

Assessing pupils' progress in mathematics at Key Stage 3

Year 7 assessment package
Shape, space and measures
Teacher pack



Year 7 Shape, space and measures task: *Making shapes* and *What's the area?*

Levels 3/4/5

The lesson plans in this pack are set out in two columns. The left-hand column has indicative times for activities, highlights the resource sheets required and also has some examples of questions which teachers may wish to use with pupils during the activities. The right-hand column describes each activity in detail.

APP ASSESSMENT CRITERIA

These lessons may generate evidence to help inform judgements against a number of assessment criteria, including the following:

Shape, space and measure

- level 3: classify 2-D and 3-D shapes in various ways using mathematical properties such as reflective symmetry for 2-D shapes
- level 4: find perimeters of simple shapes and find areas by counting squares
- level 4: use the properties of 2-D and 3-D shapes
- level 5: understand and use the formula for the area of a rectangle and distinguish area from perimeter
- level 5: use a wider range of properties of 2-D and 3-D shapes and identify all the properties of 2-D shapes

Using and applying mathematics

- level 4: present information and results in a clear and organised way
- level 5: show understanding of situations by describing them mathematically using symbols, words and diagrams.

LESSON 1: MAKING SHAPES

Resources

- Teacher OHT/whiteboard slide:
Making shapes starter (one of two versions, with or without grid, **T2L1teacher1** or **2**)
- If required, two cut out tiles of each shape (of a size appropriate for the board/OHP used)
- Teacher OHT/whiteboard slide:
Making shapes group work (**T2L1teacher3**)
- For each group, four cardboard tiles each of shape Q (optional)
- Assessment sheets for pupils:
Each level 3/4 pupil needs one of each of the following:
Name the shapes (**T2L1assess1**)
Sorting into groups sheet 1 (**T2L1assess2**)
Sorting into groups sheet 2 (**T2L1assess3**) (could be omitted by level 3 pupils)
Sorting into groups sheet 3 (**T2L1assess4a**)
Sorting into groups sheet 3 (continued) (**T2L1assess4b**)
Each level 4/5 pupil needs one of each of the following:
Name the shapes (**T2L1assess1**)
Sorting into groups sheet 2 (**T2L1assess3**)
Sorting into groups sheet 3 (**T2L1assess4a**)
Sorting into groups sheet 3 (continued) (**T2L1assess4b**)
- Squared paper for the group activity and any rough working
- Plain or squared paper for the assessment activity, if needed

<p>Starter about 5 minutes</p> <p>T2L1teacher1 or T2L1teacher2</p> <p><i>What are we counting when we find the 'area' of a shape?</i></p> <p><i>If this rectangle had an area of 2 square centimetres, what area would the square [made from two rectangles] have?</i></p> <p><i>Is a square a rectangle? How could you convince another person that it is?</i></p> <p><i>[Sketch a regular hexagon.] Is this a hexagon? How do you know?</i> <i>[Sketch an irregular but convex hexagon.] Is this a hexagon too? Why?</i> <i>How is a regular hexagon special?</i></p> <p><i>[Sketch an irregular convex/concave hexagon.] This is also a hexagon.</i> <i>What must a hexagon have?</i> <i>What might a hexagon have?</i></p>	<p>Show the pupils the lesson 1 starter OHT/whiteboard slide showing the four shapes P, Q, R and S. Either use the version with the grid underneath or, especially if tiles are being used, the version without the grid (T2L1teacher1 or 2).</p> <p>Suppose you had two of each shape – which would fit together to make a square? (A pupil could show how the square is made by drawing or holding up two of the shape.)</p> <p>What is the relationship between the area of the square and the area of the shape used to make the square? Establish that the area of the shape is half the area of the square.</p> <p>Now ask which shape is half a rectangle. Which other shape? Are there any others? Who agrees/disagrees? Discuss the fact that a square is also a rectangle.</p> <p>Now ask which shape is half a triangle. Which other shape? Are there any others? Why not?</p> <p>Finally, ask the pupils to describe a hexagon. Can you make a hexagon with two shape Rs? Discuss the fact that the sides and angles need not be equal (a common misconception is to assume that the hexagon must be regular).</p>
<p>Group work about 10 minutes</p> <p>T2L1teacher3</p>	<p>Introduce the activity by saying that the class will be working with four shape Qs.</p> <p>Ask the pupils to draw on the whiteboard/OHT a square using four shape Qs. Discuss the fact that the sides of a square need not be horizontal and vertical.</p> <p>Then, in groups, pupils should find and draw as many different shapes as they can using four shape Qs. Emphasise that, for this part of the activity, shapes must be joined edge to edge with vertices touching, i.e. do not allow:</p> <div data-bbox="1043 1335 1203 1438" data-label="Image"> </div> <p>Note that four cardboard tiles can be prepared for each group if needed, but results should also be drawn on squared paper.</p> <p>Ask pupils to present their findings, then show the OHT/whiteboard slide <i>Making shapes group work (T2L1teacher3)</i> with seven of the possible shapes, A to G. Did they find all these? (At this point discourage the use of shape names, as this will be assessed later.) Did they find any others? E.g.</p> <div data-bbox="746 1733 1267 1890" data-label="Image"> </div> <p>Briefly discuss properties of shapes that make them different from each other – e.g. number of sides, area, perimeter, angles, symmetry – but do not discuss this in detail since this is part of the assessment.</p>

