LONG TERM PLAN Year 5

Number and place value:

- read, write, order and compare numbers to at least 1 000 000 and determine the value of each digit
  - read and write numbers to at least *100 000* and determine the value of each digit A1
  - compare and order numbers up to *100 000* A1
  - read and write numbers to 1 000 000 and determine the value of each digit A2
  - compare and order numbers to 1 000 000 A2
- count forwards or backwards in steps of powers of 10 for any given number up to 1 000 000
  - *count forwards or backwards in 10s, 100s and 1000s, from any number up to 100 000 A2*
  - count forwards or backwards in steps of powers of 10 for any number up to 1 000 000 A3
- interpret negative numbers in context, count forwards and backwards with positive and negative whole numbers, including through zero
  - count forwards and backwards with positive and negative whole numbers including through zero A1
  - interpret negative numbers in context A1
- round any number up to 1 000 000 to the nearest 10, 100, 1000, 10 000 and 100 000
  - *round any number up to 100 000 to the nearest 10, 100, 1000 or 10 000 A1*
  - round any number up to 1 000 000 to the nearest 10, 100, 1000, 10 000 and 100 000 A2
- solve number problems and practical problems that involve all of the above
  - *solve number problems and practical problems using the mental skills in this unit A1/A3*
- read Roman numerals to 1000 (M) and recognise years written in Roman numerals
  - read Roman numerals to *200 (1-CC)* A1
  - read Roman numerals to *500 (1-D)* A2
  - read Roman numerals to 1000 (1-M) A3
  - recognise years written in Roman Numerals A3

Addition and subtraction:

- add and subtract whole numbers with more than 4 digits, including using formal written methods (columnar addition and subtraction)
  - add and subtract whole numbers with more than 4 digits, including using formal written methods (columnar addition and subtraction) C1/C3
- add and subtract numbers mentally with increasingly large numbers
  - *add and subtract small multiples of 100 and a 1000 with a 4 digit number mentally (e.g. 1485 – 300) A1*
  - *add and subtract multiples of 100 and a 1000 with a 4 digit number mentally (e.g. 1485-600) A2*
  - add and subtract numbers mentally with increasingly large numbers *(e.g. 12 462-2300)* A3
- use rounding to check answers to calculations and determine, in the context of a problem, levels of accuracy
  - *use rounding to help me estimate my mental calculations A2/A3*
  - use rounding to check answers to calculations and determine, in the context of a problem, levels of accuracy C1/C2/C3
- solve addition and subtraction multi-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 C1

Multiplication and division:

- identify multiples and factors, including finding all factor pairs of a number, and common factors of two numbers
  - identify multiples and factors of a number A2
  - identify all factor pairs of a number and common factors of two numbers A3
  - *use and understand the terms factor and multiple C2*
- know and use the vocabulary of prime numbers, prime factors and composite (non-prime) numbers
  - know and can use the vocabulary of prime numbers, prime factors and composite (non-prime numbers) C1
  - *use and understand the term prime number C2*
- establish whether a number up to 100 is prime and recall prime numbers up to 19
  - establish whether a number up to 100 is prime and recall prime numbers up to 19 C1
- 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 numbers up to 4 digits by a *one-digit* number using a formal written method C1
  - multiply numbers up to *3 digits by a two-digit* number using the formal written method of long multiplication for two-digit numbers C2
  - 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 C3
- multiply and divide numbers mentally drawing upon known facts
  - multiply and divide numbers mentally drawing upon known facts A1/A3
  - *use multiplication and division as inverses C1/C2/C3*
  - *begin to write laws algebraically (e.g. distributive law as a(b + c) = ab + ac C3*
- 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
  - divide numbers up *to 2 digits by* a one-digit number using the formal written method of short division and interpret remainders appropriately for the context C1
  - divide numbers up to *3 digits* by a one-digit number using the formal written method of short division and interpret remainders appropriately for the context C2
  - 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 C3
- multiply and divide whole numbers and those involving decimals by 10, 100 and 1000
  - multiply and divide whole numbers and those involving decimals by 10, 100 and 1000 C1/C2
- recognise and use square numbers and cube numbers, and the notation for squared (²) and cubed (³)
  - *use and understand the terms square and cube numbers C2*
  - recognise and use square numbers and cube numbers C2
  - use the notation for squared (²) & cubes (³) C2

