Guided by God, we build a community of learners who flourish and are filled with hope.

Keighley St Andrew's C of E Primary School

Progression document

At Keighley St Andrew's, we strive to deliver a high-quality Mathematics education that provides a foundation for understanding the world, the ability to reason mathematically, an appreciation of the beauty and power of mathematics, and a sense of enjoyment and curiosity about the subject. We aim to ensure that the mathematics curriculum shows coverage and progression throughout school and allows every child to develop the skills and knowledge to become mathematicians.

The Mathematics curriculum is clearly sequenced and progressive starting in EYFS, up to Year 6. This covers all of the substantive knowledge in the National Curriculum, but also extends the expectations of when concepts are introduced to give children opportunities to develop their disciplinary knowledge at an age-appropriate level.

<table>
<tr><th colspan="2">Early Years Framework: Mathematics</th></tr>
<tr><td colspan="2">Developing a strong grounding in number is essential so that all children develop the necessary building blocks to excel mathematically. Children should be able to count confidently, develop a deep understanding of the numbers to 10, the relationships between them and the patterns within those numbers. By providing frequent and varied opportunities to build and apply this understanding - such as using manipulatives, including small pebbles and tens frames for organising counting - children will develop a secure base of knowledge and vocabulary from which mastery of mathematics is built. In addition, it is important that the curriculum includes rich opportunities for children to develop their spatial reasoning skills across all areas of mathematics including shape, space and measures. It is important that children develop positive attitudes and interests in mathematics, look for patterns and relationships, spot connections, 'have a go', talk to adults and peers about what they notice and not be afraid to make mistakes</td></tr>
<tr><th>ELG: Number</th><th>ELG: Numerical Patterns</th></tr>
<tr><td>Children at the expected level of development will:
Have a deep understanding of number to 10, including the composition of each number; 14
Subitise (recognise quantities without counting) up to 5;
Automatically recall (without reference to rhymes, counting or other aids)
number bonds up to 5 (including subtraction facts) and some number bonds to 10, including double facts.</td><td>Children at the expected level of development will:
Verbally count beyond 20, recognising the pattern of the counting system;
Compare quantities up to 10 in different contexts, recognising when one
quantity is greater than, less than or the same as the other quantity;
Explore and represent patterns within numbers up to 10, including evens and odds, double facts and how quantities can be distributed equally.</td></tr>
<tr><th colspan="2">Development Matters: Mathematics</th></tr>
<tr><th>3-4 Years</th><th>Reception</th></tr>
</table>

● Develop fast recognition of up to 3 objects, without having to count them individually (‘subitising’). ● Recite numbers past 5. ● Say one number for each item in order: 1,2,3,4,5. ● Know that the last number reached when counting a small set of objects tells you how many there are in total (‘cardinal principle’). ● Show ‘finger numbers’ up to 5. ● Link numerals and amounts: for example, showing the right number of objects to match the numeral, up to 5. ● Experiment with their own symbols and marks as well as numerals. ● Solve real world mathematical problems with numbers up to 5. ● Compare quantities using language: ‘more than’, ‘fewer than’. ● Talk about and explore 2D and 3D shapes (for example, circles, rectangles, triangles and cuboids) using informal and mathematical language: ‘sides’, ‘corners’; ‘straight’, ‘flat’, ‘round’. ● Understand position through words alone – for example, “The bag is under the table,” – with no pointing. ● Describe a familiar route. ● Discuss routes and locations, using words like ‘in front of’ and ‘behind’. ● Make comparisons between objects relating to size, length, weight and capacity. ● Select shapes appropriately: flat surfaces for building, a triangular prism for a roof, etc. ● Combine shapes to make new ones – an arch, a bigger triangle, etc. ● Talk about and identify the patterns around them. For example: stripes on clothes, designs on rugs and wallpaper. Use informal language like ‘pointy’, ‘spotty’, ‘blobs’, etc. ● Extend and create ABAB patterns – stick, leaf, stick, leaf. ● Notice and correct an error in a repeating pattern. ● Begin to describe a sequence of events, real or fictional, using words such as ‘first’, ‘then...’	● Count objects, actions and sounds. ● Subitise. ● Link the number symbol (numeral) with its cardinal number value. ● Count orally beyond ten. ● Compare numbers. ● Understand the ‘one more than/one less than’ relationship between consecutive numbers ● Explore the composition of numbers to 10. ● Automatically recall number bonds for numbers 0–5 and some to 10. ● Select, rotate and manipulate shapes to develop spatial reasoning skills. ● Compose and decompose shapes so that children recognise a shape can have other shapes within it, just as numbers can. ● Continue, copy and create repeating patterns. ● Compare length, weight and capacity.