<p>Assessment activity about 25 minutes</p> <p>T2L1assess1 T2L1assess2 T2L1assess3 T2L1assess4a T2L1assess4b</p> <p><i>Angles: Look at shape ... Are all its angles the same size? How do you know?</i></p> <p><i>Which angles are acute? Are there any obtuse angles in any of the shapes?</i></p> <p><i>How many examples of reflex angles can you find?</i></p> <p><i>Symmetry: Which shapes have line symmetry? [Answers depend on whether the completed shapes are viewed as composite triangles or not.]</i></p> <p><i>Which shape has exactly four lines of symmetry?</i> [Shape A, irrespective of triangle composition.]</p>	<p>Give out the following assessment materials, noting that all pupils will need to complete the worksheet <i>Name the shapes (T2L1assess1)</i> since this is used as a reference for the succeeding worksheets.</p> <p>All pupils: <i>Name the shapes (T2L1assess1)</i></p> <p>Level 3/4 pupils: <i>Sorting into groups sheet 1 (T2L1assess2)</i> <i>Sorting into groups sheet 2 (T2L1assess3)</i> (could be omitted by level 3 pupils) <i>Sorting into groups sheet 3 (T2L1assess4a)</i> <i>Sorting into groups sheet 3 (continued) (T2L1assess4b)</i></p> <p>Level 4/5 pupils: <i>Sorting into groups sheet 2 (T2L1assess3)</i> <i>Sorting into groups sheet 3 (T2L1assess4a)</i> <i>Sorting into groups sheet 3 (continued) (T2L1assess4b)</i></p> <p>Note that support from the teacher may be needed for sheet 3, particularly for pupils at the lower levels. Teachers should emphasise that pupils can use the same type of sorting diagrams as on the previous sheets or use more complex ones like the examples shown, but they should use different properties and challenge themselves as much as possible.</p> <p>Pupils who finish before the rest of the class could be asked to draw another, different sorting diagram.</p>
<p>Plenary about 10 minutes</p> <p>T2L1teacher3</p> <p><i>What is the same about all seven shapes?</i></p> <p><i>How can I show that the area of each of the seven shapes is 2 (square units)?</i></p> <p><i>What can you tell me about the lengths of the sides of the shapes? Do all the shapes have all sides the same length?</i></p> <p><i>I think the only shape that has a perimeter of 6 (units) is shape B. Do you agree? Why? Which shapes have a perimeter greater than 6 (units)? How do you know without measuring?</i></p> <p><i>Which shapes have the same perimeter? [C, D, E, F and G]</i></p>	<p>Show the seven shapes A to G on OHT/whiteboard slide <i>Making shapes group work (T2L1teacher3)</i> again.</p> <p>Ask the pupils to tell you some properties of the shapes.</p> <p>Focus on the area and perimeter of the shapes (recapping if this has already been discussed). Review the definitions of 'area' and 'perimeter'.</p> <p>Compare the perimeters of shapes B and D. How can the pupils convince you that the perimeters are not the same? What about shapes F and G?</p> <p>Discuss shapes with equal/different areas and equal/different perimeters in general.</p>

LESSON 2: WHAT'S THE AREA?

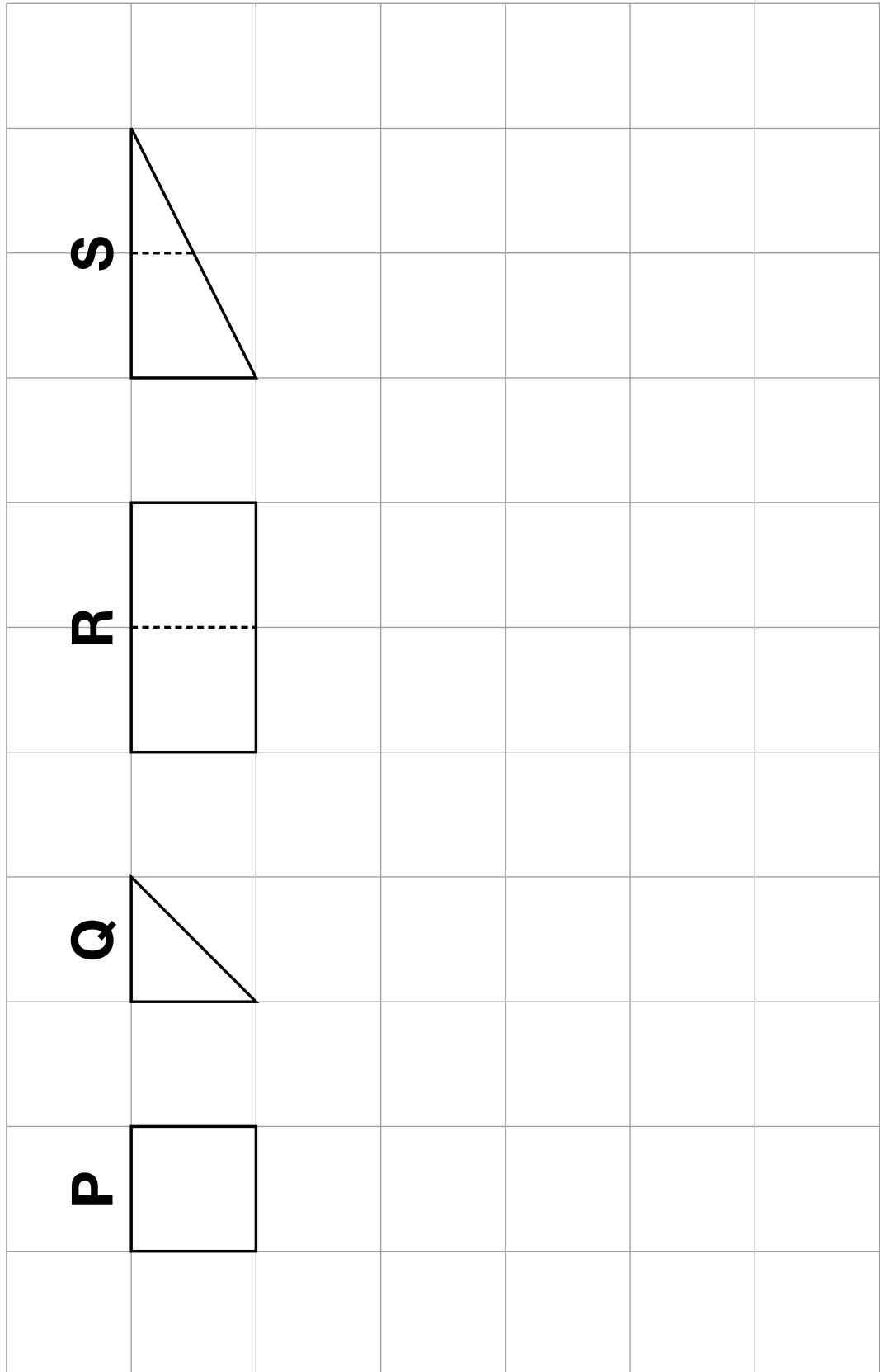
Resources

- Teacher OHT/whiteboard slide:
What's the area? starter (T2L2teacher1)
 - Sets of the shapes cut out from card if needed
 - Assessment sheets for pupils:
Each pupil needs one or more of the following worksheets, depending on ability:
Level 3/4 pupils: *Area of 3 (T2L2assess1a)*
Area of 3 (continued) (T2L2assess1b)
Level 4/5 pupils: *What are the areas? sheet 1 (T2L2assess2)*
What are the areas? sheet 2 (T2L2assess3)
- Pupils who complete their assessment with confidence may wish to attempt the next in the series of worksheets. For pupils working at level 5 or above, the following worksheet is available:
Extension activity: *Making triangles (T2L2assess4)*
- Extra squared paper if needed and/or for rough working

