

YEAR 6 MATHS CURRICULUM

Outlined below is the Year 6 Maths Curriculum which includes details of both the National Curriculum and the KPS Curriculum. The first column indicates what we have to teach with guidance for this given in the second column. The third column enhances the first by outlining our expectations based on our knowledge of the children of KPS and what we want them to learn and our expectations for their achievement and attainment.

	Programmes of Study STATUTORY	Notes and Guidance NON STATUTORY	Kexborough Primary School OUR EXPECTATIONS AND NON NEGOTIABLES
NUMBER – PLACE VALUE	<p>Pupils should be taught to:</p> <ul style="list-style-type: none"> ▪ read, write, order and compare numbers up to 10 000 000 and determine the value of each digit ▪ round any whole number to a required degree of accuracy ▪ use negative numbers in context, and calculate intervals across zero ▪ solve number and practical problems that involve all of the above. 	<p>Pupils use the whole number system, including saying, reading and writing numbers accurately.</p>	<p><i>As in Year 5, the number strand of Maths should be revisited continually through its' application during mental and oral starters. It must be ensured that chn are reminded of terminology and meanings learnt in previous year groups.</i></p> <p><i>Pupils are expected to understand the terms 'prime number', 'square number', 'square root' and 'factor'. They should be able to recognise prime numbers to at least 20 and factorise numbers to 100 into prime factors. Children should also recognise multiples up to 12x12 and use and apply simple tests of divisibility. They must recognise squares of numbers to at least 12x12.</i></p>

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NUMBER – ADDITION, SUBTRACTION, MULTIPLICATION AND DIVISION	<p>Pupils should be taught to:</p> <ul style="list-style-type: none"> ▪ multiply multi-digit numbers up to 4 digits by a two-digit whole number using the formal written method of long multiplication ▪ divide numbers up to 4 digits by a two-digit whole number using the formal written method of long division, and interpret remainders as whole number remainders, fractions, or by rounding, as appropriate for the context ▪ divide numbers up to 4 digits by a two-digit number using the formal written method of short division where appropriate, interpreting remainders according to the context ▪ perform mental calculations, including with mixed operations and large numbers ▪ identify common factors, common multiples and prime numbers ▪ use their knowledge of the order of operations to carry out calculations involving the four operations ▪ solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why ▪ solve problems involving addition, subtraction, multiplication and division ▪ use estimation to check answers to calculations and determine, in the context of a problem, an appropriate degree of accuracy. 	<p>Pupils practise addition, subtraction, multiplication and division for larger numbers, using the formal written methods of columnar addition and subtraction, short and long multiplication, and short and long division (see Mathematics Appendix 1).</p> <p>They undertake mental calculations with increasingly large numbers and more complex calculations.</p> <p>Pupils continue to use all the multiplication tables to calculate mathematical statements in order to maintain their fluency.</p> <p>Pupils round answers to a specified degree of accuracy, for example, to the nearest 10, 20, 50 etc., but not to a specified number of significant figures.</p> <p>Pupils explore the order of operations using brackets; for example, $2 + 1 \times 3 = 5$ and $(2 + 1) \times 3 = 9$.</p> <p>Common factors can be related to finding equivalent fractions.</p>	<p><i>The 'Calculation Policy' is a non-negotiable and MUST be followed to ensure consistency of approach and progression throughout school.</i></p> <p><i>To support their calculation in the other areas of maths, it is vital that chn are able to confidently multiply and divide decimals mentally by 10 or 100, and integers by 1000 and explain the effect.</i></p> <p><i>Their knowledge and understanding of negative numbers should be reinforced and secured so that students are able to find the difference between a positive and a negative integer or 2 negative integers.</i></p> <p><i>Calculations should always be presented within context and as part of problem solving. Chn must be given frequent opportunities to identify and use appropriate operations to solve word problems involving numbers and quantities and explain methods and reasoning within real situations, for example in enterprise initiatives.</i></p>

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		<p>Pupils multiply decimals by whole numbers, starting with the simplest cases, such as $0.4 \times 2 = 0.8$, and in practical contexts, such as measures and money.</p> <p>Pupils are introduced to the division of decimal numbers by one-digit whole number, initially, in practical contexts involving measures and money. They recognise division calculations as the inverse of multiplication.</p> <p>Pupils also develop their skills of rounding and estimating as a means of predicting and checking the order of magnitude of their answers to decimal calculations. This includes rounding answers to a specified degree of accuracy and checking the reasonableness of their answers.</p>	
RATIO AND PROPRTION	<p>Pupils should be taught to:</p> <ul style="list-style-type: none"> ▪ solve problems involving the relative sizes of two quantities where missing values can be found by using integer multiplication and division facts ▪ solve problems involving the calculation of percentages [for example, of measures, and such as 15% of 360] and the use of percentages for comparison ▪ solve problems involving similar shapes where the scale factor is known or can be found ▪ solve problems involving unequal sharing and grouping using knowledge of fractions and multiples. 	<p>Pupils recognise proportionality in contexts when the relations between quantities are in the same ratio (for example, similar shapes and recipes).</p> <p>Pupils link percentages or 360° to calculating angles of pie charts.</p> <p>Pupils should consolidate their understanding of ratio when comparing quantities, sizes and scale drawings by solving a variety of problems. They might use the notation $a:b$ to record their work.</p> <p>Pupils solve problems involving unequal quantities, for example, 'for every egg you need three spoonfuls of flour', '$\frac{3}{5}$ of the class are boys'. These problems are the foundation for later formal approaches to ratio and proportion.</p>	<p><i>Ratio and proportion is best taught as practically as possible, with strategies including changing recipes to serve a greater or smaller amount of people.</i></p>

