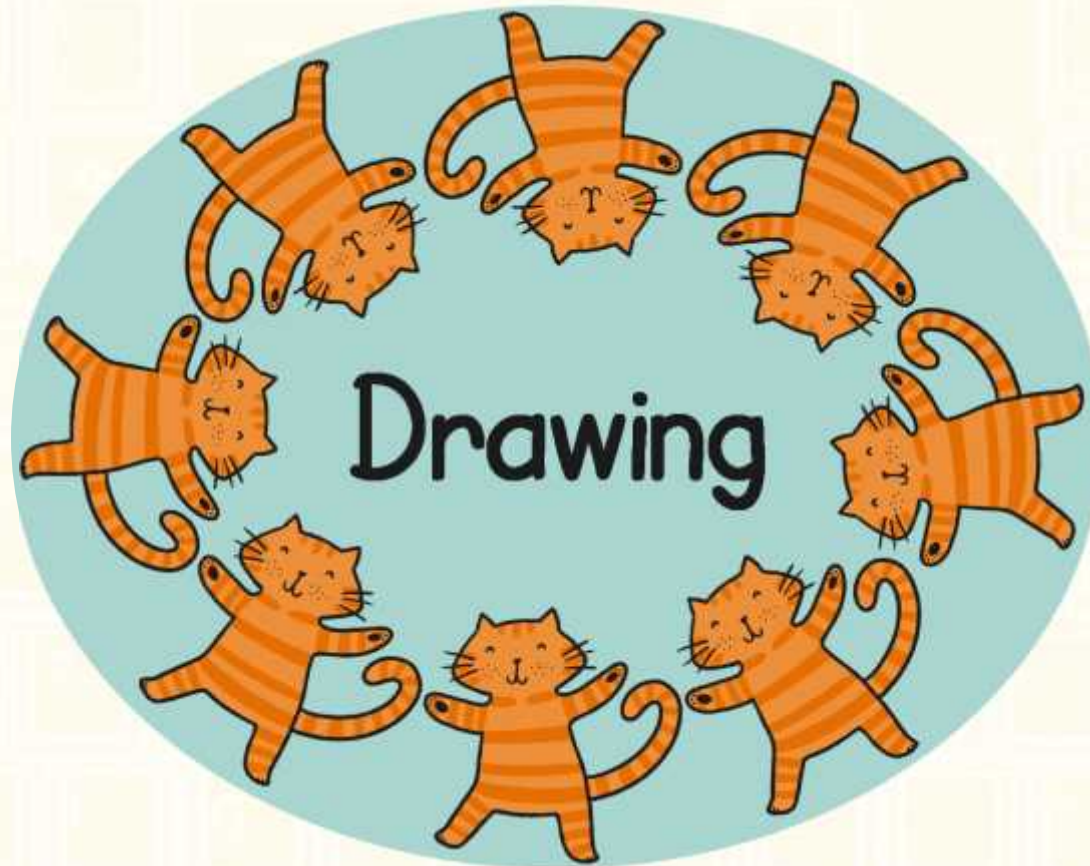
Drawing

Aim

- I can create and debug algorithms that draw shapes.

Success Criteria

- I can use commands in the correct order.

- I can use a variable value where required.

- I can correct any mistakes.

- I can use the pen block to draw.

Can You Remember?

Create an algorithm that will achieve the following:

1. Move forward 50 and change colour.

2. Move back 100 and say "Forward again!".

3. Move back to the start and make a sound.

Save your work, then...

4. Have the algorithm repeat 8 times.

5. Start when the green flag is clicked.

Finally:
- Add a backdrop and another sprite.
- Create your own algorithm for the new sprite which starts when you press the space bar.