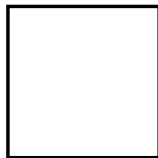
<p>Starter about 10 minutes</p> <p>T2L2teacher1</p> <p><i>What is the area of each large square?</i></p> <p><i>Which shape, P, Q, R or S, do you need most of to fill the larger square? How many of this small shape do you need? What is the area of the smallest shape?</i></p> <p><i>If the larger square needs four of shape D, how does that help us work out the area of shape D?</i></p>	<p>Show the pupils the OHT/whiteboard slide <i>What's the area? starter (T2L2teacher1)</i> showing the four shapes P, Q, R and S with a 2-by-2 square underneath each one.</p> <p>Ask the pupils to show how many of each shape will fit into the 2-by-2 square.</p> <p>After all four diagrams are completed correctly (you may discuss how, as for some of the shapes there is more than one way of fitting them in), ask them which shape, P, Q, R or S, is the smallest.</p> <p>Who agrees/disagrees? Why? Bring in the concept of 'area'.</p> <p>Which shape is the next smallest? Who agrees/disagrees?</p> <p>Establish that P and S have the same area and ask pupils to explain why (S is half of a 1-by-2 rectangle, and so is P). Conclude that R must be the largest and write the shapes in order of size, i.e. Q (smallest), then P and S, then R.</p> <p>If the area of each square is 1, what is the area of each shape? Write the values, i.e. $\frac{1}{2}$, 1, 1 and 2, on/by each shape.</p>
<p>Assessment activity about 30 minutes</p> <p>T2L2assess1a T2L2assess1b T2L2assess2 T2L2assess3 T2L2assess4</p>	<p>Explain that the pupils are going to work with the shapes P, Q, R and S to make shapes of given areas and to find areas.</p> <p>Briefly introduce the task for level 3/4 pupils if needed, while other groups proceed with their assessment activities. Note that some level 3/4 pupils may find it helpful to label the shape drawings with letters, i.e. P, Q, R or S.</p>

Teacher resource sheets

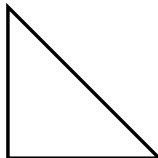
Making shapes starter, with grid



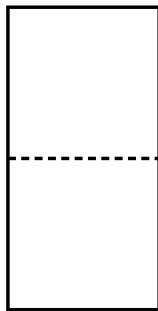
P



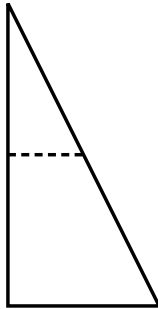
Q

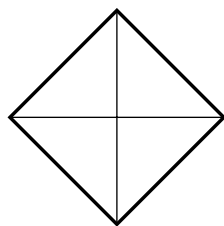


R

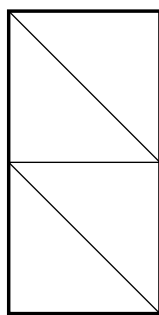


S

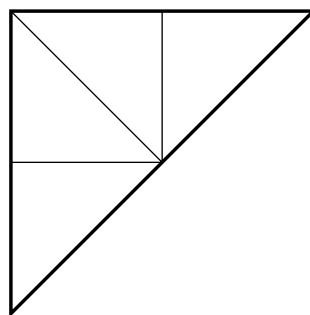




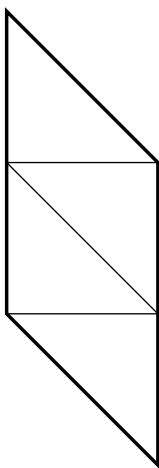
A



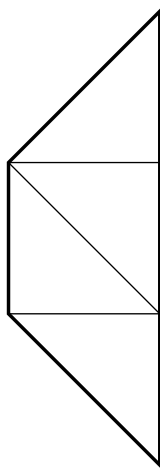
B



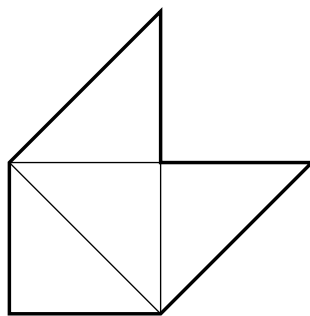
C



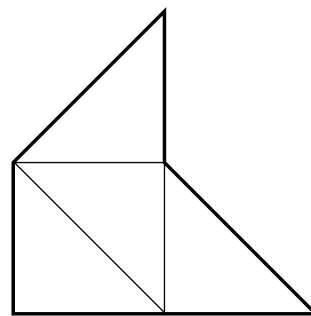
D



E

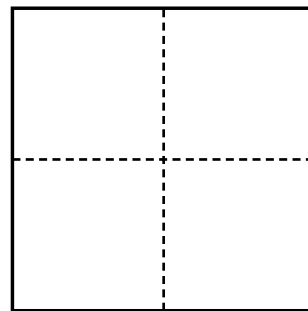


F

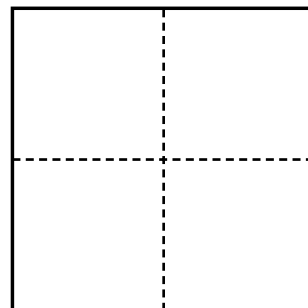
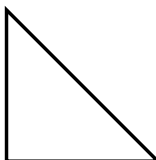


G

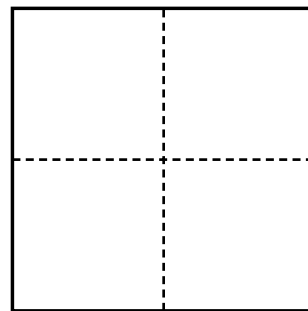
P



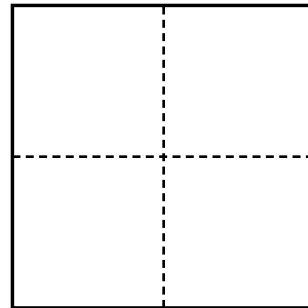
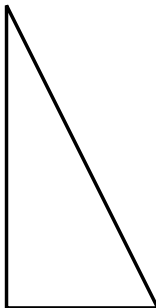
Q



R



S



Pupil sheets

Name the shapes

Name: _____

Look at the list of shape names below.

For each of the shapes A to G, choose a correct name from the list and write it next to the shape.

The first one is done for you.

Parallelogram

Hexagon

Square

Triangle

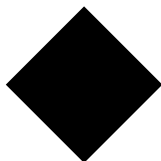
Trapezium

Pentagon

Rectangle

Square

A



D



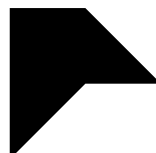
E

B



F

C



G

Sorting into groups sheet 1

Name: _____

Look at the worksheet called **Name the shapes**.

Sort all the shapes on the sheet using the sorting diagram below.

Write the letter of each shape in the correct place on the diagram.

The first one is done for you.

Has exactly 4 sides	Does not have exactly 4 sides
A	

Now write **different** labels for the sorting diagram below.

Then write the letter of each shape in the correct place on this diagram.

.....

Sorting into groups sheet 2

Name: _____

Look at the worksheet called *Name the shapes*.

Sort all the shapes on the sheet using the sorting diagram below.

Write the letter of each shape in the correct place on the diagram.

The first one is done for you.

	Is a quadrilateral	Is not a quadrilateral
Has at least one right angle	A	
Has no right angles		

Now write **different** labels for the sorting diagram below.

Then write the letter of each shape in the correct place on the diagram.

.....		
.....		

