

## Cranbrook Primary School- Progression in Maths- Geometry: properties of shape

Purpose of study –Mathematics is a creative and highly interconnected discipline that has been developed over centuries, providing the solution to some of history’s most intriguing problems. It is essential to everyday life, critical to science, technology and engineering, and necessary for financial literacy and most forms of employment. A high-quality mathematics education therefore provides a foundation for understanding the world, the ability to reason mathematically, an appreciation of the beauty and power of mathematics, and a sense of enjoyment and curiosity about the subject.

### Aims

The national curriculum for mathematics aims to ensure that all pupils:

- become fluent in the fundamentals of mathematics, including through varied and frequent practice with increasingly complex problems over time, so that pupils develop conceptual understanding and the ability to recall and apply knowledge rapidly and accurately
- reason mathematically by following a line of enquiry, conjecturing relationships and generalisations, and developing an argument, justification or proof using mathematical language
- can solve problems by applying their mathematics to a variety of routine and non-routine problems with increasing sophistication, including breaking down problems into a series of simpler steps and persevering in seeking solutions

Mathematics is an interconnected subject in which pupils need to be able to move fluently between representations of mathematical ideas. The programmes of study are, by necessity, organised into apparently distinct domains, but pupils should make rich connections across mathematical ideas to develop fluency, mathematical reasoning and competence in solving increasingly sophisticated problems. They should also apply their mathematical knowledge to science and other subjects.

The expectation is that the majority of pupils will move through the programmes of study at broadly the same pace. However, decisions about when to progress should always be based on the security of pupils’ understanding and their readiness to progress to the next stage. Pupils who grasp concepts rapidly should be challenged through being offered rich and sophisticated problems before any acceleration through new content. Those who are not sufficiently fluent with earlier material should consolidate their understanding, including through additional practice, before moving on.

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Intent								
<p>We want our children to become <b>confident and articulate communicators</b> by enriching their mathematical vocabulary. We aim to enrich our pupils learning with a deep and confident understanding in fluency and reasoning. We aspire for our children to appreciate the power of mathematics and build a <b>life-long passion for maths</b> by exploring their curiosity through <b>memorable learning experiences</b>. As the children progress we aim to build confidence, <b>widen their horizons</b> and attain a positive growth mind set. Through our enterprise scheme we will provide children with an opportunity to develop their <b>global identity</b> through working with the local community. We want them to know that mathematics is essential to succeed in life and necessary for financial responsibilities and most forms of employment.</p>								
Geometry: Properties of Shapes								
Area of Study	N	Rec	1	2	3	4	5	6
IDENTIFYING SHAPES AND THEIR PROPERTIES	Use own words or gestures to indicate or describe shape properties, such as corners and sides.	Use words or gestures to describe shapes by their properties.	Recognise and name common 2-D and 3-D shapes, including: * 2-D shapes [e.g. rectangles (including squares), circles and triangles]	Identify and describe the properties of 2-D shapes, including the number of sides and line symmetry in a vertical line		Identify lines of symmetry in 2-D shapes presented in different orientations	Identify 3-D shapes, including cubes and other cuboids, from 2-D representations	Recognise, describe and build simple 3-D shapes, including making nets (appears also in Drawing and Constructing)

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			* 3-D shapes [e.g. cuboids (including cubes), pyramids and spheres].				
	Recognise two or three familiar shapes (in different sizes and orientations).	Recognise four or more shapes by their properties (including different triangles and rectangles, in a range of orientations).		Identify and describe the properties of 3-D shapes, including the number of edges, vertices and faces			Illustrate and name parts of circles, including radius, diameter and circumference and know that the diameter is twice the radius
	Use shapes to make pictures. Build simple structures such as walls	Combine and separate shapes to make new shapes and find shapes within shapes.		Identify 2-D shapes on the surface of 3-D shapes, [for example,			

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				a circle on a cylinder and a triangle on a pyramid]				
		Build corners, bridges and simple buildings (perhaps with windows or doors) when constructing.						
Area of Study			1	2	3	4	5	6
DRAWING AND CONSTRUCTING					Draw 2-D shapes and make 3-D shapes using modelling materials; recognise 3-D shapes in different orientations and describe them	Complete a simple symmetric figure with respect to a specific line of symmetry	Draw given angles, and measure them in degrees ( $^{\circ}$ )	Draw 2-D shapes using given dimensions and angles
								Recognise, describe and build simple 3-D shapes, including

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								making nets (appears also in Identifying Shapes and Their Properties)
Area of Study			1	2	3	4	5	6
COMPARING AND CLASSIFYING				Compare and sort common 2-D and 3- D shapes and everyday objects		Compare and classify geometric shapes, including quadrilaterals and triangles, based on their properties and sizes	Use the properties of rectangles to deduce related facts and find missing lengths and angles  Distinguish between regular and irregular polygons based on reasoning about equal sides and angles	Compare and classify geometric shapes based on their properties and sizes and find unknown angles in any triangles, quadrilaterals, and regular polygons

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Area of Study			1	2	3	4	5	6
ANGLES					Recognise angles as a property of shape or a description of a turn		Know angles are measured in degrees: estimate and compare acute, obtuse and reflex angles	
					Identify right angles, recognise that two right angles make a half-turn, three make three quarters of a turn and four a complete turn; identify whether angles are greater than	Identify acute and obtuse angles and compare and order angles up to two right angles by size	Identify: * angles at a point and one whole turn (total $360^\circ$ ) * angles at a point on a straight line and $\frac{1}{2}$ a turn (total $180^\circ$ ) * other multiples of $90^\circ$	Recognise angles where they meet at a point, are on a straight line, or are vertically opposite, and find missing angles

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					or less than a right angle			
					Identify horizontal and vertical lines and pairs of perpendicular and parallel lines			
Key Vocabulary								
Areas	EYFS		Y1	Y2	Y3	Y4	Y5	Y6
GEOMETRY: PROPERTIES OF SHAPE		shape, pattern flat curved, straight round hollow, solid	Cube Cuboid Pyramid Cone Cylinder Sphere Face	Pentagon Hexagon Sides Vertices or vertex Symmetry	Turn Angle Clockwise Anti-clockwise Right angle Acute Obtuse	Degrees Isosceles Scalene Equilateral Right-angle triangle Quadrilateral	Reflex Protractor Regular Irregular	Vertically opposite

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		<p>sort make, build, draw size bigger, larger, smaller symmetrical pattern, repeating pattern match 2-D Shape corner, side rectangle (including square) circle triangle 3-D Shape face, edge, vertex, vertices cube pyramid sphere cone</p>	<p>Curved Rectangle Square Circle Triangle</p>	<p>Line of symmetry Vertical line of symmetry Face Surface Curved surface Edge Apex</p>	<p>Horizontal Vertical Parallel Perpendicular Prism Polygon</p>	<p>Trapezium Rhombus Parallelogram</p>		
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