Algorithms

Click on the algorithms to see them running in Scratch

move 50 steps
change colour effect by 25
move -100 steps
say Forward again! for 25 secs
move 50 steps
play drum 1 for 0.25 beats

when 🏳 clicked
repeat 8
move 50 steps
change colour effect by 25
move -100 steps
say Forward again! for 25 secs
move 50 steps
play drum 1 for 0.25 beats

Remember the Blocks

Do you remember the blocks?

move 10 steps	Moves the sprite forwards or backwards the number in the box.
play drum 1 for 0.25 beats	Plays the chosen drum sound.
change colour effect by 25	Changes the colour of the sprite.
say Watch me dance! for 2 secs	Shows the words in the box for the time shown.
when [green flag] clicked	Starts the algorithm when the green flag is clicked.
when space key pressed	Starts the algorithm when the space bar is pressed.
repeat 10	Repeats the algorithm enclosed for the number of times shown.

Drawing

We can draw using the pen blocks.

pen up

pen down

pen down
move 10 steps

Turning

We can draw using the Turn blocks.

turn ↻ 90 degrees
turn ↺ 15 degrees

pen down
move 100 steps
turn ↺ 90 degrees
move 100 steps
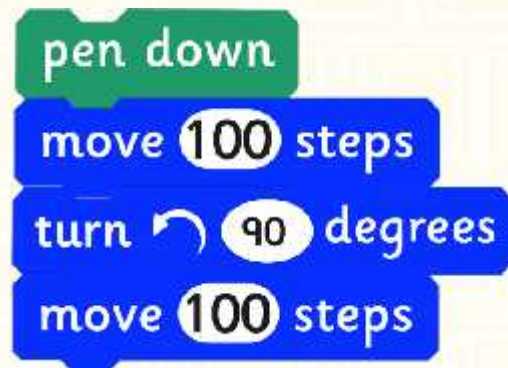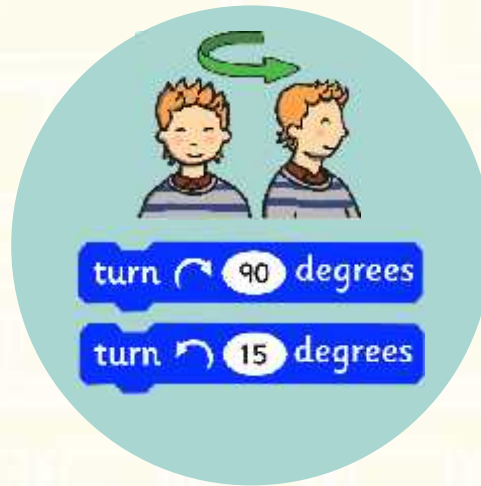
Duplicate

We can duplicate (copy) blocks.

Stamp tool

duplicate

Right click, then select duplicate.

move 100 steps
turn 90 degrees
move 100 steps
turn 90 degrees
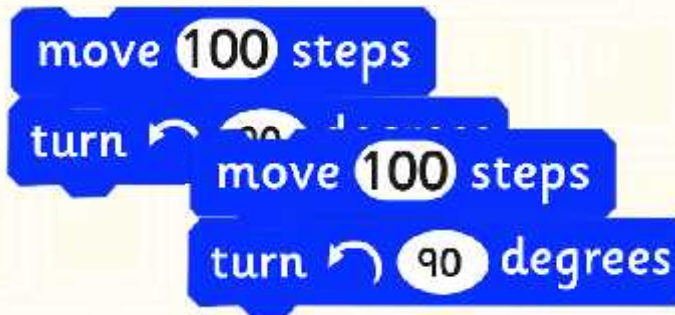
Clear Screen

Use the following algorithm to clear the screen.

