LONG TERM PLAN MATHS 2014-2015

RED= Y4 Objectives

BLUE= Y5 Objectives

GREEN= Y6 Objectives

	AUTUMN	SPRING	SUMMER
NUMBER AND PLACE VALUE	• Read, write, order and compare numbers to at least 1 000 000 and determine the value of each digit • Round any number up to 1 000 000 to the nearest 10, 100, 1000, 10 000 and 100 000 • Round any whole number to a required degree of accuracy • Count forwards or backwards in steps of powers of 10 for any given number up to 1 000 000 • Read, write, order and compare numbers up to 10 000 000 and determine the value of each digit • Interpret negative numbers in context, count forwards and backwards with positive and negative whole numbers through zero • Use negative numbers in context, and calculate intervals across zero	• Round any number up to 1 000 000 to the nearest 10, 100, 1000, 10 000 and 100 000 • Round any whole number to a required degree of accuracy • Solve number problems and practical problems that involve all of the above • Solve number problems and practical problems that involve all of the above • Interpret negative numbers in context, count forwards and backwards with positive and negative whole numbers through zero • Use negative numbers in context, and calculate intervals across zero	• Read Roman numerals to 1000 (M) and recognise years written in Roman numerals • Solve number problems and practical problems that involve all of the above
ADDITION AND SUBTRACTION	• Add and subtract whole numbers with more than 4 digits, including using formal written methods (columnar addition and subtraction • Add and subtract numbers mentally with increasingly large numbers • Use rounding to check answers to calculations and determine, in the context of a problem, levels of accuracy • Solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why	• Add and subtract whole numbers with more than 4 digits, including using formal written methods (columnar addition and subtraction • Add and subtract numbers mentally with increasingly large numbers • Use rounding to check answers to calculations and determine, in the context of a problem, levels of accuracy • Solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why	

MULTIPLICATION AND DIVISION	• 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 • Multiply multi-digit numbers up to 4 digits by a two-digit whole number using the efficient written method of long multiplication • 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 • 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 • Multiply and divide whole numbers and those involving decimals by 10, 100 and 1000 • Multiply and divide numbers mentally drawing upon known facts • Perform mental calculations, including with mixed operations and large numbers • Identify multiples and factors, including finding all factor pairs of a number, and common factors of two numbers. • Recognise and use square numbers and cube numbers, and the notation for squared (^{2}) and cubed (^{3}) •	• Know and use the vocabulary of prime numbers, prime factors and composite (non-prime) numbers • Establish whether a number up to 100 is prime and recall prime numbers up to 19 • Identify common factors, common multiples and prime numbers • Solve problems involving multiplication and division including using their knowledge of factors and multiples, squares and cubes • Solve problems involving addition, subtraction, multiplication and division and a combination of these, including understanding the meaning of the equals sign • Use their knowledge of the order of operations to carry out calculations involving the four operations • Solve problems involving addition, subtraction, multiplication and division • Use estimation to check answers to calculations and determine, in the context of a problem, levels of accuracy	• 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 context • Solve problems involving multiplication and division, including scaling by simple fractions and problems involving simple rates

