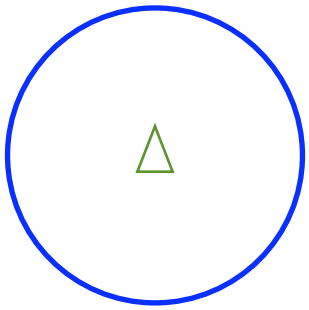
Arc

The arc command will draw an arc for a specific arc length, measured in degrees, of a specific radius. For example, arc 180 100 will draw a semi circle starting in the direction in which the turtle is facing.

To draw a circle you would use arc 360 100.



To change the colour of the line, use setcolor or setpc

To fill the circle use the fill command. Another option is to change the width of the pen use:

setwidth *

or

setpenwidth [* *]

In this example * is the width of the line.

Programming Turtle Logo: Arc

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. In the context of using Turtle Logo to create and debug an algorithm to draw arcs. I can create and debug an algorithm to draw an arc.	I can write commands in the correct order. I can write a procedure. I can correct any mistakes. I can draw an arc.	**Lesson Pack** Desktop computer /laptop Turtle Logo application: installed /online Whiteboards and pens or books and pens for recording.
	Key/New Words: Algorithm, instructions, commands, forward (fd), left (lt), right (rt), move, turn, clear screen (cs), variable, procedure, setpos, setxy, setpc, random, arc.	**Preparation:** **Arc Activity Sheet** - as required

Prior Learning:	Children will have created and debugged an algorithm to make a procedure, used coordinates to draw shapes, fill an area with colour and added text in lessons 1 to 5.

Learning Sequence

	**Can You Draw a Curved Line?** Explain that a curved line is also called an arc. Ask the children to see if they can find out how to draw arcs.	
	**Arcs:** Demonstrate how to draw arcs using the arc command. Don't tell the children how to use this to draw a circle at this point (arc 90 50 will draw an arc of 900 with a radius of 50, so arc 360 50 will draw a circle of radius 50).	
	**Draw Your Own Arcs:** Children draw arcs of different sizes and then work out how to draw a circle.	
	**Patterns With Arcs:** Children move on to drawing patterns using arcs. This includes moving the turtle, taking a screen shot of their pattern and recording the algorithms in a word processing document.  Children use support when completing the activities.  Children use the guide to complete the activities.  Children complete the activities and create a set of randomly coloured arcs.	
	**Share:** Children share their algorithms with partners. They should test and debug if necessary.	
	**Draw:** Children use ideas from their partners and other children to complete a range of patterns.	
	**Which Commands?** Which new commands have you learnt in this unit? Which commands are you most confident with? Which commands do you think need to practise?	

Task*it*

***Arc*it:** Children make further patterns using the arc command. They could search the web for algorithms that make interesting patterns.

***Challenge*it:** Use the **Challenge Cards** for extension activities.

Arcs

Try the procedures below. Remember to look for the > symbol that indicates where text must be typed and the lines following will be in a dialogue box.

0: black	1: blue	2: green	3: cyan
4: red	5:magenta	6: yellow	7: white
8: brown	9: tan	10: green	11: aqua
12: salmon	13: purple	14: orange	15: gray

Draw Arcs and Circles

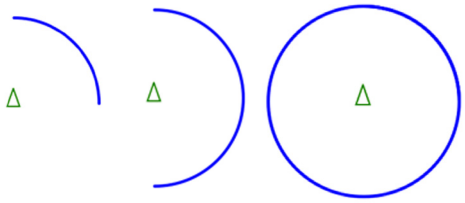
Draw arcs and circles.

Try:

arc 90 100

arc 180 100

arc 360 100



Try to make arcs and circles of different sizes.

Screenshot or snip your pictures and algorithms and paste into a document.

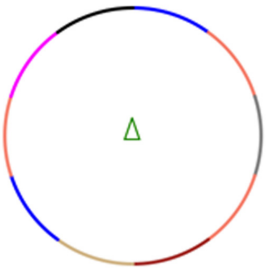
A Multi-Coloured Circle

Draw a multi-coloured circle.

Use the algorithm below to draw short arcs:

> arc 36 100

Change the colour using setpc and repeat the arc until you make a circle.



Screenshot or snip your pattern and algorithm and paste into your document.

Concentric Circles

Draw concentric circles (circles with the same centre).