Year 1 & 2

<table>
<tr><th colspan="2">National Curriculum Objectives</th></tr>
<tr><th colspan="2">Number and Place Value</th></tr>
<tr><th>Year 1</th><th>Year 2</th></tr>
<tr><td>• count to and across 100, forwards and backwards, beginning with 0 or 1, or from any given number
• count, read and write numbers to 100 in numerals; count in multiples of twos, fives and tens
• given a number, identify one more and one less
• identify and represent numbers using objects and pictorial representations including the number line, and use the language of: equal to, more than, less than (fewer), most, least
• read and write numbers from 1 to 20 in numerals and words.</td><td>• count in steps of 2, 3, and 5 from 0, and in tens from any number, forward and backward
• recognise the place value of each digit in a two-digit number (tens, ones)
• identify, represent and estimate numbers using different representations, including the number line
• compare and order numbers from 0 up to 100; use <, > and = signs
• read and write numbers to at least 100 in numerals and in words
• use place value and number facts to solve problems.</td></tr>
<tr><th colspan="2">Addition and Subtraction</th></tr>
<tr><th>Year 1</th><th>Year 2</th></tr>
<tr><td>• read, write and interpret mathematical statements involving addition (+), subtraction (–) and equals (=) signs
• represent and use number bonds and related subtraction facts within 20
• add and subtract one-digit and two-digit numbers to 20, including zero
• solve one-step problems that involve addition and subtraction, using concrete objects and pictorial representations, and missing number problems such as 7 = □ – 9.
• recognise and know the value of different denominations of coins and notes (Obj. taken from measures)</td><td>• solve problems with addition and subtraction:
• using concrete objects and pictorial representations, including those involving numbers, quantities and measures
• applying their increasing knowledge of mental and written methods
• recall and use addition and subtraction facts to 20 fluently, and derive and use related facts up to 100
• add and subtract numbers using concrete objects, pictorial representations, and mentally, including:
➢ a two-digit number and ones
➢ a two-digit number and tens
➢ two two-digit numbers
➢ adding three one-digit numbers
• show that addition of two numbers can be done in any order (commutative) and subtraction of one number from another cannot
• recognise and use the inverse relationship between addition and subtraction and use this to check calculations and solve missing number problems.
• recognise and use symbols for pounds (£) and pence (p); combine amounts to make a particular value (Obj. taken from measures)
• find different combinations of coins that equal the same amounts of money (Obj. taken from measures)
• solve simple problems in a practical context involving addition and subtraction of money of the same unit, including giving change (Obj. taken from measures)</td></tr>
<tr><th colspan="2">Multiplication and Division</th></tr>
<tr><th>Year 1</th><th>Year 2</th></tr>
</table>

