

Geometry

Ready to Progress

G	<u>1G-1</u> Recognise common 2D and 3D shapes presented in different orientations, and know that rectangles, triangles, cuboids and pyramids are not always similar to one another. →	<u>2G-1</u> Use precise language to describe the properties of 2D and 3D shapes, and compare shapes by reasoning about similarities and differences in properties. →	<u>3G-1</u> Recognise right angles as a property of shape or a description of a turn, and identify right angles in 2D shapes presented in different orientations.		<u>5G-1</u> Compare angles, estimate and measure angles in degrees (°) and draw angles of a given size.	
Strand	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
G					<u>5G-2</u> Compare areas and calculate the area of rectangles (including squares) using standard units.	
	<u>1G-2</u> Compose 2D and 3D shapes from smaller shapes to match an example, including manipulating shapes to place them in particular orientations. →		<u>3G-2</u> Draw polygons by joining marked points, and identify parallel and perpendicular sides. →	<u>4G-1</u> Draw polygons, specified by coordinates in the first quadrant, and translate within the first quadrant. →		<u>6G-1</u> Draw, compose, and decompose shapes according to given properties, including dimensions, angles and area, and solve related problems.
				<u>4G-2</u> Identify regular polygons, including equilateral triangles and squares, as those in which the side-lengths are equal and the angles are equal. Find the perimeter of regular and irregular polygons.		
				<u>4G-3</u> Identify line symmetry in 2D shapes presented in different orientations. Reflect shapes in a line of symmetry and complete a symmetric figure or pattern with respect to a specified line of symmetry.		

Example Assessment Questions

Taken from DFE Maths Guidance 2020

Compiled by Michelle Knott (ECM Trust & South Yorkshire Maths Hub)

Geometry

1G-1

2G-1

3G-1

5G-1

G	<u>1G-1</u> Recognise common 2D and 3D shapes presented in different orientations, and know that rectangles, triangles, cuboids and pyramids are not always similar to one another.	→	<u>2G-1</u> Use precise language to describe the properties of 2D and 3D shapes, and compare shapes by reasoning about similarities and differences in properties.	→	<u>3G-1</u> Recognise right angles as a property of shape or a description of a turn, and identify right angles in 2D shapes presented in different orientations.		<u>5G-1</u> Compare angles, estimate and measure angles in degrees (°) and draw angles of a given size.	
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Year 1 – Geometry

Ready to Progress Criterion:

1G–1 Recognise common 2D and 3D shapes presented in different orientations, and know that rectangles, triangles, cuboids and pyramids are not always similar to one another.

1G–1 Example assessment questions

1. Task: Lay out a selection of 3D shapes, then ask “Can you find 3 different cuboids?”
2. Task: Lay out a selection of 2D shapes that include triangles and plausible distractors, and other 2D shapes, then instruct pupils to choose 3 shapes as follows:
 - a triangle
 - a shape that reminds you of a triangle but is not one
 - a shape which is nothing like a triangle
3. Task: Lay out a selection of shapes, hold up one of them, and ask:
 - “I wonder whether this shape is a rectangle. What do you think?”
 - “Can you find a shape which is a rectangle?” (if the original shape is not a rectangle)
4. Task: Lay out a selection of shapes, hold up a cylinder, and instruct pupils to find another shape which “is a bit like this one”. Ask pupils to explain their reasoning.

Assessment guidance: Practical work, carried out in small groups, provides the most reliable method of assessing whether pupils have met this criterion. Teachers should assess pupils based, not just on their answers, but on the reasoning they use to reach their answers, for example, in question 4, a pupil may choose a cone because “it has a circle too”. When selecting shapes, careful attention should be paid to providing plausible distractors to allow assessment of reasoning. Pupils may use informal language, especially when discussing plausible distractors, for example, the shape presented in question 3 could be a parallelogram, which pupils could describe as being “a bit like a rectangle, but squashed.” Ask pupils to explain why they chose that one.

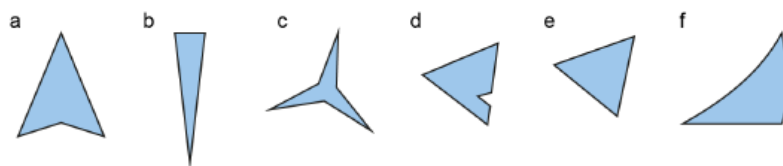


Figure 36: distinguishing triangles from plausible distractors

Pupils need a lot of experience in exploring and discussing common 2D and 3D shapes. In the process, they should learn to recognise and name, at a minimum:

- rectangles (including squares), circles, and triangles
- cuboids (including cubes), cylinders, spheres and pyramids

Year 2 – Geometry

Ready to Progress Criterion:

2G–1 Use precise language to describe the properties of 2D and 3D shapes, and compare shapes by reasoning about similarities and differences in properties.

2G–1 Example assessment questions

1. How many sides does this shape have? What is the name of this shape?



2. Sketch a hexagon. Try to think of a hexagon that will look different to those drawn by other pupils.
3. Task: Lay out a selection of 3D shapes, then instruct pupils to find a shape that has:
- a. fewer than 5 edges
 - b. more than 5 faces
 - c. exactly 1 vertex
 - d. all faces the same shape
 - e. no flat faces
 - f. no straight edges
 - g. both a square face and a triangular face
- 4.



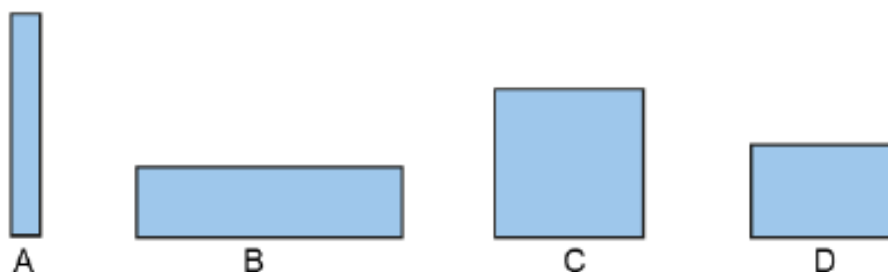
- a. Circle all of the octagons.
 - b. Explain why the shapes you have *not* circled are *not* octagons.
5. Task: Present pupils with a cylinder and a cone (the 3D shapes rather than pictures), then instruct pupils to:
- a. describe something that is the same about the 2 shapes
 - b. describe something that is different about the 2 shapes
6. Task: Lay out a selection of 3D shapes, then ask pupils to identify all of the shapes that have a square face.

Year 2 – Geometry (cont.)

Ready to Progress Criterion:

2G–1 Use precise language to describe the properties of 2D and 3D shapes, and compare shapes by reasoning about similarities and differences in properties.