The algorithm for filled circles is:

> arc 360 160 setcolor colour fill

Repeat but make circle smaller and fill with a different colour.

Screenshot or snip your pattern and algorithm and paste into your document.

Arcs

Try the procedures below. Remember to look for the > symbol that indicates where text must be typed and the lines following will be in a dialogue box.

0: black	1: blue	2: green	3: cyan
4: red	5:magenta	6: yellow	7: white
8: brown	9: tan	10: green	11: aqua
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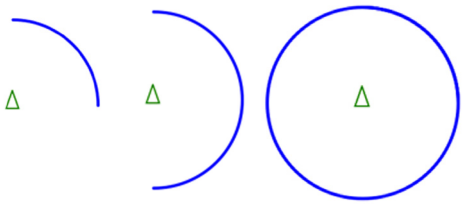
Draw Arcs and Circles



Draw arcs and circles.

Try to make arcs and circles of different sizes.

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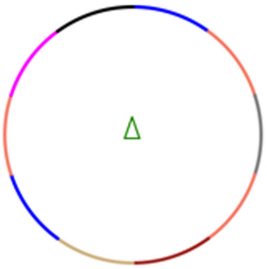
A Multi-Coloured Circle



Draw a multi-coloured circle.

Use the algorithm below to draw short arcs:

> arc 36 radius

Set a random colour using:

> setpc random 16

Repeat the arc until you make a circle.

Screenshot or snip your pattern and algorithm and paste into your document.

Concentric Circles

Draw concentric circles (circles with the same centre).

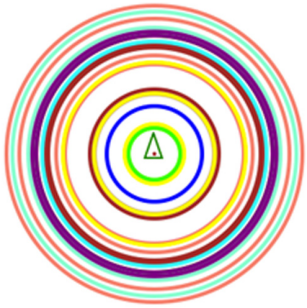
The algorithm for filled circles is:

> arc 360 160 setcolor colour fill

Run the algorithm again but make circle smaller and fill with a different colour.

Screenshot or snip your pattern and algorithm and paste into your document.

Random Arcs



Draw a set of randomly coloured arcs.

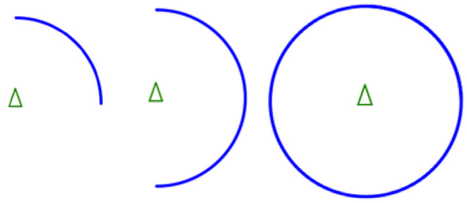
Create a single algorithm that does the following:

- randomly sets the pencolour
- draws a 180° arc with a radius 80
- pen up, back 80, right 10, forward 80, pendown
- repeats 36 times

Screenshot or snip your pattern and algorithm and paste into your document.

Arcs

Draw Arcs and Circles

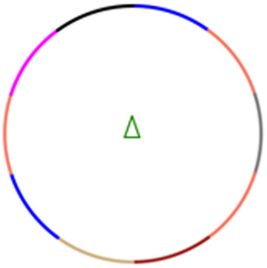


Draw arcs and circles.

Try to make arcs and circles of different sizes.

Screenshot or snip your picture and algorithms and paste into a document.

A Multi-Coloured Circle



Draw a multi-coloured circle.

Use the algorithm below to draw short arcs:

> arc 36 radius

Set a random colour using:

> setpc random 16

Write a single algorithm using repeat.

Screenshot or snip your pattern and algorithm and paste into your document.

Concentric Circles

Draw concentric circles (circles with the same centre).

The algorithm for filled circles is:

> arc 360 160 setcolor colour fill

Run the algorithm again but make circle smaller and fill with a different colour.

Screenshot or snip your pattern and algorithm and paste into your document.

Random Circles

Create an algorithm for a pattern with random circles.

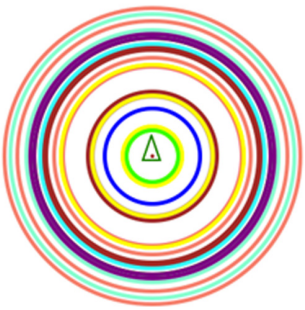
Combine the following:

An algorithm for random pen colour and an algorithm for random size circle up to 150.

Repeat the algorithms for the number of required circles.

Screenshot or snip your pattern and algorithm and paste into your document.

Random Arcs



Draw a set of randomly coloured arcs.

