Honeywell JUNIOR SCHOOL

Progression of Skills In Mathematics

KEY SKILLS	YEAR 3	YEAR 4	YEAR 5	YEAR 6
Number and Place Value - Counting	count from 0 in multiples of 4, 8, 50 and 100; find 10 or 100 more or less than a given number	count backwards through zero to include negative numbers count in multiples of 6, 7, 9, 25 and 1000 find 1000 more or less than a given number	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 1 000 000	use negative numbers in context, and calculate intervals across zero
Number and Place Value Comparing Numbers	compare and order numbers up to 1000	order and compare numbers beyond 1 000 compare numbers with the same number of decimal places up to two decimal places (copied from Fractions)	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)	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)
Number and Place Value Representing And Estimating Numbers	identify, represent and estimate numbers using different representations	identify, represent and estimate numbers using different representations		
Number and Place Value Reading And Writing Numbers (including Roman Numerals)	read and write numbers up to 1 000 in numerals and in words tell and write the time from an analogue clock, including using Roman numerals from I to XII, and 12-hour and 24-hour clocks (copied from Measurement)	read Roman numerals to 100 (I to C) and know that over time, the numeral system changed to include the concept of zero and place value.	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.	read, write, order and compare numbers up to 10 000 000 and determine the value of each digit (appears also in Understanding Place Value)

Number and Place Value Understanding Place Value	recognise the place value of each digit in a three-digit number (hundreds, tens, ones)	recognise the place value of each digit in a four-digit number (thousands, hundreds, tens, and ones) 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 units, tenths and hundredths (copied from Fractions)	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) recognise and use thousandths and relate them to tenths, hundredths and decimal equivalents (copied from Fractions)	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) identify the value of each digit to three decimal places and multiply and divide numbers by 10, 100 and 1 000 where the answers are up to three decimal places (copied from Fractions)
Number and Place Value - Rounding		round any number to the nearest 10, 100 or 1 000 round decimals with one decimal place to the nearest whole number (copied from Fractions)	round any number up to 1 000 000 to the nearest 10, 100, 1 000, 10 000 and 100 000 round decimals with two decimal places to the nearest whole number and to one decimal place (copied from Fractions)	round any whole number to a required degree of accuracy solve problems which require answers to be rounded to specified degrees of accuracy (copied from Fractions)
Number and Place Value – Problem Solving	solve number problems and practical problems involving these ideas.	solve number and practical problems that involve all of the above and with increasingly large positive numbers	solve number problems and practical problems that involve all of the above	solve number problems and practical problems that involve all of the above
Number – Addition and Subtraction – Mental Calculation	add and subtract numbers mentally, including: * a three-digit number and ones * a three-digit number and tens * a three-digit number and hundreds		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

Number – Addition and Subtraction – Written Methods	add and subtract numbers with up to three digits, using formal written methods of columnar addition and subtraction	add and subtract numbers with up to 4 digits using the formal written methods of columnar addition and subtraction where appropriate	add and subtract whole numbers with more than 4 digits, including using formal written methods (columnar addition and subtraction)	
Number – Addition and Subtraction – Inverse Operations, Estimating And Checking Answers	estimate the answer to a calculation and use inverse operations to check answers	estimate and use inverse operations to check answers to a calculation	use rounding to check answers to calculations and determine, in the context of a problem, levels of accuracy	use estimation to check answers to calculations and determine, in the context of a problem, levels of accuracy.
Number – Addition and Subtraction – Problem Solving	solve problems, including missing number problems, using number facts, place value, and more complex addition and subtraction	solve addition and subtraction two-step problems in contexts, deciding which operations and methods to use and why	solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why	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
Number – Multiplication and Division Facts	count from 0 in multiples of 4, 8, 50 and 100 (copied from Number and Place Value) recall and use multiplication and division facts for the 3, 4 and 8 multiplication tables	count in multiples of 6, 7, 9, 25 and 1 000 (copied from Number and Place Value) recall multiplication and division facts for multiplication tables up to 12 × 12	count in multiples of 6, 7, 9, 25 and 1 000 (copied from Number and Place Value) recall multiplication and division facts for multiplication tables up to 12 × 12	
Number – Multiplication and Division Mental Calculation	write and calculate mathematical statements for multiplication and division using the multiplication tables that they know, including for two-digit numbers times one-digit numbers, using mental and progressing to formal written	use place value, known and derived facts to multiply and divide mentally, including: multiplying by 0 and 1; dividing by 1; multiplying together three numbers recognise and use factor pairs and commutativity in mental	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 associate a fraction with division and calculate decimal fraction equivalents (e.g. 0.375) for a simple fraction (e.g. 3/8) (copied from Fractions)

