Bramcote Hills Primary School
'Make the future better for all'

Curriculum Depth Map - Maths

## Intent:

At BHPS we provide children with a challenging and engaging Maths curriculum by offering a mastery approach, in order to deliver the three aims of the National Curriculum: fluency, reasoning and problem solving. Underpinning this pedagogy is a belief that all children can achieve in maths. We believe in promoting sustained and deepening understanding by employing a variety of mastery strategies. Our approach aims to provide children with full access to the curriculum, enabling them to develop independence, confidence and competence.

By the end of Key Stage 2, we want our children to have developed the necessary skills to make them 'deep thinkers', acquiring mathematical knowledge, skills and understanding that can be recalled quickly, transferred and applied in different contexts. They need to be able to make rich connections across the areas of maths and use their knowledge in other subjects. We aim to create independent mathematicians who are well equipped to apply their learning to the wider world.

## Implementation:

We have adopted the White Rose Maths Hub long term approach to maths. The WRMH planning is a national project designed to provide schools with the most up to date processes and procedures in Mathematics teaching and learning. Our aim is to develop a culture of deep understanding, confidence and competence in maths across the whole of our school - a culture that produces strong, secure mathematics within each year group.

Our Maths curriculum is designed to allow children time to think, discuss, practise, explore and embed. This allows time for teaching, practice and repetition - both in a year group and across both key stages. Curriculum coverage is mapped out carefully from Year 1 to Year 6, which allows some key concepts to be developed at a deeper level of learning, understanding and mastery. Fundamental knowledge and skills are covered at key points throughout the primary phase and repeated to allow pupils to build on what has been taught before. Our aim is to ensure that the three core areas of the National Curriculum are covered in all of our lessons: fluency, reasoning and problem solving. We offer the children the opportunity to have varied and frequent practice (varied fluency - VF) of their maths skills, with the focus on their ability to recall and apply their knowledge rapidly and accurately. Reasoning is a key area in all of our lessons. Mathematical vocabulary is an essential part of each lesson and the children need to understand this within the area they are studying and be able to make rich connections across other areas within this subject. Each lesson provides children with the opportunity to reason through their ideas, use their mathematical language to explore a line of enquiry and problem solve routine and non-routine problems. We aim to build problem-solvers of the future and build resilience in our children; essential skills that they can use in all aspects of their learning. Lessons will be planned and a knowledge organiser provided for pupils, which outlines the area to be taught, where the new knowledge and skills fit in with their prior learning, any sticky knowledge they need to understand and key vocabulary they need to learn.

## Impact:

Impact is evidenced through:

- Pupils' use and understanding of the identified mathematical vocabulary
- Retaining key knowledge
- Quick recall of facts and procedures
- Demonstrating that they know more all the time
- Low-stakes tests/quizzes
- The flexibility and fluidity to move between different contexts and representations of mathematics.
- The ability to recognise relationships and make connections in mathematics
- High aspirations, which will see them through to further study, work and a successful adult life; particularly girls


## Key Stage One



## Year 2

Number: Place Value
Number: Addition \& Subtraction
Measurement: Money
Number: Multiplication \& Division
Number: Multiplication \& Division
Statistics
Geometry: Properties of Shape
Number: Fractions
Measurement: Length \& height
Geometry: position and direction
Problem solving
Measurement: Time
Measurement: Mass, capacity and temperature
Investigations

| Place Value |  |
| :---: | :---: |
| Counting |  |
| Count to and across 100, forwards and backwards, beginning with 0 or 1 , or from a given number | Count in steps of 2, 3 and 5 from 0 , and in tens from any number, forward and backward. |
| Count numbers to 100 in numerals; count in multiples of twos, fives and tens |  |
| Represent |  |
| Identify and represent numbers using objects and pictorial representations |  |
| Read and write numbers to 100 in numerals | Read and write numbers to at least 100 in numerals and in words |
| Read and write numbers from 1 to 20 in numerals and words | Identify, represent and estimate numbers using different representations, including the number line |
| Use \& Compare |  |
| Give a number, identify one more and one less | Recognise the place value of each digit in a two-digit number (tens, ones) |
|  | Compare and order numbers from o up to 100 |
|  | Use <, > and = signs |
| Problems \& Rounding |  |
|  | Use place value and number facts to solve problems |
| Addition \& Subtraction |  |
| Recall, Represent, Use |  |
| Read, write and interpret mathematical statements involving addition (+), subtraction (-) and equals (=) signs |  |
| Represent and use number bonds and related subtraction facts within 20 | Recall and use addition and subtraction facts to 20 fluently and derive and use related facts up to 100 |
|  | 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. |
| Calculations |  |
| Add and subtract one-digit and two-digit numbers to 20, including zero | Add and subtract numbers using concrete objects, pictorial representations and mentally, including: <br> a two-digit number and ones <br> a two-digit number and tens <br> two two-digit numbers <br> adding three one-digit numbers |
| Solve Problems |  |
| Solve one-step problems that involve addition and subtraction: using concrete objects and pictorial representations missing number problems such as $7=$ ? -9 | Solve problems with addition and subtraction: <br> using concrete objects and pictorial representations, including those involving numbers, quantities and measures applying their knowledge of mental and written methods |


| Multiplication and Division |  |
| :---: | :---: |
| Recall, Represent, Use |  |
|  | Recall and use multiplication and division facts for the 2,5 and 20 multiplication tables, including recognising odd and even numbers |
|  | Show that multiplication of two numbers can be done in any order (commutative) and division of one number by another cannot |
| Calculations |  |
|  | Calculate mathematical statements for multiplication and division within the multiplication tables and write them using the multiplication ( $x$ ), division $(\div)$ and equals $(=)$ signs |
| Solve Problems |  |
| Solve one-step problems involving multiplication and division, by using concrete objects, pictorial representations and arrays, with support from the teacher | Solve one-step problems involving multiplication and division, by using materials, arrays, repeated addition, mental methods and multiplication and division facts, including problems in contexts |
| Fractions |  |
| Recognise and write |  |
| Recognise, find and name a half as one of two equal parts of an object, shape or quantity | Recognise, find, name and write fractions $\frac{1}{3}, \frac{1}{4}, \frac{2}{4}$ and $\frac{3}{4}$ of a length, shape, set of objects or quantity |
| Recognise, find and name a quarter as one of four equal parts of an object, shape or quantity |  |
| Compare |  |
|  | Recognise the equivalence of $\frac{2}{4}$ or $\frac{1}{2}$ |
| Calculations |  |
|  | Write simple fractions e.g. $\frac{1}{2}$ of $6=3$ |
| Algebra <br> (algebraic thinking $=$ missing number objectives) |  |
| Solve one-step problems that involve addition and subtraction: <br> > using concrete objects and pictorial representations <br> > missing number problems such as $7=$ ? - 9 | Recognise and use the inverse relationship between addition and subtraction and use this to check calculations and solve missing number problems |
| Measurement |  |
| Using measures |  |
| Compare, describe and solve practical problems for: <br> > lengths and heights (long (er)/short (er), tall/short, double/half) <br> > mass and weight (heavy/light, heavier than, lighter than) capacity and volume (full/empty, more than, less than, half, half full, quarter) <br> > time (quicker/slower, earlier/later) |  |
| Measure and begin to record the following: <br> > lengths \& heights <br> > mass/weight <br> > capacity and volume <br> > time (hours, minutes, seconds) | Choose and use appropriate standard unis to estimate and measure length/height in any direction ( $\mathrm{m} / \mathrm{cm}$ ); mass ( $\mathrm{kg} / \mathrm{g}$ ); temperature ( ${ }^{\circ} \mathrm{C}$ ); capacity (litres $/ \mathrm{ml}$ ) 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 = |
| Money |  |
| Recognise and know the value of different denominations of coins and notes | Recognise and use symbols for pounds ( $£$ ) and pence (p); combine amounts to make a particular value |
|  | Find different combinations of coins that equal the same amounts of money |
|  | Solve simple problems in a practical context involving addition and subtraction of money of the same unit, including giving change |
| Time |  |
| Sequence events in chronological order using language (e.g. before, after, next, first, today, yesterday, tomorrow, morning, afternoon and evening) | Compare and sequence intervals of time |
| 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 hands on a clock face to show these times | Tell and write the time in five minutes, including quarter past/to the hour and draw hands on a clock face to show these times |


|  | Know the number of minutes in an hour and the number of hours in <br> a day |
| :--- | :--- |
| Geometry |  |

## Key Stage Two

| Year 3 | Year 4 | Year 5 | Year 6 |
| :---: | :---: | :---: | :---: |
| Number: Place Value <br> Number: Addition \& Subtraction <br> Number: Multiplication \& Division <br> Number: Multiplication \& Division <br> Measurement: Money <br> Statistics <br> Measurement: Length and perimeter <br> Number: Fractions <br> Number: Fractions <br> Measurement: Time <br> Geometry: Properties of Shape <br> Measurement: Mass and Capacity | Number: Place Value <br> Number: Addition \& Subtraction <br> Measurement: Length and perimeter <br> Number: Multiplication \& Division <br> Number: Multiplication \& Division <br> Measurement: Area <br> Number: Fractions <br> Number: Decimals <br> Number: Decimals <br> Measurement: Money <br> Measurement: Time <br> Statistics <br> Geometry: Properties of Shape <br> Geometry: Position and Direction | Number: Place Value <br> Number: Addition \& Subtraction Statistics <br> Number: Multiplication \& Division <br> Measurement: Perimeter \& Area <br> Number: Multiplication \& Division <br> Number: Fractions <br> Number: Decimals \& Percentages <br> Number: Decimals <br> Geometry: Properties of Shape Geometry: Position and Direction Measurement: Converting Units Measurement: Volume | Number: Place Value <br> Number: Addition, Subtraction, <br> Multiplication \& Division <br> Number: Fractions <br> Geometry: Position and Direction <br> Number: Decimals <br> Number: Percentages <br> Number: Algebra <br> Measurement: Converting Units <br> Measurement: Perimeter, Area \& Volume <br> Number: Ratio <br> Geometry: Properties of Shape <br> Problem Solving <br> Statistics/Investigations |
| 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 in multiples of 6, 7, 9, 25 and 1000 | Count forwards or backwards in steps of powers of 10 for any given number up to 1,000,000 |  |
|  | Count backwards through zero to include negative numbers | Count forwards and backwards with positive and negative whole number, including through zero |  |
| Represent |  |  |  |
| Identify, represent and estimate numbers using different representations | Identify, represent and estimate numbers using different representations | Read, write (order and compare) numbers to at least $1,000,000$ and determine the value of each digit | Read, write (order and compare) numbers to at least $1,000,000$ and determine the value of each digit |
| Read and write numbers up to 1000 in numerals and in words | Read roman numerals to $100(1$ to $C$ ) and know that over time, the numeral system changes to include the concept of zero and place value | Read Roman numerals to 1000 (M) and recognise years written in Roman numerals |  |
| Use \& Compare |  |  |  |
| 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, ones) |  |  |
| Compare and order numbers up to 1000 | Order and compare numbers beyond 1000 | (Read, write) order and compare numbers to at least $1,000,000$ and determine the value of each digit | (Read, write) order and compare numbers to at least $10,000,000$ and determine the value of each digit |
|  | Find 1000 more or less than a given number |  |  |


