UPPER KS2 LONG TERM MATHS PLAN 2019-2020

From the National Curriculum

The principal focus of mathematics teaching in upper key stage 2 is to ensure that pupils extend their understanding of the number system and place value to include larger integers. This should develop the connections that pupils make between multiplication and division with fractions, decimals, percentages and ratio.

At this stage, pupils should develop their ability to solve a wider range of problems, including increasingly complex properties of numbers and arithmetic, and problems demanding efficient written and mental methods of calculation. With this foundation in arithmetic, pupils are introduced to the language of algebra as a means for solving a variety of problems. Teaching in geometry and measures should consolidate and extend knowledge developed in number. Teaching should also ensure that pupils classify shapes with increasingly complex geometric properties and that they learn the vocabulary they need to describe them. By the end of year 6, pupils should be fluent in written methods for all four operations, including long multiplication and division, and in working with fractions, decimals and percentages. Pupils should read, spell and pronounce mathematical vocabulary correctly.

Maths at Westbury Park

We aim to inspire children to develop a love for maths and, as a staff team, we work closely together to promote risk taking, curiosity and enthusiasm for maths from Reception to year 6- and beyond!

We believe that there are fundamental mathematical skills that will provide children with a foundation for their learning: times tables, number bonds and formal written methods. These areas of maths are intertwined within most of our lessons, through chanting, tests, discrete teaching and reminders around the classroom. We aim to teach mental and written methods consistently across the school; these are detailed in our calculation policies.

Westbury Park is part of a Mastery Maths Hub, which gives us the opportunity to work closely with other local schools to enhance our maths teaching, share good practice and ultimately give the children the best possible maths education. Embracing the concept of mastery means that we encourage children to 'learn without limits'; we want them to feel supported and challenged to take the next steps within maths all the while knowing that they are learning at their pace. We encourage children to work together to reason and justify and to link their learning to life outside of the classroom. For those children who have a natural love for the subject, mastery helps to inspire them to look more deeply at their learning, to ask questions, to find alternatives and to use their skills to challenge what they think they know!

	Term 1	**Term 2**	**Term 3**	**Term 4**	**Term 5**	**Term 6**
YEAR 5	Number: Place value (3 weeks) Number: Four operations (4 weeks)	Number: Four operations (2 weeks) Measure: Area and perimeter (2 weeks) Statistics (2 weeks)	Number: Fractions (4 weeks) Number: Decimals (2 weeks)	Number: Decimals and percentages (3 weeks) Bikeability and consolidation	Geometry: Properties of shape (2 weeks) Position and direction (2 weeks) Residential (1 week)	Measure: Converting units (2 weeks) Measure: Volume (1 week)
YEAR 6	Number: Place value (2 weeks) Number: Four operations (4 weeks)	Number: Fractions (4 weeks) Geometry: Position and direction (1-2 weeks)	Number: Decimals (2 weeks) Number: Percentages (2 weeks) Number: Algebra (2 weeks)	Measure: Converting units (1 week) Measure: Area, perimeter, volume (2 weeks) Number: Ratio (2 weeks)	Geometry: Properties of shape (2 weeks) Statistics (2 weeks) Revision	Investigations and problem solving. Transition maths **Residential** **1 week**

KS1 EXPECTATIONS AND STRANDS		YEAR 1	YEAR 2
Place value	**Counting**	• Count forwards or backwards in steps of powers of 10 for any given number up to 10 000 000 • Count forwards and backwards with positive and negative whole numbers including through zero.	
	Representing number	• Read, write, order and compare numbers up to 1 000 000 and determine the value of each digit • Read Roman numerals to 1000 (M) and recognise years written in Roman numerals	• Read, write, order and compare numbers up to 10 000 000 and determine the value of each digit
	Using and comparing number	• Read, write, order and compare numbers up to 1 000 000 and determine the value of each digit	• Read, write, order and compare numbers up to 10 000 000 and determine the value of each digit
	Problem solving and rounding	• Interpret negative numbers in contect • Round any number up to 1 000 000 to the nearest 10, 100, 1000, 10 000 and 100 000. • Solve number problems and practical problems that involve all of the above	• Round any whole number to a degree of accuracy • Use negative numbers in context and calculate intervals across zero • Solve number and practical problems that involve all of the above
Addition and Subtraction	**Recall, representation and use**	• Use rounding to check answers to calculations and determine in the context of a problem levels of accuracy	
	Calculations	• Add and subtract whole numbers with more than 4 digits, including using formal written methods • Add and subtract numbers mentally with increasingly large numbers	• Perform mental calculations, including with mixed operations and large numbers • Use their knowledge of the order of operations to carry out calculations involving the four operations
	Problem solving	• Solve addition and subtraction multi step problems in contexts, deciding which operations and methods to use and why • Solve addition and subtraction, multiplication and division and a combination of these including understanding the meaning of the equals sign	• Solve addition and subtraction multi step problems in contexts, deciding which operations and methods to use and why