	methods (appears also in Written Methods)	calculations (appears also in Properties of Numbers)		
Number – Multiplication and Division Written Calculation	write and calculate mathematical statements for multiplication and division using the multiplication tables that they know, including for two-digit numbers times one-digit numbers, using mental and progressing to formal written methods (appears also in Mental Methods)	multiply two-digit and three-digit numbers by a one-digit number using formal written layout	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	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 use written division methods in cases where the answer has up to two decimal places (copied from Fractions (including decimals))
Number – Multiplication and Division Properties Of Numbers: Multiples, Factors, Primes, Square And Cube Numbers		recognise and use factor pairs and commutativity in mental calculations (repeated)	identify multiples and factors, including finding all factor pairs of a number, and common factors of two numbers. 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 use common factors to simplify fractions; use common multiples to express fractions in the same denomination (copied from Fractions) calculate, estimate and compare volume of cubes and cuboids using standard units, including

			recognise and use square numbers and cube numbers, and the notation for squared (2) and cubed (3)	centimetre cubed (cm3) and cubic metres (m3), and extending to other units such as mm3 and km3 (copied from Measures)
Number – Multiplication and Division Order of Operations				use their knowledge of the order of operations to carry out calculations involving the four operations
Number – Multiplication and Division Inverse Operations, Estimating and Checking Answers	estimate the answer to a calculation and use inverse operations to check answers (copied from Addition and Subtraction)	estimate and use inverse operations to check answers to a calculation (copied from Addition and Subtraction)		use estimation to check answers to calculations and determine, in the context of a problem, levels of accuracy
Number – Multiplication and Division 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 the 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	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 solve problems involving multiplication and division, including scaling by simple fractions and problems involving simple rates	solve problems involving addition, subtraction, multiplication and division solve problems involving similar shapes where the scale factor is known or can be found (copied from Ratio and Proportion)

Number: Fractions [including Decimals and % Counting in Fractional Steps	count up and down in tenths	count up and down in hundredths		
Number: Fractions [including Decimals and % Recognising Fractions	recognise, find and write fractions of a discrete set of objects: unit fractions and non-unit fractions with small denominators recognise that tenths arise from dividing an object into 10 equal parts and in dividing one – digit numbers or quantities by 10. recognise and use fractions as numbers: unit fractions and non-unit fractions with small denominators	recognise that hundredths arise when dividing an object by one hundred and dividing tenths by ten	recognise and use thousandths and relate them to tenths, hundredths and decimal equivalents (appears also in Equivalence)	
Number: Fractions [including Decimals and % Comparing Fractions	compare and order unit fractions, and fractions with the same denominators		compare and order fractions whose denominators are all multiples of the same number	compare and order fractions, including fractions >1
Number: Fractions [including Decimals and % Comparing Decimals		compare numbers with the same number of decimal places up to two decimal places	read, write, order and compare numbers with up to three decimal places	identify the value of each digit in numbers given to three decimal places
Number: Fractions [including Decimals and % Rounding Including Decimals		round decimals with one decimal place to the nearest whole number	round decimals with two decimal places to the nearest whole number and to one decimal place	solve problems which require answers to be rounded to specified degrees of accuracy
Number: Fractions [including Decimals and % Equivalence	recognise and show, using diagrams, equivalent fractions with small denominators	recognise and show, using diagrams, families of common equivalent fractions	identify, name and write equivalent fractions of a given fraction, represented visually, including tenths and hundredths	use common factors to simplify fractions; use common multiples to express fractions in the same denomination