| Problems \& Rounding |  |  |  |
| :---: | :---: | :---: | :---: |
| Solve number problems and practical problems involving these ideas | Solve number and practical problems that involve all of the above and with increasingly larger positive numbers | Solve number problems and practical problems that involve all of the below | Solve number and practical problems that involve all of the below |
|  | Round any number to the nearest 10,100 or 1000 | Round any number up to $1,000,000$ to the nearest $10,100,1000,10,000,100,000$ | Round any whole number to a required degree of accuracy |
|  |  | Interpret negative numbers in context | Use negative numbers in context and calculate intervals across zero |
| Addition \& Subtraction |  |  |  |
| Recall, Represent, Use |  |  |  |
| 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 |  |
| Calculations |  |  |  |
| Add and subtract numbers mentally, including: <br> > a three-digit number and ones <br> > a three-digit number and tens <br> $>$ a three-dig number and hundreds | Add and subtract numbers with up to fourdigits using the formal written methods of columnar addition and subtraction where appropriate | Add and subtract whole numbers with more than four-digits using the formal written methods (columnar addition and subtraction) | Perform mental calculations, including with mixed operations and large numbers |
| Add and subtract numbers with up to three digits, using formal written methods of columnar addition and subtraction |  | Add and subtract numbers mentally with increasingly large numbers | Use their knowledge of the order of operations to carry out calculations involving the four operations |
| Solve Problems |  |  |  |
| 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 and a combination of these, including understanding the meaning of the equals sign |  |
| Multiplication \& Division |  |  |  |
| Recall, Represent, Use |  |  |  |
| Recall and use multiplication and division facts for the 3,4 \& 8 multiplication tables | Recall multiplication and division facts for multiplication tables up to $12 \times 12$. | Identify multiples and factors, including finding all factor pairs of a number and common factors of two numbers | Identify common factors, common multiples and prime numbers |
|  | Use place value, known and derived facts to multiply and divide mentally, including: <br> > multiplying by 0 and 1 <br> $>$ dividing by 1 | Know and use the vocabulary of prime numbers, prime factors and composite (non-prime) numbers | Use estimation to check answers to calculations and determine, in the context of a problem, an appropriate degree of accuracy |


|  | > multiplying together three numbers |  |  |
| :---: | :---: | :---: | :---: |
|  | Recognise and use factor pairs and commutativity in mental calculations | Establish whether a number up to 100 is prime \& recall prime numbers up to 19 |  |
|  |  | Recognise and use square numbers and cube numbers and the notation for squared $\left({ }^{2}\right)$ and cubed ( ${ }^{3}$ ) |  |
| Calculations |  |  |  |
| 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 | 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 twodigit number using a formal written method, including long multiplication for two-digit numbers | Multiply multi-digit numbers up to 4 digits by a two-digit whole number using the formal method of long multiplication |
|  |  | Multiply and divide numbers mentally drawing upon known fact |  |
|  |  | Divide numbers up to four-digits by a one-digit number using the formal written method of short division and interpret remainders appropriately for the context | Divide numbers up to 4 digits by a two-digit whole number using the formal written method of long division and interpret remainders as whole number remainders, fractions, or by rounding, as appropriate for the context |
|  |  | Multiply and divide whole numbers and those involving decimals by 10,100 and 1000 | 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 |
|  |  |  | Perform mental calculations, including with mixed operations and large numbers |
| Solve Problems |  |  |  |
| 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 correspondence problems in which ' $n$ ' 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 |
|  |  | Solve problems involving multiplication and division, including scaling by simple fractions and problems involving simple rates |  |
| Combined Operations |  |  |  |
|  |  | Solving problems involving addition, subtraction, multiplication and division and a combination of these, including understanding the meaning of the equals sign | Use their knowledge of the order of operations to carry out calculations involving the four operations |


| Fractions |  |  |  |
| :---: | :---: | :---: | :---: |
| Recognise and Write |  |  |  |
| 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 | Count up and down in hundredths; recognise that hundredths arise when dividing an object by one hundred and dividing tenths by ten | Identify, name and write equivalent fractions of a given fraction, represented visually, including tenths and hundredths |  |
| Recognise, find and write fractions of a discrete set of objects: unit fractions and non-unit fractions with small denominators |  | 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. $\frac{2}{5}+\frac{4}{5}=\frac{6}{5}=1 \frac{1}{5}$ |  |
| Recognise and use fractions as numbers: unit fractions and non-unit fractions with small denominators |  |  |  |
| Compare |  |  |  |
| Recognise and show, using diagrams, equivalent fractions with small denominators | Recognise and show, using diagrams, families of common equivalent fractions |  | Use common factors to simply fractions; use common multiples to express fractions in the same denomination |
| 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 |
| Calculations |  |  |  |
| Add and subtract fractions with the same denominator within one whole e.g. $\frac{5}{7}+\frac{1}{7}=\frac{6}{7}$ | Add and subtract fractions with the same denominator | Add and subtract fractions with the same denominator and denominators that are multiples of the same number | Add and subtract fractions with different denominators and mixed numbers, using the concept of equivalent fractions |
|  |  | Multiply proper fractions and mixed number by whole numbers, supported by materials and diagram | Multiply simple pairs of proper fractions, writing the answer in its simplest form e.g. $\frac{1}{4} \times \frac{1}{2}=\frac{1}{8}$ |
|  |  |  | Divide proper fractions by whole numbers e.g. $\frac{1}{3} \div 2=\frac{1}{6}$ |
| Solve Problems |  |  |  |
| 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 |  |  |



| Ratio \& Proportion |  |  |  |
| :---: | :---: | :---: | :---: |
|  |  |  | Solve problems involving the relative sizes of two quantities where missing values can be found by using integer multiplication and division facts |
|  |  |  | Solve problems involving the calculation of percentages and the use of percentages for comparison |
|  |  |  | Solve problems involving unequal sharing and grouping using knowledge of fractions and multiples |
| Algebra |  |  |  |
| Solve problems, including missing number problems |  |  | 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 |
| Measurement |  |  |  |
| Using Measures |  |  |  |
| Measure, compare, add and subtract lengths ( $\mathrm{m} / \mathrm{cm} / \mathrm{mm}$ ) <br> mass (kg/g) <br> volume/capacity ( $1 / \mathrm{ml}$ ) | Convert between different units of measure e.g. km to m , hours to minutes | Convert between different units of metric measure | Solve problems involving the calculation and conversion of units of measure, using decimal notation up to three decimal places where appropriate |
|  | Estimate, compare and calculate different measures | Understand and use approximate equivalences between metric units and common imperial units such as inches, pounds and pints | Use, read, write and convert standard units, converting measurements of length, mass, volume and time from a smaller unit of measure to a larger unit and vice versa, using decimal notation of up to three decimal places |
|  |  | Use all four operations to solve problems involving measure, using decimal notation, including scaling | Convert between miles and kilometres |
| Money |  |  |  |
| Add and subtract amounts of money to give change, using both $£$ and $p$ in practical contexts | Estimate, compare and calculate different measures, including money in pounds and pence | Use all four operations to solve problems involving money. |  |


| Time |  |  |  |
| :---: | :---: | :---: | :---: |
| Tell and write the time from an analogue clock, including using Roman numerals I to XII and 12 hour and 24 hour clocks | Read, write and convert time between analogue and digital 12 and 24 hour clocks |  | Use read, write and convert between stand units, converting measures of time from a smaller unit of measure to a larger unit and vice versa |
| 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, am/pm, morning, noon and midnight | 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 |  |
| Know the number of seconds in a minute and the number of days in each month, year and leap year |  |  |  |
| Compare durations of events |  |  |  |
| Perimeter, Area, Volume |  |  |  |
| Measure the perimeter of simple 2-D shapes | Measure and calculate the perimeter of rectilinear figure in centimetres and metres | Measure and calculate the perimeter of composite rectilinear shapes in centimetres and metres | Recognise that shapes with the same areas can have different perimeters and vice versa |
|  | Find the area of rectilinear shapes by counting squares | Calculate the area of rectangles, including using standard units, square centimetres ( $\mathrm{cm}^{2}$ ) and square metres $\left(m^{2}\right)$ and estimate the area of irregular shapes | Calculate, estimate and compare volume of cubes and cuboids using standard units including square centimetres $\left(\mathrm{cm}^{2}\right)$ and square metres $\left(m^{2}\right)$ and extending to other units (e.g $\mathrm{mm}^{3}$ and $\mathrm{km}^{3}$ ) |
|  |  | Estimate volume and capacity | Calculate the area of parallelograms and triangles |
|  |  |  | Recognise when it is possible to use formulae for area and volume of shapes |
| Geometry |  |  |  |
| 2-D Shapes |  |  |  |
| Draw 2-D shapes | Compare and classify geometric shapes, including quadrilaterals and triangles, based on their properties and size | Distinguish between regular and irregular polygons based on reasoning about equal sides and angles | Draw 2-D shapes using given dimensions and angles |
|  | Identify lines of symmetry in 2D shapes presented in different orientations | Use the properties of rectangles to deduce related facts and find missing lengths and angles | Compare and classify geometric shapes based on their properties and sizes |
|  |  |  | Illustrate and name parts of circles, using radius, diameter, circumference and know that the diameter is twice the radius |


| 3-D Shapes |  |  |  |
| :---: | :---: | :---: | :---: |
| Make 3-D shapes using modelling materials; recognise 3-D shapes in different orientations and describe them |  | Identify 3-D shapes including cubes and other cuboids, from 2-D representations | Recognise, describe and build simple 3-D shapes, including making nets |
| Angles \& Lines |  |  |  |
| Recognise angles as a property of shape or a description of a turn |  | Know angles are measured in degrees | Find unknown angles in any triangles, quadrilaterals and regular polygons |
| 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 acute and obtuse angles and compare and order angles up to two right angles by size | Estimate and compare acute, obtuse and reflex angles | Recognise angles where they meet at a point, are on a straight line, or are vertically opposite and find missing angles |
| Identify horizontal and vertical lines and pairs of perpendicular and parallel lines | Identify lines of symmetry in 2-D shapes presented in different orientations | Draw given angles and measure them in degrees |  |
|  | Complete a simple symmetric figure with respect to a specific line of symmetry | Identify: <br> > angles at a point and one whole turn <br> > angles at a point on a straight line and a $\frac{1}{2}$ turn <br> > other multiples of $90^{\circ}$ |  |
| Position \& Direction |  |  |  |
|  | 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 appropriate language, and know that the shape has not changed | Describe positions on the full coordinate grid (all four quadrants) |
|  | Plot specified points and draw sides to complete a given polygon |  |  |
|  | Describe movements between positions as translations of a given unit to the left/right and up/down |  | Draw and translate simple shapes on the coordinate plane and reflect them in the axes |
| Statistics |  |  |  |
| Present and interpret |  |  |  |
| 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 |
| Solve problems |  |  |  |
| Solve one-step and two-step questions using information present in scaled bar charts and pictograms and tables | Solve comparison, sum and difference problems using information present in bar charts, pictograms, tables and other graphs | Solve comparison, sum and difference problems using information present in a line graph | Calculate and interpret the mean as an average |

