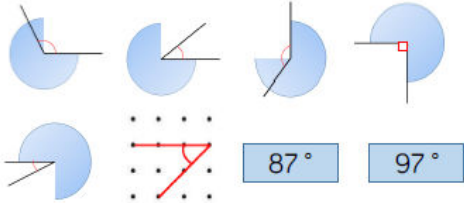


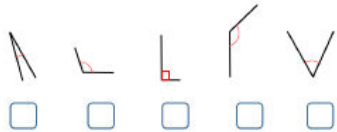
<p><b>Links to prior learning/ objectives</b></p> <p>~ Place value of ones, tens, hundreds and thousands.          ~ Understanding of time and experience of telling the time to the nearest minute.          ~ Knowledge of basic shapes and their properties.          ~ Knowledge of angles and being able to identify obtuse, acute and right angles.          ~ Understanding of comparison and ordering.</p> <p>Children have covered the entire Year 4 curriculum- focus on key areas that they have found difficult. Especially number and fractions.</p>	<p><b>Resources</b></p> <p>coordinate grids, 2-D shapes, angles, tracing paper.</p> <p><b>Mastery:</b>          (where to find some resources)</p> <ul style="list-style-type: none"> <li>• Teaching for Mastery</li> <li>• White Rose <b>New and old documents</b></li> <li>• Mastery maths stickers</li> <li>• Nrich (curriculum mapping)</li> </ul>	<p><b>Vocabulary:</b></p> <p>2-D shapes, symmetry, vertex, vertices, sides, orientations, symmetrical, pattern, shapes, figure, Acute, obtuse, right, angles, compare, order, position, coordinates, quadrant, movement, left, right, up, down, Plot, points, polygons, properties, lengths, sides, complete, missing.</p>
<p><b>Objectives and Teaching</b></p>		
<p><b>Barriers to ARE (misconceptions)</b></p> <p><b>Week 1</b></p> <p>Children may not recognise right angles by eye.          Children may not recognise a right angle in different orientations.          Children may not be able to compare angles on sight.</p>	<p>Identify acute and obtuse angles and compare and order angles up to two right angles by size.</p> <ul style="list-style-type: none"> <li>• To know how to identify acute and obtuse angles.</li> <li>• To develop the skill of identifying angles.</li> <li>• To know how to order and compare angles.</li> <li>• To develop the skill of ordering and comparing fractions.              (You may wish to have the third lesson as ordering and the fourth as comparing and push for reasoning challenges in each session?)</li> </ul>	
<p><b>Fluency</b></p>	<p><b>Reasoning</b></p>	<p><b>Problem Solving</b></p>

A right angle is \_\_\_\_\_ degrees.  
Acute angles are \_\_\_\_\_ than a right angle.  
Obtuse angles are \_\_\_\_\_ than a right angle.

Sort the angles into acute, obtuse and right angles.



Label the angles. O for obtuse, A for acute and R for right angle.



Circle the largest angle in each shape or diagram.



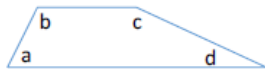
Can you label each angle as acute, obtuse or right angle?

Order the angles from largest to smallest.

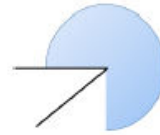


Can you draw a larger obtuse angle?  
Can you draw a smaller acute angle?

Order the angles in the shape from smallest to largest.  
Complete the sentences.



Angle \_\_\_\_\_ is smaller than angle \_\_\_\_\_.  
Angle \_\_\_\_\_ is larger than angle \_\_\_\_\_.



I know the angle is not obtuse.



Max

I know the angle is acute.



Tina

I think the angle is roughly 45°.



Jess

Who do you agree with? Explain why.

Jannat looks at the analogue clock four times during the morning.

The times she sees are:

Eight o'clock

Five past 11

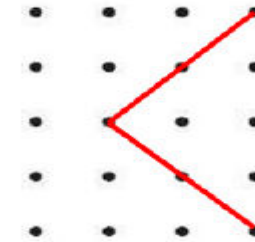
Twenty to eleven

08:15

Draw the times on the clock faces and find the angles less than 180 degrees.



Order the angles from greatest to smallest.



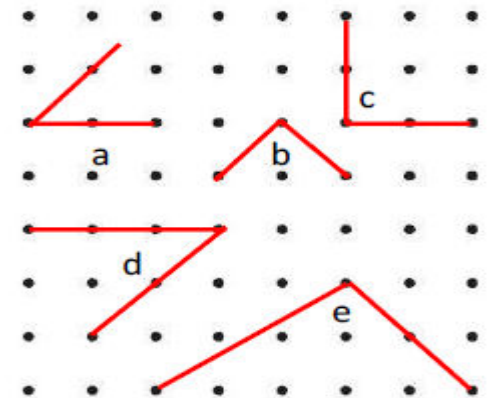
Is the angle acute, obtuse or a right angle?  
Can you prove it?