7. Here are 4 rectangles.

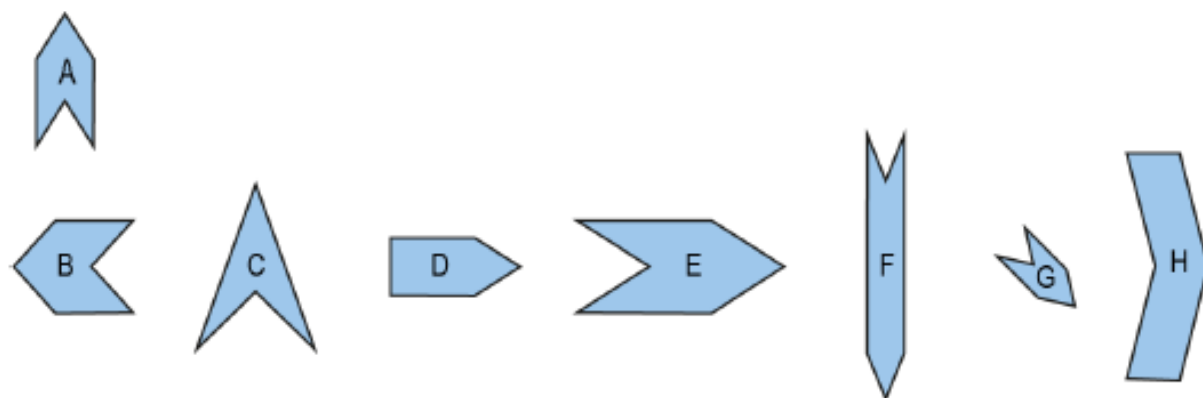


Which do you think is the largest rectangle?

Which do you think is the smallest rectangle?

If each rectangle was a slice of your favourite food, which one would you choose to have?

8. Which of the shapes B to H are exactly the same shape as shape A, but just a different size?



Assessment guidance: Practical work, carried out in small groups, should form part of the assessment of this criterion. For question 3, pupils must be able to name common 3D shapes, but do not need to be able to name every shape they might select to fulfil the required criteria. For questions 7 and 8, assessment should be discussion based – pupils need not necessarily provide a ‘correct’ answer, but should demonstrate an emerging sense of the size and shape of the space within 2D shapes. For question 8, for example, some pupils may say that shape F is the same shape as A but just stretched, and some pupils may say that F is a different shape to A because F is “long and thin” and A is “shorter and fatter”: both of these answers would show that pupils are developing awareness of the overall shape rather than just attending to the number of sides and vertices.

Year 3 – Geometry

Ready to Progress Criterion:

3G–1 Recognise right angles as a property of shape or a description of a turn, and identify right angles in 2D shapes presented in different orientations.

3G–1 Example assessment questions

1. Here is a map of a treasure island.



a. Follow the instructions and say where you end up. Each time, start at the camp, facing north.

- Go forwards 3 squares.
Make a quarter turn clockwise.
Go forwards 2 squares.
Make a quarter turn anticlockwise.
Go forwards 2 squares.
Where are you?

- Make a three-quarter turn clockwise.
Go forward 3 squares.
Make a quarter turn anticlockwise.
Go forward 1 square.
Where are you?

b. Start at the camp, facing North. Write some instructions, like the ones above, to get to the treasure.

2. Draw an irregular hexagon with one right angle on this grid.

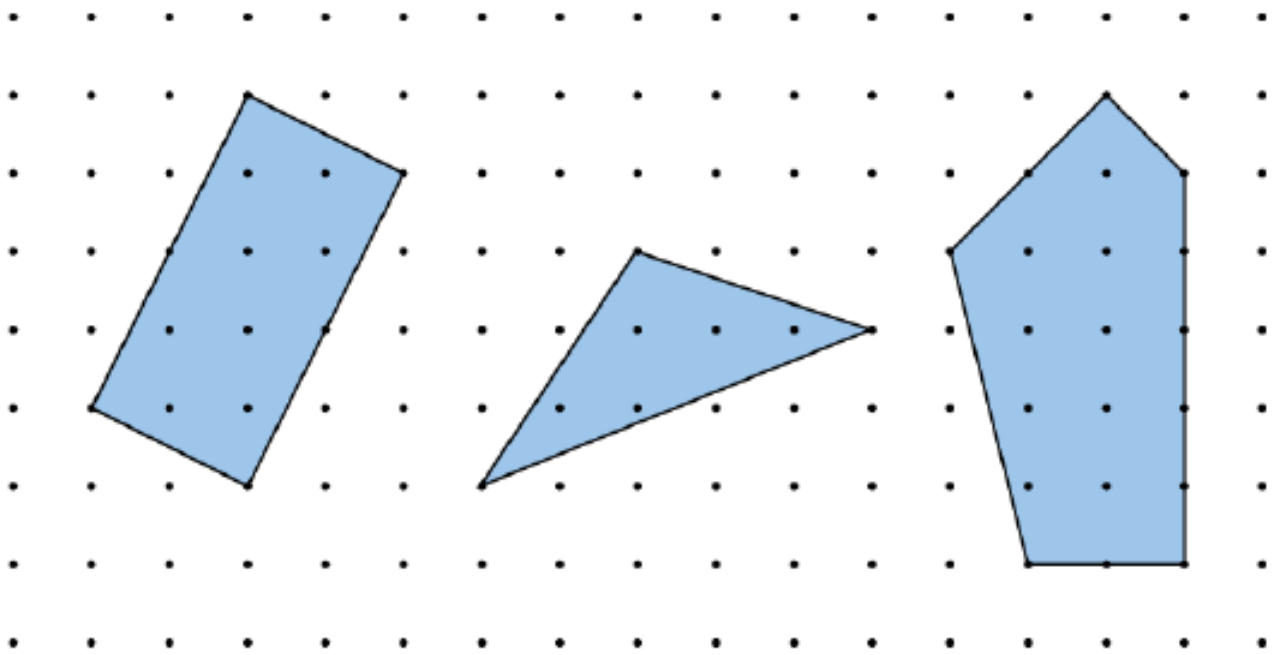


Year 3 – Geometry (Cont.)

Ready to Progress Criterion:

3G–1 Recognise right angles as a property of shape or a description of a turn, and identify right angles in 2D shapes presented in different orientations.

3. Mark all of the right angles in these shapes. Use a right-angle checker to help you.



Year 5 – Geometry

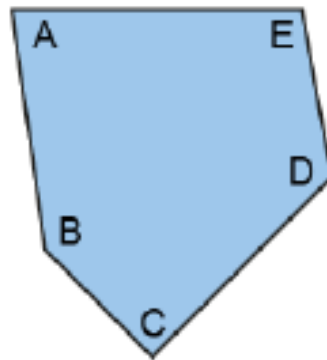
Ready to Progress Criterion:

5G–1 Compare angles, estimate and measure angles in degrees ($^{\circ}$) and draw angles of a given size.

5G–1 Example assessment questions

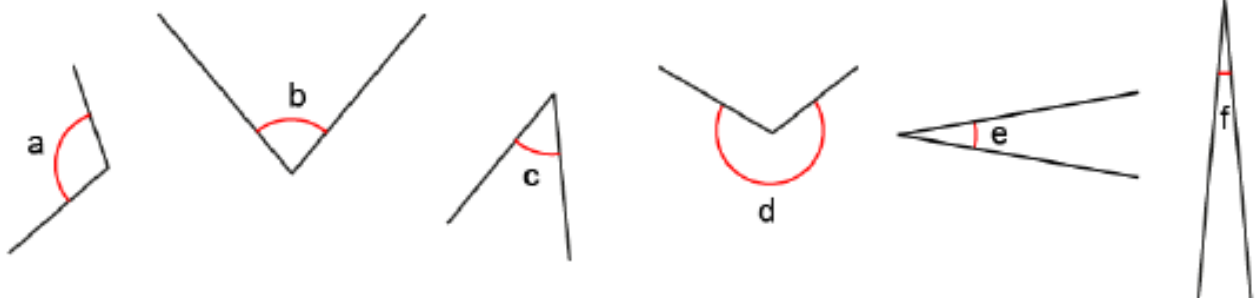
Do not use a protractor for questions 1, 2 and 3.

