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
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| 4 Stages of lesson | Recap of previous learningFluency  | 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 1,000find 1,000 more or less than a given numbercount backwards through 0 to include negative numbersrecognise the place value of each digit in a four-digit number (1,000s, 100s, 10s, and 1s)order and compare numbers beyond 1,000identify, represent and estimate numbers using different representationsround any number to the nearest 10, 100 or 1,000solve number and practical problems that involve all of the above and with increasingly large positive numbersread 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 appropriateestimate and use inverse operations to check answers to a calculationsolve 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 × 12use 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 fractionscount up and down in hundredths; recognise that hundredths arise when dividing an object by 100 and dividing tenths by 10add and subtract fractions with the same denominatorrecognise and write decimal equivalents of any number of tenths or hundredsrecognise 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 hundredthsround decimals with 1 decimal place to the nearest whole numbercompare numbers with the same number of decimal places up to 2 decimal placessolve simple measure and money problems involving fractions and decimals to 2 decimal places | recognise and use factor pairs and commutativity in mental calculationsmultiply two-digit and three-digit numbers by a one-digit number using formal written layoutsolve 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 hundredsrecognise 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 hundredthsround decimals with 1 decimal place to the nearest whole numbercompare numbers with the same number of decimal places up to 2 decimal placessolve 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 metresfind the area of rectilinear shapes by counting squares |  | Interpret and present discrete and continuous data using appropriate graphical methods, including bar charts and time graphssolve 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 quadrantdescribe movements between positions as translations of a given unit to the left/right and up/downplot specified points and draw sides to complete a given polygon | compare and classify geometric shapes, including quadrilaterals and triangles, based on their properties and sizesidentify acute and obtuse angles and compare and order angles up to 2 right angles by sizeidentify lines of symmetry in 2-D shapes presented in different orientationscomplete 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 sizesidentify acute and obtuse angles and compare and order angles up to 2 right angles by sizeidentify lines of symmetry in 2-D shapes presented in different orientationscomplete 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 penceread, write and convert time between analogue and digital 12- and 24-hour clockssolve problems involving converting from hours to minutes, minutes to seconds, years to months, weeks to days |
| Small Steps | Roman numerals to 1,000Numbers to 1,000,000Read and write numbers to 1,000,000Numbers to 10,000,000Read and write numbers to 10,000,000Powers of 10Partition and place on number line numbers to 10,000,000Compare and order any integerRound within 100,000Round any integerCompare and order negative numbersCalculate with negative numbers  | Mental StrategiesAdd integersSubtract integersInverse operations and missing numbersReason from known facts  | MultiplesCommon multiplesFactorsCommon factorsRules of divisibility  | Recognise equivalent fractionsEquivalent fractions and simplifyingEquivalent fractions on a number lineConvert improper fractions to mixed numbers and vice versaCompare fractionsOrder fractionsAdd and subtract fractions (same denominator)Adding fractionsAdd mixed numbersSubtract any 2 fractionsSubtract from a mixed numberSubtract 2 mixed numbersMulti-step problems | Multiply a 2 digit number by 2 digitMultiply up to 4 digits by 2 digitsSolve problems with multiplicationShort DivisionDivide a 4-digit number by 1 digitIntroduction to long divisionLong Division with remaindersSolving problemsOrder of operationsReason from known facts | Multiply a unit fraction by an integer Multiply a non-unit fraction by an integerMultiply mixed numbers by an integerMultiply fractions by fractionsDivide a fraction by an integerFraction of amountFraction of amount – find the whole | Decimals up to 2 and 3 decimal placesPlace value of integers and decimalsOrder and compare decimalsRound to the nearest whole numberRound to 1 and 2 decimal places Add and subtract decimalsMultiply by 10, 100 and 1000Divide by 10, 100 and 1000Multiply decimals by integersDivide decimals by integersMultiply and divide decimals in contexts | Equivalent fractions and decimals – tenthsEquivalent fractions and decimals hundredth and thousandthFractions as divisionUnderstand percentagesPercentages as fractions and decimalsEquivalent FDPOrder FDPPercentages of amounts | Perimeter of rectangles and rectilinear shapesArea of rectanglesArea of compound shapesArea of trianglesArea of parallelogramsVolume Volume of cuboidsCompare volume and capacity | Use ratio languageRatio and fractionsUse scale factorsRatio problemsProportion problemsFunction machinesForm expressionsSubstitutionsFormulaeForm equationsSolve equationsFind pairs of valuesSolve problems with 2 unknowns | Read and interpret line graphsBar chartsTablesTimetablesRead and interpret pie chartsPie charts with percentagesDraw pie charts The mean | The first quadrantFour quadrantsSolve problems with coordinateTranslationsLines of symmetryReflections | Understand and use degreesClassify anglesMeasure anglesCalculate angles around a pointCalculate angles on a straight lineAngles in a triangleAngles in quadrilaterals | CirclesDraw shapes3D shapes | Kilograms and kilometresMillimeters and millilitresConvert metric unitsMiles and kilometersImperial measuresConvert units of timeCalculate with timetablesGo back to previous units, focus on arithmetic and FDP for Year 5Consolidation 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 = 10Year 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 100Year 6:Know common decimals, fractions and percentages equivalents | Year 5:Know all pairs of factors of numbers up to 100Year 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, 1/10Year 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 millionInverse, 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 digitcount forwards or backwards in steps of powers of 10 for any given number up to 1,000,000interpret negative numbers in context, count forwards and backwards with positive and negative whole numbers, including through 0round any number up to 1,000,000 to the nearest 10, 100, 1,000, 10,000 and 100,000solve number problems and practical problems that involve all of the aboveread Roman numerals to 1,000 (M) and recognise years written in Roman numeralsadd 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 numbersuse rounding to check answers to calculations and determine, in the context of a problem, levels of accuracysolve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and whyidentify