LOUDWATER COMBINED SKILLS
Maths: progression of skills

We have used White Rose Maths to create this document

Skills

	Reception	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Place value: counting	• Count objects, actions and sounds • Subsitise • Count beyond ten • Count verbally beyond 20	• Count to and across 100, forwards and backwards, beginning with 0 or 1, or from any given number • Count numbers to 100 in numerals; count in multiples of twos, fives and tens	• Count in steps of 2,3, and 5 from 0, and in tens from any number, forward and backward	• 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 backwards through zero to include negative numbers	• Count forwards or backwards in steps of powers of 10 for any given number up to 1 000 000 • Count forwards and backwards with positive and negative whole numbers, including through zero	
Place value: represent	• Link the number symbol (numeral) with its cardinal number value • Explore the composition of numbers to 10	• Identify and represent numbers using objects and pictorial representations • Read and write numbers to 100 in numerals • Read and write numbers from 1 to 20 in numerals and words	• Read and write numbers to at least 100 in numerals and in words • Identify, represent and estimate numbers using different representations including the number line	• Identify, represent and estimate numbers using different representations • Read and write numbers to 1000 in numerals and in words	• Identify, represent and estimate numbers using different representations • Read Roman numerals to 100 (I to C) and know that over time the numeral system changed to include the concept of zero and place value	• Read, write (order and compare) numbers to at least 1 000 000 and determine the value of each digit • Read Roman numerals to 1000 (M) and recognise years written in Roman numerals • Partition numbers to 1,000,000 • identify numbers on a number line	• Read, write (order and compare) numbers up to 10 000 000 and determine the value of each digit
Place value: using Place value to compare	• Compare numbers using language: 'more than', 'less than', 'fewer', 'same as' • Understand the 'one more than/one less than' relationship between consecutive numbers	• Given a number, identify one more and one less	• Recognise the value of each digit in a two-digit number (tens, ones) • Compare and order numbers from 0 up to 100; use <,> and = signs	• Recognise the place value of each digit in a three-digit number (hundreds, tens, one's) • Compare and order numbers up to 1000	• Find 1000 more or less than a given number • Recognise the place value of each digit in a four-digit number (thousands, hundreds, tens, and ones) • 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

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Place value: Problems and Rounding			• Use place value and number facts to solve problems	• Solve number problems and practical problems involving these ideas	• Round any number to the nearest 10, 100 or 1000 • Solve number and practical problems that involve all of the above and with increasingly large and positive numbers	• Interpret negative numbers in context • Round any number up to 1 000 000 to the nearest 10, 100, 1000, 10 000 and 100 000 • Solve number problems and practical problems that involve all of the above	• Round any whole number to a required degree of accuracy • Use negative numbers in context, and calculate intervals across zero • Solve number and practical problems that involve all of the above
Addition and subtraction: Recall, represent, Use	• Automatically recall number bonds for numbers 0-10	• 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 one number to another cannot • Recognise and use the inverse relationship between addition and subtraction and use this to check calculations and solve missing number problems	• 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	

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Addition and subtraction: 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: - A two-digit number and ones - A two-digit number and ones - Two two-digit numbers - Adding three one-digit numbers	• Add and subtract numbers mentally, including: - A three-digit number and ones - A three-digit number and tens - A three-digit number and hundreds • Add and subtract numbers with up to three digits, using formal written methods of columnar addition and subtraction	• Add and subtract numbers with up to 4 digits using the formal written methods of columnar addition and subtraction where appropriate	• Add and subtract whole numbers with more than 4 digits, including formal written methods (columnar addition and subtraction) • Add and subtract numbers mentally with increasingly large numbers	• Perform mental calculations, including with mixed operations and large numbers • Use their knowledge of the order of operations to carry out calculations involving the four operations • To add and subtract integers
Addition and subtraction: Solve problems		• Solve one-step problems that involve addition and subtraction, using concrete objects and pictorial representations and missing number problems	• Solve problems with addition and subtraction: - Using concrete objects and pictorial representation, including numbers, quantities and measures - Applying their increasing knowledge of mental and written methods	• 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 problems involving addition, subtraction, multiplication and division and a combination of these, including understanding the meaning of the equals sign	• Solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why