[including Fractions, Decimals & %]		recognise and write decimal equivalents of any number of tenths or hundredths recognise and write decimal equivalents to 1/4; 1/2; 3/4	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 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 as a decimal fraction	associate a fraction with division and calculate decimal fraction equivalents (e.g. 0.375) for a simple fraction (e.g. 3/8) recall and use equivalences between simple fractions, decimals and percentages, including in different contexts.
Number: Fractions [including Decimals and % Addition & Subtraction of Fractions	add and subtract fractions with the same denominator within one whole (e.g. 5/7 + 1/7 = 6/7)	add and subtract fractions with the same denominator	add and subtract fractions with the same denominator and multiples of the same number 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. 2/5 + 4/5 = 6/5 = 11/5)	add and subtract fractions with different denominators and mixed numbers, using the concept of equivalent fractions
Number: Fractions [including Decimals and % Multiplication and Division of Fractions			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. 1/4 × 1/2 = 1/8) multiply one-digit numbers with up to two decimal places by whole numbers divide proper fractions by whole numbers (e.g. 1/3 ÷ 2 = 1/6)

Number: Fractions [including Decimals and % Multiplication and 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 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. 3/8) use written division methods in cases where the answer has up to two decimal places
Number: Fractions [including Decimals and % Problem solving	solve problems that involve all of the above	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 problems involving numbers up to three decimal places solve problems which require knowing percentage and decimal equivalents of 1/2, 1/4, 1/5, 2/5, 4/5 and those with a denominator of a multiple of 10 or 25.	

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 [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.
Measurement – Measuring and Calculating	measure the perimeter of simple 2-D shapes	estimate, compare and calculate different measures, including money in pounds and pence (appears also in Comparing) measure and calculate the perimeter of a rectilinear figure (including squares) in centimetres and metres	use all four operations to solve problems involving measure (e.g. length, mass, volume, money) using decimal notation including scaling. measure and calculate the perimeter of composite rectilinear shapes in centimetres and metres	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
Geometry – Properties of Shapes Identifying Shapes and Their Properties		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) illustrate and name parts of circles, including radius, diameter and

				circumference and know that the diameter is twice the radius
Geometry – Properties of Shapes 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 (^{o})	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)
Geometry – Properties of Shapes Comparing and Classifying		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
Geometry – Properties of Shapes Angles	recognise angles as a property of shape or a description of a turn 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 or less than a right angle identify horizontal and vertical lines and pairs of perpendicular and parallel lines	identify acute and obtuse angles and compare and order angles up to two right angles by size	know angles are measured in degrees: estimate and compare acute, obtuse and reflex angles identify: * angles at a point and one whole turn (total 360^{o}) * angles at a point on a straight line and ½ a turn (total 180^{o}) * other multiples of 90^{o}	recognise angles where they meet at a point, are on a straight line, or are vertically opposite, and find missing angles
Geometry – Position and Direction – Position, direction and Movement		describe positions on a 2-D grid as coordinates in the first quadrant	identify, describe and represent the position of a shape following a reflection or translation, using the	describe positions on the full coordinate grid (all four quadrants)

		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	appropriate language, and know that the shape has not changed	draw and translate simple shapes on the coordinate plane, and reflect them in the axes.
Statistics – Interpreting, Constructing and Presenting Data	interpret and present data using bar charts, pictograms and tables	interpret and present discrete and continuous data using appropriate graphical methods, including bar charts and time graphs	complete, read and interpret information in tables, including timetables	interpret and construct pie charts and line graphs and use these to solve problems
Statistics – Solving Problems	solve one-step and two-step questions [e.g. 'How many more?' and 'How many fewer?'] using information presented in scaled bar charts and pictograms and tables.	solve comparison, sum and difference problems using information presented in bar charts, pictograms, tables and other graphs.	solve comparison, sum and difference problems using information presented in a line graph	calculate and interpret the mean as an average
Algebra - Equations	solve problems, including missing number problems, using number facts, place value, and more complex addition and subtraction. (copied from Addition and Subtraction) solve problems, including missing number problems, involving multiplication and division, including integer scaling (copied from Multiplication and Division)		*use the properties of rectangles to deduce related facts and find* ***missing lengths and angles*** (copied from Geometry: Properties of Shapes)	express missing number problems algebraically find pairs of numbers that satisfy number sentences involving two unknowns enumerate all possibilities of combinations of two variables
Algebra - Formulae		*Perimeter can be expressed algebraically as 2(a + b) where a and b are the dimensions in the same unit. (Copied from NSG measurement)*		use simple formulae recognise when it is possible to use formulae for area and volume of shapes (copied from Measurement)

