**Mathematics Overview Year 5/6**

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| **Ongoing Learning Objectives**   |
| Year 5* Count forwards or backwards in steps of powers of 10 for any given number up to 1,000,000;
* ~~Interpret negative numbers in context~~, count forwards and backwards with positive and negative whole numbers, including numbers through zero;
* Recall multiplication and division facts for multiplication tables up to 12 x 12 (Y4).
 | Year 6* Count forwards/backwards in steps of powers of 10 for any given number up to 1,000,000 (Y5);
* ~~Interpret negative numbers in context~~, count forwards and backwards with positive and negative whole numbers, including through zero (Y5);
* Recall multiplication and division facts for multiplication tables up to 12 x 12 (Y4).
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| **Term** | **Weeks** |
|  | **1** | **2** | **3** | **4** | **5** | **6** | **7** | **8** | **9** | **10** | **11** | **12** |
| **1** | Place Value | Calculation(4 rules) | Fractions | Calculation(recall) | Meas. |
| **2** | Calc. | Fractions/ Decimals/ Percentages | Measurement | Ratio & Prop (Y6)Decimals (Y5) | Algebra (Y6)Calculation (Y5) | Geometry |
|  | **Year 6 Ongoing throughout term 2:*** Children need opportunities to develop/practise their calculation skills, using both the written methods and mental methods and apply these when reasoning and problem solving;
* Pupils need daily arithmetic practise.
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| **3** | Y6 Revision | **SATs**moveable | Investigations/ Consolidation (Y6) |
| Place Value/ Calculation (Y5) | Geometry(Y5) | Stats(Y5) | Fractions(Y5) | Measures(Y5) | *Catch Up!*(Y5) |

**Do NOT extend the Year 5 children by giving them the Y6 work or objectives. Use support from NCETM to ‘drill down’ into the objectives and give the children lots of opportunities for reasoning and to apply fluency.**

