Maths Learning Sequence Document Year 5/6 –2024 / 2025

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| National Curriculum KS2, pupils should be taught to: | | | | | | | | | | | | | | | | | | | | |
| * Pupils to extend their understanding of the number system and place value to include larger integers * Develop connections that pupils make between multiplication and division with fractions, decimals and percentages * Develop ability to solve a wider range of problems including increasingly complex properties of numbers and arithmetic and problems demanding efficient written methods of calculation | | | | | | * Foundation in arithmetic lead to introducing the language of algebra as a means of solving a variety of problems | | | | * Teaching in geometry and measures should consolidate and extend knowledge developed in number * Teaching should also ensure that pupils classify shapes with increasingly geometric properties and learn the vocabulary they need to describe them | | | | | | * By the end of Year 6, pupils should be fluent in written methods for all 4 operations including long multiplication and division and in working with fractions, decimals and percentages * Pupils should read, spell and pronounce mathematical vocabulary correctly | | | | |
| 4 Stages of lesson | | Recap of previous learning  Fluency | | | | | I do, We do, You do – guided practice | | | | Independent Practice | | | | | | Assessment to inform planning | | | |
| Term | | Autumn 1 | | | Autumn 2 | | | Spring 1 | | | Spring 2 | | | Summer 1 | | | | | Summer 2 | |
| **Topic** | | **Place Value** | **Addition and Subtraction** | **Multiplication and division (A)** | **Fractions A** | | **Multiplication and Division (B)** | **Fractions B** | **Decimals A**  **Decimals B** | | **Fractions/Decimals/Percentages** | **Area, Perimeter and Volume** | **Ratio and Algebra** | **Statistics** | **Position and Direction** | | | **Shape** | **Shape** | **Converting Units**  **Consolidation** |
| Prior Learning – End of Year 4 | | count in multiples of 6, 7, 9, 25 and 1,000  find 1,000 more or less than a given number  count backwards through 0 to include negative numbers  recognise the place value of each digit in a four-digit number (1,000s, 100s, 10s, and 1s)  order and compare numbers beyond 1,000  identify, represent and estimate numbers using different representations  round any number to the nearest 10, 100 or 1,000  solve number and practical problems that involve all of the above and with increasingly large positive numbers  read Roman numerals to 100 (I to C) and know that over time, the numeral system changed to include the concept of 0 and place value | add and subtract numbers with up to 4 digits using the formal written methods of columnar addition and subtraction where appropriate  estimate and use inverse operations to check answers to a calculation  solve addition and subtraction two-step problems in contexts, deciding which operations and methods to use and why | recall multiplication and division facts for multiplication tables up to 12 × 12  use place value, known and derived facts to multiply and divide mentally, including: multiplying by 0 and 1; dividing by 1; multiplying together 3 numbers | recognise and show, using diagrams, families of common equivalent fractions  count up and down in hundredths; recognise that hundredths arise when dividing an object by 100 and dividing tenths by 10  add and subtract fractions with the same denominator  recognise and write decimal equivalents of any number of tenths or hundreds  recognise and write decimal equivalents to find the effect of dividing a one- or two-digit number by 10 and 100, identifying the value of the digits in the answer as ones, tenths and hundredths  round decimals with 1 decimal place to the nearest whole number  compare numbers with the same number of decimal places up to 2 decimal places  solve simple measure and money problems involving fractions and decimals to 2 decimal places | | recognise and use factor pairs and commutativity in mental calculations  multiply two-digit and three-digit numbers by a one-digit number using formal written layout  solve problems involving multiplying and adding, including using the distributive law to multiply two-digit numbers by 1 digit, integer scaling problems and harder correspondence problems such as n objects are connected to m objects | 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 | recognise and write decimal equivalents of any number of tenths or hundreds  recognise and write decimal equivalents to find the effect of dividing a one- or two-digit number by 10 and 100, identifying the value of the digits in the answer as ones, tenths and hundredths  round decimals with 1 decimal place to the nearest whole number  compare numbers with the same number