Algebra - Sequences				generate and describe linear number sequences

Mathematics Topic Map

	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Year 3	**Number and Place Value** numbers up to 1000 in numerals and in words Recognise the place value of each digit in a 3-digit number (100s, 10s, 1s) **Addition and Subtraction** Add and subtract multiples and near multiples of 10 by counting on and back or by using number facts **Multiplication and Division** Recall and use multiplication and division facts for the 2, 3, 4, 5 and 10 multiplication tables (Ongoing all year) **Fractions, Decimals, Ratios and Percentages** Recognise, find and write fractions of a discrete set of objects: unit fractions and non-unit fractions with small denominators, e.g. 1/2 , 1/3s and 1/4s of multiples of 2, 3 and 4 **Measures** Tell and write the time to the nearest 5 minutes from an analogue or digital clock, including using Roman numerals from I to XII. Know the number of days in each month, year and leap year **Geometry** Draw and make 3D shapes using modelling materials Recognise 3D shapes in different orientations and describe them **Statistics**		**Number and Place Value** Find 1, 10 or 100 more or less than a given number Identify, represent and estimate numbers using different representations find 10 or 100 more or less than a given number Compare and order numbers up to 1000 **Addition and Subtraction** Add numbers mentally, including 2-digit and 3-digit numbers Solve simple word problems using addition or subtraction Begin to add numbers with up to 3 digits, using formal written methods of columnar addition **Multiplication and Division** Solve problems, including missing number problems, involving multiplication and division **Fractions, Decimals, Ratios and Percentages** Recognise, find and write fractions of a discrete set of objects: unit fractions and non-unit fractions with small denominators, for example 1/2s, 1/3s, 1/4s, and 1/5s of amounts (whole number answers only). **Measures** Tell and write the time to the **nearest minute** from an analogue clock, including using Roman Numerals from I to XII, or a digital clock. Calculate time intervals and compare durations of events Measure the perimeter of simple 2D shapes. Know the number of seconds in a minute **Geometry**		**Number and Place Value** Count from 0 in multiples of 4, 8, 10, 50 and 100; find 10 or 100 more or less than a give number Compare and order numbers up to 1000, using < and > signs **Addition and Subtraction** Subtract numbers with up to 3 digits by counting up (difference less than 100) Estimate the answer and use inverse operations to check answers Add numbers with up to 3 digits using column addition **Multiplication and Division** Understand the relationship between multiplication and division. Write and calculate mathematical statements for multiplication using multiplication tables, including for 2-digit numbers times 1-digit numbers, using mental and progressing to formal written methods, for example using grid methods Solve problems, including missing number problems and word problems, involving 2-digit by 1-digit multiplication or division. **Fractions, Decimals, Ratios and Percentages** Add and subtract fractions with the same denominator within one whole. Compare and order unit fractions, and fractions with the same denominators.	