1. Here is an irregular pentagon.



- Which is the largest angle in this pentagon?
- Which is the smallest angle?
- Which angle is 100° ?

2. Here are 6 angles.



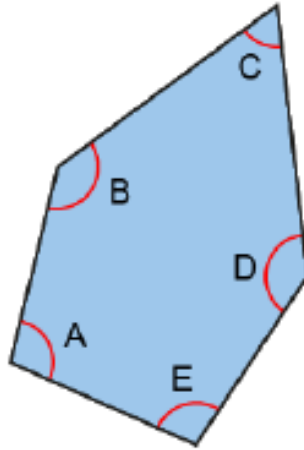
- Which is the largest angle?
- Which is the smallest angle?
- Which angle is 45° ?

Year 5 – Geometry (Cont.)

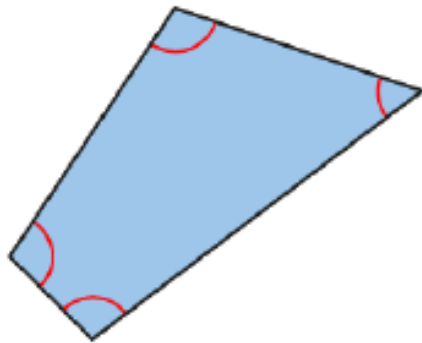
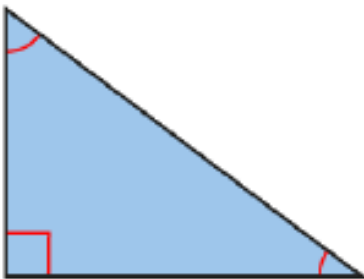
Ready to Progress Criterion:

5G–1 Compare angles, estimate and measure angles in degrees ($^{\circ}$) and draw angles of a given size.

3. This pentagon has a line of symmetry. Estimate the size of each angle.



4. Measure and label each of the angles in these shapes using a protractor.



5. a. Draw an angle of 68° .
b. Draw an angle of 103° .

Geometry

5G-2

				5G-2 Compare areas and calculate the area of rectangles (including squares) using standard units.	
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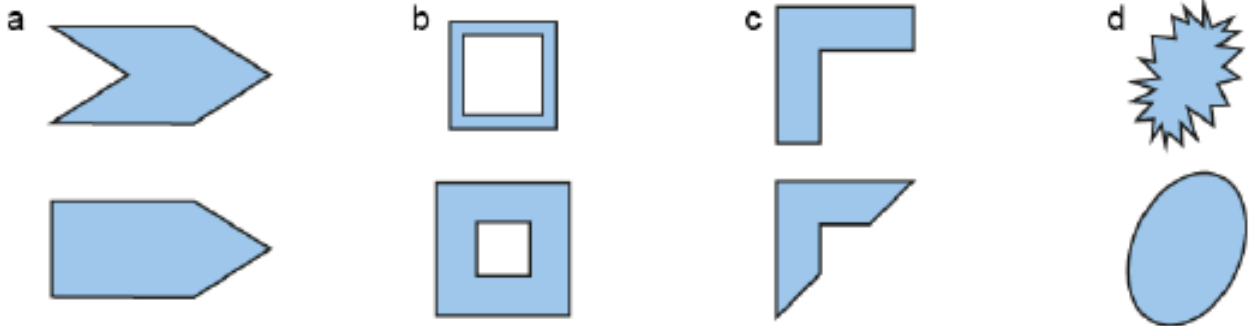
Year 5 – Geometry

Ready to Progress Criterion:

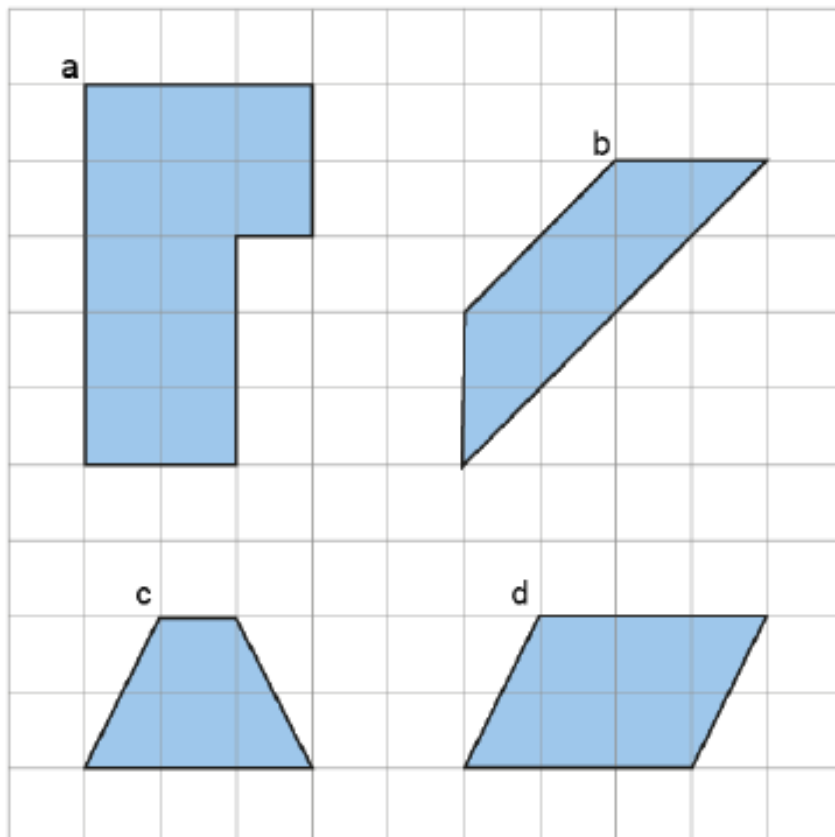
5G–2 Compare areas and calculate the area of rectangles (including squares) using standard units.

5G–2 Example assessment questions

1. For each pair of shapes, tick the shape with the larger shaded area.



2. Find the area of these shapes drawn on a square-centimetre grid.



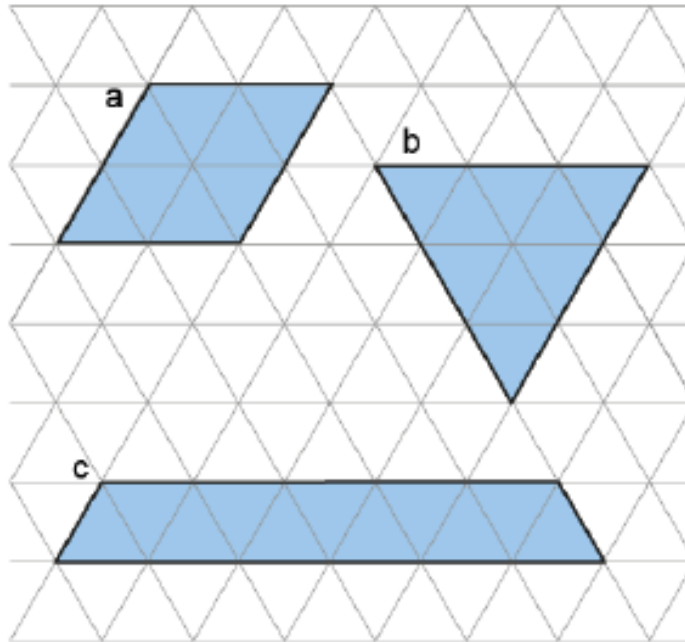
Drawn to actual size.