of decimal places up to 2 decimal places  solve simple measure and money problems involving fractions and decimals to 2 decimal places | |  | measure and calculate the perimeter of a rectilinear figure (including squares) in centimetres and metres  find the area of rectilinear shapes by counting squares |  | Interpret and present discrete and continuous data using appropriate graphical methods, including bar charts and time graphs  solve comparison, sum and difference problems using information presented in bar charts, pictograms, tables and other graphs | describe positions on a 2-D grid as coordinates in the first quadrant  describe movements between positions as translations of a given unit to the left/right and up/down  plot specified points and draw sides to complete a given polygon | | | compare and classify geometric shapes, including quadrilaterals and triangles, based on their properties and sizes  identify acute and obtuse angles and compare and order angles up to 2 right angles by size  identify lines of symmetry in 2-D shapes presented in different orientations  complete a simple symmetric figure with respect to a specific line of symmetry | compare and classify geometric shapes, including quadrilaterals and triangles, based on their properties and sizes  identify acute and obtuse angles and compare and order angles up to 2 right angles by size  identify lines of symmetry in 2-D shapes presented in different orientations  complete a simple symmetric figure with respect to a specific line of symmetry | convert between different units of measure [for example, kilometre to metre; hour to minute]  estimate, compare and calculate different measures, including money in pounds and pence  read, write and convert time between analogue and digital 12- and 24-hour clocks  solve problems involving converting from hours to minutes, minutes to seconds, years to months, weeks to days |
| Small Steps | | Roman numerals to 1,000  Numbers to 1,000,000  Read and write numbers to 1,000,000  Numbers to 10,000,000  Read and write numbers to 10,000,000  Powers of 10  Partition and place on number line numbers to 10,000,000  Compare and order any integer  Round within 100,000  Round any integer  Compare and order negative numbers  Calculate with negative numbers | Mental Strategies  Add integers  Subtract integers  Inverse operations and missing numbers  Reason from known facts | Multiples  Common multiples  Factors  Common factors  Rules of divisibility | Recognise equivalent fractions  Equivalent fractions and simplifying  Equivalent fractions on a number line  Convert improper fractions to mixed numbers and vice versa  Compare fractions  Order fractions  Add and subtract fractions (same denominator)  Adding fractions  Add mixed numbers  Subtract any 2 fractions  Subtract from a mixed number  Subtract 2 mixed numbers  Multi-step problems | | Multiply a 2 digit number by 2 digit  Multiply up to 4 digits by 2 digits  Solve problems with multiplication  Short Division  Divide a 4-digit number by 1 digit  Introduction to long division  Long Division with remainders  Solving problems  Order of operations  Reason from known facts | Multiply a unit fraction by an integer  Multiply a non-unit fraction by an integer  Multiply mixed numbers by an integer  Multiply fractions by fractions  Divide a fraction by an integer  Fraction of amount  Fraction of amount – find the whole | Decimals up to 2 and 3 decimal places  Place value of integers and decimals  Order and compare decimals  Round to the nearest whole number  Round to 1 and 2 decimal places  Add and subtract decimals  Multiply by 10, 100 and 1000  Divide by 10, 100 and 1000  Multiply decimals by integers  Divide decimals by integers  Multiply and divide decimals in contexts | | Equivalent fractions and decimals – tenths  Equivalent fractions and decimals hundredth and thousandth  Fractions as division  Understand percentages  Percentages as fractions and decimals  Equivalent FDP  Order FDP  Percentages of amounts | Perimeter of rectangles and rectilinear shapes  Area of rectangles  Area of compound shapes  Area of triangles  Area of parallelograms  Volume  Volume of cuboids  Compare volume and capacity | Use ratio language  Ratio and fractions  Use scale factors  Ratio problems  Proportion problems  Function machines  Form expressions  Substitutions  Formulae  Form equations  Solve equations  Find pairs of values  Solve problems with 2 unknowns | Read and interpret line graphs  Bar charts  Tables  Timetables  Read and interpret pie charts  Pie charts with percentages  Draw pie charts  The mean | The first quadrant  Four quadrants  Solve problems with coordinate  Translations  Lines of symmetry  Reflections | | | Understand and use degrees  Classify angles  Measure angles  Calculate angles around a point  Calculate angles on a straight line  Angles in a triangle  Angles in quadrilaterals | Circles  Draw shapes  3D shapes | Kilograms and kilometres  Millimeters and millilitres  Convert metric units  Miles and kilometers  Imperial measures  Convert units of time  Calculate with timetables  Go back to previous units, focus on arithmetic and FDP for Year 5  Consolidation and investigations for Year 6 |