when space key pressed

clear

go to x: 0 y: 0

point in direction 90
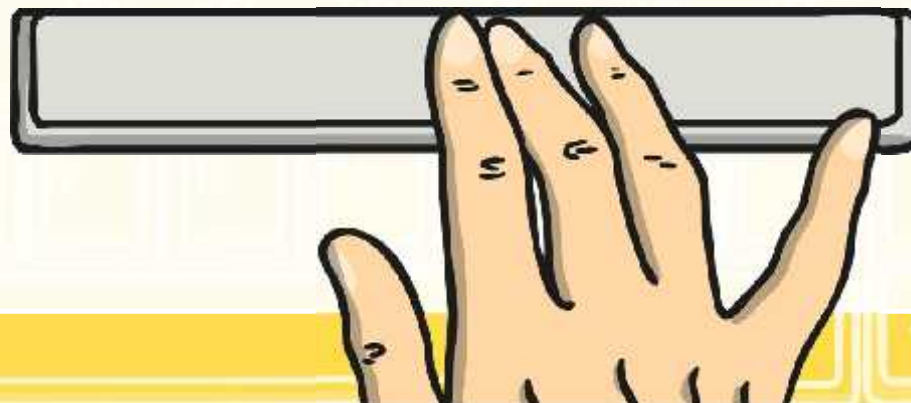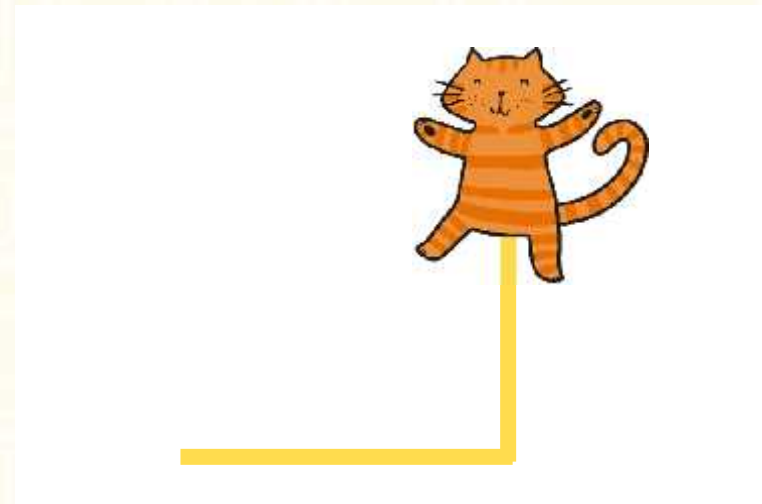
Saving Projects

Select file, then save.

If you're working online, save if you have registered or download to your computer.
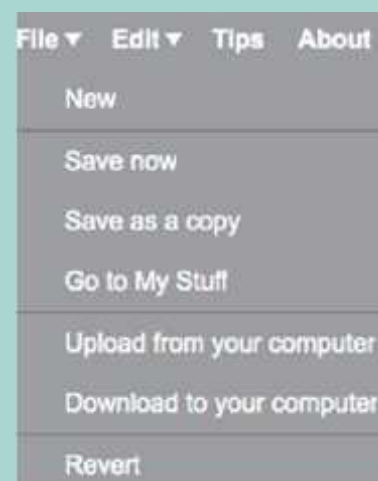
Drawing Shapes

Use the pen, forward and turn blocks to draw the shapes below.
Think about how you will start each of the shapes, use a different letter for each.

pen up

pen down

turn 90 degrees

move 10 steps

A square.

A rectangle.

A set of growing rectangles.

A set of growing squares.

Now try drawing the same shapes using repeat.

repeat 10

Share

Share your algorithm with your partner.

Test and debug it if you need to.

What Will Happen?

What will happen when these algorithms run?

when [a] key pressed
pen down
move (100) steps
turn ↰ (90) degrees
move (100) steps
turn ↰ (90) degrees
move (100) steps
turn ↰ (90) degrees
move (100) steps
turn ↰ (90) degrees
pen up

when [b] key pressed
pen down
move (200) steps
turn ↰ (90) degrees
move (50) steps
turn ↰ (90) degrees
move (200) steps
turn ↰ (90) degrees
move (50) steps
turn ↰ (90) degrees
pen up

Aim

- I can create and debug algorithms that draw shapes.

Success Criteria

- I can use commands in the correct order.

- I can use a variable value where required.

- I can correct any mistakes.

- I can use the pen block to draw.

Drawing

Use Scratch to create the shapes below. Before you begin each algorithm remember to clear your screen using the algorithm opposite.

