



HILLSBOROUGH
NURSERY & PRIMARY SCHOOL

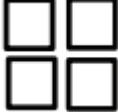
**Hillsborough primary school
Maths Content and progression**

Geometry position and direction

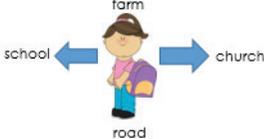
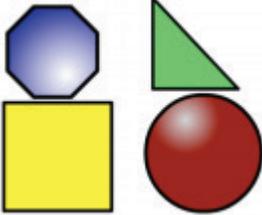
Progression of skills Overview

Geometry: Position and Direction					
Position, Direction and Movement					
Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
describe position, direction and movement, including half, quarter and three-quarter turns.	use mathematical vocabulary to describe position, direction and movement including movement in a straight line and distinguishing between rotation as a turn and in terms of right angles for quarter, half and three-quarter turns (clockwise and anti-clockwise)		describe positions on a 2-D grid as coordinates in the first quadrant	identify, describe and represent the position of a shape following a reflection or translation, using the appropriate language, and know that the shape has not changed	describe positions on the full coordinate grid (all four quadrants)
			describe movements between positions as translations of a given unit to the left/right and up/down		draw and translate simple shapes on the coordinate plane, and reflect them in the axes.
			plot specified points and draw sides to complete a given polygon		
Pattern					
	order and arrange combinations of mathematical objects in patterns and sequences				

Year 1.

NC Objective	Learning Objectives	Pre-learning	Methods from Calculation Policy	Key Questions for GDS
<p>describe position, direction and movement, including half, quarter and three-quarter turns.</p>	<p>Use terms left and right in different contexts.</p> <p>Remind them of moving bodies through full turns; half turns; quarter turns and three-quarter turns.</p> <p>Use shape apparatus to show movements through these turns in practical setting</p> <p>Describe position, direction, movement using appropriate vocabulary</p> <p><u>Vocabulary</u></p> <p style="padding-left: 40px;">underneath centre journey</p> <p style="padding-left: 40px;">half turn, quarter turn, three-quarter turn</p>	<p>Revise turns:</p> <p>Pupils stand up and turn through half a turn and then a full turn.</p> <p>Pupils to revise turning a quarter turn to the left or to the right.</p> <p>Then, work on three quarter turns to the left and to the right.</p> <p>Ask questions about various objects being to the left or to the right.</p>	<p>Use practical equipment set out in a circle around a person, get them to turn and see which object they face.</p> <p>Betty faces the green car.</p> <div style="text-align: center;">  </div> <p>Which car will she face if she makes half a turn? Which car will she face if she makes a quarter turn to the left? What about half a turn to the right?</p>	<p>Use these clues to colour the four squares.</p> <p>Blue is above green. Red is below yellow. Yellow is to the left of blue</p> <div style="text-align: center;">  </div> <p>Five blocks have been labelled A, B, C, D and E. A is immediately to the right of B. C is to the right of D. B is in between E and D. E is immediately to the left of B. Where is D?</p> <div style="text-align: center;">  </div>

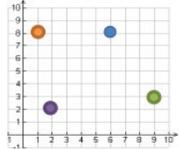
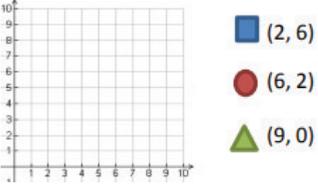
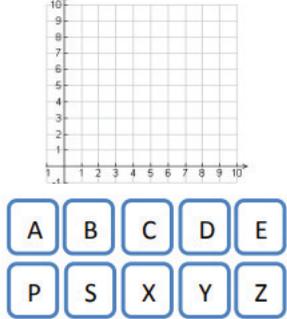
Year 2.

