



Year 5 Programme of Study for Mathematics

- The topics in this document should be taught in the order that they are written.
- All objectives should be taught through problem solving and encourage the development of reasoning and fluency.
- Please refer to the other planning documents for further guidance.
- Use the last week of each half term for addressing misconceptions and assessment.
- By the end of each half term, the children should have a firm understanding of the objectives highlighted in red.
- **Every lesson should include 10-15 minutes of daily arithmetic – focusing on previous learning, key number facts for the year group and the developing of conceptual understanding through the discussion of related examples.**

Daily Arithmetic

Each maths lesson should start with daily arithmetic. The focus of this time must be mental strategies and revision of learning already covered. This session should be quick and focused with discussion over strategies used. Maximum of 15 minutes before the main teaching session begins. Refer to examples in the maths folder.

Daily Ten

At the end of each day, children should be practising use key mental strategies using Daily Ten on Topmarks.

Mastery Checker		
Taught in the context of number through problem solving over the year	Line graphs and timetables	<ul style="list-style-type: none">• solve comparison, sum and difference problems using information presented in a line graph• complete, read and interpret information in tables, including timetables

Transition Fortnight. (1st 2 weeks of July.) Consolidation and assessment of key number based objectives from the previous year.	<ul style="list-style-type: none">• 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
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1st Half of Autumn term	Reasoning with number (2 weeks)	<ul style="list-style-type: none"> • read, write, order and compare numbers to at least 1 000 000 and determine the value of each digit • round any number up to 1 000 000 to the nearest 10, 100, 1000, 10 000 and 100 000 • interpret negative numbers in context, count forwards and backwards with positive and negative whole numbers, including through zero • count forwards or backwards in steps of powers of 10 for any given number up to 1000 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
	Problem solving using addition and subtraction (4 weeks)	<ul style="list-style-type: none"> • add and subtract numbers mentally with increasingly large numbers • add and subtract whole numbers with more than 4 digits • 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
	Assessment and addressing misconceptions (1 week)	Assess at the beginning of the week then plan to address misconceptions for the remainder of the sessions.

2nd Half of Autumn term	Week of Inspirational Maths / Problem solving week	Use Youcubed website/NRich to begin half term focusing on these areas: <ul style="list-style-type: none"> • Problem solving, reasoning, fluency • Mindset in Maths
	Multiplication and division (5 weeks)	<ul style="list-style-type: none"> • multiply and divide numbers mentally drawing upon known facts • multiply and divide whole numbers by 10, 100 and 1000 • multiply numbers up to 4 digits by a one- or two-digit number • divide numbers up to 4 digits by a one-digit number. Use remainders appropriately for the context • identify multiples and factors, including finding all factor pairs of a number, and common factors of two 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 • know and use the vocabulary of prime numbers, prime factors and composite (non-prime) numbers
	Assessment and addressing misconceptions (1 week)	Assess at the beginning of the week then plan to address misconceptions for the remainder of the sessions.



1 st Half of Spring term	Proportionality [Fractions] (4 weeks) Relate all of these objectives to percentages and decimals	<ul style="list-style-type: none"> compare and order fractions whose denominators are all multiples of the same number 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, $0.71 = \frac{71}{100}$] 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
	Assessment and addressing misconceptions (1 week)	Assess at the beginning of the week then plan to address misconceptions for the remainder of the sessions.

2 nd Half of Spring term	Proportionality [Decimals] (3 weeks)	<ul style="list-style-type: none"> read, write, order and compare numbers with up to three decimal places recognise and use thousandths and relate them to tenths, hundredths and decimal equivalents round decimals with two decimal places to the nearest whole number and to one decimal place multiply and divide whole numbers and those involving decimals by 10, 100 and 1000 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
	Proportionality [Percentages] (2 weeks)	<ul style="list-style-type: none"> 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 those fractions with a denominator of a multiple of 10 or 25
	Assessment and addressing misconceptions (1 week)	Assess at the beginning of the week then plan to address misconceptions for the remainder of the sessions.



1st Half of Summer term	Angles, 2D and 3D shape and transformations (3 weeks)	<ul style="list-style-type: none"> • know angles are measured in degrees: estimate and compare acute, obtuse and reflex angles • draw given angles, and measure them in degrees ($^{\circ}$) • 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° • identify 3-D shapes, including cubes and other cuboids, from 2-D representations • 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 • 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
	Converting units – weight, length, perimeter and time (2 weeks)	<ul style="list-style-type: none"> • measure and calculate the perimeter of composite rectilinear shapes in centimetres and metres • convert between different units of metric measure (for example, kilometre and metre; centimetre and metre; centimetre and millimetre; gram and kilogram; litre and millilitre) • solve problems involving converting between units of time • understand and use approximate equivalences between metric units and common imperial units such as inches, pounds and pints
	Assessment and addressing misconceptions (1 week)	Assess at the beginning of the week then plan to address misconceptions for the remainder of the sessions.

2nd Half of Summer term Last two weeks of the term are dedicated to transition weeks	Introduction of Formal written methods of calculation (3 weeks)	<ul style="list-style-type: none"> • add and subtract whole numbers with more than 4 digits, including using formal written methods (columnar addition and subtraction) • see appendix to the calculation policy
	Calculating with whole numbers and decimals (2 weeks)	<ul style="list-style-type: none"> • consolidation of understanding of calculation from the year through the use of problem solving in a range of contexts.
	Assessment and addressing misconceptions (1 week)	Assess at the beginning of the week then plan to address misconceptions for the remainder of the sessions.