		Identify and draw 2D shapes Identify right angles, recognise that 2 right angles make a half turn, 3 make 3/4 of a turn and 4 complete a turn; identify whether angles are greater than or less than a right angle **Statistics**	Recognise that tenths arise from dividing an object into 10 equal parts and in dividing 1-digit numbers or quantities by 10. **Measures** Add and subtract amounts of money to give change, using both £ and p in practical contexts. Measure, compare, add and subtract: lengths (m/cm/mm); mass (kg/g); volume/capacity (L/ml). Tell and write the time from 12-hour and 24-hour clocks. **Geometry** Recognise angles as a property of shape or a description of a turn. Identify horizontal and vertical lines and pairs of perpendicular and parallel lines. **Statistics** Interpret and present data using bar charts, pictograms and tables.
Year 4	**Number and Place Value** Recognise the place value of each digit in a 4-digit number (1000s, 100s, 10s, and 1s); order and compare numbers Round 4 digit numbers to the nearest 10, 100 or 1000 **Addition and Subtraction** Solve addition and subtraction problems for numbers with up to 3-digits Use column addition to add 3-digit numbers; begin to add 4-digit numbers Use expanded column subtraction to subtract 3-digit numbers **Multiplication and Division** Recall multiplication and division facts for multiplication tables up to 12 × 12 (ongoing all year) Multiply 2-digit and 3-digit numbers by a 1-digit number using formal written layout (grid) Recognise and use factor pairs and commutativity in mental calculations	**Number and Place Value** Count on and back in multiples of 6, 7, 9, 25 and 1000 Find 1, 10, 100 and 1000 more or less than a given number. Count backwards through zero to include negative numbers **Addition and Subtraction** Add and subtract numbers with up to 4 digits using formal columnar addition and subtraction methods. **Multiplication and Division** Multiply 2-digit and 3-digit numbers by a 1-digit number using a formal written layout (vertical algorithm – ladder) **Fractions, Decimals, Ratios and Percentages** Round decimals with 1 decimal place to the nearest whole number **Measures** Read, write and convert time between analogue and digital 12- and 24-hour clocks. **Geometry**	**Number and Place Value** Identify, represent and estimate numbers using different representations Solve number and practical problems with increasingly large positive numbers Read Roman numerals to 100 (I to C) and know that, over time, the numeral system changed to include the concept of zero and place value **Addition and Subtraction** Use inverse to check answers **Multiplication and Division** Use place value and known and derived facts to multiply 2-digit and 3-digit numbers by a 1-digit number (including multiplying by 0 and 1) Multiply 2- and 3-digit numbers by a 1-digit number using formal written layout Use doubling and halving to multiply and divide mentally **Fractions, Decimals, Ratios and Percentages**

	Fractions, Decimals, Ratios and Percentages Recognise and show families of common equivalent fractions Recognise and write decimal and fraction equivalents of tenths and a ½ Find the effect of dividing a 1-digit or 2-digit number by 10 **Measures** Read, write and convert time between analogue and digital 12-hour clocks Solve problems involving converting from hours to minutes; minutes to seconds; years to months; weeks to days Convert between different units of measure – mm, cm, m; ml, l; g, kg.	Identify acute and obtuse angles and compare and order angles Identify lines of symmetry in 2D shapes presented in different orientations. Complete a simple symmetric figure with respect to a specific line of symmetry.	Count up and down in tenths and hundredths. Compare numbers with up to 2 decimal places, identify the value of the digits as ones, tenths and hundredths, and round decimal numbers to the nearest whole Solve simple measure and money problems using fractions and decimals to 2 decimal places Add and subtract 0·1 and 0·01 Recognise and write decimal and fraction equivalents of tenths, hundredths, 1/4, 1/2 and ¾ Add and subtract fractions with the same denominator **Measures** Measure and calculate the perimeter of a rectilinear figure (including squares) in centimetres and metres. Find the area of rectilinear shapes. **Geometry** Compare and classify geometric shapes, including quadrilaterals and triangles Describe positions on a 2D grid as coordinates in the first quadrant. Describe movements between positions as translations of a unit left/right and up/down. Plot specified points. **Statistics** Interpret and present discrete and continuous data using appropriate graphical methods, including bar charts and time graphs. Solve comparison, sum and difference problems using information presented in bar charts, pictograms, tables and other graphs.
Year 5	**Number and Place Value** Order and compare numbers to at least 100 000 **Addition and Subtraction** Add whole numbers with 4 digits, including using the formal written method of columnar addition	**Number and Place Value** Count forwards or backwards in steps of powers of 10 for any given number up to 1000 000 Read and write numbers to at least 1 000 000.	**Number and Place Value** Interpret negative numbers in context; count forwards and backwards with positive and negative whole numbers, including through 0 Round any number up to 1 000 000 to the nearest 10, 100, 1000, 10 000 and 100 000.