Year 5 – Geometry (Cont.)

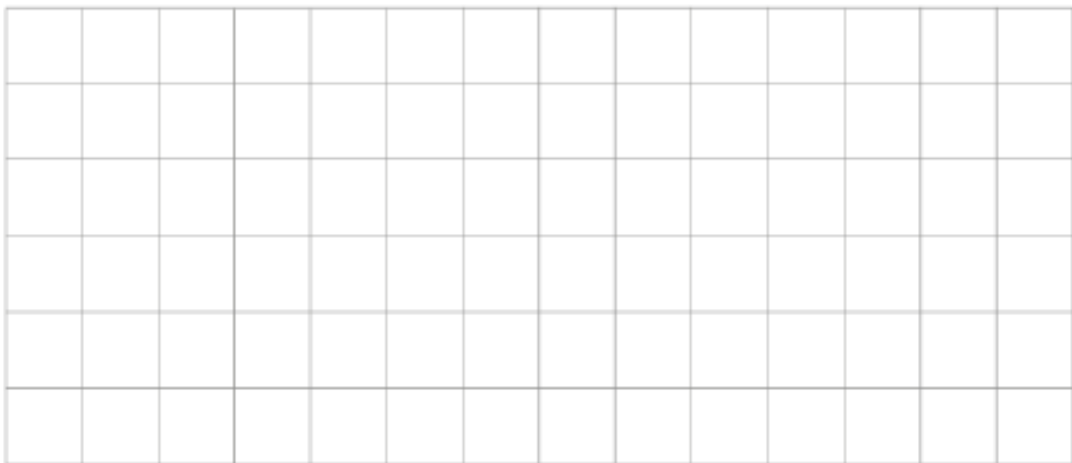
Ready to Progress Criterion:

5G–2 Compare areas and calculate the area of rectangles (including squares) using standard units.

3. Here are three shapes on a triangular grid. Put the shapes in order from smallest to largest according to their area.



4. a. Draw a rectangle with an area of 12cm^2 on this square-centimetre grid.
b. Draw a hexagon with an area of 12cm^2 on this square-centimetre grid.



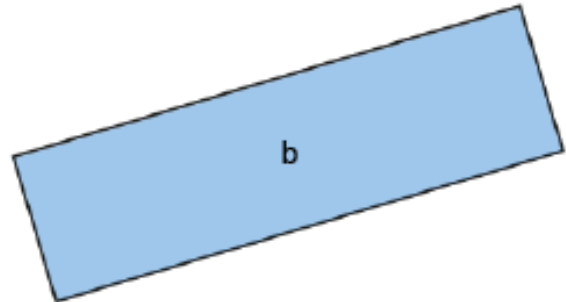
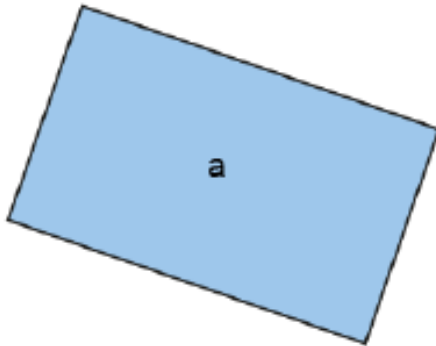
Drawn to actual size.

Year 5 – Geometry (Cont.)

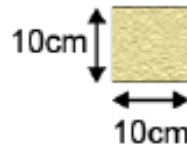
Ready to Progress Criterion:

5G–2 Compare areas and calculate the area of rectangles (including squares) using standard units.

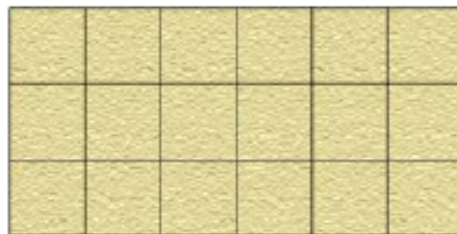
5. Find the area of each of these rectangles.



6. Leila is putting some tiles on the wall behind her kitchen sink. Each tile is square, with sides equal to 10cm.



Here is the area she has tiled so far.



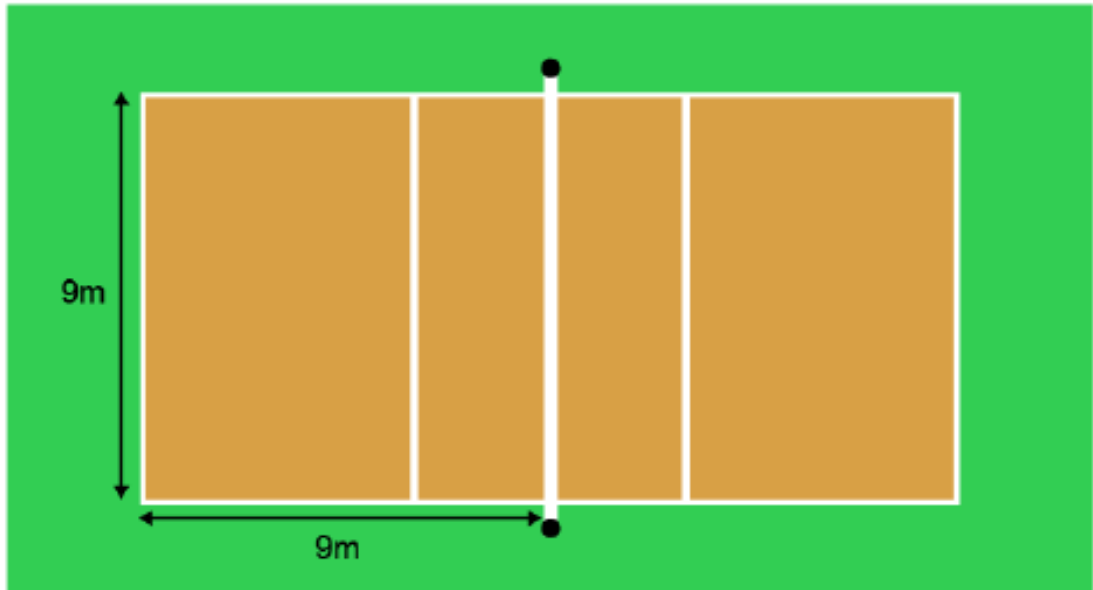
If Leila adds one more row of tiles on top of these ones, what is the total area she will have tiled?

Year 5 – Geometry (Cont.)

Ready to Progress Criterion:

5G–2 Compare areas and calculate the area of rectangles (including squares) using standard units.

7. Each half of a volleyball court is a $9\text{m} \times 9\text{m}$ square. What is the total area of a volleyball court?



Drawn to scale.

8. Estimate the area of your classroom floor.

Geometry

1G-2

3G-2

4G-1

6G-1

1G-2 Compose 2D and 3D shapes from smaller shapes to match an example, including manipulating shapes to place them in particular orientations.

→

3G-2 Draw polygons by joining marked points, and identify parallel and perpendicular sides.

→

4G-1 Draw polygons, specified by coordinates in the first quadrant, and translate within the first quadrant.

→

6G-1 Draw, compose, and decompose shapes according to given properties, including dimensions, angles and area, and solve related problems.

Year 1 – Geometry

Ready to Progress Criterion:

1G–2 Compose 2D and 3D shapes from smaller shapes to match an example, including manipulating shapes to place them in particular orientations.