multiples and factors, including finding all factor pairs of a number, and common factors of 2 numbersknow and use the vocabulary of prime numbers, prime factors and composite (non-prime) numbersestablish whether a number up to 100 is prime and recall prime numbers up to 19recognise 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 cubessolve problems involving addition, subtraction, multiplication and division and a combination of these, including understanding the meaning of the equals signsolve 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 digitround any whole number to a required degree of accuracyuse negative numbers in context, and calculate intervals across 0solve number and practical problems that involve all of the abovemultiply multi-digit numbers up to 4 digits by a two-digit whole number using the formal written method of long multiplicationdivide numbers up to 4 digits by a two-digit whole number using the formal written method of long division, and interpret remaindersas whole number remainders, fractions, or by rounding, as appropriate for the contextdivide 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 contextperform mental calculations, including with mixed operations and large numbersidentify common factors, common multiples and prime numbersuse their knowledge of the order of operations to carry out calculations involving the 4 operationssolve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and whysolve problems involving addition, subtraction, multiplication and divisionuse estimation to check answers to calculations and determine, in the context of a problem, an appropriate degree of accuracyidentify common factors, common multiples and prime numbers | **Year 5**:compare and order fractions whose denominators are all multiples of the same numberidentify, name and write equivalent fractions of a given fraction, represented visually, including tenths and hundredthsrecognise 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 numbermultiply proper fractions and mixed numbers by whole numbers, supported by materials and diagramsmultiply numbers up to 4 digits by a one- or two-digit number using a formal written method, including long multiplication for two digit numbersmultiply and divide numbers mentally, drawing upon known factsdivide 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 denominationcompare and order fractions, including fractions >1add and subtract fractions with different denominators and mixed numbers, using the concept of equivalent fractionsmultiply multi-digit numbers up to 4 digits by a two-digit whole number using the formal written method of long multiplicationdivide 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 contextdivide 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 contextperform mental calculations, including with mixed operations and large numbers |  **Year 5**:multiply proper fractions and mixed numbers by whole numbers, supported by materials and diagramsread and write decimal numbers as fractions [for example, 0.71 =  ]recognise and use thousandths and relate them to tenths, hundredths and decimal equivalentsround decimals with 2 decimal places to the nearest whole number and to 1 decimal placeread, write, order and compare numbers with up to 3 decimal placessolve problems involving number up to 3 decimal placesmultiply 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 operationssolve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and whysolve problems involving addition, subtraction, multiplication and divisionuse estimation to check answers to calculations and determine, in the context of a problem, an appropriate degree of accuracyidentify 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 equivalentsround decimals with 2 decimal places to the nearest whole number and to 1 decimal placeread, write, order and compare numbers with up to 3 decimal placessolve problems involving number up to 3 decimal placesrecognise 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 fractionsolve 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 25measure and calculate the perimeter of composite rectilinear shapes in centimetres and metrescalculate 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 shapesestimate 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 placesmultiply one-digit numbers with up to 2 decimal places by whole numbersuse written division methods in cases where the answer has up to 2 decimal placessolve problems which require answers to be rounded to specified degrees of accuracyrecall and use equivalences between simple fractions, decimals and percentages, including in different contextssolve problems involving the relative sizes of 2 quantities where missing values can be found by using integer multiplication and division factssolve problems involving the calculation of percentages [for example, of measures and such as 15% of 360] and the use of percentages for comparisonsolve problems involving similar shapes where the scale factor is known or can be foundsolve problems involving unequal sharing and grouping using knowledge of fractions and multiplesuse simple formulaegenerate and describe linear number sequencesexpress missing number problems algebraicallyfind pairs of numbers that satisfy an equation with 2 unknownsrenumerate possibilities of combinations of 2 variablesrecognise that shapes with the same areas can have different perimeters and vice versarecognise when it is possible to use formulae for area and volume of shapescalculate the area of parallelograms and trianglescalculate, 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 graphcomplete, read and interpret information in tables, including timetablesidentify, describe and represent the position of a shape following a reflection or translation, using the appropriate language, and know that the shape has not changedknow angles are measured in degrees: estimate and compare acute, obtuse and reflex anglesdraw 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 problemscalculate and interpret the mean as an averagedescribe positions on the full coordinate grid (all 4 quadrants)draw and translate simple shapes on the coordinate plane, and reflect them in the axesrecognise 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 representationsconvert 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 pintssolve problems involving converting between units of timeuse 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 anglesrecognise, describe and build simple 3-D shapes, including making netscompare and classify geometric shapes based on their properties and sizes and find unknown angles in any triangles, quadrilaterals, and regular polygonsillustrate and name parts of circles, including radius, diameter and circumference and know that the diameter is twice the radiussolve problems involving the calculation and conversion of units of measure, using decimal notation up to 3 decimal places where appropriateuse, 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 placesconvert between miles and kilometres |
| Assessment  | WR end block assessments | NFER Autumn Y52024 SATS – Year 6WR end block assessments | WR end block assessments | NFER Spring Y52023 SATS – Year 6WR end block assessments | Year 6 SATSWR end block assessments | NFER Summer – Y5WR end block assessments |