Remember to save your work after each project.
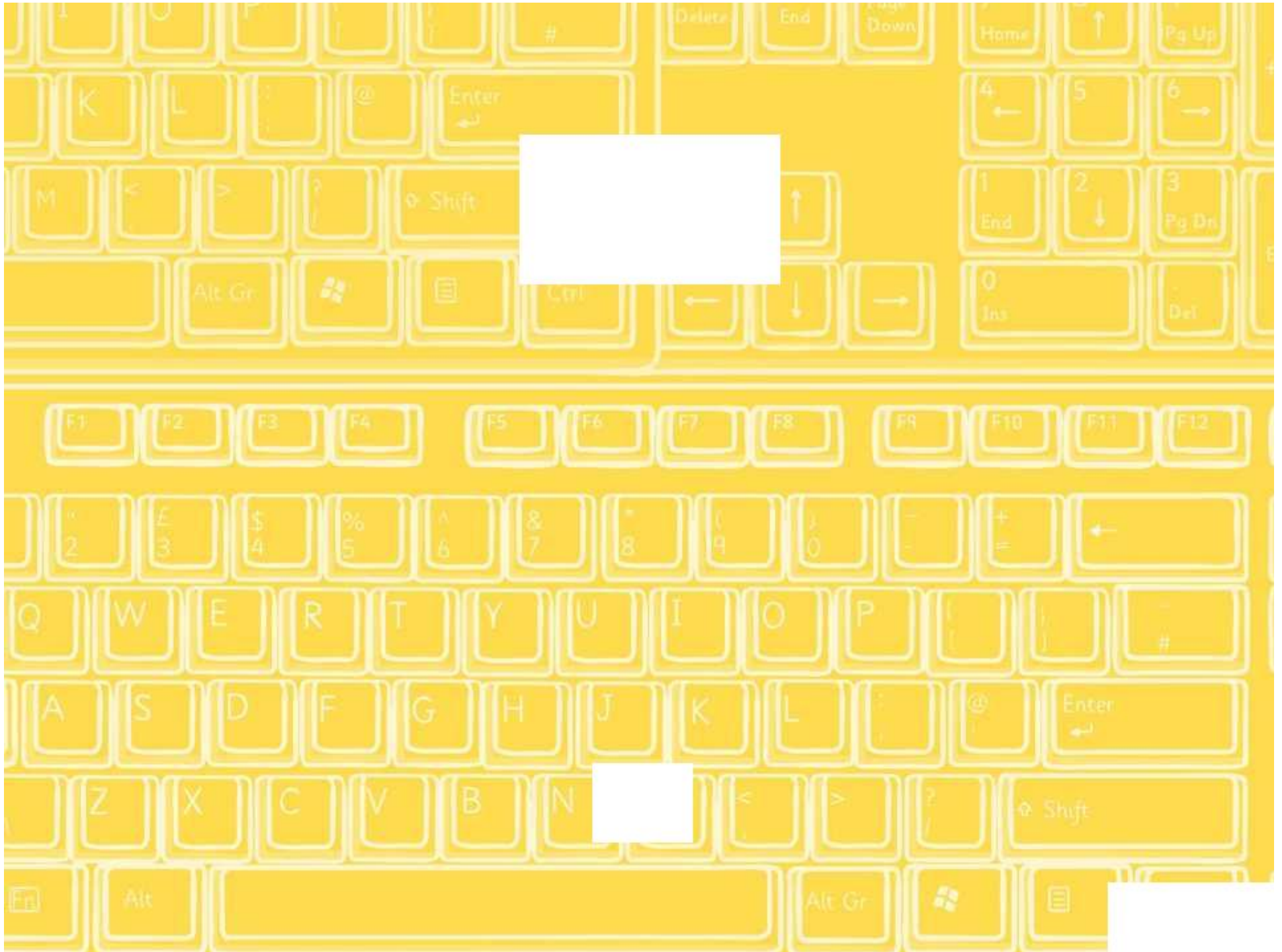
when [space] **key pressed**
clear
go to x: (0) **y:** (0)
point in direction (90)