Appendix - Key Knowledge and Vocabulary



|  | outside, inside left, right <br> around up, down <br> in front, behind forwards, <br> front, back backwards <br> beside, next to sideways <br> opposite across | movement slide, roll, turn stretch, bend full turn, whole turn, half turn, quarter turn, three-quarter turn |
| :---: | :---: | :---: |
| Measurement - Length and Height <br> Step 1 - Compare lengths and heights, <br> Step 2 - Measure length (1) <br> Step 3 - Measure length (2) | centimetre, metre <br> length, height, width, depth <br> long, short, tall <br> high, low <br> wide, narrow <br> thick, thin <br> longer, shorter, taller | longest, shortest, tallest, <br> highest ... and so on <br> far, near, close <br> ruler <br> metre stick <br> height <br> same |
| Measurement - Weight and Volume <br> Step 1 - Introduce weight and mass <br> Step 2 - Measure mass <br> Step 3 - Compare mass <br> Step 4 - Introduce capacity <br> Step 5 - Measure capacity <br> Step 6 - Compare capacity | Weight and Volume Vocab <br> kilogram, gram weigh, weighs, balances heavy, light heavier than, lighter than heaviest, lightest scales | Capacity and Volume Vocab <br> litre, millilitre capacity volume full, empty more than, less than half full, quarter full holds container |
| Measurement: Money <br> Step 1 - Recognising coins <br> Step 2 - Recognising notes <br> Step 3 - Counting in coins | money <br> coin <br> penny, pence, pound <br> price, cos $\dagger$ <br> buy, sell <br> spend, spent <br> pay <br> value <br> silver, bronze | change <br> dear, costs more <br> cheap, costs less, cheaper <br> costs the same as <br> how much ...? <br> how many ...? <br> Total <br> amount |
| Measurement: Time <br> Step 1 - Before and after <br> Step 2 - Dates <br> Step 3 - Time to the hour <br> Step 4 - Time to the half hour <br> Step 5 - Writing time <br> Step 6 - Comparing time | time, date <br> days of the week, Monday, <br> Tuesday ... <br> months of the year <br> (January, February ...) <br> seasons: spring, summer, <br> autumn, winter <br> day, week, weekend, month, <br> year <br> birthday, holiday <br> morning, afternoon, <br> morning, afternoon, evening, <br> night, midnight <br> bedtime, dinner time, <br> playtime <br> today, yesterday, tomorrow before, after <br> earlier, later <br> next, first, last, finally | now, soon, early, late quick, quicker, quickest, quickly, faster, slower slow, slower, slowest, slowly old, older, oldest new, newer, newes $\dagger$ takes longer, takes less time <br> how long ago? <br> how long will it be to ...? <br> how long will it take to ...? <br> how often? <br> always, never, often, <br> sometimes <br> usually <br> once, twice <br> hour, o'clock, half past, <br> clock, clock face, watch, <br> hands <br> hour hand, minute hand <br> hours, minutes, seconds |


| Maths - KS1 - Year 2 |  |  |
| :---: | :---: | :---: |
| Key Vocabulary |  |  |
| show how you ... describe the pattern <br> investigate mental | mental calculation written calculation | explain your thinking |
| Key Knowledge | Key Vocabulary |  |
| NUMBER - Place Value <br> Step 1 - Count objects to 100 and read and write numbers in numerals/words <br> Step 2 - Represent numbers to 100 <br> Step 3 - Tens and ones with a part whole model <br> Step 4 - Tens and ones using addition <br> Step 5 - Use a place value chart <br> Step 6 - Compare objects <br> Step 7 - Compare numbers <br> Step 8 - Order objects and numbers <br> Step 9 - Count in $2 s, 5 s$ and $10 s$ <br> Step 10 - Count in 3s | hundreds <br> one-, two- or three-digit <br> place, place value <br> stands for, represents <br> exchange <br> twenty-first, twenty-second ... <br> continue | two hundred ... one thousand <br> threes, fours and <br> so on <br> tally <br> predict <br> rule |
| NUMBER - Addition and Subtraction <br> Step 1 - Fact families - Addition and subtraction bonds to 20 <br> Step 2 - Check calculations <br> Step 3 -Compare number sentences <br> Step 4 - Related facts <br> Step 5 - Bonds to 100 (tens) <br> Step 6 - Add and subtract 1 s <br> Step 7-10 more and 10 less <br> Step 8 - Add and subtract 10s <br> Step 9 - Add a 2-digit and 1-digit number - crossing ten <br> Step 10 - Subtract a 1-digit number from a 2-digit number - crossing ten <br> Sep 11 - Add two 2-digit numbers - not crossing ten-add ones/add tens <br> Step 12 - Add two 2-digit numbers - crossing ten - add ones/add tens <br> Step 13 - Subtract a 2-digit no. from a 2-digit no. - not crossing ten <br> Step 14 - Subtract a 2-digit number from a 2-digit number - crossing tensubtract ones \& tens <br> Step 15 - Bonds to 100 (tens and ones) <br> Step 16 - Add three 1-digit numbers | one hundred more one hundred less facts tens boundary exact, exactly |  |
| Number: Fractions <br> Step 1 - Make equal parts <br> Step 2 - Recognise a half <br> Step 3 - Find a half <br> Step 4 - Recognise a quarter <br> Step 5 - Find a quarter <br> Step 6 - Recognise a third <br> Step 7 - Find a third <br> Step 8 - Unit fractions <br> Step 9 - Non-unit fractions <br> Step 10 - Equivalence of $\frac{1}{2}$ and $2 / 4$ <br> Step 11 - Find three quarters <br> Step 12 - Count in fractions | equivalent fraction <br> mixed number <br> numerator <br> denominator <br> two halves <br> two quarters, three quarters one third, two thirds one of three equal parts |  |
| Multiplication and Division <br> Step 1 - Recognise equal groups <br> Step 2 - Make equal groups <br> Step 3 - Add equal groups <br> Step 4 -Multiplication sentences using the $\times$ symbol <br> Step 5 - Multiplication sentences from pictures <br> Step 6 - Use arrays <br> Step 7-2 times-table <br> Step 8 - 5 times-table <br> Step 9-10 times-table <br> Step 10 - Make equal groups-sharing <br> Step 11- Make equal groups -grouping <br> Step 12 - Divide by 2 <br> Step 13 -Odd \& even numbers <br> Step 14 - Divide by 5 <br> Step 15 - Divide by 10 | groups of <br> times <br> once, twice, three times ... <br> ten times <br> repeated addition <br> divide, divided by, <br> divided into <br> share, share equally <br> left, left over | one each, two each, three each ... ten each group in pairs, threes ... tens row, column multiplication table multiplication fact division fact |


| Measurement: Money <br> Step 1 - Count money - pence <br> Step 2 - Count money - pounds (notes and coins) <br> Step 3 - Count money - notes and coins <br> Step 4 - Select money <br> Step 5 - Make the same amount <br> Step 6 - Compare money <br> Step 7 - Find the total <br> Step 8 - Find the difference <br> Step 9 - Find change <br> Step 10 -Two-step problems | bought sold |  |
| :---: | :---: | :---: |
| Measurement: Length and Height <br> Step 1 - Measure length (cm) <br> Step 2 - Measure length (m) <br> Step 3 -Compare lengths <br> Step 4-Order lengths <br> Step 5 - Four operations with lengths | measuring scale <br> further <br> furthest <br> tape measure |  |
| Measurement: Time <br> Step 1 - O'clock and half past <br> Step 2 - Quarter past and quarter to <br> Step 3 - Telling time to 5 minutes <br> Step 4 - Minutes in an hour, hours in a day <br> Step 5 - Find durations of time <br> Step 6 - Compare durations of time | 5, 10, 15 ... minutes past digital/analogue timer |  |
| Measurement: Capacity, Mass and temperature <br> Step 1 - Compare mass <br> Step 2 - Measure mass in grams <br> Step 3 - Measure mass in kilograms <br> Step 4 - Compare volume <br> Step 5 - Millilitres <br> Step 6 - Litres <br> Step 7 - Temperature | millilitre <br> contains <br> temperature degree |  |
| Geometry: Properties of Shape <br> Step 1 - Recognise 2D and 3D shapes <br> Step 2 - Count sides on 2D shapes <br> Step 3 -Count vertices on 2D shapes <br> Step 4 - Draw 2D shapes <br> Step 5 - Lines of symmetry <br> Step 6 - Sort 2D shapes <br> Step 7 - Make patterns with 2D shapes <br> Step 8 -Count faces on 3D shapes <br> Step 9 - Count edges on 3D shapes <br> Step 10 - Count vertices on 3D shapes <br> Step 11 - Sort 3D shapes <br> Step 12 - Make patterns with 3D shapes | line symmetry <br> rectangular <br> circular <br> triangular <br> pentagon <br> hexagon <br> octagon |  |
| Geometry : Position and Direction <br> Step 1 Describing movement <br> Step 2 Describing turns <br> Step 3 Describing movement and turns <br> Step 4 Making patterns with shapes | Route higher, lower clockwise, anticlockwise | right angle straight line |
| Statistics <br> Step 1 - Make tally charts? <br> Step 2 - Draw pictograms (1-1) <br> Step 3 - Interpret pictograms (1-1) <br> Step 4 - Draw pictograms (2,5 and 10) <br> Step 5 - Interpret pictograms (2, 5 and 10) <br> Step 6 - Block diagrams | tally, <br> graph, block graph, <br> pictogram <br> represent <br> label, title | mos $\dagger$ popular, mos $\dagger$ common least popular, least common |


| Maths - KS2 |  |
| :---: | :---: |
| Key Vocabulary |  |
| greatest value, round, nearest, round <br> least value round up round <br> statement round down  | he nearest ten, approximate, <br> he nearest hundred approximately |
| Key Knowledge | Key Vocabulary |
| Year 3 |  |
| Number: Place Value <br> Step 1 - Hundreds <br> Step 2 - Represent numbers to 1,000 <br> Step 3 - 100s, 10s and 1s (1) <br> Step 4-100s, 10s and 1s (2) <br> Step 5 - Number line to 1,000 <br> Step 6 - Find 1, 10, 100 more or less than a given number <br> Step 7 - Compare objects to 1,000 <br> Step 8 -Compare numbers to 1,000 <br> Step 9 - Order numbers <br> Step 10 - Count in 50s | eights, fifties hundreds factor of relationship one hundred less one hundred more |
| Number: Addition and Subtraction <br> Step 1 - Add and subtract multiples of 100 <br> Step 2 - Add and subtract 3-digit numbers and ones - not crossing 10 <br> Step 3 - Add 3-digit and 1-digit numbers - crossing 10 <br> Step 4 - Subtract a 1-digit number from a 3-digit number - crossing 10 <br> Step 5 - Add and subtract 3-digit numbers and tens - not crossing 100 <br> Step 6 - Add a 3-digit number and tens - crossing 100 <br> Step 7 - Subtract tens from a 3-digit number - crossing 100 <br> Step 8 - Add and subtract 100s <br> Step 9 - Spot the pattern - making it explicit <br> Step 10 - Add and subtract a 2-digit and 3-digit number - not crossing 10 or 100 <br> Step 11 - Add a 2-digit and 3-digit number - crossing 10 or 100 <br> Step 12 - Subtract a 2-digit number from a 3-digit number - cross the 10 or 100 <br> Step 13 - Add two 3-digit numbers - not crossing 10 or 100 <br> Step 14 - Add two 3-digit numbers - crossing 10 or 100 <br> Step 15 - Subtract a 3-digit number from a 3-digit number - no exchange <br> Step 16 - Subtract a 3-digit number from a 3-digit number - exchange <br> Step 17 - Estimate answers to calculations <br> Step 18 - Check | hundreds boundary eights, fifties hundreds |
| Number : Multiplication and Division <br> Step 1 - Multiplication - equal groups <br> Step 2 - Multiplying by 3 <br> Step 3 - Dividing by 3 <br> Step 4 - The 3 times-table <br> Step 5 - Multiplying by 4 <br> Step 6 - Dividing by 4 <br> Step 7 - The 4 times-table <br> Step 8 - Multiplying by 8 <br> Step 9 - Dividing by 8 <br> Step 10 - The 8 times-tables | factor product remainder |
| NUMBER: Multiplication and Division <br> Step 1 - Comparing statements <br> Step 2 - Related calculations <br> Step 3 - Multiply 2-digits by 1-digit (1) <br> Step 4 - Multiply 2-digits by 1 -digit (2) <br> Step 5 - Divide 2-digits by 1-digit (1) <br> Step 6 - Divide 2-digits by 1-digit (2) Step 7 - Divide 2-digits by 1digit (3) <br> Step 8 - Scaling <br> Step 9 - How many ways? |  |
| Number: Fractions <br> Step 1 - Unit and non-unit fractions <br> Step 2 - Making the whole <br> Step 3 - Tenths | Sixths Sevenths Eighths Tenths |