1G–2 Example assessment questions

1. Task: Give each pupil some multilink cubes. Present pupils with a shape composed of multilink cubes and ask them to copy it.
2. Task: Give each pupils some pattern block pieces. Present pupils with a pattern block picture and ask them to copy it.
3. Task: Give each pupil some building blocks. Build a tower from different-shaped building blocks, then ask pupils to copy it .
4. Task: Give each pupil a set of identical 2D shapes (for example, equilateral triangles of equal size). Make a pattern from the set of identical shapes and ask pupils to copy it.

Assessment guidance: Practical work, carried out in small groups, provides the most reliable method of assessing whether pupils have met this criterion. Teachers should carefully watch pupils to assess their ability to rotate shapes to match those within the patterns, pictures and arrangements, and to place shapes relative to other shapes.



Figure 37: example pattern block picture



Figure 38: example tangram picture

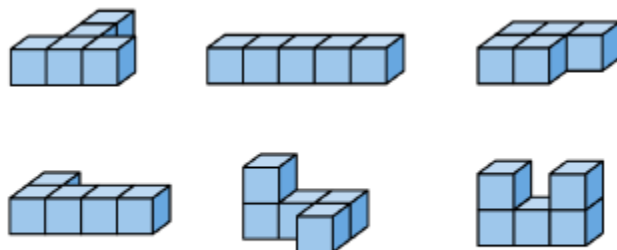


Figure 39: example compound 3D shapes composed of cubes

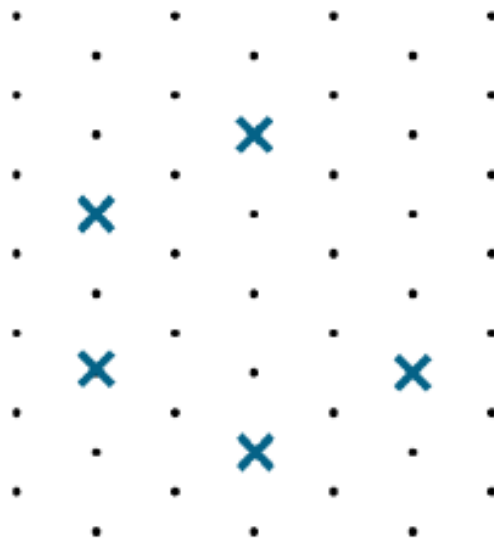
Year 3 – Geometry

Ready to Progress Criterion:

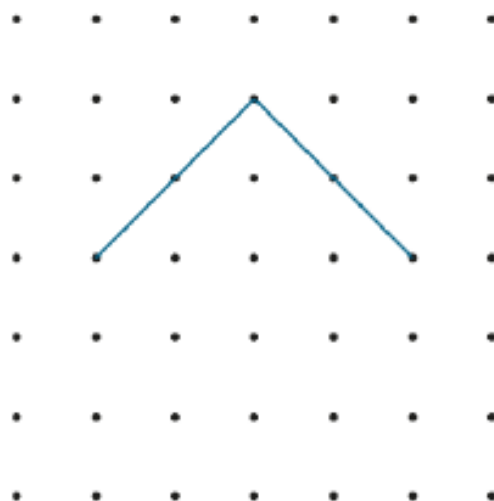
3G–2 Draw polygons by joining marked points, and identify parallel and perpendicular sides.

3G–2 Example assessment questions

1. Task: Provide each pupil with 2 trapezium pieces from a pattern block set. Then ask them to make 3 different shapes by joining the pieces and discuss the properties of each shape they make.
2. Here are 5 vertices of a regular hexagon. Mark the sixth vertex and join the points to draw the hexagon.



3. Here are 2 sides of a square. Complete the square.



Year 3 – Geometry Cont.)

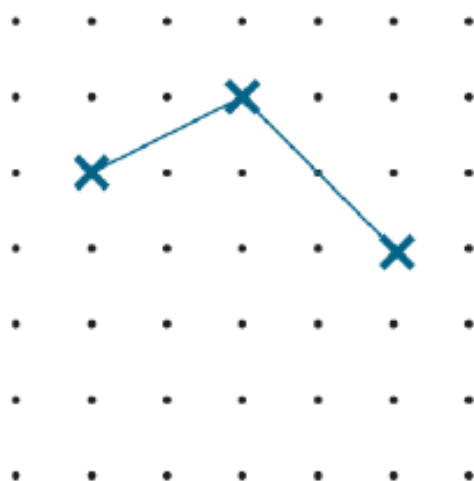
Ready to Progress Criterion:

3G–2 Draw polygons by joining marked points, and identify parallel and perpendicular sides.

4. Look at these 5 quadrilaterals. Mark all the pairs of parallel sides. Hint: you can extend sides to help you.



5. Mark the missing vertex of this quadrilateral so that 2 of the sides are perpendicular.



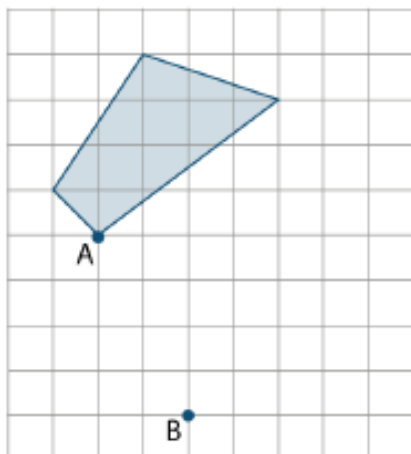
Year 4 – Geometry

Ready to Progress Criterion:

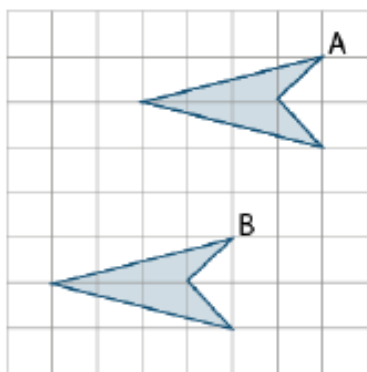
4G–1 Draw polygons, specified by coordinates in the first quadrant, and translate within the first quadrant.

4G–1 Example assessment questions

1. Translate the quadrilateral so that point A moves to point B.

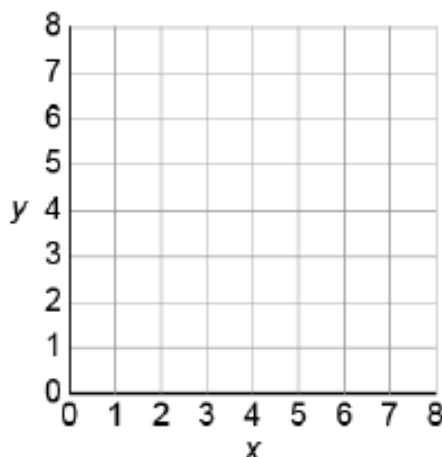


2. A kite has been translated from position A to position B. Describe the translation.



3. Mark the points, and join them to make a square.

(3,1) (2,4) (5,5) (6,2)

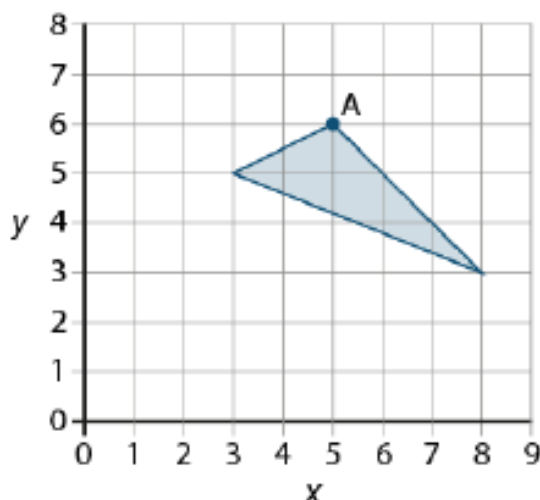


Year 4 – Geometry (Cont.)