• solve one-step problems involving multiplication and division by calculating the answer using concrete objects, pictorial representations and arrays with the support of the teacher.	• recall and use multiplication and division facts for the 2, 5 and 10 multiplication tables, including recognising odd and even numbers • calculate mathematical statements for multiplication and division within the multiplication tables and write them using the multiplication (×), division (÷) and equals (=) signs • show that multiplication of two numbers can be done in any order (commutative) and division of one number by another cannot • solve problems involving multiplication and division, using materials, arrays, repeated addition, mental methods, and multiplication and division facts, including problems in contexts.
Measurement – length, weight, capacity, temperature	
Year 1	**Year 2**
• compare, describe and solve practical problems for: lengths and heights [for example, long/short, longer/shorter, tall/short, double/half], mass/weight [for example, heavy/light, heavier than, lighter than], capacity and volume [for example, full/empty, more than, less than, half, half full, quarter] • measure and begin to record the following: lengths and heights, mass/weight, capacity and volume	• choose and use appropriate standard units to estimate and measure length/height in any direction (m/cm); mass (kg/g); temperature (°C); capacity (litres/ml) to the nearest appropriate unit, using rulers, scales, thermometers and measuring vessels • compare and order lengths, mass, volume/capacity and record the results using >, < and =
Geometry – Position and Direction	
Year 1	**Year 2**
• describe position, direction and movement, including whole, half, quarter and three-quarter turns.	• order and arrange combinations of mathematical objects in patterns and sequences • use mathematical vocabulary to describe position, direction and movement, including movement in a straight line and distinguishing between rotation as a turn and in terms of right angles for quarter, half and three-quarter turns (clockwise and anti-clockwise).
Geometry- Shape	
Year 1	**Year 2**
• recognise and name common 2-D and 3-D shapes, including: • 2-D shapes [for example, rectangles (including squares), circles and triangles] • 3-D shapes [for example, cuboids (including cubes), pyramids and spheres].	• identify and describe the properties of 2-D shapes, including the number of sides and line symmetry in a vertical line • identify and describe the properties of 3-D shapes, including the number of edges, vertices and faces • identify 2-D shapes on the surface of 3-D shapes [for example, a circle on a cylinder and a triangle on a pyramid] • compare and sort common 2-D and 3-D shapes and everyday objects.
Fractions	
Year 1	**Year 2**
• recognise, find and name a half as one of two equal parts of an object, shape or quantity • recognise, find and name a quarter as one of four equal parts of an object, shape or quantity.	• recognise, find, name and write fractions 1/3 , 1/4 , 2/4 and 3/4 of a length, shape, set of objects or quantity • write simple fractions for example, ½ of 6 = 3 and recognise the equivalence of 2/4 and 1/2.
Measurement - Time	
Year 1	**Year 2**

• sequence events in chronological order using language [for example, before and after, next, first, today, yesterday, tomorrow, morning, afternoon and evening] • recognise and use language relating to dates, including days of the week, weeks, months and years • tell the time to the hour and half past the hour and draw the hands on a clock face to show these times. • Compare, describe and solve practical problems for time [for example, quicker, slower, earlier, later] • Measure and begin to record time (hours, minutes, seconds)	• compare and sequence intervals of time • tell and write the time to five minutes, including quarter past/to the hour and draw the hands on a clock face to show these times • know the number of minutes in an hour and the number of hours in a day.

Statistics	
Year 1	**Year 2**
n/a	• interpret and construct simple pictograms, tally charts, block diagrams and simple tables • ask and answer simple questions by counting the number of objects in each category and sorting the categories by quantity • ask and answer questions about totalling and comparing categorical data.

Year 3 & 4

Place Value	
Year 3	**Year 4**
• count from 0 in multiples of 4, 8, 50 and 100; find 10 or 100 more or less than a given number • recognise the place value of each digit in a three-digit number (hundreds, tens, ones) • compare and order numbers up to 1000 • identify, represent and estimate numbers using different representations • read and write numbers up to 1000 in numerals and in words • solve number problems and practical problems involving these ideas.	• count in multiples of 6, 7, 9, 25 and 1000 • find 1000 more or less than a given number • count backwards through zero to include negative numbers • recognise the place value of each digit in a four-digit number (thousands, hundreds, tens, and ones) • order and compare numbers beyond 1000 • identify, represent and estimate numbers using different representations • round any number to the nearest 10, 100 or 1000 • solve number and practical problems that involve all of the above and 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	
Year 3	**Year 4**
• add and subtract numbers mentally, including: ➢ a three-digit number and ones ➢ a three-digit number and tens	• add and subtract numbers with up to 4 digits using the formal written methods of columnar addition and subtraction where appropriate • estimate and use inverse operations to check answers to a calculation