Find the total number of degrees of the largest acute angle and the smallest obtuse angle:

12° 98° 87° 179° 90° 5°

Here are five angles.

There are two sets of identical sized angles and one odd one out.  
Which angle is the odd one out?  
Prove it.



Week 2

Compare and classify geometric shapes, including quadrilaterals and triangles, based on their properties and sizes.

- To know the properties of different triangles.

Summer 2 Year 4

Children may struggle to recall the names of 2-D shapes. They may confuse or not remember terminology associated to shape.

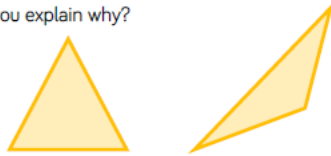
- To understand the different properties of the types of triangles.
- To know the properties of quadrilaterals.
- To understand the different properties of quadrilaterals.

**Fluency**

Label each of these triangles isosceles, scalene or equilateral.

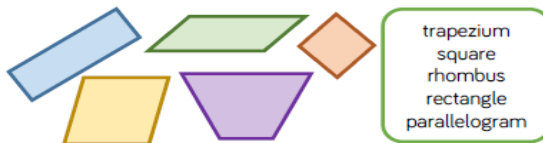


Look at these Triangles.  
What is the same and what is different?  
Can you explain why?



- Using a ruler draw:
- An isosceles triangle
  - A scalene triangle
  - An equilateral triangle

Label the quadrilaterals using the word bank.



Use the criteria to describe the shapes.

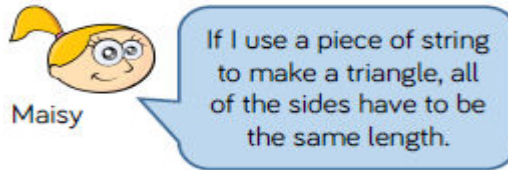


- four sides
- 2 pairs of parallel sides
- four equal sides
- polygon
- 1 pair of parallel sides
- 4 right angles

Which criteria can be used more than once?  
Which shapes share the same criteria?  
Can you add any more properties to the shapes?

- Draw and label;
- a rhombus.
  - a parallelogram.
  - 3 different trapeziums

**Reasoning**



Investigate whether Maisy is correct.

- Draw two more sides to create:
- An equilateral triangle
  - A scalene triangle
  - An isosceles triangle



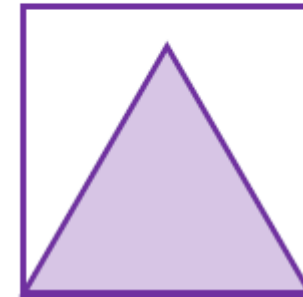
Complete each of the boxes in a table with a different quadrilateral.

	4 equal sides	2 pairs of equal sides	1 pair of parallel sides
4 right angles			
No right angles			

Which box cannot be completed?  
Explain why.

**Problem Solving**

Here is a square.  
Inside the square is an equilateral triangle.  
The perimeter of the square is 60 cm.  
Find the perimeter of the triangle.



You will need:  
4 centimetre straws  
6 centimetre straws

How many different quadrilaterals can you make using the straws?

Calculate the perimeter of each shape.

**Week 3**

Children may not understand what symmetry is.

Identify lines of symmetry in 2-D shapes presented in different orientations

Children may struggle to visualise where a shape is the same on both sides.  
Children may not be accurate or may only find one line of symmetry.  
Children may struggle to use strategies such as tracing paper or counting using the background to accurately complete a symmetrical figure.

Complete a simple symmetric figure with respect to a specific line of symmetry. (Horizontal, vertical, diagonal lines of symmetry- also vary the type of background used- isometric paper, squared etc).

- To know how to identify a line of symmetry.
- To develop the skill of identifying lines of symmetry.
- To know how to complete a symmetrical figure.
- To develop the skill of creating symmetrical figures

**Fluency**

Find and draw the lines of symmetry in these shapes.



Sort the shapes into the table.

	1 line of symmetry	More than 1 line of symmetry
Up to 4 sides		
More than 4 sides		

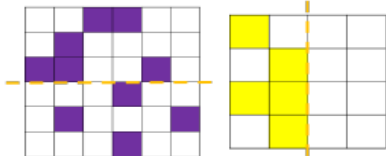


Draw the lines of symmetry in these shapes.