Sorting into groups sheet 3

Name: _____

Now make up your own sorting diagram to sort the same seven shapes.

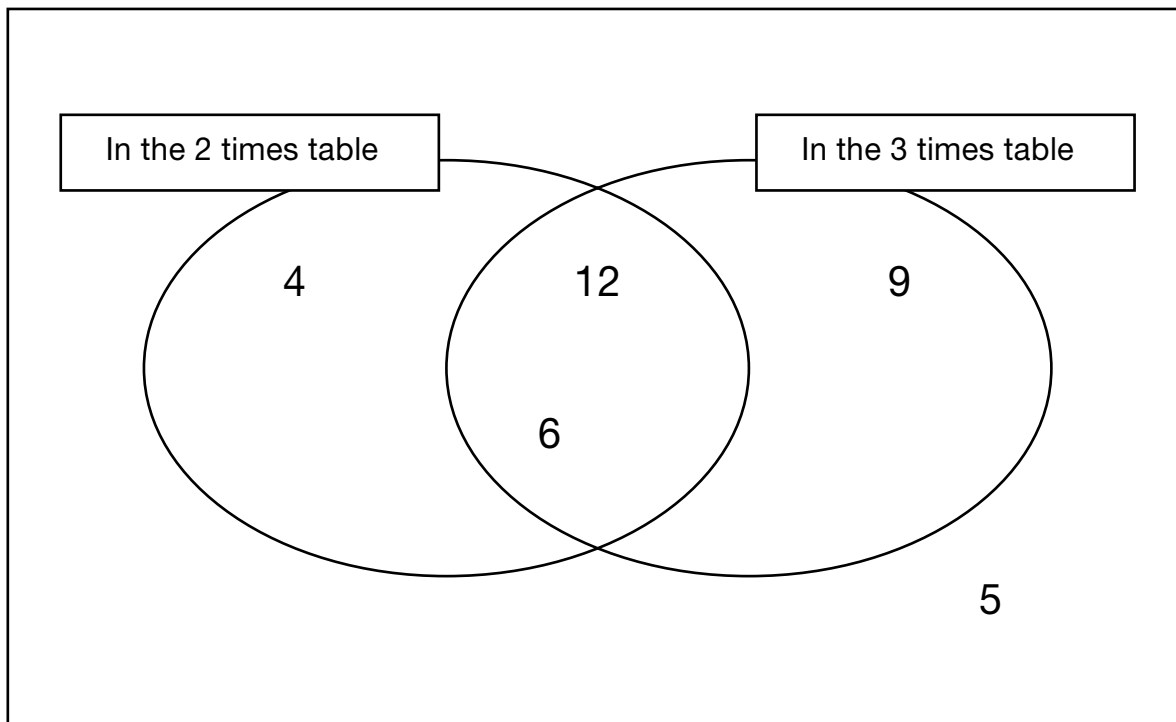
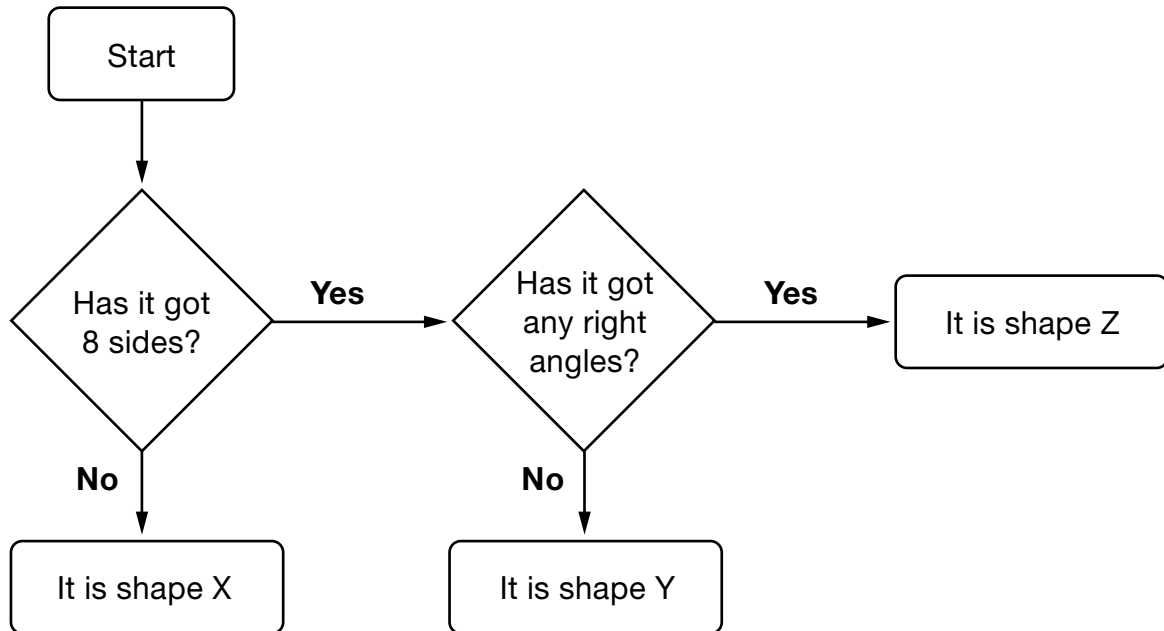
The shapes must **all** fit in a place on the diagram.

Try to use different properties of the shapes from those used on other worksheets.

On the next page, there are some examples of different sorting diagrams.

My sorting diagram:

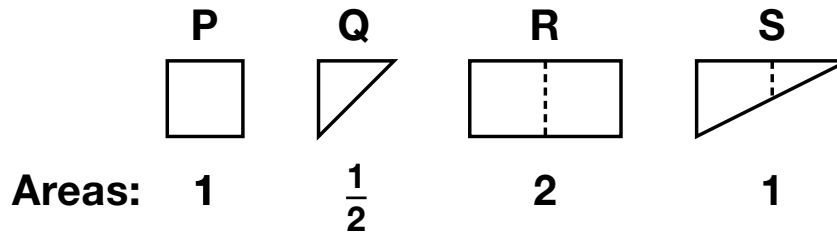
Sorting into groups sheet 3 (continued)



Area of 3



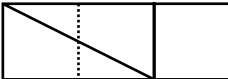
Name: _____

Look at the shapes.

You can use them in different ways to make a **rectangle** with **area 3**

Complete the table below to show the different ways.

The first row is done for you.









Shapes	Area sum
	$1 + 1 + 1 = 3$
	$1 + \frac{1}{2} + \frac{1}{2} + 1 = 3$
	$= 3$

Area of 3 (continued)

Name: _____

Now draw some other different ways in the table below, and write the area sums.