➢ a three-digit number and hundreds • add and subtract numbers with up to three digits, using formal written methods of columnar addition and subtraction • estimate the answer to a calculation and use inverse operations to check answers • solve problems, including missing number problems, using number facts, place value, and more complex addition and subtraction. • add and subtract amounts of money to give change, using both £ and p in practical contexts *(Obj. taken from Measurement)*	• solve addition and subtraction two-step problems in contexts, deciding which operations and methods to use and why. • estimate, compare and calculate different measures, including **money in pounds and pence** *(Obj. taken from Measurement)*
Multiplication and Division	
Year 3	**Year 4**
• recall and use multiplication and division facts for the 3, 4 and 8 multiplication tables • 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 • 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.	• recall multiplication and division facts for multiplication tables up to 12 × 12 • 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 calculations • multiply two-digit and three-digit numbers by a one-digit number using formal written layout • 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.
Measurement	
Year 3	**Year 4**
• measure, compare, add and subtract: lengths (m/cm/mm); mass (kg/g); volume/capacity (l/ml) • measure the perimeter of simple 2-D shapes	• Convert between different units of measure [for example, kilometre to metre; kilogram to gram] • measure and calculate the perimeter of a rectilinear figure (including squares) in centimetres and metres • find the area of rectilinear shapes by counting squares • estimate, compare and calculate different measures, including money in pounds and pence
Geometry – Position and direction	
Year 3	**Year 4**
n/a	• 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.
Geometry – Shape	
Year 3	**Year 4**
• draw 2-D shapes and make 3-D shapes using modelling materials; recognise 3-D shapes in different orientations and describe them • 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.	• compare and classify geometric shapes, including quadrilaterals and triangles, based on their properties and sizes • identify acute and obtuse angles and compare and order angles up to two right angles by size • identify lines of symmetry in 2-D shapes presented in different orientations • complete a simple symmetric figure with respect to a specific line of symmetry.
Fractions	

Year 3	Year 4
• count up and down in tenths; recognise that tenths arise from dividing an object into 10 equal parts and in dividing one-digit numbers or quantities by 10 • recognise, find and write fractions of a discrete set of objects: unit fractions and non-unit fractions with small denominators • recognise and use fractions as numbers: unit fractions and non-unit fractions with small denominators • recognise and show, using diagrams, equivalent fractions with small denominators • add and subtract fractions with the same denominator within one whole [for example, 1/7 + 5/7 = 6/7] • compare and order unit fractions, and fractions with the same denominators • solve problems that involve all of the above.	• recognise and show, using diagrams, families of common equivalent fractions • count up and down in hundredths; recognise that hundredths arise when dividing an object by one hundred and dividing tenths by ten. • 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 • add and subtract fractions with the same denominator • recognise and write decimal equivalents of any number of tenths or hundredths • recognise and write decimal equivalents to 1/4 , 1/2 , 3/4 • 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 • round decimals with one decimal place to the nearest whole number • compare numbers with the same number of decimal places up to two decimal places • solve simple measure and money problems involving fractions and decimals to two decimal places.
Measurement - Time	
Year 3	**Year 4**
• tell and write the time from an analogue clock, including using Roman numerals from I to XII, and 12-hour and 24-hour clocks • estimate and read time with increasing accuracy to the nearest minute; record and compare time in terms of seconds, minutes and hours; use vocabulary such as o'clock, a.m./p.m., morning, afternoon, noon and midnight • know the number of seconds in a minute and the number of days in each month, year and leap year • compare durations of events [for example to calculate the time taken by particular events or tasks].	• 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.

Statistics	
Year 3	**Year 4**
• interpret and present data using bar charts, pictograms and tables • solve one-step and two-step questions [for example, 'How many more?' and 'How many fewer?'] using information presented in scaled bar charts and pictograms and tables.	• 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 & 6

Place Value	
Year 5	**Year 6**
• read, write, order and compare numbers to at least 1 000 000 and determine the value of each digit • count forwards or backwards in steps of powers of 10 for any given number up to 1 000 000 • interpret negative numbers in context, count forwards and backwards with positive and negative whole numbers, including through zero • 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 • read Roman numerals to 1000 (M) and recognise years written in Roman numerals. • round decimals with two decimal places to the nearest whole number and to one decimal place *(Obj taken from FDP)* • read, write, order and compare numbers with up to three decimal places *(Obj taken from FDP)*	• 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. • 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 *(Obj taken from FDP)*
Addition and Subtraction	
Year 5	**Year 6**
• 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. • use +/- to solve problems involving measure (money) *(Obj taken from Measures)*	• perform mental calculations, including with mixed operations and large numbers • solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why • solve problems involving addition, subtraction. • use estimation to check answers to calculations and determine, in the context of a problem, an appropriate degree of accuracy. • solve problems involving the calculation and conversion of units of measure (money), using decimal notation. *(Obj taken from Measures)*
Multiplication and Division	
Year 5	**Year 6**
• 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 • 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 and divide numbers mentally drawing upon known facts • use x/÷ to solve problems involving measure (money) *(Obj taken from Measures)* • 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 and divide whole numbers and those involving decimals by 10, 100 and 1000	• solve problems involving multiplication and division • perform mental calculations, including with mixed operations and large numbers • identify common factors, common multiples and prime numbers • 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 • use estimation to check answers to calculations and determine, in the context of a problem, an appropriate degree of accuracy.