| Step 4 - Count in tenths <br> Step 5 - Tenths as decimals <br> Step 6 - Fractions of a number line <br> Step 7 - Fractions of a set of objects (1) <br> Step 8 - Fractions of a set of objects (2) <br> Step 9 - Fractions of a set of objects (3) |  |
| :---: | :---: |
| Number: Fractions <br> Step 1 - Equivalent fractions (1) <br> Step 2 - Equivalent fractions (2) <br> Step 3 - Equivalent fractions (3) <br> Step 4 - Compare fractions <br> Step 5 - Order fractions <br> Step 6 - Add fractions <br> Step 7 - Subtract fractions |  |
| Measurement : Money <br> Step 1 - Pounds and pence <br> Step 2 - Converting pounds and pence <br> Step 3 - Adding money <br> Step 4 - Subtracting money <br> Step 5 - Giving change |  |
| Measurements: Length and Perimeter <br> Step 1 - Measure length <br> Step 2 - Equivalent lengths -m \& cm <br> Step 3 - Equivalent lengths - mm \& cm <br> Step 4 - Compare lengths <br> Step 5 - Add lengths <br> Step 6 - Subtract lengths <br> Step 7 - Measure perimeter <br> Step 8 - Calculate perimeter | perimeter <br> millimetre <br> kilometre <br> mile <br> distance apart ... between ... to ... from perimeter |
| Measurement: Time <br> Step 1 -Months and years <br> Step 2 - Hours in a day <br> Step 3 - Telling the time to 5 minutes <br> Step 4 - Telling the time to the minute <br> Step 5 - Using AM and PM <br> Step 6-24 hour clock <br> Step 7 - Finding the duration <br> Step 8 - Comparing the duration <br> Step 9 - Start and end times <br> Step10 - Measuring time in seconds | Roman numerals Earliest <br> 12 -hour clock time, latest <br> 24 -hour clock time a.m., <br> Century p.m. <br> calendar  |
| Measurement: Mass and Capacity <br> Step 1 - Measure mass (1) <br> Step 2 - Measure mass (2) <br> Step 3 - Compare mass <br> Step 4 - Add and subtract mass <br> Step 5 - Measure capacity (1) <br> Step 6 -Measure capacity (2) <br> Step 7 - Compare capacity <br> Step 8 - Add and subtract capacity | Division approximately |
| Geometry: Properties of Shape <br> Step 1 - Turns and angles <br> Step 2 - Right angles in shapes <br> Step 3 - Compare angles <br> Step 4 - Draw accurately <br> Step 5 - Horizontal and vertical <br> Step 6 - Parallel and perpendicular <br> Step 7 - Recognise and describe 2D shapes <br> Step 8 - Recognise and describe 3D shapes <br> Step 9 - Make 3D shapes | compass point octagonal <br> north, south, east, quadrilateral <br> west, N, S, E, W right-angled <br> horizontal, vertical, parallel, <br> diagonal perpendicular <br> acute angle angle ... is a greater / <br> obtuse angle smaller angle than <br> pentagonal hemisphere <br> hexagonal prism, triangular prism |
| Statistics <br> Step 1 - Pictogram <br> Step 2 - Bar Charts <br> Step 3 - Tables | Char axis, axes <br> bar chart diagram <br> frequency table Venn diagram <br> Carroll diagram  |


| Maths - KS2 |  |  |
| :---: | :---: | :---: |
| Key Vocabulary |  |  |
| justify next <br> make a statement consecutive |  |  |
| Key Knowledge | Key Vocabulary |  |
| Year 4 |  |  |
| Number - Place Value <br> Step 1 - Roman numerals to 100 <br> Step 2 - Round to the nearest 10 <br> Step 3 - Round to the nearest 100 <br> Step 4 -Count in 1,000s <br> Step 5-1,000s, 100s, 10s and 1s Step 6 - Partitioning <br> Step 7 - Number line to 10,000 <br> Step 8-1,000 more or less <br> Step 9 - Compare numbers <br> Step 10 - Order numbers <br> Step 11 - Round to the nearest 1,000 <br> Step 12 - Count in 25s <br> Step 13 - Negative numbers | ten thousand <br> hundred thousand <br> million <br> sixes, sevens, nines, twenty-fives one thousand more one thousand less | integer <br> positive <br> negative <br> above/below zero <br> minus <br> negative numbers |
| Number - Addition and subtraction <br> Step 1 - Add and subtract 1s, 10s, 100s and 1000s <br> Step 2 - Add two 4-digit numbers - no exchange <br> Step 3 - Add two 4-digit numbers - one exchange <br> Step 4 - Add two 4-digit numbers - more than one exchange <br> Step 5 - Subtract two 4-digit numbers - no exchange <br> Step 6 - Subtract two 4-digit numbers - one exchange <br> Step 7 - Subtract two 4-digit numbers - more than one exchange Step <br> 8 - Efficient subtraction <br> Step 9 - Estimate answers <br> Step 10 - Checking strategies | inverse thousand |  |
| Number - Multiplication and Division <br> Step 1 - Multiply by 10 <br> Step 2 - Multiply by 100 <br> Step 3 - Divide by 10 <br> Step 4 - Divide by 100 <br> Step 5 - Multiply by 1 and 0 <br> Step 6 - Divide by 1 <br> Step 7 - Multiply and divide by 6 <br> Step 8-6 times-table and division facts <br> Step 9 - Multiply and divide by 9 <br> Step 10-9 times-table and division facts <br> Step 11 - Multiply and divide by 7 <br> Step 12-7 times-table and division facts | inverse <br> square <br> squared <br> cube <br> cubed |  |
| Number - Multiplication and Division <br> Step 1-11 and 12 times-table <br> Step 2 - Multiply 3 numbers <br> Step 3 - Factor pairs <br> Step 4 -Efficient multiplication <br> Step 5 - Written methods <br> Step 6 - Multiply 2-digits by 1-digit <br> Step 7 - Multiply 3-digits by 1 -digit <br> Step 8 - Divide 2-digits by 1-digit (1) <br> Step 9 - Divide 2-digits by 1-digit (2) <br> Step 10 - Divide 3 digits by 1 digit <br> Step 11 - Correspondence problems |  |  |
| Number - Fractions <br> Step 1 - What is a fraction? <br> Step 2 - Equivalent fractions (1) <br> Step 3 - Equivalent fractions (2) <br> Step 4 - Fractions greater than 1 <br> Step 5 - Count in fractions <br> Step 6 - Add 2 or more fractions <br> Step 7 - Subtract 2 fractions <br> Step 8 - Subtract from whole amounts <br> Step 9 - Calculate fractions of a quantity | hundredths <br> decimal decimal fraction decimal point | decimal place decimal equivalent proportion |


| Number - Decimals <br> Step 1 - Recognise tenths and hundredths <br> Step 2 - Tenths as decimals <br> Step 3 - Tenths on a place value grid <br> Step 4 - Tenths on a number line <br> Step 5 - Divide 1 digit by 10 <br> Step 6 - Divide 2 digits by 10 <br> Step 7 - Hundredths <br> Step 8 - Hundredths as decimals <br> Step 9 - Hundredths on a place value grid <br> Step 10 - Divide 1 or 2 digits by 100 |  |  |
| :---: | :---: | :---: |
| Number - Decimals <br> Step 1 - Make a whole, <br> Step 2 - Write decimals <br> Step 3 - Compare decimals <br> Step 4 - Order decimals <br> Step 5 - Round decimals <br> Step 6 - Halves and quarters |  |  |
| Measurement Length and Perimeter <br> Step 1 - Kilometres <br> Step 2 - Perimeter on a grid <br> Step 3 -Perimeter of a rectangle <br> Step 4 -Perimeter of rectilinear shapes | unit <br> standard unit <br> metric unit breadth | edge <br> area <br> covers <br> square centimetre (cm2) |
| Measurement - Area <br> Step 1 -What is area? <br> Step 2 - Counting squares <br> Step 3 - Making shapes <br> Step 4 - Comparing area |  |  |
| Measurement - Money <br> Step 1 - Pounds and pence <br> Step 2 - Ordering amounts of money <br> Step 3 - Using rounding to estimate money <br> Step 4 - Four operations |  |  |
| Measurement - Time <br> Step 1 - Hours, minutes and seconds <br> Step 2 - Years, months, weeks and days <br> Step 3 - Analogue to digital - 12 hour <br> Step 4 - Analogue to digital - 24 hour | leap year millennium noon date of birth | timetable arrive depart |
| Geometry - Properties of Shape <br> Step 1 - Identify angles <br> Step 2 - Compare and order angles <br> Step 3 - Triangles <br> Step 4-Quadrilaterals <br> Step 5 -Lines of symmetry <br> Step 6 - Complete a symmetrical figure | line <br> construct $\dagger$ <br> sketch <br> centre angle, right-angled base, square-based reflect, reflection regular, irregular 3-D, threedimensional spherical cylindrical tetrahedron | 2-D, two-dimensional oblong rectilinear equilateral triangle isosceles triangle scalene triangle heptagon parallelogram rhombus trapezium polygon polyhedron |
| Geometry Position and Direction <br> Step 1 - Describe position <br> Step 2 - Draw on a grid <br> Step 3 - Move on a grid <br> Step 4 -Describe a movement on a grid | north-east, northwest, south-east, <br> south-west, NE, NW, <br> SE, SW <br> translate, translation | rotate, rotation <br> degree <br> reflection <br> ruler, set square <br> angle measurer, compass |
| Statistics <br> Step 1 - Interpret charts <br> Step 2 - Comparison, sum and difference <br> Step 3 - Introducing line graphs <br> Step 4 - Line graphs | survey <br> questionnaire data |  |