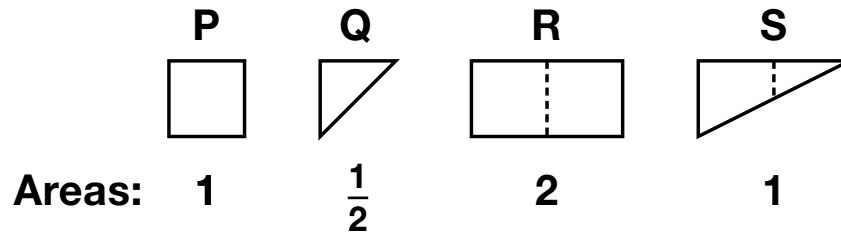
You can draw as many as you like. Carry on using another piece of paper if you need to.

Shapes	Area sum
	= 3
	= 3
	= 3
	= 3
	= 3
	= 3
	= 3
	= 3

What are the areas? sheet 1

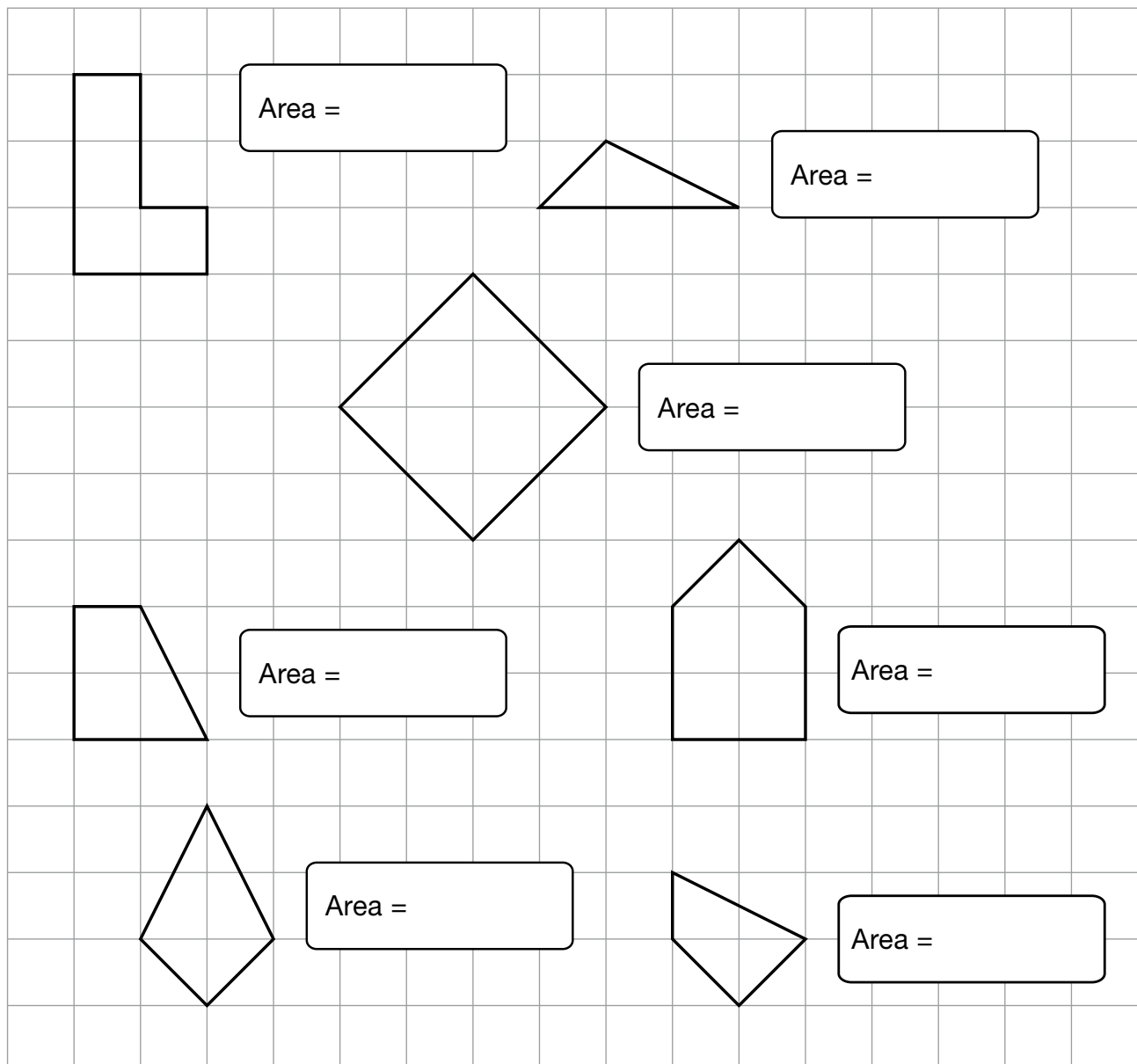
Name: _____

Look at the shapes.



You can use them to find the areas of the shapes below.

Write the areas in the boxes.

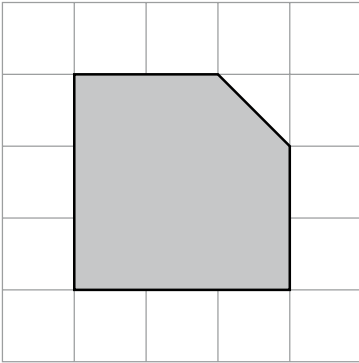


What are the areas? sheet 2

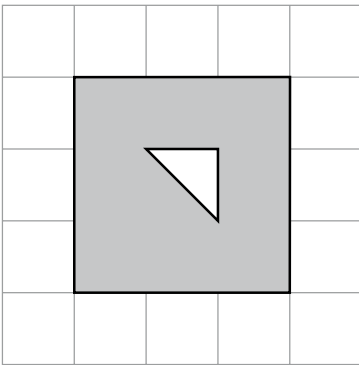
Name: _____

Work out the area of each shaded shape below.

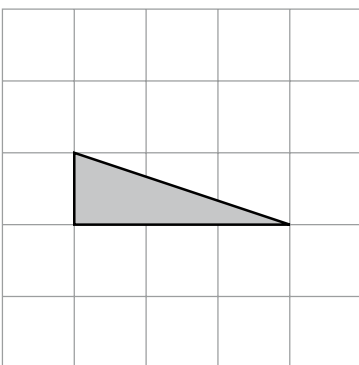
For each one, **you must show your working or explain how you worked it out.**



