

Mrs Yorke

National Curriculum Maths Planning –Upper KS2

Year Five and Year Six

Children will be taught each subject area when appropriate to the individual. Week allocations show the amount of school days given to each topic area and approximately when they will be taught. However, some aspects are taught in real life contexts (such as 'calculating speed on their bicycles, scaling a Roman fort and Coffee afternoons) as well as there being extra cross curricular activities using mathematics and therefore may not always be taught in the sequence shown in this plan. Children are taught to calculate without the use of calculators, but are also taught to use calculators accurately for self-checking. Also most of these areas are revisited in starting activities two or three times a week.

<p><u>Place Value</u></p> <p><u>Autumn Term</u></p> <p><u>Week 1 and 2</u></p> <p><u>Summer Term</u></p> <p><u>Weeks 1 and 2</u></p> <p><u>Summer Term</u></p> <p><u>Roman Project</u></p>	COUNTING	interpret negative numbers in context, count forwards and backwards with positive and negative whole numbers, including through zero count forwards or backwards in steps of powers of 10 for any given number up to 1000 000 <i>use negative numbers in context, and calculate intervals across zero</i>
	COMPARING NUMBERS	read, write, order and compare numbers to at least 1 000 000 and determine the value of each digit <i>read, write, order and compare numbers up to 10 000 000 and determine the value of each digit (appears also in Reading and Writing Numbers)</i>
	IDENTIFYING, REPRESENTING & ESTIMATING NUMBERS	Use vocabulary of estimation and approximation. Make and justify estimates of large numbers and estimate simple proportions.
	READING & WRITING NUMBERS	read, write, order and compare numbers to at least 1 000 000 and determine the value of each digit (appears also in Comparing Numbers) Read Roman numerals to 1 000 (M) and recognise years written in Roman numerals. <i>read, write, order and compare numbers up to 10 000 000 and determine the value of each digit(appears also in Understanding Place Value)</i>
	UNDERSTANDING PLACE VALUE	read, write, order and compare numbers to at least 1 000 000 and determine the value of each digit (appears also in Reading and Writing Numbers) <i>recognise and use thousandths and relate them to tenths, hundredths and decimal equivalents (copied from Fractions)</i> <i>read, write, order and compare numbers up to 10 000 000 and determine the value of each digit (appears also in Reading and Writing Numbers)</i>
	ROUNDING	round any number up to 1 000 000 to the nearest 10, 100, 1 000, 10 000 and 100 000 <i>round decimals with two decimal places to the nearest whole number and to one decimal place (copied from Fractions)</i> <i>round any whole number to a required degree of accuracy</i>
	PROBLEM SOLVING	solve number problems and practical problems that involve all of the above <i>solve number and practical problems that involve all of the above</i>

<p><u>Addition & Subtraction</u></p> <p><u>Autumn Term</u></p> <p><u>Week 2 and 3</u></p> <p><u>Summer Term</u></p> <p><u>Weeks 3 and 4</u></p>	NUMBER BONDS	Recall addition and subtraction facts for each number up to 20. Find pairs with sum of 100; derive multiples of 50 with a sum of 1000. <i>Find pairs with sum of 100; multiples of 50 with sum 1000, decimals with sum of 0.1, 1, 10</i>
	MENTAL CALCULATION	add and subtract numbers mentally with increasingly large numbers perform mental calculations, including with mixed operations and large numbers <i>use their knowledge of the order of operations to carry out calculations involving the four operations</i>
	WRITTEN METHODS	add and subtract whole numbers with more than 4 digits, including using formal written methods (columnar addition and subtraction) <i>If appropriate, use informal pencil and paper methods.</i> <i>Extend written methods to column + and -numbers involving decimals.</i>
	INVERSE OPERATIONS, ESTIMATING & CHECKING ANSWERS	use rounding to check answers to calculations and determine, in the context of a problem, levels of accuracy <i>Use estimation to check answers to calculations and determine, in the context of a problem, levels of accuracy.</i>
	PROBLEM SOLVING	solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why <i>solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why</i> <i>Solve problems involving addition, subtraction, multiplication and division</i>