| Maths - KS2 - Year 5 |  |  |
| :---: | :---: | :---: |
| Key Vocabulary |  |  |
| explain your reasoning $\geq$ greater than or equal to ascend <br> factor pair $\leq$ less than or equal to formula <br> divisibility   | descending order | square number prime number |
| Key Knowledge | Key Vocabu |  |
| Number: Place Value <br> Step 1 - Number to 10,000 <br> Step 2 - Roman numerals to 1,000 <br> Step 3 - Round to the nearest 10,100 and 1,000 <br> Step 4 - Number to 100,000 <br> Step 5 - Compare and order numbers to 100,000 <br> Step 6 - Round numbers within 100,00 <br> Step 7 - Numbers to a million <br> Step 8 - Counting in 10s, 100s, 1,000 s, 10,000 s and 100,000 s <br> Step 9 - Compare and order numbers to a million <br> Step 10 - Round numbers to a million <br> Step 11 - Negative |  |  |
| Number: Addition and Subtraction <br> Step 1 - Add whole numbers with more than 4-digits (column method) <br> Step 2 - Subtract whole numbers with more than 4-digits (column method) <br> Step 3 - Round to estimate and approximate <br> Step 4 - Inverse operations (addition and subtraction) <br> Step 5 - Multi-step addition and subtraction problems | ones boundary, tenths boundary ten thousand |  |
| Number: Multiplication and Division <br> Step 1 - Multiples, <br> Step 2 - Factors <br> Step 3 - Common factors <br> Step 4 - Prime numbers <br> Step 5 - Square numbers <br> Step 6 - Multiply by 10, 100, 1000 <br> Step 7 - Divide by 10,1001000 <br> Inverse operations (Multiplication and Division) <br> Step 8 - Multiply and divide by multiples of 10,100 and 1,000 |  |  |
| Number: Multiplication and Division <br> Step 1 - Multiply 4-digits by 1-digit <br> Step 2 - Multiply 2-digits (area model) <br> Step 3 - Multiply 2-digits by 2-digits <br> Step 4 - Multiply 3-digits by 2-digits <br> Step 5 - Multiply 4-digits by 2-digits <br> Step 6 - Divide 4-digits by 1-digit <br> Step 7 - Divide with remainders |  |  |
| Number: Decimals and Percentages <br> Step 1 - Decimals up to 2 d.p. <br> Step 2 - Decimals as fractions (1) <br> Step 3 - Decimals as fractions (2) <br> Step 4 - Understand thousandths <br> Step 5 - Thousands as decimals <br> Step 6 - Rounding decimals <br> Step 7 - Order and compare decimals <br> Step 8 - Understand percentages <br> Step 9 - Percentages as fractions and decimals <br> Step 10 - Equivalent | in every for every percentage per cent, \% |  |
| Number: Decimals <br> Step 1 - Adding decimals within 1 <br> Step 2 - Subtracting decimals within 1 <br> Step 3 - Complements to 1 <br> Step 4 - Adding decimals - crossing the whole <br> Step 5 - Adding decimals with the same number of decimal places <br> Step 6 - Subtracting decimals with the same number of decimal places <br> Step 7 - Adding decimals with a different number of decimal places <br> Step 8 - Subtracting decimals with a different no. of decimal places <br> Step 9 - Adding and subtracting wholes and decimals <br> Step 10 - Decimal sequences |  |  |


| Step 11 - Multiplying decimals by 10,100 and 1,000 <br> Step 12 - Dividing decimals by 10,100 and 1,000 |  |
| :---: | :---: |
| Number: Fractions <br> Step 1 - Equivalent fractions <br> Step 2 - Improper fractions to mixed numbers <br> Step 3 - Mixed numbers to improper fractions <br> Step 4 - Number sequences <br> Step 5 - Compare and order fractions less than 1 <br> Step 6 - Compare and order fractions greater than 1 <br> Step 7 - Add and subtract fractions <br> Step 8 - Add fractions within 1 <br> Step 9 - Add 3 or more fractions <br> Step 10 - Add fractions <br> Step 11 - Add mixed numbers Subtract fractions <br> Step 12 - Subtract mixed numbers <br> Step 13 - Subtract - breaking the whole <br> Step 14 - Subtract 2 mixed numbers <br> Step 15 - Multiply unit fractions by an integer <br> Step 16 - Multiply non-unit fractions by an integer <br> Step 16 - Multiply mixed numbers by integers <br> Step 17 - Fraction of an amount <br> Step 18 - Using fractions as operators | proper/improper fraction thousandths equivalent reduced to cancel |
| Measurement: Converting Units <br> Step 1 - Kilograms and kilometres <br> Step 2 - Milligrams and millilitres <br> Step 3 - Metric units <br> Step 4 -Imperial units <br> Step 5 - Converting units of time <br> Step 6 - Timetables | imperial unit discount currency |
| Measurement: Volume <br> Step 1 - What is volume? <br> Step 2 - Compare volume <br> Step 3 - Estimate volume <br> Step 4 - Estimate capacity | pint <br> gallon |
| Geometry: Perimeter and Area <br> Step 1 - Measure perimeter <br> Step 2 -Calculate perimeter <br> Step 3 - Find unknown lengths <br> Step 4 - Area of rectangles <br> Step 5 - Area of compound shapes <br> Step 6 - Area of irregular shapes <br> Step 7 - Estimate | radius square metre $(\mathrm{m} 2)$ <br> diameter square millimetre $(\mathrm{mm} 2)$ <br> congruent x-axis <br> axis of symmetry y-axis, <br> reflective symmetry quadrant |
| Geometry: Properties of Shape <br> Step 1 - Can I measure angles in degrees? <br> Step 2 - Can I measure with a protractor? (1) <br> Step 3 - Can I measure with a protractor? (2) <br> Step 4 - Can I draw lines and angles accurately? <br> Step 5 -Calculating angles on a straight line? <br> Step 6 - Can I calculating angles around a point? <br> Step 7 - Can I calculate lengths and angles in shapes? <br> Step 8 - Can I distinguish between regular and irregular polygons? <br> Step 9 - Can I reason about 3-D shapes? | Radius x-axis, <br> diameter y-axis <br> congruent quadrant <br> axis of symmetry octahedron <br> reflective symmetry protractor |
| Geometry: Position and Direction <br> Step 1 - Position in the first quadrant <br> Step 2 -Reflection <br> Step 3 - Reflection with coordinates <br> Step 4 - Translation <br> Step 5 - Translation with coordinates | coordinate |
| Statistics <br> Step 1 - Read and interpret line graphs <br> Step 2 - Draw line graphs <br> Step 3 - Use line graphs to solve problems <br> Step 4 - Read and interpret tables <br> Step 5 - Two way tables <br> Step 6 - Timetables | database <br> bar line chart <br> line graph <br> maximum/minimum <br> value <br> outcome |


| Maths - KS2 |  |
| :---: | :---: |
| Key Vocabulary |  |
| Key Knowledge | Key Vocabulary |
| Year 6 |  |
| Number: Place Value <br> Step 1 - Numbers to ten million <br> Step 2 - Compare and order any number <br> Step 3 - Round any numbers <br> Step 4 - Negative numbers |  |
| Number: Four operations <br> Step 1 - Add and subtract whole numbers <br> Step 2 - Multiply up to a 4-digit by 1-digit number <br> Step 3 - Short division <br> Step 4 - Division using factors <br> Step 5 - Long division (1) <br> Step 6 - Long division (2) <br> Step 7 - Long division (3) <br> Step 8 - Long division (4) <br> Step 9 - Common factors <br> Step 10 - Common multiples <br> Step 11 - Primes <br> Step 12 - Squares and cubes <br> Step 13 - Order of operations <br> Step 14 - Mental calculations and estimation <br> Step 15 - Reasoning from known facts | factorise prime factor digit total |
| Number: Fractions <br> Step 1 - Simplify fractions <br> Step 2 - Fractions on a number line <br> Step 3 -Compare and order fractions by the denominator <br> Step 4 Compare and order fractions by the numerator <br> Step 5 - Add and subtract fractions (1) <br> Step 6 - Add and subtract fractions (2) <br> Step 7 - Adding fractions <br> Step 8 - Subtracting fractions <br> Step 9 - Mixed addition and subtraction problems <br> Step 10 - Multiply fractions by whole number <br> Step 11 - Multiply fractions by fraction <br> Step 12 - Divide a fraction by a whole number (1) <br> Step 13 - Divide a fraction by a whole number (2) <br> Step 14 - Four rules with fractions <br> Step 15 - Fraction of an amount <br> Step 16 - Fraction of an amount - finding the whole |  |
| Number: Decimals <br> Step 1 - Three decimal places <br> Step 2 - Multiply by 10, 100 and 1,000 <br> Step 3 - Divide by 10, 100 and 1,000 <br> Step 4 - Multiply decimals by integers <br> Step 5 - Divide decimals by integers <br> Step 6 - Division to solve problems <br> Step 7 - Decimals as fractions <br> Step - 8 Fractions to decimals (1) <br> Step 9 - Fractions to decimals (2) |  |
| Number: Ratio <br> Step 1 - Using ratio language <br> Step 2 - Ratio and fractions <br> Step 3 - Introducing the ratio symbol <br> Step 4 - Calculating ratio <br> Step 5 - Using scale factors <br> Step 6 - Calculating scale factors <br> Step 7 - Ratio and proportion problems | ratio |
| Number: Algebra <br> Step 1 - Find a rule - one step <br> Step 2 - Find a rule - two step <br> Step 3 Forming expression | formulae equation unknown |


| Step 4 - Substitution <br> Step 5 - Formulae <br> Step 6 - Forming equations <br> Step 7 - Solve simple one step equations <br> Step 8 - Solve two step equations <br> Step 9 - Find pairs of values <br> Step 10 - Enumerate possibilities | variable |
| :---: | :---: |
| Measurement: Converting Units <br> Step 1 - Metric measures <br> Step 2 - Convert metric measures <br> Step 3 -Calculate with metric measures <br> Step 4 - Miles and kilometres <br> Step 5 - Imperial measures | yard, foot, feet <br> inch, inches <br> cubic Greenwich Mean Time, <br> British Summer Time, <br> centimetres(cm3), International Date Line <br> cubic metres (m3),  <br> cubic millimetres  <br> (mm3), cubic  <br> kilometres (km3)  |
| Measurement: Perimeter, Area, Volume <br> Step 1 - Shapes - same area <br> Step 2 - Area and perimeter <br> Step 3 - Area of a triangle (1) <br> Step 4 - Area of a triangle (2) <br> Step 5 - Area of a triangle (3) <br> Step 6 - Area of a parallelogram <br> Step 7 - Volume - counting cubes <br> Step 8 - Volume of a cuboid |  |
| Geometry <br> Step 1 - Coordinates in the first quadrant <br> Step 2 -Coordinates in four quadrants <br> Step 3 - Translations <br> Step 4 - Reflections | circumference intersecting <br> concentric intersection <br> arc plane <br> net open/closed  |
| Geometry: Properties of Shape <br> Step 1 - Measure with a protractor <br> Step 2 - Introduce angles <br> Step 3 - Calculate angles <br> Step 4 - Vertically opposite angles <br> Step 5 - Angles in a triangle <br> Step 6 - Angles in a triangle - special cases <br> Step 7-Angles in a triangle - missing angles <br> Step 8 - Angles in special quadrilaterals <br> Step 9 - Angles in regular polygons <br> Step 10 - Draw shapes accurately <br> Step 11 - Nets of 3D shapes | kite <br> dodecahedron <br> net, open, closed |
| Statistics <br> Step 1 - Read and interpret line graphs <br> Step 2 - Draw line graphs <br> Step 3 - Use line graphs to solve problems <br> Step 4 - Circles <br> Step 5 - Read and interpret pie charts <br> Step 6 - Pie charts with percentages <br> Step 7 - Draw pie charts <br> Step 8 - The mean | pie chart <br> mean (mode, median, range as estimates for this) <br> Statistics <br> distribution |

Ready-to-progress criteria and the curriculum
The ready-to-progress criteria in this document are organised into 6 strands, each of which has its own code for ease of identification. These are listed below.
Measurement and Statistics are integrated as applications of number criteria, and elements of measurement that relate to shape are included in the Geometry strand.

| Ready-to-progress criteria strands | Code |
| :--- | :---: |
| Number and place value | NPV |
| Number facts | NF |
| Addition and subtraction | AS |
| Multiplication and division | MD |
| Fractions | F |
| Geometry | G |