Ready to Progress Criterion:

4G–1 Draw polygons, specified by coordinates in the first quadrant, and translate within the first quadrant.

4. This triangle is translated so that point A moves to (4, 3). Draw the shape in its new position.



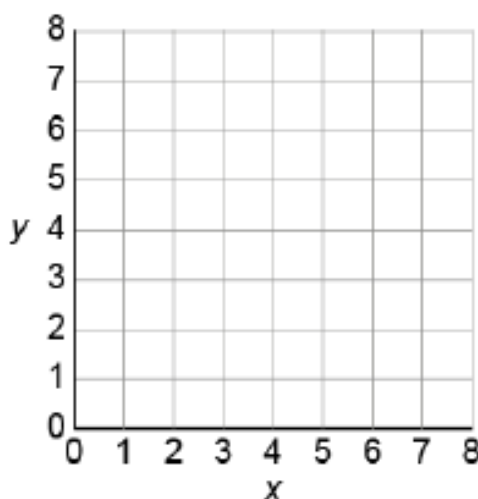
5. Mark the following points, and join them to make a polygon.

(5, 0)

(3, 1)

(5, 2)

(7, 1)



- What is the name of the polygon that you have drawn?
- Translate the polygon you have just drawn left 2 and up 3. What are the coordinates of the vertices of this new polygon?

Year 6 – Geometry

Ready to Progress Criterion:

6G–1 Draw, compose, and decompose shapes according to given properties, including dimensions, angles and area, and solve related problems.

Pupils should be able to draw a named shape to meet a given measurement criterion, for example:

- drawing a rectangle, on squared-centimetre paper, with a perimeter of 14cm (Example 1 below)
- drawing a pentagon, on squared-centimetre paper, with an area of 10cm^2 (Example 2 below)
- drawing a triangle at actual size, based on a sketch with labelled lengths and angles (see [6G–1](#), question 5)

Example 1

Task: draw a rectangle with a perimeter of 14cm.

Example solution:

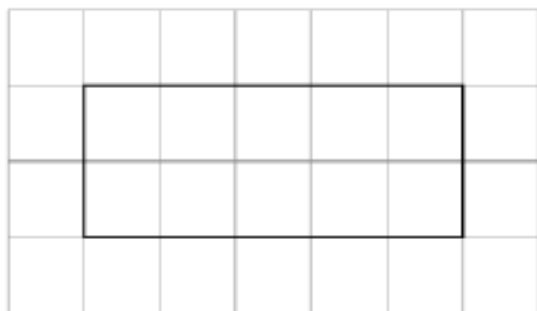


Figure 233: a 5cm by 2cm rectangle on a squared-centimetre grid

Drawn to actual size.

Example 2

Task: draw a pentagon with an area of 10cm^2 .

Example solution:

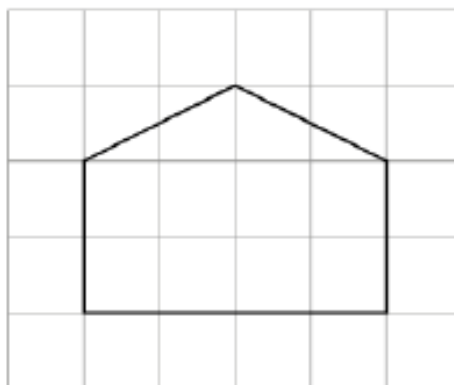


Figure 234: an irregular pentagon with an area of 10cm^2

Drawn to actual size.

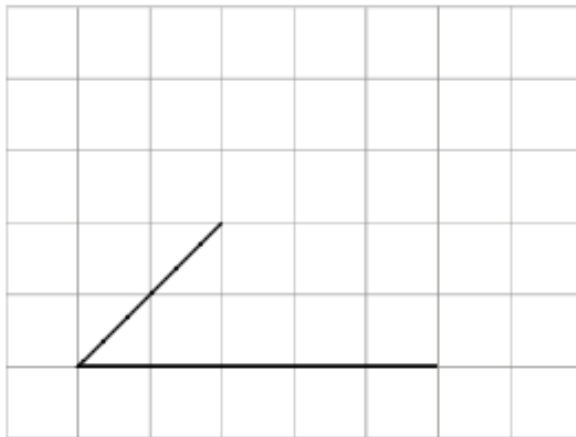
Year 6 – Geometry (Cont.)

Ready to Progress Criterion:

6G–1 Draw, compose, and decompose shapes according to given properties, including dimensions, angles and area, and solve related problems.

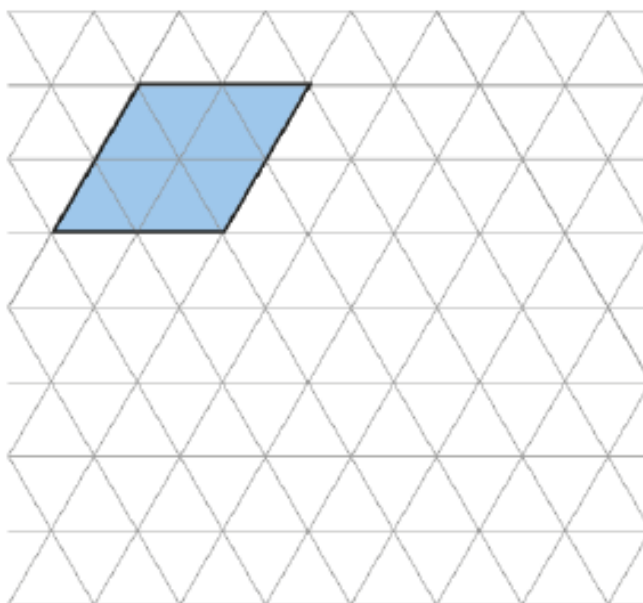
6G–1 Example assessment questions

1. Lois has started drawing a shape on this squared-centimetre grid. Complete her shape so that it has an area of 14cm^2 .



Drawn to actual size

2. Here is a rhombus on a triangular grid. Draw a different shape with the same area on the grid.

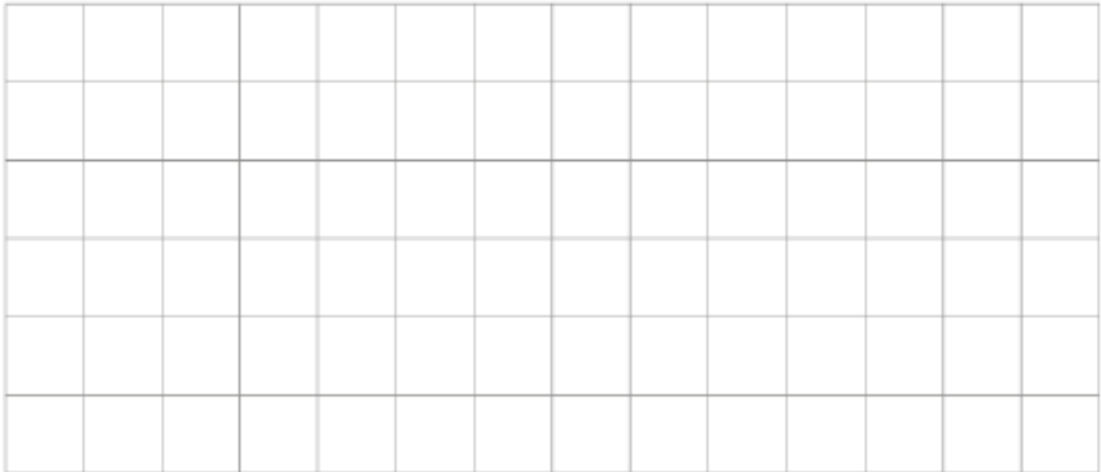


Year 6 – Geometry (Cont.)