	Subtract whole numbers with 4 digits, including using the formal written method of columnar subtraction. **Multiplication and Division** Solve problems involving multiplication and division using knowledge of factors **Fractions, Decimals, Ratios and Percentages** Compare and order fractions with the same denominator Identify, name and write equivalent fractions Read, write, order and compare numbers with up to 2 decimal places. **Measures** Begin to calculate the perimeter of rectilinear shapes in cm **Geometry** 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 on a straight line and half a turn (total 180°) Identify 90° and other multiples of 90° **Statistics** Complete, read and interpret information in timetables using 24-hour times.	Determine the value of each digit in numbers to at least 1 000 000 Order and compare 6-digit numbers and place on a number line **Addition and Subtraction** Add and subtract numbers mentally with increasingly large numbers. Solve addition 1- step and multi-step problems **Multiplication and Division** Identify multiples and factors, including finding all factor pairs of a number, and common factors of 2 numbers Know prime factors and composite (non-prime) numbers; establish whether a number up to 100 is prime and recall prime numbers up to 19. Recognise and use square numbers **Fractions, Decimals, Ratios and Percentages** Round decimals with 2 decimal places to the nearest whole number and to 1 decimal place. Solve problems involving numbers with up to 3 decimal places Compare and order fractions, including mixed numbers, whose denominators are all multiples of the same number. Recognise mixed numbers and improper fractions and convert from one form to the other Multiply proper fractions by whole numbers **Measures** Convert between different units of metric measure (km / m; cm / m; cm / mm; g / kg; L / ml). Understand and use approximate equivalences between metric units and common imperial units such as inches, pounds and pints. **Geometry** Distinguish between regular and irregular polygons based on reasoning about equal sides and angles. **Statistics**	Read Roman numerals to 1000 (M) and recognise years written in Roman numerals. **Addition and Subtraction** Use rounding to check answers to calculations Add and subtract whole numbers with more than 4 digits, including using formal written methods such as columnar addition and subtraction. **Multiplication and Division** Multiply and divide whole numbers and those involving decimals by 10, 100 and 1000. Divide numbers up to 4 digits by a 1-digit number using the formal written method of short division and interpret remainders Multiply numbers up to 4 digits by a 1- or 2-digit number using a formal written method, including long multiplication for 2-digit numbers. **Fractions, Decimals, Ratios and Percentages** Compare and order fractions whose denominators are all multiples of the same number. Read, write, order and compare numbers with up to 3 decimal places. Read and write decimal numbers as fractions. Multiply proper fractions by whole numbers Recognise and use thousandths and relate them to tenths, hundredths and decimal equivalents. Add and subtract fractions with the same denominator and denominators that are multiples of the same whole number Recognise the per cent symbol (%) and understand that it relates to 'number of parts per hundred'; write percentages as a fraction with denominator 100 and as a decimal.

		Draw line graphs; solve comparison, sum and difference problems using information presented in a line graph.	Solve problems which require knowing percentage and decimal equivalents of 1/2, 1/4, 1/5, 2/5, 4/5 and those fractions with a denominator of a multiple of 10 or 25. **Measures** Measure and calculate the perimeter of composite rectilinear shapes in cm and m. Solve problems involving time, telling the time using 12- and 24-hour clocks, and converting between units of time. Calculate and compare the area of rectangles (including squares), including using standard units, cm2 and m2, Estimate the area of irregular shapes. **Geometry** Identify 3D shapes, including cubes and other cuboids, from 2D representations Recognise and use the properties of rectangles to deduce related facts and find missing lengths and angles. Identify, describe and represent the position of a shape following a reflection or translation using the appropriate language; know that the shape has not changed
Year 6	**Number and Place Value** Read, write, order and compare numbers up to 1 000 000 and determine the value of each digit Use negative numbers in context, and calculate intervals across zero **Addition and Subtraction** Use knowledge of the order of operations to carry out calculations involving the four operations. Use knowledge of the order of operations and brackets to carry out multi-step calculations involving addition, subtraction, **Multiplication and Division** Multiply multi-digit numbers up to 4 digits by numbers between 10 and 40 using the formal written method of long multiplication.	**Number and Place Value** Round any whole number to a required degree of accuracy. **Addition and Subtraction** Use estimation to check answers to calculations and determine, in the context of a problem, an appropriate degree of accuracy. **Multiplication and Division** Multiply multi-digit numbers up to 4 digits by a 1- or 2-digit whole number using the formal written method of long multiplication. Identify common factors, common multiples and prime numbers Divide numbers up to 4 digits by a 2-digit whole number using the formal written method of **long division** **Fractions, Decimals, Ratios and Percentages**	**Number and Place Value** Use negative numbers in context, and calculate intervals across zero. Round any whole number to a required degree of accuracy. **Addition and Subtraction** Perform mental calculations, including with mixed operations and large numbers, and use inverse operations to solve missing number problems. **Multiplication and Division** Multiply multi-digit numbers up to 4 digits by a 2-digit whole number using the formal written method of long multiplication Divide numbers up to 4 digits by a 2-digit whole number using the formal written method of long division, making approximations, and interpret remainders as whole number remainders, fractions