- solve problems involving multiplication and division including using their knowledge of factors and multiples, squares and cubes
  - *solve problems involving mental multiplication and division by splitting them into their factors A2*
  - solve problems involving multiplication and division including using their knowledge of factors and multiples, squares and cubes C2
- solve problems involving addition, subtraction, multiplication and division and a combination of these, including understanding the meaning of the equals sign
  - solve problems involving addition, subtraction, multiplication and division and a combination of these, including understanding the meaning of the equals sign C1/C3
- solve problems involving multiplication and division, including scaling by simple fractions and problems involving simple rates
  - solve problems involving multiplication and division, including scaling by simple fractions and problems involving simple rates C2

Fractions (including decimals and percentages):

- compare and order fractions whose denominators are all multiples of the same number
  - *count in thousandths D1*
  - *know how to count in thousandths in both decimals & fractions D2*
  - *count in thousandths and know how to write them as both decimals and fractions D3*
  - *count forwards in simple fractions D1*
  - *count backwards in simple fractions D2*
  - *count forwards and backwards in simple fractions D3*
  - compare fractions with the same denominator and multiples of the same number D1
  - order fractions whose denominators are multiples of the same number D2
  - compare and order fractions whose denominators are all multiples of the same number D3
- identify, name and write equivalent fractions of a given fraction, represented visually, including tenths and hundredths
  - identify, name and write equivalent fractions of a given fraction, represented visually D1
  - identify, name and write equivalent fractions of a given fraction, represented visually, including tenths and hundredths D3
- 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, $\frac{2}{5} + \frac{4}{5} = \frac{6}{5} = 1\frac{1}{5}$]
  - *convert from an improper fraction to a mixed number D1*
  - convert from an improper fraction to a mixed number and vice versa D2
  - 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, 2/5 + 4/5 = 6/5 = 11/5] D1/D2
  - recognise mixed numbers and improper fractions and convert from *an improper fraction to a mixed number and vice versa and represent these numbers on a number line D3*
- add and subtract fractions with the same denominator and denominators that are multiples of the same number
  - *mentally add tenths and one-digit whole numbers and tenths D1*
  - *mentally subtract tenths and one-digit whole numbers and tenths D2*
  - *mentally add and subtract tenths and one-digit whole numbers and tenths D3*
  - add fractions with the same denominator and denominators that are multiples of the same number D1
  - add and subtract fractions with the same denominator and denominators that are multiples of the same number D2
  - add and subtract fractions with the same denominator and multiples of the same number *simplifying my answer or giving it as a mixed number D3*
- multiply proper fractions and mixed numbers by whole numbers, supported by materials and diagrams
  - multiply proper fractions by whole numbers, supported by materials and diagrams D1
  - multiply mixed numbers by whole numbers, supported by materials and diagrams D2
  - multiply proper fractions and mixed numbers by whole numbers, supported by materials and diagrams D3
  - *make the connection between finding a 'fraction of' and multiplying by a fraction D1/D3*
  - *solve problems involving finding fractions of amounts and write remainders as a fraction D3*
- read and write decimal numbers as fractions [for example, 0.71 = $\frac{71}{100}$]
  - read and write decimal numbers as fractions A1
  - *say, read and write decimal fractions and related tenths accurately D1*
  - *say, read and write decimal fractions and related tenths, and hundredths accurately D2*
  - *say, read and write decimal fractions and related tenths, hundredths and thousandths accurately D3*
  - read and write decimal numbers as fractions [for example, 0.71 = 71/100] D2/D3
- recognise and use thousandths and relate them to tenths, hundredths and decimal equivalents
  - *recognise and use tenths and hundredths and give decimal equivalents A2*
  - recognise and use thousandths and relate them to tenths, hundredths and decimal equivalents A3
- round decimals with two decimal places to the nearest whole number and to one decimal place
  - round decimals with two decimal places to the nearest whole number A2
  - round decimals with two decimal places to the nearest whole number and to one decimal place A3
- read, write, order and compare numbers with up to three decimal places
  - read and write numbers with up to 2 decimal places A1/B1/A2/B2
  - read and write numbers with up to 3 decimal places A3/B3
  - compare and order numbers with the same number of decimal places up to 2 decimal places A1/B1
  - compare and order numbers with *up to 2* decimal places A2/B2
  - compare and order numbers with up to 3 decimal places A3/B3
- solve problems involving number up to three decimal places
  - *add decimals, including a mix of whole numbers and decimals, decimals with different numbers of decimals places D1*
  - *add and subtract decimals, including a mix of whole numbers and decimals, decimals with different numbers of decimals places D2*
  - *add and subtract decimals, including a mix of whole numbers and decimals, decimals with different numbers of decimals places and complements of 1 (e.g. 0.83 + 0.17 = 1)*
  - solve problems *and puzzles* involving numbers up to three decimal places, *check my answers for reasonablenessD1*