---

1. Draw a square using the following algorithm.

pen down
move (100) **steps**
turn ↺ (90) **degrees**
move (100) **steps**
turn ↺ (90) **degrees**
move (100) **steps**
turn ↺ (90) **degrees**
move (100) **steps**
turn ↺ (90) **degrees**

---

2. Draw a rectangle using the following algorithm.

pen down
move (150) **steps**
turn ↺ (90) **degrees**
move (80) **steps**
turn ↺ (90) **degrees**
move (150) **steps**
turn ↺ (90) **degrees**
move (80) **steps**
turn ↺ (90) **degrees**

---

3. Add the key press block to the start of your algorithms.

when [s] **key pressed**

when [r] **key pressed**

Start the square with an 's' and the rectangle with an 'r'.

---

4. Draw a set of growing squares using the same blocks in algorithms above. You will need to change the variables (numbers) in all of the blocks.

move ( ) **steps**   **pen down**   **turn** ↺ ( ) **degrees**

Drawing

Use Scratch to create the shapes below. Before you begin each algorithm remember to clear your screen using the algorithm opposite.

Remember to save your work after each project.

when `space` **key pressed**
clear
go to x: `0` **y:** `0`
point in direction `90`

---

1. Draw a square using the following blocks.

pen down

move `100` **steps**

turn ↰ `90` **degrees**

---

2. Draw a rectangle using the following blocks.

pen down

move `150` **steps**

turn ↰ `90` **degrees**

---

3. Add the key press block to the start of your algorithms.

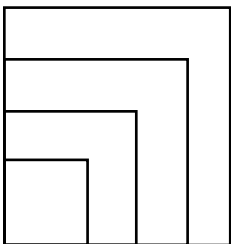**when** `s` **key pressed**

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---

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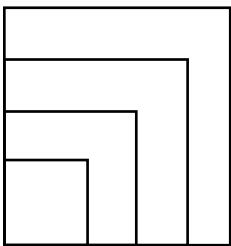
move ◯ **steps**   **pen down**   **turn** ↰ ◯ **degrees**

5. Draw a set of growing rectangles.

6. Draw the growing squares and rectangles again but this time use the repeat block.

Drawing

Use Scratch to create the shapes below. Before you begin each algorithm remember to clear your screen.
Remember to save your work after each project.

---

1. Draw a square using the following blocks.
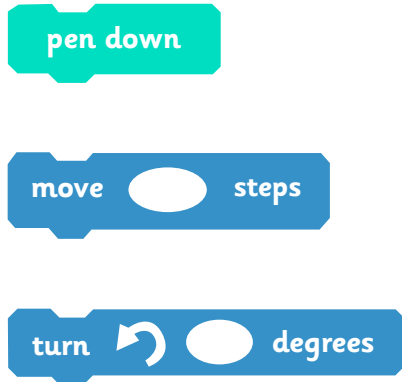
pen down

move ⬭ **steps**

turn ↺ ⬭ **degrees**

---

2. Draw a rectangle using the following blocks.

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turn ↺ ⬭ **degrees**

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when ☐ **key pressed**

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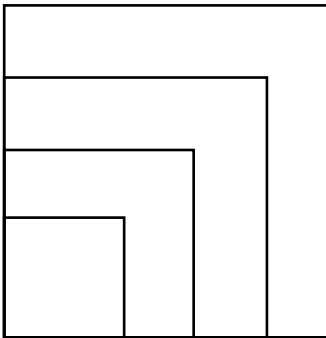
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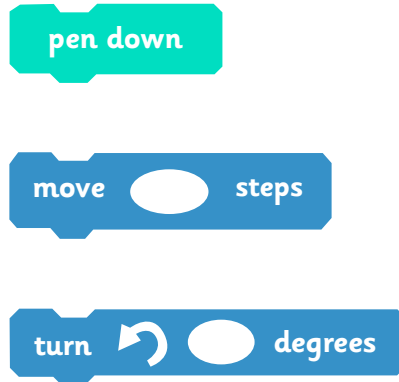Programming Turtle Logo and Scratch | Drawing

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