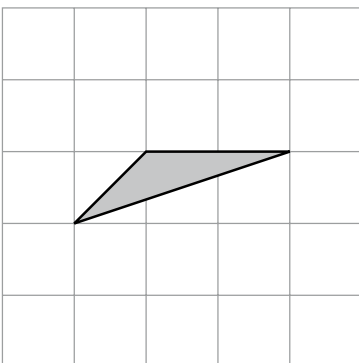
Area = _____



Area = _____



Area = _____

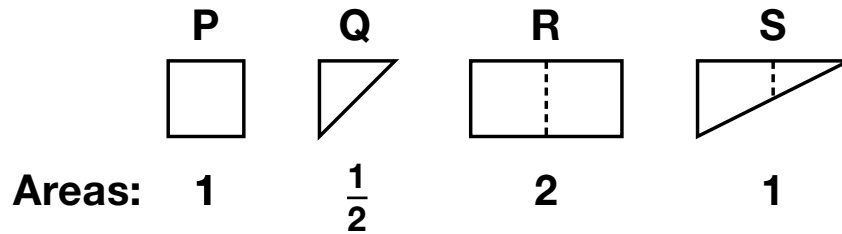


Area = _____

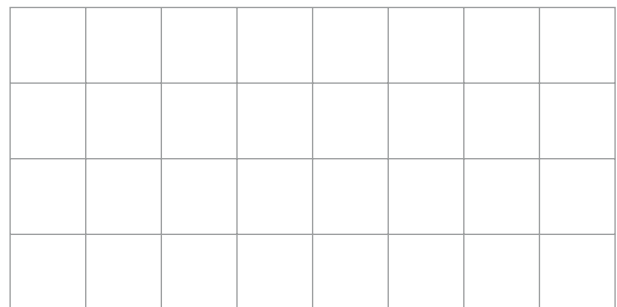
Making triangles

Name: _____

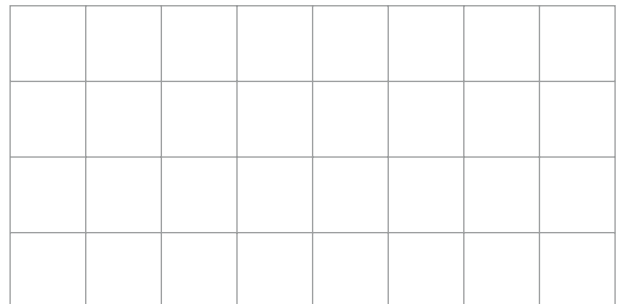
Look at the shapes.



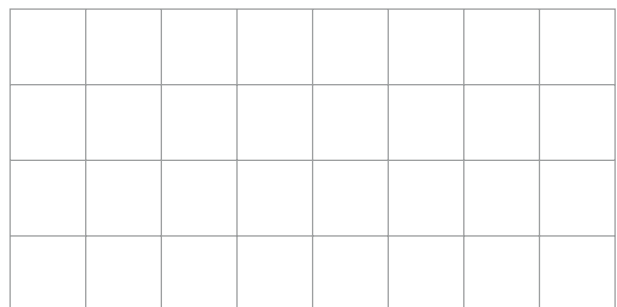
Use the shapes to make
a **triangle** with **area 2**



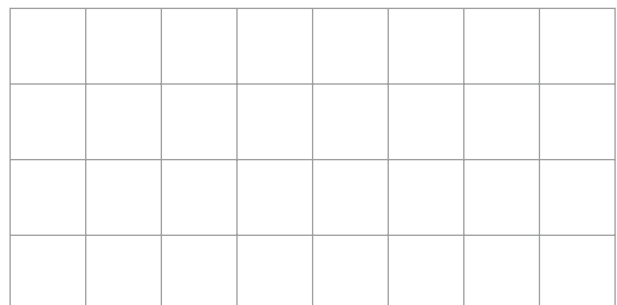
Use the shapes to make
a **different triangle** with **area 2**



Use the shapes to make
a **triangle** with **area $4\frac{1}{2}$**



Use the shapes to make
a **triangle** with an **area** that is
an **odd number greater than 1**



Solutions and performance indicators

LESSON 1: MAKING SHAPES

Solutions

Name the shapes (target level 3/4, but done by all)		T2L1assess1																
Solutions		Notes																
<div>A: Square (given) D: Parallelogram B: Rectangle E: Trapezium C: Triangle F: Hexagon G: Pentagon</div> <div>or</div> <div>A: Square (given) D: Parallelogram B: Parallelogram E: Trapezium C: Triangle F: Hexagon G: Pentagon</div> <div>Accept misspellings where the pupil's intention is still clear</div>		<div>Good responses name most of the shapes correctly.</div> <div>Better responses are more consistent.</div>																
Sorting into groups sheet 1 (target level 3/4)		T2L1assess2																
Solutions		Notes																
<div>Shapes correctly sorted, in any order within the columns, e.g.</div> <table><tr><th>Has exactly 4 sides</th><th>Does not have exactly 4 sides</th></tr><tr><td>A (given)</td><td></td></tr><tr><td>B</td><td>C</td></tr><tr><td>D</td><td>F</td></tr><tr><td>E</td><td>G</td></tr></table>		Has exactly 4 sides	Does not have exactly 4 sides	A (given)		B	C	D	F	E	G	<div>Good responses show understanding of how the table works.</div> <div>Better responses sort the shapes correctly.</div>						
Has exactly 4 sides	Does not have exactly 4 sides																	
A (given)																		
B	C																	
D	F																	
E	G																	
<div>Any correct new labels for each column with each of the seven shapes placed in its correct column, e.g.</div> <div><table><tr><th>Has 3 sides</th><th>Has more than 3 sides</th></tr><tr><td>C</td><td>A B D E F G</td></tr></table>or<table><tr><th>Has right angle(s)</th><th>Has no right angles</th></tr><tr><td>A B C F G</td><td>D E</td></tr></table></div> <div><table><tr><th>Line(s) of symmetry</th><th>No lines of symmetry</th></tr><tr><td>A, B, C, E, F</td><td>D, G</td></tr></table>or<table><tr><th>Rotation symmetry</th><th>No rotation symmetry</th></tr><tr><td>A B D</td><td>C E F G</td></tr></table></div>		Has 3 sides	Has more than 3 sides	C	A B D E F G	Has right angle(s)	Has no right angles	A B C F G	D E	Line(s) of symmetry	No lines of symmetry	A, B, C, E, F	D, G	Rotation symmetry	No rotation symmetry	A B D	C E F G	<div>Good responses use labels that could place most of the seven shapes in the table.</div> <div>Better responses ensure that labels are original and mutually exclusive, and that the shapes are then correctly placed.</div>
Has 3 sides	Has more than 3 sides																	
C	A B D E F G																	
Has right angle(s)	Has no right angles																	
A B C F G	D E																	
Line(s) of symmetry	No lines of symmetry																	
A, B, C, E, F	D, G																	
Rotation symmetry	No rotation symmetry																	
A B D	C E F G																	