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Multiplication and division: Recall, represent, Use			• Recall and use multiplication and division facts for the 2, 5 and 10 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	• Recall and use multiplication and division facts for the 3, 4 and 8 multiplication tables	• Recall multiplication and division facts for multiplication tables up to 12 X 12 • Use place value, known and derived facts to multiply and divide mentally, including multiplying by 0 and 1; dividing by 1; multiplying together three numbers • Recognise and use factor pairs and commutativity in mental calculations	• Identify multiples and factors, including finding all factor pairs of a number, and common factors of two numbers • Know and use the vocabulary of prime numbers, prime factors and composite (non-prime) numbers • Establish whether a number up to 100 is prime and recall prime numbers up to 19 • Recognise and use square numbers and cube numbers, and the notion for squared and cubed	• Identify common factors, common multiples and prime numbers • Identify square and cube numbers • Use estimation to check answers to calculations and determine, in the context of a problem, an appropriate degree of accuracy • To understand the rules of divisibility.
Multiplication and division: Calculations			• Calculate mathematical statements for multiplication and division within the multiplication tables and write them using the multiplication, division and equals signs	• Write and calculate mathematical statements for multiplication and division using the multiplication tables that they know, including for two-digit numbers times onedigit numbers, using mental and progressing to formal written methods	• Multiply two-digit and three-digit number by a one- digit number using a formal written number	• Multiply numbers up to 4 digits by a one or two-digit number using a formal written method, including long multiplication for twodigit 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 • Multiply and divide whole numbers and those involving decimals by 10, 100 and 1000	• Multiply multi- digit numbers up to 4 digits by a two-digit whole number using the formal written method 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

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Multiplication and division: Solve problems		• Solve one-step problems involving multiplication and division, by calculating the answer using concrete objects, pictorial representations and arrays with the support of the teacher	• Solve problems involving multiplication and division, using materials, arrays, repeated addition, mental methods, and multiplication and division facts, involving problems in contexts	• Solve problems, including missing number problems, involving multiplication and division, including positive integer scaling problems and correspondence problems in which n objects are connected to m objects	• Solve problems involving multiplying and adding, including using the distributive law to multiply two digit numbers by one digit, integer scaling problems and harder correspondence problems such as n objects are connected to m objects	• Solve problems involving multiplication and division including using their knowledge of factors and multiples, squares and cubes • Solve problems involving multiplication and division, including scaling by simple fractions and problems involving simple rates • Solve problems including addition, subtraction, multiplication and division and a combination of these, including the meaning of the equals sign	• Solve problems involving multiplication and division • Use their knowledge of the order of operations to carry out calculations involving the four operations

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Fractions: Recognise and Write		• Find, recognise and name a half as one of two equal parts of an object, quantity or shape • Find, recognise and name a quarter as one of four equal parts of an object, quantity or shape	• Recognise, find and name fractions ½, ¼, 2/4 and ¾ of a length, shape, set of objects or quantity	• Count up and down in tenths; recognise that tenths arise from dividing an object into 10 equal parts and in dividing one-digit numbers or quantities by 10 • Recognise, find and write fractions of a discrete set of objects: unit fractions and non-unit fractions with small denominators • Recognise and use fractions as numbers: unit fractions and non-unit fractions with small denominators	• Count up and down in hundredths; recognise that hundredths arise when dividing an object by one hundred and dividing tenths by 10	• 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	
Fractions: compare			• Recognise the equivalence of 2/4 and ½	• Recognise and show, using diagrams, equivalent fractions with small denominators • Compare and order unit fractions, and fractions with the same denominators	• Recognise and show, using diagrams, families of common equivalent fractions	• Compare and order fractions whose denominators are all multiples of the same number	• Use common factors to simplify fractions; use common multiples to express fractions in the same denomination • Compare and order fractions including fractions > 1 including on a number line • Compare and order fractions (numerator) • Compare and order fractions (denominator)

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Fractions: Calculations			• Write simple fractions for example ½ of 6 = 3	• Add and subtract fractions with the same denominator within one whole	• 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 • Multiply proper fractions and mixed numbers by whole numbers, supported by materials and diagrams • Add and subtract mixed numbers	• Add and subtract fractions with different denominators and mixed numbers, using the concept of equivalent fractions • Multiply fractions by an integer • Multiply simple pairs of proper fractions, writing the answer in its simplest form • Divide proper fractions by whole numbers • Find fractions of an amount
Fractions: 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		• Solve multi-step problems with fractions (Addition, subtraction, multiplication and division).
Decimals: Recognise					• Recognise and write decimal equivalents of any number of tenths or hundredths • Recognise and write decimal equivalents to ¼, ½, ¾	• Read and write decimal numbers as fractions – 0.71 = 71/100 • Recognise and use thousandths and relate them to tenths, hundredths and decimal fractions	• Identify the value of each digit in numbers given to three decimal places
Decimals: compare					• Round decimals with one decimal place to the nearest whole number • Compare numbers with the same number of decimal places up to two decimal places	• Round decimals with two decimal places to the nearest whole number and to one decimal place • Read, write, order and compare numbers with up to three decimal places	• Read, write, order and compare numbers with up to three decimal places