## Year 1 guidance

## Ready-to-progress criteria

| Previous experience | Year 1 ready-to-progress criteria | Future applications |
| :---: | :---: | :---: |
| Begin to develop a sense of the number system by verbally counting forward to and beyond 20, pausing at each multiple of 10 . | 1NPV-1 Count within 100, forwards and backwards, starting with any number. | Count through the number system. <br> Place value within 100. <br> Compare and order numbers. <br> Add and subtract within 100. |
| Play games that involve moving along a numbered track, and understand that larger numbers are further along the track. | 1NPV-2 Reason about the location of numbers to 20 within the linear number system, including comparing using < > and = | Reason about the location of larger numbers within the linear number system. <br> Compare and order numbers. <br> Read scales. |
| Begin to experience partitioning and combining numbers within 10. | 1NF-1 Develop fluency in addition and subtraction facts within 10. | Add and subtract across 10. <br> All future additive calculation. <br> Add within a column during columnar addition when the column sums to less than 10 (no regrouping). <br> Subtract within a column during columnar subtraction when the minuend of the column is larger than the subtrahend (no exchanging). |
| Distribute items fairly, for example, put 3 marbles in each bag. <br> Recognise when items are distributed unfairly. | 1NF-2 Count forwards and backwards in multiples of 2, 5 and 10, up to 10 multiples, beginning with any multiple, and count forwards and backwards through the odd numbers. | Recall the 2, 5 and 10 multiplication tables. <br> Carry out repeated addition and multiplication of 2,5 , and 10, and divide by 2, 5 and 10. <br> Identify multiples of 2,5 and 10. <br> Unitise in tens. <br> Identify odd and even numbers. |


| Previous experience | Year 1 ready-to-progress criteria | Future applications |
| :---: | :---: | :---: |
| Understand the cardinal value of number words, for example understanding that 'four' relates to 4 objects. <br> Subitise for up to to 5 items. <br> Automatically show a given number using fingers. | 1AS-1 Compose numbers to 10 from 2 parts, and partition numbers to 10 into parts, including recognising odd and even numbers. | Add and subtract within 10. |
| Devise and record number stories, using pictures, numbers and symbols (such as arrows). | 1AS-2 Read, write and interpret equations containing addition (+), subtraction ( $\perp$ and equals ( $\ddagger$ symbols, and relate additive expressions and equations to real-life contexts. | Represent composition and decomposition of numbers using equations. |
| See, explore and discuss models of common 2D and 3D shapes with varied dimensions and presented in different orientations (for example, triangles not always presented on their base). | 1G-1 Recognise common 2D and 3D shapes presented in different orientations, and know that rectangles, triangles, cuboids and pyramids are not always similar to one another. | Describe properties of shape. <br> Categorise shapes. Identify similar shapes. |
| Select, rotate and manipulate shapes for a particular purpose, for example: <br> - rotating a cylinder so it can be used to build a tower <br> - rotating a puzzle piece to fit in its place | 1G-2 Compose 2D and 3D shapes from smaller shapes to match an example, including manipulating shapes to place them in particular orientations. | Find the area or volume of a compound shape by decomposing into constituent shapes. <br> Rotate, translate and reflect 2D shapes. <br> Identify congruent shapes. |

## Year 2 guidance

Ready-to-progress criteria

| Year 1 conceptual prerequesites | Year 2 ready-toprogress criteria | Future applications |
| :---: | :---: | :---: |
| Know that 10 ones are equivalent to 1 ten. <br> Know that multiples of 10 are made up from a number of tens, for example, 50 is 5 tens. | 2NPV-1 Recognise the place value of each digit in two-digit numbers, and compose and decompose twodigit numbers using standard and nonstandard partitioning. | Compare and order numbers. Add and subtract using mental and formal written methods. |
| Place the numbers 1 to 9 on a marked, but unlabelled, 0 to 10 number line. <br> Estimate the position of the numbers 1 to 9 on an unmarked 0 to 10 number line. <br> Count forwards and backwards to and from 100. | 2NPV-2 Reason about the location of any twodigit number in the linear number system, including identifying the previous and next multiple of 10 . | Compare and order numbers. Round whole numbers. <br> Subtract ones from a multiple of 10 , for example: $30-3=27$ |
| Develop fluency in addition and subtraction facts within 10. | 2NF-1 Secure fluency in addition and subtraction facts within 10, through continued practice. | All future additive calculation. <br> Add within a column during columnar addition when the column sums to less than 10 (no regrouping). <br> Subtract within a column during columnar subtraction when the minuend of the column is larger than the subtrahend (no exchanging). |


| Year 1 conceptual prerequesites | Year 2 ready-toprogress criteria | Future applications |
| :---: | :---: | :---: |
| Learn and use number bonds to 10 , for example: $8+?=10$ <br> Partition numbers within 10, for example: $5=2+3$ | 2AS-1 Add and subtract across 10, for example: $\begin{aligned} & 8+5=13 \\ & 13-5=8 \end{aligned}$ | Add and subtract within 100: add and subtract any 2 twodigit numbers, where the ones sum to 10 or more, for example: $26+37=63$ <br> Use knowledge of unitising to add and subtract across other boundaries, for example: $1.3-0.5=0.8$ <br> Add within a column during columnar addition when the column sums to more than 10 (regrouping), for example, for: $126+148$ <br> Subtract within a column during columnar subtraction when the minuend of the column is smaller than the subtrahend (exchanging), for example, for: $453-124$ |
| Solve missing addend problems within 10, for example: $4+\square=10$ | 2AS-2 Recognise the subtraction structure of 'difference' and answer questions of the form, "How many more...?". | Solve contextual subtraction problems for all three subtraction structures (reduction, partitioning and difference) and combining with other operations. |
| Add and subtract within 10, for example: $\begin{aligned} & 6+3=9 \\ & 6-2=4 \end{aligned}$ <br> Know that a multiple of 10 is made up from a number of tens, for example, 50 is 5 tens. | 2AS-3 Add and subtract within 100 by applying related onedigit addition and subtraction facts: add and subtract only ones or only tens to/from a two-digit number. | Add and subtract using mental and formal written methods. |


| Year 1 conceptual prerequesites | Year 2 ready-toprogress criteria | Future applications |
| :---: | :---: | :---: |
| Add and subtract within 10. Know that a multiple of 10 is made up from a number of tens, for example, 50 is 5 tens. | 2AS-4 Add and subtract within 100 by applying related onedigit addition and subtraction facts: add and subtract any 2 twodigit numbers. | Add and subtract numbers greater than 100, recognising unitising, for example: <br> 32 ones +23 ones $=55$ ones so <br> 32 tens +23 tens $=55$ tens $320+230=550$ |
| Count in multiples of 2, 5 and 10. | 2MD-1 Recognise repeated addition contexts, representing them with multiplication equations and calculating the product, within the 2,5 and 10 multiplication tables. | Use multiplication to represent repeated addition contexts for other group sizes. <br> Memorise multiplication tables. |
| Count in multiples of 2, 5 and 10 to find how many groups of 2,5 or 10 there are in a particular quantity, set in everyday contexts. | 2MD-2 Relate grouping problems where the number of groups is unknown to multiplication equations with a missing factor, and to division equations (quotitive division). | Division with other divisors. |
| Recognise common 2D and 3D shapes presented in different orientations. | 2G-1 Use precise language to describe the properties of 2D and 3D shapes, and compare shapes by reasoning about similarities and differences in properties. | Identify similar shapes. <br> Describe and compare angles. <br> Draw polygons by joining marked points <br> Identify parallel and perpendicular sides. <br> Identify regular polygons <br> Find the perimeter of regular and irregular polygons. <br> Compare areas and calculate the area of rectangles (including squares) using standard units. <br> Compare areas and calculate the area of rectangles (including squares) using standard units. |

## Year 3 guidance

Ready-to-progress criteria

| Year 2 conceptual <br> prerequisite | Year 3 ready-to-progress <br> criteria | Future applications |
| :--- | :--- | :--- |
| Know that 10 ones are <br> equivalent to 1 ten, and that <br> 40 (for example) can be <br> composed from 40 ones or <br> 4 tens. <br> Know how many tens there <br> are in multiples of 10 up to <br> 100. | 3NPV-1 Know that 10 tens <br> are equivalent to 1 <br> hundred, and that 100 is 10 <br> times the size of 10; apply <br> this to identify and work out <br> how many 10s there are in <br> other three-digit multiples of <br> 10. | Solve multiplication <br> problems that that involve a <br> scaling structure, such as <br> 'ten times as long'. |
| Recognise the place value <br> of each digit in two-digit <br> numbers, and compose and <br> decompose two-digit <br> numbers using standard <br> and non-standard <br> partitioning. | 3NPV-2 Recognise the <br> place value of each digit in <br> three-digit numbers, and <br> compose and decompose <br> three-digit numbers using <br> standard and non-standard <br> partitioning. | Compare and order <br> numbers. <br> Add and subtract using <br> mental and formal written <br> methods. |
| Reason about the location <br> of any two-digit number in <br> the linear number system, <br> including identifying the <br> previous and next multiple <br> of 10. | 3NPV-3 Reason about the <br> location of any three-digit <br> number in the linear <br> number system, including <br> identifying the previous and <br> next multiple of 100 and 10. | Compare and order <br> numbers. <br> Estimate and approximate <br> to the nearest multiple of <br> $1,000,100$ or 10. |
| Count in multiples of 2, 5 <br> and 10. | 3NPV-4 Divide 100 into 2, <br> 4,5 and 10 equal parts, <br> and read scales/number <br> lines marked in multiples of <br> 100 with 2, 4, 5 and 10 <br> equal parts. | Read scales on graphs and <br> measuring instruments. |


| Year 2 conceptual <br> prerequisite | Year 3 ready-to-progress <br> criteria | Future applications |
| :--- | :--- | :--- |
| Add and subtract across <br> 10, for example: <br> $8+5=13$ <br> $13-5=8$ | 3NF-1 Secure fluency in <br> addition and subtraction <br> facts that bridge 10, <br> through continued practice. | Add and subtract mentally <br> where digits sum to more <br> than 10, for example: <br> $26+37=63$ |


| Year 2 conceptual prerequisite | Year 3 ready-to-progress criteria | Future applications |
| :---: | :---: | :---: |
| Automatically recall number bonds to 9 and to 10. <br> Know that 10 ones are equivalent to 1 ten, and 10 tens are equivalent to 1 hundred. | 3AS-1 Calculate complements to 100 , for example: $46+?=100$ | Calculate complements to other numbers, particularly powers of 10 . <br> Calculate how much change is due when paying for an item. |
| Automatically recall addition and subtraction facts within 10 and across 10. <br> Recognise the place value of each digit in two- and three-digit numbers. <br> Know that 10 ones are equivalent to 1 ten, and 10 tens are equivalent to 1 hundred. | 3AS-2 Add and subtract up to three-digit numbers using columnar methods. | Add and subtract other numbers, including fourdigits and above, and decimals, using columnar methods. |
| Have experience with the commutative property of addition, for example, have recognised that $3+2$ and $2+3$ have the same sum. <br> Be able to write an equation in different ways, for example, $2+3=5 \text { and } 5=2+3$ <br> Write equations to represent addition and subtraction contexts. | 3AS-3 Manipulate the additive relationship: <br> Understand the inverse relationship between addition and subtraction, and how both relate to the part-part-whole structure. Understand and use the commutative property of addition, and understand the related property for subtraction. | All future additive reasoning. |
| Recognise repeated addition contexts and represent them with multiplication equations. <br> Relate grouping problems where the number of groups is unknown to multiplication equations with a missing factor, and to division equations (quotitive division). | 3MD-1 Apply known multiplication and division facts to solve contextual problems with different structures, including quotitive and partitive division. |  |


| Year 2 conceptual prerequisite | Year 3 ready-to-progress criteria | Future applications |
| :---: | :---: | :---: |
|  | 3F-1 Interpret and write proper fractions to represent 1 or several parts of a whole that is divided into equal parts. | Use unit fractions as the basis to understand nonunit fractions, improper fractions and mixed numbers, for example: <br> $\frac{2}{5}$ is 2 one-fifths <br> $\frac{6}{5}$ is 6 one-fifths, so $\frac{6}{5}=1 \frac{1}{5}$ |
|  | 3F-2 Find unit fractions of quantities using known division facts (multiplication tables fluency). | Apply knowledge of unit fractions to non-unit fractions. |
| Reason about the location of whole numbers in the linear number system. | 3F-3 Reason about the location of any fraction within 1 in the linear number system. | Compare and order fractions. |
| Automatically recall addition and subtraction facts within 10. <br> Unitise in tens: understand that 10 can be thought of as a single unit of 1 ten, and that these units can be added and subtracted. | 3F-4 Add and subtract fractions with the same denominator, within 1. | Add and subtract improper and mixed fractions with the same denominator, including bridging whole numbers. |
| Recognise standard and non-standard examples of 2D shapes presented in different orientations. <br> Identify similar shapes. | 3G-1 Recognise right angles as a property of shape or a description of a turn, and identify right angles in 2D shapes presented in different orientations. | Compare angles. Estimate and measure angles in degrees. |
| Compose 2D shapes from smaller shapes to match an exemplar, rotating and turning over shapes to place them in specific orientations. | 3G-2 Draw polygons by joining marked points, and identify parallel and perpendicular sides. | Find the area or volume of a compound shape by decomposing into constituent shapes. <br> Find the perimeter of regular and irregular polygons. |