Sorting into groups sheet 2 (target level 4/5)		T2L1assess3																		
Solutions		Notes																		
<p>Shapes correctly sorted, in any order within the cells, e.g.</p> <table> <tr> <th></th><th>Is a quadrilateral</th><th>not a quadrilateral</th></tr> <tr> <th>at least one right angle</th><td>A B</td><td>C F G</td></tr> <tr> <th>no right angles</th><td>D E</td><td></td></tr> </table>			Is a quadrilateral	not a quadrilateral	at least one right angle	A B	C F G	no right angles	D E		<p>Good responses show understanding of how the table works.</p> <p>Better responses sort the shapes correctly.</p>									
	Is a quadrilateral	not a quadrilateral																		
at least one right angle	A B	C F G																		
no right angles	D E																			
<p>Any correct new labels with each of the seven shapes placed in its correct cell, e.g.</p> <table> <tr> <th></th><th>Has line(s) of symmetry</th><th>No lines of symmetry</th></tr> <tr> <th>Has a reflex angle</th><td>F</td><td>G</td></tr> <tr> <th>No reflex angles</th><td>A, B, C, E</td><td>D</td></tr> </table> <p>or</p> <table> <tr> <th></th><th>More than 4 sides</th><th>4 sides or less</th></tr> <tr> <th>Rotation symmetry</th><td></td><td>A B D</td></tr> <tr> <th>No rotation symmetry</th><td>F G</td><td>C E</td></tr> </table>			Has line(s) of symmetry	No lines of symmetry	Has a reflex angle	F	G	No reflex angles	A, B, C, E	D		More than 4 sides	4 sides or less	Rotation symmetry		A B D	No rotation symmetry	F G	C E	<p>Good responses use labels that could place most of the seven shapes in the table.</p> <p>Better responses ensure that labels are original and mutually exclusive, and that the shapes are then correctly placed.</p>
	Has line(s) of symmetry	No lines of symmetry																		
Has a reflex angle	F	G																		
No reflex angles	A, B, C, E	D																		
	More than 4 sides	4 sides or less																		
Rotation symmetry		A B D																		
No rotation symmetry	F G	C E																		
Sorting into groups sheet 3 (open-ended, done by all)		T2L1assess4a																		
Solutions		Notes																		
<p>Any correct sorting diagram that allows a place for each of the seven shapes, preferably including some different properties from any used by the pupil previously</p>		<p>Good responses use diagrams, possibly based on those used previously, that involve most of the seven shapes.</p> <p>Better responses use diagrams that are different from those used previously and ensure that the shapes are then correctly sorted.</p>																		

LESSON 1: MAKING SHAPES

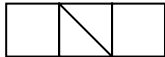

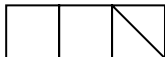
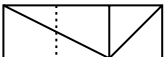

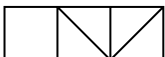
Performance indicators

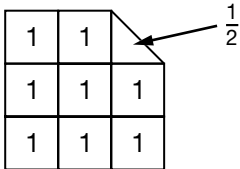

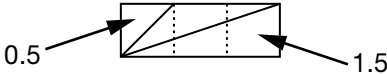
Note that performance indicators involving an element of 'Using and applying mathematics' are given in **bold**.

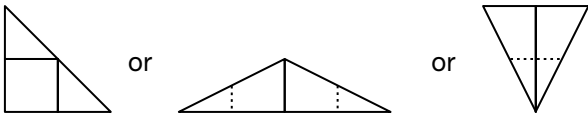
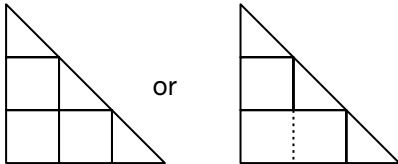
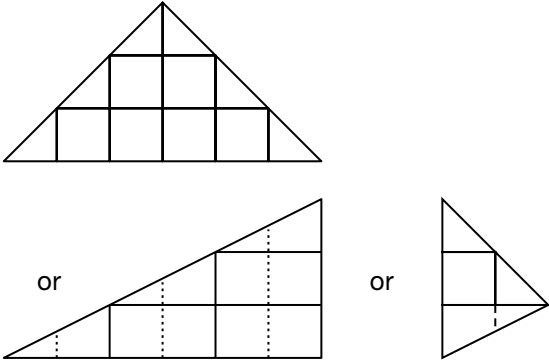
Worksheet	Performance indicators
<p><i>Name the shapes</i> (target level 3/4, but done by all) T2L1assess1</p>	<p>Level 3: At this level, pupils are generally able to:</p> <ul style="list-style-type: none"> name simple shapes, such as rectangle, triangle, hexagon or pentagon; sort shapes correctly in a table when given two simple categories; think of two new simple categories, e.g. still using numbers of sides, that would enable the shapes to be sorted. <p>However, they are less likely to be able to:</p> <ul style="list-style-type: none"> name quadrilaterals, such as parallelogram or trapezium; recognise the importance of mutually exclusive categories for sorting shapes in the tables; identify <u>different</u> properties of the shapes that can be used; sort shapes correctly in a two-way table using four categories.
<p><i>Sorting into groups sheet 1</i> (target level 3/4) T2L1assess2</p>	<p>Level 4: At this level, pupils are generally able to:</p> <ul style="list-style-type: none"> name simple shapes including different quadrilaterals; think of a few new categories that would enable the shapes to be sorted in simple tables; identify some <u>different</u> properties of the shapes that can be used, including reflective symmetry or side lengths; sort shapes correctly in a two-way table using four categories. <p>However, they are less likely to be able to:</p> <ul style="list-style-type: none"> avoid duplicating categories from previous examples or using non-geometrical properties; recognise the importance of mutually exclusive categories for sorting shapes in the tables; develop and use a sorting diagram that is different in design from any already seen.
<p><i>Sorting into groups sheet 2</i> (target level 4/5) T2L1assess3</p>	<p>Level 5: At this level, pupils are generally able to:</p> <ul style="list-style-type: none"> sort shapes correctly in a two-way table using four categories; think of four new categories that would enable the shapes to be sorted in a two-way table; identify some <u>different</u> properties of the shapes that can be used, including types of angle, such as acute, obtuse or reflex; avoid duplicating categories from previous examples or using spurious or non-geometrical properties; recognise the importance of mutually exclusive categories for sorting shapes in the tables; develop and use a simple sorting diagram that is different in design from any already seen.
<p><i>Sorting into groups sheet 3</i> (open-ended, done by all) T2L1assess4a</p>	<p>Above level 5: At these levels, pupils are generally able to:</p> <ul style="list-style-type: none"> give evidence for the performance indicators listed previously for pupils working at level 5, plus; identify some <u>different</u> properties of the shapes that can be used, including parallel lines or rotation symmetry; develop and use a fairly complex sorting diagram that is different in design from any already seen.

LESSON 2: WHAT'S THE AREA?