- solve problems *and puzzles* involving numbers up to three decimal places, *check my answers for reasonableness and round where appropriate D2/D3*

- 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
  - *know a percentage is a proportion of a quantity D1*
  - *know a percentage is an operator D2*
  - *know a percentage is a proportion of a quantity as well as an operator D3*
  - *understand that fractions, decimals and percentages are all different ways of expressing proportions D1/D2/D3*
  - represent the per cent symbol (%) & understand that per cent relates to 'number of parts per hundred' D1
  - represent the per cent symbol (%) & understand that per cent relates to 'number of parts per hundred' & write percentages as a fraction with denominator hundred D2
  - represent the per cent symbol (%) & understand that per cent relates to 'number of parts per hundred' & write percentages as a fraction with denominator hundred and as a decimal D3
  - *make connections between percentages, fractions and decimals (e.g. 100% represents a whole quantity and 1% is 1/100, 50% is 50/100, 25% is 25/100) and relate this to 'fractions of' D2*
  - *make connections between percentages, fractions and decimals D3*
- 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
  - solve problems which require knowing percentage and decimal equivalents of 1/2, 1/4, 1/5, 2/5, 4/5 D1
  - solve problems which require knowing percentage and decimal equivalents of 1/2, 1/4, 1/5, 2/5, 4/5 and those fractions with a denominator of a multiple of 10 or 25 D2/D3

ALSO: *recognise and describe linear number sequences, including those involving fractions and decimals, and find the term-to-term rule C3*