• recognise and use square numbers and cube numbers, and the notation for squared (2) and cubed (3) • 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.	• use their knowledge of the order of operations to carry out calculations involving the four operations • solve problems involving the calculation and conversion of units of measure (money), using decimal notation. *(Obj taken from Measures)*
Geometry - Shape	
Year 5	**Year 6**
• identify 3-D shapes, including cubes and other cuboids, from 2-D representations • know angles are measured in degrees: estimate and compare acute, obtuse and reflex angles • draw given angles, and measure them in degrees (o) • identify: ➢ angles at a point and one whole turn (total 360o) ➢ angles at a point on a straight line and 1/2 a turn (total 180o) ➢ other multiples of 90o • 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.	• 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.
Measurement	
Year 5	**Year 6**
• convert between different units of metric measure (for example, kilometre and metre; centimetre and metre; centimetre and millimetre; gram and kilogram; litre and millilitre) • understand and use approximate equivalences between metric units and common imperial units such as inches, pounds and pints • 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 (cm2) and square metres (m2) and estimate the area of irregular shapes • estimate volume [for example, using 1 cm3 blocks to build cuboids (including cubes)] and capacity [for example, using water] • use all four operations to solve problems involving measure [for example, length, mass, volume, money] using decimal notation, including scaling.	• 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 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].
Measurement – Time	
Year 5	**Year 6**
• solve problems involving converting between units of time • complete, read and interpret information in tables, including **timetables**.*(Obj. from statistics)*	• 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. •
Fractions, Decimals and Percentages	

Year 5	Year 6
• 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 form to the other and write mathematical statements > 1 as a mixed number [for example, 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 • multiply proper fractions and mixed numbers by whole numbers, supported by materials and diagrams • read and write decimal numbers as fractions [for example, 0.71 = 71/100] • recognise and use thousandths and relate them to tenths, hundredths and decimal equivalents • solve problems involving number up to three decimal places • 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 1/2 , 1/4 , 1/5 , 2/5 , 4/5 and those fractions with a denominator of a multiple of 10 or 25.	• 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 • multiply simple pairs of proper fractions, writing the answer in its simplest form [for example,1/2×1/4=1/8] • divide proper fractions by whole numbers [for example, 1/3 ÷ 2 = 1/6] • associate a fraction with division and calculate decimal fraction equivalents [for example, 0.375] for a simple fraction [for example, 3/8] • 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 • recall and use equivalences between simple fractions, decimals and percentages, including in different contexts.
Geometry – Position and direction	
Year 5	**Year 6**
• 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.
Ratio	
Year 5	**Year 6**
n/a	• 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.
Algebra	
Year 5	**Year 6**
n/a	• 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.

Statistics	
Year 5	**Year 6**
• 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.

Substantive Knowledge (National Curriculum) →

	Nur	Rec	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Place Value			count to and across 100, forwards and backwards, beginning with 0 or 1, or from any given number count, read and write numbers to 100 in numerals; count in multiples of twos, fives and tens given a number, identify one more and one less identify and represent numbers using objects and pictorial representations including the number line, and use the language of: equal to, more than, less than (fewer), most, least read and write numbers from 1 to 20 in numerals and words.	count in steps of 2, 3, and 5 from 0, and in tens from any number, forward and backward recognise the place value of each digit in a two-digit number (tens, ones) identify, represent and estimate numbers using different representations, including the number line compare and order numbers from 0 up to 100; use <, > and = signs read and write numbers to at least 100 in numerals and in words use place value and number facts to solve problems.	count from 0 in multiples of 4, 8, 50 and 100; find 10 or 100 more or less than a given number recognise the place value of each digit in a three-digit number (hundreds, tens, ones) compare and order numbers up to 1000 identify, represent and estimate numbers using different representations read and write numbers up to 1000 in numerals and in words solve number problems and practical problems involving these ideas.	count in multiples of 6, 7, 9, 25 and 1000 find 1000 more or less than a given number count backwards through zero to include negative numbers recognise the place value of each digit in a four-digit number (thousands, hundreds, tens, and ones) order and compare numbers beyond 1000 identify, represent and estimate numbers using different representations round any number to the nearest 10, 100 or 1000 solve number and practical problems that involve all of the above and with increasingly large positive numbers read Roman numerals to 100 (I to C) and know that	read, write, order and compare numbers to at least 1 000 000 and determine the value of each digit count forwards or backwards in steps of powers of 10 for any given number up to 1 000 000 interpret negative numbers in context, count forwards and backwards with positive and negative whole numbers, including through zero 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 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 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. 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 (Obj taken from FDP)

						over time, the numeral system changed to include the concept of zero and place value.	round decimals with two decimal places to the nearest whole number and to one decimal place (Obj taken from FDP) read, write, order and compare numbers with up to three decimal places (Obj taken from FDP)	