Multiplication and Division	**Recall, represent, use**	• Recall and use multiplication and division facts for the 3, 4 and 8 multiplication tables	• Recall multiplication and division facts for multiplication tables up to 12 x 12 • Use place value, known and derived facts to multiply and divide mentally including: multiplying by 0 and 1; dividing by 1; multiplying together 3 numbers • Recognise and use factor pairs and commutativity in mental calculations
	Calculations	• Write and calculate mathematical statements for multiplication and division using the multiplication tables that they know, including for 2 digit numbers times one digit numbers using mental and progressing to formal written methods	• multiply two digit and three digit numbers by a one digit number using formal written layout
	Problem solving	• Solve problems including missing number problems involving multiplication and division including positive integer scaling problems and correspondence problems in which n objects are connected to m objects	• Solve problems involving multiplying and adding, including using distributive law, to multiply two digit numbers by one digit, integer scaling problems and harder correspondence problems such as n objects are connected to m objects
	Combined operations		
Fractions	**Recognise and write**	• Identify, name and write equivalent fractions of a given fractions represented visually including tenths and hundredths • Recognise mixed numbers and improper fractions and convert from one form to the other and write mathematical statements >1 as a mixed number e.g. ⅖ + ⅘ = 1 ⅕	
	Compare	• Compare and order fractions whose denominators are all multiples of the same number	• Use common factors to simplify fractions; ue common multiples to express fractions in the same denomination • compare and order fractions, including fractions >1
	Calculations	• Add and subtract fractions with the same denominators that are multiples of the same number • Multiply proper fractions and mixed numbers by whole numbers, supported by materials and diagrams	• Add and subtract fractions with different denominators and mixed numbers, using the concept of equivalent fractions • Multiply simple pairs of proper fractions • Divide proper fractions by whole numbers
	Problem solving		
Decimals	**Recognise and write**	• Read and write decimal numbers as fractions • Recognise and use thousandths and relate them to tenths, hundredths and decimal equivalents	• identify the value of each digit in numbers given to three decimal places
	Compare	• Round decimals with two decimal places to the nearest whole number and to one decimal place • Read, write, order and compare numbers with up to 3dp	
	Calculations		• multiply and divide numbers by 10, 100 and 1000, giving answers up to 3 dp • multiply one digit numbers with up to two dp by whole numbers • use written division methods in cases where the answer has up to two dp
	Problem solving	• Solve problems involving number up to three dp	• Solve problems which require answers to be rounded to specified degrees of accuracy

Fractions, decimals and percentages		• Recognise the percent symbol and understand that per cent relates to 'number of parts per hundred' and write percentages as a fraction with denominator 100 and as a decimal • Solve problems which require knowing percentage and decimal equivalents of ½, ¼, ⅕, ⅖, ⅘ and those fractions with a denominator of a multiple of 10 or 25	• Associate a fraction with division and calculate decimal fraction equivalents • Recall and use equivalences between simple fractions, decimals and percentages
Ratio and 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 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
Algebra			• Use simple formulae • gGenerate 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

Measurement	**Using measures**	• Convert between different metric measures • Understand and use approximate equivalences between metric units and common imperial units such as inches, pounds and pints • Use all 4 operations to solve problems involving measure using decimal notation including scaling	• Solve problems involving the calculation and conversion of units of measure, using decimal notation up to 3 dp 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 of up to 3dp • Convert between miles and km
	Money	• Use all four operations to solve problems involving measure	•
	Time	• Solve problems involving converting between units of time	• Use, read, write and convert between standard units, converting measurements of time from a smaller unit of measure to a larger unit and vice versa
	Perimeter, area & volume	• MEasure and calculate the perimeter of composite rectilinear shapes in cm and m • Calculate and compare the area of rectangles and including using standard units, square cm and square m and estimate the areas of irregular shapes • Estimate volume e.g. using cm cubed blocks to build cuboids and capacity	• 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 and cubic metres eg km3 and mm3

Geometry	**2-D shapes**	• Distinguish between regular and irregular polygons based on reasoning about equal sides and angles • USe the properties of rectangles to deduce related facts and find missing lengths and angles	• Draw 2-D shapes using given dimensions and angles • Compare and classify geometric shapes based on their properties and sizes • Illustrate and name parts of a circle including radius, diameter and circumference and know that the diameter is twice the radius
	3-D shapes	• Identify 3 D shapes including cubes and cuboids	• Recognise, describe and build simple 3-D shapes including making nets
	Angles and lines	• Know angles are measured in degrees: estimate and compare acute, obtuse and reflex angles • Draw given angles and measure them in degrees • Identify- angles at a point, angles on a straight line and other multiples of 90 degrees	• Find unknown angles in any triangles, quadrilaterals and regular polygons • Recognise angles where they meet at a point, are on a straight line or are vertically opposite, and find missing angles.
	Position and Direction	• Identify, describe and represent the position of a shape following a reflection or translation using appropriate language and know that the shape has not changed	• Describe position on the full coordinate grid (all four quadrants) • Draw and translate simple shapes on the coordinate plane and reflect them in the axes

Statistics	**Present and Interpret**	• Complete, read and interpret information in tables including timetables	• Interpret and construct pie charts and line graphs and use these to solve problems
	Problem solving	• Solve comparison, sum and difference problems using information presented in a line graph	• Calculate and interpret mean as an average