| Declarative Knowledge - KIRFS |  | Year 5:  Know all decimals that total 1 or 10 (decimal place) eg 0.3 + 0.7 = 1 and 6.2 + 3.8 = 10  Year 6:  Consolidate all multiplication and division facts for all tables including decimals eg 8 x 7 = 56 so 8 x 0.7 = 5.6 | | | Year 5:  Consolidate all multiplication and division facts for all tables  Year 6:  Multiply and divide by 10, 100 and 1000 | | | Year 5:  Know the doubles and halves of all two digit numbers  Year 6:  Know all the square and cubed numbers to 12 x 12 | | | Year 5:  Know the prime numbers up to 100  Year 6:  Know common decimals, fractions and percentages equivalents | | | Year 5:  Know all pairs of factors of numbers up to 100  Year 6:  Know the formulae for finding the area of different shapes | | | | | Year 5:  Know the decimal and percentage equivalents of ½, ¼, ¾, 1/3, 2/3, 1/5, 1/10  Year 6:  Know the order of operations (BODMAS) | |
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| Vocabulary | | Numerals, Integer, digit, Place Value, Partition, Compare, greater than and less than, ascending, descending, calculate, negative number, power of 10, thousand, ten thousand, million, 10 million  Inverse, calculation, strategies, formal, mental methods | | | Equivalent, simplify, denominator, numerator, improper fraction, mixed number, convert, compare, order, multiply, divide, reason, known facts, order, operations | | | Unit fraction, non-unit fraction, fraction of amount, part of whole, integer, multiply, divide, round, decimal place, tenths, hundredths, thousandths, value, digit | | | Equivalent, equivalent value, compare, order, partition, fraction, decimal, percentage, out of 100, part of a whole.  Volume, cubed, capacity, Perimeter, area, compound shape, rectilinear, equilateral, isosceles, scalene, parallelogram, perpendicular | | | Charts, interpret, graph, pie chart, time, hours, minutes, seconds, mean.  Angles – acute, obtuse, reflex, point, vertices, faces, edges, quadrilaterals, triangles. | | | | | Circumference, diameter, radius, circle, net, edges, faces, vertices, operations, BODMAS. | |
| End Point (NC) | | **Year 5:**  read, write, order and compare numbers to at least 1,000,000 and determine the value of each digit  count forwards or backwards in steps of powers of 10 for any given number up to 1,000,000  interpret negative numbers in context, count forwards and backwards with positive and negative whole numbers, including through 0  round any number up to 1,000,000 to the nearest 10, 100, 1,000, 10,000 and 100,000  solve number problems and practical problems that involve all of the above  read Roman numerals to 1,000 (M) and recognise years written in Roman numerals  add and subtract whole numbers with more than 4 digits, including using formal written methods (columnar addition and subtraction)  add and subtract numbers mentally with increasingly large numbers  use rounding to check answers to calculations and determine, in the context of a problem, levels of accuracy  solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why  identify multiples and factors, including finding all factor pairs of a number, and common factors of 2 numbers  know and use the vocabulary of prime numbers, prime factors and composite (non-prime) numbers  establish whether a number up to 100 is prime and recall prime numbers up to 19  recognise and use square numbers and cube numbers, and the notation for squared (²) and cubed (³)  solve problems involving multiplication and division, including using their knowledge of factors and multiples, squares and cubes  solve problems involving addition, subtraction, multiplication and division and a combination of these, including understanding the meaning of the equals sign  solve problems involving multiplication and division, including scaling by simple fractions and problems involving simple rates  **Year 6:**  read, write, order and compare numbers up to 10,000,000 and determine the value of each digit  round any whole number to a required degree of accuracy  use negative numbers in context, and calculate intervals across 0  solve number and practical problems that involve all of the above  multiply multi-digit numbers up to 4 digits by a two-digit whole number using the formal written method of long multiplication  divide numbers up to 4 digits by a two-digit whole number using the formal written method of long division, and interpret remainders  as