

# Coloured Chalk Shape<sup>TM</sup>



Curriculum Correlation: Key Stages 3 and 4 - Shape, Space and Measure

	Key Stage 3	Key Stage 4
<b>Using and applying shape, space and measures</b>		
	select problem-solving strategies and resources, including ICT, to use in geometrical work, and monitor their effectiveness	select the problem-solving strategies to use in geometrical work, and consider and explain the extent to which the selections they made were appropriate
	select and combine known facts and problem-solving strategies to solve complex problems	
	identify what further information is needed to solve a problem; break complex problems down into a series of tasks	develop and follow alternative lines of enquiry, justifying their decisions to follow or reject particular approaches
<b>Communication</b>	interpret, discuss and synthesise geometrical information presented in a variety of forms	
	communicate mathematically, making use of geometrical diagrams and related explanatory text	communicate mathematically, with emphasis on a critical examination of the presentation and organisation of results, and on effective use of symbols and geometrical diagrams
	use precise language and exact methods to analyse geometrical configurations	use precise formal language and exact methods for analysing geometrical configurations
<b>Reasoning</b>	explain and justify inferences and deductions using mathematical reasoning	
	explore connections in geometry; pose conditional constraints of the type 'If ... then ...'; and ask questions 'What if ...?' or 'Why?'	
	show step-by-step deduction in solving a geometrical problem	
<b>Geometrical reasoning</b>		
	distinguish between acute, obtuse, reflex and right angles; estimate the size of an angle in degrees	
<b>Properties of triangles and other rectilinear shapes</b>	use angle properties of equilateral, isosceles and right-	use angle properties of equilateral, isosceles and right-

	angled triangles; understand congruence, recognising when two triangles are congruent	angled triangles
	use their knowledge of rectangles, parallelograms and triangles to deduce formulae for the area of a triangle, from the formula for the area of a rectangle	
	understand, recall and use Pythagoras' theorem	
		understand similarity of triangles and of other plane figures, and use this to make geometric inferences; understand, recall and use trigonometrical relationships in right-angled triangles, and use these to solve problems; use the sine and cosine rules to solve 2-D problems
<b>Properties of circles</b>	recall the definition of a circle and the meaning of related terms, including centre, radius, diameter, circumference, arc, sector and segment	
<b>Transformations and coordinates</b>		
	understand that rotations are specified by a centre and an (anticlockwise) angle; use right angles, fractions of a turn or degrees to measure the angle of rotation; understand that reflections are specified by a mirror line, translations by a distance and direction, and enlargements by a centre and positive scale factor	
<b>Properties of transformations</b>	recognise and visualise rotations, reflections and translations, including reflection symmetry of 2-D shapes, and rotation symmetry of 2-D shapes; transform 2-D shapes by translation, rotation and reflection, recognising that these transformations preserve length and angle	
	recognise, visualise and construct enlargements of objects using positive integer scale factors greater than one, then positive scale factors less than one; understand from this that any two circles and any two squares are mathematically similar, while, in general, two rectangles are not	use positive fractional and negative scale factors
	recognise that enlargements preserve angle but not length; understand the implications of enlargement for perimeter; use and interpret maps and scale drawings; understand the implications of enlargement for perimeter and area	
<b>Measures</b>		
	know that measurements using real numbers depend on the choice of	

	unit; recognise that measurements given to the nearest whole unit may be inaccurate by up to one half in either direction; convert measurements from one unit to another; make sensible estimates of a range of measures in everyday settings	
<b>Mensuration</b>	find areas of rectangles, recalling the formula, understanding the connection to counting squares and how it extends this approach; recall and use the formulae for the area of a triangle; calculate perimeters and areas of shapes made from triangles and rectangles	
	find circumferences of circles and areas enclosed by circles, recalling relevant formulae	calculate the lengths of arcs and the areas of sectors of circles
	find loci, both by reasoning and by using ICT to produce shapes	
<b>Breadth of study</b>		
	activities that ensure they become familiar with and confident using standard procedures for a range of problems	
	solving familiar and unfamiliar problems, including multi-step problems, in a range of numerical, algebraic and graphical contexts and in open-ended and closed form	
	activities that develop short chains of deductive reasoning and concepts of proof in algebra and geometry	
	activities focused on geometrical definitions in which they do practical work with geometrical objects to develop their ability to visualise these objects and work with them mentally	
	tasks focused on using appropriate ICT [for example, spreadsheets, databases, geometry or graphic packages]	