

Lines of Symmetry

Using Mathematics and Using ICT Level 3



Assessment Focus	
Using Mathematics	Using ICT
Knowledge and Understanding	Interactive Design
<ul style="list-style-type: none"> • Shape and Space 	<ul style="list-style-type: none"> • Explore (2)* • Evaluate • Exhibit

Pupil Notes		
Level 3	Using Mathematics	Using ICT
	Part 1 Resource Sheet 1	Part 2

* Explore (2) refers to the second bullet point of Explore in the UICT Levels of Progression.

Task Description

In the mathematics part of the task pupils are required to label each shape with its name, cut it out and then fold it to find one line of symmetry.

In the Using ICT part of the task pupils are required to use programming software to draw three 2-D shapes (a square, a rectangle and a triangle), to select a pen width and to make each shape a different colour. They are then required to draw one line of symmetry on each shape, save their work and show it to the other members of their class.

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Prior Knowledge/Experience

Pupils should have experience of:

- recognising, naming and describing simple 2-D shapes;
- identifying lines of symmetry in 2-D shapes;
- using programming software;
- changing pen colour and width;
- combining commands to draw patterns and shapes; and
- saving and printing work.

Resources

- Resource Sheet 1
- Crayons/colouring pencils
- Scissors
- Software e.g. Logo, Scratch or Hopscotch

Managing the Task

Pupils should be given opportunities to:

Plan

- engage in discussion to revise the concepts of symmetry;
- plan commands to draw 2-D shapes;

Do

- work individually or in pairs to complete each part of each task;
- combine commands including use of the repeat command in suitable software to draw the three 2-D shapes and one line of symmetry on each one;
- they should save, store and retrieve their work appropriately;

Review

- demonstrate an ability to recognise and name common 2-D shapes;
- demonstrate an understanding of symmetry;
- make improvements to their programming work;
- share their work with the class; and
- explain their findings.

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Evidence of UICT External Moderation

As well as submitting the final product, please include:

- evidence of planning
- a pupil evaluation at the appropriate level.

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Assessing Pupils' Responses to the Task

This page sets out the Requirements for Using Mathematics that are covered in this task. Alongside these are the Progression Statements related to this task and evidence of achievement that illustrates the standard at Level 3.

Requirements for Using Mathematics	Progression Statements Level 3	Evidence
<p>Across the curriculum, at the level appropriate to their ability, pupils should be enabled to:</p>	<p>In structured activities, in familiar and accessible contexts, pupils can:</p>	<p>Evidence that illustrates the standard at Level 3 may include the ability to:</p>
<ul style="list-style-type: none"> choose the appropriate materials, equipment and mathematics to use in a particular situation; 	<ul style="list-style-type: none"> suggest different ways an activity might be approached; select and use the appropriate materials, equipment and mathematics required; 	<ul style="list-style-type: none"> suggest ways in which the paper shapes can be folded to create a line of symmetry; use the materials provided to fold accurately, cut out and then fold the paper shapes;
<ul style="list-style-type: none"> explore ideas, make and test predictions and think creatively; 	<ul style="list-style-type: none"> identify and explain patterns and relationships and make predictions; 	<ul style="list-style-type: none"> state which shapes might have a line of symmetry before testing;
<ul style="list-style-type: none"> read, interpret, organised and present information in mathematical formats; <p><i>using their Knowledge and Understanding of Shape and Space; and</i></p>	<ul style="list-style-type: none"> present their findings clearly using a range of appropriate mathematical formats; <i>recognise, name and describe common 2-D and 3-D shapes;</i> <i>recognise one line of symmetry in common 2-D shapes; and</i> 	<ul style="list-style-type: none"> make suggestions as to the best way of presenting their findings; <i>name each of the shapes correctly;</i> <i>cut out the shapes and fold them to find if they have one line of symmetry;</i> <i>explain why they chose a particular way to present their findings;</i>
<ul style="list-style-type: none"> use mathematical understanding and language to ask and answer questions, talk about and discuss ideas and explain ways of working. 	<ul style="list-style-type: none"> use appropriate mathematical language to respond to questions about their work. 	<ul style="list-style-type: none"> describe how they carried out the activity; and discuss what they found out; respond to questions about their work, findings and presentation.

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Assessing Pupils' Responses to the Task

The first column of the Assessment Criteria Grid sets out, the Requirements for **Using ICT** that are covered in this task. Alongside this are the Levels of Progression and the Using ICT Desirable Features for **Interactive Design** at **Level 3**. These Desirable Features have been produced as guidance for teachers to consider when observing a pupil and assigning a level to a piece of work. When coming to a holistic judgement of the pupil's level of Using ICT competence, teachers should ensure that these Desirable Features are used in conjunction with the Using ICT Levels of Progression.

Assessment Criteria Grid	
Using ICT Requirements	Level 3
Explore <ul style="list-style-type: none">investigate, make predictions and solve problems through interaction with digital tools.	Pupils can: <ul style="list-style-type: none">carry out and edit a series of instructions, make predictions and solve problems using a digital device or environment;
Evaluate <ul style="list-style-type: none">talk about, review and make improvements to work, reflecting on the process and outcome and consider the sources and resources used, including safety, reliability and acceptability.	<ul style="list-style-type: none">make modifications to improve their work; and
Exhibit <ul style="list-style-type: none">manage and present their stored work and showcase their learning across the curriculum, using ICT safely and responsibly.	<ul style="list-style-type: none">save using file names and select work to showcase learning digitally.