Solutions

Area of 3 (target level 3/4)		T2L2assess1a
Solutions		Notes
<p>A correct combination of shapes P, Q, R and S, e.g.</p> <div style="display: flex; align-items: center; justify-content: center;">  or  </div> <p>or</p> <div style="display: flex; align-items: center; justify-content: center;">  or  </div>		<p>Good responses do not necessarily mirror the order of the area sum.</p> <p>Better responses mirror the order of the area sum.</p>
Correct area sum for the given shapes, i.e. $1 + 1 + 1$		
Area of 3 (continued) (target level 3/4)		T2L2assess1b
Solutions		Notes
<p>Different arrangements of shapes P, Q, R and S with their corresponding area sums, e.g.</p> <div style="display: flex; align-items: center; justify-content: center; margin-bottom: 10px;">  <div style="margin-left: 20px;"> $2 + 1 = 3$ </div> </div> <div style="display: flex; align-items: center; justify-content: center;">  <div style="margin-left: 20px;"> $1 + \frac{1}{2} + \frac{1}{2} + \frac{1}{2} + \frac{1}{2} = 3$ </div> </div>		<p>Good responses show a few arrangements that do not necessarily mirror the order of the area sum.</p> <p>Better responses show a range of different arrangements that mirror the order of the area sum.</p>
What are the areas? sheet 1 (target level 4/5)		T2L2assess2
Solutions		Notes
(‘L’ shape)	Area = $4 \text{ (cm}^2\text{)}$	<p>Good responses work out most of the areas correctly.</p> <p>Better responses are more consistent, show how their shapes have been dissected and give correct units with their answers.</p>
(Triangle)	Area = $1.5 \text{ (cm}^2\text{)}$ or equivalent	
(Square)	Area = $8 \text{ (cm}^2\text{)}$	
(Trapezium)	Area = $3 \text{ (cm}^2\text{)}$	
(Pentagon)	Area = $5 \text{ (cm}^2\text{)}$	
(Kite)	Area = $3 \text{ (cm}^2\text{)}$	
(Quadrilateral)	Area = $2 \text{ (cm}^2\text{)}$	

Solutions	Notes
<p>Area = 8.5 (cm²) or equivalent</p> <p>A correct explanation or method to show how the area can be calculated, e.g.</p> <ul style="list-style-type: none"> • '8 shape Ps and a shape Q' •  • $3 \times 3 = 9, 9 - \frac{1}{2}$ 	<p>Good responses show the shapes correctly divided up into smaller shapes of known area.</p> <p>Better responses communicate the method used more clearly and evaluate the areas correctly.</p>
<p>Area = 8.5 (cm²) or equivalent</p> <p>A correct explanation or method to show how the area can be calculated, e.g.</p> <ul style="list-style-type: none"> • One of the methods shown previously, or similar • 'I did it the same way as the last one' with a correct method shown for the previous area 	
<p>Area = 1.5 (cm²) or equivalent</p> <p>A correct explanation or method to show how the area can be calculated, e.g.</p> <ul style="list-style-type: none"> • $3 \div 2$ •  'Divided in half' • '$\frac{1}{2} \times \text{base} \times \text{height}$' 	
<p>Area = 1 (cm²) or equivalent</p> <p>A correct explanation or method to show how the area can be calculated, e.g.</p> <ul style="list-style-type: none"> • $3 - 1\frac{1}{2} - \frac{1}{2}$ •  • '$\frac{1}{2} \times \text{base} \times \text{height}$' 	

Making triangles (extension activity)		T2L2assess4
Solutions		Notes
<p>Triangle with area 2 that can be made with the given shapes, with or without internal lines shown, e.g.</p> 		<p>Good responses show a triangle with area 2.</p> <p>Better responses use the given shapes to make a triangle with area 2.</p>
<p>Different triangle with area 2 that can be made with the given shapes, with or without internal lines shown</p>		<p>Good responses show a different triangle with the same area as the previous one.</p> <p>Better responses use the given shapes to make a triangle with area 2 that is different from the previous one.</p>
<p>Triangle with area $4\frac{1}{2}$ that can be made with the given shapes, with or without internal lines shown, e.g.</p> 		<p>Good responses show a triangle with area $4\frac{1}{2}$.</p> <p>Better responses use the given shapes to make a triangle with area $4\frac{1}{2}$.</p>
<p>Triangle with an area that is an odd number greater than 1 that can be made with the given shapes, with or without internal lines shown, e.g.</p> 		<p>Good responses show a triangle with an area that is an odd number.</p> <p>Better responses use the given shapes to make a triangle with an area that is an odd number greater than 1, possibly joining two copies of the previous triangle.</p>

LESSON 2: WHAT'S THE AREA?

Performance indicators

Note that performance indicators involving an element of 'Using and applying mathematics' are given in **bold**.

Worksheet	Performance indicators
<p><i>Area of 3</i> (target level 3/4) T2L2assess1a</p>	<p>Level 3: At this level, pupils are generally able to:</p> <ul style="list-style-type: none"> • match arrangements of shapes to corresponding area sums; • give several different arrangements of given shapes to fit a given area, possibly using shapes made of card to help them. <p>However, they are less likely to be able to:</p> <ul style="list-style-type: none"> • give arrangements of shapes that mirror the order of area sums; • use a more systematic approach to generate a range of different arrangements of given shapes and avoid duplication. <p>Level 4: At this level, pupils are generally able to:</p> <ul style="list-style-type: none"> • give arrangements of shapes that mirror the order of the area sums; • use a more systematic approach to generate a range of different arrangements of given shapes and avoid duplication; • find areas of simple shapes made up of given shapes. <p>However, they are less likely to be able to:</p> <ul style="list-style-type: none"> • find areas of more complex shapes that include a 1-by-2 right-angled triangle and half squares, e.g. the given triangle, kite or quadrilateral; • successfully show or explain correct methods for finding areas. <p>Level 5: At this level, pupils are generally able to:</p> <ul style="list-style-type: none"> • find areas of more complex shapes that include a 1-by-2 right-angled triangle and half squares, e.g. the given triangle, kite or quadrilateral; • show or explain correct methods for finding areas using counting squares and half squares and adding or subtracting; • draw triangles with simple areas, e.g. 2 or $4\frac{1}{2}$, made of given shapes. <p>However, they are less likely to be able to:</p> <ul style="list-style-type: none"> • show an understanding of the conservation of area; • show or explain correct methods for finding more complex areas using dissections or formulae, e.g. the area of the triangle with a reflex angle; • draw triangles with areas defined by more complex conditions, e.g. with an odd area greater than 1, made of given shapes. <p>Above level 5: At these levels, pupils are generally able to:</p> <ul style="list-style-type: none"> • give evidence for the performance indicators listed previously for pupils working at level 5, plus; • show an understanding of the conservation of area; • show or explain correct methods for finding more complex areas using dissections or formulae, e.g. the area of the triangle with a reflex angle; • draw triangles with areas defined by more complex conditions, e.g. with an odd area greater than 1, made of given shapes.
<p><i>Area of 3</i> (continued) (target level 3/4) T2L2assess1b</p>	
<p><i>What are the areas? sheet 1</i> (target level 4/5) T2L2assess2</p>	
<p><i>What are the areas? sheet 2</i> (target level 5) T2L2assess3</p>	
<p><i>Making triangles</i> (extension activity) T2L2assess4</p>	

Audience: Teachers
Date of issue: 06-2009
Ref: **00588-2009PDF-EN-02**

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