Create a single algorithm that does the following: uses random colours, includes a semi circle of radius 80, uses pen up and takes the turtle to one end of the arc and turns before going forward to the centre of a new arc.

Repeat the number of turns you need to get back to the first semi-circle.

Screenshot or snip your pattern and algorithm and paste into your document.

Extension Task:

Try creating your own patterns, repeating these algorithms.

Programming Turtle Logo

Challenge Cards

Programming Turtle Logo

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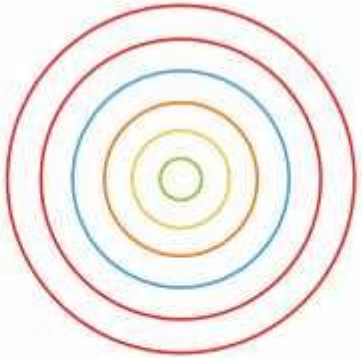
Programming Turtle Logo

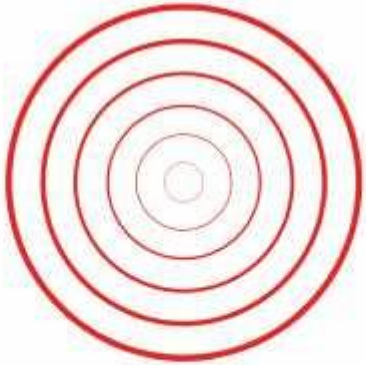
Challenge Cards

Create a set of concentric circles of different colours that are evenly spaced.

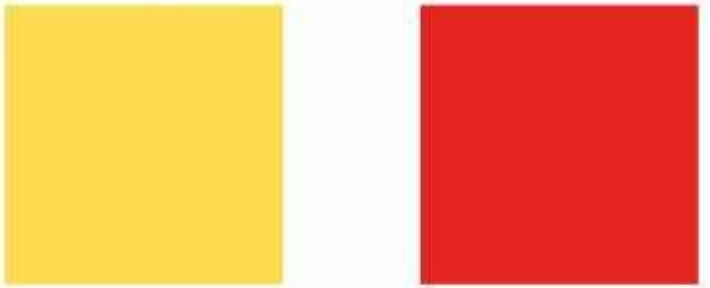


Create the pattern below. Think how you will move the turtle without drawing lines so you can alter the centre of the arc.

Create a set of concentric circles of the same colour but with different line widths.



Create the shape below. Think how you will move the turtle without drawing lines so you can create both shapes.



Programming Turtle Logo

Challenge Cards

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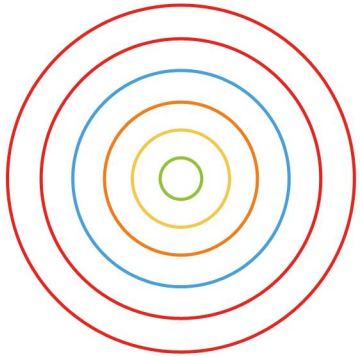

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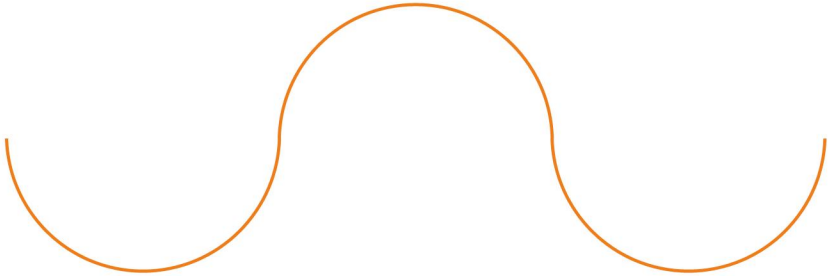

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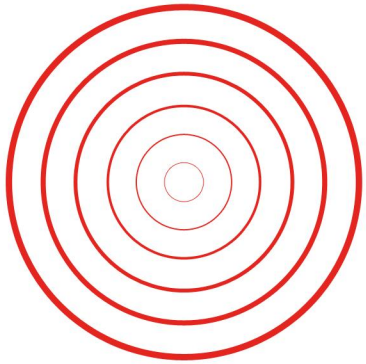

Create the shape below. Think how you will move the turtle without drawing lines so you can create both shapes.

Programming Turtle Logo | Arc

I can create and debug an algorithm to draw an arc.		
I can write commands in the correct order.		
I can write a procedure.		
I can correct any mistakes.		
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