Multiplication & Division Autumn Term Week 3 and 4 Summer Term Weeks 5 and 6	MULTIPLICATION & DIVISION FACTS	count forwards or backwards in steps of powers of 10 for any given number up to 1 000 000 Recall multiplication and division facts to 12×12 .
	MENTAL CALCULATION	multiply and divide numbers mentally drawing upon known facts multiply and divide whole numbers and those involving decimals by 10, 100 and 1000 perform mental calculations, including with mixed operations and large numbers
	WRITTEN CALCULATION	multiply numbers up to 4 digits by a one- or two-digit number using a formal written method, including long multiplication for two-digit numbers divide numbers up to 4 digits by a one-digit number using the formal written method of short division and interpret remainders appropriately for the context Extend written methods to $HTU \times U$ or $U.t \times U$. 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 short division where appropriate for the context 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
	PROPERTIES OF NUMBERS: MULTIPLES, FACTORS, PRIMES, SQUARE & CUBE NUMBERS	Know square numbers to 10×10 Identify factors of two- digit numbers. Use factors. Find all the pairs of factors of any number up to 100. Recognise multiples of 6, 7, 8, 9 up to the 10th multiple. identify common factors, common multiples and prime numbers Give pairs of factors for whole numbers to 100. Use tests of divisibility. Recall squares to 12×12 . Recognise multiples up to 10×10 . Find simple common multiples. Know tests of divisibility. Recognise primes to at least 20. Find prime factors. Factorise numbers to 100 into prime factors.
	ORDER OF OPERATIONS	use their knowledge of the order of operations to carry out calculations involving the four operations
	INVERSE OPERATIONS, ESTIMATING & CHECKING ANSWERS	Approximate first. Check with inverse operation or equivalent calculation. use estimation to check answers to calculations and determine, in the context of a problem, levels of accuracy
	PROBLEM SOLVING	Use all four operations to solve money or 'real life' word problems, including percentages. Choose appropriate operations/calculation methods. Use all four operations to solve measurement word problems, including time. Choose appropriate operations/calculation methods. Explain working. solve problems involving addition, subtraction, multiplication and division Use all four operations to solve money or 'real life' word problems, including finding percentages and VAT. Choose appropriate operations/ calculation methods.

Fractions (including decimals & percentages) Autumn Term Weeks 5, 6, 8,9 10. Spring Term Weeks 1 and 2 Summer Term weeks 7 and 8	COUNTING IN FRACTIONAL STEPS	count up and down in hundredths Count up and down in $\frac{1}{2}$, $\frac{1}{4}$, etc using whole numbers and decimal numbers.
	RECOGNISING FRACTIONS	recognise that hundredths arise when dividing an object by one hundred and dividing tenths by ten Recognise equivalent fractions. Know simple fractions as percentages; find simple percentages. Understand percentage as the number of parts in every 100.
	COMPARING FRACTIONS	compare and order unit fractions $\frac{1}{3}$, $\frac{1}{4}$ and $\frac{1}{2}$, and fractions with the same denominators compare and order fractions, including fractions >1
	COMPARING DECIMALS	compare numbers with the same number of decimal places up to two decimal places identify the value of each digit in numbers given to three decimal places
	ROUNDING INCLUDING DECIMALS	round decimals with one decimal place to the nearest whole number solve problems which require answers to be rounded to specified degrees of accuracy
	EQUIVALENCE	recognise and show, using diagrams, families of common equivalent fractions recognise and write decimal equivalents of any number of tenths or hundredths recognise and write decimal equivalents to $\frac{1}{4}$; $\frac{1}{2}$; $\frac{3}{4}$ use common factors to simplify fractions; use common multiples to express fractions in the same denomination

Weeks 9 and 10		associate a fraction with division and calculate decimal fraction equivalents (e.g. 0.375) for a simple fraction (e.g. $\frac{3}{8}$) recall and use equivalences between simple fractions, decimals and percentages, including in different contexts.
	ADDITION & SUBTRACTION OF FRACTIONS	add and subtract fractions with the same denominator add and subtract fractions with different denominators and mixed numbers, using the concept of equivalent fractions
	MULTIPLICATION & DIVISION OF DECIMALS	find the effect of dividing a one- or two-digit number by 10 and 100, identifying the value of the digits in the answer as ones, tenths and hundredths multiply simple pairs of proper fractions, writing the answer in its simplest form (e.g. $\frac{1}{4} \times \frac{1}{2} = \frac{1}{8}$) multiply one-digit numbers with up to two decimal places by whole numbers divide proper fractions by whole numbers (e.g. $\frac{1}{3} \div 2 = \frac{1}{6}$) multiply one-digit numbers with up to two decimal places by whole numbers multiply and divide numbers by 10, 100 and 1000 where the answers are up to three decimal places identify the value of each digit to three decimal places and multiply and divide numbers by 10, 100 and 1000 where the answers are up to three decimal places associate a fraction with division and calculate decimal fraction equivalents (e.g. 0.375) for a simple fraction (e.g. $\frac{3}{8}$) use written division methods in cases where the answer has up to two decimal places
	RATIO & PROPORTION	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.
	PROBLEM SOLVING	solve problems involving increasingly harder fractions to calculate quantities, and fractions to divide quantities, including non-unit fractions where the answer is a whole number solve simple measure and money problems involving fractions and decimals to two decimal places. Solve simple problems involving ratio and proportion.

Geometry: Position & Direction Autumn Term Weeks 13 and 14 Summer Term Week 9	POSITION, DIRECTION & MOVEMENT	describe positions on a 2-D grid as coordinates in the first quadrant describe movements between positions as translations of a given unit to the left/right and up/down plot specified points and draw sides to complete a given polygon describe positions on the full coordinate grid (all four quadrants) Read and plot co-ordinates in all four quadrants. draw and translate simple shapes on the coordinate plane, and reflect them in the axes.
	PATTERN	Solve shape problems or puzzles. Explain reasoning and methods. Make patterns from rotating shapes. Recognise and explain patterns and relationships, generalise and predict. Make and investigate a general statement about shapes.