whole number remainders, fractions, or by rounding, as appropriate for the context  divide numbers up to 4 digits by a two-digit number using the formal written method of short division where appropriate, interpreting remainders according to the context  perform mental calculations, including with mixed operations and large numbers  identify common factors, common multiples and prime numbers  use their knowledge of the order of operations to carry out calculations involving the 4 operations  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  use estimation to check answers to calculations and determine, in the context of a problem, an appropriate degree of accuracy  identify common factors, common multiples and prime numbers | | | **Year 5**:  compare and order fractions whose denominators are all multiples of the same number  identify, name and write equivalent fractions of a given fraction, represented visually, including tenths and hundredths  recognise mixed numbers and improper fractions and convert from one form to the other and write mathematical statements > 1 as a mixed number [for example,  +  =  = 1  ]  add and subtract fractions with the same denominator, and denominators that are multiples of the same number  multiply proper fractions and mixed numbers by whole numbers, supported by materials and diagrams  multiply numbers up to 4 digits by a one- or two-digit number using a formal written method, including long multiplication for two digit numbers  multiply and divide numbers mentally, drawing upon known facts  divide numbers up to 4 digits by a one-digit number using the formal written method of short division and interpret remainders appropriately for the context  **Year 6:**  use common factors to simplify fractions; use common multiples to express fractions in the same denomination  compare and order fractions, including fractions >1  add and subtract fractions with different denominators and mixed numbers, using the concept of equivalent fractions  multiply multi-digit numbers up to 4 digits by a two-digit whole number using the formal written method of long multiplication  divide numbers up to 4 digits by a two-digit whole number using the formal written method of long division, and interpret remainders as whole number remainders, fractions, or by rounding, as appropriate for the context  divide numbers up to 4 digits by a two-digit number using the formal written method of short division where appropriate, interpreting remainders according to the context  perform mental calculations, including with mixed operations and large numbers | | | **Year 5**:  multiply proper fractions and mixed numbers by whole numbers, supported by materials and diagrams  read and write decimal numbers as fractions [for example, 0.71 =  ]  recognise and use thousandths and relate them to tenths, hundredths and decimal equivalents  round decimals with 2 decimal places to the nearest whole number and to 1 decimal place  read, write, order and compare numbers with up to 3 decimal places  solve problems involving number up to 3 decimal places  multiply and divide whole numbers and those involving decimals by 10, 100 and 1,000  **Year 6:**  multiply simple pairs of proper fractions, writing the answer in its simplest form [for example,  ×  =  ]  divide proper fractions by whole numbers [for example,  ÷ 2 =  ]  use their knowledge of the order of operations to carry out calculations involving the 4 operations  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  use estimation to check answers to calculations and determine, in the context of a problem, an appropriate degree of accuracy  identify the value of each digit in numbers given to 3 decimal places and multiply and divide numbers by 10, 100 and 1,000 giving answers up to 3 decimal places | | | **Year 5:**  read and write decimal numbers as fractions [for example, 0.71 =  ]  recognise and use thousandths and relate them to tenths, hundredths and decimal equivalents  round decimals with 2 decimal places to the nearest whole number and to 1 decimal place  read, write, order and compare numbers with up to 3 decimal places  solve problems involving number up to 3 decimal places  recognise the per cent symbol (%) and understand that per cent relates to ‘number of parts per 100’, and write percentages as a fraction with denominator 100, and as a decimal fraction  solve problems which require knowing percentage and decimal equivalents of 1/2, ¼, 1/5, 2/5, 4/5 and those fractions with a denominator of a multiple of 10 or 25  measure and calculate the perimeter of composite rectilinear shapes in centimetres and metres  calculate and compare the area of rectangles (including squares), including using standard units, square centimetres (cm²) and square metres (m²), and estimate the area of irregular shapes  