	Nur	Rec	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Addition and Subtraction			read, write and interpret mathematical statements involving addition (+), subtraction (–) and equals (=) signs represent and use number bonds and related subtraction facts within 20 add and subtract one-digit and two-digit numbers to 20, including zero solve one-step problems that involve addition and subtraction, using concrete objects and pictorial representations, and missing number problems such as 7 = – 9. recognise and know the value of different denominations of coins and notes	solve problems with addition and subtraction: using concrete objects and pictorial representations, including those involving numbers, quantities and measures applying their increasing knowledge of mental and written methods recall and use addition and subtraction facts to 20 fluently, and derive and use related facts up to 100 add and subtract numbers using concrete objects, pictorial representations, and mentally, including: a two-digit number and ones	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 with up to three digits, using formal written methods of columnar addition and subtraction estimate the answer to a calculation and use inverse operations to check answers solve problems, including missing number problems, using number facts, place value, and more complex addition and subtraction. add and subtract amounts of money	add and subtract numbers with up to 4 digits using the formal written methods of columnar addition and subtraction where appropriate estimate and use inverse operations to check answers to a calculation solve addition and subtraction two-step problems in contexts, deciding which operations and methods to use and why. estimate, compare and calculate different measures, including money in pounds and pence (Obj. taken from Measurement)	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. use +/- to solve problems involving measure (money) (Obj	perform mental calculations, including with mixed operations and large numbers solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why solve problems involving addition, subtraction. use estimation to check answers to calculations and determine, in the context of a problem, an appropriate degree of accuracy. solve problems involving the calculation and conversion of units of measure (money), using decimal notation. (Obj taken from Measures)

			(Obj. taken from measures)	a two-digit number and tens two two-digit numbers adding three one-digit numbers show that addition of two numbers can be done in any order (commutative) and subtraction of one number from another cannot recognise and use the inverse relationship between addition and subtraction and use this to check calculations and solve missing number problems. recognise and use symbols for pounds (£) and pence (p); combine amounts to make a particular value (Obj. taken from measures) find different combinations of coins that equal the same amounts of money (Obj. taken from measures) solve simple problems in a practical context involving addition and subtraction of money of the same unit, including giving change (Obj. taken from measures)	to give change, using both £ and p in practical contexts (Obj. taken from Measurement)		taken from Measures)	

	Nur	Rec	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Multiplication and Division			solve one-step problems involving multiplication and division by calculating the answer using concrete objects, pictorial representations and arrays with the support of the teacher.	recall and use multiplication and division facts for the 2, 5 and 10 multiplication tables, including recognising odd and even numbers calculate mathematical statements for multiplication and division within the multiplication tables and write them using the multiplication (×), division (÷) and equals (=) signs show that multiplication of two numbers can be done in any order (commutative) and division of one number by another cannot solve problems involving multiplication and division, using materials, arrays, repeated addition, mental methods, and multiplication and division facts, including problems in contexts.	recall and use multiplication and division facts for the 3, 4 and 8 multiplication tables 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 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.	recall multiplication and division facts for multiplication tables up to 12 × 12 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 calculations multiply two-digit and three-digit numbers by a one-digit number using formal written layout 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.	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 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 and divide numbers mentally drawing upon known facts use x/÷ to solve problems involving measure (money) (Obj taken from Measures) 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 and divide whole numbers and those	solve problems involving multiplication and division perform mental calculations, including with mixed operations and large numbers identify common factors, common multiples and prime numbers 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 use estimation to check answers to calculations and determine, in the context of a problem, an appropriate degree of accuracy. use their knowledge of the order of operations to carry

							involving decimals by 10, 100 and 1000 recognise and use square numbers and cube numbers, and the notation for squared (2) and cubed (3) 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.	out calculations involving the four operations solve problems involving the calculation and conversion of units of measure (money), using decimal notation. (Obj taken from Measures)