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| **Term** | **Area** | **Learning Objective** |
| **1** | **Place Value** | **Year 5*** 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;
* 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
 | **Year 6*** Read, write, order and compare numbers to at least 10,000,000 and determine the value of each digit;
* Read, write, order and compare numbers with up to three decimal places (Y5);
* Identify the value of each digit in numbers given to three decimal places and multiply and divide numbers by 10, 100 and 1000 giving answers up to 3 decimal places;
* Interpret negative numbers in context, (Y5);
* Use negative numbers in context and calculate intervals across 0;
* Round any number to a required degree of accuracy;
* Solve number problems and practical problems that involve all of the above.
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| **Calculation** | **Year 5*** Add and subtract numbers mentally with increasingly large numbers;
* Multiply and divide numbers mentally, drawing upon known facts;
* Use rounding to check answers to calculations and determine, in the context of a problem, levels of accuracy;
* Multiply and divide whole numbers and those involving decimals by 10, 100 and 1000.
* Add and subtract whole numbers with more than 4 digits, including using formal written methods (columnar addition and subtraction);
* Solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why;
* 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;
* 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;
 | **Year 6*** Add and subtract whole numbers with more than 4 digits, including using formal written methods (columnar addition and subtraction) (Y5);
* Add and subtract numbers mentally with increasingly large numbers (Y5);
* Solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why;
* Multiply multi-digit numbers up to 4 digits by a two-digit whole number using the formal written method of long multiplication;
* Multiply one-digit numbers with up to two decimal places by whole numbers;
* 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;
* Use written division methods in cases where the answer has up to two decimal places;
* Solve problems which require answers to be rounded to specified degrees of accuracy;
* Use estimation to check answers to calculations and determine, in the context of a problem, an appropriate degree of accuracy;
* Solve problems using addition, subtraction, multiplication and division.
* Perform mental calculations, including with mixed operations and large numbers;
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| **Fractions** | **Year 5*** Compare and order fractions whose denominators are all multiples of the same number;
* 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;
 | **Year 6*** Use common factors to simplify fractions; use common multiples to express fractions in the same denomination;
* Compare and order fractions, including fractions >1;
* 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 [for example, ¼ x ½ = $\frac{1}{8}$].
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| **Calculation****(recall)** | **Year 5*** Identify multiples and factors, including finding all factor pairs of a number and common factors of 2 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 (²) and cubed (³);
 | **Year 6*** Identify common factors, common multiples and prime numbers;
* Know and use the vocabulary of prime numbers, prime factors and composite (non-prime) numbers (Y5);
* Establish whether a number up to 100 is prime and recall prime numbers up to 19 (Y5);
* Recognise and use square numbers and cube numbers and the notation for squared (2) and cubed (3) (Y5);
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|  | **Measures** | **Year 5*** Solve problems involving converting between units of time.
 | **Year 6*** 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 notation up to three decimal places;
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| **2** | **Calculation** | **Year 5*** Use all four operations to solve problems involving measure [for example, length, mass, volume, money];
 | **Year 6*** Use their knowledge of the order of operations to carry out calculations involving the four operations;
* Solve problems using addition, subtraction, multiplication and division.
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| **Fractions, decimals & percentages** | **Year 5*** Solve problems involving numbers up to three decimal places;
* Identify, name and write equivalent fractions of a given fraction, represented visually, including tenths and hundredths;
* Recognise mixed numbers and improper fractions and convert them 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$\frac{1}{5}$];
* 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 ½, ¼, $\frac{1}{5}$, $\frac{2}{5}$ and those fractions with a denominator of a multiple of 10 or 25.
 | **Year 6*** multiply and divide numbers by 10, 100 and 1000 giving answers up to 3 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;
* Solve problems which require answers to be rounded to specified degrees of accuracy;
* Associate a fraction with division and calculate decimal fraction equivalents [for example, 0.375] for a simple fraction [for example, $\frac{3}{8}$];
* Solve problems involving the calculation of percentages [e.g. of measures such as 15% of 360°] and the use of percentages for comparison;
* Recall and use equivalences between simple fractions, decimals and percentages including in different contexts.
* Divide proper fractions by whole numbers [for example, $\frac{1}{3}$ ÷ 2 = $\frac{1}{6}$];
* 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 [for example, ¼ x ½ = $\frac{1}{8}$];
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| **Measures** | **Year 5*** 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 (cm²) and square metres (m²) and estimate the area of irregular shapes
* Estimate volume [for example, using 1cm³ blocks to build cuboids (including cubes)] and capacity [for example using water.
 | **Year 6*** 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 parallelograms and triangles;
* Calculate, estimate and compare volumes 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].
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| **Ratio & Proportion (Y6)****Decimals (Y5)** | **Year 5*** Read and write decimal numbers as fractions [for example, 0.71 = $\frac{71}{100}$];
* 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;
* Read, write order and compare numbers with up to three decimal places;
 | **Year 6*** 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 similar shapes where the scale factor is known or can be found;
* Solve problems using unequal sharing or grouping using knowledge of fractions and multiples.
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| **Algebra Y6****Calculation Y5** | **Year 5*** Add and subtract whole numbers with more than 4 digits, including using formal written methods (columnar addition and subtraction);
* Solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why;
* 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;
* 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;
 | **Year 6*** Use simple formulae;
* Generate and describe linear number sequences;
* Express number sequences algebraically;
* Find pairs of numbers that satisfy number sentences involving two unknowns;
* Enumerate possibilities of combinations of two variables.
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| **Geometry** | **Year 5*** 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 ½ a turn (total 180°)
* Other multiples of 90°;
 | **Year 6*** ~~Compare and classify geometric shapes based on their properties and sizes and~~ 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.
* Draw 2-D shapes using given dimensions and angles;
* Recognise, describe and build simple 3-D shapes, including making nets;
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| **3** | **Place value /Calculation Y5**  | **Year 5*** 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;
* Solve number problems and practical problems that involve all of the above
* Use all four operations to solve problems involving measure [for example, length, mass, volume, money];
* Add and subtract whole numbers with more than 4 digits, including using formal written methods (columnar addition and subtraction);
* Solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why;
* 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;
* 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;
 | **Year 6 – Learning Objectives still to be covered*** **Measures** – convert between miles and kilometres;
* **Geometry (properties of shape)** – illustrate and name parts of circle, including radius, diameter and circumference and know that the diameter is twice the radius;
* **Geometry (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;
* **Statistics** – interpret and construct pie charts and line graphs and use these to solve problems
* Calculate and interpret the mean as an average.

***For revision purposes, do not forget learning objectives that have not arisen at year six, such as Roman Numerals etc.*** |
| **Geometry Y5** | **Year 5*** 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 3-D shapes, including cubes and other cuboids, from 2-D representations;
* 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.
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| **SAT week Y6****Stats Y5** | **Year 5*** Solve comparison, sum and difference problems using information presented in a line graph;
* Complete, read and interpret information in tables, including timetables.
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| **Measures Y5** | **Year 5*** Multiply and divide whole numbers and those involving decimals by 10, 100 and 1000.
* Convert between different units of metric measure (for example, kilometre and metre; centimetre and metre; centimetre and millimetre; gram kilogram; litre and millilitre);
* Use all four operations to solve problems involving measure [for example, length, mass, volume, money];
* Understand and use approximate equivalences between metric units and common imperial units such as inches, pounds and pints;
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