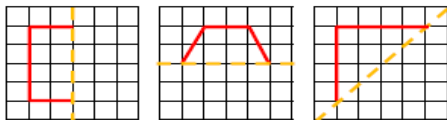


What do you notice?

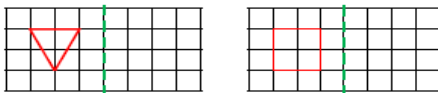
Colour the squares to make the pattern symmetrical.



Complete the shapes according to the line of symmetry.



Reflect the shapes in the mirror line.



**Reasoning**



Josef

A triangle has 1 line of symmetry unless you change the orientation.

Is Josef correct? Prove it.

**Always, Sometimes, Never.**

A four-sided shape has four lines of symmetry.



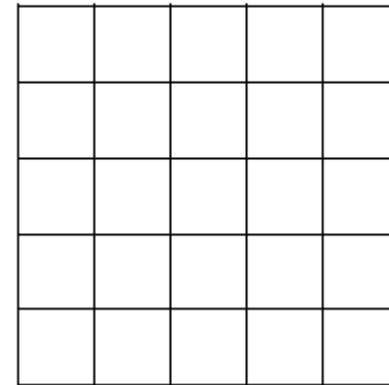
Anusha

When given half of a symmetrical shape I know the original shape will have double the amount of sides.

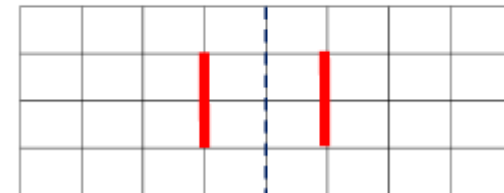
Do you agree with Anusha? Convince me.

**Problem Solving**

How many symmetrical shapes can you make by colouring in a maximum of 6 squares?



How many different symmetrical shapes can you create using the given sides?



**Week 4**

Children may read coordinate in reverse.  
Children may not accurately count when identify and recording coordinates.  
Children may mix up left and right or not know their left and right.  
Children may struggle to follow two steps when moving a shape.

Describe positions on a 2-D grid as coordinates in the first quadrant.  
Plot specified points and draw sides to complete a given polygon.

- To know how to describe position using co-ordinates.
- To develop the skill of describing position using co-ordinates.
- To know how to plot shapes on a co-ordinate grid.
- To develop the skill of finding missing information of shapes on a co-ordinate grid.

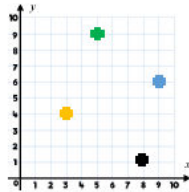
**Fluency**

Create a large grid using chalk/masking tape. Give the children co-ordinates to physically stand at. Encourage the children to move along the axis in the order they read them.

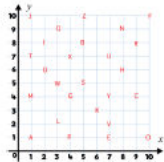
Write the co-ordinates for the shapes shown.

Yellow cross (2, 4)    Black cross (8, 1)

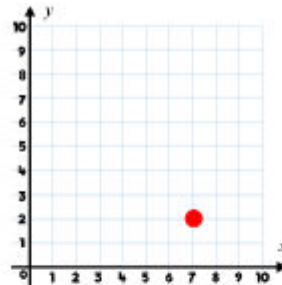
Green cross (5, 9)    Blue cross (9, 6)



Write out the co-ordinates that spell your name.



**Reasoning**



The circle is plotted at (7, 2)

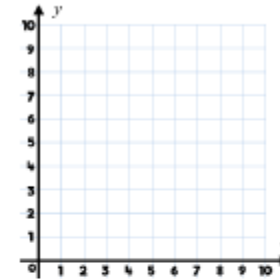


The circle is plotted at (2, 7)

Who is correct?  
What mistake has one of the children made?

**Problem Solving**

Plot the animals in the correct place on the grid.



(2,     )




(    ,     )



(    , 9)

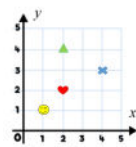
- The panda's co-ordinates are the same on both axis and come between 4 and 6.
- The x co-ordinate for the horse is two more than the panda.
- The y co-ordinate for the bird is 3 more than the panda.