Measurement

- convert between different units of metric measure (for example, kilometre and metre; centimetre and metre; centimetre and millimetre; gram and kilogram; litre and millilitre)
  - convert between different units of metric measure (e.g. kilometre and metre; centimetre and metre; centimetre and millimetre) E1
  - convert between different units of metric measure (e.g. kilometre and metre; centimetre and metre; centimetre and millimetre; gram and kilogram) E2
  - convert between different units of metric measure (e.g. kilometre & metre; centimetre & metre; centimetre & millimetre; gram & kilogram; litre & millilitre E3
  - *use my knowledge of place value and multiplication and division to convert between standard units E2/E3*
- understand and use approximate equivalences between metric units and common imperial units such as inches, pounds and pints
  - *know the names of metric units and some common imperial units E1*
  - *know the names of metric units and common imperial units E2*
  - *know the names of metric units and an increasing number of common imperial units E3*
  - understand approximate equivalences between metric units and common imperial units such as inches, pounds and pints E2
  - understand and use approximate equivalences between metric units and common imperial units such as inches, pounds and pints E3
- measure and calculate the perimeter of composite rectilinear shapes in centimetres and metres
  - measure and calculate the perimeter of composite rectilinear shapes in centimetres and metres E1
- 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
  - calculate and compare the area of rectangles (including squares) and *related composite shapes* including using standard units, square centimetres (cm²) and square metres (m²) and estimate the area of irregular shapes E2
- estimate volume [for example, using 1 cm³ blocks to build cuboids (including cubes)] and capacity [for example, using water]
  - estimate volume (e.g. using 1 cm³ blocks to build cuboids (including cubes)) and capacity (e.g. using water) E3
- solve problems involving converting between units of time
  - *use all four operation in problems involving time including conversions (e.g. days to weeks, leaving the answers as weeks and days) E1*
  - solve problems involving converting between units of time E1/E2
  - *use coordinates and scales to solve problems involving interpreting time graphs E2*
- use all four operations to solve problems involving measure [for example, length, mass, volume, money] using decimal notation, including scaling
  - use all four operations to solve problems involving money, including conversions E1
  - *solve problems using the relations of perimeter and area to find unknown lengths. Missing length questions such as these can be expressed algebraically 4 + 2b = 20 for a rectangle of sides 2cm and b cm and perimeter 20cm) E2*
  - use all four operations to solve problems involving measures (e.g. length, mass, volume, money) using decimal notation including scaling E3

Properties of shape

- identify 3-D shapes, including cubes and other cuboids, from 2-D representations
  - identify 3-D shapes, including cubes and other cuboids, from 2-D representations B1/B3
- know angles are measured in degrees: estimate and compare acute, obtuse and reflex angles
  - know angles are measured in degrees B1/B2
  - estimate acute, obtuse and reflex angles B1/B2
  - estimate and compare acute, obtuse and reflex angles B3
- draw given angles, and measure them in degrees (°)
  - draw given angles and measure them in degrees (°) B1
- identify:
  angles at a point and one whole turn (total 360°)

- identify angles at a point and one whole turn (total 360°) B1/B2/B3

angles at a point on a straight line and $\frac{1}{2}$ a turn (total 180°)

- identify angles at a point on a straight line and 1/2 a turn (total 180°) B2/B3

other multiples of 90°

- identify other multiples of 90° B3
- *use angle sum facts and other properties to make deductions about missing angles and relate these to missing number problems B3*

- use the properties of rectangles to deduce related facts and find missing lengths and angles
  - use the properties of rectangles to deduce related facts and find missing lengths B1
  - use the properties of rectangles to deduce related facts and find missing lengths and angles B2/B3
  - *use the term diagonal and make conjectures about the angles formed by diagonals and sides, and other properties of quadrilaterals, for example using dynamic geometry ICT tools B1/B2*
  - *draw lines with a ruler to the nearest millimetre B2*
  - *use conventional marking for parallel lines and right angles B3*
- distinguish between regular and irregular polygons based on reasoning about equal sides and angles
  - distinguish between regular and irregular polygons based on reasoning about equal sides and angles B2/B3

Position and direction

- 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
  - identify, describe and represent the position of a shape following a translation, using the appropriate language and know that the shape has not changed B1
  - 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 B2
  - *recognise and use reflection and translation in a variety of diagrams, including continuing to use a 2-D grid and coordinates in the first quadrant. Reflection should be in lines that are parallel to the axes B3*

Statistics

- solve comparison, sum and difference problems using information presented in a line graph
  - solve comparison, sum and difference problems using information presented in a line graph E2/E3
- complete, read and interpret information in tables, including timetables
  - read and interpret information in tables, including timetables E1/E3
  - complete information in tables, including timetables E1/E2
  - *begin to decide which representations of data are most appropriate and why E3*