Year 5 Programme of Study

Mathematics Mastery is fully aligned to the National Curriculum. Our Programmes of Study outline the objectives taught throughout the year in Mathematics Mastery lessons*.

**Some National Curriculum objectives are also further embedded during Maths Meetings, see Maths Meeting termly guidance here.*

Autumn	**1. Reasoning with large whole numbers** **(2 weeks)**	• 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 • 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 • read Roman numerals to 1000 (M) and recognise years written in Roman numerals
	2. Problem solving with integer addition and subtraction **(2 weeks)**	• add and subtract numbers mentally with increasingly large numbers • add and subtract whole numbers with more than 4 digits, including using formal written methods (columnar addition and subtraction) • 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
	3. Line graphs and timetables **(2 weeks)**	• solve comparison, sum and difference problems using information presented in a line graph • complete, read and interpret information in tables, including timetables • solve problems involving converting between units of time
	4. Multiplication and division **(3 weeks)**	• identify multiples and factors, including finding all factor pairs of a number, and common factors of two numbers • recognise and use square numbers and the notation for squared (^{2}) • 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 • multiply and divide whole numbers by 10, 100 and 1000 • multiply and divide numbers mentally drawing upon known facts • solve problems involving multiplication and division including using their knowledge of factors and multiples, squares and cubes • multiply numbers up to 4 digits by a one- or two-digit number using a formal written method • 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 • solve problems involving addition, subtraction, multiplication and division and a combination of these, including understanding the meaning of the equals sign
	5. Perimeter and area **(1 week)**	• 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 (cm^2) and square metres (m^2) and estimate the area of non-rectilinear shapes

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Spring	**6. Fractions and decimals** **(3 weeks)**	• compare and order fractions whose denominators are all multiples of the same number • recognise and use thousandths and relate them to tenths, hundredths and decimal equivalents • 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, $\frac{2}{5}+\frac{4}{5}=\frac{6}{5}=1\frac{1}{5}$] • identify, name and write equivalent fractions of a given fraction, represented visually, including tenths and hundredths • read and write decimal numbers as fractions [for example, 0.71 = $\frac{71}{100}$] • 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
	7. Angles **(2 weeks)**	• 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°); angles at a point on a straight line and $\frac{1}{2}$ a turn (total 180°); other multiples of 90°
	8. Fractions, decimals and percentages **(3 weeks)**	• 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 • solve problems involving multiplication and division, including scaling by simple fractions and problems involving simple rates • recognise the per cent symbol (%) and understand that per cent relates to 'number of parts per hundred', and write percentages as a fraction with denominator 100, and as a decimal • solve problems which require knowing percentage and decimal equivalents of $\frac{1}{2}, \frac{1}{4}, \frac{1}{5}, \frac{2}{5}, \frac{4}{5}$ and fraction and decimal equivalents of percentages that are multiples of 10 and 25 • solve problems involving number up to three decimal places • use all four operations to solve problems involving measure (for example length, mass, volume, money) using decimal notation, including scaling
	9. Transformations **(2 weeks)**	• 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 • use the properties of rectangles to deduce related facts and find missing lengths and angles • describe positions on the full coordinate grid (all four quadrants) (Y6 objective) • interpret negative numbers in context, count forwards and backwards with positive and negative whole numbers, including through zero (through coordinates context)

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Summer	**10. Converting units of measure** **(2 week)**	• convert between different units of metric measure (for example, kilometre and metre; centimetre and metre; centimetre and millimetre; gram and kilogram) • multiply and divide whole numbers and those involving decimals by 10, 100 and 1000 • understand and use approximate equivalences between metric units and common imperial units such as inches, pounds and pints
	11. Calculating with whole numbers and decimals **(3 weeks)**	• use all four operations to solve problems involving measure (for example length, mass, volume, money) using decimal notation, including scaling • solve problems involving number up to three decimal places • 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 whole numbers and those involving decimals by 10, 100 and 1000
	12. 2-D and 3-D shape **(2 weeks)**	• 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 • identify 3-D shapes, including cubes and other cuboids, from 2-D representations • recognise, describe and build simple 3-D shapes, including making nets (Y6 objective) • illustrate and name parts of circles, including radius, diameter and circumference and know that diameter is twice the radius. (Y6 objective)
	13. Volume **(1 week)**	• estimate volume [for example, using 1 cm^3 blocks to build cuboids (including cubes)] and capacity [for example, using water] • recognise and use cube numbers and the notation for cubed (^{3})
	14. Problem solving **(2 weeks)**	• interpret negative numbers in context, count forwards and backwards with positive and negative whole numbers, including through zero • 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 • interpret non-integer answers to division by expressing results in different ways according to the context, including with remainders, as fractions, as decimals or by rounding (for example, 98 ÷ 4 = 4 98 = 24 r 2 = 24 21 = 24.5 ≈ 25). (Non-statutory) • calculate and interpret the mean as an average (Y6 objective)