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<p>Draw the shapes at the correct points on the grid.</p> <p>Plot the final points to create squares.</p> <p>Plot these points on a 2D grid.          (2, 4)    (4, 2)    (5, 8)    (7, 6)</p> <p>What shape has been created?</p>	<div style="border: 2px solid green; border-radius: 15px; padding: 10px; margin-bottom: 10px;"> <p>When you are plotting a point on a grid it does not matter whether you go up or across first as long as you do one number on each axis.</p>  <p>Arjun</p> </div> <p>Do you agree with Arjun?          Convince me.</p> <p><b>Always, Sometimes, Never.</b></p> <p>The number of points plotted is the same number of vertices the shape has.</p>	<p>What shapes could be made by plotting three more points?</p>
<p><b>Week 5</b></p> <p>Children may not recognise or may misname a shape.          Children may not know the shape when a side is missing.          Children may read coordinate in reverse.          Children may not accurately count when identify and recording coordinates.</p>	<p>Describe movements between positions as translations of a given unit to the left/right and up/down</p> <ul style="list-style-type: none"> <li>• To know how to translate a shape.</li> <li>• To develop the skill of translation.</li> <li>• To know how to describe a translation.</li> <li>• To develop the skill of recording translations.</li> </ul>	
<p><b>Fluency</b></p>	<p><b>Reasoning</b></p>	<p><b>Problem Solving</b></p>

Summer 2 Year 4

Write the new co-ordinates for each shape after they have been translated 2 right and 3 up:



Heart = (\_\_, \_\_)    Smiley = (\_\_, \_\_)

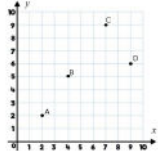
Write the new co-ordinates for each shape after they have been translated 2 right and 3 down:

Triangle = (\_\_, \_\_)    Cross = (\_\_, \_\_)

Use the grid above to describe the translation from:

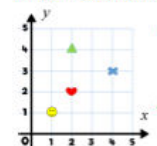
Triangle to Cross    Heart to Smiley    Heart to Cross  
Triangle to Heart    Smiley to Cross    Triangle to Smiley

Describe the translation from:  
A to B    B to C    C to D    D to A



Plot points E, F and G and describe the translations from A to your new points, then from B.

Write the co-ordinates for each shape:



Heart = (\_\_, \_\_)    Cross = (\_\_, \_\_)

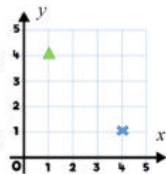
Triangle = (\_\_, \_\_)    Smiley = (\_\_, \_\_)

Translate Triangle 2 right and 3 down.

Record the co-ordinates before (\_\_, \_\_) and after (\_\_, \_\_)

Translate Cross 3 left and 2 up.

Record the co-ordinates before (\_\_, \_\_) and after (\_\_, \_\_)

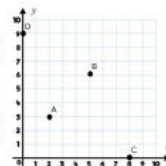


Translate A 6 right and 3 down.

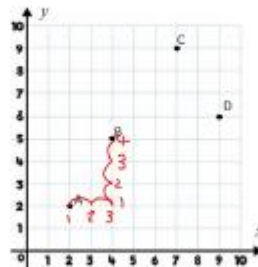
Record the co-ordinates before (\_\_, \_\_) and after (\_\_, \_\_)

Translate B and C 4 left and 3 up.

Record the co-ordinates before (\_\_, \_\_) and after (\_\_, \_\_)



Justin has described the translation from A to B as 3 right and 4 up.



Can you explain his mistake?

Points have been placed on the following co-ordinates:

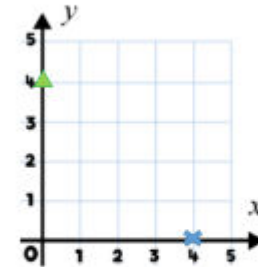
(0,4) (4,0) (7,2) (2,7)

Each point is translated in the same way. They are each translated 4 right and 7 up. What would the new co-ordinates be?

Write a question similar to this for your partner.

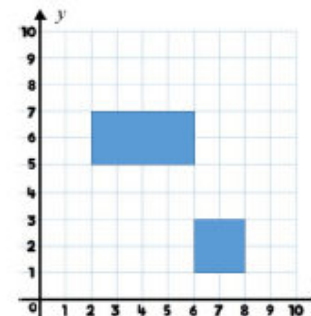
Triangle to Cross is 4 right and 4 down.

Cross to Triangle is 4 left and 4 up.



Can you plot other points where you travel the same left or right as you travel up or down?  
What do you notice about the co-ordinates?

Translate the rectangle 2 left and 3 up. Record the co-ordinates of each vertices for the rectangle before and after the translation.



The square has already been translated 3 right and 5 down. Record the new and original co-ordinates of each vertices for square.

Summer 2 Year 4

<b>Week 6</b>	Consolidation ready for Year 5.	
<b>Fluency</b>	<b>Reasoning</b>	<b>Problem Solving</b>
<b>Week 7</b>	Consolidation	
<b>Fluency</b>	<b>Reasoning</b>	<b>Problem Solving</b>
<b>Week 8</b>	Consolidation	
<b>Fluency</b>	<b>Reasoning</b>	<b>Problem Solving</b>