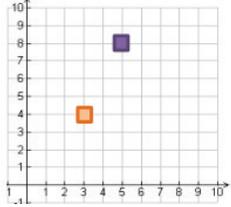
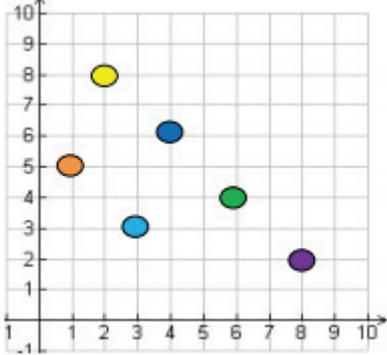
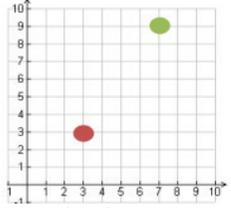
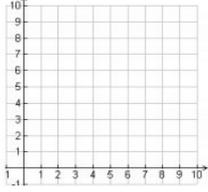
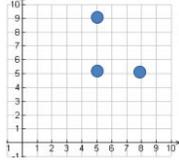
NC Objective	Learning Objectives	Pre-learning	Methods from Calculation Policy	Key Questions for GDS
<p>use mathematical vocabulary to describe position, direction and movement including movement in a straight line and distinguishing between rotation as a turn and in terms of right angles for quarter, half and three-quarter turns (clockwise and anti-clockwise)</p>	<p>Know what a right angle is</p> <p>Describe quarter, half and three-quarter turns in relation to right angles</p> <p>Use the terms clockwise, anti-clockwise to describe movement</p> <p>Vocabulary</p> <p style="text-align: center;">position route higher, lower clockwise, anticlockwise right angle straight line</p>	<p>Pupils stand up and turn through half a turn and then a full turn.</p> <p>Pupils to revise turning a quarter turn to the left or to the right.</p> <p>Then, work on three quarter turns to the left and to the right.</p> <p>Ask questions about various objects being to the left or to the right.</p> <p>Use practical equipment set out in a circle around a person, get them to turn and see which object they face.</p>	<p>Find at least 5 right angles in the classroom or outside and make a list of them.</p> <p style="color: green;">Which of these is turning in a clockwise and which is turning in an anti-clockwise direction?</p>  <p>Betty is facing the school. If she makes a quarter turn, anti-clockwise, what will she be facing?</p> 	<p>Use a chess board. Place a figure (play person) on one square and set a challenge for a friend to describe how he would move to another square on the board.</p> <p>Put in some obstacles, e.g. a lake that he cannot move through.</p> <p>When you are used to the game, try to give a challenge of getting from one square to another, using as few moves as you require.</p>
<p>order and arrange combinations of mathematical objects in patterns and sequences</p>	<p>Place objects in a repeating pattern.</p> <p>Place objects in an order which forms a sequence</p> <p>Vocabulary</p> <p style="text-align: center;">As above</p>		<p>Set out a number of different shapes. Let pupils create their own repeating patterns before setting up a repeating pattern for their friends to solve. Introduce two different aspects, eg, colour and shape and see how they cope.</p> <p>Look at the following repeated pattern. Continue the pattern by adding the next 2 shapes.</p>  <p>What are the next 2 in the pattern? Think position and colour.</p> 	<p style="color: green;">How many different sequences can you make from the shapes below?</p>  <p style="color: green;">Can you create a sequence for a partner?</p>

Year 3.

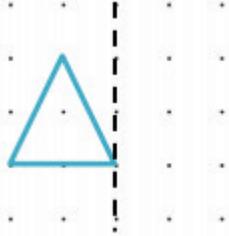
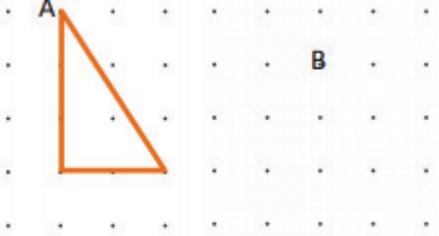
<u>NC Objective</u>	<u>Learning Objectives</u>	<u>Pre-learning</u>	<u>Methods from Calculation Policy</u>	<u>Key Questions for GDS</u>
	<u>Vocabulary</u> compass point north, south, east, west, N, S, E, W horizontal, vertical, diagonal angle ... is a greater/smaller angle than acute angle obtuse angle			
	<u>Vocabulary</u>			

Year 4.

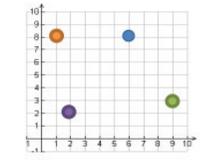
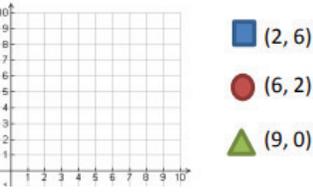
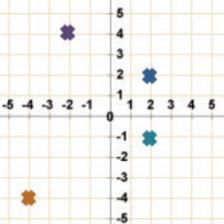
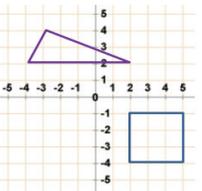
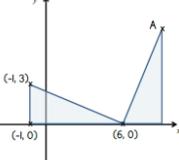
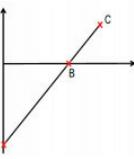
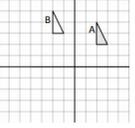
NC Objective	Learning Objectives	Pre-learning	Methods from Calculation Policy	Key Questions for GDS
<p>describe positions on a 2-D grid as coordinates in the first quadrant</p>	<p>Read coordinates using both axes</p> <p>Plot points using both axes</p> <p>Answer questions involving coordinates</p> <p>Create shapes by plotting points in first quadrant</p> <p>Vocabulary</p> <p>north-east, north-west, south-east, south-west, NE, NW, SE, SW</p> <p>translate, translation</p> <p>rotate, rotation</p> <p>degree</p> <p>reflection</p> <p>ruler, set square</p> <p>angle measurer, compass</p>	<p>Remind pupils of a chess or draughts board and get them to work in pairs and move a chess or draught piece a given amount.</p> <p>Look again at common children's games such as battleships and others which require pupils to know about co-ordinates.</p> <p>Introduce the terms: reflect; rotate and translate in relation to changing positions of the shapes.</p>	<p>Write the co-ordinates of the coloured dots.</p>  <p> ● ● ● ● </p> <p>Draw the shapes on the co-ordinates given.</p>  <p> ■ (2, 6) ● (6, 2) ▲ (9, 0) </p>	<p>When I find a coordinate, I can choose whether I move along the 'x' axis or the 'y' axis first.</p> <p style="color: green;">Is this always, sometimes or never true?</p> <p>Can you place the letters below on the grid by following the rules?</p>  <p>The letters at (1,1), (1,2) and (1,3) are all symmetrical about a vertical line. The letter at (8,3) is not symmetrical and is made of straight and curved lines. The letters at (1,1), (2,1) and (5,1) are symmetrical about a horizontal line. The letter at (5,1) consists of just straight lines. The letters at (5,3) and (2,0) consist of just curved lines. The letters at (5,3), (5,2) and (5,1) are consecutive in the alphabet. The letters at (0,2) and (1,2) are at the two ends of the alphabet.</p>
<p>describe movements between positions as translations of a given unit to the left/right and up/down</p>	<p>Explain a change in a given position by the movement made along the axes of the quadrant</p>	<p style="text-align: center;"><u>As above</u></p>	<p>Describe the movement of the orange square to the purple square.</p>	<p>Write a set of instructions to move from the yellow circle to the purple circle while passing through all the other coloured circles. Compare your</p>