Geometry: Properties of shape Autumn Term Weeks 11 and 12	IDENTIFYING SHAPES & THEIR PROPERTIES	identify lines of symmetry in 2-D shapes presented in different orientations recognise, describe and build simple 3-D shapes, including making nets (appears also in Drawing and Constructing) illustrate and name parts of circles, including radius, diameter and circumference and know that the diameter is twice the radius
	DRAWING & CONSTRUCTING	complete a simple symmetric figure with respect to a specific line of symmetry draw 2-D shapes using given dimensions and angles recognise, describe and build simple 3-D shapes, including making nets (appears also in Identifying Shapes and Their Properties)
	COMPARING & CLASSIFYING	compare and classify geometric shapes, including quadrilaterals and triangles, based on their properties and sizes

<u>Spring Term Weeks 11 and 12</u> <u>Summer Term Week 9 and 10</u>		compare and classify geometric shapes based on their properties and sizes and find unknown angles in any triangles, quadrilaterals, and regular polygons
	ANGLES	identify acute and obtuse angles and compare and order angles up to two right angles by size recognise angles where they meet at a point, are on a straight line, or are vertically opposite, and find missing angles

<u>Measurement</u> <u>Spring Term Weeks 3, 4, and 5</u> <u>Summer Term Roman Project</u>	COMPARING & ESTIMATING	estimate, compare and calculate different measures, including money in pounds and pence calculate, estimate and compare volume of cubes and cuboids using standard units, including centimetre cubed (cm^3) and cubic metres (m^3), and extending to other units such as mm^3 and km^3 .
	MEASURING & CALCULATING	estimate, compare and calculate different measures , including money in pounds and pence measure and calculate the perimeter of a rectilinear figure (including squares) in centimetres and metres find the area of rectilinear shapes by counting squares solve problems involving the calculation and conversion of units of measure , using decimal notation up to three decimal places where appropriate (appears also in Converting) recognise that shapes with the same areas can have different perimeters and vice versa calculate the area of parallelograms and triangles calculate, estimate and compare volume of cubes and cuboids using standard units, including cubic centimetres (cm^3) and cubic metres (m^3), and extending to other units [e.g. mm^3 and km^3]. recognise when it is possible to use formulae for area and volume of shapes
	TELLING THE TIME	read, write and convert time between analogue and digital 12 and 24-hour clocks solve problems involving converting from hours to minutes; minutes to seconds; years to months; weeks to days Appreciate different times around the world.
	CONVERTING	convert between different units of measure (e.g. kilometre to metre; hour to minute) read, write and convert time between analogue and digital 12 and 24-hour clocks solve problems involving converting from hours to minutes; minutes to seconds; years to months; weeks to days 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 solve problems involving the calculation and conversion of units of measure, using decimal notation up to three decimal places where appropriate convert between miles and kilometres

<u>Statistics</u> <u>Throughout the year</u> - covered in topic based work (cross-curricular). <u>Spring Term week 13</u>	INTERPRETING, CONSTRUCTING & PRESENTING DATA	interpret and present discrete and continuous data using appropriate graphical methods, including bar charts and time graphs interpret and construct pie charts and line graphs and use these to solve problems
	SOLVING PROBLEMS	solve comparison, sum and difference problems using information presented in bar charts, pictograms, tables and other graphs. Present and interpret data on a bar chart and bar line graph: axis in 2s, 5s, 10s, 20s, 100s. Make a simple database on paper. calculate and interpret the mean as an average Find the mode and range of a set of data. Begin to find median and mean. Solve a problem by representing, extracting and interpreting data in frequency tables and bar charts with grouped discrete data

<u>Algebra</u> <u>Spring Term</u>	EQUATIONS	solve problems, including missing number problems, using number facts, place value, and more complex addition and subtraction. Begin to use brackets. solve problems, including missing number problems, involving multiplication and division, including integer scaling
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<u>Weeks 6 and 7</u> <u>Summer Term week 11 and 12</u>		express missing number problems algebraically Use brackets. find pairs of numbers that satisfy number sentences involving two unknowns enumerate all possibilities of combinations of two variables
	FORMULAE	<i>Perimeter can be expressed algebraically as $2(a + b)$ where a and b are the dimensions in the same unit.</i> use simple formulae <i>recognise when it is possible to use formulae for area and volume of shapes (copied from Measurement)</i>
	SEQUENCES	Recognise, extend number sequences formed by counting from any number in steps of constant size, e.g. 25 to 500. Recognise and extend number sequences formed by counting from any number in steps of a constant size, extend beyond zero when counting back. Recognise and extend sequences formed by adding 6,7,8,9..., starting from any number. Solve number puzzles, recognise patterns, generalise and predict. generate and describe linear number sequences <i>Recognise and extend number sequences such as square, triangular numbers.</i> <i>Investigate number sequences.</i> <i>Develop a generalised relationship in words; express it in a formula using symbols.</i>