	Nur	Rec	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Fractions			recognise, find and name a half as one of two equal parts of an object, shape or quantity recognise, find and name a quarter as one of	recognise, find, name and write fractions 1/3 , 1/4 , 2/4 and 3/4 of a length, shape, set of objects or quantity write simple fractions for	count up and down in tenths; recognise that tenths arise from dividing an object into 10 equal parts and in dividing one-digit numbers or quantities by 10	recognise and show, using diagrams, families of common equivalent fractions count up and down in hundredths; recognise that	compare and order fractions whose denominators are all multiples of the same number identify, name and write equivalent fractions of a given fraction,	use common factors to simplify fractions; use common multiples to express fractions in the same denomination compare and order fractions, including fractions > 1

			four equal parts of an object, shape or quantity.	example, ½ of 6 = 3 and recognise the equivalence of 2/4 and 1/2.	recognise, find and write fractions of a discrete set of objects: unit fractions and non-unit fractions with small denominators recognise and use fractions as numbers: unit fractions and non-unit fractions with small denominators recognise and show, using diagrams, equivalent fractions with small denominators add and subtract fractions with the same denominator within one whole [for example, 1/7 + 5/7 = 6/7] compare and order unit fractions, and fractions with the same denominators solve problems that involve all of the above.	hundredths arise when dividing an object by one hundred and dividing tenths by ten. 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 add and subtract fractions with the same denominator recognise and write decimal equivalents of any number of tenths or hundredths recognise and write decimal equivalents to 1/4 , 1/2 , 3/4 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 round decimals with one decimal place to the nearest whole number compare numbers with the same number of decimal places up to two decimal places	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 [for example, 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 multiply proper fractions and mixed numbers by whole numbers, supported by materials and diagrams read and write decimal numbers as fractions [for example, 0.71 = 71/100] recognise and use thousandths and relate them to tenths, hundredths and decimal equivalents solve problems involving number up to three decimal places recognise the per cent symbol (%) and understand that per cent relates to ‘number of parts per	add and subtract fractions with different denominators and mixed numbers, using the concept of equivalent fractions multiply simple pairs of proper fractions, writing the answer in its simplest form [for example,1/2×1/4=1/8] divide proper fractions by whole numbers [for example, 1/3 ÷ 2 = 1/6] associate a fraction with division and calculate decimal fraction equivalents [for example, 0.375] for a simple fraction [for example, 3/8] 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 recall and use equivalences between simple fractions, decimals and percentages, including in different contexts.

						solve simple measure and money problems involving fractions and decimals to two decimal places.	hundred', and write percentages as a fraction with denominator 100, and as a decimal 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.	

	Nur	Rec	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Measurement			compare, describe and solve practical problems for: lengths and heights [for example, long/short, longer/shorter, tall/short, double/half], mass/weight [for example, heavy/light, heavier than, lighter than], capacity and volume [for example, full/empty, more than, less than, half, half full, quarter] measure and begin to record the following: lengths and heights, mass/weight, capacity and volume	choose and use appropriate standard units to estimate and measure length/height in any direction (m/cm); mass (kg/g); temperature (°C); capacity (litres/ml) to the nearest appropriate unit, using rulers, scales, thermometers and measuring vessels compare and order lengths, mass, volume/capacity and record the results using >, < and =	tell and write the time from an analogue clock, including using Roman numerals from I to XII, and 12-hour and 24-hour clocks estimate and read time with increasing accuracy to the nearest minute; record and compare time in terms of seconds, minutes and hours; use vocabulary such as o'clock, a.m./p.m., morning, afternoon, noon and midnight know the number of seconds in a minute and the number of days in each month, year and leap year	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.	convert between different units of metric measure (for example, kilometre and metre; centimetre and metre; centimetre and millimetre; gram and kilogram; litre and millilitre) understand and use approximate equivalences between metric units and common imperial units such as inches, pounds and pints measure and calculate the perimeter of composite rectilinear shapes in centimetres and metres calculate and compare the area of rectangles (including	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 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

					compare durations of events [for example to calculate the time taken by particular events or tasks].		squares), and including using standard units, square centimetres (cm2) and square metres (m2) and estimate the area of irregular shapes estimate volume [for example, using 1 cm3 blocks to build cuboids (including cubes)] and capacity [for example, using water] use all four operations to solve problems involving measure [for example, length, mass, volume, money] using decimal notation, including scaling.	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].