	<p>Use numbered axes to plot points to form a polygon</p> <p>Describe the properties of the polygon</p>			<p>instructions with a friend. How are they the same? How are they different?</p> 
	<p><u>Vocabulary</u></p> <p>As above</p>		<p>Describe the movement from the green circle to the red circle.</p>  <p>Describe the movement from the red circle to the green circle. What do you notice about your descriptions?</p>	
<p>plot specified points and draw sides to complete a given polygon</p>	<p><u>Vocabulary</u></p> <p>As above</p>		<p>Plot the points on the grid below to make a 2d shape.</p> <p>(2,9) (2,2) (5,9) (5,2)</p> 	<p>Henry plots three points on a grid.</p> <p>Aisha says "You can make a square if you mark another point at (8, 9)"</p>  <p>Do you agree with Aisha? Explain your answer.</p>

Year 5.

NC Objective	Learning Objectives	Pre-learning	Methods from Calculation Policy	Key Questions for GDS
<p>identify, describe and represent the position of a shape following a reflection or translation, using the appropriate language, and know that the shape has not changed</p>	<p>Reflect a shape and re-plot</p> <p>Translate a shape and re-plot</p> <p>Describe the properties of the reflected and/or translated shape – evidencing that the shape and size has not changed</p> <p>Vocabulary coordinate quadrants (1st ,2nd.3rd and 4th) plot move translate reflect</p>	<p>Focus on the use of the language: reflection and translation and ensure pupils are secure and confident about what they mean.</p> <p>Ensure pupils are also secure and confident about the use of the 4 quadrants.</p> <p>Talk to pupils about the naming of the 4 quadrants and how they are often shown using Roman numerals.</p>	<p>A square is translated two dots to the right and three down. Draw the new square.</p>  <p>Reflection Draw the reflection of the triangle</p>  <p>Translation A triangle is translated 360°.</p>  <p>Draw the new triangle.</p>	<p>A rectangle is translated 3 squares up and two squares to the left. Three of the coordinates of the translated rectangle are: (5, 7) (10, 14) (10, 7). <i>What are the co-ordinates of the original rectangle?</i></p> <p>A triangle is drawn on a grid. It is translated so that point A becomes point B Draw the new triangle.</p> 

Year 6.

NC Objective	Learning Objectives	Pre-learning	Methods from Calculation Policy	Key Questions for GDS
<p>describe positions on the full coordinate grid (all four quadrants)</p>	<p>Read coordinates in all four quadrants</p> <p>Plot points using coordinates in all four quadrants</p> <p>Create shapes by plotting points in all four quadrants</p> <p>Vocabulary reflex angle coordinate quadrants (1st, 2nd, 3rd and 4th) plot move translate reflect</p>	<p>Children should be able to read and write coordinates in the 1st quadrant. They should be able to identify the different quadrants. They must be able to translate shapes at least in the 1st quadrant.</p> <p>Write the co-ordinates of the coloured dots.</p>  <p>● — ● — ● — ● —</p> <p>Draw the shapes on the co-ordinates given.</p> 	<p>Describe the position of the crosses marked on the grid.</p>  <p>Write down the co-ordinates of the vertices of the shapes below</p> 	<p>The diagram shows two identical triangles. The co-ordinates of three points are shown. Find the co-ordinates of point A.</p>  <p>A is the point (0, -10) B is the point (8, 0) The distance from A to B is two thirds of the distance from A to C. Find the coordinates of C</p> 
<p>draw and translate simple shapes on the coordinate plane, and reflect them in the axes.</p>	<p>Use four quadrants of the grid to draw different shapes</p> <p>Reflect a shape in any of the axes and re-plot</p> <p>Translate a shape into any of the quadrants, or across quadrants</p> <p>Vocabulary As above</p>		<p>Describe the single translation that takes A to B.</p>  <p>Reflect the triangle in the y axis.</p>	<p>Max is designing a pattern.</p> <p>Copy the diagram and reflect the pattern in the y axis. Now reflect the whole pattern in the x axis.</p>