FR ACTIONS, DECIMALS AND PERCENTAGES	• Compare and order fractions whose denominators are all multiples of the same number • Identify, name and write equivalent fractions of a given fraction, represented visually, including tenths and hundredths • Recognise mixed numbers and improper fractions and convert from one to the other and write mathematical statements >1 as a mixed number (e.g. 2/5 + 4/5 = 6/5 = 1 1/5) • Add and subtract fractions with the same denominator and denominators that are multiples of the same number • • Use common factors to simplify fractions; use common multiples to express fractions in the same denomination • Compare and order fractions including fractions >1 • Add and subtract fractions with different denominators and mixed numbers, using the concept of equivalent fractions • Read and write decimal numbers as fractions (e.g. 0.71 = 71/100) • Recognise and use thousandths and relate them to tenths, hundredths and decimal equivalents • 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 three decimal places Solve problems involving numbers up to three decimal places	• Multiply proper fractions and mixed numbers by whole numbers, supported by materials and diagrams. • Multiply simple pairs of proper fractions, writing the answer in its simplest form (e.g. ¼ x ½ = 1/8) • Divide proper fractions by whole numbers (e.g. 1/3 ÷ 2 = 1/6) • • Read and write decimal numbers as fractions (e.g. 0.71 = 71/100) • Recognise and use thousandths and relate them to tenths, hundredths and decimal equivalents • 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 three decimal places • Solve problems involving numbers 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. 3/8) • Identify the value of each digit in numbers given to three decimal places and multiply and divide numbers by 10, 100 and 1000 giving answers up to three decimal places • Multiply one-digit numbers with up to two decimal places by whole numbers • Use written division methods in cases where the answer has up to two decimal places • Solve problems which require answers to be rounded to specified degrees of accuracy. •	• Recognise the per cent 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, 1/5, 2/5, 4/5 and those fractions with a denominator of a multiple of 10 or 25 • Recall and use equivalences between simple fractions, decimals and percentages, including in different contexts

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 (e.g 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
ALGEBRA		• Use simple formulae • Generate and describe linear number sequences • Express missing number problems algebraically	• Find pairs of numbers that satisfy number sentences involving two unknowns • Enumerate possibilities of combinations of two variables.

MEASUREMENT	• Convert between different units of measure (e.g. kilometre and metre; centimetre and metre; centimetre and millimetre; gram and kilogram; litre and millilitre) • 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 three decimal places	• Solve problems involving the calculation and conversion of units of measure, using decimal notation up to three decimal places where appropriate • Understand and use approximate equivalences between metric units and common imperial units such as inches, pounds and pints • Convert between miles and kilometre • Measure and calculate the perimeter of composite rectilinear shapes in centimetres and metres • Calculate and compare the area of rectangles (including squares) and including using standard units, square centimetres (cm^2) and square metres (m^2) and estimate the area of irregular shapes • Estimate volume (e.g. using 1 cm^3 blocks to build cuboids (including cubes)) and capacity (e.g. using water) • 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 • Recognise when it is necessary to use the formulae for area and volume of shapes	• Solve problems involving converting between units of time • Use all four operations to solve problems involving measure (for example, length, mass, volume, money)using decimal notation, including scaling • 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).

GEOMETRY	**PROPERTIES OF SHAPE**	• Identify 3-D shapes, including cubes and cuboids, from 2-D representations ▪ draw 2D shapes using given dimensions and angles ▪ recognise , describe and build simple 3-D shapes, including making nets	• Identify 3-D shapes, including cubes and cuboids, from 2-D representations • Know angles are measured in degrees; estimate and compare acute, obtuse and reflex angles • draw given angles, measuring them in degrees (°) • Identify ▪ Angles at a point and one whole turn (total 360°) ▪ Angles at a point on a straight line and ½ a turn (total 180°) ▪ Other multiples of 90˚ ▪ draw 2D 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 ▪ recognise angles where they meet at a point, are on a straight line, or are vertically opposite, and find missing angles	• use the properties of a rectangle to deduce related facts and find missing lengths and angles • distinguish between regular and irregular polygons based on reasoning about equal sides and angles

GEOMETRY	**POSITION, DIRECTION AND**		▪ Identify, describe and represent the position of a shape following a reflection or translation, using the appropriate language, and know that the shape has not changed. • 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.	▪ Identify, describe and represent the position of a shape following a reflection or translation, using the appropriate language, and know that the shape has not changed. • 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
STATISTICS		•	• Solve comparison, sum and difference problems using information presented in a line graph • Complete, read and interpret information in tables, including timetables	• Interpret and construct pie charts and line graphs and use these to solve problems ▪ Calculate and interpret the mean as an average