Pupils should demonstrate, when and where appropriate, knowledge and understanding of e-safety including acceptable online behaviour.

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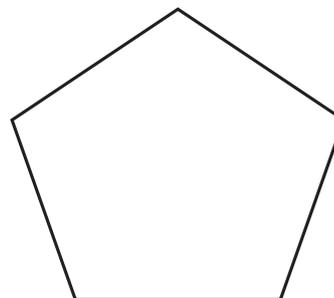
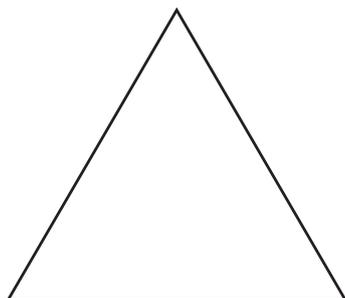
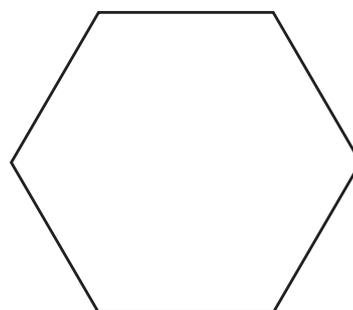
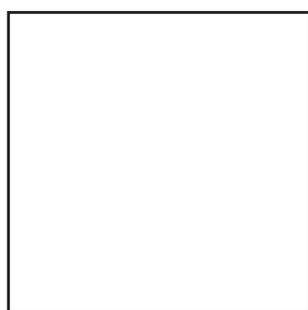
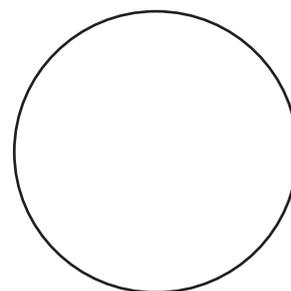
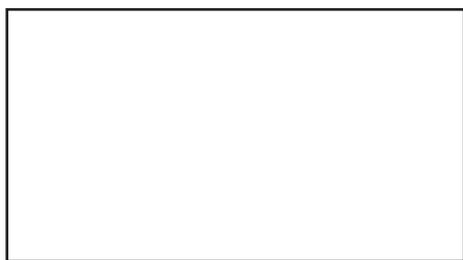
Desirable Features

Interactive Design	
Level 3	<p>Pupils can:</p> <ul style="list-style-type: none">• solve problems using a digital device or environment, <i>for example use the 'repeat' command to create patterns or shapes using Logo or Scratch;</i>• input sequences of commands; and• make modifications to improve their work.

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Resource 1



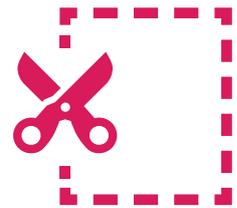
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Pupil Notes

Pupil Notes

Part 1

Cut out the shapes on the worksheet, label each one with its name then fold each one in turn to find **one** line of symmetry.



Choose a way of presenting your work showing each shape labelled with its name and showing its line of symmetry.

Part 2

Use Logo, Scratch or an iPad app such as Hopscotch to design three shapes; a square, a rectangle and a triangle.

Draw each shape with a different colour.

Once you have created each shape, draw **one** line of symmetry in each using a different colour from the one you've used to draw the shape.

Give your work a name and save it. Show it to the other members of your class.

N.B. Make sure you use the 'repeat' command when drawing your shapes.

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Teacher Notes

Possible Scratch Solution

The sample code shown below illustrates the drawing of a blue square and one line of symmetry drawn in purple.

Drawing the square



```
pen down
repeat 4
  move 100 steps
  turn 90 degrees
```

Changing the pen colour and size

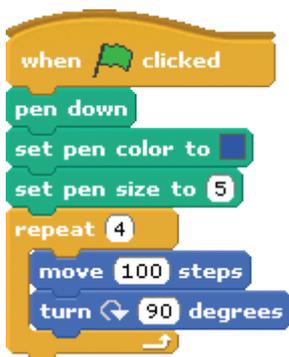
Use the **set pen colour to** and **set pen size to** blocks to select the pen colour and size for the shape



```
set pen color to [blue]
set pen size to 5
```

Using a control to start the program

Use **when green flag clicked** to start the drawing of the square



```
when green flag clicked
  pen down
  set pen color to [blue]
  set pen size to 5
  repeat 4
    move 100 steps
    turn 90 degrees
```

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Teacher Notes

Draw one line of symmetry

(NB It is possible to draw both the vertical and horizontal lines of symmetry. The diagonal line of symmetry involves the use of coordinates in Scratch and is above Level 3.)

```
when clicked
pen down
set pen color to blue
set pen size to 5
repeat 4
  move 100 steps
  turn 90 degrees
move 50 steps
turn 90 degrees
set pen color to purple
move 100 steps
```

