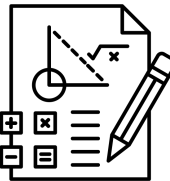


	Mathematics – Whole School Curriculum Progression Map	
	Mathematics	

At Little Green, we are determined to give children the best skills to become masters of mathematics, implementing this through consistency and the mastery approach. This includes being fluent in fundamentals, being able to reason mathematically and being able to solve problems by applying their conceptual understanding in real life situations. To ensure consistency and coverage of the National Curriculum, Little Green Junior School follows the White Rose Maths schemes.

[White Rose Maths National Curriculum Progression](#)

National Curriculum Key stage 2 [Mathematics](#)

The national curriculum for mathematics aims to ensure that all pupils:

- become fluent in the fundamentals of mathematics, including through varied and frequent practice with increasingly complex problems over time, so that pupils develop conceptual understanding and the ability to recall and apply knowledge rapidly and accurately.
- reason mathematically by following a line of enquiry, conjecturing relationships and generalisations, and developing an argument, justification or proof using mathematical language
- can solve problems by applying their mathematics to a variety of routine and nonroutine problems with increasing sophistication, including breaking down problems into a series of simpler steps and persevering in seeking solutions.

Subject Overview

Mathematics is broken down into the following areas:

Number and Place Value
Addition and Subtraction
Multiplication and Division
Fractions
Decimals
Fractions, Decimals and Percentages
Measurement
Geometry
Statistics
Ratio and Proportion (Year 6)
Algebra (Year 6)

[View Exemplar](#)

These key skills/intentions/learning/opportunities run across all areas of the **Mathematics** curriculum

Year 3	Year 4	Year 5	Year 6
Number and 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. Represent - identify, represent and estimate numbers using different representations. - read and write numbers up to 1,000 in numerals and in words. Compare - recognise the place value of each digit in a 3-digit number (100s, 10s, 1s). - compare and order numbers up to 1,000. Problems and Rounding - solve number problems and practical problems involving these ideas.	Counting - count in multiples of 6, 7, 9, 25 and 1000. - count backwards through zero to include negative numbers. Represent - 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. Compare - find 1000 more or less than a given number. - recognise the place value of each digit in a four-digit number (thousand, hundreds, tens and ones). - order and compare numbers beyond 1000. Problems and Rounding - round any number to the nearest 10, 100 or 1000. - solve number and practical problems that involve all of the above and with increasingly large positive numbers.	Counting - 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. Represent - 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. Problems and Rounding - interpret negative numbers in context. - 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.	Represent - read, write, (order and compare) numbers up to 10,000,000 and determine the value of each digit. Problems and Rounding - 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.

Year 3	Year 4	Year 5	Year 6
Addition and Subtraction			
Recall, Represent and Use - estimate the answer to a calculation and use inverse operations to check answers. Calculations - add and subtract numbers mentally, including: - a three-digit number and 1s - a three-digit number and 10s - a three-digit number and 100s - add and subtract numbers with up to 3 digits, using formal written methods of columnar addition and subtraction. Solve Problems - solve problems, including missing number problems, using number facts, place value, and more complex addition and subtraction.	Recall, Represent and Use - estimate and use inverse operations to check answers to a calculation. Calculations - add and subtract numbers with up to 4 digits using the formal written methods of columnar addition and subtraction where appropriate. Solve Problems - solve addition and subtraction two-step problems in contexts, deciding which operations and methods to use and why.	Recall, Represent and Use - use rounding to check answers to calculations and determine, in the context of the problem, levels of accuracy. Calculations - add and subtract whole numbers with more than four digits, including using formal written methods (columnar addition and subtraction) - add and subtract numbers mentally with increasingly large numbers. Solve Problems - solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why.	Calculations - perform mental calculations, including with mixed operations and large numbers. Solve Problems - solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why.