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ALGEBRA	<p>Pupils should be taught to:</p> <ul style="list-style-type: none"> use simple formulae generate and describe linear number sequences express missing number problems algebraically find pairs of numbers that satisfy an equation with two unknowns enumerate possibilities of combinations of two variables. 	<p>Pupils should be introduced to the use of symbols and letters to represent variables and unknowns in mathematical situations that they already understand, such as:</p> <ul style="list-style-type: none"> missing numbers, lengths, coordinates and angles formulae in mathematics and science equivalent expressions (for example, $a + b = b + a$) generalisations of number patterns number puzzles (for example, what two numbers can add up to). 	<p><i>If available, the 'Algebra Bridging Unit' is an excellent resource for enthusing chn about algebra and equipping them with 'secondary readiness'. Algebra should be taught through collaboration and investigation, with children working together to explore possibilities.</i></p>
MEASUREMENT	<p>Pupils should be taught to:</p> <ul style="list-style-type: none"> solve problems involving the calculation and conversion of units of measure, using decimal notation up to three decimal places where appropriate use, read, write and convert between standard units, converting measurements of length, mass, volume and time from a smaller unit of measure to a larger unit, and vice versa, using decimal notation to up to three decimal places convert between miles and kilometres recognise that shapes with the same areas can have different perimeters and vice versa recognise when it is possible to use formulae for area and volume of shapes calculate the area of parallelograms and triangles calculate, estimate and compare volume of cubes and cuboids using standard units, including cubic centimetres (cm³) and cubic metres (m³), and extending to other units [for example, mm³ and km³]. 	<p>Pupils connect conversion (for example, from kilometres to miles) to a graphical representation as preparation for understanding linear/proportional graphs.</p> <p>They know approximate conversions and are able to tell if an answer is sensible.</p> <p>Using the number line, pupils use, add and subtract positive and negative integers for measures such as temperature.</p> <p>They relate the area of rectangles to parallelograms and triangles, for example, by dissection, and calculate their areas, understanding and using the formulae (in words or symbols) to do this.</p> <p>Pupils could be introduced to compound units for speed, such as miles per hour, and apply their knowledge in science or other subjects as appropriate.</p>	<p><i>Measurement must be taught in real contexts, with chn investigating real problems involving multi-step calculations. There can be clear links made to Geography, with chn converting miles to kilometres and vice versa.</i></p> <p><i>Pupils must be taught to apply formulae to finding the area of parallelograms and triangles, as well as composite shapes that can be split into rectangles and triangles.</i></p>

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GEOMETRY – PROPS OF SHAPE	<p>Pupils should be taught to:</p> <ul style="list-style-type: none"> draw 2-D shapes using given dimensions and angles recognise, describe and build simple 3-D shapes, including making nets compare and classify geometric shapes based on their properties and sizes and find unknown angles in any triangles, quadrilaterals, and regular polygons illustrate and name parts of circles, including radius, diameter and circumference and know that the diameter is twice the radius recognise angles where they meet at a point, are on a straight line, or are vertically opposite, and find missing angles. 	<p>Pupils draw shapes and nets accurately, using measuring tools and conventional markings and labels for lines and angles.</p> <p>Pupils describe the properties of shapes and explain how unknown angles and lengths can be derived from known measurements.</p> <p>These relationships might be expressed algebraically for example, $d = 2 \times r$; $a = 180 - (b + c)$.</p>	<p><i>Chn should be able to identify acute, obtuse and reflex angles. They need to be taught to use a protractor to measure and draw acute and obtuse angles to the nearest degree.</i></p> <p><i>Building on from work in Lower KS2, chn should be able to use a pair of compasses to draw circles of given diameters and circumferences. They should also be able to recognise & name parts of a circle.</i></p> <p><i>They should be able to calculate the volume of a cube or cuboid using a given formula.</i></p>
GEOMETRY – POS AND DIR	<p>Pupils should be taught to:</p> <ul style="list-style-type: none"> describe positions on the full coordinate grid (all four quadrants) draw and translate simple shapes on the coordinate plane, and reflect them in the axes. 	<p>Pupils draw and label a pair of axes in all four quadrants with equal scaling. This extends their knowledge of one quadrant to all four quadrants, including the use of negative numbers.</p> <p>Pupils draw and label rectangles (including squares), parallelograms and rhombuses, specified by coordinates in the four quadrants, predicting missing coordinates using the properties of shapes. These might be expressed algebraically for example, translating vertex (a, b) to $(a - 2, b + 3)$; (a, b) and $(a + d, b + d)$ being opposite vertices of a square of side d.</p>	

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STATISTICS	<p>Pupils should be taught to:</p> <ul style="list-style-type: none"> ▪ interpret and construct pie charts and line graphs and use these to solve problems ▪ calculate and interpret the mean as an average. 	<p>Pupils connect their work on angles, fractions and percentages to the interpretation of pie charts.</p> <p>Pupils both encounter and draw graphs relating two variables, arising from their own enquiry and in other subjects.</p> <p>They should connect conversion from kilometres to miles in measurement to its graphical representation.</p> <p>Pupils know when it is appropriate to find the mean of a data set.</p>	<ul style="list-style-type: none"> • Solve a problem by representing, extracting & interpreting data in tables, graphs & charts. • Find the mode, mean, median & range of a set of data. • Construct, interpret & compare a range of data displays, including line graphs and pie charts.