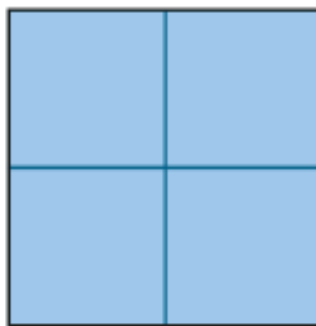
Ready to Progress Criterion:

6G–1 Draw, compose, and decompose shapes according to given properties, including dimensions, angles and area, and solve related problems.

3. Draw a hexagon on this squared-centimetre grid. Include one side of length 4cm and one side of length 3cm.



4. Here is a square made from 4 smaller squares. The area of the large square is 64cm^2 . What is the length of 1 side of each small square?

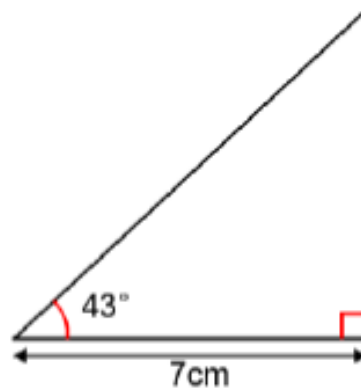


Year 6 – Geometry (Cont.)

Ready to Progress Criterion:

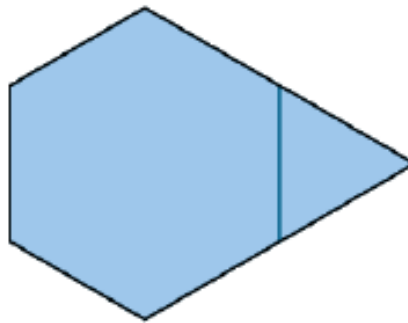
6G–1 Draw, compose, and decompose shapes according to given properties, including dimensions, angles and area, and solve related problems.

5. Here is a sketch of a triangle. It is not drawn to scale. Draw the full-size triangle accurately. Use an angle measurer (protractor) and a ruler.



Not drawn to scale

6. Here is a picture of a pentagon made from a regular hexagon and an equilateral triangle. The perimeter of the triangle is 24cm. What is the perimeter of the pentagon?



Drawn to scale, not actual size

Geometry

4G-2

4G-3

			<u>4G-2</u> Identify regular polygons, including equilateral triangles and squares, as those in which the side-lengths are equal and the angles are equal. Find the perimeter of regular and irregular polygons.		
			<u>4G-3</u> Identify line symmetry in 2D shapes presented in different orientations. Reflect shapes in a line of symmetry and complete a symmetric figure or pattern with respect to a specified line of symmetry.		

Year 4 – Geometry

Ready to Progress Criterion:

4G–2 Identify regular polygons, including equilateral triangles and squares, as those in which the side-lengths are equal and the angles are equal. Find the perimeter of regular and irregular polygons.

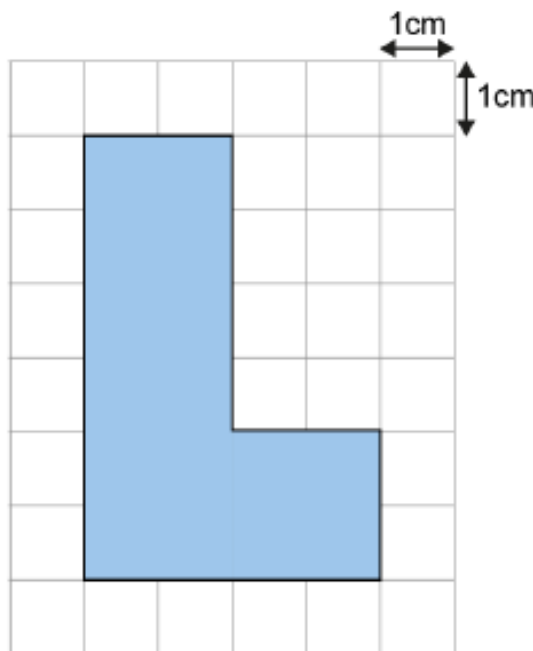
4G–2 Example assessment questions

1. Taro uses some 8cm sticks to make these shapes. Name each shape and find its perimeter.



Drawn to scale.

2. What is the perimeter of this shape?



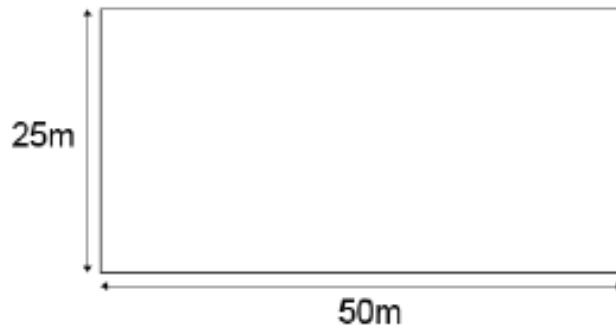
Drawn to actual size.

Year 4 – Geometry (Cont.)

Ready to Progress Criterion:

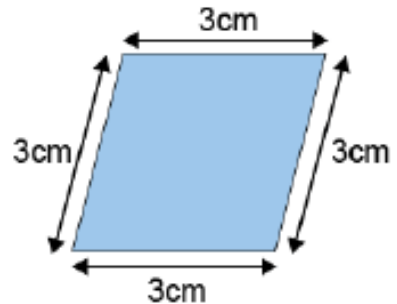
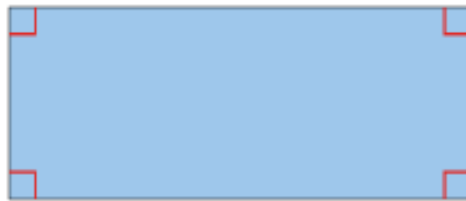
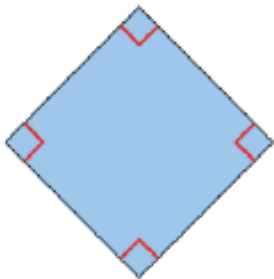
4G–2 Identify regular polygons, including equilateral triangles and squares, as those in which the side-lengths are equal and the angles are equal. Find the perimeter of regular and irregular polygons.

3. Sarah draws a rhombus with a perimeter of 36cm. What is the length of each side?
4. Here is a plan of a school playground. How many metres of fencing is needed to put a fence around the perimeter?



Drawn to scale.

5. Name each shape and say whether it is regular or irregular. Explain your reasons.



Year 4 – Geometry

Ready to Progress Criterion:

4G–3 Identify line symmetry in 2D shapes presented in different orientations. Reflect shapes in a line of symmetry and complete a symmetric figure or pattern with respect to a specified line of symmetry.

Pupils need to be able to identify line symmetry regardless of the orientation a shape is presented in, including cases where the line of symmetry is neither a horizontal nor a vertical line.