## Year 4 guidance

Ready-to-progress criteria

| Year 3 conceptual prerequesite | Year 4 ready-to-progress criteria | Future applications |
| :---: | :---: | :---: |
| Know that 10 tens are equivalent to 1 hundred, and that 100 is 10 times the size of 10 . | 4NPV-1 Know that 10 hundreds are equivalent to 1 thousand, and that 1,000 is 10 times the size of 100 ; apply this to identify and work out how many 100s there are in other four-digit multiples of 100 . | Solve multiplication problems that that involve a scaling structure, such as '10 times as long'. |
| Recognise the place value of each digit in three-digit numbers, and compose and decompose three-digit numbers using standard and non-standard partitioning. | 4NPV-2 Recognise the place value of each digit in four-digit numbers, and compose and decompose four-digit numbers using standard and non-standard partitioning. | Compare and order numbers. Add and subtract using mental and formal written methods. |
| Reason about the location of any threedigit number in the linear number system, including identifying the previous and next multiple of 10 and 100. | 4NPV-3 Reason about the location of any four-digit number in the linear number system, including identifying the previous and next multiple of 1,000 and 100 , and rounding to the nearest of each. | Compare and order numbers. Estimate and approximate to the nearest multiple of $1,000,100$ or 10. |
| Divide 100 into 2, 4, 5 and 10 equal parts, and read scales/number lines marked in multiples of 100 with 2 , 4,5 and 10 equal parts. | 4NPV-4 Divide 1,000 into 2, 4, 5 and 10 equal parts, and read scales/number lines marked in multiples of 1,000 with $2,4,5$ and 10 equal parts. | Read scales on graphs and measuring instruments. |
| Recall multiplication and division facts in the 5 and 10, and 2, 4 and 8 multiplication tables, and recognise products in these multiplication tables as multiples of the corresponding number. | 4NF-1 Recall <br> multiplication and division facts up to $12 \times 12$, and recognise products in multiplication tables as multiples of the corresponding number. | Use multiplication facts during application of formal written methods. <br> Use division facts during application of formal written methods. |


| Year 3 conceptual prerequesite | Year 4 ready-to-progress criteria | Future applications |
| :---: | :---: | :---: |
| Use known division facts to solve division problems. <br> Calculate small differences, for example: $74-72=2$ | 4NF-2 Solve division problems, with two-digit dividends and one-digit divisors, that involve remainders, for example: $74 \div 9=8 \text { r } 2$ <br> and interpret remainders appropriately according to the context. | Correctly represent and interpret remainders when using short and long division. |
| Apply place-value knowledge to known additive and multiplicative number facts (scaling facts by 10), for example: $\begin{aligned} & 80+60=140 \\ & 140-60=80 \\ & 30 \times 4=120 \\ & 120 \div 4=30 \end{aligned}$ | 4NF-3 Apply place-value knowledge to known additive and multiplicative number facts (scaling facts by 100), for example: $\begin{aligned} & 8+6=14 \text { and } 14-6=8 \\ & \text { so } \\ & 800+600=1,400 \\ & 1,400-600=800 \\ & \\ & 3 \times 4=12 \text { and } 12 \div 4=3 \\ & \text { so } \\ & 300 \times 4=1,200 \\ & 1,200 \div 4=300 \end{aligned}$ | Apply place-value knowledge to known additive and multiplicative number facts, extending to a whole number of larger powers of ten and powers of ten smaller than one, for example: $\begin{aligned} & 800,000+600,000=1,400,000 \\ & 1,400,000-600,000=800,000 \end{aligned}$ $\begin{aligned} & 0.03 \times 4=0.12 \\ & 0.12 \div 4=0.03 \end{aligned}$ |
| Multiply two-digit numbers by 10 , and divide three-digit multiples of 10 by 10 . | 4MD-1 Multiply and divide whole numbers by 10 and 100 (keeping to whole number quotients); understand this as equivalent to making a number 10 or 100 times the size. | Convert between different metric units of measure. <br> Apply multiplication and division by 10 and 100 to calculations involving decimals, for example: $\begin{aligned} & 0.03 \times 100=3 \\ & 3 \div 100=0.03 \end{aligned}$ |
| Understand the inverse relationship between multiplication and division. <br> Write and use multiplication table facts with the factors presented in either order. | 4MD-2 Manipulate multiplication and division equations, and understand and apply the commutative property of multiplication. | Recognise and apply the structures of multiplication and division to a variety of contexts. |
|  | 4MD-3 Understand and apply the distributive property of multiplication. | Recognise when to use and apply the distributive property of multiplication in a variety of contexts. |


| Year 3 conceptual prerequesite | Year 4 ready-to-progress criteria | Future applications |
| :---: | :---: | :---: |
| Reason about the location of fractions less than 1 in the linear number system. | 4F-1 Reason about the location of mixed numbers in the linear number system. | Compare and order fractions. |
| Identify unit and nonunit fractions. | 4F-2 Convert mixed numbers to improper fractions and vice versa. | Compare and order fractions. Add and subtract fractions where calculation bridges whole numbers. |
| Add and subtract fractions with the same denominator, within 1 whole, for example: $\frac{2}{5}+\frac{2}{5}=\frac{4}{5}$ | 4F-3 Add and subtract improper and mixed fractions with the same denominator, including bridging whole numbers, for example: $\begin{aligned} & \frac{7}{5}+\frac{4}{5}=\frac{11}{5} \\ & 3 \frac{7}{8}-\frac{2}{8}=3 \frac{5}{8} \\ & 7 \frac{2}{5}+\frac{4}{5}=8 \frac{1}{5} \\ & 8 \frac{1}{5}-\frac{4}{5}=7 \frac{2}{5} \end{aligned}$ |  |
| Draw polygons by joining marked points. | 4G-1 Draw polygons, specified by coordinates in the first quadrant, and translate within the first quadrant. | Draw polygons, specified by coordinates in the 4 quadrants. |
| Measure lines in centimetres and metres. <br> Add more than 2 addends. <br> Recall multiplication table facts. | 4G-2 Identify regular polygons, including equilateral triangles and squares, as those in which the side-lengths are equal and the angles are equal. Find the perimeter of regular and irregular polygons. | Draw, compose and decompose shapes according to given properties, dimensions, angles or area. |
|  | 4G-3 Identify line symmetry in 2D shapes presented in different orientations. Reflect shapes in a line of symmetry and complete a symmetric figure or pattern with respect to a specified line of symmetry. | Draw polygons, specified by coordinates in the 4 quadrants: draw shapes following translation or reflection in the axes. |

## Year 5 guidance

## Ready-to-progress criteria

| Year 4 conceptual prerequesite | Year 5 ready-to-progress criteria | Future applications |
| :---: | :---: | :---: |
| Know that 10 hundreds are equivalent to 1 thousand, and that 1,000 is 10 times the size of 100; apply this to identify and work out how many 100s there are in other four-digit multiples of 100. | 5NPV-1 Know that 10 tenths are equivalent to 1 one, and that 1 is 10 times the size of 0.1. <br> Know that 100 hundredths are equivalent to 1 one, and that 1 is 100 times the size of 0.01 . <br> Know that 10 hundredths are equivalent to 1 tenth, and that 0.1 is 10 times the size of 0.01 . | Solve multiplication problems that have the scaling structure, such as 'ten times as long'. <br> Understand that per cent relates to 'number of parts per hundred', and write percentages as a fraction with denominator 100, and as a decimal fraction. |
| Recognise the place value of each digit in four-digit numbers, and compose and decompose four-digit numbers using standard and non-standard partitioning. | 5NPV-2 Recognise the place value of each digit in numbers with up to 2 decimal places, and compose and decompose numbers with up to 2 decimal places using standard and nonstandard partitioning. | Compare and order numbers, including those with up to 2 decimal places. <br> Add and subtract using mental and formal written methods. |
| Reason about the location of any four-digit number in the linear number system, including identifying the previous and next multiple of 1,000 and 100, and rounding to the nearest of each. | 5NPV-3 Reason about the location of any number with up to 2 decimals places in the linear number system, including identifying the previous and next multiple of 1 and 0.1 and rounding to the nearest of each. | Compare and order numbers, including those with up to 2 decimal places. <br> Estimate and approximate to the nearest 1 or 0.1 . |
| Divide 1,000 into 2, 4, 5 and 10 equal parts, and read scales/number lines marked in multiples of 1,000 with 2,4 , 5 and 10 equal parts. | 5NPV-4 Divide 1 into 2, 4, 5 and 10 equal parts, and read scales/number lines marked in units of 1 with 2 , 4,5 and 10 equal parts. | Read scales on graphs and measuring instruments. |


| Year 4 conceptual prerequesite | Year 5 ready-to-progress criteria | Future applications |
| :---: | :---: | :---: |
| Divide 100 and 1,000 into 2, 4,5 and 10 equal parts. <br> Find unit fractions of quantities using known division facts (multiplication tables fluency). | 5NPV-5 Convert between units of measure, including using common decimals and fractions. | Read scales on measuring instruments, and on graphs related to measures contexts. <br> Solve measures problems involving different units by converting to a common unit. |
| Recall multiplication and division facts up to $12 \times 12$. <br> Solve division problems, with two-digit dividends and onedigit divisors, that involve remainders, for example: $74 \div 9=8 r 2$ | 5NF-1 Secure fluency in multiplication table facts, and corresponding division facts, through continued practice. | Use multiplication facts during application of formal written layout. <br> Use division facts during short division and long division. |
| Apply place-value knowledge to known additive and multiplicative number facts (scaling facts by 10 or 100), for example: $\begin{aligned} & 8+6=14 \\ & 80+60=140 \\ & 800+600=1,400 \end{aligned}$ $\begin{aligned} & 3 \times 4=12 \\ & 30 \times 4=120 \\ & 300 \times 4=1,200 \end{aligned}$ | 5NF-2 Apply place-value knowledge to known additive and multiplicative number facts (scaling facts by 1 tenth or 1 hundredth), for example: $\begin{aligned} & 8+6=14 \\ & 0.8+0.6=1.4 \\ & 0.08+0.06=0.14 \\ & \\ & 3 \times 4=12 \\ & 0.3 \times 4=1.2 \\ & 0.03 \times 4=0.12 \end{aligned}$ | Recognise number relationships within the context of place value to develop fluency and efficiency in calculation. |
| Multiply and divide whole numbers by 10 and 100 (keeping to whole number quotients); understand this as equivalent to scaling a number by 10 or 100 . | 5MD-1 Multiply and divide numbers by 10 and 100; understand this as equivalent to making a number 10 or 100 times the size, or 1 tenth or 1 hundredth times the size. | Convert between different metric units of measure. |