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Decimals: Calculations & Problems					• Find the effect of dividing a one-digit number by 10 and 100, identifying the value of the digits in the answer as ones, tenths and hundredths	• Solve problems involving a number up to three decimal places	• Multiply and divide numbers by 10, 100 and 1000 giving answers up to three decimal places • Multiply one-digit numbers with up to two decimal places by whole numbers • Use written division methods in cases where the answer has up to two decimal places
Fractions, Decimals and Percentages					• Solve simple measure and money problems involving fractions and decimals to two decimal places	• Recognise the percent symbol and understand that percent relates to 'number of parts per hundred', and write percentages as a fraction with a denominator 100 and as a decimal • Solve problems which require knowing percentage and decimal equivalents of ½, ¼, 1/5, 2/5, 4/5 and those fractions with a denominator of a multiple of 10 or 25	• Associate a fraction with division and calculate decimal fraction equivalents • Recall and use equivalences between simple fractions, decimals and percentages, including in different contexts • Order fractions, decimals and percentages by converting. • Calculate percentages of amount • Calculate the missing whole or missing percentage when other values are given.

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Ratio and proportion							• Solve problems including 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 similar shapes where the scale factor is known or can be found • Solve problems involving unequal sharing and grouping using knowledge of fractions and multiples
Algebra	• Continue, copy and create repeating patterns.	• Solve one-step problems that involve addition and subtraction, using concrete objects and pictorial representations, and missing number problems	• Recognise and use the inverse relationship between addition and subtraction and use this to check calculations and solve missing number problems	• 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

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Measurement: Using measures	Compare length, weight and capacity.	• Compare, describe and solve practical problems for: - Lengths and heights - Mass/weight - Capacity and volume - Time	• Choose and use appropriate standard units to estimate and measure length/height in any direction (m/cm); mass (kg/g); temperature; capacity (litres/ml) to the nearest appropriate unit, using rulers, scales, thermometers and measuring vessels	• Measure, compare add and subtract lengths (m/cm/mm); mass (kg/g); volume capacity (l/ml)	• Convert between different units of measure – kilometre to metre and hour to minute	• Convert between different units of metric measure • Understand and use approximate equivalences between metric units and common imperial units such as inches, pounds and pints	Solve problems involving the calculation and conversion of units of measure, using decimal notation up to three decimal places where appropriate
Measurement: Capacity, volume & time		• Measure and begin to record the following: - Lengths and heights - Mass/weight - Capacity and volume - Time (hours, minutes, seconds)	• Compare and order lengths, mass, volume/capacity and record the results using >,< and =		• Estimate, compare and calculate different measures	• Use all four operations to solve problems involving measure using decimal notion including scaling	• 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 notion up to three decimal places • Convert between miles and kilometres
Measurement: money		• Recognise and know the value of different denominations of coins and notes	• Recognise and use symbols for pounds and pence; 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 recording pounds and pence separately	• 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	

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Measurement: Time		• Sequence events in chronological order using language (for example, before and after, next, first, today, yesterday, tomorrow, morning, afternoon and evening) • Recognise and use language relating to dates, including days of the week, weeks, months and years • Tell the time to the hour and half past the hour and draw the hands on a clock face to show these times	• Compare and sequence intervals of time • Tell and write the time to five minutes including quarter past/ to the hour and draw the hands on a clock face to show these times • Know the number of minutes in an hour and the number of hours in a day	• Tell and write the time from an analogue clock, including using Roman numerals from I to XII, and 12-hour and 24- hour clocks • Estimate and read time with increasing accuracy to the nearest minute; record and compare time in terms of seconds, minutes and hours; use vocabulary such as o'clock, a.m./p.m., morning, afternoon, noon and midnight. • Know the number of seconds in a minute and the number of days in each month, year and leap year • Compare durations of events, for example the amount of time taken by a particular event	• Read, write and convert time between analogue and digital 12- and 24- hour clocks • Solve problems involving converting from hours to minutes; minutes to seconds; years to months; weeks to days	• Solve problems involving converting between units of time	
Measurement: Perimeter, area, Volume				• Measure the perimeter of 2- D shapes	• Measure and calculate the perimeter of a rectilinear figure (including squares) in centimetres and metres • Find the area of rectilinear shapes by counting squares	• Measure and calculate the perimeter of composite rectilinear shapes in centimetres and metres • Calculate and compare the area of rectangles (including squares) and including using standard units, square centimetres and square metres and estimate the area of irregular shapes • Estimate volume • Calculate and compare volume	• Calculate area and perimeter of rectilinear shapes. • 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 and cubic metres and extending to other units (km and mm)