Year 3	Year 4	Year 5	Year 6
Multiplication and Division			
Recall, Represent and Use - recall and use multiplication and division facts for the 3, 4 and 8 multiplication tables. 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. Problem Solving - solve problems, including missing number problems, involving multiplication and division, including positive integer scaling problems and correspondence problems in which n objects are connected to m objects.	Recall, Represent and Use - recall multiplication and division facts for multiplication tables up to 12×12. - use place value, known and derived facts to multiply and divide mentally, including: multiplying by 0 and 1; dividing by 1; multiplying together three numbers. - recognise and use factor pairs and commutativity in mental calculations. Calculations - multiply two-digit and three-digit numbers by a one-digit number using formal written layout. Problem Solving - 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.	Recall, Represent and Use - 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 notation for squared and cubed. Calculations - 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. - multiply and divide whole numbers and those involving decimals by 10, 100 and 1,000. Problem Solving	Recall, Represent and Use - identify common factors, common multiples and prime numbers. - use estimation to check answers to calculations and determine, in the context of a problem, an appropriate degree of accuracy. Calculations - 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. Problem Solving

		• solve problems involving multiplication and division including using their knowledge of factors and multiples, squares and cubes. Combined Operations • solve problems involving multiplication and division, including scaling by simple fractions and problems involving simple rates.	• solve problems involving addition, subtraction, multiplication and division. Combined Operations • use their knowledge of the order of operations to carry out calculations involving the four operations.
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Year 3	Year 4	Year 5	Year 6
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 • 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 Compare • recognise and show, using diagrams, equivalent fractions	Recognise and Write • count up and down in hundredths, recognise that hundredths arise when dividing an object by one hundred and dividing tenths by ten. Compare • recognise and show, using diagrams, families of common equivalent fractions. Calculations • add and subtract fractions with the same denominator. Solve Problems • solve problems involving increasingly harder fractions to	Recognise and Write • 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. Compare • compare and order fractions whose denominators are all multiples of the same number. Calculations • add and subtract fractions with the same denominator and	Compare • use common factors to simplify fractions; use common multiples to express fractions in the same denomination. • compare and order fractions, including fractions > 1. Calculations • add and subtract fractions with different denominators and mixed numbers, using the concept of equivalent fractions. • multiply simple pairs of proper fractions, writing the answer in its simplest form. • divide proper fractions by whole numbers.

with small denominators - compare and order unit fractions, and fractions with the same denominators. Calculations - add and subtract fractions with the same denominator within one whole. Solve Problems - solve problems that involve all of the above	calculate quantities, and fractions to divide quantities, including non-unit fractions where the answer is a whole number.	denominators that are multiples of the same number. multiply proper fractions and mixed numbers by whole numbers, supported by materials and diagrams.	
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Year 3	Year 4	Year 5	Year 6
Decimals			
	Recognise and Write - recognise and write decimal equivalents of any number of tenths or hundredths. - recognise and write decimal equivalents to $\frac{1}{4}$, $\frac{1}{2}$ and $\frac{3}{4}$ 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. Calculations and Problems - find the effect of dividing a one or	Recognise and Write - read and write decimal numbers as fractions. - recognise and use thousandths and relate them to tenths, hundredths and decimal equivalents. Compare - 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. Calculations and Problems	Recognise and Write - Identify the value of each digit in numbers given to three decimal places. Calculations and Problems - multiply and divide numbers by 10, 100 and 1,000 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.

	two-digit number by 10 and 100, identifying the value of the digits in the answer as ones, tenths and hundredths.	• solve problems involving numbers up to three decimal places.	• solve problems which require answers to be rounded to specified degrees of accuracy.
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Year 3	Year 4	Year 5	Year 6
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 per cent relates to 'number of parts per hundred', and write percentages as a fraction with a denominator of 100, and as a decimal. • solve problems which require knowing percentage and decimal equivalents of $\frac{1}{2}$, $\frac{1}{4}$, $\frac{1}{5}$, $\frac{2}{5}$, $\frac{3}{5}$ and those fractions with a denominator of a multiple of 10 or 25.	• associate a fraction with division and calculate decimal fraction equivalents for a simple fraction ($\frac{3}{8} = 0.375$) • recall and use equivalences between simple fractions, decimals and percentages, including in different contexts.