| Year 4 conceptual prerequesite | Year 5 ready-to-progress criteria | Future applications |
| :---: | :---: | :---: |
| Recall multiplication and division facts up to $12 \times 12$, and recognise products in multiplication tables as multiples of the corresponding number. <br> Recognise multiples of 10, 100 and 1,000. <br> Apply place-value knowledge to known additive and multiplicative number facts. <br> Multiply and divide whole numbers by 10 and 100 (keeping to whole number quotients). | 5MD-2 Find factors and multiples of positive whole numbers, including common factors and common multiples, and express a given number as a product of 2 or 3 factors. | Solve contextual division problems. <br> Simplify fractions. <br> Express fractions in the same denomination. |
| Recall multiplication facts up to $12 \times 12$. <br> Manipulate multiplication and division equations. | 5MD-3 Multiply any whole number with up to 4 digits by any one-digit number using a formal written method. | Solve contextual and noncontextual multiplication problems using a formal written method. |
| Recall multiplication and division facts up to $12 \times 12$. <br> Manipulate multiplication and division equations. <br> Solve division problems, with two-digit dividends and onedigit divisors, that involve remainders, for example: $74 \div 9=8 r 2$ <br> and interpret remainders appropriately according to the context. | 5MD-4 Divide a number with up to 4 digits by a one-digit number using a formal written method, and interpret remainders appropriately for the context. | Solve contextual and noncontextual division problems using a formal written method. |
| Recall multiplication and division facts up to $12 \times 12$. <br> Find unit fractions of quantities using known division facts (multiplicationtables fluency). <br> Unitise using unit fractions (for example, understand that there are 3 one-fifths in threefifths). | 5F-1 Find non-unit fractions of quantities. | Solve multiplication problems that have the scaling structure. |


| Year 4 conceptual prerequesite | Year 5 ready-to-progress criteria | Future applications |
| :---: | :---: | :---: |
| Recall multiplication and division facts up to $12 \times 12$. <br> Reason about the location of fractions in the linear number system. | 5F-2 Find equivalent fractions and understand that they have the same value and the same position in the linear number system. | Compare and order fractions. <br> Use common factors to simplify fractions. <br> Use common multiples to express fractions in the same denomination. <br> Add and subtract fractions with different denominators and mixed numbers, using the concept of equivalent fractions. |
| Divide powers of 10 into 2, 4, 5 and 10 equal parts. | 5F-3 Recall decimal fraction equivalents for $\frac{1}{2}$, $\frac{1}{4}, \frac{1}{5}$ and $\frac{1}{10}$, and for multiples of these proper fractions. | Read scales on graphs and measuring instruments. <br> Know percentage equivalents of common fractions. |
| Recognise right angles as a property of shape or a description of a turn, and identify right angles in 2D shapes presented in different orientations. <br> Identify whether the interior angles of a polygon are equal or not. | 5G-1 Compare angles, estimate and measure angles in degrees $\left({ }^{\circ}\right)$ and draw angles of a given size. | Solve problems involving missing angles. |
| Compose polygons from smaller shapes. <br> Recall multiplication facts up to $12 \times 12$. | 5G-2 Compare areas and calculate the area of rectangles (including squares) using standard units. | Calculate the area of compound rectilinear shapes and other 2D shapes, including triangles and parallelograms, using standard units. <br> Use the relationship between side-length and perimeter, and between side-length and area to calculate unknown values. |

## Year 6 guidance

Ready-to-progress criteria

| Year 5 conceptual prerequesite | Year 6 ready-toprogress criteria | Key stage 3 applications |
| :---: | :---: | :---: |
| Understand the relationship between powers of 10 from 1 hundredth to 1,000 in terms of grouping and exchange (for example, 1 is equal to 10 tenths) and in terms of scaling (for example, 1 is ten times the size of 1 tenth). | 6NPV-1 Understand the relationship between powers of 10 from 1 hundredth to 10 million, and use this to make a given number 10, 100, 1,000, 1 tenth, 1 hundredth or 1 thousandth times the size (multiply and divide by 10,100 and 1,000 ). | Understand and use place value for decimals, measures, and integers of any size. <br> Interpret and compare numbers in standard form $A \times 10^{n} 1 \leq A<10$, where $n$ is a positive or negative integer or zero. |
| Recognise the place value of each digit in numbers with units from thousands to hundredths and compose and decompose these numbers using standard and nonstandard partitioning. | 6NPV-2 Recognise the place value of each digit in numbers up to 10 million, including decimal fractions, and compose and decompose numbers up to 10 million using standard and nonstandard partitioning. | Understand and use place value for decimals, measures, and integers of any size. <br> Order positive and negative integers, decimals, and fractions. <br> Use a calculator and other technologies to calculate results accurately and then interpret them appropriately. |
| Reason about the location of numbers between 0.01 and 9,999 in the linear number system. <br> Round whole numbers to the nearest multiple of 1,000, 100 or 10, as appropriate. <br> Round decimal fractions to the nearest whole number or nearest multiple of 0.01 | 6NPV-3 Reason about the location of any number up to 10 million, including decimal fractions, in the linear number system, and round numbers, as appropriate, including in contexts. | Order positive and negative integers, decimals, and fractions; use the number line as a model for ordering of the real numbers; use the symbols $=, \neq,<,>, \leq, \geq$ <br> Round numbers and measures to an appropriate degree of accuracy (for example, to a number of decimal places or significant figures). <br> Use approximation through rounding to estimate answers and calculate possible resulting errors expressed using inequality notation $a<x \leq b$ |


| Year 5 conceptual prerequesite | Year 6 ready-toprogress criteria | Key stage 3 applications |
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| Divide 1000, 100 and 1 into 2, 4,5 and 10 equal parts, and read scales/number lines with $2,4,5$ and 10 equal parts. | 6NPV-4 Divide powers of 10 , from 1 hundredth to 10 million, into 2, 4, 5 and 10 equal parts, and read scales/number lines with labelled intervals divided into 2, 4,5 and 10 equal parts. | Use standard units of mass, length, time, money, and other measures, including with decimal quantities. Construct and interpret appropriate tables, charts, and diagrams. |
| Be fluent in all key stage 2 additive and multiplicative number facts (see Appendix: number facts fluency overview <br> ) and calculation. <br> Manipulate additive equations, including applying understanding of the inverse relationship between addition and subtraction, and the commutative property of addition. <br> Manipulate multiplicative equations, including applying understanding of the inverse relationship between multiplication and division, and the commutative property of multiplication. | 6AS/MD-1 Understand that 2 numbers can be related additively or multiplicatively, and quantify additive and multiplicative relationships (multiplicative relationships restricted to multiplication by a whole number). | Understand that a multiplicative relationship between 2 quantities can be expressed as a ratio or a fraction. <br> Express 1 quantity as a fraction of another, where the fraction is less than 1 and greater than 1. <br> Interpret mathematical relationships both algebraically and geometrically. <br> Interpret when the structure of a numerical problem requires additive, multiplicative or proportional reasoning. |
| Make a given number (up to 9,999, including decimal fractions) 10, 100, 1 tenth or 1 hundredth times the size (multiply and divide by 10 and 100). <br> Apply place-value knowledge to known additive and multiplicative number facts (scaling facts by 10, 100, 1 tenth or 1 hundredth). <br> Manipulate additive equations. Manipulate multiplicative equations. | 6AS/MD-1 Use a given additive or multiplicative calculation to derive or complete a related calculation, using arithmetic properties, inverse relationships, and place-value understanding. | Recognise and use relationships between operations including inverse operations. <br> Use algebra to generalise the structure of arithmetic, including to formulate mathematical relationships. <br> Understand and use standard mathematical formulae; rearrange formulae to change the subject. |


| Year 5 conceptual prerequesite | Year 6 ready-toprogress criteria | Key stage 3 applications |
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| Recall multiplication and division facts up to $12 \times 12$. <br> Apply place-value knowledge to known additive and multiplicative number facts. | 6AS/MD-3 Solve problems involving ratio relationships. | Use ratio notation, including reduction to simplest form. <br> Divide a given quantity into 2 parts in a given part:part or part:whole ratio; express the division of a quantity into 2 parts as a ratio. |
| Be fluent in all key stage 2 additive and multiplicative number facts and calculation. <br> Manipulate additive equations. <br> Manipulate multiplicative equations. <br> Find a fraction of a quantity. | 6AS/MD-4 Solve problems with 2 unknowns. | Reduce a given linear equation in two variables to the standard form $y=m x+c$; calculate and interpret gradients and intercepts of graphs of such linear equations numerically, graphically and algebraically. <br> Use linear and quadratic graphs to estimate values of $y$ for given values of $x$ and vice versa and to find approximate solutions of simultaneous linear equations. |
| Recall multiplication and division facts up to $12 \times 12$. <br> Find factors and multiples of positive whole numbers, including common factors and common multiples. <br> Find equivalent fractions and understand that they have the same value and the same position in the linear number system. | 6F-1 Recognise when fractions can be simplified, and use common factors to simplify fractions. | Use the concepts and vocabulary of prime numbers, factors (or divisors), multiples, common factors, common multiples, highest common factor, lowest common multiple, prime factorisation, including using product notation and the unique factorisation property. <br> Simplify and manipulate algebraic expressions by taking out common factors. |


| Year 5 conceptual prerequesite | Year 6 ready-toprogress criteria | Key stage 3 applications |
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| Recall multiplication and division facts up to $12 \times 12$. <br> Find factors and multiples of positive whole numbers. <br> Find equivalent fractions. <br> Reason about the location of fractions and mixed numbers in the linear number system. | 6F-2 Express fractions in a common denomination and use this to compare fractions that are similar in value. | Order positive and negative integers, decimals and fractions. <br> Use the 4 operations, including formal written methods, applied to integers, decimals, proper and improper fractions, and mixed numbers, all both positive and negative. <br> Use and interpret algebraic notation, including: <br> $a / b$ in place of $a \div b$ <br> coefficients written as fractions rather than as decimals. |
| Reason about the location of fractions and mixed numbers in the linear number system. Find equivalent fractions. | 6F-3 Compare fractions with different denominators, including fractions greater than 1, using reasoning, and choose between reasoning and common denomination as a comparison strategy. | Order positive and negative integers, decimals, and fractions; use the number line as a model for ordering of the real numbers; use the symbols $=, \neq,<,>, \leq, \geq$ |
| Find the perimeter of regular and irregular polygons. <br> Compare angles, estimate and measure angles in degrees ( ${ }^{\circ}$ ) and draw angles of a given size. <br> Compare areas and calculate the area of rectangles (including squares) using standard units. | 6G-1 Draw, compose, and decompose shapes according to given properties, including dimensions, angles and area, and solve related problems. | Draw shapes and solve more complex geometry problems (see Mathematics programmes of study: key stage 3 - Geometry and measures). |