estimate volume [for example, using 1 cm³ blocks to build cuboids (including cubes)] and capacity [for example, using water]  **Year 6:**  associate a fraction with division and calculate decimal fraction equivalents [for example, 0.375] for a simple fraction [for example,  ]  identify the value of each digit in numbers given to 3 decimal places and multiply and divide numbers by 10, 100 and 1,000 giving answers up to 3 decimal places  multiply one-digit numbers with up to 2 decimal places by whole numbers  use written division methods in cases where the answer has up to 2 decimal places  solve problems which require answers to be rounded to specified degrees of accuracy  recall and use equivalences between simple fractions, decimals and percentages, including in different contexts  solve problems involving the relative sizes of 2 quantities where missing values can be found by using integer multiplication and division facts  solve problems involving the calculation of percentages [for example, of measures and such as 15% of 360] and the use of percentages for comparison  solve problems involving similar shapes where the scale factor is known or can be found  solve problems involving unequal sharing and grouping using knowledge of fractions and multiples  use simple formulae  generate and describe linear number sequences  express missing number problems algebraically  find pairs of numbers that satisfy an equation with 2 unknowns  renumerate possibilities of combinations of 2 variables  recognise that shapes with the same areas can have different perimeters and vice versa  recognise when it is possible to use formulae for area and volume of shapes  calculate the area of parallelograms and triangles  calculate, estimate and compare volume of cubes and cuboids using standard units, including cubic centimetres (cm³) and cubic metres (m³), and extending to other units [for example, mm³ and km³] | | | **Year 5**:  solve comparison, sum and difference problems using information presented in a line graph  complete, read and interpret information in tables, including timetables  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  know angles are measured in degrees: estimate and compare acute, obtuse and reflex angles  draw given angles, and measure them in degrees (°)  identify:   * + angles at a point and 1 whole turn (total 360°)   + angles at a point on a straight line and half a turn (total 180°)   + other multiples of 90°   + use the properties of rectangles to deduce related facts and find missing lengths and angles   + distinguish between regular and irregular polygons based on reasoning about equal sides and angles   **Year 6**:  interpret and construct pie charts and line graphs and use these to solve problems  calculate and interpret the mean as an average  describe positions on the full coordinate grid (all 4 quadrants)  draw and translate simple shapes on the coordinate plane, and reflect them in the axes  recognise angles where they meet at a point, are on a straight line, or are vertically opposite, and find missing angles | | | | | **Year 5:**  identify 3-D shapes, including cubes and other cuboids, from 2-D representations  convert between different units of metric measure [for example, kilometre and metre; centimetre and metre; centimetre and millimetre; gram and kilogram; litre and millilitre]  understand and use approximate equivalences between metric units and common imperial units such as inches, pounds and pints  solve problems involving converting between units of time  use all four operations to solve problems involving measure [for example, length, mass, volume, money] using decimal notation, including scaling  **Year 6:**  draw 2-D shapes using given dimensions and angles  recognise, describe and build simple 3-D shapes, including making nets  compare and classify geometric shapes based on their properties and sizes and find unknown angles in any triangles, quadrilaterals, and regular polygons  illustrate and name parts of circles, including radius, diameter and circumference and know that the diameter is twice the radius  solve problems involving the calculation and conversion of units of measure, using decimal notation up to 3 decimal places where appropriate  use, read, write and convert between standard units, converting measurements of length, mass, volume and time from a smaller unit of measure to a larger unit, and vice versa, using decimal notation to up to 3 decimal places  convert between miles and kilometres | |
| Assessment | | WR end block assessments | | | NFER Autumn Y5  2024 SATS – Year 6  WR end block assessments | | | WR end block assessments | | | NFER Spring Y5  2023 SATS – Year 6  WR end block assessments | | | Year 6 SATS  WR end block assessments | | | | | NFER Summer – Y5  WR end block assessments | |