	Use knowledge of the order of operations and brackets to carry out multi-step calculations involving multiplication and division. Divide numbers up to 4 digits by numbers up to 12 using the formal written method of **short division** **Fractions, Decimals, Ratios and Percentages** Identify the value of each digit in numbers with up to 3 decimal places and multiply and divide numbers by 10, 100 and 1000 giving answers to up to 3 decimal places Compare and order fractions, including fractions > 1. Solve problems involving the calculation of percentages Divide proper fractions by whole numbers. **Measures** Solve problems involving the calculation and conversion of units of measure, using decimal notation up to 3 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 3 decimal places. Begin to 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). **Geometry** Recognise, describe and build simple 3D shapes, including making nets. **Algebra**	Associate a fraction with division and calculate decimal fraction equivalents for a simple fraction. Multiply 1- and 2-digit numbers with up to 2 decimal places by whole numbers. Use written division methods in cases where the answer has up to 2 decimal places Solve problems which require answers to be rounded to specified degrees of accuracy. Solve problems involving simple ratios, i.e. unequal sharing and grouping using knowledge of fractions and multiples **Measures** Solve problems involving the calculation and conversion of units of measure. Convert between miles and kilometres. **Geometry** Draw 2D shapes using given dimensions and angles. Illustrate and name parts of circles, including radius, diameter and circumference and know that the diameter is twice the radius. Compare and classify geometric shapes based on their properties and sizes and use mathematical reasoning to 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. 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** Interpret and construct pie charts and use these to solve problems. Interpret and construct line graphs and use these to solve problems	Know all multiplication and division facts up to 12 × 12; identify common factors, common multiples and prime numbers. **Fractions, Decimals, Ratios and Percentages** identify the value of each digit in numbers given to 3 decimal places and multiply and divide numbers by 10, 100 and 1000 giving answers up to 3 decimal places Use common factors to simplify fractions; use common multiples to express fractions in the same denomination. Add and subtract fractions, with different denominators and mixed numbers, using the concept of equivalent fractions. Divide proper fractions by whole numbers. Multiply simple pairs of proper fractions writing the answer in its simplest form Solve problems involving the relative sizes of two quantities where missing values can be found by using integer multiplication and division facts. Recall and use equivalences between simple fractions, decimals and percentages, including in different contexts. Solve problems involving similar shapes where the scale factor is known or can be found. **Measures** Calculate, estimate and compare volumes of cubes and cuboids. **Geometry** Compare and classify geometric shapes based on their properties and sizes and find unknown angles in any triangles, quadrilaterals, and regular polygons; **Statistics** Read, interpret and construct tables, bar charts, pictograms, pie charts and line graphs and use these to solve problems. **Algebra** Express missing number problems algebraically

	numbers that satisfy an equation with two unknowns. Enumerate possibilities of combinations of two variables	Calculate and interpret the mean as an average **Algebra** Use simple formulae. Continue, generate and describe linear number sequences.	
Whole School Projects			