For the second part of this criterion, pupils must be able to reflect shapes in a line of symmetry, both where the line dissects the original shape (see [4G–3 Example assessment questions](#)) and where it does not, and complete symmetrical patterns.

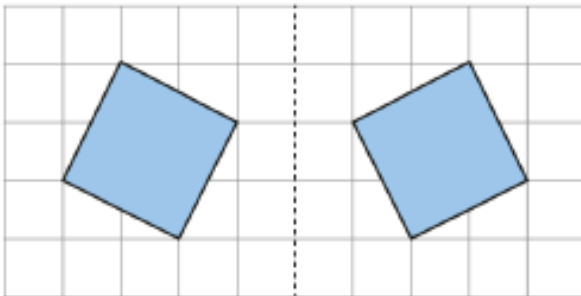


Figure 148: reflecting a shape in a line of symmetry

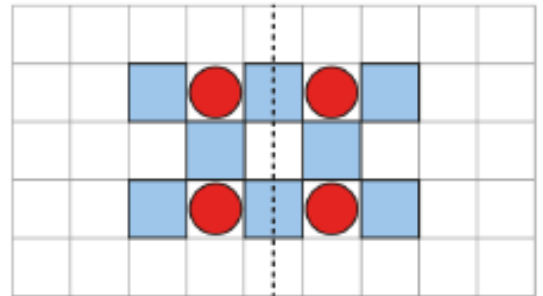
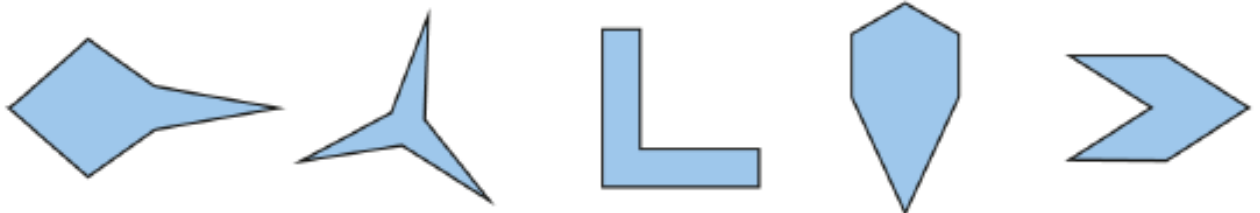


Figure 149: a symmetrical pattern

4G–3 Example assessment questions

1. Draw one or more lines of reflection symmetry in each of these irregular hexagons.

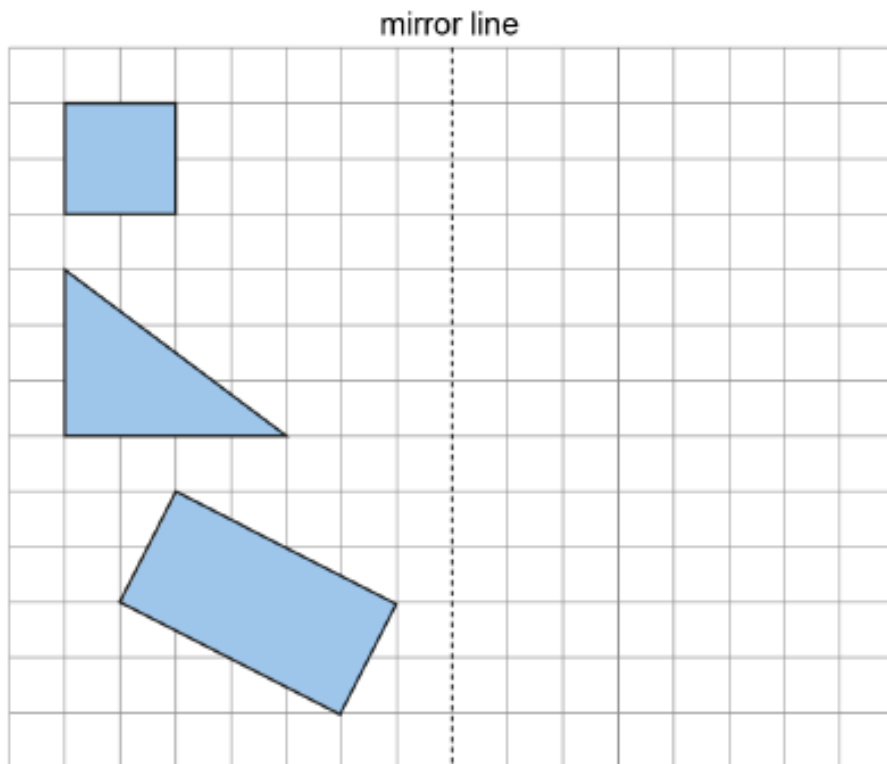


Year 4 – Geometry (Cont.)

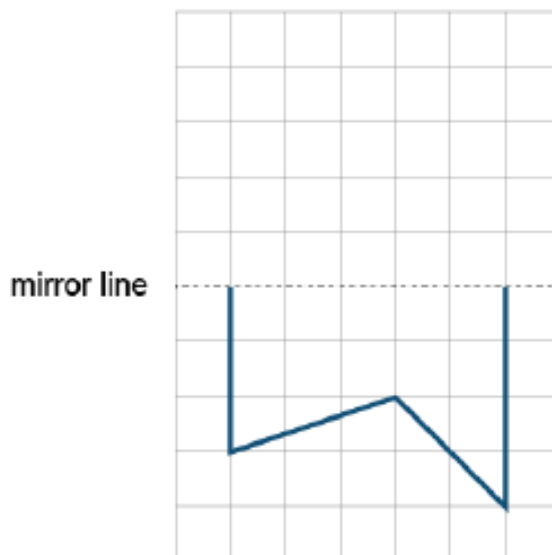
Ready to Progress Criterion:

4G–3 Identify line symmetry in 2D shapes presented in different orientations. Reflect shapes in a line of symmetry and complete a symmetric figure or pattern with respect to a specified line of symmetry.

2. Reflect the three shapes in the mirror line.



3. Complete the shape by reflecting it in the mirror line.



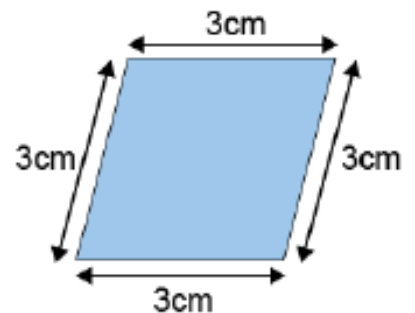
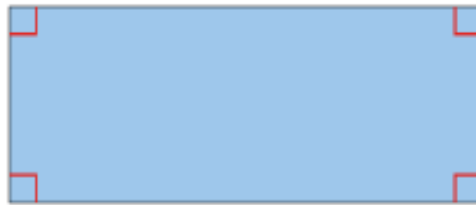
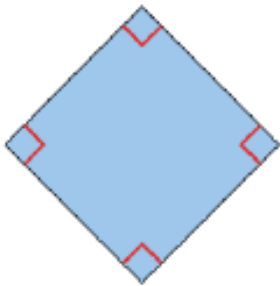
Name the polygon that you have completed.

Year 4 – Geometry (Cont.)

Ready to Progress Criterion:

4G–3 Identify line symmetry in 2D shapes presented in different orientations. Reflect shapes in a line of symmetry and complete a symmetric figure or pattern with respect to a specified line of symmetry.

4. Draw a line of symmetry on each shape. Are you able to draw more than one line of symmetry on any of the shapes?



5. Complete the symmetrical pattern.