	Nur	Rec	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Measurement - Time			sequence events in chronological order using language [for example, before and after, next, first, today, yesterday, tomorrow, morning, afternoon and evening] recognise and use language relating to dates, including days of the week, weeks, months and years tell the time to the hour and half past the hour and draw	compare and sequence intervals of time tell and write the time to five minutes, including quarter past/to the hour and draw the hands on a clock face to show these times know the number of minutes in an hour and the number of hours in a day.	tell and write the time from an analogue clock, including using Roman numerals from I to XII, and 12-hour and 24-hour clocks estimate and read time with increasing accuracy to the nearest minute; record and compare time in terms of seconds, minutes and hours; use vocabulary such as o'clock,	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.	solve problems involving converting between units of time complete, read and interpret information in tables, including timetables.(Obj. from statistics)	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.

			the hands on a clock face to show these times. Compare, describe and solve practical problems for time [for example, quicker, slower, earlier, later] Measure and begin to record time (hours, minutes, seconds)		a.m./p.m., morning, afternoon, noon and midnight know the number of seconds in a minute and the number of days in each month, year and leap year compare durations of events [for example to calculate the time taken by particular events or tasks].			

	Nur	Rec	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Geometry – Shape			recognise and name common 2-D and 3-D shapes, including: 2-D shapes [for example, rectangles (including squares), circles and triangles] 3-D shapes [for example, cuboids (including cubes), pyramids and spheres].	identify and describe the properties of 2-D shapes, including the number of sides and line symmetry in a vertical line identify and describe the properties of 3-D shapes, including the number of edges, vertices and faces identify 2-D shapes on the surface of 3-D shapes [for example, a circle on a cylinder and a triangle on a pyramid] compare and sort common 2-D and 3-D shapes and everyday objects.	draw 2-D shapes and make 3-D shapes using modelling materials; recognise 3-D shapes in different orientations and describe them 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	compare and classify geometric shapes, including quadrilaterals and triangles, based on their properties and sizes identify acute and obtuse angles and compare and order angles up to two right angles by size identify lines of symmetry in 2-D shapes presented in different orientations complete a simple symmetric figure with respect to a specific line of symmetry.	identify 3-D shapes, including cubes and other cuboids, from 2-D representations know angles are measured in degrees: estimate and compare acute, obtuse and reflex angles draw given angles, and measure them in degrees (o) identify: angles at a point and one whole turn (total 360o) angles at a point on a straight line and 1/2 a turn (total 180o) other multiples of 90o use the properties of rectangles to deduce related facts and find missing lengths and angles	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.

					perpendicular and parallel lines.		distinguish between regular and irregular polygons based on reasoning about equal sides and angles.	

	Nur	Rec	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Geometry – Position and direction			describe position, direction and movement, including whole, half, quarter and three-quarter turns.	order and arrange combinations of mathematical objects in patterns and sequences use mathematical vocabulary to describe position, direction and movement, including movement in a straight line and distinguishing between rotation as a turn and in terms of right angles for quarter, half and three-quarter turns (clockwise and anti-clockwise).		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.	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.

	Nur	Rec	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Statistics				interpret and construct simple pictograms, tally charts, block diagrams and simple tables ask and answer simple questions by counting the number of objects in each category and sorting the categories by quantity	interpret and present data using bar charts, pictograms and tables solve one-step and two-step questions [for example, 'How many more?' and 'How many fewer?'] using information presented in	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	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.

				ask and answer questions about totalling and comparing categorical data.	scaled bar charts and pictograms and tables.	charts, pictograms, tables and other graphs.		

	Nur	Rec	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Algebra								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.

	Nur	Rec	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Ratio								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.

Disciplinary Knowledge (Being a Mathematician) →

The children are taught these disciplinary concepts within all domains of mathematics across all year groups: Using and applying, investigating, reasoning, problem solving, analysing and justifying and proving.
This is how our children learn how to be successful Keighley St Andrew's mathematicians and achieve our intent below..

I am a Keighley St Andrew's mathematician because…

I demonstrate quick and efficient recall of facts and procedures
I am a mathematical thinker, who reasons and solves problems
I feel confident using mathematical vocabulary
I can make connections in my learning to new ideas and within the world around me
I can describe, explain and represent mathematical concepts in a variety of ways