Year 3	Year 4	Year 5	Year 6
Measurement			
Using Measures • measure, compare, add and subtract: lengths (m/cm/mm); mass (kg/g); volume/capacity (l/ml). Money • add and subtract amounts of money to give change, using	Using Measures • Convert between different units of measure. • estimate, compare and calculate different measures. Money	Using Measures • 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. • use all four operations to solve problems involving measure using	Using Measures • solve problems involving the calculation and conversion of units of measure, using decimal notation up to three decimal places where appropriate. • use, read, write and convert between standard units, converting measurements of

both £ and p in practical contexts. Time • 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, am/pm, morning, afternoon, noon and midnight. • know the number of seconds in a minute and the number of days in each month, year and leap year. • compare durations of events (for example, to calculate the time taken by particular events or tasks). Perimeter, Area and Volume • measure the perimeter of simple 2-D shapes.	• estimate, compare and calculate different measures, including money in pounds and pence. Time • read, write and convert time between 12 and 24-hour clocks. • solve problems involving converting from hours to minutes; minutes to seconds; years to months; weeks to days. Perimeter, Area and Volume • measure and calculate the perimeter of a rectilinear figure (including squares) in centimetres and metres. • find the area of rectilinear shapes by counting squares.	decimal notation, including scaling. Money • use all four operations to solve problems involving measure (for example, money). Time • solve problems involving converting between units of time. Perimeter, Area and Volume • measure and calculate the perimeter of composite rectilinear shapes in centimetres and metres. • calculate and compare the area of rectangles (including squares), and using standing units, square centimetres and square metres and estimate the area of irregular shapes. • estimate volume and capacity.	length, mass, volume and time from a smaller unit of measure to a larger unit, and vice versa, using decimal notation to up to three decimal places. • convert between miles and kilometres. Time • use, read, write and convert between standard units, converting measurements of time from a smaller unit of measure to a larger unit, and vice versa, Perimeter, Area and Volume • 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 prallelograms 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.
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Year 3	Year 4	Year 5	Year 6
Geometry			
2-D Shapes - draw 2-D shapes 3-D Shapes - make 3-D shapes using modelling materials; recognise 3-D shapes in different orientations and describe them Angles and Lines. - recognise angles as a property of shape or a description of a turn. - identify right angles, recognise that 2 right angles make a half-turn, 3 make three-quarters of a turn and 4 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.	2-D Shapes - compare and classify geometric shapes, including quadrilaterals and triangles, based on their properties and sizes. - identify lines of symmetry in 2-D shapes presented in different orientations. Angles and Lines. - identify acute and obtuse angles and compare and order angles up to two right angles by size. - complete a simple symmetric figure with respect to a specific line of symmetry. Position and Direction - 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.	2-D Shapes - distinguish between regular and irregular polygons based on reasoning about equal sides and angles. - use the properties of rectangles to deduce related facts and find missing lengths and angles. 3-D Shapes - identify 3-D shapes, including cubes and other cuboids, from 2-D representations. Angles and Lines. - 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 (total 360 degrees) - angles at a point on a straight line and $\frac{1}{2}$ a turn (total 180 degrees) - other multiples of 90 degrees. Position and Direction - identify, describe and represent the position of a shape following a reflection or translation, using the	- draw 2-D shapes using given 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. 3-D Shapes - recognise, describe and build simple 3-D shapes, including making nets. Angles and Lines. - find unknown angles in any triangles, quadrilaterals, and regular polygons. - recognise angles where they meet at a point, on a straight line, or are vertically opposite, and find missing angles. Position and Direction - describe positions on the full coordinate grid (all four quadrants). - draw and translate simple shapes on the coordinate plane, and reflect them in the axes.

		appropriate language, and know that the shape has not changed.	
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Year 3	Year 4	Year 5	Year 6
Statistics			
Present and Interpret - interpret and present data using bar charts, pictograms and tables. Solve Problems - solve one-step and two-step questions [for example 'How many more?' and 'How many fewer?'] using information presented in scaled bar charts and pictograms and tables.	Present and Interpret - interpret and present discrete and continuous data using appropriate graphical methods, including bar charts and time graphs. Solve Problems - solve comparison, sum and difference problems using information present in bar charts, pictograms, tables and other graphs.	Present and Interpret - complete, read and interpret information in tables, including timetables. Solve Problems - solve comparison, sum and difference problems using information presented in a line graph.	Present and Interpret - interpret and construct pie charts and line graphs and use these to solve problems. Solve Problems - calculate and interpret the mean as an average.

Year 3	Year 4	Year 5	Year 6
Ratio and 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 percentage 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.

Year 3	Year 4	Year 5	Year 6
Algebra			
			• use simple formulae. • generate and describe linear number sequences. • express missing number problems algebraically. • find pairs of numbers that satisfy an equation with two unknowns. • enumerate possibilities of combinations of two variables.