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Geometry: 2-d shapes	• Select, rotate and manipulate shapes in order to develop spatial reasoning skills • Compose and decompose shapes so that children recognise a shape can have other shapes within it, just as numbers can	• Recognise and name common 2- D shapes (for example, rectangles (including squares), circles and triangles)	• Identify and describe 2D shapes, including the number of sides and line of symmetry in a vertical line • Identify 2-D shapes on the surface of 3- D shape • Compare and sort common 2-D shapes and everyday objects	• Draw 2-D shapes	• Comapre3 and classify geometric shapes including quadrilaterals and triangles, based on their properties and size • Identify lines of symmetry in 2-D shapes presented in different orientations	• Distinguish between regular and irregular polygons based on reasoning about equal sides and angle • Use the properties of rectangles to deduce relating facts and find missing lengths and angles	• Draw 2-D shapes using dimensions and angles • Compare and classify geometric shapes based on their properties and sizes • Illustrate and name parts of circles, including radius, diameter and circumference and know that the diameter is twice the radius
Geometry: 3-d shapes	• Select, rotate and manipulate shapes in order to develop spatial reasoning skills • Compose and decompose shapes so that children recognise a shape can have other shapes within it, just as numbers can	• Recognise and name common 3- D shapes (for example, cuboids, (including cubes), pyramids and spheres)	• Identify and describe the properties of 3-D shapes, including the number of edges, vertices and faces	• 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
Geometry: angles and lines				• Recognise angles as a property of shape or a description of a turn • Identify right angles, recognise that two right angles make a half-turn, three make three- quarters of a turn and four a complete turn; identify whether angles are greater than or less than a right angle • Identify horizontal and vertical lines and pairs of perpendicular and parallel lines	• Identify acute and obtuse angles and compare and order angles up to two right angles by size • 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	• 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 one whole turn - Angles at a point on a straight line and ½ a turn (total 180 degrees) - Other multiples of 90 degrees	• Find unknown angles in any triangles, quadrilaterals and regular polygons • Recognise angles where they meet at a point, are on a straight line, or are vertically opposite and find missing angles

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Geometry: Position and Direction		• Describe position, direction and movement, including whole, half, quarter and three-quarter turns	• Order and arrange combinations of mathematical objects in patterns and sequences • Use mathematical vocabulary to describe position and movement, including movement in a straight line and distinguishing between rotation as a turn and in terms of right angles for quarter, half, and three-quarter turns (clockwise and anti-clockwise)		• Describe positions on a 2-D grid as coordinates in the first quadrant • Describe movements between positions as translations of a given unit to the left/right and up/down • Plot specified points and draw sides to complete a given polygon	• Identify, describe and represent the position of a shape following a reflection or translation, using the appropriate language, and know that the shape has not been changes	• Describe positions on the full coordinate grid • Draw and translate simple shapes on the coordinate plane, and reflect them in the axes
Statistics: Present and Interpret			• Interpret and construct simple pictograms, tally charts, block diagrams and simple tables	• 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 them to solve problems
Statistics: solve Problems			• Ask and answer simple questions by counting the number of objects in each category and sorting the categories by quantity • Ask and answer questions about totalling and comparing categorical data	• Solve one-step and two-step questions using information presented in scaled bar charts and pictograms and tables	• Solve comparison, sum and difference problems using information presented in bar charts, pictograms, tables and other graphs	• Solve comparison, sum and difference problems using information presented in a line graph	• Calculate and interpret the mean as an average • Illustrate and name parts of a circle • Read, interpret and draw pie charts